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A FRAMEWORK OF CRITICAL SUCCESS FACTORS FOR BUSINESS ORGANIZATIONS
THAT LEAD TO PERFORMANCE EXCELLENCE BASED ON A FINANCIAL AND
QUALITY SYSTEMS ASSESSMENT

by

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ABSTRACT

One of the most important tasks that business leaders undertake in order to achieve a superior market position is strategic planning. Beyond this obligation, business owners desire to maximize profit and maintain steady growth. In order to do this, resources must be invested in the most efficient way possible in order to achieve performance excellence. Adjusting business operations quickly, however, especially in times of economic uncertainty, is extremely difficult. Business leaders therefore need insight into which elements of organizational improvement are most effective in order to strategically invest their resources to achieve superior performance in the most efficient way possible.

This research examines the results of companies which have a demonstrated ability to achieve performance excellence as defined by the National Institute of Standards and Technology's Malcolm Baldrige Criteria for Performance Excellence. This research examined award-winning applications to determine common input factors, compared the business results of a subset of those award-winners with the overall market for a time-frame of 11 years, and then investigated the profitability, liquidity, debt management, asset management, and per share performance ratios of award-winners compared with their industry peers over 11 years as well.

The main focus of this research is to determine whether participation in performance excellence best practices have created value for shareholders and business owners. This objective is achieved through the analysis of performance results of award winning companies. This research demonstrates that the integration of efforts associated with performance excellence is in-fact advantageous.

There is a special and rare group of people who love to learn and continuously improve. Of this group, there is an even rarer subset of those who are willing to be vulnerable and invest themselves in the lives of others to help them along their journey. These are the precious, valuable, and hard-to-find gems of the world. They are the kind of people who teach you about the importance and power of asking the right questions. These are the people who are willing to risk everything to forever change the lives of those with whom they come in contact. This research is dedicated to them.

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LIST OF ACRONYMS

AET	Accrued Expenses Turnover
APT	Accounts Payable Turnover
BVPS	Book Value per Share
C&ET	Cash & Equivalents Turnover
CEO	Chief Executive Officer
CFpS	Cash Flow per Share
CR	Current Ratio
CTR	Calculated Tax Rate %
EBITDA	Earnings Before Interest Taxes Depreciation and Amortization
GDP	Gross Domestic Product
IC	Interest Coverage
IT	Inventory Turnover
LTdTE	LT Debt to Equity
MBCPE	Malcolm Baldrige Criteria for Performance Excellence
MBNQA	Malcolm Baldrige National Quality Award
MBTI	Myers-Briggs Type Indicator
NAICS	North American Industry Classification System
NBER	National Bureau of Economic Research
NCA	Net Current Asset
NIST	National Institute of Standards and Technology

PP&ET	Property Plant & Equip Turnover
QR	Quick Ratio
RT	Receivables Turnover
RpE	Revenue per Employee
ROA	Return on Assets
ROE	Return on Equity
ROI	Return on Investment
ROS	Return on Sales
SIC	Standard Industrial Classification
SML	Security Market Line
SWOT	Strengths, Weaknesses, Opportunities, Threats
TA	Total Assets
TAT	Total Asset Turnover
TDtE	Total Debt to Equity
TQM	Total Quality Management

CHAPTER 1: INTRODUCTION

1.1 Relevant Background to this Research

Economic constraints and fiscal pressures add to the complexity of the environment in which businesses operate, thus making it more difficult for companies to sustain or improve performance results. Facing these changes objectively can, however, become a catalyst which drives businesses toward adaptation and a position of strength (Porter, 2010). The purpose of this research is to examine the business results of companies who have won the Malcolm Baldrige National Quality Award in relation to companies who have not, in order to determine whether award-winning companies are indeed superior. This research adds to the body of knowledge by integrating multiple measurement approaches and examining business performance over an 11-year time span which includes downward economic pressure.

The pace of organizational change is higher than in the past due to advances in technology as well as the integration of various national economies around the world. There is a greater pressure on business leaders today to maximize the capability for business performance to the best degree possible. Maintaining a strong economic position is important in order to ensure that the company is positioned to maintain and improve its viability and strength into the future. This task is made especially difficult for leaders when there is a tough and volatile economic environment in which they must operate their businesses.

A professor of Economics at Northeastern University cited the decade between 2000 and 2010 a "lost decade" for the nation's economy. He cited that the performance of the economy in

the United States during that decade had been worse than in the past 70 years in terms of producing additional real output (GDP), new payroll employment opportunities, or any employment for workers who are aged sixteen and over. Total payroll employment at the end of 2010 was below its level ten years earlier. This had not previously happened since the Great Depression (Sum, 2011).

Factors that have contributed to a slow-motion recovery from the 2008 recession include financial crises in Europe, gridlock in Washington, and continuing high unemployment rates in the U.S. (Decision Analyst, 2012). The pace of recovery since that timeframe has been slower than expected. The actions of consumers and businesses alike suggest that they are being more cautious and careful with their dollars. These economic forces put greater pressure on American businesses to maintain or improve levels of performance, while simultaneously managing limitations on the financial resources necessary which are needed to enable these improvements.

Rapid changes in the business environment may also cause increased stress and anxiety for employees, difficulty in obtaining capital, declining sales, diminished value in the market, an increased vulnerability to risks and volatility, suppliers to go out of business, and declines in the overall demand for products and services. Business leaders must make time to plan how they will adjust to the economic environment by incorporating approaches that respond to these discontinuities in order to identify potential hazards, formulate nimble strategic plans, and implement them quickly (Kotter, 2012).

One of the most important tasks for a business leader is the ability to engage in strategic planning and forecasting in order to ensure that business objectives are addressed. Many large businesses, especially those that have a large amount of capital, are especially limited in their capacity to quickly adapt and adjust to mitigate the short and long-term effects of rapid change. One of the main approaches for better positioning the company for success is the pursuit and implementation of a higher level of quality throughout all business operations to the greatest extent possible.

A quality movement in the United States began in the 1980s out of “a strategic objective to grow in a highly uncertain business environment characterized by rapid technological advances, global competition, and demanding customers” (Lee, Rho, & Lee, *Impact of Malcolm Baldrige National Quality Award Criteria on Organizational Quality Performance*, 2003). "Quality," as observed by a senior vice president at Federal Express, "is to economic success as the nuclear reaction process is to energy production: the output is wildly disproportionate to the input once it builds to a chain reaction" (Gradig & Harris, 1994). This quote suggests that the efforts and costs associated with improving business operations are minimal when compared to the benefits that are achieved as a result of this focus.

There are many definitions of quality as it relates to business improvement. According to a study which cited interviews from 86 firm managers, several descriptions of the term include: perfection, consistency, eliminating waste, improving speed of delivery, compliance with policies and procedures, providing a good, usable product, doing it right the first time, delighting

or pleasing customers, and ensuring total customer service and satisfaction (Tamimi & Sebastianelli, How Firms Define and Measure Quality, 1996). Quality improvements must be integrated into every aspect of the business in order for its effectiveness to be maximized, and measurements must take place along the way in order to determine that effectiveness. As customer needs are met, and as the operations and results of business operations are maximized, a business is said to be operating with performance excellence. However, the need for performance excellence despite constrained budgets presents an interesting paradox: businesses simultaneously experience severe financial restrictions and pressure to deliver more (and better) results at a faster pace (Fale, 2012).

In order to facilitate integration of performance excellence into a company as quickly as possible, various quality management approaches have been recommended and applied to different business environments over the past several decades. The Malcolm Baldrige Criteria for Performance Excellence serves as a national model and has been recommended by the United States National Institute of Standards and Technology as a guide for businesses on their journey towards performance excellence (NIST, 2012). The Criteria has been designed to represent a standard and framework for performance excellence in the United States.

Joseph Juran is known as one of the most respected leaders of the quality movement, and he emphasized that while productivity had been the nation's focus in the past, quality must be the nation's focus for the future. Juran stated that "we've made the dependence on the quality of our technology a part of life", as noted by Thomas Stewart (1999). This comment emphasizes that

quality become vitally integrated into modern society, and will remain important companies continue their quest for improving performance (Evans & Lindsay, *Managing for Quality and Performance Excellence*, 2011). While there are more than 60 awards that recognize companies for improving quality, the Malcolm Baldrige National Quality Award is among the more notable (Wilson, Walsh, & Needy, 2003).

This is partly due to the fact that many of the categories which other quality awards measure are already contained within the Malcolm Baldrige framework, so the framework presents an overarching ‘systems’ perspective. The ISO 9000 registration requirements, for example, represent less than 10% of the award criteria (NIST, 2012). In addition, the Malcolm Baldrige National Quality Award is highly regarded for its emphasis on results, and the award is only provided to those businesses which have a demonstrated and proven capacity for consistently achieving results.

There are other nations which have models for managing organizational excellence, and many of these were modeled after the Baldrige Award. Other national awards that are similar to the Baldrige framework include the Canadian Award for Excellence, the European Quality Award (which, according to Tuck in 2005, was based upon the Malcolm Baldrige Model), the Australian Business Excellence Award, the Singapore Quality Award, the Japan Quality Award, the Costa Rica Excellence Award, the South African Excellence Award, and Jordan’s King Abdullah II Award for Excellence (Hui & Chuan, *Nine Approaches to Organizational Excellence*, 2002). In addition, the Malaysian Prime Minister’s Quality Award also reflects

elements with the MBNQA (Tuck, A Quality Award and Stock Market Reaction: Evidence from Malaysia, 2005).

1.2 Problem Statement

Business leaders need comprehensive, relevant, and recent understanding of what organizational aspects are most effective in order to strategically invest their resources to achieve performance excellence in the most efficient way possible. Although they want to improve business results, often resources are constrained. Conflicting results exist with respect to how financial results are directly related to the Malcolm Baldrige Criteria for Performance Excellence. Several studies have determined that the stock market reacts positively to quality award announcements (Hendricks & Singhal, Quality Awards and the Market Value of the Firm: An Empirical Investigation, 1996), while other studies do not demonstrate a positive relation to organizational success (Boyne & Walker, Total Quality Management and Performance: An Evaluation of the Evidence and Lessons for Research on Public Organizations, 2002).

Studies have been conducted to understand the relationship between performance improvements and certain resulting measurements such as operating income, asset changes, productivity growth (Hendricks & Singhal, Does Implementing an Effective TQM Program Actually Improve Operating Performance, 1997, Van Der Stede, Chow, & Lin, 2006, James & Johnson, 2009), as well as on stock returns (Easton & Jarrell, 1998, DeBaylo, 1999, Cheah, A Quality Award and Stock Market Reaction: Evidence from Malaysia, 2005, Balasubramanian Ike

Mathur & Thakur, 2005, Cheah, Baldrige Award Announcement and Long Memory in Shareholder Wealth, 2007).

Other studies have investigated the qualitative nature of the award, and have analyzed which of the Malcolm Baldrige criteria are the most statistically significant or even how the length of the implementation time effects the company as a whole (Samson & Terziovski, 1999, Wilson & Collier, 2000, Evans & Jack, 2003, Stephens, Evans, & Matthews, 2005, Lakhali, 2009, Tanninen, Puumalainen, & Sandstrom, 2010).

Studies have also analyzed the award from an Industry Benchmark perspective, in order to determine the degree to which the award winning companies outperform their peers (Jacob, Madu, & Tang, 2004), as well as lead to enhanced customer satisfaction (Maiga & Jacobs, 2005). Many of the commonly referenced studies related to this topic were conducted over ten years ago. Several studies have previously examined the relationship between the award winners and success factors, and several inconsistencies exist in relation to what findings have been reported.

1.3 Research Objective

This research examines the business results of companies who have won the Malcolm Baldrige National Quality Award, in order to determine whether they are indeed superior to the market as well as to their respective industries. This research adds value to the body of knowledge by determining the strength of the relationship between those businesses that have won the award to their overall business results during various points in the economy. As illustrated in the literature review, there is moderate evidence to suggest that companies who

have won the Malcolm Baldrige National Quality Award have also demonstrated a superior market return as well as financial performance, however none of the previous studies have provided an integrated analysis, nor have they reviewed the results over the time period specified.

In addition, prior reviews have included only a few companies in the analysis, as only a few awardees are identified each year. This may place limitations on the results based on the year that the study was conducted. As the Baldrige program continues to thrive over the years, the accumulation in the amount of total companies that have won increases each year, thus yielding more data and information available for analysis.

This research provides an integrated perspective of many of the business measurements that have been investigated within the previous research, while doing so over a period of time that represents various economic conditions. During times of recessionary pressure, business performance may be more difficult to sustain, and even more difficult to enhance. This research will examine the market and financial measurements of firms that have won the Malcolm Baldrige National Quality Award in comparison to the market returns and industry comparison companies. Through the identification and validation of these linkages, business leaders will be provided with evidence and data for the results of the nationally recommended model.

The Malcolm Baldrige Criteria for Performance Excellence serves as the national model for Performance Excellence in the United States. It was initiated by Congress in 1987 and is still personally awarded by the President of the United States each year. The purpose of the award is

to identify and recognize role model businesses, establish criteria for evaluating improvement efforts, and disseminate and share best practices (NIST, 2012). The National Institute of Standards and Technology reports that the Malcolm Baldrige Criteria for Performance Excellence has been called “the single most influential document in the modern history of American business”.

Several million copies of the Criteria have been distributed, and many state-level performance excellence programs have been modeled after it. Several former United States Presidents (including Clinton, Bush, and Reagan) have also personally commented regarding the award’s effectiveness and value (NIST, 1998). Receiving the award carries with it tremendous prestige. Businesses across the country use this nationally recommended model as a template for developing their performance strategy. It is anticipated that contributions to this body of knowledge through the approaches that will be used within this research will be valuable and provide insight across a variety of industries for businesses that are interested in maximizing their organization’s performance.

The Malcolm Baldrige Criteria for Performance Excellence has been made publicly available, so even if an organization does not intend to apply for the award, they can still benefit from its recommendations. These recommendations, in turn, can be incorporated into organizational strategies and cultures in order to help businesses facilitate change and increase their ability to respond to the business environment in which they operate. This research adds to the general body of knowledge by providing further information about how the nationally

recommended performance excellence model relates to a firm's business performance. This research examines the relationship of companies who have won the Malcolm Baldrige National Quality Award with their results in the overall market and their respective industries. In addition, this research uncovers the factors that the award-winners have in common.

This research will help business leaders know how business results for companies that have implemented the nationally-recommended performance excellence model change over time, as well as the common factors that contribute to an above-average result. This research will help provide a business case for justifying the costs associated with striving toward performance excellence, as well as serve as a guide for improvement efforts. In addition, this research will help determine in what ways participation in performance excellence programs have created value for shareholders and business owners.

1.4 Research Questions

This research investigates the relationship between the Malcolm Baldrige Criteria for Performance Excellence with the business results of organizations that have implemented it. In order to do this, the research questions are: (1) what common input factors do winners have that lead to award selection?

(2) How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with the overall market? (3) How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with their industry peers in a comparison of (a)

profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios?

In order to answer these questions, several hypotheses will be developed in order to effectively manage the research methodology. Each of the research questions will be answered using specific measurements which are specifically outlined in the Methodology section. The companies which will be included within the scope of this research include winners of the Malcolm Baldrige National Quality Award. These winners are compared with the overall market as it relates to the S&P 500 as well as peer companies within their same industry.

With respect to the business performance measurements, information commonly used in economic analysis will be investigated. In order to ensure a comprehensive analysis, a thorough review using publicly available information will be conducted. This review will include aspects related to measures of business performance. The Methodology section outlines the specific measurements, variables, and statistical procedures for how the data will be handled.

The research questions were derived following the steps (Kumar, 2011):

1. Identify. This includes choosing a broad field or subject area of interest.
2. Dissect. Determine what subareas are relevant to the broad topic identified.
3. Select. It is not feasible to study all subareas, so it becomes necessary to select those that are most relevant and important and are of interest.
4. Raise Questions. This includes asking “what information is to be found out within the subarea?”

5. Formulate Objectives. The main research question and sub-research questions are formulated based on the field, topic, and subareas previously identified.
6. Assess Objectives. Ensure the feasibility of achieving objectives within the constraints of time, resources, and technical expertise.
7. Double Check. Ensure that the research questions correlate to the research problem and ensure that adequate resources are available to undertake it.

1.5 Potential Contributions

The scope of this research includes companies who have won the Malcolm Baldrige National Quality Award, which are also publicly traded firms. The awards are given each year in various sectors and include manufacturing, service, small business, education, health care, and non-profit organizations. The scope of this research will focus on businesses that are publically traded. These businesses include primarily winners within the manufacturing and service categories.

Companies which have won the Malcolm Baldrige National Quality Award through 2012 will be included in this research. Winning companies must demonstrate beneficial trends sustained over a period of time in all areas of evaluation as well as provide evidence of industry and benchmark leadership in order to win the award. The award is provided to companies who have the proven capacity to sustain high levels of performance, show positive performance trends, perform higher than appropriate comparative organizations, as well as have result

indicators that demonstrate valid probability of future performance (NIST, 2011-2012 Criteria for Performance Excellence).

Many opportunities exist to contribute to the body of knowledge on this topic. Multiple approaches will therefore be integrated within this research in order to provide an overarching view of how winners perform. Specifically, the performance of award-winners will be examined over an 11-year time span which includes a recession. This research methodology also includes a content analysis of the award-winner applications to determine those input factors that winning companies have in common. This research presents a holistic contribution to the body of knowledge by investigating the common input factors of businesses that have won the award, their overall business results, and then compares these results with the market as a whole and with their industry peers.

1.6 Introduction Summary

There are a myriad of goals which businesses seek to satisfy. Perhaps most important among them is the goal to maximize the market value of the existing owner's equity (Ross, Westerfield, & Jordan, 2010). Beyond this obligation, business owners desire to maximize profit and maintain steady growth in business performance. A paper which reviewed twenty-four introductory finance textbooks from major publishers found that "the goal of the firm is defined differently in different textbooks, in different chapters of the same textbook, and even in the same chapter of a textbook" (Ardalan, 2001).

Therefore, one of the most important tasks that business leaders must undertake in order to achieve their business goals is strategic planning in order to increase the likelihood that they will meet their business obligations. Adjusting business operations quickly, especially in times of economic uncertainty, however, is extremely difficult. One of the most important things that a company can do to help this process is to ensure a high quality in its execution of resources: “an organization’s long-term success hinges on aligning current operations and strategic goals” (Weinstein, 2009).

According to the Miriam-Webster dictionary, quality is defined “as an inherent feature, a degree of excellence, or a distinguishing attribute” (Dictionary, 2013). A focus of this research is whether participation in quality improvement initiatives, as demonstrated by companies who have won the Malcolm Baldrige National Quality Award, have created value for the shareholders as well as for the business owners (via analysis of business results and performance), which leads to the satisfaction of business objectives.

If the integration of efforts associated with improving quality is in-fact advantageous, then those businesses which have demonstrated their capability to achieve it should outperform the market as well as peers within their industry. In addition, they may have factors in common, which can be used to help guide business owners to those actions which may have the highest impact on achieving superior results.

Economic pressure will most likely continue due to evolving technological capabilities and worldwide economic integration, and business strategies must be adjusted in order to keep

pace and adapt to the business environment. In order to achieve this objective, performance excellence models have been developed in order to result in superior customer satisfaction and above-average business performance. The Malcolm Baldrige Criteria for Performance Excellence is considered to be particularly comprehensive, primarily due to its overall systems approach.

This research seeks to examine the relationship between business performance results relative to companies that have a demonstrated capability in performance excellence management efforts. If business leaders can see additional and recent evidence of this relationship, especially in a turbulent economic environment, then they may be more likely to embark on a journey towards performance excellence. As businesses strive towards performance excellence, there is an increased the likelihood that their business will remain viable and be in a better position to effectively compete in a challenging economic environment.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction to Literature Review

The purpose of this Literature Review is to expound upon relevant prior research, identify gaps in this research area, and understand past contributions to the body of knowledge on this topic. Five unique knowledge areas were investigated during this review. These include a review of the economic environment in which businesses operate, a review of measurements that businesses use to determine or validate success, a review of the definition of performance excellence as it relates to businesses today (as well as how it is measured), a review of the Malcolm Baldrige Criteria for Performance Excellence and a review of contributors of performance excellence.

A thorough, lengthy, and comprehensive review of the Malcolm Baldrige Criteria for Performance Excellence was undertaken within the scope of this review because the Criteria is a foundation for this research. The development of relevant research questions and analysis methodology are founded upon a complete understanding of the Criteria. The Malcolm Baldrige section of the Literature Review includes a description of its history, purpose, overview, the assessment process, results that have been demonstrated, as well as the benefits of assessment.

Since the first Malcolm Baldrige National Quality Award was given out in 1988, attention has been given to promoting its value and quantitatively measuring its contribution to American businesses. This is partly due to the fact that the award process is highly selective, as

well as the fact that proven business results are required in order for businesses to receive the award.

This approach to the Literature Review formed the conceptual foundation for examining the relationship of the Malcolm Baldrige Criteria for Performance Excellence with demonstrated market and financial performance results for those companies that have won this prestigious award. While the primary references included in this section consist of published academic and peer-reviewed journal articles, related textbooks, appropriate news articles, and books have also been used to supplement knowledge gaps and to help formulate the path to answering the research questions.

Ideally, only the most recent research would be used, as it would include many of the environmental factors that are relevant to businesses today. However, this was not possible. Many of the prior quantitative research studies were conducted in the 1990's or early 2000's which underscores the need for updated contributions to the existing body of knowledge. This approach to the Literature Review formed a solid model for gaining a comprehensive understanding of the works published. It also provided a foundation for gaining insight into the recommended approaches, methodologies, and limitations within this area of study.

Developing a deep comprehension in each of the five unique knowledge areas provided the background that was essential in grasping the linkages between the Malcolm Baldrige Criteria for Performance Excellence to market and financial results. A brief overview of the five knowledge areas contained within this Literature Review will now be provided.

The first area that is investigated is the economic environment in which businesses operate. This subject area provides the foundation for understanding the overall situation in which businesses operate, and provides the essential background for comprehending the period of time that will be included within this research.

The second area of research is business success measurements, which provides a foundational understanding of the various financial measurements that businesses and investors use in evaluating performance. This section will also provide an insight into the background for why certain measurements will be included within the scope of this research.

The third area of investigation is business performance excellence and assessment methodologies. There are a multitude of evaluation methodologies which business leaders use to validate internal and external progress towards strategic objectives, and these will be covered in detail within this Literature Review.

The fourth area of this research is the actual Malcolm Baldrige Criteria for Performance Excellence. This included a thorough review of the Criteria's history, purpose, overview, assessment process, and benefits. This section also includes a comprehensive review of the prior research on this specific topic.

The fifth and final area of investigation is the criteria that contribute to business excellence. This is often referred to in the literature as inputs or causes of business performance. Some of these causes are not contained within the construct of the MBCPE (Malcolm Baldrige Criteria for Performance Excellence) model.

Together, an analysis of these subject areas form the foundation of understanding needed for this research. Determining the background and linkages between the Malcolm Baldrige Criteria for Performance Excellence with business performance provides insight into the critical aspects that contribute to above-average business results.

2.2 Review of the Economic Environment

An examination of the economic condition in the United States was undertaken in order to provide insight into the environment in which American businesses operate. This information is relevant to this research in the respect that a firm's overarching strategy must account for external factors which are beyond control. There exists a wide variety of information on the evolution of the United States economy. The information relevant to this research, however, is focused on a time period that includes a recession. The main reason for this is that the topic of 'performance excellence' should be studied under various economic environments, not just favorable conditions.

In the United States, the beginning and ending dates of national recessions are defined by an American private nonprofit research organization known as the National Bureau of Economic Research (NBER) (Wikipedia, List of Recessions in the United States). This organization refers to a "recession" in the academic sense of the word, and defines it operationally as "an economic contraction with two or more consecutive quarters of negative Gross Domestic Product growth" (Wikipedia, 2008–2012 Global Recession). At their Business Cycle Dating Committee meeting of September 2010, this organization determined that a trough in business activity occurred in

the U.S. economy in June of 2009, marking the end of the recession that began in December 2007. The recession lasted 18 months, which made it the longest of any recession since World War II (Committee, 2010).

Although the organization claimed that the recession ended in June 2009, “lingering effects” such as lower unemployment, lower GDP, lower industrial production and lower income continue to plague the United States. "In determining that a trough occurred in June 2009, the committee did not conclude that economic conditions since that month have been favorable or that the economy has returned to operating at normal capacity," the NBER reported in September 2010. "Rather, the committee determined only that the recession ended and a recovery began in that month" (Murse, 2010). The committee decided that any future downturn of the economy would be a new recession and not a continuation of the recession that began in December 2007 (NBER, Business Cycle Dating Committee, 2010).

In the broader sense of the word, many people use the term “recession” to refer to the ongoing hardship in a similar way that the term "Great Depression" is also widely used. This can refer to persistent high unemployment remains, along with lower consumer confidence, a continuing decline in home values, an increase in personal bankruptcies, an escalating federal debt crisis, inflation, and rising petroleum and food prices (Wikipedia, 2008–2012 Global Recession). According to a poll in 2011, more than fifty percent of all Americans stated that the U.S. was still in recession or even depression, despite official data that demonstrated a historically modest recovery (Morgan, 2011).

A 'recession' represents a significant decline in economic activity that is spread across the economy, and lasts longer than just a few months. It is usually made visible by looking at indicators such as production, employment, and real incomes (NBER, Business Cycle Dating Committee, 2008). According to the Business Cycle Dating Committee of the National Bureau of Economic Research, December 2007 was identified as the indicator month, after which the subsequent decline in economic activity was large enough to qualify as a recession (NBER, Business Cycle Dating Committee, 2008).

While there were many interrelated factors that contributed to this event, it was primarily caused by a subprime mortgage crisis which led to the collapse of the United States housing bubble. These falling housing-related assets contributed to financial crisis around the globe, which subsequently led to the failure of several of the largest U.S. financial institutions such as Bear Stearns, Fannie Mae, Freddie Mac, Lehman Brothers and AIG. The government responded with an unprecedented \$700 billion bailout and \$787 billion fiscal stimulus package (Wikipedia, List of Recessions in the United States).

The economic growth that was evident prior to this recession relied strongly on borrowed money and speculation. By 2008, approximately four to five dollars of debt was required to create one dollar of US growth (Ghemawat, et al., 2012). The ability to maintain a high rate of national economic growth through the use of debt in this way became unsustainable.

The result of these factors was an economic and business landscape that included short-term and long-term volatility factors that businesses had to address. The cyclical, short-term

forces included imbalanced supply and demand markets, market uncertainty, lower supply chain orders, and volatile spot market trades. These short-term forces became even more troublesome when augmented by the long-term volatility factors such as shifts in underlying costs, increases in marginal costs of producing materials, and the shorter price cycles of commodities.

Sharp shifts in prices have seriously impacted the profitability and share performance of some of the top companies during the past few years, and it is likely that these factors indicate that many businesses and industries may be going through a permanent and disruptive economic transformation (Gautam, 2012). This is a two-pronged threat in the respect that they not only require immediate attention due to the effects on profitability, but they also have the potential to affect the long term by altering the makeup of industries for many years to come.

Economic slowdowns and recessions impact business sales, as even a modest drop in sales penetrates profitability, which results in dramatically reduced profits or even losses. The typical effects of a recession include a decline in sales volume by 3 to 5 percent, a reduction in gross margin by 1/2 to 1 percent, slower inventory turnover by 1/4 to 1/2, slower collection periods for accounts receivable by 3 to 5 days as customers take longer to pay, and a decline in net profit by as much as 40 to 60 percent (Torok & Cordon, 2002). A diminished cash flow position usually results.

Almost fifty percent of the businesses that are listed on the Fortune 500 list did not exist prior to 1986 (Sarasvathy, 2001). Yet these businesses must continue to adapt and execute strategies in order to respond appropriately to changes in the economic environment. According

to Steve Hoisington, the President of Electro-Motive Diesel and Locomotive Company, “Most organizations do not focus on long-term viability, but rather operate more in a survival mode – especially in today’s economic environment. Great organizations, especially those identified as Baldrige winners...anticipate changes or create robust contingency plans that address nearly any scenario, including a recession” (Hoisington, Spong, & Fredendall, 2012).

The uncertain economic environment has resulted in banks, public sector businesses, private companies and even individuals all deleveraging (decreasing financial leverage by paying off existing debt) at the same time. Simultaneously, companies are aggressively seeking to identify efficiencies that may have been overlooked when growth rates were higher. Firms must be opportunistic and flexible in the face of these multidimensional challenges (Ghemawat, et al., 2012).

In parallel with all of these factors, customers today still expect to receive the same (or higher) degree of service. According to Robert Weiner, who has run lean manufacturing programs for over 20 years at companies such as General Electric and Pratt & Whitney, “our largest customers require confidence in our ability...anything below 100 percent means that there are dissatisfied customers and lost sales” (Trombly, 2002).

How executive leadership responds during volatile economic times is especially important. In hostile environments, managers tend to make more erratic strategic decisions (Mitchell, Shepherd, & Sharfman, 2011). Employees are often under a greater amount of stress physically, emotionally, and mentally as they are being tasked to do more with fewer resources,

and fears regarding job loss are high. Employees expect that the primary job of the leadership team is to define and adjust the organizational strategy to respond to the environmental changes.

Any leader can assess where he or she has been, as well as his or her successes and failures, but to establish the path for future success, track progress, and adjust course as needed is much more challenging (Schaefer, 2011). Employees expect their leaders to make decisions and outline goals in a timely manner because after the strategy has been defined, and after the core business operations and processes take over, it is ultimately the employees which are held accountable for implementing these strategies, making it a cooperative effort (Cokins, 2007).

The economic factors at work today are contributing to a “survival of the fittest” environment in which businesses must operate. It is possible, however, that the economic environment can serve a catalyst for growth, change, and improvement, as unwelcome as it may be. Research and common sense suggest that the best time to gain ground on the competition is when they are retreating. Tough economic times can provide amazing opportunities for businesses that have the ability to deliver more, rather than less (Ghemawat, et al., 2012). Dr. Joseph M. Juran, the chairman and founder of the Juran Institute, has said that an organization will improve quality only when there is the need for it. Today, the evidence of that need is inescapable (De Feo, 2001).

Clearly, there is a difference between “playing to win” and “playing not to lose”. Business analysts today have likened today’s economic effects to Darwin’s “survival of the fittest” theory, stating that tomorrow’s market leaders will be those companies who are strong,

well run, and well managed using solid execution methodologies. Companies that have weaknesses will be shaken out (Hubler, 2012).

Those strong and well-run companies will still need to diligently seek opportunities to cut expenses and improve business processes in order to ensure that they are in a favorable position when (and if) economic storm passes. There are several ways that companies can do this. One is by reducing costs, which may result in a loss of productivity due to lower level of customer service and fewer employees, and the other is by increasing the value of a product through maximizing quality (Wisner & Eakins, 1994).

2.3 Review of Business Success Measurements

A review of business success measurements is introduced within this section, to provide the next link in developing the critical foundation for this research. When American businesses are successful and generate above-average returns, the effects spill into the overall economy. Effective business performance, when aggregated over multiple industries, reduces the amount of downward economic pressure. W. Edwards Deming, a statistician and internationally renowned contributor to the field of quality management, noted that:

“Failure of management to plan for the future and to foresee problems has brought about waste of manpower, of materials, and of machine time, all of which raise the manufacturer’s cost and price that the purchaser must pay. The consumer is not always willing to subsidize this waste. The inevitable result is loss of market. Loss of market begets unemployment. Performance of management should be measured by potential to stay in business, to protect investment, to ensure future dividends and jobs through improvement of product and service for the future, not [solely] by the quarterly dividend” (Deming, 1982).

The quote from Dr. Deming highlights the fact that there is not one measurement that can provide comprehensive insight into the health of the business. There are many different internal and external measurements which must be made in order to effectively evaluate the position of the business. To conduct effective benchmarking means that businesses must make distinctions between internal and external measures, with an emphasis on internal benchmarking, in order to measure the situation in relation to past performance (Moriarty, 2011).

Of particular importance to investors in determining the effectiveness of business processes is the analysis of market and financial performance measurements. Stockholders invest with the expectation that the business will continue to succeed and remain viable into the future, and demonstrated financial results are required to maintain the business's long-term growth and ensure staying power (Torok & Cordon, 2002).

While market and financial performance aren't the final measures of business success, they represent a large component of it. There are many metrics that companies use to measure success and use for decision making, resource allocation, and performance management. Most of them are financial, although individually they may not provide an all-encompassing picture of total organizational health (Weinstein, 2009). Investors need to understand that while absolute numbers may not tell the whole story, their success (or lack thereof) in achieving favorable business performance measures help determine their company's success (Loth, 2012). Effectively understanding and interpreting these measures correctly is equally important - a large growth in

sales, for example, will do little for a company's earnings if costs and expenses grow disproportionately.

Using market and financial measures as indicators of business performance is more of an art than a science. As much as it is based on numbers, and follows certain rules, this analysis is fragile, fluid and not all black-and white (Slywotzky, 2002). Background knowledge is necessary in order to make relevant comparisons when conducting the analysis. (Profitability Ratios, 2012) According to Torok and Cordon (2002), there are many indicators of a business which contribute to market and financial performance for a business, which include:

1. The involvement and commitment of management
2. High quarter-to-quarter return on operating assets and inventory turns
3. Positive and consistent cash flow and net income
4. Declaration and enforcement of company goals by management
5. The existence and enforcement of a business performance monitoring system
6. Identification and correction of the root cause of problems
7. Business performance analyses conducted and acted on appropriately
8. Utilization of an auditable system which is verified by external analysis
9. The successful implementation of feedback by management
10. A focus on customer needs
11. A supplier/customer relationship that is well-defined with mutually agreed-upon requirements

12. A prevention attitude that exists throughout the company, and is accompanied by an early detection and correction system
13. The establishment of clearly understood documented procedures for everyone involved
14. Deployment of company-wide procedures
15. Control of all appropriate documents and data
16. Adequate quality training that is provided for everyone
17. A working relationship with external analysis constituents
18. Corrective action closure to prevent reoccurrence

There are also several manufacturing effectiveness indicators which contribute to business results as well. These include forecasting methodologies which are centered around customer production demand, an accurate bill of materials, nonexistent material shortages, coordinated sales/inventory planning, reduced set-up times, reduced inventory buffers, synchronized processes, production to need, synchronized work flow to reduce stock, balancing of work flows with workers and equipment, reduced transportation and material movement, shortened set up times, reduced lead times, reduced or eliminated waste, minimized motion, and reduced lead times (Torok & Cordon, 2002).

All of these factors combined help create a manufacturing environment that is designed to prevent defects, which directly contributes to and enhances market and financial performance. While these measurements are relevant and contribute to results, the majority of them can only be assessed by internal employees and information regarding them is not readily available for the

public, which explains why external business stakeholders must rely on publicly available information and metrics within financial statements in order to analyze and predict company results.

There are many ways that external constituents measure a company's success. One of these methods is the use of financial ratios, which help measure management's ability to control costs and expenses and generate profits as measured over time (Loth, 2012). Financial metrics can be analyzed to assess a business's ability to generate earnings compared to expenses over a period of time. If a business can achieve a higher value relative to a competitor's ratio (or achieve a stronger ratio from a previous period), it is usually indicative that the company is performing effectively (Profitability Ratios, 2012).

Using performance ratios helps ensure that business stakeholders such as shareholders, leadership, employees, and customers have a good understanding of how well the company is utilizing its resources to generate returns, profit, and increase value. The long-term financial performance of a company is vital not only to ensure long-term survivability of the company, but also to provide a financial benefit to shareholders (Loth, 2012).

Ratios from Financial Statements provide insight into business performance, and the objective of year-over-year analysis is to detect consistency and identify positive or negative trends in a company's earnings. Achieving values that are above industry benchmarks translates into positive investment performance excellence, which will result in an enhanced probability that investors will be attracted to the firm. To a large degree, it is the growth and decline of a

company's earnings which drive its stock price and have an impact on its ability to remain viable into the future (Loth, 2012).

Financial ratios are also used by the investment community to gain insight into a company's overall efficiency and performance over time. They can be categorized into several different groups. For example, margin ratios represent the company's ability to translate sales dollars into profits, and return ratios represent the firm's ability to measure the overall efficiency in generating returns for its shareholders (Peavler, 2012). A description of the specific performance ratios which will be used within the scope of this research is outlined in the Methodology section.

The Return on Equity (ROE) measurement warrants further explanation. Most Wall Street analysts and investors tend to focus on return on equity as their primary measure of company performance (Hagel, Brown, & Davison, 2010). ROE focuses on return to the shareholders of the company. From a shareholder's perspective, this is a metric that is easy to understand, but ROE can also obscure a lot of potential problems because companies can employ various financial strategies to artificially maintain a healthy ROE (for a while) while hiding deteriorating performance.

One example of this would be by growing debt leverage and increasing stock buybacks, which are funded through accumulated cash, in order to help to maintain a company's ROE even though operational profitability is eroding (Hagel, Brown, & Davison, 2010). Without a way of breaking down the actual components of ROE, it is possible that investors could be misled into

believing a company is a good investment when in fact it is not. Many investors therefore use the DuPont analysis, which is a tool that can be employed to further break apart ROE into separate parts, providing a clearer understanding from where movements in the ROE measure originate (Pinsent, 2009).

While performance ratios help provide solid insight into the health of a business, they may not be the end-all-be-all measurement of performance or predictor of future success. Too narrow of a focus solely on retroactive and lagging measurements can make business leaders myopic, which contributes to a loss in competitive edge. Many enterprises cling to financial measures as the cornerstone of their operational and management control systems, which creates a compounded problem when financial measures are developed independently to strategy. It is possible that a short-term focus on financial results may diminish an organization's ability to carry out its strategy. This happens when it passes opportunities for strategic investments in lieu of efforts that are focused on improving the financial statements, which shifts the focus from business strategy to business measurement (Weinstein, 2009).

The impact and importance of measuring business performance cannot be denied. Yet these measures alone may not provide an all-encompassing determination of business success. Several intangible asset measures have also become a major source for competitive advantage, and include things such as employee knowledge, customer relationships, and innovative cultures (Weinstein, 2009). The quality of the goods and services provided to customers, designing and

producing these goods and services more quickly, and doing so in a manner that minimizes costs and increases revenue also are indicators of success (Torok & Cordon, 2002).

The push for businesses to thrive in an environment that is increasingly more challenging and competitive requires improvements to the competitive posture by raising the bar on any and all opportunities that are geared towards improving business operations and results. Developing an understanding of a business's position enables internal and external stakeholders to gauge and monitor organizational performance.

Effective and action-based business analysis is intended to help uncover opportunities for improvement in products or services, organizational stability, or organizational effectiveness and capabilities (Weinstein, 2009). Business leaders must therefore effectively measure and continuously monitor the organization in order to increase the likelihood that the business performance expectations will be achieved.

2.4 Review of Business Performance Excellence and Assessment

A review of internal business performance excellence and assessment measures used by business leaders today is introduced within this section. This review continues to add to the foundation of knowledge that is applicable to this research. When business leaders effectively understand and measure internal indicators of success and performance, they are more likely to generate above average market returns and financial performance that investor's desire. Effective business analytics is dependent on knowing what to measure, as well as how those measurements contribute to the overall market and financial posture.

The financial reviews described previously are reactive measurements, and therefore must be part of an overall measurement profile in order to help companies proactively predict what is needed in order to achieve their business strategies. In addition, financial measurements may not provide insight into the overall environment in which the firm is working. Additional measures are therefore needed to help guide business leaders in understanding and projecting customer needs in the marketplace.

The term “Performance Excellence” refers to an integrated approach of assessing organizational performance beyond using market and financial indicators alone. The results of this approach include the ability to deliver ever-improving value to customers and stakeholders, organizational sustainability, improvement of organizational effectiveness and capabilities, and organizational and personal learning (What is Performance Excellence?, 2010). Performance Excellence is determined to have occurred when an organization is generating the maximum level of profitability possible given the human, financial, capital, and other resources it possesses (Luftig, 2012).

In order to achieve Performance Excellence, measurements must be in place and operating effectively to determine that the organization is on the right road toward success. One definition of Quality refers to the incorporation of performance excellence into products and services in order to meet business objectives. There are many different definitions of quality, but according to Aamimi and Sabastianelli, it means perfection, consistency, eliminating waste, speed of delivery, compliance to organizational policies and procedures, providing a good,

usable product, doing it right the first time, delighting or pleasing customers, and total customer service and satisfaction (1996). The integration of quality management efforts in the public sector has lagged in relation to the private sector (Rodin & Beruvides, 2012); however, the Malcolm Baldrige Criteria for Performance Excellence has proven to be a viable set of measures for which even a municipal government can benchmark and measure organizational processes (Prybutok, Zhang, & Peak, 2011).

“Performance management” is a term used to measure the effectiveness of quality efforts within a business, and empowers employees to improve product or service quality, achieve organizational stability, enhance the organization’s capabilities and effectiveness, as well as to increase organizational and personal learning through the use of data and analytics to ensure progress toward goals (Weinstein, 2009). In order to execute performance excellence, a plan must first be developed, and then subsequently implemented, both of which require a tremendous amount of work. In order to achieve performance excellence, leaders must allocate time and resources for it as part of the overall corporate strategy.

The goal of performance excellence efforts and performance management measures are to provide a mechanism to bridge the business intelligence gap between the CEO’s vision and employee actions in order to highlight areas of opportunity for further alignment (Cokins, 2007). One of the most important aspects to consider when aligning efforts of performance management during a stressful economic time is to ensure that a holistic systems-based approach is taken in

order to account for the integrated nature of the challenges that are being faced (Bititci, Garengo, Dorfler, & Nudurupati, 2012).

In a study about the components that contribute to a business's ability to create and implement a business strategy, Ariyachandra and Frolick found that the critical success factors include: having a champion, an approach for managing resistance, leadership support, adequate resources, team collaboration, user support, effective communication, as well as a clear link to business strategy (2008). By assessing the factors and results that contribute to performance excellence, a business can ensure effective strategy implementation by analyzing its effects.

According to Heidi Skillman, the Vice President of Supply Chain Management at Exide Technologies, "One of the most important yet overlooked aspects of implementing an [improvement] program is the execution stage, which is when the results pay off." She also mentioned that the implementation is as important as the plan itself (Trombly, 2002).

The Balanced Scorecard is a specific type of performance measurement approach which is designed to evaluate certain business processes that contribute to the overall corporate strategy. It emphasizes the linkages among operations, strategy and the measurement of performance excellence. It provides a set of indicators to for business stakeholders that communicate the outcomes and drivers through which the organization achieves its mission and strategic objectives (Weinstein, 2009). The intent of the balanced scorecard is to augment the traditional financial measures previously highlighted with benchmarks for performance in three other nonfinancial areas: customer relationships, internal processes, and learning and growth.

Popular balanced scorecard indicators have been derived from the Baldrige Criteria (Bell & Elkins, 2004). The Balanced Scorecard framework helps establish a continuous process improvement culture so that companies can achieve better results than those without a framework (Hirschel, 2012).

There are four facets to a balanced scorecard which determine the long-term success of the organization's performance. The first of these is the organization's financial performance. The financial measures which were previously mentioned provide feedback on the financial results of actions and decisions related to the enterprise operations. The second facet is customer perspective, which focuses on the company's ability to satisfy its customers. The third facet is internal processes, which is used to evaluate how well the organization performs its core processes in order to succeed. The fourth facet, innovation and learning, evaluates how well the enterprise prepares for the intermediate to distant future. These four perspectives are interrelated, and are chosen by the company's leadership team. They must be chosen very carefully because they represent the company's main measurements which evaluate alignment and progress toward its strategy (Weinstein, 2009).

When the performance measures of a balanced scorecard are added to the financial metrics, the result is an augmented perspective on the company's health and activities. It is a powerful tool for coordinating and fine-tuning a company's activities to ensure that all of its actions are aligned with its strategy (Kaplan & Norton, 2007). Without a balanced scorecard, most organizations are unable to achieve consistency of vision and action as they introduce new

strategies and operational processes. The Balanced Scorecard provides a framework for managing the implementation of strategy, as well as for evaluating how strategy might need to evolve in response to competitive, market, and technological environment changes (Kaplan & Norton, 2007).

An effective Balanced Scorecard implementation process, therefore, must be iterative and continue beyond its initial implementation. Just as a company's strategy evolves over time, so also must the performance analysis system that measures it. A scorecard requires periodic reviews to validate the relevance of the performance measures it uses, so an interim assessment can be useful to help drive evolution. A study by Hui and Chuan was conducted in 2002 to evaluate various management and performance excellence approaches in order to find the common factors among them. After reviewing the criteria for total organizational excellence for the United States, Canada, Europe, Australia, Singapore, Japan, Costa Rica, South Africa, and Jordan, it was determined that there were twelve critical aspects that each had in common (Hui & Chuan, 2002):

1. Establishing a Strong Vision and mission
2. Forming Policies and Strategies
3. Commitment to Excellence
4. Management Values and Ethics
5. People Development
6. Empowerment and Innovation

7. People Well-Being
8. Use of New Technologies
9. Suppliers and Business Partnerships
10. Providing Customer Care, Service, and Satisfaction
11. Fostering Good Working Relations
12. Responsibilities to the Public

Another study compared and contrasted Total Quality Control, Total Quality Management, Deming's System of Profound Knowledge, Business Process Reengineering, Lean Thinking, and Six Sigma, and found nine common factors which included (Chiarini, 2011):

1. Results and Benefits
2. Management Style
3. Deployment of the System
4. Employee Management, Deployment and Participation
5. Voice of the Customer
6. Tools, Techniques and IT
7. Optimization of the System
8. Day-by-Day Check and Control of the Results
9. Review of the System

The Balanced Scorecard framework represents one approach for measuring business results (Hossain & Prybutok, 2008). Only organizations which are motivated by an internal

desire to improve performance on a voluntary basis undergo performance analysis (Natarajan & Barger, 2008). Approaches such as this help identify and uncover gaps between corporate strategies and performance metrics, and help enterprises evaluate how effectively their metrics drive performance (Weinstein, 2009). The Malcolm Baldrige Criteria for Performance Excellence includes elements of the balanced scorecard, in addition to other elements that form an overarching approach that provide a systems perspective into business performance.

2.5 Review of Malcolm Baldrige Criteria for Performance Excellence

The fourth area of research included this review is the Malcolm Baldrige Criteria for Performance Excellence. Within this section, a thorough review of the Criteria's history, purpose, overview, assessment process, results and benefits will be provided, as well as a comprehensive review of the prior research. The Malcolm Baldrige Criteria for Performance Excellence is nationally recommended, and represents the model for organizations within the United States to follow in order to analyze organizational performance and achieve performance excellence.

The Criteria serves as a comprehensive approach for integrating financial measurements, Balanced Scorecard operational assessments, and strategy execution into a written plan without requiring a company to start out at square one with their planning efforts. A 2008 study found that most elements of business performance management are critical constructs of the Malcolm Baldrige National Quality Award (MBNQA) framework (Hossain & Prybutok, 2008).

2.5.1 History

The Malcolm Baldrige National Quality Award is the highest level of national recognition for performance excellence that a U.S. organization can receive (NIST, 2011-2012 Criteria for Performance Excellence). Its purpose is “to help to stimulate American companies to improve quality and productivity, establish guidelines and criteria that can be used by business, industrial, governmental, and other organizations in evaluating their own quality improvement efforts, and to provide specific guidance for American organizations that wish to learn how to manage for high quality” (Weinstein, 2009).

This quality award program is valuable because it creates a healthy spirit of competition and recognizes firms that have implemented effective approaches that lead to results, and serves to motivate and challenge firms to improve. It provides a benchmark and goal from which a firm can evaluate progress (Hendricks & Singhal, *The Long-Run Stock Price Performance of Firms with Effective TQM Programs*, 2001).

The Malcolm Baldrige National Quality Award was originally created as a response to a crisis in the competitiveness of the United States. This crisis originated when manufacturing firms started to lose ground to Japanese firms that had adopted quality improvement methodologies. These methodologies were taught to them primarily by W. Edwards Deming, an American. Japan’s coveted “Deming Prize” was created in 1950 as a way to honor him (Schaefer, 2011). In the mid-1980s, leaders in the United States realized that U.S. businesses also needed to focus on quality in order to remain competitive in the expanding global market.

Malcolm Baldrige, the U.S. Secretary of Commerce at the time, established the award, and congress named the Award after him in recognition of his contributions. The Malcolm Baldrige award was created to stop the U.S. loss of market share to foreign producers in the 1980's. It was designed to serve as the engine that fueled the nation's interest in effective performance and customer satisfaction. The Criteria was released during a time when many companies were trying to cut costs in such a way that had only resulted in a weakened ability to compete.

The goal of the Malcolm Baldrige National Quality Improvement Act of 1987 was to enhance the competitiveness of U.S. businesses, to identify and recognize role-model businesses, establish criteria for evaluating improvement efforts, and disseminate and share best practices (NIST, History, 2010). The scope of the award was expanded in 1999 to include health care and education organizations, and in 2005 to include nonprofit and government organizations.

The President of the United States traditionally presents the award at a special ceremony (NIST, 2011-2012 Criteria for Performance Excellence) for the purpose of encouraging United States businesses to not only examine their practices, but also to benchmark against the best companies in order to become leaner, faster, more customer-oriented, and use fact-based decision making and stakeholder analysis in pursuit of zero defects and high performance (Schaefer, 2011).

The Baldrige Award is regarded as primarily a national education program: "The award criteria are the centerpiece of the education process as they provide the best way to capture and

disseminate lessons learned to a mass audience” (Bemowski & Stratton, 1995). The Criteria for Performance Excellence include a focused set of questions which analyze the critical aspects of a business that help management guide the organization toward success and sustainability (Schaefer, 2011).

2.5.2 Purpose

In addition to being the basis for giving awards and feedback to applicants, the criteria's purposes are: "to help improve performance practices and capabilities, to facilitate communication and sharing of best practices information among and within organizations of all types based upon a common understanding of performance requirements, and to serve as a working tool for managing performance, planning, training, and assessment" (Bemowski & Stratton, 1995).

According to Paul W. DeBaylo, a senior Baldrige examiner from 1989 to 1992, the Baldrige core concepts and values include customer-driven quality, leadership, continuous improvement and learning, valuing employees, fast response, design quality and prevention, long-range view of the future, management by fact, partnership development, company responsibility and citizenship, and results focus (DeBaylo, 1999). Harry S. Hertz, the Director for the Baldrige Performance Excellence Program, had this message to say to potential applicants regarding why the award is important and relevant for organizations today:

“The Baldrige Criteria for Performance Excellence are about you! They are about survival and sustainability in your marketplace with a high-performing, high-integrity organization. The Baldrige Criteria ask you all the right questions. Is addressing all the Baldrige Criteria easy? No! But neither is achieving sustainable results in today’s

challenging environment. Will the Criteria help you think and act strategically? Yes. Will they help you align your processes and your resources? Yes. Will they help you engage your workforce and your customers? Yes. Are these worthwhile goals? You decide. Whether your organization is small or large; is involved in service, manufacturing, government, or nonprofit work; has one location or sites across the globe, the Criteria provide a valuable framework that can help you plan, perform, and measure results in an uncertain environment. The Criteria can help you decide on tools such as ISO 9000, Lean, a Balanced Scorecard, and Six Sigma” (NIST, 2011-2012 Criteria for Performance Excellence).

2.5.3 Overview

The Malcolm Baldrige Criteria for Performance Excellence provides a seven-part framework for organizational excellence. It affords companies the opportunity to deploy aligned, effective, systematic, and integrated approaches to the categories of leadership, strategic planning, customer and market focus, measurement, analysis, and knowledge management, workforce focus, process management [operations focus], and results (Weinstein, 2009).

The Criteria initially dealt with only products and services, but has now evolved into a broader set of standards that addresses corporate processes from cradle to grave. Over time, there has been a steady shift in the criteria to move from separate processes to an integrated perspective of overall business practices and excellence (Ettorre, 1996). According to Curt W. Reimann, former director for quality programs at NIST and formerly the director of the award, “ISO 9000 and Baldrige are really very different beasts. ISO 9000 is a minimum standard, whereas the Baldrige is a stretch standard and much more comprehensive. The overlap is less than 10 percent” (Ettorre, 1996).

The award Criteria has evolved and changed since its inception in 1987. While these changes have incorporated elements from the competitive environment, and the underlying focus on quality within the model has remained steadfast (Lee, Zuckweiler, & Trimi, Modernization of the Malcolm Baldrige National Quality Award, 2006).

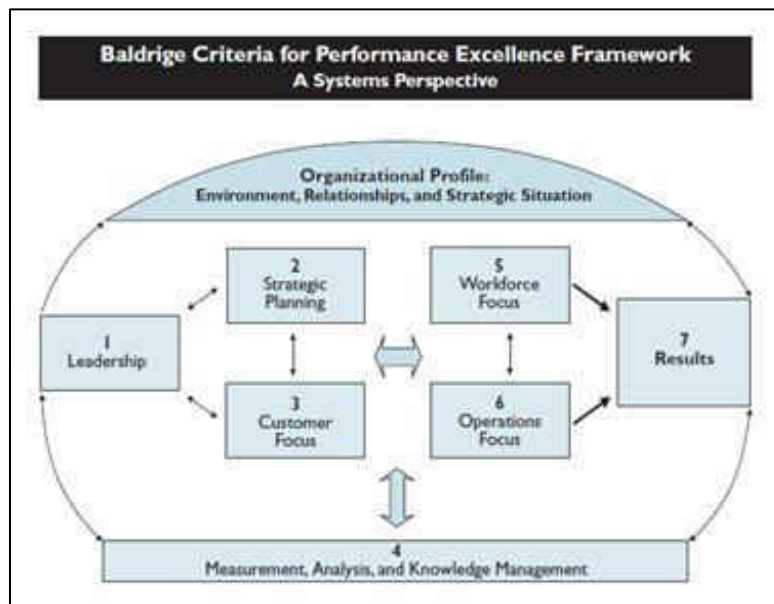


Figure 1: Baldrige Criteria for Performance Excellence

Figure 1 outlines the basic elements of the Baldrige Criteria for Performance Excellence (NIST, 2011-2012 Criteria for Performance Excellence). The Organizational Profile is displayed at the top of the figure and sets the context for the way that the organization operates as a whole. The environment, working relationships, and strategic situation (which includes the competitive environment, strategic challenges and advantages as measured by a SWOT analysis), and performance improvement system are integrated and serve as a guide for the overall

organizational performance management system. The Performance System which is displayed in the center of the figure is composed of six Baldrige categories that define processes and results.

Leadership (Category 1), Strategic Planning (Category 2), and Customer Focus (Category 3) represent the Leadership triad. When analyzed together, they emphasize the importance that leadership has on a company's strategy and its customers. Senior leaders set are responsible for setting the organizational direction and for analyzing future opportunities of the organization (NIST, 2011-2012 Criteria for Performance Excellence).

The Workforce Focus (Category 5), Operations Focus (Category 6), and Results (Category 7) categories represent the Results triad. An organization's workforce and operational processes accomplish the work that represents the overall performance results. All of the actions point toward Results, which is meant to represent a composite of all the outcomes from an organization's products, processes, customer-focus, workforce-focus, leadership and governance, and financial market (NIST, 2011-2012 Criteria for Performance Excellence).

Leadership, the first of the Baldrige framework's seven categories, has two parts, which review senior leadership first, and governance and societal responsibilities second (Schaefer, 2011). A study was conducted by Gertrude P. Pannirselvam and Lisa A. Ferguson which analyzed the relationship between the Baldrige categories, and found that leadership significantly directly or indirectly affects all of the other system constructs in the model. The results from their research also determined that the leadership category within the MBNQA criteria represent the driving force that influences all other elements of quality management (2001).

The horizontal arrow in the center of the framework links the leadership triad to the results triad, which represents a critical link that feeds organizational success. The arrow also represents the central relationship between Leadership (Category 1) and Results (Category 7). These two-way arrows also hint at the importance of feedback in an effective performance management system (NIST, 2011-2012 Criteria for Performance Excellence).

Displayed at the bottom of the figure is the System Foundation, which includes Measurement, Analysis, and Knowledge Management (Category 4), and is critical to the effective management of an organization. It also helps to drive a fact-based, knowledge-rich performance evaluation system that improves performance and competitiveness. Measurement, analysis, and knowledge management serve as the foundation for the performance management system.

2.5.4 Assessment Process

The Assessment Process for Baldrige Criteria for Performance Excellence begins with a set of questions in each of the seven interrelated categories mentioned above. These areas serve as a guide to help assess an organization's performance (Schaefer, 2011). A self-assessment worksheet is available on the Baldrige Website that can be used in conjunction with the Criteria for Performance Excellence to help identify strengths and opportunities for improvement of companies, and to help them establish associated goals and action plans for further improvement (Baldrige Performance Excellence Program).

A company begins the assessment process by responding to a series of questions to describe its organizational characteristics, performance management system, and challenges. The Organizational Description section describes its operating environment and relationships with customers, stakeholders, suppliers, and partners. The Organizational Challenges section describes its competitive environment, strategic challenges, and system for performance improvement (Baldrige Performance Excellence Program).

Application forms can be filled out or simply reviewed for learning purposes. There are seven categories which follow each of these steps, in which the applicant must provide a significant amount of information regarding organizational leadership, strategic planning, customer focus, measurement, analysis, and knowledge management, workforce focus, operations focus, and results. Table 1 provides a summary of each of these topics.

Table 1: The Baldrige Criteria for Performance Excellence (NIST, 2012)

The Baldrige Criteria for Performance Excellence provide a systems perspective for understanding performance management. They reflect validated, leading-edge management practices against which an organization can measure itself. With their acceptance nationally and internationally as the model for performance excellence, the Criteria represent a common language for sharing best practices among organizations. The Criteria are also the basis for the Malcolm Baldrige National Quality Award process, and consist of seven categories:	
Leadership	The Leadership category examines how an organization’s senior leaders’ personal actions guide and sustain the organization. Also examined are the organization’s governance system and how the organization fulfills its legal, ethical, and societal responsibilities and supports its key communities.
Strategic Planning	The Strategic Planning category examines how the organization develops strategic objectives and action plans. Also examined are how the chosen strategic objectives and action plans are implemented and changed if circumstances require, and how progress is measured.
Customer Focus	The Customer Focus category examines how the organization engages its customers for long-term marketplace success. This engagement strategy includes how the organization listens to the voice of its customers, builds customer relationships, and uses customer information to improve and identify opportunities for innovation.
Measurement,	The Measurement, Analysis, and Knowledge Management category examines how

The Baldrige Criteria for Performance Excellence provide a systems perspective for understanding performance management. They reflect validated, leading-edge management practices against which an organization can measure itself. With their acceptance nationally and internationally as the model for performance excellence, the Criteria represent a common language for sharing best practices among organizations. The Criteria are also the basis for the Malcolm Baldrige National Quality Award process, and consist of seven categories:	
Analysis, and Knowledge Management	the organization selects, gathers, analyzes, manages, and improves its data, information, and knowledge assets and how it manages its information technology. The category also examines how the organization uses review findings to improve its performance.
Workforce Focus	The Workforce Focus category examines an organization’s ability to assess workforce capability and capacity needs and build a workforce environment conducive to high performance. The category also examines how the organization engages, manages, and develops the workforce to utilize its full potential in alignment with the organization’s overall mission, strategy, and action plans.
Operations Focus	The Operations Focus category examines how the organization designs, manages, and improves its work systems and work processes to deliver customer value and achieve organizational success and sustainability. Also examined is the organization’s readiness for emergencies.
Results	The Results category examines the organization’s performance and improvement in all key areas—product and process outcomes, customer-focused outcomes, workforce-focused outcomes, leadership and governance outcomes, and financial and market outcomes. Performance levels are examined relative to those of competitors and other organizations with similar product offerings.

The organization can either employ a self-assessment process to complete the application, or they can request help from a formal third-party to assist with the assessment of their organization. After the application is complete, it is reviewed by a team of examiners. These examiners must adhere to strict rules to prevent any conflict of interest. They are responsible for reviewing each award application against the Criteria for Performance Excellence, and reaching a consensus about whether it will move to the next step in the process.

In 2010, 2,270 State Baldrige examiners volunteered approximately \$29.5 million in services to evaluate 1,350 organizations. The winners progressed to the national evaluation after 578 Baldrige examiners volunteered roughly \$8.8 million in evaluation services (2011 Baldrige

Impacts). Baldrige examiners are recognized as performance excellence experts, and they are specially trained professionals who are selected from industry, academia, and consulting firms. They undergo an intensive training process to ensure that the criteria and processes that they are responsible for reviewing are thoroughly understood, effectively measured, and consistently compared (Gradig & Harris, 1994).

If an organization passes this initial assessment stage, a site visit is then arranged to review the processes outlined in the application. The results of this step are documented and then provided to a final panel of judges who make comparisons and identify the final award recipients (NIST, 2011-2012 Criteria for Performance Excellence). The director of the Baldrige Award has listed eight critical factors that are considered all by the examiners and judges in this final assessment stage (Gradig & Harris, 1994):

- 1) A plan to keep continuously improving all categories.
- 2) A system for accurately measuring these improvements.
- 3) A strategic plan based on benchmarks that compare the company's performance with the world's best performance.
- 4) A close partnership with suppliers and customers to cycle improvements back into the operation.
- 5) A clear understanding of current and potential customers so that their wants can be translated into products (services).

- 6) A long-lasting relationship with customers, going beyond the delivery of the product to include service and ease of maintenance.
- 7) A focus on preventing mistakes rather than merely correcting them.
- 8) A commitment to improving quality that goes from the top of the organization to the bottom.

A very important product of this entire process is the Feedback Report, which consists of non-prescriptive comments from the independent reviewers regarding how well the company’s responses meet the criteria requirements. The report does not include recommendations regarding how the company should address these observations, so company leaders must take the opportunity to interpret the reviewers’ comments and make improvements in anticipation of the next assessment cycle. Through this cyclical feedback and improvement process, management develops the internal alignment necessary for an effective balanced scorecard and works toward continuous improvement.

Below is a list of all of the Malcolm Baldrige National Quality Awardees from the award’s inception through 2012, and also outlines whether it was a small business, manufacturing firm, service organization, educational institution, or healthcare organization (NIST, Baldrige Award Recipients' Contacts and Profiles):

Table 2: Malcolm Baldrige Award Winners, 1988 thru 2012 (NIST)

Year Awarded	Company Name	Type
1988	Globe Metallurgical Inc. (now part of Globe Specialty Metals, Inc.)	Small Business
1988	Motorola, Inc.	Manufacturing
1988	Westinghouse Electric Corporation Commercial Nuclear Fuel Division	Manufacturing

Year Awarded	Company Name	Type
1989	Milliken & Company	Manufacturing
1989	Xerox Corporation Business Products & Systems	Manufacturing
1990	Cadillac Motor Car Company	Manufacturing
1990	Federal Express Corporation	Service
1990	IBM Rochester	Manufacturing
1990	Wallace Co., Inc.	Small Business
1991	Marlow Industries, Inc.	Small Business
1991	Solectron Corporation	Manufacturing
1991	Zytec Corporation (now part of Artesyn Technologies)	Manufacturing
1992	AT&T Network Systems Group Transmission Systems Business Unit (now part of Alcatel-Lucent)	Manufacturing
1992	AT&T Universal Card Services (now part of Citigroup, Inc.)	Service
1992	Granite Rock Company (now known as Graniterock)	Small Business
1992	Texas Instruments Incorporated Defense Systems & Electronics Group (now part of Raytheon Company)	Manufacturing
1992	The Ritz-Carlton Hotel Company, L.L.C. (now part of Marriott International)	Service
1993	Ames Rubber Corporation	Small Business
1993	Eastman Chemical Company	Manufacturing
1994	AT&T Consumer Communications Services (now known as the Consumer Markets Division of AT&T)	Service
1994	GTE Directories Corporation (now part of Verizon Information Services)	Service
1994	Wainwright Industries, Inc.	Small Business
1995	Armstrong World Industries, Inc., Building Products Operations	Manufacturing
1995	Corning Incorporated Telecommunications Products Division	Manufacturing
1996	ADAC Laboratories	Manufacturing
1996	Custom Research Inc. (now known as GFK Custom Research, Inc.)	Small Business
1996	Dana Commercial Credit Corporation (now part of Dana Holding Corporation)	Service
1996	Trident Precision Manufacturing, Inc.	Small Business
1997	3M Dental Products Division (now known as 3M ESPE Dental Products)	Manufacturing
1997	Merrill Lynch Credit Corporation	Service

Year Awarded	Company Name	Type
1997	Solectron Corporation	Manufacturing
1997	Xerox Business Services	Service
1998	Boeing Airlift and Tanker Programs (now known as Boeing Global Mobility Systems)	Manufacturing
1998	Solar Turbines Incorporated	Manufacturing
1998	Texas Nameplate Company, Inc.	Small Business
1999	BI	Service
1999	STMicroelectronics, Inc.-Region Americas	Manufacturing
1999	Sunny Fresh Foods, Inc. (now known as Cargill Kitchen Solutions)	Small Business
1999	The Ritz-Carlton Hotel Company, L.L.C. (now part of Marriott International)	Service
2000	Dana Corporation-Spicer Driveshaft Division (now known as Dana Corporation Torque Traction Technologies Incorporated)	Manufacturing
2000	KARLEE Company, Inc.	Manufacturing
2000	Los Alamos National Bank	Small Business
2000	Operations Management International, Inc. (now known as CH2M HILL)	Service
2001	Chugach School District	Education
2001	Clarke American Checks, Inc. (now known as Harland Clarke)	Manufacturing
2001	Pal's Sudden Service	Small Business
2001	Pearl River School District	Education
2001	University of Wisconsin-Stout	Education
2002	Branch-Smith Printing Division	Small Business
2002	Motorola Commercial, Government and Industrial Solutions Sector (now part of Motorola Government and Enterprise Mobility Solutions)	Manufacturing
2002	SSM Health Care	Health Care
2003	Baptist Hospital, Inc.	Health Care
2003	Boeing Aerospace Support (now known as Boeing Support Systems)	Service
2003	Caterpillar Financial Services Corporation-U.S.	Service
2003	Community Consolidated School District 15	Education
2003	MEDRAD, Inc.	Manufacturing
2003	Saint Luke's Hospital of Kansas City	Health Care

Year Awarded	Company Name	Type
2003	Stoner, Inc.	Small Business
2004	Kenneth W. Monfort College of Business	Education
2004	Robert Wood Johnson University Hospital Hamilton	Health Care
2004	Texas Nameplate Company, Inc.	Small Business
2004	The Bama Companies, Inc.	Manufacturing
2005	Bronson Methodist Hospital	Health Care
2005	DynMcDermott Petroleum Operations Company (now known as DM Petroleum Operations Company)	Service
2005	Jenks Public Schools	Education
2005	Park Place Lexus	Small Business
2005	Richland College	Education
2005	Sunny Fresh Foods, Inc. (now known as Cargill Kitchen Solutions)	Manufacturing
2006	MESA Products, Inc.	Small Business
2006	North Mississippi Medical Center	Health Care
2006	Premier Inc.	Service
2007	City of Coral Springs	Non-Profit
2007	Mercy Health System	Health Care
2007	PRO-TEC Coating Company	Small Business
2007	Sharp HealthCare	Health Care
2007	U.S. Army Armament Research, Development and Engineering Center	Non-Profit
2008	Cargill Corn Milling North America	Manufacturing
2008	Iredell-Statesville Schools	Education
2008	Poudre Valley Health System	Health Care
2009	AtlantiCare	Health Care
2009	Heartland Health	Health Care
2009	Honeywell Federal Manufacturing & Technologies, L.L.C.	Manufacturing
2009	MidwayUSA	Small Business
2009	Veterans Affairs Cooperative Studies Program Clinical Research Pharmacy Coordinating Center	Non-Profit
2010	Advocate Good Samaritan Hospital	Health Care
2010	Freese and Nichols Inc.	Small Business
2010	K&N Management	Small Business
2010	MEDRAD, Inc.	Manufacturing

Year Awarded	Company Name	Type
2010	Montgomery County Public Schools	Education
2010	Nestlé Purina PetCare Company	Manufacturing
2010	Studer Group	Small Business
2011	Concordia Publishing House	Non-Profit
2011	Henry Ford Health System	Health Care
2011	Schneck Medical Center	Health Care
2011	Southcentral Foundation	Health Care
2012	Lockheed Martin Missiles & Fire Control	Manufacturing
2012	MESA Products, Inc.	Small Business
2012	North Mississippi Medical Center	Health Care
2012	City of Irving	Non-Profit
2013	Pewaukee School District	Education
2013	Sutter Davis Hospital	Health Care

According to Quality Progress, each of these recipients have faced unique circumstances and challenging obstacles in order to obtain the Malcolm Baldrige award. Through undergoing this process, each recipient was able to clearly demonstrate that they have not only made a commitment to continuously innovate, but have also proven results of continuous improvement (Anonymous, Climb to the Top, 2011).

2.5.5 Results

In 2006, two researchers named Albert Link and John Scott compared the net social benefits of the program to its members, extrapolated those benefits to the economy as a whole, and made a comparison of these benefits to the social costs associated with the program in an effort to estimate the overarching value of the Malcolm Baldrige program as a whole. Their study found that the ratio of economy-wide benefits to social costs exceeded 207:1. This

supported their hypothesis that public investments in quality-standards infrastructure such as Malcolm Baldrige are worthwhile (Link & Scott, 2006).

In addition to this net societal benefit, company-level benefits have been demonstrated and proven by improved financial results, satisfied customers, satisfied workforce, and improved operations (Schaefer, 2011). Several specific improvements that have resulted from pursuing the Criteria for Performance Excellence have included the following (Schaefer, 2011):

1. Manufacturing awardees realized average annual revenue increases of 48%.
2. Nestlé Purina PetCare Company achieved global sales of \$12.5 billion in the year it won the Baldrige Award, and it increased its revenue over the 7 years leading up to its Baldrige Award despite marginal growth in the U.S. pet population during the same period.
3. Honeywell Federal Manufacturing & Technologies achieved a 15-fold annual improvement in cost savings from supply-chain efforts, from \$2 million to \$65 million over 2 years, and realized a 20% annual cost savings from energy conservation improvements over 3 years. They realized \$23.5 million to \$27 million annual cost savings from deployed innovations and increased productivity for 3 fiscal years. They achieved 99.9% combined quality/reliability ratings by traditional customers and 98.4% to 99% ratings by nontraditional customers for 3 years. In addition, they kept a 96% customer loyalty rating over 4 quarters, beating the commercial industry's best-in-class level of 95% for same period.

4. Cargill Corn Milling realized more than \$7.5 million annual cost savings from implementing innovative ideas over 2 years, and a 23% annual decline in customer complaints and rejections per 1,000 shipments, which moved from 10.5% to 3.3% over 3 years. The company improved these results despite an increase in shipments of 18% over 5 years. They achieved a 95% operational reliability effectiveness rate (a ratio of actual production vs. commercial demand), which was 3 percentage points shy of the world-class benchmark set by the Society of Maintenance and Reliability Professionals. Over 5 years, they realized a 42% improvement in operational asset health, which increased from 60% healthy assets to 85%, a world-class level.
5. From 1996 to 2003, MEDRAD, Inc. improved from the top 20 to 2nd in a ranking of customer satisfaction among more than 50 medical imaging companies. In addition, from 2001 to 2010, this company's global customer satisfaction ratings using the Net Promoter scoring system, which measures customer loyalty based on willingness to refer, showed a steady improvement from 50% to 63%, surpassing the best-in-class benchmark of 50%.
6. Operations Management International, Inc. (now CH2M HILL) realized a nearly 7% per year increase in market share on average in the core business segment over 3 years, had 95% of contracts renewed by its customers in the year the Baldrige Award was received, and achieved the highest average length of customer retention in the industry in the year the Baldrige Award was received.

7. The U.S. division of Caterpillar Financial Services Corporation saw a 34% increase in assets and 54% increase in profit over 5 years, against industry declines of 21% and 35%, respectively.
8. DynMcDermott Petroleum Operations Company (now DM Petroleum Operations Company) achieved customer award fees about 70% higher than earned by the previous contractor over 5 years.
9. Premier, Inc. achieved a nearly 20% average annual increase in consolidated pretax operating income over 4 years, and achieved a 95% customer loyalty rating and 97% customer retention rating in the year the Baldrige Award was received.
10. K&N Management realized more than 40% annual gross profit, exceeding the industry standard.
11. The Studer Group achieved more than 30% annual growth in revenues for 9 years, which exceeded the Association of Management Consulting Firms average of 10% annual growth.
12. Freese and Nichols Inc. saw annual revenues grow at a rate of 12% to 16% for 4 years, despite minimal growth in the engineering industry.
13. MESA Products, Inc. achieved a 93% increase in sales over 6 years.
14. Midway USA saw a 25% sales growth rate in 1 year, compared to 10% for its competitor, and a 300% increase in net income as a percentage of sales over 5 years.

15. Park Place Lexus realized a 51% increase in gross profit percentage over 4 years and a 30% increase in new and pre-owned cars sold over 4 years. They saw an 11% growth in share of luxury car market at their Plano dealership over 3 years.
16. Texas Nameplate Company, Inc. achieved an 11% increase in profitability over 6 years.
17. Los Alamos National Bank achieved a 48% growth in net income over 4 years as well as a 5% growth in share of primary customers over 2 years.
18. ARDEC achieved a 56% increase in revenue over 6 years, and a cost avoidance of \$3.22 billion over 5 years.
19. The Center achieved budget growth of 143% over 6 years, and realized a 99% or greater performance to budget rating over 6 years.
20. K&N, the franchisor for four Country Store & BBQ, the second restaurant to win the Malcolm Baldrige award, ranked number one in food sales per square foot over approximately 67,000 restaurants in Texas (Ruggless, 2010).

The Malcolm Baldrige Criteria for Performance Excellence has been applied in many areas of companies and service groups by providing a gauge or “scale for success” that are used to measure performance (Fisher, Pearson, Goolsby, & Onken, 2010). Specifically, all of the healthcare organizations that have either received the Malcolm Baldrige National Quality Award or that were visited by Baldrige examiners have outperformed other hospitals in practically every metric used at the top 100 nationally recognized hospitals. In fact, hospitals using the Baldrige

process are significantly more likely to achieve a performance level equal or better than the top 3%” of their peers (Anonymous, Healthy Returns, 2011).

A study by Thompson Reuters that compared the Baldrige Award applicants and recipients with peer hospitals on a national balanced scorecard found that there was substantial correlation between the Baldrige process results and the ‘100 Top Hospitals’ award. Hospitals that were Baldrige award recipients were significantly more likely than their peers to win the 100 Top Hospitals national award. In addition, Baldrige hospitals were also more likely to display a faster performance improvement over a five year period compared to their peers (Foster & Chenoweth, 2011).

In fact, Baldrige hospitals were about 83 percent more likely to be awarded a 100 Top Hospitals national award for excellence in organization-wide performance, and Baldrige hospitals outperformed non-Baldrige hospitals in nearly each measure of performance used in the 100 Top Hospitals composite score (Foster & Chenoweth, 2011). “We’ve known for years...using the Baldrige criteria and earnest pursuit of the Baldrige evaluation will improve organizations by nearly every measure of success, be it in outcomes, safety, customer and employee satisfaction, or profitability” (Quality Progress, 2011).

2.5.6 Benefits of Assessment

The most encouraging news about the benefits of the Malcolm Baldrige Criteria for Performance Excellence is that they are not limited only to award recipients. It has been reported that every organization that uses or applies the Baldrige Criteria towards corporate self-study and

change “wins” in the respect that they have greater insight and increased ability to learn, adapt, innovate, and achieve excellence (Schaefer, 2011). The Baldrige National Quality Program has served as a blueprint for more than 50 similar programs at the state, regional, and local levels.

These programs provide a great opportunity for organizations that are not quite ready to apply for the Baldrige Award to receive feedback from trained and experienced examiners (Weinstein, 2009). In 2010, for example, the 83 applicants which applied for the award represented over 277,000 jobs, 1,500 work locations, over \$38.5 billion in revenues/budgets, and an estimated 80 million customers served (U.S. Department of Commerce).

Even companies who do not intend to actually apply for the award have benefitted from the assessment criteria. Almost 1 million copies of the Malcolm Baldrige National Quality Award (MBNQA) criteria have been distributed. Yet, in the first seven years that the award was given, only 546 companies applied for it. The question became, “what happened to the other 999,000 copies that were distributed?” To find out, Quality Progress magazine conducted a survey of those companies that requested a free, single copy or that purchased bulk copies of the criteria between 1992 and 1995. The result was that the criteria were being used primarily to obtain information on how to achieve business excellence (Bemowski & Stratton, 1995).

Companies can use the assessment process to provide a comprehensive portrait of their organization and to help them develop short and long term goals that link quality into their strategic planning process in order to help them focus their attention on achieving better organizational performance (Weinstein, 2009). One of the widely-acclaimed benefits of

participating in the Baldrige self-assessment it is the opportunity to increase organizational learning (DeBaylo, 1999).

There have been some who say, however, that the business environment has changed considerably since the conception of Performance Excellence models in the 1980's, questioning its practical validity (Williams, Bertsch, Van Der Wiele, Van Iwaarden, & Dale, 2006). Many successful companies, however, have been able to achieve organizational learning by reading the criteria and supporting process descriptions, working through the analysis questions, analyzing the results data and relevant benchmarks, sharing the completed application document with employees, customers, and suppliers, reading the feedback report, sharing best practices with other business units and organizations, and by participating in criteria training at all levels within the organization (DeBaylo, 1999).

2.6 Contributing Factors of Performance Excellence

Studies have also been conducted which evaluate other criteria that contribute to the performance of a firm. As part of this topical review, 31 peer-reviewed journal articles on this specific topic were analyzed with the intent of uncovering trends that might further contribute and enhance the MBNQA model. A Pareto graph which visually demonstrates the overall themes is provided in Figure 2.

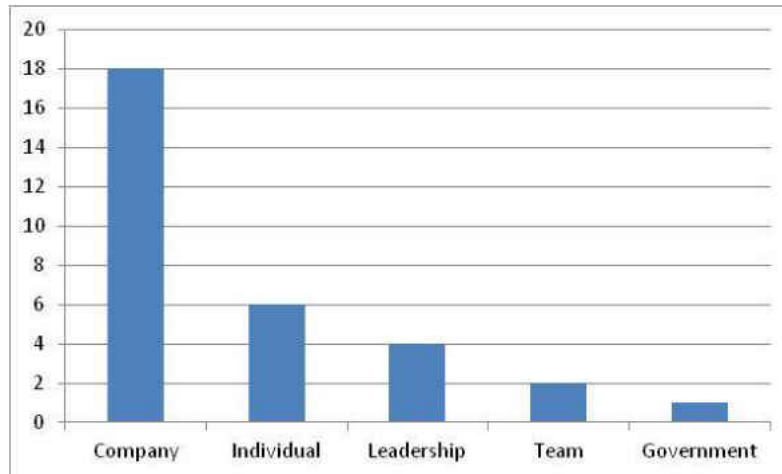


Figure 2: Contributing Factors to Performance within Literature

The first main contributor to performance excellence is leadership. One such study by Pannirselvam and Ferguson (2001) indicates that leadership significantly directly or indirectly affects all of the systems constructs within the model. A similar finding resulted from the research of Wilson and Collier (2000), when they determined through an empirical investigation that leadership is the most important driver of system performance.

Another study examined the performance of healthcare organizations determined that leadership drives the direction of the organization, which affects the system from which results are derived (Kim & Oh, Causality Analysis on Health Care Evaluation Criteria for State-Operated Mental Hospitals in Korea Using Malcolm Baldrige National Quality Award Model, 2012).

Typically, organizational factors are the subject of study among firms with performance differences. However, variation amongst individuals, and especially mid-level managers, has proven to have greater significance on firm performance (Mollick, 2012). The topic of leader

performance specifically is the subject of many studies, particularly the causes of effective leadership. In 2009, Van Iddekinge, Ferris, and Heffner found that the knowledge, skills, abilities, and consciousness of leaders were directly correlated to firm performance. Leaders emerge from those employees which exhibit the greatest amount of initiating structure behavior (Taggar & Seijts, 2003), which means that they are task-oriented in order to help the team accomplish its goals.

This observation is further augmented by the information processing theory, which proposes that employees work towards achieving organizational goals because they want to succeed, but this focus may also result in lowered attentiveness towards recognizing the efforts of others (Powell, Lovallo, & Caringal, Causal Ambiguity, Management Perception, and Firm Performance, 2006). The CEO is the company's foremost leader, and that role is therefore of great importance. As determined by a 2010 study, a one-point increase in strategic flexibility (the ability to adapt to varying environmental circumstances) results in a 4.21 percent increase in ROA, a 5.01 increase in ROS, and a 3.85 percent increase in ROI (Nadkarno & Herrmann).

To foster this strategic flexibility in order to contribute to leadership performance, CEOs must adopt extraversion traits as well as receptivity toward new experiences, and avoid comprehensiveness (being too-detail oriented) and the status quo in decision-making (Nadkarno & Herrmann, 2010). Businesses which select successor CEOs who are external to the company have been shown to foster a greater degree of firm internationalization during complex industrial environments (Lin & Liu, 2012). Additionally, top management teams which have functional

background diversity realize increasing positive effects as environmental uncertainty increases (Cannella, Park, & Lee, 2008).

Another main contributor to performance excellence is employee performance. Employee performance has been a widely studied subject, although it is possible that budget constraints may reduce investments in performance measurement systems in the future (Sanger, 2012). Curiosity and learning were determined to strongly relate to successful employee socialization and the best possible job performance (Reio & Callahan, 2004). The work environment and even procedures and instructions can have an effect on system performance as well (Elshennawy, Lee, & Hines, 1989).

The cognitive style of employees has also been the subject of study by McIntyre, Claxton, Anselmi, and Wheatley (2000) to correlate higher performance with the ability to adapt to situational constructs. Using the MBTI (Myers-Briggs Type Indicator) framework, they concluded that employees who use think abstractly (Intuition) from a detached standpoint (Thinking) are more likely to exhibit adaptive behavior than those who look at concrete information (Sensing) and are highly empathetic (Feeling).

Within a team setting, the most successful employees attribute group success to the sense of responsibility that they place on themselves, each group member, and the team as a whole versus on group constraints and situational distractions (Forsyth & Schlenker, 1976). High self-esteem has been found to make people more willing to speak up in groups and also more willing

to challenge the group's approach (Baumeister, Campbell, Krueger, & Vohs, 2003), leading to constructive brainstorming sessions and enhanced productivity.

Another contributor to performance excellence is business characteristics. Specific business characteristics have also been the subject of study in determining the link to performance. One study determined that firm effects (difficult-to-copy attributes) are more important than industry effects (such as the technology life-cycle) on firm performance (Mauri & Michaels, 1998). In addition, a 2012 study by Delcea, Scarlat and Maracine determined six contributing factors to a firm's current situation. These contributing factors include competitiveness, learning, marketing, management, planning, and resources. In an analysis of 120 independent samples, another study found that a multinational company has intrinsic value that supercedes the intangible assets that firms possess (Kirca, et al., 2011). Extra-national (offshore) technology units have also been proven to reduce resource-based power (Medcof, 2001).

Intangible resources such as intellectual capital and customer capital are another contributor that positively influence firm performance (Cater & Cater, 2009). Research in 2008 (Ariyachandra & Frolick) surveyed the literature for critical success factors contributing to performance, and a trend analysis revealed that having a champion, management support, sufficient resources, team skills, user support, effective communication, clear links to business strategy, data management infrastructure, a development methodology and managing resistance all help guide evolution.

Even corporate philanthropy efforts have been shown to positively contribute to the financial performance of a firm, mostly due to the effect it has on stakeholder responses which lead to political gains (Wang & Qian, 2011). In a somewhat related study, socially responsible activities (such as volunteerism and a concern for the environment) were determined to help maximize the overall market value of the firm (Mackey, Mackey, & Barney, 2007).

Variations in firm profitability contribute to variations in corporate-level strategies and business-level strategies (Beard & Dess, 1981). The degree to which a company organizes the relatedness of its products, markets and technologies within its diversification strategy helps to increase firm performance (Varadarajan & Ramanujam, 1987). Surprisingly, strategic planning alone does not provide a sustainable strategic advantage in and of itself, because although it does provide value, it is easily imitated and can be substituted (Powell, Research Notes and Communications Strategic Planning as Competitive Advantage, 1992). Even if strategic planning is completed at the business-unit level, this distributed approach can hinder innovation (Grant, 2003).

According to a study which focused solely on TQM (Total Quality Management) and firm performance, the strongest predictors of firm performance included leadership, management of people, and customer focus (Samson & Terziovski, 1999). These authors also made a surprising discovery that behavioral factors such as executive commitment, employee empowerment and an open culture can produce competitive advantage more strongly than the

TQM tools and techniques of process improvement, benchmarking, and information and analysis.

Knowledge assets also contribute to performance excellence. Data from focus groups was collected in another study (Andreou, Green, & Stankosky, 2007) to determine knowledge assets leading to enhanced performance. The authors created a taxonomy of value drivers for these intangible assets, and these resulted in the categories of customer, competitor, employee, information, partner, process, product/service, and technology. Studies within the education field also help uncover potentially-related factors contributing to performance. One such study identified that leaders are responsible for creating a customer focus, setting values through actions, and for developing future leaders (Belohlav, Cook, & Heiser, 2004).

The literature reviewed within this section provides a unique perspective in gaining an understanding and appreciation for factors which have been proven to contribute to performance, but may not necessarily be completely reflected within the scope of the MBCPE model. A synthesis of these findings are provided in Table 3.

Table 3: Summary of Factors Contributing to Performance

Year	Author	Findings & Results That Are Related to Performance
1975	Forsyth & Schlenker	Strong sense of personal ability and responsibility versus internal constraints, situational distractions, and task difficulty.
1981	Beard & Dess	Corporate-level and business-level strategies.
1983	Lubatkin	Acquired firms achieve performance improvements as a result of technical, pecuniary, and diversification synergies.
1986	Chakravarthy	The quality of firm transformational efforts and satisfaction of all firm stakeholders are important discriminators of strategic importance.
1987	Varadarajan & Ramanujam	Diversification based on relatedness of products, markets, and technologies.
1989	Elshennawy, Lee, Hines	Machines and work environments arranged to reduce error.

Year	Author	Findings & Results That Are Related to Performance
1992	Powell	Strategic planning does not provide a sustainable competitive advantage in and of itself, as it is easily imitated and may be substitutable.
1995	Hart	Pollution prevention, product stewardship, and sustainable development contribute to development of a sustained competitive advantage.
1996	Peng & Heath	The growth of a firm is constrained by the ability of the management team to effectively articulate organization information to employees and its ability to overcome transaction costs associated with growth.
1998	Mauri & Michaels	Firm effects are more important than industry effects.
1999	Zahra	The dynamic interplay between technology, strategy, organization, and regions determine the identity, skills, and contributions of the firm.
2000	McIntyre, Claxton, Anselmi, Wheatley	Preferences for information intake by intuiting (rather than sensing) and information processing/decision-making by thinking (rather than feeling).
2001	Medcof	When important technical (R&D) resources are located offshore for strategic and efficiency reasons, resource-based power goes with them.
2003	Grant	Strategic planning systems aimed at coordinating decentralized strategy formulation foster adaptation and responsiveness, but these may limit innovation as well as analytical sophistication.
2003	Baumeister, Campbell, Krueger, Vohs	Praise boosts self-esteem as a reward for socially desirable behavior and leads to self-improvement.
2003	Taggar & Seijts	Emergence of strong leadership behaviors, emergence of strong staff role behaviors.
2004	Reio & Callahan	Emotions, curiosity, learning.
2006	Powell, Lovallo, Caringal	Causal ambiguity (availability of strategic resources) has no net effect on firm performance.
2007	Andreou, Green, Stankosky	Competitive intelligence, enterprise intelligence, social intelligence, leveraging competencies, leveraging technology, capitalizing on processes, customer intimacy.
2007	Mackey, Mackey, Barney	Socially responsible investment opportunities do not maximize future cash flows, yet maximize the market value of the firm.
2008	Cannella, Park, Lee	The effects of intrapersonal functional diversity become more positive as environmental uncertainty increases.
2009	Cater & Cater	Financial Resources, Customer Capital.
2010	Nadkarni & Herrmann	Facets of personality either enhance or inhibit strategic flexibility.
2011	Wang & Qian	Corporate philanthropy, which elicits positive stakeholder responses and gains in political access.
2011	Kirca, Hult, Roth, Cavusgil, Perry, Akdeniz, Deligonul, Mena, Pollitte, Hoppner, Miller, White	Multi-nationality provides an efficient organizational form that enables firms to transfer their firm-specific assets to generate higher returns in international markets.

Year	Author	Findings & Results That Are Related to Performance
2011	Mitchell, Shepherd, Sharfman	Hostile work environments increase erratic strategic decision-making, dynamic work environments reduce erratic decision-making.
2011	He & Huang	Clarification of hierarchies to coordinate interaction.
2012	Delcea, Scarlet, Maracine	Gaining an understanding to the underlying causes of failure will help improve a firm's situation and lengthen its life.
2012	Sanger	No evidence of performance measurement systems being used to help government manage for performance.
2012	Mollick	Variation among middle managers has a particularly large impact on firm performance, much larger than that of those individuals who are assigned innovative roles.
2012	Lin & Liu	Leadership successors which are external to the company foster a greater degree of change in the level of firm internationalization when the industrial environment is munificent or complex.

2.7 Literature Review Gaps

Four gaps have been identified as a result of the literature review: limitations of the comparative methods used, limitations of the time frame used, limitations of the sample sizes used, and limitations of the recency in which prior studies were conducted.

Limitations of the comparative methods used were evident. One-for-one comparisons were used to provide an effective comparison of a specific company to another; however, these may not have effectively accounted for industry effects and may be highly sensitive to unrelated events which may affect the comparison company under study (Hendricks & Singhal, 2001; Wisner & Eakins, 1994; Przasnyski & Tai, 2002; Jacob, Madu & Tang, 2004). The proposed method for addressing this gap within the scope of this study is to compare winning company results related to the industry as a whole, using publicly traded U.S. based companies in the same NAICS or SIC code as a basis for comparison.

Limitations of the time frame used were also evident. Of the studies that review stock performance, most add the stock to the portfolio in the winning year (Helton, 1995; Hendricks & Singhal, 1997; Easton & Jarrell, 1998; DeBaylo, 1999; Curkovic, Vickery, & Droge 2000; Hendricks & Singhal 1996 and 2001; Przasnyski & Tai, 2002; Balasubramanian Ike Mathur & Thakur, 2005; Cheah, 2005 and 2007; and Cazzell & Ulmer, 2009). The proposed method for addressing this gap within the scope of this research is to conduct long-term analysis (11-years) to measure market performance conducted as if an entire portfolio of award-winning companies was held from the beginning of a specific time period until the end of that period. A premise of this research is that award-winning companies begin integrating elements of performance excellence long before the award is granted, and as such, will begin demonstrating results before this recognition is obtained. This presents a new and comprehensive approach of award-winner analysis.

Limitations of the sample sizes used were evident. The number of publically-traded award-winning firms in previous studies was limited, because winners have only been selected since 1988. The proposed method for addressing this gap within the scope of this research is to conduct analysis using publically-traded award-winning companies and use methodologies that include as much data as reasonably possible.

Limitations of the recency in which prior studies were conducted were evident. Only a limited number of peer-reviewed journal articles were available which focused on the Criteria or performance improvement results from quality-improvement initiatives. Over 70% of these

articles were published prior to 2008. The proposed method for addressing this gap within the scope of this research is to update the analysis that has been conducted in the past, and integrate new measures which will provide a new systems perspective of the results.

This research design has been structured in such a way as to address these gaps that exist in the literature.

2.8 Synthesis of Prior MBCPE Research

Numerous studies have been conducted over the past twenty years that have analyzed the link between Quality Awards and business performance. Most of this research, however, has centered on whether Quality Awards improved a company's financial position after they were issued. Some of these studies have been conducted by the National Institute of Standards & Technology in an effort compare the performance of award winners with the S&P 500 (NIST, 2012).

These studies were discontinued after 2004 as many of the awardees were divisions of larger companies or were privately held or non-profit companies. The index performed exponentially higher during upward trends, and experienced a more severe decline in negative trends. The results of the years which were calculated performed as follows:

Table 4: Baldrige Stock Studies, Table View (1994-2004)

Year	# Companies	Result	Ratio	MBNQA Return	S&P 500 Return
1994	5	Outperformed Market	6.5 to 1	188%	28%
1995	14	Outperformed Market	4 to 1	249%	59%
1996	16	Outperformed Market	3 to 1	325%	112%
1997	18	Outperformed Market	2.4 to 1	362%	148%
1998	23	Outperformed Market	2.5 to 1	426%	173%

Year	# Companies	Result	Ratio	MBNQA Return	S&P 500 Return
1999	24	Outperformed Market	3.8 to 1	841%	222%
2000	24	Outperformed Market	4.2 to 1	685%	163%
2001	21	Outperformed Market	2.94 to 1	323%	110%
2002	19	Underperformed Market	-.53 to 1	-24%	45%
2003	16	Underperformed Market	-.49 to 1	-28%	58%
2004	17	Underperformed Market	-.51 to 1	-18%	36%

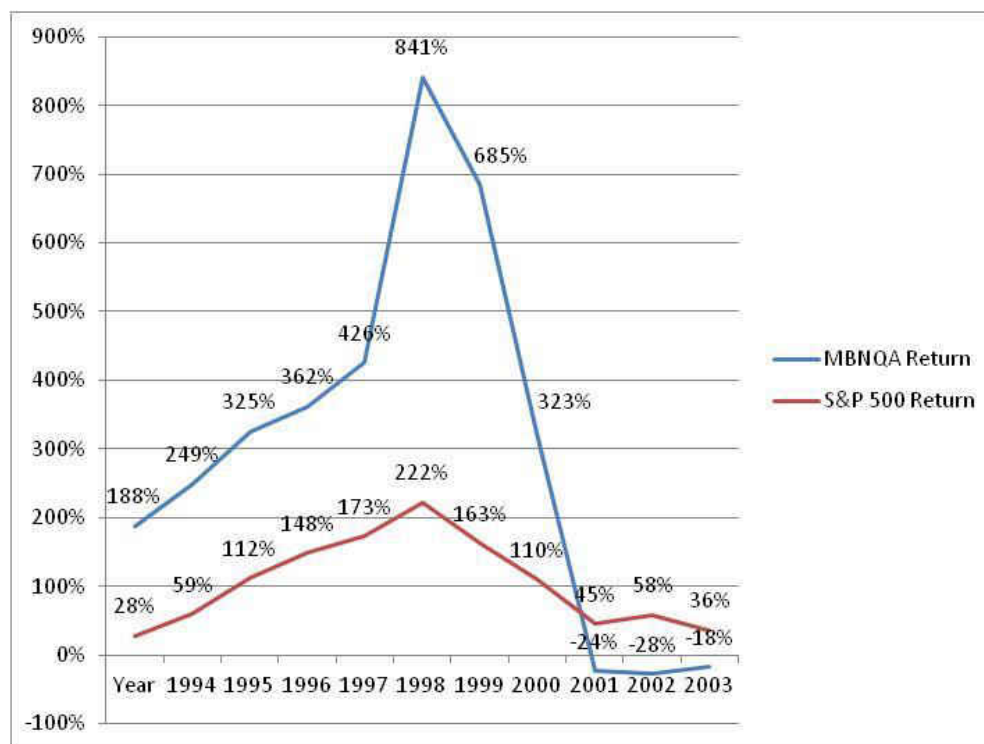


Figure 3: Baldrige Stock Studies, Graphical View (1994-2004)

Another observation obtained during the course of this literature review was the limited amount of information that was available on this subject of study. A large amount of information was related to the subject matter within news and magazine articles; however these were primarily limited to specific case studies in which a particular local company was being

highlighted as a feature. Only a limited number of peer-reviewed journal articles were available which focused on the Criteria or performance improvement results from quality-improvement initiatives. In addition, over 70% of these articles were published prior to 2008. This highlights the tremendous contribution which can be made to the existing body of knowledge to update the analysis that has been conducted in the past as well as and to integrate measures which were previously analyzed.

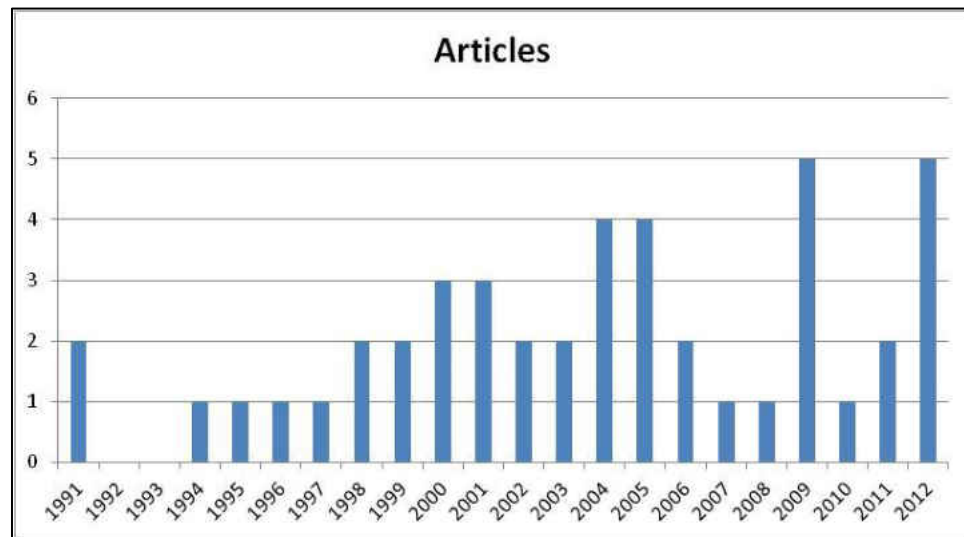


Figure 4: Journal Articles Reviewed Which Focused on the Market, Financial, or Operating Performance of Award-Winning Companies

As related articles were reviewed, several themes began to emerge. The topics under study in this subject area have been relatively consistent over time, and are primarily focused on the themes of causes of market return, operating performance, strategic planning, financial performance, causes of performance excellence, literature reviews, and quality performance. In addition to this, there were several very specific studies which were focused on the topics of

education, employee perceptions, ethics, government and health care and human resources. A Pareto diagram of these themes is presented in Figure 5.

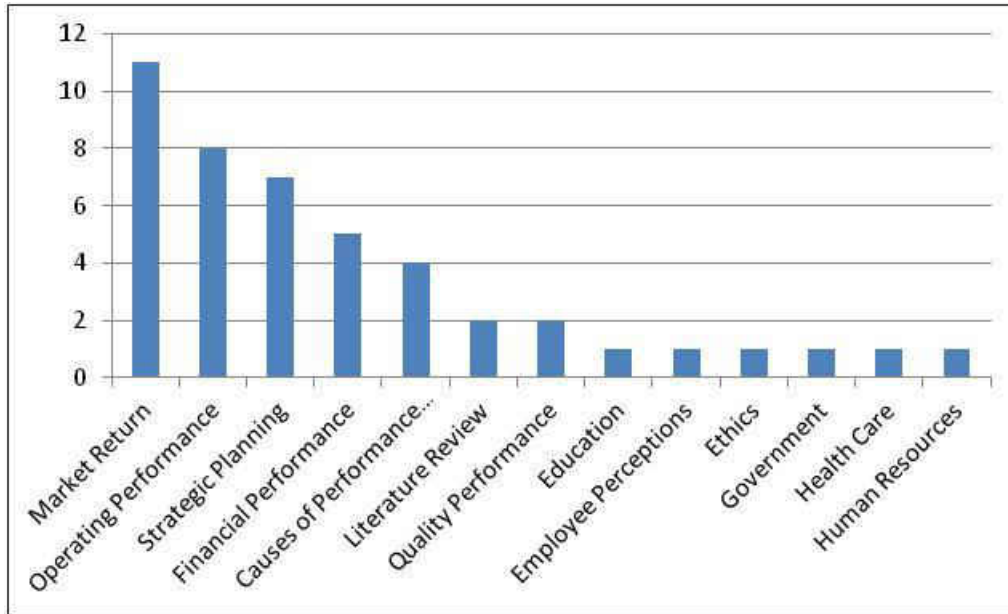


Figure 5: Pareto of Literature Themes

After the above Pareto of the Literature Themes was complete, these results were cross-analyzed with the year in which they were conducted. The purpose of this was to determine whether the topics under evaluation were investigated uniformly over time, and to uncover trends in the subject matter. From this information, it is evident that the research in these particular topics of study has grown over the past 10 years.

Of those studies which reviewed Market Performance (Helton, 1995; Hendricks & Singhal, 1997; Easton & Jarrell, 1998; DeBaylo, 1999; Curkovic, Vickery, & Droge 2000; Hendricks & Singhal 1996 and 2001; Przasnyski & Tai, 2002; Balasubramanian Ike Mathur & Thakur, 2005; Cheah, 2005 and 2007; and Cazzell & Ulmer, 2009), there have not yet been any

scenario-analysis studies conducted as if an entire portfolio of award-winning companies was held from the beginning of a specific time period until the end of that period. Instead, all of these studies were conducted as if the stock were added to the portfolio in the winning year.

In addition, researchers have conducted industry analysis using one-for-one company matching approaches with (Hendricks & Singhal, The Long-Run Stock Price Performance of Firms with Effective TQM Programs, 2001) their competitors (Wisner & Eakins, 1994) or to specific industry comparison companies (Przasnyski & Tai, 2002; Jacob, Madu, & Tang, 2004). While these one-for-one comparisons to provide an effective comparison of a specific company to another, they may not effectively account for industry effects and may be highly sensitive to unrelated events which may affect the comparison company under study.

A detailed overview on the prior award/quality related research is summarized below:

Table 5: Literature Overview for MBNQA Winning Companies

Year	Author	Results
1991	Garvin	The Baldrige Award is a strong predictor of long-term survival and a leading indicator of future profitability.
1991	Hart & Schlesinger	The Baldrige framework is emerging as an agent of change, helping organizations understand the how and why of quality, and giving them a practical tool they can use to drive change initiatives in the organization.
1994	Wisner & Eakins	The firms studied performed financially as well or better than their competitors.
1995	Helton	An investment of \$1,000 in each publicly owned quality award winner increased by 99% from 1991 through 1994.
1996	Hendricks & Singhal	The stock market reacted positively to quality award announcements.
1997	Hendricks & Singhal	The mean change in the operating income for the test sample was 48% higher than the control sample, and the mean change in sales was 24% higher than the control sample.

Year	Author	Results
1998	Easton & Jarrell	Performance was improved for the firms adopting TQM.
1998	Winn & Cameron	The MBNQA framework may be applicable to those interested in implementing a quality improvement effort.
1999	DeBaylo	Companies that were selected for site visits beat the S&P by ratios of 2:1.
1999	Samson & Terziowski, 1999)	Leadership, management of people, and customer focus were the strongest significant predictors of operational performance.
2000	Curkovic, Melnyk, Calantone, & Handfield	The MBNQA framework does capture the concept of Total Quality Management.
2000	Curkovic, Vickery, Droge	Both product quality and customer responsiveness lead to superior ROI, the former leads to enhanced ROA, and the latter to enhanced market-share performance.
2000	Wilson & Collier	Leadership is the most important driver of system performance. Information and analysis is statistically the second most important.
2001	Armstrong-Stassen, Wagar, Cattaneo	Downsizing has an adverse effect on quality initiatives.
2001	Hendricks & Singhal	Award winners significantly outperformed the control group firms, and the average increase of this outperformance ranged from 38% to 46%.
2001	Hillmer & Karney	Deming's axioms constitute a rational foundation on which to build a management theory.
2002	Hui & Chuan	The Malcolm Baldrige National Quality Award has elements in common with eight quality awards that are sponsored by other nations.
2002	Przasnyski & Tai	The sample of publicly traded MBNQA recipients (1988-1999) outperformed the market.
2003	Evans & Jack	Many fundamental management practices that are embedded in the Baldrige requirements, such as a focus on employee well-being and motivation, and attention to the design of work systems and their linkage to other categories, such as process management.
2003	Lee, Rho, Lee	Information and analysis has a strong, positive impact on strategic quality planning and process management.
2004	Bell & Elkins	Dashboard indicators for a balanced scorecard reflect

Year	Author	Results
		leadership implications from the Baldrige Criteria.
2004	Goodpaster, Maines, & Weimerskirch	An organizational improvement process which helps executives shape their firm's conscience through self-appraisal has been modeled after the self-assessment methodology of the MBNQA.
2004	Jacob, Madu & Tang	Award winners are superior financial performers and are valued higher by investors compared with similar sized firms and industry benchmarks.
2004	Jasinski	The Baldrige criteria support a systems perspective and a focus on results.
2005	Balasubramanian, Mathur, Thakur	These awards generate significant shareholder value for the MBNQA winners.
2005	Cheah	The announcement did not bring the intended effect of creating statistically abnormal returns.
2005	Maiga & Jacobs	Substantial support linking quality goals, feedback, and incentives to quality performance.
2005	Stephens, Evans, & Matthews	Small-business leaders ranked the strategy development process and leadership systems as most important to the success of their business.
2006	Van Der Stede, Chow, & Lin	Diversity in performance measurement techniques positively influenced performance.
2006	Williams, Bertsch, Van Der Wiele, Van Iwaarden, & Dale	The MBNQA might be a useful guide for improvement, but only for organizations whose conformance quality is poor.
2007	Cheah	Award recipient companies were not able to sustain the previously-generated significant abnormal returns that were achieved on the day that the award announcement was made.
2008	Natarajan & Barger	An innovative instructional approach was highlighted, in which business students develop organizational diagnostic and consulting skills through applying the Baldrige Organizational Profile as a performance improvement tool.
2009	Cazzell & Ulmer	All five companies under study experienced financial growth of approximately 100%.
2009	James & Johnson	TQM firms outperformed non-TQM firms in terms of domestic sales, export sales, net income, return on assets, and productivity growth.

Year	Author	Results
2009	Lakhal	Quality improvement efforts can lead to enhanced competitive advantage and improved organizational performance. Quality improvement efforts provide a source of competitive advantage for the organization.
2009	Molina-Azorin, Tari, Claver-Cortes, Lopez-Gamero	The large body of Quality Management research informs environmental management as well as a QM-EM system.
2009	Yaoli & Zhou	The MBNQA may be a theoretical foundation of a performance measurement system for the supply chain.
2010	Tanninen, Puumalainen & Sandstrom	TQM does have an effect on ROCE, productivity, and customer satisfaction.
2011	Prybutok, Zhang, and Peak	The MBNQA provides a viable set of measures for a municipal government to review and measure their organization's processes.
2011	Sun	Hong Kong companies have not reached the synthesis, alignment and integration as suggested by the MBNQA framework.
2012	Evans, Ford, Masterson, & Hertz	The MBCPE helps business leaders think strategically, align organizational structures, plans, and decisions and make them consistent with what is important to survive and sustain for the long run, better engage your workforce and customers, and perhaps achieve outstanding results along the way.
2012	Hertz	Application of the Baldrige criteria can provide an incredibly valuable framework for organizations of all types, leading them to superior results within their industry sectors and impacting the U.S. economy positively.
2012	Jacob, Madu & Tang	There is parsimonious evidence to suggest that Award winners do witness an increase in market value.
2012	Kim & Oh	Verified that Leadership drives Foundation and Direction, affecting System measurements which drive Results for 15 out of 18 hypotheses supported.
2012	Latham	A stakeholder-centered design framework is built upon the foundation of the MBCPE.

The Malcolm Baldrige Criteria for Performance Excellence is intended to serve as a tool and an integrated approach that helps companies achieve organizational performance management (Weinstein, 2009). The criteria and associated assessment processes are evolutionary and dynamic, not static. The Criteria are not prescriptive; they do not explicitly call out what is needed in order to gain results. Instead, they are focused on the drivers of success and those interrelated core values and concepts that help drive visionary leadership, excellence, and management for innovation (Schaefer, 2011).

It can be hard to keep the entrepreneurial spirit alive and flourishing after having succeeded in the past (Slywotzky, 2002). This is especially challenging in a volatile economy where discipline and a commitment to excellence are needed in order to sustain profitability and company viability into the future. After all, it takes more than pride to lead a company, it takes strategy, vision, and a desire to be the best (Brandt, 2011).

2.9 Conclusion to Literature Review

This review provided a summary of five foundational knowledge areas that emerged as a result of investigating the literature. These knowledge areas included: the economic environment in which businesses operate, a review of measurements used to determine or validate business success, a review of the definitions of performance excellence as it relates to businesses today (as well as how it is measured), a comprehensive review of the specific studies relating to the Malcolm Baldrige Criteria for Performance Excellence, and factors that contribute to performance excellence.

This approach was undertaken in order to provide a logical flow from what is occurring in the economic environment through how the Malcolm Baldrige Criteria for Performance Excellence can be incorporated by businesses in order to increase the likelihood of business performance excellence and sustainability. These results are evident through incremental improvements in business performance measurements and aggregated to improve the overall business position.

The Malcolm Baldrige Criteria for Performance Excellence and its associated Malcolm Baldrige National Quality Award form the subject of investigation for this research. This literature review was conducted to better understand the environment and the critical link that Performance Excellence efforts have on helping companies sustain and improve business performance. The ability of a company to sustain and improve performance excellence is the primary focus of this research.

It is generally accepted that the task of achieving performance excellence is much more difficult to obtain in a volatile economic environment. Making business performance projections and forward-looking statements in times of economic uncertainty are even more difficult. In volatile economic environments, competitive pressure is more intense and the ability of businesses to improve business results is more challenging.

Periods of weakness in the economy should not be regarded as a plateau also for quality improvement initiatives, but rather as opportunities to re-energize the need for further improvement (De Feo, 2001). The key for improvement during these times is the integration (and

balance) of multiple improvement methods. Organizations need top-down guidance along with bottom-up execution (Cokins, 2007). Firms get back the return on their quality investments as an increase in the viability of their corporation, which is a worthwhile investment (Saravanan & Rao, 2007). Additionally, empirical evidence suggests that conventional referents of performance (such as profitability or financial market measures) may provide an incomplete picture of excellence, and a narrow focus on satisfaction of stockholders may alienate a business's other stakeholders (Chakravarthy, 1986).

Based on this research, the Malcolm Baldrige Criteria for Performance Excellence may have the ingredients necessary to provide companies with the tools and skills to achieve business performance excellence. Companies that have previously won the Malcolm Baldrige Award for Performance Excellence have demonstrated that they have the knowledge, processes and tools to respond to a changing environment.

The Malcolm Baldrige Criteria for Performance Excellence serves as a tool and model that companies can use to acquire the skills, tools, and processes necessary to achieve and sustain better performance into the future. The underlying assumption for those who have won the national quality award is that they should be better equipped to demonstrate a higher performance than the industry and the market over the long term. If this can be objectively researched, then business leaders today can determine in what ways participating in performance excellence best practices creates value for business stakeholders.

CHAPTER 3: METHODOLOGY

3.1 Introduction to Methodology

This research uses both quantitative and qualitative measures to analyze the business results that have implemented the nationally-recommended performance excellence model, and is therefore a mixed-methods design. It analyzes company performance with market and industry trends, as well as the potential input factors that award-winning companies have in common. The mixed-methods design was driven by the overall research questions.

The purpose of this methodology section is to introduce the specific approach for how this research will be carried out. There are generally two types of accepted reasoning approaches: deductive and inductive (Leedy & Ormrod, 2013). Deductive reasoning begins with a premise, and moves forward toward conclusions that, if premises are true, must also be true. Inductive begins with an observation and moves to a truth. This research methodology approach will utilize an inductive reasoning approach for Research Question #1 and deductive reasoning approaches for Research Questions #2 and #3.

The scientific method was also employed to develop the construct of this research. The scientific method consists of four steps: the development of a problem, the development of a hypothesis, the gathering of data, and then analysis and interpretation of the data (Leedy & Ormrod, 2013). Due to the nature of the problem statement, both quantitative and qualitative approaches were used to analyze the information under investigation.

Several steps are required to complete the analysis of Malcolm Baldrige Award-Winning companies for this research. The first step includes an intra-company investigation to determine common input factors for award-winning companies, a new analysis approach initiated for the first time within this research. The second step includes a market comparison to illustrate the risk-return relationship between publically-traded MBNQA recipients and the S&P 500 Index, and leverages the work conducted by Przasnyski & Tai (2002) to compare the results of award-winning companies with the overall market. This step will include measures of excess return to its systematic risk as measured by the stock's beta, as well as measures of the difference between the actual return on a stock and its expected return. A matched pairs test of the overall results will also be conducted. The third and final element includes industry-to-industry comparisons help evaluate individual publically traded award-winning companies against others in the same SIC or NAICS code, and leverages initial work conducted by Jacob, Madu & Tang (2004) and Hendricks & Singhal (1997). Their work will be augmented by analyzing twenty-one different performance ratios to gain insight into the overall performance of award-winners.

3.2 Research Questions

In order to answer the primary research objective, three main research questions have been derived.

Research Question #1

What common input factors do winners have that lead to award selection?

Research Question #2

How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with the overall market?

Research Question #3

How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with their industry peers in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios?

Determining the best approach to find the answers to these three questions helped create an appropriate conceptual framework from which to approach the research methodology.

3.3 Conceptual Framework

This research aligns the relationship between the input factors that contribute to Performance Excellence within the Malcolm Baldrige Criteria with the results that are achieved for the award-winning companies in comparison with both the market as a whole as well as to their industry peers. This conceptual framework drives the research design, and is based on four premises:

1. Internal environment characteristics can drive performance.
2. Performance is evaluated by myriad measurements.
3. Superior measurements may lead to superior market and / or industry position.
4. Internal characteristics can lead to superior measurements which can lead to superior market and / or industry position.

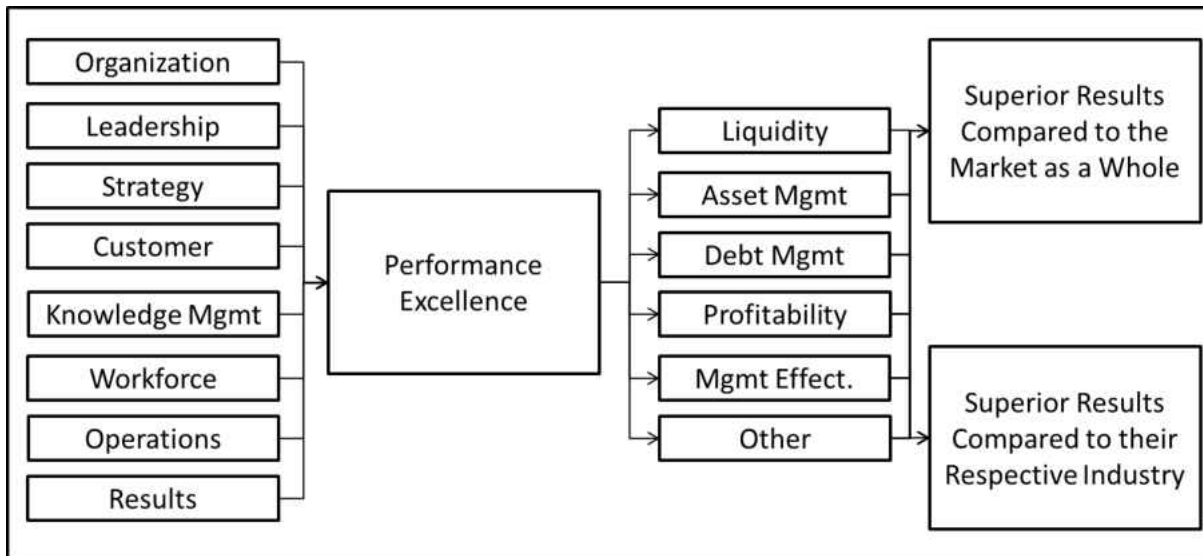


Figure 6: Conceptual Framework for Research

3.4 Hypotheses

The hypotheses were derived from the research questions. The research questions include: (1) what common input factors do winners have that lead to award selection? (2) How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with the overall market? (3) How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with their industry peers in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios? The hypotheses include:

H₀1: The majority of Malcolm Baldrige award winners do not have common input factors that lead to award selection.

H_A1: The majority of Malcolm Baldrige award winners have common input factors that lead to award selection.

H₀2: A portfolio of Malcolm Baldrige award winners does not outperform the market over an 11-year time period in comparison to the S&P 500.

H_A2: A portfolio of Malcolm Baldrige award winners outperforms the market over an 11-year time period in comparison to the S&P 500.

H₀3: The majority of Malcolm Baldrige award winners do not outperform their industry peers over an 11-year time period in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios.

H_A3: The majority of Malcolm Baldrige award winners outperform their industry peers over an 11-year time period in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios.

3.5 Data Sources and Definitions

For the analysis of this research, only publically available information is used. Financial data originated from company submissions to the Security and Exchange Commission (SEC), and retrieved through information contained within the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) database. This financial information was extracted using the Mergent Online and IBIS World Databases that are available through the University of Central Florida (UCF) library website. Individual company financial results will be obtained for an 11-year time

period covering the years 2002 through 2012. Industry information will be obtained using the associated NAICS code that matches each of the individual award-winning companies.

3.5.1 Profitability Ratios

Research Question #3 includes performance assessments based on profitability, liquidity, debt management, asset management, and per share ratios. The specific ratios used as well as their definitions are listed here (Mergent Online):

1. ROA – Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit.
2. ROE – Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Indicates how effectively the Stockholders' Investment is being used to produce profit.
3. ROI – Annualized Income expressed as a percentage of Average Invested Capital.
4. EBITDA Margin % – (Earnings before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue.
5. Calculated Tax Rate % – Taxation expressed as a percentage of Earnings before Tax.
6. Revenue Per Employee – Annualized Revenue divided by Number of Employees.

3.5.2 Liquidity Ratios

7. Quick Ratio – This ratio divides Quick Assets by Current Liabilities. It measures whether assets readily convertible into cash could meet current obligations. Therefore a ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

8. Current Ratio – This ratio divides Current Assets by Current Liabilities. A ratio of 2.5 is generally considered desirable for industrial companies. The current ratio is a financial ratio that measures whether or not a firm has enough resources to pay its debts over the next 12 months.
9. Net Current Assets % TA – Net Current Assets expressed as a percentage of Total Assets.

3.5.3 Debt Management Ratios

10. LT Debt to Equity – LT Debt (external funding) compared with Equity funding.
11. Total Debt to Equity – Total Debt (external funding) compared with Equity funding.
12. Interest Coverage – How many times Interest Expense is covered by Operating Income.

3.5.4 Asset Management Ratios

13. Total Asset Turnover – Annualized Revenue divided by Average Total Assets.
14. Receivables Turnover – Annualized Revenue divided by Average Receivables (ST).
15. Inventory Turnover – Annualized Cost of Sales divided by Average Inventories.
16. Accounts Payable Turnover – Annualized Revenue divided by Average Accounts Payable.
17. Accrued Expenses Turnover – Annualized Revenue divided by Average Accrued Expenses.
18. Property Plant & Equip Turnover – Annualized Revenue divided by Average Net Property Plant & Equipment.
19. Cash & Equivalents Turnover – Annualized Revenue divided by Average Cash & Equivalents.

3.5.5 Per Share Ratios

20. Cash Flow per Share – The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period.

21. Book Value per Share – The Net Assets attributable to each outstanding Common Share.

3.6 Data Collection

The population of data that was investigated for Research Question #1 began with winners of the Malcolm Baldrige National Quality Award. These winners are listed on the NIST website. Starting in 2002, the full applications of the award winners were posted online (NIST, Baldrige Award Recipients' Contacts and Profiles). There are 51 total award-winners whose profile was analyzed for Research Question #1.

Table 6: Award-Winning Profiles Used for RQ #1

Winning Year	Company Name	Winning Year	Company Name
2002	Branch-Smith Printing	2007	PROTEC
2002	Motorola CGISS	2007	Sharp
2002	SSM Healthcare	2008	Cargill Corn Milling
2003	Baptist Hospital	2008	Iredell Statesville
2003	Boeing Aerospace	2008	Poudre Valley
2003	Caterpillar	2009	AtlantiCare
2003	CC School District	2009	Heartland
2003	Medrad	2009	Honeywell
2003	Saint Luke's	2009	Midway USA
2003	Stoner	2009	VA CSP
2004	Bama	2010	Advocate Good Samaritan
2004	Monfort	2010	Freese and Nichols
2004	RWJ Hamilton	2010	K&N Management
2004	Texas Nameplate	2010	MC Public Schools
2005	Bronson Methodist Hospital	2010	MEDRAD
2005	DynMcDermott	2010	Nestle
2005	Jenks Public School	2010	Studer Group

Winning Year	Company Name	Winning Year	Company Name
2005	Park Place Lexus	2011	Concordia
2005	Richland College	2011	Henry Ford Health System
2005	Sunny Fresh Foods	2011	Schneck
2006	MESA Products, Inc.	2011	Southcentral Foundation
2006	NM Medical Center	2012	City of Irving
2006	Premier	2012	Lockheed Martin
2007	ARDEC	2012	MESA
2007	City of Coral Springs	2012	North MS Health Svcs
2007	Mercy Health System		

The 2013-2014 Malcolm Baldrige Criteria for Performance Excellence was used to obtain keywords for each of the categories within the framework. An equal number of 45 keywords for each Category of the Criteria were identified, totaling 360 keywords that were searched for each document. These keywords are listed in Appendix A. MAXQDA Version 11 software was used for the content analysis, and then www.worldle.net was used to create the visual frequency distribution images. These images are visual representations of data text, and the importance of each tag (or word) is shown using font size. This format is useful for quickly understanding the most important terms and also for determining prominence amongst a group of words.

The population of data that was investigated for Research Questions #2 and #3 began with winners of the Malcolm Baldrige National Quality Award. These winners are listed on the NIST website (NIST, Baldrige Award Recipients' Contacts and Profiles). Companies which did not have a ticker symbol were eliminated, because research questions #2 and #3 focus primarily on publically-traded companies. The companies that remained included ALU, AWI, BA, BA,

BAC, C, CAT, DAN EMN, FDX, FLEX, GFKAF, GLW, GM, GSM, HON, IBM, LMT, MAR, MAR, MMM, MSI, MSI, NSRG Y, RTN, STM, TM, VZ, WAB, XRX, and XRX. Some of the award-winning company ticker symbols were purchased or acquired by other companies since the date of their award, and this list reflects those changes.

Second instances of repeat award-winning companies were eliminated so that their results would not be counted twice (Ticker Symbols: XRX, MAR, MSI, BA). The Malcolm Baldrige Criteria for Performance Excellence is focused on enhancing “the competitiveness, quality, and productivity of U.S. organizations for the benefit of all citizens” (NIST, Baldrige Frequently Asked Questions), so companies whose parent organizations are not based in the U.S. were eliminated from the scope of this research (Ticker Symbols: FLEX, ALU, GFKAF, STM, TM, NSRG Y). Companies were also eliminated if they did not have the required 11 years’ worth of stock information available which was required to complete this analysis (Ticker Symbols: GSM, GM, AWI, DAN, BAC). Companies which did not have all of the performance ratio information listed in section 3.5 were also eliminated from the scope of this research (Ticker Symbol: C).

After these filters were applied to the original list of award-winning companies, 15 companies remained. These companies included Boeing (BA), Caterpillar (CAT), Eastman Chemical (EMN), Federal Express (FDX), Corning (GLW), Honeywell (HON), International Business Machines (IBM), Lockheed Martin (LMT), Marriott (parent company for Ritz-Carlton,

MAR), 3M (MMM), Motorola (MSI), Raytheon (RTN), Verizon (VZ), Wabtec (acquired Westinghouse, WAB) and Xerox (XRX).

3.7 Data Assumptions

This research is based upon the published information of award-winning companies. This information consists of their award application, their stock information, and their performance ratio information. Therefore, the data analyzed is based on and subject to the data that is published by these companies.

One assumption made on the data was that very extreme outliers were anomalies to the intended data entry. Where extreme outliers appeared to be illegitimately included in the data, these anomalies were removed. These were very extreme and obvious outliers, such as a 1000% tax rate, for example. Instead of deleting the data point completely, I averaged out the other data points from the other years and replaced the outlier number with the average of the other years of data. Apart from several extreme data points, all outliers were left in the data. Conceptually, there are strong arguments for removal or alteration of outliers. Researcher training, reasoned argument, and thoughtful consideration were used to determine that due to the nature of this research including a recession and market volatility, all outliers except for very extreme outliers would be included in the data.

Another assumption is that the Baldrige Performance Excellence framework is up-to-date and considered to be a complete model. Whether this is actually the case is the subject of other

studies. The Criteria is updated to reflect changes that are relevant for businesses, and adaptations to the model are made every two years to account for them.

The final assumption is that there are different definitions of excellent performance. Companies who are presently “performing excellently” in the market may or may not meet the Baldrige criteria and are therefore not the subject of this research. This research is focused on the topic of “performance excellence” within the context of the Baldrige Criteria.

A data assumption was made regarding the level at which to analyze firm performance. Firms that have an award-winning sector or business unit were investigated at the company-level for analysis of financial information. There are 15 publically-traded companies that are analyzed within the context of this research. These companies include Boeing (BA), Caterpillar (CAT), Eastman Chemical (EMN), Federal Express (FDX), Corning (GLW), Honeywell (HON), International Business Machines (IBM), Lockheed Martin (LMT), Marriott (parent company for Ritz-Carlton, MAR), 3M (MMM), Motorola (MSI), Raytheon (RTN), Verizon (VZ), Wabtec (acquired Westinghouse, WAB) and Xerox (XRX).

Only two of these fifteen companies received the award at the company level, and those are Federal Express, and Eastman Chemical Company. The rest of the winners received the award at the Business Unit level. Ideally only the award-winning sector or business unit would be analyzed, but due to precedence established in the body of research, as well as due to the limited availability of SEC data at the segment level, the ticker symbol was used to gather the data, and the overall company was analyzed.

3.8 Data Analysis

The methodological procedures that follow are revolved around answering the three research questions of: (1) what common input factors do winners have that lead to award selection? (2) How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with the overall market? (3) How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with their industry peers in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios?

The first step in determining which type of statistical method to employ will begin with conducting a test of normality. It must be determined whether the data follows a normal distribution. If the data follows a normal distribution, then a parametric statistical test will be selected. If the data do not follow a normal distribution, then a non-parametric statistical test will be used. Non-parametric tests do not depend on the distribution and are thus called distribution-free tests (Mendenhall & Terry, 2007). The test for normality that will be employed within this research is the Kolmogorov-Smirnov Test for Normal Distribution. This test was developed by H.W. Lilliefors in 1967, and is a goodness-of-fit test that compares the empirical cumulative distribution function with the normal cumulative distribution function (Ebeling, 2010).

If the data follows a normal distribution, then a parametric matched-pairs (paired) t-test will be conducted for the 11 years under investigation. T-tests are used to compare a response

where the test subject (the S&P 500) is the control. The first stimulus is applied (year 1), the response is recorded, and then the second stimulus is applied (year 2), until all years have been accounted for. Since the same subject is being used (award-winners) and the differences of the stimuli are recorded, the change in responses (stock returns) to that subject (award-winners) is under investigation. An important factor for use in this statistical approach is that the same population (companies that are publically traded) are analyzed.

If the data does not follow a normal distribution, then a non-parametric technique called the Wilcoxon Signed Ranks Test will be used. This method helps “test the hypothesis that two population probability distributions are identical against the alternative hypothesis that one is shifted to the right (or left) of the other” (Mendenhall & Terry, 2007). Graphical methods for describing the quantitative results were employed as appropriate throughout this process.

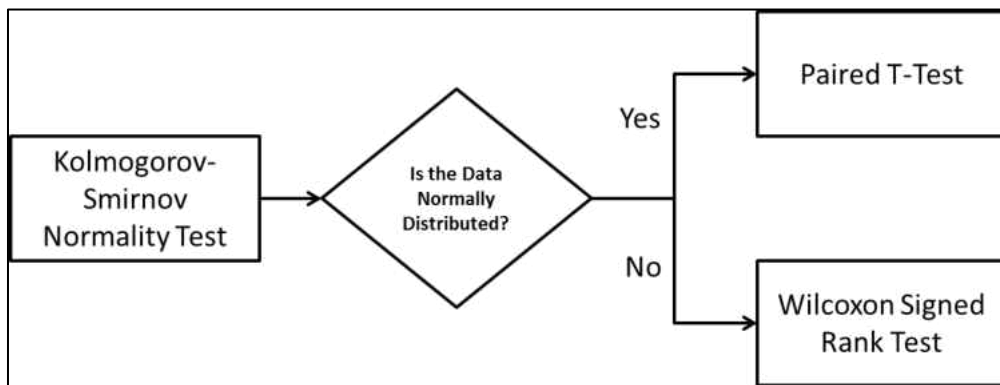


Figure 7: Data Testing Approach For Research Questions #2 and #3

For Research Question #2, the risk- return relationship between the award-winning companies and the S&P 500 index was analyzed for the years 2002 – 2012. The rate of return and beta of the 15 publicly-traded award-winning companies were plotted against the security

market line (SML). The companies that lie above this line are considered to have outperformed the market, whereas those which fall below the line have underperformed the market. This line “connects the risk-free return (i.e. the return at zero risk, when beta equals zero, proxied by the average yield on 91-day Treasury bills) and the market return (proxied by the average return of the S&P 500 index which has a beta of 1)” (Przasnyski & Tai, 2002).

After this graphical analysis is conducted for Research Question #2, then a statistical analysis will be conducted to analyze the overarching results of all of the Malcolm Baldrige award-winning companies against the S&P 500. The total results for all of the award winners will be averaged as if they were weighted equally in a portfolio. After normality is investigated, either a Paired T-Test or a Wilcoxon Signed Rank Test will be conducted to determine whether the overall portfolio outperforms the S&P 500. The paired test method will be used because the same subject (publically traded companies) will be used and differences of the stimuli (award winner vs. not) will be measured. An important factor in any paired statistical test is that the same population (companies that are publically traded in this case) is used to perform these tests.

For Research Question #3, industry comparisons were identified through the use of NAICS codes and the secondary use of SIC codes where additional filtering needed to take place. NAICS codes consist of 6-digits, whereas SIC codes use only 4-digits. The longer NAICS code therefore allowed for greater specificity in the number of sectors and subsectors to identify industry comparison companies.

Companies that were in the same industry as award-winning companies were eliminated if they were not publically-traded or based within the United States. For some companies, the 6 digit NAICS codes yielded too small a sample for industry comparison companies. The NAICS codes were reduced to 5-digits in these cases, and additional filtering was conducted with the SIC code. Peer industry company results were averaged together prior to comparison against the award-winning company. The award-winning company itself was not included in any industry comparison averages. If a comparison company was only missing one year of data or only one of the performance ratios, they were included in the analysis where data was needed. The companies that had the most complete financial profiles available were chosen.

FedEx was an exception in the NAICS code used. There were only 12 companies found by reducing the NAICS code to only two digits (49). Only 4 of these results were usable, so I searched for results under the NAICS code of 48, which was still under the sector of "transportation and warehousing".

Each industry comparison group had at least 10 peer industry companies. The number of industry comparison companies that were compared with each award-winning company is listed below. The specific company names are included in Appendix F.

Table 7: Count of Industry Comparison Companies

Ticker	Winning Year	Classification	NAICS	SIC	Count of Industry Comparison Companies
BA	1998	Manufacturing	336411	3721	19
CAT	2003	Service	333120	3531	13
EMN	1993	Manufacturing	325211	2821	13
FDX	1990	Service	492110	4513	12
GLW	1995	Manufacturing	327211	3211	12
HON	2009	Manufacturing	336312	3714	12

Ticker	Winning Year	Classification	NAICS	SIC	Count of Industry Comparison Companies
IBM	1990	Manufacturing	541519	7379	10
LMT	2012	Manufacturing	336414	3761	19
MAR	1992	Service	721110	7011	10
MMM	1997	Manufacturing	339112	3841	11
MSI	1988	Manufacturing	334220	3663	10
RTN	1992	Manufacturing	334511	3812	13
VZ	1994	Service	517110	4813	10
WAB	1988	Manufacturing	336510	3743	12
XRX	1989	Manufacturing	333315	3577	13

This research differs from other studies in the respect that it considers an 11-year time-span for analysis of the publically-traded award-winning firms. Other studies (Helton, 1995; Hendricks & Singhal, 1997; Easton & Jarrell, 1998; DeBaylo, 1999; Curkovic, Vickery, & Droge 2000; Hendricks & Singhal 1996 and 2001; Przasnyski & Tai, 2002; Balasubramanian Ike Mathur & Thakur, 2005; Cheah, 2005 and 2007; and Cazzell & Ulmer, 2009) evaluate the financial performance before and / or after the award date.

This research evaluates performance excellence not only obtained in the award winning year. Performance excellence must be strived for, and included as part of the organizational culture years before a Baldrige award is ever applied for. Therefore, this research examines all publically-traded award-winning firms for a consistent window of time, regardless of the award-winning year, in order to analyze performance results in-depth.

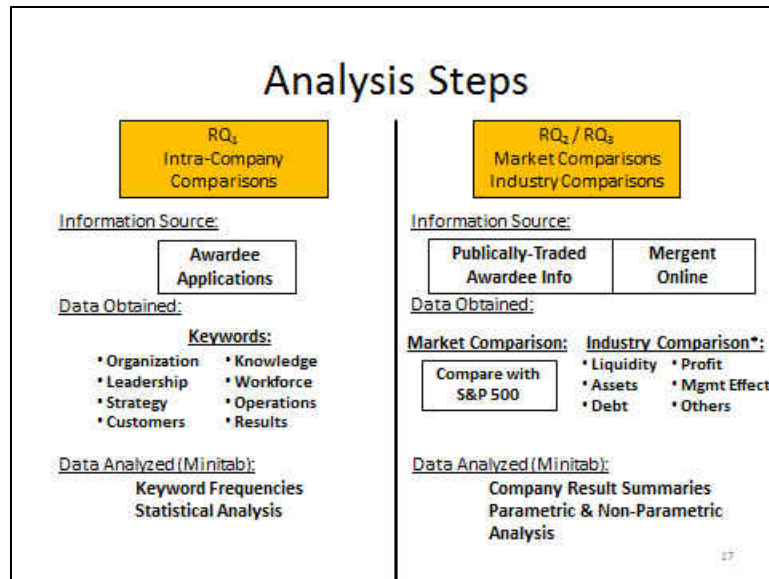


Figure 8: Methodological Approach for Analysis

3.9 Research Quality: Validity and Reliability

Four important qualities of research plan (Leedy & Ormrod, 2013) include that it is (a) universal, that any competent person can carry it out; (b) repeatable, that comparable results can be achieved in the future; (c) controllable, that it is possible to isolate the factors that are central to the problem; and (d) it is measurable, using data that can be measured.

Leedy and Ormrod (2013) also state that research design validity means that the instrument measures what it is intended to measure. To properly measure validity, the following aspects were considered when designing this research methodology:

1. Face validity: it looks like it is measuring the right thing.
2. Content validity: the measurement instrument is a representative sample.
3. Criterion validity: whether the instrument correlates with another measure.

4. Construct validity: the extent to which an instrument measures a characteristic that can't be directly observed.

In addition to validity, research design must also be reliable. Reliability refers to the degree to which a research instrument yields a consistent result. To properly measure reliability, the following aspects were considered when designing this research methodology:

1. Inter-rater reliability: the extent to which two or more individuals evaluating the same product or performance give identical judgments.
2. Test-retest reliability: the extent to which a single instrument yields the same results for the same people on two different occasions.
3. Equivalent forms reliability: the extent to which two different versions of the same instrument yields similar results.
4. Internal consistency reliability: the extent to which all of the items within a single instrument yield similar results.

The above criteria have been considered with respect to the research design and methodology approach in order to ensure a high quality analysis. According to Leedy and Ormrod (2013), researchers “should consider both internal validity and external validity when designing a research project.” Internal Validity refers to the extent to which accurate conclusions can be drawn based on the data collected, and external validity refers to the extent to which the results found can be generalized to other contexts beyond the study.

The research methodology has been designed to maximize both the validity and reliability of the measurement instruments in order to “obtain informative and useful data for addressing and solving the research problem” (Leedy & Ormrod, 2013).

3.10 Methodology Summary

This methodology approach provides the statistical and procedural framework to evaluate the three hypotheses associated with answering the three overarching research questions:

Research Question #1

What common input factors do winners have that lead to award selection?

Research Question #2

How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with the overall market?

Research Question #3

How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with their industry peers in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios?

From these research questions, three hypotheses were derived which include:

H₁: The majority of Malcolm Baldrige award winners have common input factors that lead to award selection.

H₂: A portfolio of Malcolm Baldrige award winners outperforms the market over an 11-year time period in comparison to the S&P 500.

H₃: The majority of Malcolm Baldrige award winners outperform their industry peers over an 11-year time period in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios.

These research questions and hypotheses form the foundation for the methodological approach. This approach was created in order to evaluate the performance of award recipients of the Malcolm Baldrige Criteria for Performance Excellence. The Criteria is often adopted by businesses in order to increase the likelihood of business performance excellence and sustainability, and this research should help business leaders gain insight into the expected results of their efforts.

This methodological approach was constructed in order to better understand the critical link that Performance Excellence efforts have on helping companies sustain and improve business performance trends. The ability of a company to sustain and improve performance excellence will be measured within this research. It is generally accepted that conducting analysis over a longer timeframe will yield a better and clearer interpretation of the results. The conclusions drawn from this methodology may ease the difficulty of making business performance projections and forward-looking statements in times of economic uncertainty for companies that have proven their capability to perform with excellence.

The underlying assumption in the methodological approach for this research is that those who have won the Malcolm Baldrige National Quality Award have elements in common and should be better equipped to demonstrate a higher performance than the industry and the market over an 11 year timeframe. If this can be objectively proven through the methodological approaches described herein, then the Malcolm Baldrige Criteria for Performance Excellence will be further validated as a tool and model that other companies can use to acquire the skills, tools, and processes necessary to achieve and sustain better performance into the future. The qualitative and quantitative methodology makes this analysis both inductive and deductive, and possibly more complete, as a result of the exhaustive analysis that will be conducted.

CHAPTER 4: RESULTS

4.1 Introduction to Results

This chapter provides the results of the research techniques described in the Methodology section, and the results of the statistical tests used for this research. This section provides the answers to the three research questions of: (1) what common input factors do winners have that lead to award selection? (2) How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with the overall market? (3) How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with their industry peers in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios?

4.2 Hypothesis #1 Results

Hypothesis #1 is based on Research Question #1. Research Question #1 states: what common input factors do winners have that lead to award selection? Therefore, hypothesis #1 states:

H₀1: The majority of Malcolm Baldrige award winners do not have common input factors that lead to award selection.

H_A1: The majority of Malcolm Baldrige award winners have common input factors that lead to award selection.

The population of data that was investigated for the analysis of Research Question #1 began with winners of the Malcolm Baldrige National Quality Award. These winners are listed on the NIST website. Starting in 2002, the full applications of the award winners were posted online (NIST, Baldrige Award Recipients' Contacts and Profiles). There were 51 total award-winners whose profiles were analyzed for this portion of the research. A table listing of the companies used for this portion of the research is provided in Section 3.6 (Data Collection).

The 2013-2014 Malcolm Baldrige Criteria for Performance Excellence was used to obtain keywords for each of the categories within the framework. An equal number of 45 keywords for each Category of the Criteria were identified, totaling 360 keywords that were searched for each document. The Keyword Dictionary can be found in Appendix A, and the detailed keyword results can be found in Appendix B.

One of the first tasks after conducting this analysis was to determine the words that had the highest frequency in each of the Categories. The word “process” is, by far, the most frequently found term in all of the results. A process is a series of actions that lead to a particular result (Mirriam-Webster).

Table 8: Most Common Keywords Found in RQ #1

Category	Most Common Keyword	Number of Findings
Organizational Profile	“Process”	15,909
Strategic Planning	“Plan”	11,583
Leadership	“Perform”	11,016
Customer Focus	“Customer”	10,390
Results	“Performance”	9,819
Operations Focus	“Manage”	7,991
Measurement	“Review”	6,313
Workforce Focus	“Staff”	4,419

Another insight is that “Leadership” was the Category which produced the most keyword results. The Leadership category represented about 21% of all of the keyword findings (84,002 words out of 408,684 total findings).

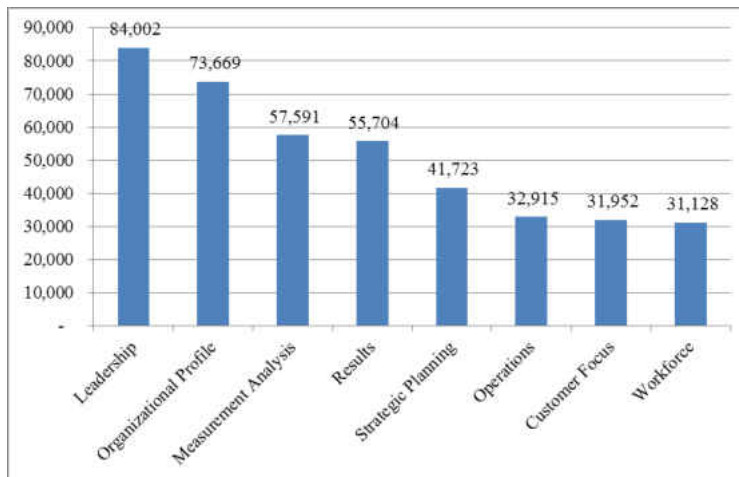


Figure 9: Keyword Frequency Counts for RQ #1

There were several words which were not found in any of the results. None of the 51 company profiles that were analyzed had these Criteria keywords within their application. About 56% of the words not found were from the Customer Focus Category.

Table 9: Keywords Not Found for RQ #1

Market Growth	Marketplace	Return on Investment	Supply Chain Management	Workforce Skills
Workforce Growth	Workforce Engagement	Measurement System	Customer Feedback	Customer Support
Customer Satisfaction	Customer Engagement	Customer Segment	Customer Group	Customer Requirement
Customer Expectation	Customer Relationship	Customer Life Cycle	Listening Method	Seek Feedback
Competitors' Customer	Adapt Product Offering	Customer Focus	Customer Communication	Future Market Segment
Strategic Planning Process	Blind Spot	Performance Evaluation	Engage the Workforce	Industry Size

The top 20 words comprise about 40% of the total word findings (161,621 words out of 408,684 total). These results were also consistent with the Pareto Principle, or 80-20 rule, which states that roughly 80% of the results can be explained by 20% of the causes.

Table 10: Top 20 Keyword Results from RQ #1

Top 20 Words	Category	Word Count
“Process”	Organizational Profile	15,909
“Plan”	Strategic Planning	11,583
“Perform”	Leadership	11,016
“Customer”	Customer Focus	10,390
“Performance”	Results	9,819
“Action”	Leadership	9,603
“System”	Organizational Profile	9,504
“Improve”	Leadership	8,853
“Manage”	Operations	7,991
“Service”	Customer Focus	7,963
“Develop”	Leadership	7,231
“Key”	Organizational Profile	6,988
“Review”	Measurement Analysis	6,313
“Data”	Measurement Analysis	6,248
“Measure”	Results	6,058
“Result”	Results	5,986
“Ratio”	Results	5,228
“Management”	Measurement Analysis	5,024
“Lead”	Leadership	4,959
“Satisfaction”	Customer Focus	4,955

After this preliminary analysis was conducted, visual frequency distribution images were then developed to gain additional insight through viewing the weighted list in visual design. These images are visual representations of data text, and the importance of each tag (or word) is shown using font size.

The Organizational Profile image was created using the keyword results for that category. The keyword results were then entered into the system to obtain the image. This image is a visual frequency distribution that represents the Organizational Profile keyword text, and those words with a larger number of keyword results appear with a larger font size. The colors chosen in this graphic were from a particular scheme and do not have any specific meaning.

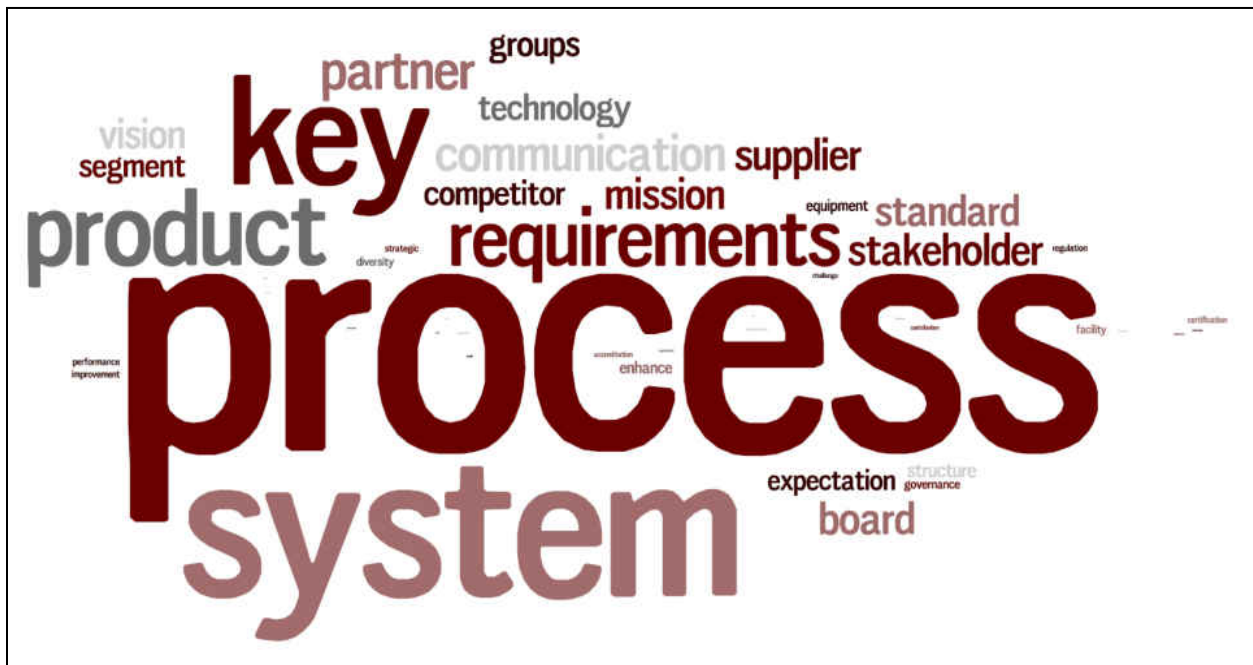


Figure 10: Organizational Profile Visual Frequency Distribution

“Process” is the most prominent word in this graphic, as it has the largest number of findings for all of the applicants (15,909). The next most prominent word is “system” (9,504), which is followed by “key” (6,988). These top three words are followed by “product” (4,911), “requirements” (3,812), “partner” (3,812), and “communication” (2,407).

The Strategic Planning image was created using the keyword results for that category. The keyword results were then entered into the system to obtain the image. This image is a visual frequency distribution that represents the Strategic Planning keyword text, and those words with a larger number of keyword results appear with a larger font size. The colors chosen in this graphic were from a particular scheme and do not have any specific meaning.



Figure 12: Strategic Planning Visual Frequency Distribution

“Plan” is the most prominent word in this graphic, as it has the largest number of findings for all of the applicants (11,583). The next most prominent word is “goal” (4,715), which is followed by “ability” (3,686). These top three words are followed by “change” (2,341), “objective” (1,962), “action plan” (1,866), and “innovation” (1,539). This graphic reflects the keywords that were chosen from the Strategic Planning section which were analyzed from the entire text of all 51 of the award-winner applications.

The Customer Focus image was created using the keyword results for that category. The keyword results were then entered into the system to obtain the image. This image is a visual frequency distribution that represents the Customer Focus keyword text, and those words with a larger number of keyword results appear with a larger font size. The colors chosen in this graphic were from a particular scheme and do not have any specific meaning.



Figure 13: Customer Focus Visual Frequency Distribution

“Customer” is the most prominent word in this graphic, as it has the largest number of findings for all of the applicants (10,390). The next most prominent word is “service” (7,963), which is followed by “satisfaction” (4,955). These top three words are followed by “support” (4,861), “complaint” (1,106), “listen” (889), and “interact” (524). This graphic reflects the keywords that were chosen from the Customer Focus section which were analyzed from the entire text of all 51 of the award-winner applications.

The Measurement & Analysis image was created using the keyword results for that category. The keyword results were then entered into the system to obtain the image. This image is a visual frequency distribution that represents the Measurement & Analysis keyword text, and those words with a larger number of keyword results appear with a larger font size. The colors chosen in this graphic were from a particular scheme and do not have any specific meaning.



Figure 14: Measurement & Analysis Visual Frequency Distribution

“Review” is the most prominent word in this graphic, as it has the largest number of findings for all of the applicants (6,313). The next most prominent word is “data” (6,248), which is followed by “management” (5,024). These top three words are followed by “information” (4,949), “measures” (3,402), “project” (3,027), and “assess” (2,871). This graphic reflects the keywords that were chosen from the Measurement & Analysis section which were analyzed from the entire text of all 51 of the award-winner applications.

The Workforce Focus image was created using the keyword results for that category. The keyword results were then entered into the system to obtain the image. This image is a visual frequency distribution that represents the Workforce Focus keyword text, and those words with a larger number of keyword results appear with a larger font size. The colors chosen in this graphic were from a particular scheme and do not have any specific meaning.



Figure 15: Workforce Focus Visual Frequency Distribution

“Staff” is the most prominent word in this graphic, as it has the largest number of findings for all of the applicants (4,419). The next most prominent word is “learn” (3,392), which is followed by “safety” (2,819). These top three words are followed by “workforce” (2,643), “education” (2,371), “manager” (1,889), and “assessment” (1,854). This graphic reflects the keywords that were chosen from the Workforce Focus section which were analyzed from the entire text of all 51 of the award-winner applications.

The Operations Focus image was created using the keyword results for that category. The keyword results were then entered into the system to obtain the image. This image is a visual frequency distribution that represents the Operations Focus keyword text, and those words with a larger number of keyword results appear with a larger font size. The colors chosen in this graphic were from a particular scheme and do not have any specific meaning.



Figure 16: Operations Focus Visual Frequency Distribution

“Manage” is the most prominent word in this graphic, as it has the largest number of findings for all of the applicants (7,991). The next most prominent word is “quality” (4,079), which is followed by “design” (2,958). These top three words are followed by “implement” (2,129), “feedback” (2,052), “success” (2,050), and “deliver” (1,873). This graphic reflects the keywords that were chosen from the Operations Focus section which were analyzed from the entire text of all 51 of the award-winner applications.

The Results image was created using the keyword results for that category. The keyword results were then entered into the system to obtain the image. This image is a visual frequency distribution that represents the Results keyword text, and those words with a larger number of keyword results appear with a larger font size. The colors chosen in this graphic were from a particular scheme and do not have any specific meaning.



Figure 17: Results Visual Frequency Distribution

“Performance” is the most prominent word in this graphic, as it has the largest number of findings for all of the applicants (9,819). The next most prominent word is “measure” (6,058), which is followed by “result” (5,986). These top three words are followed by “ratio” (5,228), “market” (3,766), “level” (3,636), and “community” (3,180). This graphic reflects the keywords that were chosen from the Results section which were analyzed from the entire text of all 51 of the award-winner applications.

The following image was created using the overall keyword results for all categories. The keyword results were then entered into the system to obtain the image. This image is a visual frequency distribution that represents the overall keyword text, and those words with a larger number of keyword results appear with a larger font size. The colors chosen in this graphic were from a particular scheme and do not have any specific meaning.



Figure 18: All Categories Combined Visual Frequency Distribution

“Process” is the most prominent word in this graphic, as it has the largest number of findings for all of the applicants (15,909). The next most prominent word is “plan” (11,583), which is followed by “perform” (11,016). These top three words are followed by “customer” (10,390), “performance” (9,819), “action” (9,603), and “system” (9,504). This graphic reflects the keywords that were chosen from all sections which were analyzed from the entire text of all 51 of the award-winner applications.

Specific recommendations regarding where company leaders can focus their performance excellence efforts were derived based on these results. These recommendations are provided in Appendix C. Top-level descriptions of the recommendations include:

1. Organizationally: Focus on requirements, systems and processes, and products.
2. Leadership: Focus on performance, action, development, and improvement.
3. Strategic Planning: Focus on planning, goals, objectives, and abilities.
4. Customers: Focus on service, satisfaction, and supporting customers.
5. Measurement & Knowledge Management: Focus on data, reviews, information, and measures.
6. Workforce: Focus on staff, learning, education, safety, assessments and skills.
7. Operations: Focus on managing operations, quality, and design.
8. Results: Focus on performance, measurement, ratios, and results.

Recall that hypothesis #1 stated:

H_0 1: The majority of Malcolm Baldrige award winners do not have common input factors that lead to award selection.

H_a 1: The majority of Malcolm Baldrige award winners have common input factors that lead to award selection.

As the content analysis results demonstrate, and as the resulting visual frequency distribution images illustrate, there are many input factors that the award-winners have in common. The Malcolm Baldrige Criteria for Performance Excellence is used as the basis from

which the award winners are selected, and include organizational elements associated with the organizational profile, leadership, strategic planning, customer focus, measurement and knowledge management, workforce focus, operations focus and results.

Graphics were created to reflect the content analysis of 51 award-winner applications. “Process”, “plan”, “perform”, “customer”, “performance”, “action”, and “system” were the top keyword findings. According to these results, the Malcolm Baldrige award winners do have common input factors that lead to award selection. Leadership, the organizational profile, and measurement have the most elements in common according to the research design. Specific focus areas for companies that want to pursue performance excellence efforts based on these findings have been included in Appendix C.

4.3 Hypothesis #2 Results

Hypothesis #2 is based on Research Question #2. Research Question #2 states: how do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with the overall market? Therefore, hypothesis #2 states:

H₀2: A portfolio of Malcolm Baldrige award winners does not outperform the market over an 11-year time period in comparison to the S&P 500.

H_a2: A portfolio of Malcolm Baldrige award winners outperforms the market over an 11-year time period in comparison to the S&P 500.

This effort is an illustration of the risk-return relationship between the MBNQA recipients and the Standard & Poor’s 500 Index. It is based on work conducted by Przasnyski &

Tai (2002), but analyzes an 11-year time period instead of just one. The historical stock betas and return results are included in Appendix D. Annualized returns were computed for all MBNQA publically traded companies that are listed on Yahoo! Finance. The calculations did not include fees, commissions, taxes and capital gains distributions in the return computations. The following companies had a complete financial ratio profile available for the years 2002 – 2012:

1. Boeing (BA)
2. Caterpillar (CAT)
3. Eastman Chemical (EMN)
4. Federal Express (FDX)
5. Corning (GLW)
6. Honeywell (HON)
7. International Business Machines (IBM)
8. Lockheed Martin (LMT)
9. Marriott (parent company for Ritz-Carlton, MAR)
10. 3M (MMM)
11. Motorola (MSI)
12. Raytheon (RTN)
13. Verizon (VZ)
14. Wabtec (acquired Westinghouse, WAB)
15. Xerox (XRX)

The risk- return relationship between the award-winning companies and the market was analyzed for 2002. The rate of return and beta of the 15 publicly-traded award-winning companies were plotted against the security market line (SML). The companies that lie above this line are considered to have outperformed the market whereas those which fall below the line have underperformed the market.

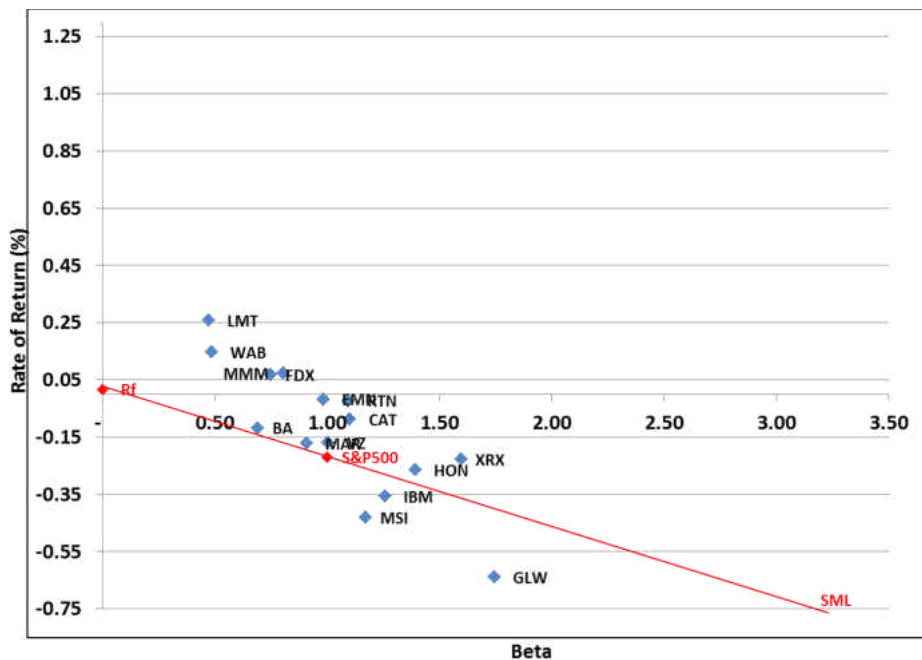


Figure 19: The Risk-Return Relationship between Winners & the S&P 500 for 2002

The optimal position lies at the top-left position of the graph, which represents those stocks which have the greatest return for the lowest risk. Of the 15 companies that were included in this analysis, 12 had higher performance than the market and 3 had lower performance than the market for 2002 (GLW, IBM, MSI). The majority of the winners outperformed the market in 2002.

The risk- return relationship between the award-winning companies and the market was analyzed for 2003. The rate of return and beta of the 15 publicly-traded award-winning companies were plotted against the security market line (SML). The companies that lie above this line are considered to have outperformed the market whereas those which fall below the line have underperformed the market.

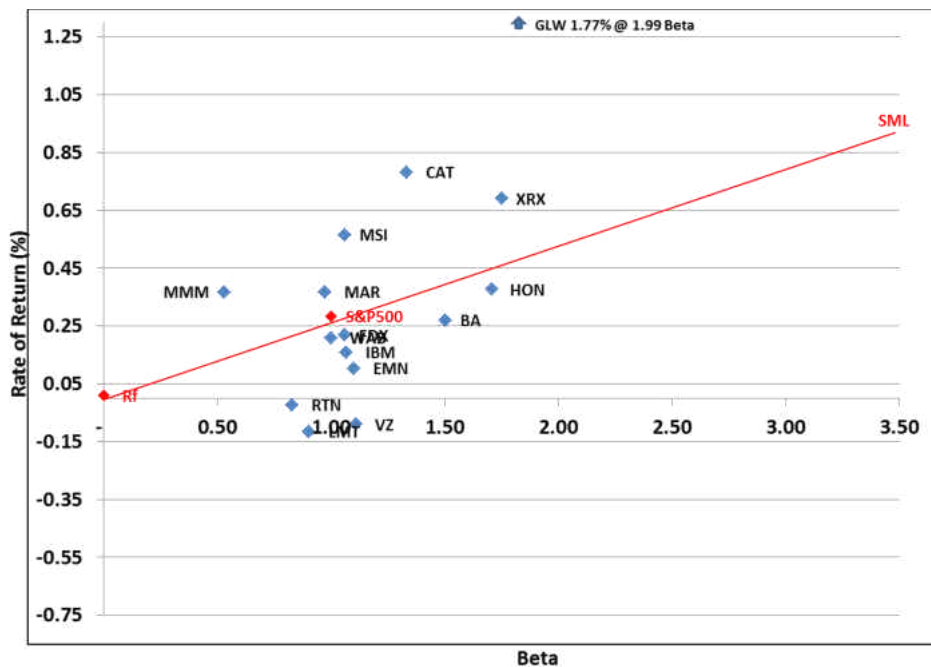


Figure 20: The Risk-Return Relationship between Winners & the S&P 500 for 2003

The optimal position lies at the top-left position of the graph, which represents those stocks which have the greatest return for the lowest risk. Of the 15 companies that were included in this analysis, 6 had higher performance than the market and 9 had lower performance than the market for 2003 (BA, EMN, FDX, HON, IBM, LMT, RTN, VZ, WAB). The majority of the winners did not outperform the market in 2003.

The risk- return relationship between the award-winning companies and the market was analyzed for 2004. The rate of return and beta of the 15 publicly-traded award-winning companies were plotted against the security market line (SML). The companies that lie above this line are considered to have outperformed the market whereas those which fall below the line have underperformed the market.

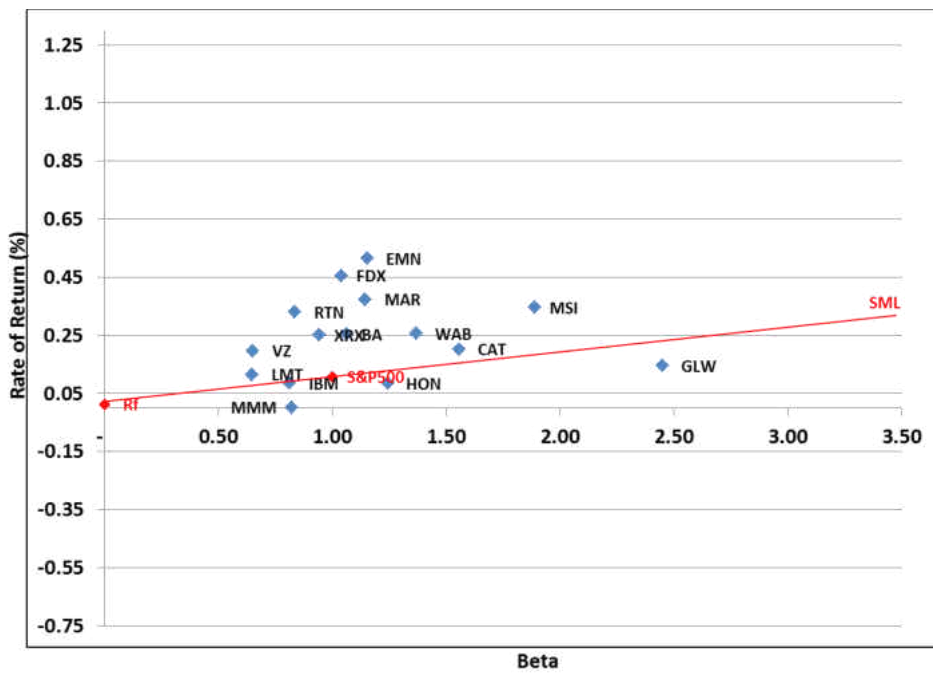


Figure 21: The Risk-Return Relationship between Winners & the S&P 500 for 2004

The optimal position lies at the top-left position of the graph, which represents those stocks which have the greatest return for the lowest risk. Of the 15 companies that were included in this analysis, 11 had higher performance than the market and 4 had lower performance than the market for 2004 (GLW, HON, IBM, MMM). The majority of the winners outperformed the market in 2004.

The risk- return relationship between the award-winning companies and the market was analyzed for 2005. The rate of return and beta of the 15 publicly-traded award-winning companies were plotted against the security market line (SML). The companies that lie above this line are considered to have outperformed the market whereas those which fall below the line have underperformed the market.

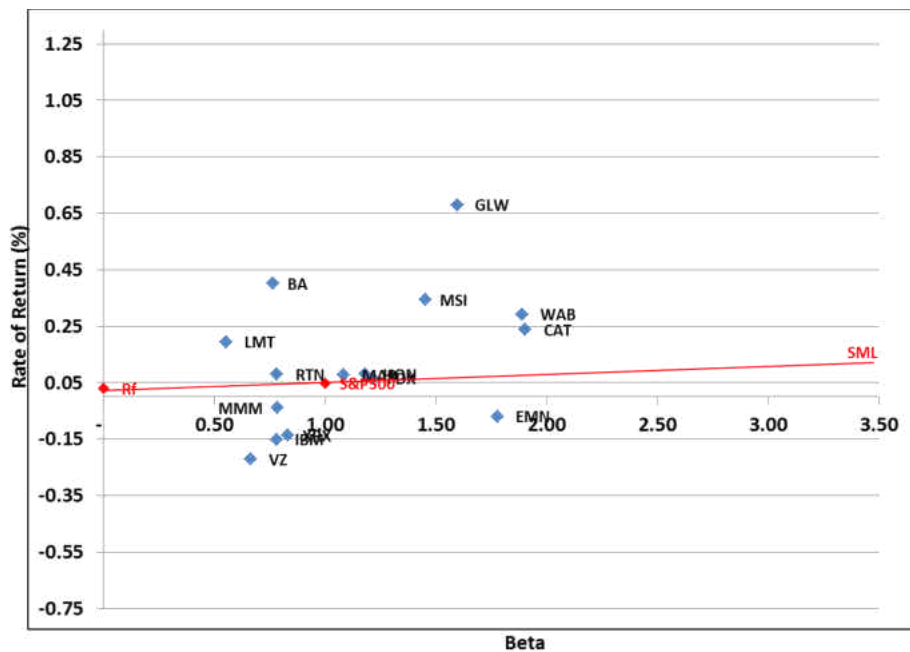


Figure 22: The Risk-Return Relationship between Winners & the S&P 500 for 2005

The optimal position lies at the top-left position of the graph, which represents those stocks which have the greatest return for the lowest risk. Of the 15 companies that were included in this analysis, 10 had higher performance than the market and 5 had lower performance than the market for 2005 (EMN, IBM, MMM, VZ, XRX). The majority of the winners outperformed the market in 2005.

The risk- return relationship between the award-winning companies and the market was analyzed for 2006. The rate of return and beta of the 15 publicly-traded award-winning companies were plotted against the security market line (SML). The companies that lie above this line are considered to have outperformed the market whereas those which fall below the line have underperformed the market.

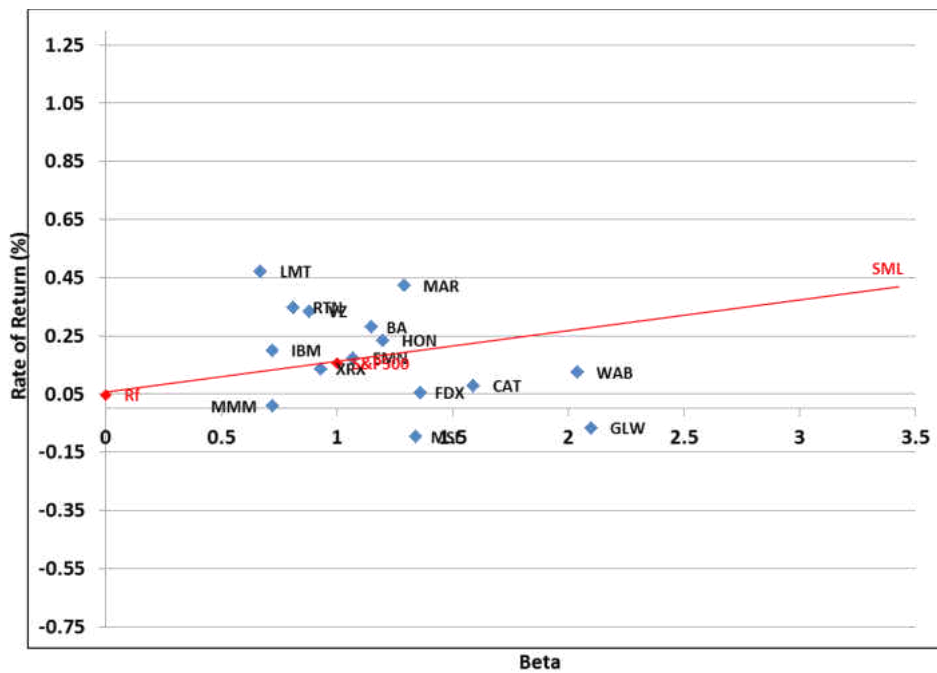


Figure 23: The Risk-Return Relationship between Winners & the S&P 500 for 2006

The optimal position lies at the top-left position of the graph, which represents those stocks which have the greatest return for the lowest risk. Of the 15 companies that were included in this analysis, 8 had higher performance than the market and 7 had lower performance than the market for 2006 (CAT, FDX, GLW, MMM, MSI, WAB, XRX). The majority of the winners outperformed the market in 2006.

The risk- return relationship between the award-winning companies and the market was analyzed for 2007. The rate of return and beta of the 15 publicly-traded award-winning companies were plotted against the security market line (SML). The companies that lie above this line are considered to have outperformed the market whereas those which fall below the line have underperformed the market.

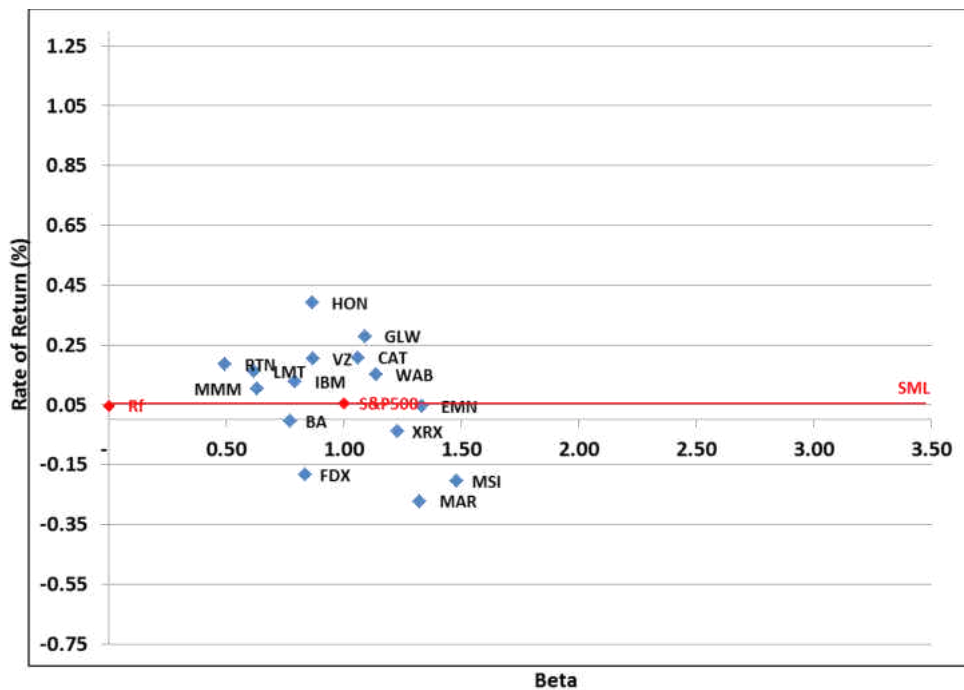


Figure 24: The Risk-Return Relationship between Winners & the S&P 500 for 2007

The optimal position lies at the top-left position of the graph, which represents those stocks which have the greatest return for the lowest risk. Of the 15 companies that were included in this analysis, 9 had higher performance than the market and 6 had lower performance than the market for 2007 (BA, EMN, FDX, MAR, MSI, XRX). The majority of the winners outperformed the market in 2007.

The risk- return relationship between the award-winning companies and the market was analyzed for 2008. The rate of return and beta of the 15 publicly-traded award-winning companies were plotted against the security market line (SML). The companies that lie above this line are considered to have outperformed the market whereas those which fall below the line have underperformed the market.

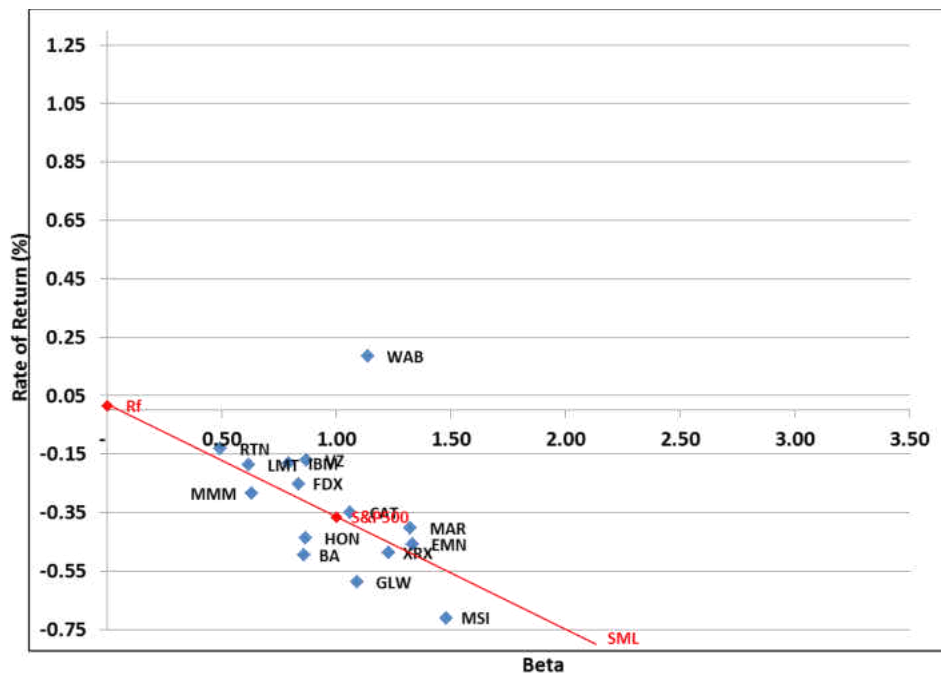


Figure 25: The Risk-Return Relationship between Winners & the S&P 500 for 2008

The optimal position lies at the top-left position of the graph, which represents those stocks which have the greatest return for the lowest risk. Of the 15 companies that were included in this analysis, 9 had higher performance than the market and 6 had lower performance than the market for 2008 (BA, HON, GLW, MMM, MSI, XRX). The majority of the winners outperformed the market in 2008.

The risk- return relationship between the award-winning companies and the market was analyzed for 2009. The rate of return and beta of the 15 publicly-traded award-winning companies were plotted against the security market line (SML). The companies that lie above this line are considered to have outperformed the market whereas those which fall below the line have underperformed the market.

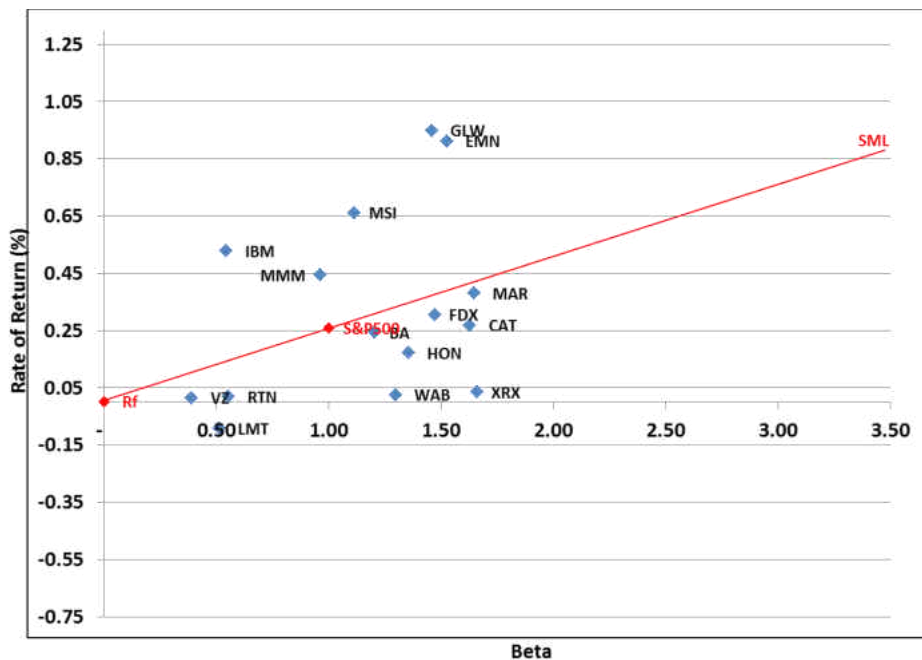


Figure 26: The Risk-Return Relationship between Winners & the S&P 500 for 2009

The optimal position lies at the top-left position of the graph, which represents those stocks which have the greatest return for the lowest risk. Of the 15 companies that were included in this analysis, 5 had higher performance than the market and 10 had lower performance than the market for 2009 (BA, CAT, FDX, HON, LMT, MAR, RTN, VZ, WAB, XRX). The majority of the winners did not outperform the market in 2009.

The risk- return relationship between the award-winning companies and the market was analyzed for 2010. The rate of return and beta of the 15 publicly-traded award-winning companies were plotted against the security market line (SML). The companies that lie above this line are considered to have outperformed the market whereas those which fall below the line have underperformed the market.

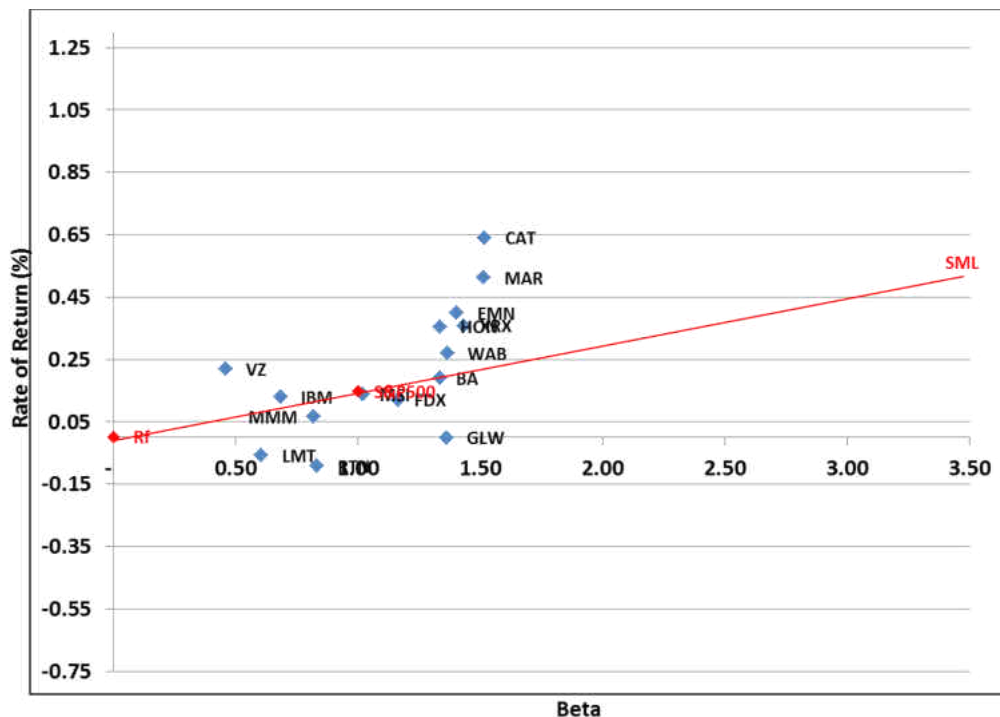


Figure 27: The Risk-Return Relationship between Winners & the S&P 500 for 2010

The optimal position lies at the top-left position of the graph, which represents those stocks which have the greatest return for the lowest risk. Of the 15 companies that were included in this analysis, 9 had higher performance than the market and 6 had lower performance than the market for 2010 (FDX, GLW, LMT, MMM, MSI, RTN). The majority of the winners outperformed the market in 2010.

The risk- return relationship between the award-winning companies and the market was analyzed for 2011. The rate of return and beta of the 15 publicly-traded award-winning companies were plotted against the security market line (SML). The companies that lie above this line are considered to have outperformed the market whereas those which fall below the line have underperformed the market.

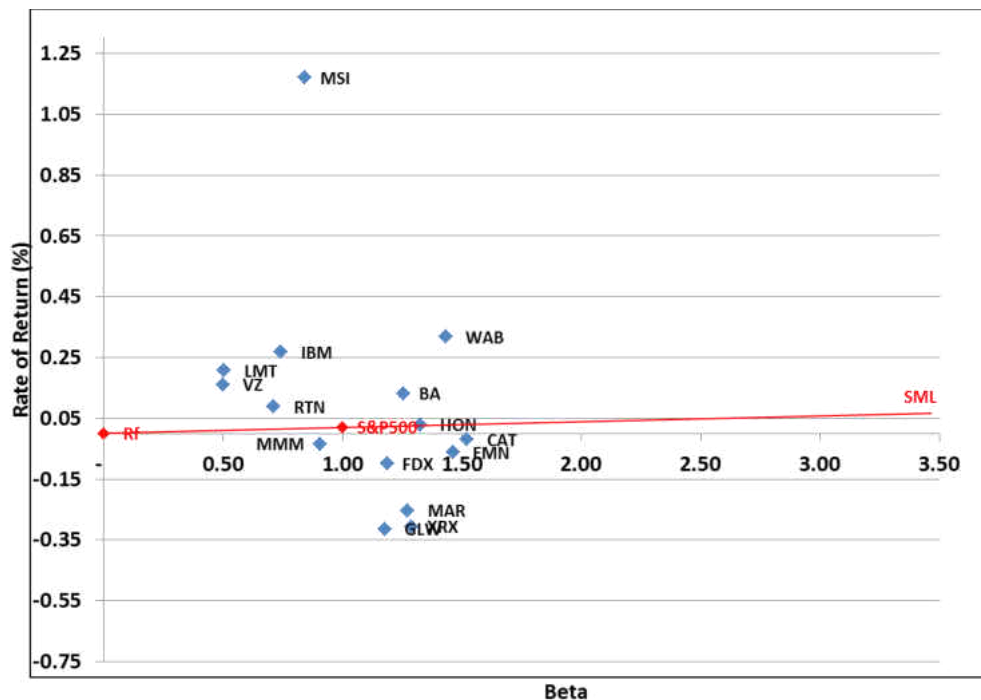


Figure 28: The Risk-Return Relationship between Winners & the S&P 500 for 2011

The optimal position lies at the top-left position of the graph, which represents those stocks which have the greatest return for the lowest risk. Of the 15 companies that were included in this analysis, 8 had higher performance than the market and 7 had lower performance than the market for 2011 (CAT, EMN, FDX, GLW, MAR, MMM, XRX). The majority of the winners outperformed the market in 2011.

The risk- return relationship between the award-winning companies and the market was analyzed for 2012. The rate of return and beta of the 15 publicly-traded award-winning companies were plotted against the security market line (SML). The companies that lie above this line are considered to have outperformed the market whereas those which fall below the line have underperformed the market.

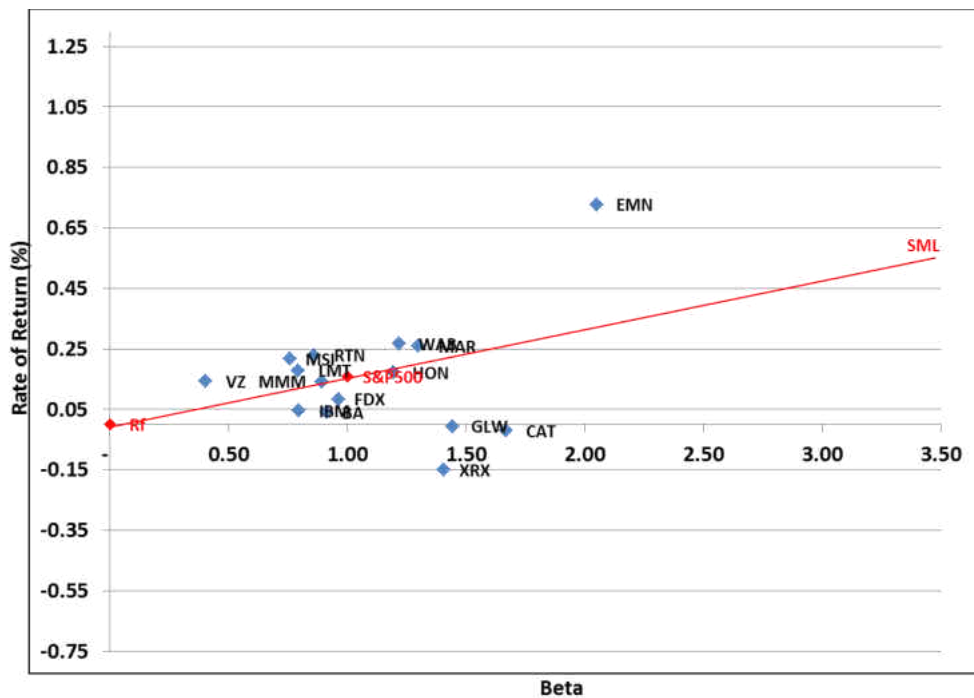


Figure 29: The Risk-Return Relationship between Winners & the S&P 500 for 2012

The optimal position lies at the top-left position of the graph, which represents those stocks which have the greatest return for the lowest risk. Of the 15 companies that were included in this analysis, 9 had higher performance than the market and 6 had lower performance than the market for 2012 (CAT, FDX, IBM, GLW, HON, XRX). The majority of the winners outperformed the market in 2012.

Overall, the majority of Malcolm Baldrige award-winning companies outperformed the market for the majority of the years analyzed.

Table 11: Market Performance Results for RQ #2

Year	# Companies Which Outperformed Market	# Companies Which Underperformed Market	Did the Majority of Companies Analyzed Outperform the Market?
2002	12	3	Yes
2003	6	9	No
2004	11	4	Yes
2005	10	5	Yes
2006	8	7	Yes
2007	9	6	Yes
2008	10	5	Yes
2009	5	10	No
2010	8	7	Yes
2011	7	8	No
2012	9	6	Yes
Did the majority of the companies outperform the market for the majority of the years analyzed?			Yes

After this step was complete, a statistical analysis was conducted to analyze the overarching results of all of the Malcolm Baldrige award-winning companies against the market. This was done by averaging the total results for all of the award winners as if they were weighted equally in a portfolio.

Prior to performing any a t-test (a parametric test that assumes normality) or a Wilcoxon Signed Rank Test (a non-parametric test that does not assume normality), a Kolmogorov-Smirnov normality test was conducted to determine whether the normal distribution assumption is valid for this data. The hypotheses for the Kolmogorov-Smirnov normality test are:

- H_0 : Data are from a normally distributed population
- H_A : Data are not from a normally distributed population

According to Minitab, if the p-value for the Kolmogorov-Smirnov normality test is lower than the chosen significance level (0.05), then a researcher may conclude that the data does not follow the specified normal distribution.

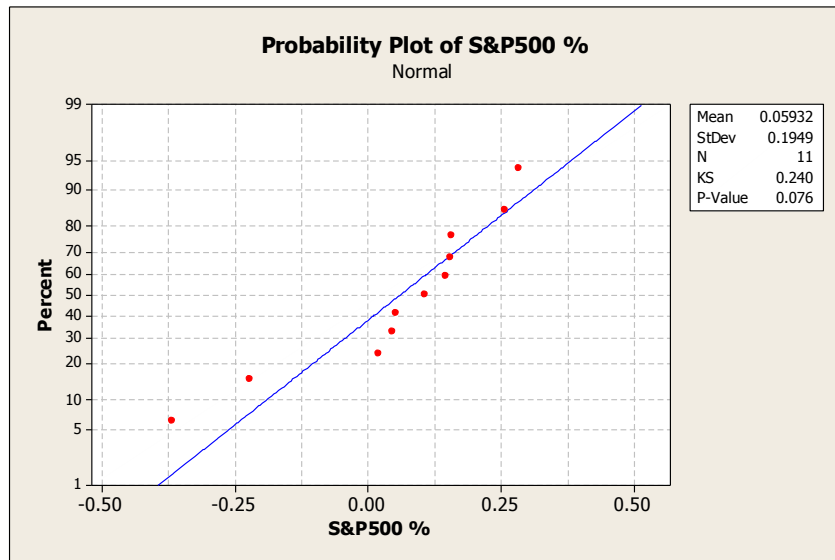


Figure 30: Normality Test Results for S&P 500 Returns from 2002 – 2012

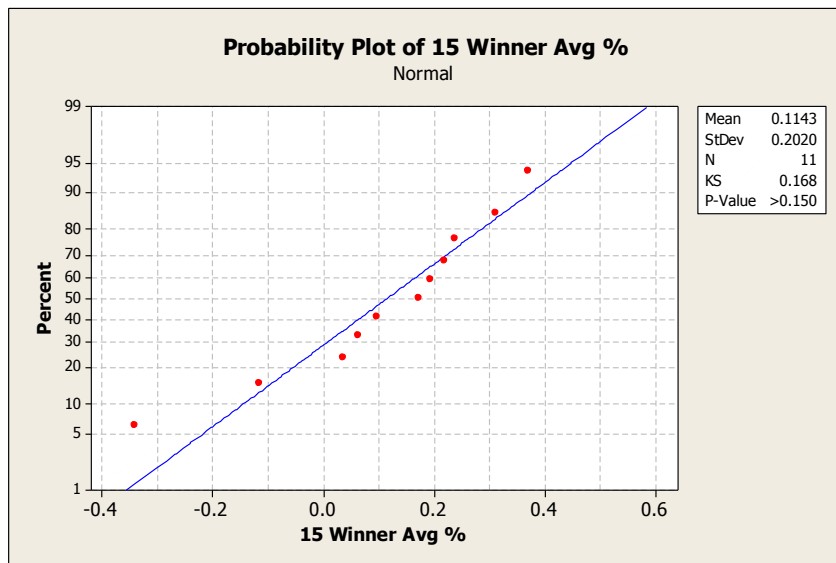


Figure 31: Normality Test Results for Award-Winning Returns from 2002 – 2012

The p-values for the Kolmogorov-Smirnov normality test are both greater than .05 for the S&P 500 and the winner average respectively. For both sets of data, the null hypothesis is not rejected at the $\alpha = 0.05$ significance level, and there is not enough evidence to conclude that the data do not come from normally distributed populations. Therefore, a paired t-test was used to compare the S&P 500 with the award-winning results for the years 2002 – 2012. The results follow:

Paired T-Test and CI: 15 Winner Avg %, S&P500 %

Paired T for 15 Winner Avg % - S&P500 %

	N	Mean	StDev	SE Mean
15 Winner Avg %	11	0.1143	0.2020	0.0609
S&P500 %	11	0.0593	0.1949	0.0588
Difference	11	0.0550	0.0397	0.0120

95% CI for mean difference: (0.0283, 0.0816)

T-Test of mean difference = 0 (vs not = 0): T-Value = 4.59 P-Value = 0.001

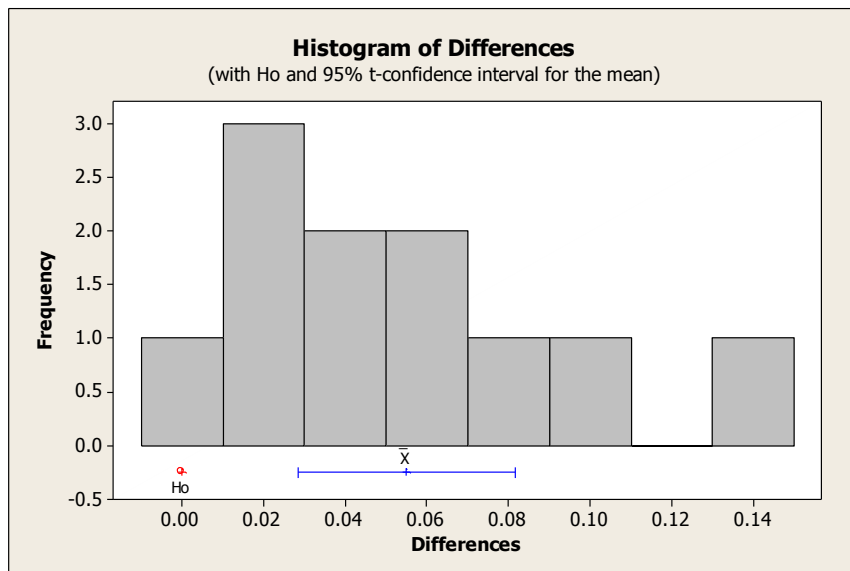


Figure 32: Histogram of Differences for the T-Test Conducted for RQ #2

According to this test, a difference does in fact exist between the Average Return Percentage for the S&P 500 and that of the 15 MBNQA Winners. The mean Return percentage is 5.9% for the S&P 500 and 11.4% for the MBNQA Winners. The mean difference is about 5.5%. A 95% confidence interval suggests that the MBNQA Winners will on average be between 2.8% and 8.1% above the S&P 500. The MBNQA Winners provide a higher Rate of Return on average when compared with the S&P 500 for the years 2002 – 2012.

The power of this test was then analyzed. Power is the ability of a test to detect a difference when one exists, as well as the probability that the null hypothesis will be rejected correctly, given that the null hypothesis is false.

Power and Sample Size

Paired t Test
 Testing mean paired difference = 0 (versus not = 0)
 Calculating power for mean paired difference = difference
 Alpha = 0.05 Assumed standard deviation of paired differences = 0.0397

Difference	Sample Size	Power
0.055	11	0.984641

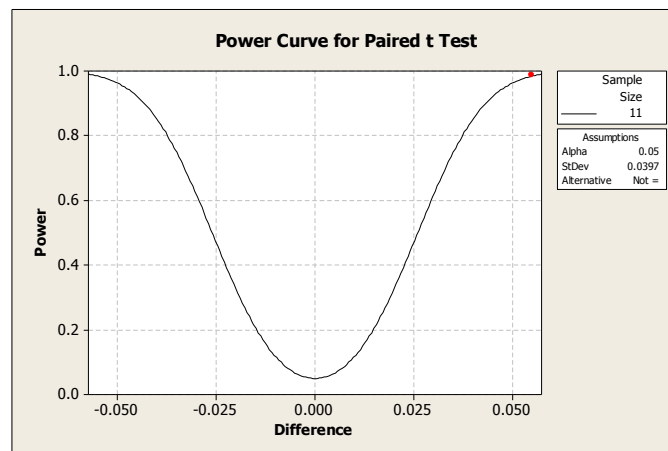


Figure 33: Power of the T-Test Conducted for RQ #2

With 11 observations, a standard deviation of 0.0397, and an α -level of 0.05, the power is 0.9846. Therefore, if the winner's μ differs by 5.5% from the S&P 500, the chance of detecting this difference with a sample size of 11 is 98.46%. In other words, the chance that you will fail to reject the null hypothesis and incorrectly conclude that the mean is not different from 5.5% is only 1.54% ($1 - 0.9846$). Therefore, this test has sufficient power.

Recall that hypothesis #2 stated:

H_0 2: A portfolio of Malcolm Baldrige award winners does not outperform the market over an 11-year time period in comparison to the S&P 500.

H_a 2: A portfolio of Malcolm Baldrige award winners outperforms the market over an 11-year time period in comparison to the S&P 500.

According to the graphical and statistical analysis conducted for Research Question #2, a portfolio of Malcolm Baldrige award winners has outperformed the market over an 11-year time period in comparison to the S&P 500.

The portfolio of 15 award-winning companies outperformed the market with the exception of the years 2003, and 2009. 2003 marked the end of Tech Bubble, and 2009 marked the end of the Great Recession. Market rallies began around the same time frame in March / April of these years. It is possible that low market returns and high volatility frightened the average investor during this time. Overall, however, the award-winners outperformed the market for the majority of years analyzed.

4.4 Hypothesis #3 Results

Hypothesis #3 is based on Research Question #3. Research Question #3 states: how do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with their industry peers in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios?

Therefore, hypothesis #3 states:

H₀3: The majority of Malcolm Baldrige award winners do not outperform their industry peers over an 11-year time period in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios.

H_A3: The majority of Malcolm Baldrige award winners outperform their industry peers over an 11-year time period in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios.

For Research Question #3, industry comparison companies were identified through the primary use of NAICS codes and the secondary use of SIC codes where additional filtering needed to take place. NAICS codes consist of 6-digits, whereas SIC codes use only 4-digits. The longer NAICS code allowed for greater specificity in the number of sectors and subsectors. Each industry comparison had at least 10 industry comparison companies.

By creating peer comparisons using a portfolio, instead of just one company, some unsystematic risk (unique or asset-specific risk) was diversified away. Diversification can

substantially reduce the variability of returns without an equivalent reduction in expected returns (worse than expected returns from one asset are offset by better than expected returns from another). This effectively made the industry portfolios stronger.

Research Question #3 was, by far, the most complex question out of the three. The analysis of each performance ratio required three tests: one tested the normality of the winner data, a second tested the normality of the industry comparison data, and a third test statistically compared the two sets of data. The statistical comparison test was either a t-test or a Wilcoxon Signed Rank Test based on the outcomes of the first two normality tests.

There were 21 different performance ratios (each requiring three statistical tests) that were analyzed for each company, and there were 15 companies total, so 945 individual statistical tests were required to analyze Research Question #3. The statistical tests that were used are listed in Appendix G. The detailed results of these statistical tests are included in Appendix H.

The results of part (A) of Research Question #3, the profitability ratios, are included below. This particular section focused on comparing the Malcolm Baldrige award winners with their industry peers over an 11-year time period in a comparison of profitability performance ratios.

	PROFITABILITY					
Ratios	ROA %	ROE %	ROI %	EBITDA M %	CTR %	RpE
Company	Return on Assets	Return on Equity	Return on Investment	EBITDA Margin	Calculated Tax Rate	Revenue per Employee
BA	NONE	BETTER	BETTER	WORSE	NONE	BETTER
CAT	WORSE	BETTER	WORSE	BETTER	NONE	BETTER
EMN	NONE	NONE	NONE	NONE	NONE	WORSE
FDX	BETTER	NONE	BETTER	WORSE	NONE	WORSE
GLW	NONE	NONE	NONE	NONE	NONE	WORSE
HON	BETTER	NONE	NONE	BETTER	BETTER	BETTER
IBM	BETTER	BETTER	BETTER	BETTER	NONE	WORSE
LMT	BETTER	BETTER	BETTER	WORSE	NONE	BETTER
MAR	NONE	BETTER	NONE	WORSE	NONE	WORSE
MMM	BETTER	BETTER	BETTER	BETTER	WORSE	BETTER
MSI	BETTER	NONE	NONE	NONE	NONE	NONE
RTN	BETTER	BETTER	BETTER	BETTER	NONE	BETTER
VZ	NONE	NONE	BETTER	NONE	BETTER	BETTER
WAB	NONE	NONE	NONE	BETTER	NONE	WORSE
XRX	BETTER	BETTER	BETTER	BETTER	NONE	NONE

Figure 34: Profitability Performance Ratio Results for RQ #3

The overall results for the profitability ratio analysis revealed that the majority of the Malcolm Baldrige Award-Winning companies outperformed their industry peers. Specifically, Return on Assets, Return on Equity, Return on Investment, the Earnings before Interest, Tax, Depreciation & Amortization and the Revenue per Employee proved to be significant.

The Return on Assets result indicates that the award-winning companies more effectively use their assets to produce profit, and that their managers are being more efficient in using the company's assets to generate earnings than their industry peers. The Return on Equity result indicates that award-winning companies are superior in their ability to generate a profit for the company with the money shareholders have invested than their industry peers. The Return on Investment result indicates that the investments are used more efficiently by award-winning companies than their industry peers.

The EBITDA margin result indicates that the award-winning companies have less operating expenses eating into the company's bottom line, thus achieving a more profitable operation than their industry peers. The calculated tax result comparison was not significant. The Revenue per Employee result indicates that the award-winning companies have higher productivity in relation to the number of employees they have than their industry peers. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity. These results indicate that from a profitability perspective, the Malcolm-Baldrige Award Winners outperform their industry comparison peers.

The results of part (B) of Research Question #3, the liquidity ratios, are included below. This particular section focused on comparing the Malcolm Baldrige award winners with their industry peers over an 11-year time period in a comparison of liquidity performance ratios.

	LIQUIDITY		
Ratios	QR	CR	NCA % TA
Company	Quick Ratio	Current Ratio	Net Current Assets % Total Assets
BA	WORSE	WORSE	WORSE
CAT	WORSE	WORSE	WORSE
EMN	NONE	WORSE	WORSE
FDX	NONE	NONE	NONE
GLW	BETTER	NONE	NONE
HON	WORSE	WORSE	WORSE
IBM	WORSE	WORSE	WORSE
LMT	WORSE	WORSE	WORSE
MAR	WORSE	WORSE	NONE
MMM	WORSE	WORSE	WORSE
MSI	WORSE	WORSE	NONE
RTN	WORSE	WORSE	WORSE
VZ	WORSE	WORSE	WORSE
WAB	WORSE	WORSE	WORSE
XRX	WORSE	WORSE	WORSE

Figure 35: Liquidity Performance Ratio Results for RQ #3

The overall results for the liquidity ratio analysis revealed that the majority of the Malcolm Baldrige Award-Winning companies failed to outperform their industry peers. Specifically, the Quick Ratio, the Current Ratio, and the Net Current Assets as a Percentage of Overall Assets proved to be significant.

The award-winners did not have as much short term liquidity from assets such as cash and marketable securities as their industry peers, as measured by the Quick Ratio. The Current

Ratio, which includes inventory and other assets that can be liquidated, also has a similar result, indicating that the industry comparison companies have a stronger ability to turn its product into cash than the award-winners.

Finally, the Net Current Assets include cash (and equivalents), stocks, bonds and bank deposits for industry comparison companies demonstrate a higher level of liquid assets that would be left if all current liabilities were paid off versus the award-winning companies. These results indicate that from a liquidity perspective, the Malcolm-Baldrige Award Winners failed to outperform their industry comparison peers.

The results of part (C) of Research Question #3, the debt management ratios, are included below. This particular section focused on comparing the Malcolm Baldrige award winners with their industry peers over an 11-year time period in a comparison of debt management performance ratios.

	DEBT		
Ratios	LTDtE	TDtE	IC
Company	Long Term Debt to Equity	Total Debt to Equity	Interest Coverage
BA	NONE	NONE	WORSE
CAT	WORSE	WORSE	WORSE
EMN	NONE	NONE	WORSE
FDX	BETTER	BETTER	BETTER
GLW	BETTER	BETTER	NONE
HON	BETTER	BETTER	NONE
IBM	WORSE	WORSE	BETTER
LMT	NONE	NONE	WORSE
MAR	BETTER	BETTER	NONE
MMM	NONE	NONE	BETTER
MSI	NONE	NONE	NONE
RTN	NONE	NONE	NONE
VZ	BETTER	BETTER	NONE
WAB	BETTER	BETTER	NONE
XRX	WORSE	WORSE	WORSE

Figure 36: Debt Management Performance Ratio Results for RQ #3

The number of positive results for the Long-Term Debt to Equity Measure was equal with the number of statistically insignificant results for the Long-Term Debt to Equity ratio. This means that the award-winning companies and their industry comparisons have been equally aggressive in financing their growth with long-term debt, with six of the award-winning companies (FDX, GLW, HON, MAR, VZ, WAB) being more-efficient. The Total Debt (external

funding) to equity funding indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. The award-winning companies and their industry comparisons have been equally aggressive in financing their growth with debt, with six of the award-winning companies (FDX, GLW, HON, MAR, VZ, WAB) being more-efficient.

The Interest Coverage ratio is used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense, and the difference between award-winning companies and their industry comparisons for this measure were not statistically significant.

The results testing whether the Malcolm-Baldrige Award Winners outperformed their industry peers from a debt management perspective were overall not statistically significant, although a few individual companies did perform better than their industry comparison peers.

The results of part (D) of Research Question #3, the asset management ratios, are included below. This particular section focused on comparing the Malcolm Baldrige award winners with their industry peers over an 11-year time period in a comparison of asset management performance ratios.

	ASSET						
Ratios	TAT	RT	IT	APT	AET	PP&ET	C&ET
Company	Total Asset Turnover	Recvbls Turnover	Inventory Turnover	Accts Payable Turnover	Accrued Expenses Turnover	Property, Plant, Equip Turnover	Cash & Equip Turnover
BA	NONE	BETTER	NONE	WORSE	WORSE	WORSE	WORSE
CAT	WORSE	WORSE	NONE	WORSE	WORSE	WORSE	NONE
EMN	WORSE	BETTER	NONE	NONE	WORSE	WORSE	WORSE
FDX	BETTER	WORSE	WORSE	NONE	WORSE	WORSE	WORSE
GLW	WORSE	NONE	WORSE	WORSE	WORSE	WORSE	WORSE
HON	WORSE	WORSE	WORSE	BETTER	WORSE	NONE	WORSE
IBM	WORSE	WORSE	BETTER	WORSE	BETTER	WORSE	WORSE
LMT	BETTER	BETTER	BETTER	BETTER	BETTER	NONE	WORSE
MAR	BETTER	WORSE	NONE	WORSE	BETTER	BETTER	BETTER
MMM	BETTER	BETTER	BETTER	WORSE	WORSE	WORSE	BETTER
MSI	WORSE	WORSE	NONE	WORSE	WORSE	WORSE	WORSE
RTN	NONE	BETTER	BETTER	NONE	WORSE	NONE	NONE
VZ	NONE	WORSE	NONE	BETTER	WORSE	BETTER	NONE
WAB	NONE	WORSE	WORSE	WORSE	WORSE	WORSE	WORSE
XRX	WORSE	WORSE	BETTER	WORSE	NONE	WORSE	NONE

Figure 37: Asset Management Performance Ratio Results for RQ #3

The results testing whether the Malcolm-Baldrige Award Winners outperformed their industry peers from an asset management perspective were statistically significant, and the majority of award-winning companies did not perform better than their industry comparison peers. For Total Asset Turnover, the amount of sales or revenues generated per dollar of assets, the majority of award-winning companies failed to outperform their industry peers. For the

Receivables Turnover, an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts, the majority of award-winning companies failed to outperform their industry peers. For Inventory Turnover, a ratio showing how many times a company's inventory is sold and replaced over a period, the difference between the majority of award-winning companies and their industry peers was not statistically significant.

For Accounts Payable Turnover, a short-term liquidity measure used to quantify the rate at which a company pays off its suppliers, the majority of award-winning companies failed to outperform their industry peers. For Accrued Expenses Turnover, the rate at which the company is paying off accrued expenses such as wages, interest, taxes, the majority of award-winning companies failed to outperform their industry peers. For Property, Plant and Equipment Turnover, the rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery, the majority of award-winning companies failed to outperform their industry peers.

For the Cash & Equivalents Turnover, which measures the rate at which a company goes through its cash cycles, the majority of award-winning companies failed to outperform their industry peers. The results testing whether the Malcolm-Baldrige Award Winners outperformed their industry peers from an asset management perspective were statistically significant, and the Malcolm Baldrige award-winning companies did not outperform their industry comparison peers.

The results of part (E) of Research Question #3 are included below. This particular section focused on comparing the Malcolm Baldrige award winners with their industry peers over an 11-year time period in a comparison of per share performance ratios.

Ratios	PER SHARE	
	CFpS	BVPS
Company	Cash Flow Per Share	Book Value Per Share
BA	BETTER	WORSE
CAT	BETTER	NONE
EMN	NONE	NONE
FDX	BETTER	BETTER
GLW	NONE	NONE
HON	BETTER	BETTER
IBM	BETTER	NONE
LMT	BETTER	NONE
MAR	WORSE	WORSE
MMM	BETTER	BETTER
MSI	BETTER	BETTER
RTN	BETTER	BETTER
VZ	BETTER	BETTER
WAB	NONE	NONE
XRX	BETTER	NONE

Figure 38: Per Share Performance Ratio Results for RQ #3

Overall, the Malcolm Baldrige Award Winners outperformed their industry peers for the Per Share Category overall. For Cash Flow per Share, the portion of a company's profit that is allocated to each outstanding share of common stock, the majority of award-winning companies performed better than their industry comparison peers. For Book Value per Share, an indication of the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid, the majority of award-winners had insignificant results in comparison with their

industry peers. Six award-winning companies, however (FDX, HON, MMM, MSI, RTN, and VZ) did outperform their peers. The results testing whether the Malcolm-Baldrige Award Winners outperformed their industry peers from a per share perspective were statistically significant for Cash Flow per Share, but not for Book Value per Share.

The majority of Malcolm Baldrige award-winning companies outperformed their industry comparison peers in terms of Cash Flow per Share, and six companies outperformed their peers in terms of Book Value per Share (FDX, HON, MMM, MSI, RTN, and VZ).

The overall results of this analysis are as follows:

Company	% Better	% Worse	% None	OVERALL	Sector	Industry
BA	24%	48%	29%	WORSE	Industrial Goods	Aerospace/Defense Products & Services
CAT	19%	62%	19%	WORSE	Industrial Goods	Farm & Construction Machinery
EMN	5%	38%	57%	NONE	Basic Materials	Chemicals - Major Diversified
FDX	38%	33%	29%	BETTER	Services	Air Delivery & Freight Services
GLW	14%	33%	52%	NONE	Technology	Diversified Electronics
HON	43%	38%	19%	BETTER	Industrial Goods	Diversified Machinery
IBM	38%	52%	10%	WORSE	Technology	Information Technology Services
LMT	48%	29%	24%	BETTER	Industrial Goods	Aerospace/Defense Products & Services
MAR	33%	38%	29%	WORSE	Services	Lodging
MMM	57%	33%	10%	BETTER	Industrial Goods	Diversified Machinery
MSI	14%	38%	48%	NONE	Technology	Communication Equipment
RTN	43%	19%	38%	BETTER	Industrial Goods	Aerospace/Defense Products & Services
VZ	43%	24%	33%	BETTER	Technology	Telecom Services - Domestic
WAB	14%	48%	38%	WORSE	Services	Railroads
XRX	29%	48%	24%	WORSE	Technology	Information Technology Services

Figure 39: Overall Ratio Analysis Results for RQ #3

The majority of award-winners outperformed their industry peers in terms of Return on Assets, Return on Equity, Return on Investment, EBITDA, Revenue per Employee, and Cash Flow per Share. A large number of companies (but not the majority) outperformed their industry

peers in terms of Long Term Debt to Equity, Total Debt to Equity, Inventory Turnover, and Book Value per Share.

The majority of award-winners underperformed their industry peers in terms of the Quick Ratio, Current Ratio, Net Current Assets as a Percentage of Total Assets, Total Asset Turnover, Receivables Turnover, Accounts Payable Turnover, Accrued Expenses Turnover, Property, Plant and Equipment Turnover, and Cash and Equivalents Turnover. Results were not statistically significant for Calculated Tax Rate and Interest Coverage.

Overall, six of the award-winning companies outperformed their industry peers. These companies include FedEx, Honeywell, Lockheed Martin, 3M, Raytheon and Verizon. Three award-winning companies did not have a difference from their industry peers. These included Eastman Chemical, Corning, and Motorola. Six award-winning companies underperformed their peers. These included Boeing, Caterpillar, IBM, Marriott, Wabtec, and Xerox.

According to these results, the majority of Malcolm Baldrige award winners do outperform their industry peers over an 11-year time period in a comparison of (a) profitability performance ratios, underperform their industry peers in terms of (b) liquidity performance ratios, are not different from their industry peers in terms of (c) debt management performance ratios, underperform their industry peers in terms of (d) asset management ratios, and outperform their industry peers in terms of (e) per share performance ratios.

4.5 Results Summary

This chapter provided the results of the methods used for this research. This research involved with answering the three questions of: (1) what common input factors do winners have that lead to award selection? (2) How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with the overall market? (3) How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with their industry peers in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios?

According to the analysis conducted to answer Research Question #1, the leadership, organizational profile, and measurement sections of the award-winner applications have the most elements in common according to this research design. The specific keywords which were investigated are listed in Appendix A, the keyword results that the award-winning companies have in common are listed in Appendix B, and the recommendations for companies based on the results of this research question are listed in Appendix C.

According to the analysis conducted to answer Research Question #2, the majority of the 15 award-winning companies outperformed the market for the majority of years analyzed. The statistical analysis of these results was confirmed at the $p = .001$ significance level, and had a power of 98.4%. The superior performance years include 2002, 2004, 2005, 2006, 2007 (recession), 2008 (recession), 2010, 2011 and 2012. Inferior performance years include 2003

(recession), and 2009 (recession). The award-winner beta and return tables are included in Appendix D.

According to the analysis conducted to answer Research Question #3, the majority of Malcolm Baldrige award winners do outperform their industry peers over an 11-year time period in a comparison of (a) profitability performance ratios, underperform their industry peers in terms of (b) liquidity performance ratios, are not different from their industry peers in terms of (c) debt management performance ratios, underperform their industry peers in terms of (d) asset management ratios, and outperform their industry peers in terms of (e) per share performance ratios.

The award-winner financial tables are included in Appendix E, the industry comparison companies used are listed in Appendix F, the statistical tests used are listed in Appendix G, and the detailed statistical analysis results are included in Appendix H.

CHAPTER 5: CONCLUSION

This research examined the results of companies which have demonstrated an ability to achieve performance excellence as defined by the National Institute of Standards and Technology's Malcolm Baldrige Criteria for Performance Excellence. This research examined fifty-one award-winners to determine the common input factors, compared the business results of fifteen award-winners with the overall market for a timeframe of 11 years, and then investigated the profitability, liquidity, debt management, asset management, and per share performance ratios of fifteen award-winners compared with their industry for a timeframe of 11 years.

The main focus of this research was to determine whether participation in performance excellence best practices have created value for the shareholders as well as for the business owners. This was demonstrated via analysis of business and performance results of award winning companies, in order to determine whether key business objectives have been satisfied. This research demonstrates that the integration of efforts associated with performance excellence is in-fact advantageous.

5.1 Review of the Findings

The quantitative and qualitative methodology approach for this research made this analysis exhaustive. The source of data employed for the purposes of this research included publically available information available from the Security and Exchange Commission as well information published by the National Institute of Standards and Technology's Baldrige Performance Excellence Program. This research examined the business performance results of

Malcolm Baldrige award-winning companies, which have demonstrated capabilities in performance excellence.

The main questions associated with this research included: (1) what common input factors do winners have that lead to award selection? (2) How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with the overall market? (3) How do business results for companies that have implemented the nationally-recommended performance excellence model compare over time with their industry peers in a comparison of (a) profitability, (b) liquidity, (c) debt management, (d) asset management, and (e) per share performance ratios?

According to the results based on the research design of Research Question #1, the leadership, organizational profile, and measurement sections of the Criteria have the most elements in common amongst award-winners. Other sections of the Criteria for Performance Excellence have elements in common amongst award-winners, but the leadership, organizational profile, and measurement sections have the most in common. Graphics were created to reflect the content analysis of 51 award-winner applications. “Process”, “plan”, “perform”, “customer”, “performance”, “action”, and “system” were the top keyword findings. The specific keywords which were analyzed are listed in Appendix A, and the keyword results for the award-winning companies are listed in Appendix B. Specific focus areas for companies that want to pursue performance excellence efforts based on these findings have been included in Appendix C.

According to the analysis conducted to answer Research Question #2, the majority of the 15 award-winning companies outperformed the market for the majority of years analyzed. The superior performance years include 2002, 2004, 2005, 2006, 2007 (recession), 2008 (recession), 2010, 2011 and 2012. Inferior performance years include 2003, and 2009 (recession). 2003 was the end of Tech Bubble, and 2009 was the end of the Great Recession. Market rallies began around the same time frame in March /April of these years. It is possible that low market returns and high volatility frightened the average investor during this time. Overall, however, the award-winners outperformed the market for the majority of years analyzed. The award-winner beta and return tables are included in Appendix D.

According to the analysis conducted to answer Research Question #3, the majority of Malcolm Baldrige award winners outperform their industry peers over an 11-year time period in a comparison of (a) profitability performance ratios, underperform their industry peers in terms of (b) liquidity performance ratios, are not different from their industry peers in terms of (c) debt management performance ratios, underperform their industry peers in terms of (d) asset management ratios, and outperform their industry peers in terms of (e) per share performance ratios. The financial tables for award-winners are included in Appendix E. The industry comparison companies are listed in Appendix F. The statistical tests used are listed in Appendix G. The detailed statistical analysis results are included in Appendix H.

The evidence of these relationships, especially during turbulent economic times, may help business leaders make the decision to embark on a journey towards performance excellence.

As businesses strive towards performance excellence, there is an increased the likelihood that their business will remain viable and be in a better position to effectively compete in a challenging global environment.

5.2 Post-Hoc Analysis and Findings

The first post-hoc question that was analyzed was “What if only the award-winners that were used in the financial analysis of Research Questions #2 (market comparison) and Research Question #3 (industry comparison) were used in the analysis of Research Question #1 (common input factors)?” The same approach used for the 51-company analysis was conducted for those award winners used in the financial analysis which had an online application available. Of the 15 companies investigated in Research Question #2 and Research Question #3, only six of them had applications available online for analysis. These companies included Boeing, Caterpillar, Honeywell, Lockheed Martin, Marriott, and Motorola.

Side-by-side comparison analysis of the 1st data run of 51 companies compared with the 2nd run of the 6 companies revealed that the results were very similar. The majority of the resulting visual frequency distribution images followed the same pattern for both data runs. In addition, the top most common keywords were the same, the top categories of results were the same, the top keywords not found were the same, and even the majority of the top 20 words found were the same.

The second post-hoc question that was analyzed was “What effects would outliers have on Research Question #3?” The debate on the handling of outliers is polarized, with strong

opinions on leaving outliers in as well as removing them prior to analysis. Ultimately, it is up to the researcher to use judgment and experience to determine the best path forward. Due to the volatility of the economic environment in which the data for Research Question #3 was gathered, outliers were left in the research design. Many businesses experienced financial and operational extremes during the years of 2002 – 2012, and this approach made solid business sense. Outlier analysis also assists with investigating the effect that economic volatility had on the overall results.

The outlier points were removed, and Research Question #3 was re-analyzed. The analysis of each financial ratio required three tests: one testing the normality of the winner data, a second testing the normality of the industry comparison data, and a third test statistically comparing the two sets of data, which was either a t-test or a Wilcoxon Signed Rank Test based on the outcomes of the first two normality tests. 21 ratios (each requiring three statistical tests) were re-analyzed for each company, and there were 15 companies total. The 945 individual statistical tests were re-calculated in order to determine the effect of outliers on Research Question #3.

Although the outliers had an effect on numerous instances within the data set, some of which will be mentioned in this section, removing them did not ultimately modify the overall results and conclusions. Six of the award-winning companies still outperformed their industry peers (FedEx, Honeywell, Lockheed Martin, 3M, Raytheon and Verizon), three award-winning companies still did not have a difference from their industry peers (Eastman Chemical, Corning,

and Motorola), and six award-winning companies still underperformed their peers (Boeing, Caterpillar, IBM, Marriott, Wabtec, and Xerox).

The results of the overall profitability, debt management, liquidity, asset management and per share performance ratios remain unchanged, with one exception. The overall Total Debt to Equity results changed from “not significant” to “significant” and winners were superior to the industry comparison peers. Xerox had the most number of outliers (15 ratios), and Marriott and FedEx had the second highest number of outliers (11 ratios).

Another observation regarding the effect of outliers was determined based on the tests of normality which were conducted. Prior to outlier removal, there were 210 total paired t-tests (for normally distributed data), and 105 Wilcoxon Signed Rank Tests (for data that is not normally distributed). After the outliers were removed, there were 255 total paired t-tests (normally distributed data), and 60 Wilcoxon Signed Rank Tests (for data that is not normally distributed). Therefore, removing the outliers resulted in 45 data tests that transitioned from being not normally-distributed to normally-distributed.

Removing outliers did not have an overall effect on the results. One would expect that the turbulent economy experienced within 2002 – 2012 would result in extreme outliers and therefore the removal of them would modify the results. One interpretation of these results is that the research design of comparing companies in the same industry to each other helped account for these effects. The specific results of the outlier analysis are listed in Appendix I.

The third post-hoc question that was investigated was “How do these results compare with other benchmark companies?” This would include the most extremely successful companies in the market today. There are several very popular books that have been written which address this exact question.

The first book is titled “Built to Last” by Jim Collins. In this book, Collins and Porras (his co-author) outlined eighteen different companies that they categorized as ‘visionary.’ They defined a visionary company as “one that is a premier institution in its industry, is widely admired by knowledgeable businesspeople, made an imprint on the world, had multiple generations of Chief Executive Officers (CEOs), has had multiple product/service life cycles, and was founded before 1950” (Collins & Porras, 1994). The list of 18 companies was based on a survey of 1,000 CEOs. Approximately 30% of the 18 “visionary companies” listed are members of the MBNQA winners which were analyzed within this study. These include: Boeing, IBM, Marriott, 3M, and Motorola.

A second book is titled “In Search of Excellence” by Tom Peters. In this book, Peters and Waterman look at leading companies which had long periods of profitability and innovation. Approximately 16% of the 32 companies analyzed within this study are MBNQA winners also included in this research (Peters & Waterman Jr., 1982). These include: Boeing, Caterpillar, Eastman, IBM and 3M. According to this book, there were eight traits that these companies had in common:

1. A bias for action, active decision making – 'getting on with it', facilitating quick decision making, and problem solving that avoids bureaucratic control.
2. Close to the customer – learning from the people served by the business.
3. Autonomy and entrepreneurship – fostering innovation and nurturing 'champions'.
4. Productivity through people – treating rank and file employees as a source of quality.
5. Hands-on, value-driven – having a management philosophy that guides everyday practice, and management showing commitment to it.
6. Stick to the knitting – staying with the business that you know.
7. Simple form, lean staff – having minimal HQ staff.
8. Simultaneous loose-tight properties – having autonomy in shop-floor activities plus centralized values.

5.3 Contributions to the Body of Knowledge

A contribution to the body of knowledge is expected as a result of conducting the research process at the Ph.D. level. This research contributes to several areas:

The first contribution as a result of this research is based on the development of a framework for reviewing the effectiveness of the performance excellence criteria. This framework has been summarized in Figure 6. The Malcolm Baldrige Criteria for Performance Excellence does not outline specific results that a business or organization must achieve in order to win the award. Instead, it affords the organization the opportunity to interpret their results based on the Criteria and then examiners confirm these results through their on-site reviews. The

‘results’ of each award-winner are customized to their unique business situation. This research introduces sophisticated and relevant criteria for performance results measurement that is based on financial performance as measured by market and industry comparison results.

The second contribution is that this framework created a baseline of analysis for all publically-traded award winners, which analyzed their performance based on their performance to the market as measured by the S&P 500 as well as to their industry peers as measured by 21 different performance ratios. This created a solid foundation from which peer-to-peer comparison studies could be conducted. Other studies have analyzed some of the elements under review; however this particular study presents an in-depth and exhaustive comparison of 15 companies over a time period of 11 years.

The third contribution as a result of this research is a contribution in methodology. This research integrated elements of quantitative and qualitative measures that were both inductive and deductive. This research identified associations based on elements that award-winners have in common, while also investigating the market and industry financial performance results. Results of the literature review confirmed that a content analysis of award-winning profiles based on specific keyword searches based on the Baldrige Criteria has not yet been conducted. Similarly, a performance analysis where all award winner results were compared over a fixed period of time has not yet been conducted.

The existing literature primarily focuses on reviewing the award-winners just prior to their award, and after, but not over a fixed window of time. A premise of this research is that

award-winning companies begin integrating elements of performance excellence long before the award is granted, and as such, will begin demonstrating results before this recognition is obtained. This presents a very comprehensive perspective of award-winner results.

The fourth contribution to the body of knowledge is related to the results that were found based on the exhaustive analysis conducted for this research. Updates were made to the analysis that has been conducted in the past, and new measures and approaches were incorporated in order to determine an overarching systems approach for analyzing the Malcolm Baldrige Award Winners.

This research therefore presents a holistic contribution to the body of knowledge on this topic. The strength of the relationship between those businesses that have won the award with their overall business results was tested in multiple ways. The comprehensive nature of this research resulted in additional information that can be added to the body of knowledge regarding elements that award-winners have in common, their market comparison results, and their peer-industry comparison results.

5.4 Conclusions

The design of this research was structured in such a way as to address the literature gaps. Four main gaps were identified as a result of the literature review which included: limitations on the comparative methods, the time frame, the sample sizes, and the recency in which prior studies were conducted.

This research addressed limitations from the one-for-one comparative methods that were noted within the existing literature. This was done through comparing award-winning company results with peers within the same (NAICS and SIC code) industry, and by using publicly available (and commonly accepted) benchmarks for information.

This research also addressed limitations of the time frame used that were noted within the existing literature by conducting a long-term analysis over 11-years. This timeframe was used to measure market performance conducted as if an entire portfolio of award-winning companies was held from the beginning of a specific time period until the end of that period to determine longitudinal effectiveness in a comparison with overall market performance.

This researched addressed limitations in the sample sizes were noted within the scope of existing literature through including as many of the companies as possible and by expanding the time-frame. The data was tested to determine if it was normally distributed, and over 60% of all data tests were normally-distributed as a result of this larger sample size approach.

This research addressed limitations in the recency of available information on this topic within the literature by providing updates to various analyses that were conducted in the past, and also integrating new comprehensive measures in order to provide an overarching systems perspective of the overall results.

As the content analysis results from Research Question #1 demonstrate, there are many input factors that the award-winners have in common, which mainly consist of elements within the Malcolm Baldrige Criteria for Performance Excellence. According to the results of this

research, leadership, the organizational profile, and measurement have the most elements in common among the award-winners analyzed. Specifically, “process” was the most prominent word found in the applications, as it had the largest number of findings for all of the applicants (15,909). The next most prominent word was “plan” (11,583), which was followed by “perform” (11,016). These top three words were followed by “customer” (10,390), “performance” (9,819), “action” (9,603), and “system” (9,504). According to these results, the Malcolm Baldrige award winners do have common input factors that lead to award selection.

The graphical and statistical analysis conducted for Research Question #2 demonstrated that a portfolio of Malcolm Baldrige award winners has outperformed the market overall for an 11-year time period when compared to the S&P 500. The statistical analysis of these results was confirmed at the $p = .001$ significance level, and had a power of 98.4%.

The statistical analysis conducted for Research Question #3 confirmed that the majority of Malcolm Baldrige award winners do outperform their industry peers over an 11-year time period in a comparison of (a) profitability performance ratios, underperform their industry peers in terms of (b) liquidity performance ratios, are not different from their industry peers in terms of (c) debt management performance ratios, underperform their industry peers in terms of (d) asset management ratios, and outperform their industry peers in terms of (e) per share performance ratios.

This research examined the business results of companies who have demonstrated a capability to achieve performance excellence as defined by the National Institute of Standards

and Technology's Malcom Baldrige Criteria for Performance Excellence. This research conducted analysis on the award-winners to determine common input factors, and conducted comparisons with the overall market as well as to their respective industries. This research adds to the body of knowledge by integrating multiple measurement approaches and examining business performance over an 11-year time span which includes downward economic pressure. This research presents a holistic contribution to the body of knowledge by determining the strength of the relationship between those businesses that have won the award to their overall business performance results.

The results of this research helps business leaders learn about the very specific performance results of companies that have implemented the nationally-recommended performance excellence model. The results of this research help provide a business case for justifying the costs associated with performance excellence. This research serves as a framework of the critical success factors for business organizations that lead to performance excellence, and is based on an overarching financial and quality systems assessment.

5.5 Limitations

The data analyzed within the scope of this study was limited in several ways. First, this study was limited to publically-traded companies. The majority of the award-winning organizations (such as health care and education) were eliminated from the scope of this study.

Second, this study was limited in scope to those award-winning companies whose parent organization was based within the United States. The Malcolm-Baldrige award is a framework

for performance excellence for U.S. companies, which is why this approach was chosen. As such, companies such as FLEX, ALU, GFKAF, STM, TM, NSRG Y were not included.

Third, this study removed those organizations which had an insufficient amount of information to analyze. This includes both companies which did not have the required 11 years' worth of stock information (GSM, GM, AWI, DAN, BAC) or companies which did not have all of the financial ratio information available (Ticker Symbol: C).

Fourth, the study was limited to the financial information that was available and published through the Security and Exchange Commission. If companies have made mistakes or typos in the publication of their data, then this has not been accounted for within the research.

This research is also limited on the basis that ticker symbols were used for analysis. Certain award-winning companies have been acquired by other organizations and, as such, their ticker symbol represents the company that acquired the award-winning organization. This is the case for Ritz-Carlton (won in 1992 and 1999, now part of Marriott International) as well as for Westinghouse Commercial Nuclear Fuel Division (won in 1988, now part of Wabtec). It is possible that the best practices acquired by these award-winning organizations were transferred across the organization as a result of this acquisition, and it is also possible that part of the reason that they were acquired was because they had demonstrated a proficiency in performance excellence.

Finally, limitations in the content analysis for Research Question #1 only included those award-winners whose complete profile was available. Award winners prior to 2002 did not have a complete profile which was available for analysis.

5.6 Future Research

Future opportunities abound for researchers who want to expand upon this analysis. This field of study presents a challenging yet rewarding field of study for researchers who are passionate about the topic of business performance. The narrowed field of study on the topic of business performance excellence is especially intriguing, as economic conditions and the rapid pace of technology make the competitive environment fierce. Many business leaders today are eager to implement proven solutions, so the return on research investments is high. Several very specific recommendations for researchers to build upon this topic or upon the results of this specific research have been outlined within this section.

The first recommendation for future research includes duplicating the financial analysis approach with a targeted focus on specific industries. These industries would include those that the profitable award-winners have in common with companies listed within the S&P 500. This analysis approach would integrate the market approach comparison with the industry peer comparison. Instead of conducting the peer-comparisons with companies in the same NAICS code, however, these comparisons would be conducted using S&P 500 companies. This analysis would help ensure that the peer comparison companies are strong and highly valued in the marketplace; however the number of peer comparison companies available may be reduced.

A second recommendation for future research includes parsing out the financial results in order to investigate them via case study on a year-by-year basis. The paired T-Test and Wilcoxon Signed Rank Tests conducted within the scope of this study present an overarching ‘better’ or ‘worse’ result comparison. The year by year approach, however, would provide researchers with an in-depth understanding of how specific financial ratios changed over time. In addition, studying the specific economic or industry effects for each year under investigation would help provide additional context for the trends found within the results. This approach would provide insight into how the external economy or industry-specific environment impacted company results on a year-by-year basis.

A third recommendation for future research involves conducting individual case studies on specific award-winning companies. This approach could build upon the results of this research in order to determine specific root causes for performance ratios that were superior or inferior to industry peers. An investigation of the root causes behind why specific performance ratios changed over time would also be valuable. As a suggestion, case studies on the award-winning companies of Boeing, IBM and 3M would be of particular interest. These three specific companies were identified as exceptionally performing companies in the books titled “Good to Great” as well as “In Search of Excellence”, and are also Malcolm Baldrige Award-winning companies.

A fourth recommendation for future research would include a focus on the business unit-level financial ratios. In the majority of existing literature, as well as within this study, award-

winners are investigated at the company level. Some award-winning companies, especially the publically traded ones which are large in size, report their financials at the business unit level as well. Future research could be done to conduct financial comparisons between business-units of the same award-winning organization, in order to determine the degree of superiority which the award-winning division outperformed the other divisions. Analysis could be conducted to determine which award-winning firms have similar business units, and comparisons among award-winners could also be conducted.

A fifth recommendation for future research would include conducting predictive analysis to investigate specific companies and determine their capability of winning the award. This research could involve a thorough investigation of the contributing factors that lead to performance excellence as well as their financial profile. A thorough content analysis of press releases or publically-available information would help supplement this analysis approach. Research and development of the specific formulae that lead to superior results in each of the categories associated with performance excellence would be incredibly valuable. Tests on the strength of these models could be conducted using the results of companies that have already won the award. This research could afford organizations the opportunity to objectively assess their capability of winning the award prior to applying for it.

A sixth recommendation for future research would include conducting a study based on very large and very successful companies that are in the market today to order to determine which of the elements of Baldrige they have best capitalized on that have most impacted their

success. This could include a causative investigation into the elements associated with leadership, strategic planning, customer focus, workforce focus, operations focus, measurement, analysis and knowledge management and company results. The results of this research would provide insight into which Baldrige elements have most contributed to their success. In addition, this research may potentially uncover contributory elements for their success which are not accounted for within the Baldrige Framework.

A final recommendation for future research would include replicating the methods used within this scope of study as time goes by and more publically-traded companies win the award and are available for analysis. This would not only increase the sample size of the companies used, but having additional data points should also enhance the power of these tests as well. Increasing the number of years analyzed would provide richer trend analysis.

APPENDIX A: KEYWORD DICTIONARY FOR RQ#1

The following keyword dictionary defines the words which were used for the Content Analysis for Research Question #1. They were taken from the respective sections of the Malcolm Baldrige Criteria for Performance Excellence. An equal number of 45 keywords for each Category of the Criteria were identified, totaling 360 keywords that were searched for each document. These words were deemed to be important based on the context from which they are used within the Criteria. These keywords were the words that were used to determine the factors that were common within the applications of the award winners.

Keyword Dictionary – 1 of 4

Category	Keyword	Category	Keyword
Organizational Profile	Organizational Environment	Leadership	Value
Organizational Profile	Product	Leadership	Relationship
Organizational Profile	Process	Leadership	Guide
Organizational Profile	Vision	Leadership	Engage
Organizational Profile	Mission	Leadership	Perform
Organizational Profile	Diversity	Leadership	Deploy
Organizational Profile	Facility	Leadership	Action
Organizational Profile	Technology	Leadership	Commit
Organizational Profile	Equipment	Leadership	Leadership
Organizational Profile	Regulation	Leadership	Positive
Organizational Profile	Accreditation	Leadership	Participate
Organizational Profile	Certification	Leadership	Develop
Organizational Profile	Standard	Leadership	Communicate
Organizational Profile	Fiscal Accountability	Leadership	Encourage
Organizational Profile	Legal Requirement	Leadership	Frank
Organizational Profile	Regulatory Requirement	Leadership	Effective
Organizational Profile	Organizational Relationship	Leadership	Motivate
Organizational Profile	Structure	Leadership	Active
Organizational Profile	Governance	Leadership	Senior Leader
Organizational Profile	Board	Leadership	Personal Action
Organizational Profile	Segment	Leadership	Performance Evaluation
Organizational Profile	Stakeholder	Leadership	Focus
Organizational Profile	Supplier	Leadership	Create
Organizational Profile	Collaborate	Leadership	Improve
Organizational Profile	System	Leadership	Enable
Organizational Profile	Organizational Profile	Leadership	Lead
Organizational Profile	Partner	Leadership	Accountability
Organizational Profile	Competitive Environment	Leadership	Transparency
Organizational Profile	Competitive Position	Leadership	Disclosure
Organizational Profile	Industry Size	Leadership	Audit
Organizational Profile	Industry Growth	Leadership	Protection
Organizational Profile	Competitor	Leadership	Promote
Organizational Profile	Strategic Context	Leadership	Public Concern
Organizational Profile	Strategic Challenge	Leadership	Resource
Organizational Profile	Strategic Advantage	Leadership	Engage The Workforce
Organizational Profile	Performance Improvement System	Leadership	Ethics
Organizational Profile	Performance Improvement	Leadership	Decision
Organizational Profile	Groups	Leadership	Compliance
Organizational Profile	Key	Leadership	Address Risk
Organizational Profile	Communication	Leadership	Societal Responsibilities
Organizational Profile	Expectation	Leadership	Reinforce
Organizational Profile	Competitiveness	Leadership	Well Being
Organizational Profile	Enhance	Leadership	Environment
Organizational Profile	Requirements	Leadership	Culture
Organizational Profile	Contribution	Leadership	Sustainable

Keyword Dictionary – 2 of 4

Category	Keyword	Category	Keyword
Strategic Planning	Strategic Development	Customer Focus	Customer
Strategic Planning	Strategic Planning	Customer Focus	Listen
Strategic Planning	Strategic Objective	Customer Focus	Interact
Strategic Planning	Short Term	Customer Focus	Observe
Strategic Planning	Long Term	Customer Focus	Customer Feedback
Strategic Planning	Horizon	Customer Focus	Customer Support
Strategic Planning	Agility	Customer Focus	Service
Strategic Planning	Flexibility	Customer Focus	Customer Satisfaction
Strategic Planning	Innovation	Customer Focus	Customer Engagement
Strategic Planning	Opportunity	Customer Focus	Customer Segment
Strategic Planning	Risk	Customer Focus	Dissatisfaction
Strategic Planning	Work System	Customer Focus	Customer Group
Strategic Planning	Advantage	Customer Focus	Customer Requirement
Strategic Planning	Sustainability	Customer Focus	Customer Expectation
Strategic Planning	Blind	Customer Focus	Customer Relationship
Strategic Planning	Strategy	Customer Focus	Customer Life Cycle
Strategic Planning	Ability	Customer Focus	Obtain Information
Strategic Planning	Execute	Customer Focus	Listening Method
Strategic Planning	Take Risk	Customer Focus	Seek Feedback
Strategic Planning	Decide	Customer Focus	Quality Of Product
Strategic Planning	Competency	Customer Focus	Support
Strategic Planning	Objective	Customer Focus	Transaction
Strategic Planning	Timetable	Customer Focus	Satisfaction
Strategic Planning	Future	Customer Focus	Former Customer
Strategic Planning	Goal	Customer Focus	Potential Customer
Strategic Planning	Change	Customer Focus	Competitors' Customer
Strategic Planning	Plan	Customer Focus	Market Segment
Strategic Planning	Challenge	Customer Focus	Actionable Information
Strategic Planning	Strategic Plan	Customer Focus	Exceed Expectation
Strategic Planning	Analyze Data	Customer Focus	Industry Benchmark
Strategic Planning	Strategic Opportunities	Customer Focus	Market Requirement
Strategic Planning	Intelligent Risk	Customer Focus	Adapt Product Offering
Strategic Planning	Strategic Planning Process	Customer Focus	Meet Requirement
Strategic Planning	Strategic Challenges	Customer Focus	Customer Focus
Strategic Planning	Strategic Advantages	Customer Focus	New Customer
Strategic Planning	Blind Spot	Customer Focus	Expand Relationship
Strategic Planning	Potential	Customer Focus	Current Customer
Strategic Planning	Determine Future	Customer Focus	Enable Customer
Strategic Planning	Important	Customer Focus	Customer Communication
Strategic Planning	Key Change	Customer Focus	Retain Customer
Strategic Planning	Leverage	Customer Focus	Conduct Business
Strategic Planning	Balance	Customer Focus	Future Customer Group
Strategic Planning	Action Plan	Customer Focus	Future Market Segment
Strategic Planning	Resource Allocation	Customer Focus	Complaint
Strategic Planning	Modification	Customer Focus	Acquire Customer

Keyword Dictionary – 3 of 4

Category	Keyword	Category	Keyword
Measurement Analysis	Social Media	Workforce	Workforce Capability
Measurement Analysis	Web	Workforce	Workforce Capacity
Measurement Analysis	Benchmark	Workforce	Workforce Skills
Measurement Analysis	Data	Workforce	Workforce Climate
Measurement Analysis	Select	Workforce	Workforce Health
Measurement Analysis	Collect Data	Workforce	Workforce Satisfaction
Measurement Analysis	Analyze	Workforce	Workforce Benefits
Measurement Analysis	Integrate Data	Workforce	Leadership Development
Measurement Analysis	Track	Workforce	Education
Measurement Analysis	Measures	Workforce	Workforce
Measurement Analysis	Measurement	Workforce	Learn
Measurement Analysis	Analysis	Workforce	Innovate
Measurement Analysis	Knowledge	Workforce	Staff
Measurement Analysis	Measurement System	Workforce	Workplace
Measurement Analysis	Reconcile	Workforce	Reductions
Measurement Analysis	Project	Workforce	Employee Benefits
Measurement Analysis	Collect	Workforce	Tuition
Measurement Analysis	Hardware	Workforce	Organizational Culture
Measurement Analysis	Software	Workforce	Compensation
Measurement Analysis	Emergency	Workforce	Reward
Measurement Analysis	Decision Making	Workforce	Incentive
Measurement Analysis	Comparative Data	Workforce	Recognition
Measurement Analysis	Information	Workforce	Retention
Measurement Analysis	Alignment	Workforce	Absenteeism
Measurement Analysis	Use Data	Workforce	Grievance
Measurement Analysis	Performance Measurement System	Workforce	Safety
Measurement Analysis	Review	Workforce	Skill
Measurement Analysis	Gather Information	Workforce	Competencies
Measurement Analysis	Voice Of The Customer	Workforce	Certifications
Measurement Analysis	Market Data	Workforce	Recruit
Measurement Analysis	Management	Workforce	Hire
Measurement Analysis	Financial	Workforce	Retain
Measurement Analysis	Best Practices	Workforce	Diverse Ideas
Measurement Analysis	Excellence	Workforce	Cultures
Measurement Analysis	Aggregated Data	Workforce	Accomplish
Measurement Analysis	Organizational Performance	Workforce	Manager
Measurement Analysis	Capabilities	Workforce	Capability
Measurement Analysis	Assess	Workforce	Capacity
Measurement Analysis	Competitive Performance	Workforce	Workforce Growth
Measurement Analysis	Continuous Improvement	Workforce	Performance Measure
Measurement Analysis	Action Plans	Workforce	Benefit
Measurement Analysis	High Performing	Workforce	Workforce Engagement
Measurement Analysis	Sharing	Workforce	Succession Planning
Measurement Analysis	Performance Review	Workforce	Career Progression
Measurement Analysis	Future Performance	Workforce	Assessment

Keyword Dictionary – 4 of 4

Category	Keyword	Category	Keyword
Operations	Growth	Results	Leadership Results
Operations	Organizational Knowledge	Results	Governance Results
Operations	Product Excellence	Results	Ethical Behavior
Operations	Work Process	Results	Trust
Operations	Daily Operations	Results	Financial Results
Operations	Operations	Results	Market Results
Operations	Product Improvement	Results	Financial Performance
Operations	Variability	Results	Return
Operations	Cycle Time	Results	Viability
Operations	Productivity	Results	Budget
Operations	Defect	Results	Market
Operations	Error	Results	Share
Operations	Rework	Results	Position
Operations	Warranty	Results	Market Growth
Operations	Loss	Results	New Market
Operations	Inspection	Results	Performance
Operations	Test	Results	Productive
Operations	Priority	Results	Product Performance
Operations	Cost Control	Results	Effectiveness
Operations	Customer Need	Results	Efficiency
Operations	Supply Chain	Results	Process Effectiveness
Operations	Control Cost	Results	Impact
Operations	Supplier Feedback	Results	Summary
Operations	Accident	Results	Result
Operations	Disaster	Results	Measure
Operations	Emergency Preparedness	Results	Trend
Operations	Root Cause	Results	Indicator
Operations	Suppliers	Results	Customer Results
Operations	Implement	Results	Workforce Results
Operations	Design	Results	Marketplace
Operations	Manage	Results	Key Measure
Operations	Deliver	Results	Level
Operations	Safety System	Results	Legal Compliance
Operations	Success	Results	Society
Operations	Resource Availability	Results	Responsibility
Operations	Continuity Of Operations	Results	Community
Operations	Product Design	Results	Achieve
Operations	Process Design	Results	Profit
Operations	Process Management	Results	Return On Investment
Operations	Supply Chain Management	Results	Ratio
Operations	Quality	Results	Surpass
Operations	Innovation Management	Results	Fulfill
Operations	Effective Management	Results	Core Competencies
Operations	Recovery	Results	Strengthen
Operations	Feedback	Results	Growth

APPENDIX B: CONTENT ANALYSIS RESULTS FOR RQ#1

The 2013-2014 Malcolm Baldrige Criteria for Performance Excellence was used to obtain keywords for each of the categories within the Malcolm Baldrige framework. An equal number of 45 keywords for each Category of the Criteria were identified, totaling 360 keywords that were searched for each document. The following pages provide the specific results of the Content Analysis for the 51 award-winning companies that were included within the scope of Research Question #1.

Organizational Profile Keywords & Results

Category	Word	Length	Freq	%
Organizational Profile	Process	7	15909	3.89
Organizational Profile	System	6	9504	2.33
Organizational Profile	Key	3	6988	1.71
Organizational Profile	Product	7	4911	1.20
Organizational Profile	Requirements	12	3812	0.93
Organizational Profile	Partner	7	2623	0.64
Organizational Profile	Communication	13	2407	0.59
Organizational Profile	Board	5	2106	0.52
Organizational Profile	Supplier	8	2091	0.51
Organizational Profile	Stakeholder	11	2088	0.51
Organizational Profile	Mission	7	2058	0.50
Organizational Profile	Standard	8	2022	0.50
Organizational Profile	Vision	6	1926	0.47
Organizational Profile	Technology	10	1707	0.42
Organizational Profile	Groups	6	1680	0.41
Organizational Profile	Competitor	10	1615	0.40
Organizational Profile	Segment	7	1545	0.38
Organizational Profile	Expectation	11	1335	0.33
Organizational Profile	Structure	9	951	0.23
Organizational Profile	Enhance	7	785	0.19
Organizational Profile	Equipment	9	755	0.19
Organizational Profile	Governance	10	599	0.15
Organizational Profile	Diversity	9	548	0.13
Organizational Profile	Facility	8	541	0.13
Organizational Profile	Regulation	10	438	0.11
Organizational Profile	Certification	13	407	0.10
Organizational Profile	Performance Improvement	23	364	0.09
Organizational Profile	Accreditation	13	362	0.09
Organizational Profile	Strategic Challenge	19	337	0.08
Organizational Profile	Contribution	12	301	0.07
Organizational Profile	Collaborate	11	123	0.03
Organizational Profile	Organizational Profile	22	123	0.03
Organizational Profile	Regulatory Requirement	22	120	0.03
Organizational Profile	Strategic Advantage	19	110	0.03
Organizational Profile	Performance Improvement System	30	102	0.03
Organizational Profile	Fiscal Accountability	21	83	0.02
Organizational Profile	Competitive Environment	23	71	0.02
Organizational Profile	Competitive Position	20	64	0.02
Organizational Profile	Legal Requirement	17	39	0.01
Organizational Profile	Organizational Environment	26	37	0.01
Organizational Profile	Organizational Relationship	27	32	0.01
Organizational Profile	Competitiveness	15	28	0.01
Organizational Profile	Strategic Context	17	18	0.00
Organizational Profile	Industry Growth	15	4	0.00

Leadership Keywords & Results

Category	Word	Length	Freq	%
Leadership	Perform	7	11016	2.70
Leadership	Action	6	9603	2.35
Leadership	Improve	7	8853	2.17
Leadership	Develop	7	7231	1.77
Leadership	Lead	4	4959	1.21
Leadership	Focus	5	3530	0.86
Leadership	Leadership	10	3510	0.86
Leadership	Commit	6	3028	0.74
Leadership	Value	5	2968	0.73
Leadership	Resource	8	2410	0.59
Leadership	Environment	11	2387	0.58
Leadership	Effective	9	2272	0.56
Leadership	Deploy	6	2156	0.53
Leadership	Engage	6	1849	0.45
Leadership	Relationship	12	1653	0.40
Leadership	Audit	5	1604	0.39
Leadership	Senior Leader	13	1466	0.36
Leadership	Create	6	1404	0.34
Leadership	Compliance	10	1386	0.34
Leadership	Culture	7	1353	0.33
Leadership	Decision	8	1183	0.29
Leadership	Active	6	893	0.22
Leadership	Communicate	11	819	0.20
Leadership	Participate	11	803	0.20
Leadership	Enable	6	681	0.17
Leadership	Guide	5	639	0.16
Leadership	Promote	7	608	0.15
Leadership	Accountability	14	581	0.14
Leadership	Ethics	6	580	0.14
Leadership	Encourage	9	574	0.14
Leadership	Reinforce	9	558	0.14
Leadership	Positive	8	495	0.12
Leadership	Protection	10	315	0.08
Leadership	Motivate	8	149	0.04
Leadership	Sustainable	11	124	0.03
Leadership	Transparency	12	114	0.03
Leadership	Disclosure	10	74	0.02
Leadership	Public Concern	14	66	0.02
Leadership	Frank	5	34	0.01
Leadership	Societal Responsibilities	25	26	0.01
Leadership	Well Being	10	21	0.01
Leadership	Personal Action	15	20	0.01
Leadership	Address Risk	12	7	0.00

Strategic Planning Keywords & Results

Category	Word	Length	Freq	%
Strategic Planning	Plan	4	11583	2.83
Strategic Planning	Goal	4	4715	1.15
Strategic Planning	Ability	7	3686	0.90
Strategic Planning	Change	6	2341	0.57
Strategic Planning	Objective	9	1962	0.48
Strategic Planning	Action Plan	11	1866	0.46
Strategic Planning	Innovation	10	1539	0.38
Strategic Planning	Strategy	8	1335	0.33
Strategic Planning	Strategic Planning	18	1174	0.29
Strategic Planning	Risk	4	1135	0.28
Strategic Planning	Potential	9	1050	0.26
Strategic Planning	Challenge	9	972	0.24
Strategic Planning	Future	6	955	0.23
Strategic Planning	Strategic Plan	14	798	0.20
Strategic Planning	Strategic Objective	19	680	0.17
Strategic Planning	Balance	7	667	0.16
Strategic Planning	Important	9	644	0.16
Strategic Planning	Work System	11	641	0.16
Strategic Planning	Opportunity	11	621	0.15
Strategic Planning	Advantage	9	469	0.12
Strategic Planning	Competency	10	452	0.11
Strategic Planning	Sustainability	14	360	0.09
Strategic Planning	Agility	7	292	0.07
Strategic Planning	Strategic Challenges	20	284	0.07
Strategic Planning	Horizon	7	250	0.06
Strategic Planning	Execute	7	212	0.05
Strategic Planning	Leverage	8	184	0.05
Strategic Planning	Flexibility	11	135	0.03
Strategic Planning	Modification	12	132	0.03
Strategic Planning	Long Term	9	99	0.02
Strategic Planning	Blind	5	87	0.02
Strategic Planning	Decide	6	85	0.02
Strategic Planning	Resource Allocation	19	83	0.02
Strategic Planning	Strategic Advantages	20	79	0.02
Strategic Planning	Key Change	10	53	0.01
Strategic Planning	Analyze Data	12	34	0.01
Strategic Planning	Timetable	9	27	0.01
Strategic Planning	Short Term	10	25	0.01
Strategic Planning	Strategic Development	21	10	0.00
Strategic Planning	Intelligent Risk	16	3	0.00
Strategic Planning	Determine Future	16	2	0.00
Strategic Planning	Take Risk	9	1	0.00
Strategic Planning	Strategic Opportunities	23	1	0.00

Customer Focus Keywords & Results

Category	Word	Length	Freq	%
Customer Focus	Customer	8	10390	2.54
Customer Focus	Service	7	7963	1.95
Customer Focus	Satisfaction	12	4955	1.21
Customer Focus	Support	7	4861	1.19
Customer Focus	Complaint	9	1106	0.27
Customer Focus	Listen	6	889	0.22
Customer Focus	Interact	8	524	0.13
Customer Focus	Dissatisfaction	15	306	0.08
Customer Focus	Market Segment	14	229	0.06
Customer Focus	Transaction	11	164	0.04
Customer Focus	New Customer	12	93	0.02
Customer Focus	Potential Customer	18	82	0.02
Customer Focus	Industry Benchmark	18	76	0.02
Customer Focus	Actionable Information	22	64	0.02
Customer Focus	Observe	7	45	0.01
Customer Focus	Current Customer	16	32	0.01
Customer Focus	Market Requirement	18	31	0.01
Customer Focus	Conduct Business	16	29	0.01
Customer Focus	Obtain Information	18	20	0.01
Customer Focus	Meet Requirement	16	19	0.01
Customer Focus	Quality Of Product	18	16	0.00
Customer Focus	Former Customer	15	15	0.00
Customer Focus	Exceed Expectation	18	15	0.00
Customer Focus	Expand Relationship	19	11	0.00
Customer Focus	Enable Customer	15	7	0.00
Customer Focus	Retain Customer	15	5	0.00
Customer Focus	Future Customer Group	21	3	0.00
Customer Focus	Acquire Customer	16	2	0.00

Measurement, Analysis, and Knowledge Management Keywords & Results

Category	Word	Length	Freq	%
Measurement Analysis	Review	6	6313	1.55
Measurement Analysis	Data	4	6248	1.53
Measurement Analysis	Management	10	5024	1.23
Measurement Analysis	Information	11	4949	1.21
Measurement Analysis	Measures	8	3402	0.83
Measurement Analysis	Project	7	3027	0.74
Measurement Analysis	Assess	6	2871	0.70
Measurement Analysis	Benchmark	9	2373	0.58
Measurement Analysis	Analysis	8	2331	0.57
Measurement Analysis	Financial	9	2186	0.54
Measurement Analysis	Knowledge	9	2155	0.53
Measurement Analysis	Excellence	10	1661	0.41
Measurement Analysis	Action Plans	12	1374	0.34
Measurement Analysis	Track	5	1302	0.32
Measurement Analysis	Select	6	1194	0.29
Measurement Analysis	Web	3	1034	0.25
Measurement Analysis	Measurement	11	1030	0.25
Measurement Analysis	Analyze	7	996	0.24
Measurement Analysis	Collect	7	987	0.24
Measurement Analysis	Emergency	9	928	0.23
Measurement Analysis	Software	8	822	0.20
Measurement Analysis	Sharing	7	748	0.18
Measurement Analysis	Alignment	9	675	0.17
Measurement Analysis	Best Practices	14	611	0.15
Measurement Analysis	Performance Review	18	507	0.12
Measurement Analysis	Capabilities	12	498	0.12
Measurement Analysis	Organizational Performance	26	478	0.12
Measurement Analysis	Comparative Data	16	445	0.11
Measurement Analysis	Continuous Improvement	22	421	0.10
Measurement Analysis	Hardware	8	350	0.09
Measurement Analysis	Decision Making	15	167	0.04
Measurement Analysis	Performance Measurement System	30	107	0.03
Measurement Analysis	Voice Of The Customer	21	102	0.03
Measurement Analysis	Social Media	12	52	0.01
Measurement Analysis	High Performing	15	39	0.01
Measurement Analysis	Market Data	11	32	0.01
Measurement Analysis	Future Performance	18	31	0.01
Measurement Analysis	Gather Information	18	27	0.01
Measurement Analysis	Collect Data	12	25	0.01
Measurement Analysis	Reconcile	9	19	0.01
Measurement Analysis	Competitive Performance	23	17	0.00
Measurement Analysis	Use Data	8	14	0.00
Measurement Analysis	Aggregated Data	15	11	0.00
Measurement Analysis	Integrate Data	14	8	0.00

Workforce Focus Keywords & Results

Category	Word	Length	Freq	%
Workforce	Staff	5	4419	1.08
Workforce	Learn	5	3392	0.83
Workforce	Safety	6	2819	0.69
Workforce	Workforce	9	2643	0.65
Workforce	Education	9	2371	0.58
Workforce	Manager	7	1889	0.46
Workforce	Assessment	10	1854	0.45
Workforce	Skill	5	1392	0.34
Workforce	Benefit	7	1005	0.25
Workforce	Recognition	11	912	0.22
Workforce	Accomplish	10	797	0.20
Workforce	Performance Measure	19	712	0.17
Workforce	Recruit	7	660	0.16
Workforce	Competencies	12	604	0.15
Workforce	Retention	9	585	0.14
Workforce	Reward	6	558	0.14
Workforce	Capacity	8	548	0.13
Workforce	Capability	10	519	0.13
Workforce	Compensation	12	423	0.10
Workforce	Hire	4	402	0.10
Workforce	Workplace	9	373	0.09
Workforce	Incentive	9	309	0.08
Workforce	Retain	6	306	0.08
Workforce	Leadership Development	22	226	0.06
Workforce	Succession Planning	19	177	0.04
Workforce	Tuition	7	147	0.04
Workforce	Innovate	8	143	0.04
Workforce	Grievance	9	111	0.03
Workforce	Career Progression	18	111	0.03
Workforce	Reductions	10	99	0.02
Workforce	Organizational Culture	22	91	0.02
Workforce	Certifications	14	90	0.02
Workforce	Workforce Capability	20	85	0.02
Workforce	Cultures	8	79	0.02
Workforce	Diverse Ideas	13	65	0.02
Workforce	Workforce Satisfaction	22	42	0.01
Workforce	Workforce Climate	17	38	0.01
Workforce	Employee Benefits	17	37	0.01
Workforce	Workforce Capacity	18	34	0.01
Workforce	Absenteeism	11	34	0.01
Workforce	Workforce Health	16	25	0.01
Workforce	Workforce Benefits	18	2	0.00

Operations Focus Keywords & Results

Category	Word	Length	Freq	%
Operations	Manage	6	7991	1.96
Operations	Quality	7	4079	1.00
Operations	Design	6	2958	0.72
Operations	Implement	9	2129	0.52
Operations	Feedback	8	2052	0.50
Operations	Success	7	2050	0.50
Operations	Deliver	7	1873	0.46
Operations	Operations	10	1518	0.37
Operations	Test	4	1311	0.32
Operations	Suppliers	9	1209	0.30
Operations	Work Process	12	656	0.16
Operations	Productivity	12	490	0.12
Operations	Error	5	395	0.10
Operations	Inspection	10	387	0.10
Operations	Recovery	8	379	0.09
Operations	Disaster	8	339	0.08
Operations	Cycle Time	10	330	0.08
Operations	Priority	8	315	0.08
Operations	Loss	4	294	0.07
Operations	Accident	8	244	0.06
Operations	Supply Chain	12	243	0.06
Operations	Process Management	18	224	0.06
Operations	Process Design	14	208	0.05
Operations	Root Cause	10	179	0.04
Operations	Defect	6	158	0.04
Operations	Organizational Knowledge	24	153	0.04
Operations	Customer Need	13	147	0.04
Operations	Emergency Preparedness	22	108	0.03
Operations	Rework	6	93	0.02
Operations	Daily Operations	16	92	0.02
Operations	Variability	11	65	0.02
Operations	Warranty	8	56	0.01
Operations	Cost Control	12	54	0.01
Operations	Continuity Of Operations	24	47	0.01
Operations	Product Design	14	32	0.01
Operations	Supplier Feedback	17	12	0.00
Operations	Control Cost	12	11	0.00
Operations	Effective Management	20	10	0.00
Operations	Safety System	13	7	0.00
Operations	Product Improvement	19	6	0.00
Operations	Resource Availability	21	6	0.00
Operations	Product Excellence	18	3	0.00
Operations	Innovation Management	21	2	0.00

Results Keywords & Results

Category	Word	Length	Freq	%
Results	Performance	11	9819	2.40
Results	Measure	7	6058	1.48
Results	Result	6	5986	1.47
Results	Ratio	5	5228	1.28
Results	Market	6	3766	0.92
Results	Level	5	3636	0.89
Results	Community	9	3180	0.78
Results	Share	5	2098	0.51
Results	Achieve	7	1900	0.47
Results	Indicator	9	1529	0.37
Results	Growth	6	1476	0.36
Results	Trend	5	1309	0.32
Results	Budget	6	1205	0.30
Results	Position	8	1192	0.29
Results	Effectiveness	13	1188	0.29
Results	Impact	6	1082	0.27
Results	Profit	6	724	0.18
Results	Responsibility	14	604	0.15
Results	Efficiency	10	466	0.11
Results	Summary	7	463	0.11
Results	Return	6	380	0.09
Results	Ethical Behavior	16	339	0.08
Results	Key Measure	11	336	0.08
Results	Trust	5	282	0.07
Results	Core Competencies	17	282	0.07
Results	Society	7	196	0.05
Results	Strengthen	10	185	0.05
Results	Financial Performance	21	157	0.04
Results	Fulfill	7	155	0.04
Results	Surpass	7	85	0.02
Results	New Market	10	60	0.02
Results	Process Effectiveness	21	60	0.02
Results	Productive	10	57	0.01
Results	Viability	9	51	0.01
Results	Market Results	14	49	0.01
Results	Financial Results	17	48	0.01
Results	Legal Compliance	16	41	0.01
Results	Product Performance	19	15	0.00
Results	Leadership Results	18	5	0.00
Results	Customer Results	16	5	0.00
Results	Workforce Results	17	5	0.00
Results	Governance Results	18	2	0.00

APPENDIX C: FOCUS AREAS FOR COMPANIES BASED ON RQ #1

The following are the focus areas recommended for companies that are interested in prioritizing the Malcolm Baldrige Criteria actions based on the results of Research Question #1. The content analysis results demonstrated that the award-winners have certain elements in common. The Malcolm Baldrige Criteria for Performance Excellence is used as the basis from which the award winners are selected, and include organizational elements associated with the organizational profile, leadership, strategic planning, customer focus, measurement and knowledge management, workforce focus, operations focus and results.

According to these results, the Malcolm Baldrige award winners have common input factors that lead to award selection. The following recommendations represent a sub-set of the Criteria for Performance Excellence which represents the most prominent elements that emerged as a result of this analysis.

I. Organizational:

a. Requirements - Understand the regulatory environment under which you operate. Define the applicable occupational health and safety regulations, accreditations, certifications, registration requirements, industry standards, and environmental, financial, and product regulations that apply to your company.

b. Systems and Processes – Outline the key elements of your performance improvement system, including your processes for evaluation and improvement of key organizational projects and processes.

c. Products - Define your main product offerings, and outline the relative importance of each to your success. Understand the mechanisms needed to deliver your products.

II. Leadership:

a. Performance - Evaluate the performance of your senior leaders, including the chief executive. Use these performance evaluations in determining compensation. Evaluate your governance board members' performance. Use these performance evaluations to advance the development and improve the effectiveness of leaders.

b. Action - Create a focus on action that will achieve the organization's objectives, improve its performance, enable innovation and intelligent risk taking, and attain its vision. Senior leaders should help identify needed actions, set expectations for organizational performance, and focus on creating and balancing value for customers and stakeholders.

- c. Development - Participate in succession planning and the development of future organizational leaders.
- d. Improvement - Create an environment for the achievement of your mission, improvement of organizational performance, performance leadership, and organizational and personal learning.

III. Strategic Planning:

- a. Planning - Conduct your strategic planning. Identify key process steps and key participants. Define your short- and longer-term planning horizons, and understand how your strategic planning process addresses these planning horizons. Address the need for organizational agility and operational flexibility through your strategic planning process.
- b. Goals – Identify your most important goals for your strategic objectives. Identify what key changes, if any, are planned in your products, your customers and markets, your suppliers and partners, and your operations.
- c. Objectives - Outline your organization's key strategic objectives and your timetable for achieving them.
- d. Abilities - Strategic challenges and advantages should relate to technology, products, finances, your operations, your parent organization's capabilities, your customers and markets, your industry, globalization, climate change, your value chain, and people.

IV. Customers:

a. Service – Determine customer and market requirements for product offerings and service. Identify and adapt product offerings to meet the requirements and exceed the expectations of your customer groups and market segments. Identify and adapt product offerings to enter new markets, to attract new customers, and to create opportunities to expand relationships with current customers, as appropriate.

b. Satisfaction - Determine customer satisfaction and engagement. These determination methods should differ among your customer groups and market segments, as appropriate. Measurements should capture actionable information to use in exceeding your customers' expectations and securing your customers' engagement for the long term.

c. Supporting Customers - Enable customers to seek information and support. Enable them to conduct business with you and give feedback on your products. Identify key means of customer support, including your key communication mechanisms, which should vary for different customers, customer groups, or market segments. Determine your customers' key support requirements, and ensure that these requirements are deployed to all people and processes involved in customer support.

V. Measurement & Knowledge Management:

a. Data - Select and ensure the effective use of key comparative data and information to support operational and strategic decision making and innovation.

b. Reviews - Review organizational performance and capabilities, and use your key organizational performance measures in these reviews. Perform analyses to support these

reviews and ensure that conclusions are valid. Use these reviews to assess organizational success, competitive performance, financial health, and progress on achieving your strategic objectives and action plans. Respond rapidly to changing organizational needs and challenges in your operating environment based on these reviews. Have the governance board review the organization's performance and its progress on strategic objectives and action plans, if appropriate.

- c. Information - Manage your organizational data and information to ensure their accuracy, their integrity and reliability, their timeliness, and their security and confidentiality.
- d. Measures - Ensure that your performance measurement system can respond to rapid or unexpected organizational or external changes.

VI. Workforce:

- a. Staff - Recruit, hire, place, and retain new workforce members. Ensure that your workforce represents the diverse ideas, cultures, and thinking of your hiring and customer community.
- b. Learning - Evaluate the effectiveness and efficiency of your learning and development system.
- c. Education - Prepare your workforce for changing capability and capacity needs, and understand how these needs, including staffing levels, have changed over time.
- d. Safety - Address workplace environmental factors to ensure and improve workforce health and security and workplace accessibility. Have performance measures and improvement

goals for each of these workforce factors. For your different workplace environments, understand the significant differences in these factors and their performance measures or targets.

e. Assessments and Skills - Assess your workforce capability and capacity needs, including the skills, competencies, certifications, and staffing levels you need.

VII. Operations:

a. Managing operations – Ensure day-to-day operation of work processes meets key process requirements. Use key performance measures or indicators and in-process measures to control and improve your work processes. Understand how these measures relate to end-product quality and performance.

b. Quality - Improve your work processes to improve products and performance and reduce variability.

c. Design - Design your products and work processes to meet all key requirements.

Incorporate new technology, organizational knowledge, product excellence, and the potential need for agility into these products and processes.

VIII. Results:

a. Performance – Implement performance and improvement in all key areas—product and process results, customer-focused results, workforce-focused results, leadership and governance results, and financial and market results. Understand performance levels relative to those of competitors and other organizations with similar product offerings.

b. Measurement - Report performance levels on a meaningful measurement scale.

c. Ratios – Understand your current levels and trends in key measures or indicators of financial performance, including aggregate measures of financial return, financial viability, and budgetary performance, as appropriate.

d. Results – Understand your current levels and trends in key measures or indicators of the performance of products and processes that are important to and directly serve your customers. Know how these results compare with the performance of your competitors and other organizations with similar offerings.

APPENDIX D: AWARD-WINNER BETA AND RETURN RESULTS FOR RQ #2

The following pages outline the Return and Beta results for the 15 companies analyzed in Research Question #2. These award-winning companies include Boeing (BA), Caterpillar (CAT), Eastman Chemical (EMN), Federal Express (FDX), Corning (GLW), Honeywell (HON), International Business Machines (IBM), Lockheed Martin (LMT), Marriott (parent company for Ritz-Carlton, MAR), 3M (MMM), Motorola (MSI), Raytheon (RTN), Verizon (VZ), Wabtec (acquired Westinghouse, WAB) and Xerox (XRX).

	2012			2011	
<i>Year</i>	Return	Beta	<i>Year</i>	Return	Beta
BA	3.98%	0.91	BA	13.18%	1.26
CAT	-2.05%	1.67	CAT	-1.96%	1.52
EMN	72.69%	2.05	EMN	-6.23%	1.46
FDX	8.37%	0.96	FDX	-9.83%	1.19
GLW	-0.65%	1.44	GLW	-31.44%	1.18
HON	17.22%	1.19	HON	2.86%	1.33
IBM	4.55%	0.80	IBM	26.79%	0.74
LMT	17.89%	0.79	LMT	20.78%	0.50
MAR	25.89%	1.30	MAR	-25.39%	1.27
MMM	14.20%	0.89	MMM	-3.39%	0.91
MSI	21.72%	0.76	MSI	117.05%	0.84
RTN	22.92%	0.86	RTN	8.87%	0.71
VZ	14.31%	0.40	VZ	16.09%	0.50
WAB	26.67%	1.22	WAB	31.82%	1.44
XRX	-14.94%	1.41	XRX	-30.66%	1.29

	2010			2009	
<i>Year</i>	Return	Beta	<i>Year</i>	Return	Beta
BA	19.09%	1.34	BA	24.28%	1.21
CAT	64.02%	1.52	CAT	26.84%	1.63
EMN	39.93%	1.40	EMN	91.24%	1.53
FDX	12.08%	1.17	FDX	30.54%	1.47
GLW	-0.06%	1.36	GLW	94.87%	1.46
HON	35.50%	1.34	HON	17.20%	1.36
IBM	12.93%	0.68	IBM	52.82%	0.54
LMT	-5.71%	0.60	LMT	-9.18%	0.51
MAR	51.27%	1.51	MAR	38.08%	1.65
MMM	6.62%	0.82	MMM	44.39%	0.96
MSI	13.81%	1.02	MSI	66.10%	1.11
RTN	-9.21%	0.83	RTN	1.82%	0.55
VZ	21.97%	0.46	VZ	1.54%	0.39
WAB	26.90%	1.37	WAB	2.58%	1.30
XRX	35.77%	1.43	XRX	3.46%	1.66

	2008			2007	
<i>Year</i>	Return	Beta	<i>Year</i>	Return	Beta
BA	-49.58%	0.86	BA	-0.47%	0.77
CAT	-35.08%	1.06	CAT	20.81%	1.20
EMN	-45.83%	1.33	EMN	4.59%	1.09
FDX	-25.14%	0.83	FDX	-18.47%	0.91
GLW	-58.76%	1.09	GLW	27.84%	1.35
HON	-43.80%	0.87	HON	39.05%	0.89
IBM	-18.20%	0.79	IBM	12.69%	0.77
LMT	-18.63%	0.62	LMT	16.14%	0.44
MAR	-40.28%	1.32	MAR	-27.32%	1.47
MMM	-28.47%	0.63	MMM	10.28%	0.77
MSI	-71.04%	1.48	MSI	-20.47%	0.95
RTN	-13.19%	0.49	RTN	18.55%	0.57
VZ	-17.16%	0.87	VZ	20.34%	0.86
WAB	18.45%	1.14	WAB	15.04%	1.65
XRX	-48.82%	1.23	XRX	-3.96%	0.94

	2006			2005	
<i>Year</i>	Return	Beta	<i>Year</i>	Return	Beta
BA	28.04%	1.15	BA	40.09%	0.77
CAT	7.80%	1.59	CAT	23.78%	1.90
EMN	17.27%	1.07	EMN	-6.96%	1.78
FDX	5.47%	1.36	FDX	6.51%	1.22
GLW	-6.72%	2.10	GLW	67.94%	1.60
HON	23.42%	1.20	HON	7.90%	1.18
IBM	19.98%	0.72	IBM	-15.12%	0.78
LMT	47.18%	0.67	LMT	19.39%	0.55
MAR	42.28%	1.29	MAR	7.73%	1.08
MMM	0.88%	0.72	MMM	-3.89%	0.79
MSI	-9.74%	1.34	MSI	34.31%	1.45
RTN	34.68%	0.81	RTN	7.95%	0.78
VZ	33.44%	0.88	VZ	-22.13%	0.66
WAB	12.42%	2.04	WAB	29.15%	1.89
XRX	13.69%	0.93	XRX	-13.69%	0.83

	2004			2003	
<i>Year</i>	Return	Beta	<i>Year</i>	Return	Beta
BA	25.33%	1.06	BA	27.01%	1.50
CAT	20.27%	1.56	CAT	78.20%	1.33
EMN	51.43%	1.15	EMN	10.36%	1.10
FDX	45.55%	1.04	FDX	21.90%	1.06
GLW	14.53%	2.45	GLW	177.74%	1.99
HON	8.55%	1.24	HON	37.70%	1.71
IBM	8.51%	0.81	IBM	15.90%	1.07
LMT	11.51%	0.65	LMT	-11.58%	0.90
MAR	37.36%	1.14	MAR	36.77%	0.97
MMM	0.22%	0.82	MMM	36.79%	0.53
MSI	34.67%	1.89	MSI	56.52%	1.06
RTN	33.06%	0.84	RTN	-2.32%	0.83
VZ	19.75%	0.65	VZ	-9.00%	1.11
WAB	25.69%	1.37	WAB	20.89%	1.00
XRX	25.10%	0.94	XRX	69.03%	1.75

	2002	
<i>Year</i>	Return	Beta
BA	-11.85%	0.69
CAT	-8.73%	1.10
EMN	-1.75%	0.98
FDX	6.84%	0.75
GLW	-63.96%	1.75
HON	-26.39%	1.39
IBM	-35.74%	1.26
LMT	25.82%	0.47
MAR	-17.19%	0.91
MMM	7.39%	0.80
MSI	-43.10%	1.17
RTN	-2.28%	1.09
VZ	-16.97%	1.00
WAB	14.64%	0.49
XRX	-22.74%	1.60

APPENDIX E: AWARD-WINNINER FINANCIAL TABLES FOR RQ #3

The following pages outline the specific financial results of the years 2002 – 2012 for the 15 award-winning companies that were used for Research Question #3. These award-winning companies include Boeing (BA), Caterpillar (CAT), Eastman Chemical (EMN), Federal Express (FDX), Corning (GLW), Honeywell (HON), International Business Machines (IBM), Lockheed Martin (LMT), Marriott (parent company for Ritz-Carlton, MAR), 3M (MMM), Motorola (MSI), Raytheon (RTN), Verizon (VZ), Wabtec (acquired Westinghouse, WAB) and Xerox (XRX).

The ratios that were analyzed include (in alphabetical order): Accounts Payable Turnover, Accrued Expenses Turnover, Book Value per Share, Calculated Tax Rate %, Cash & Equivalents Turnover, Cash Flow per Share, Current Ratio, EBITDA Margin %, Interest Coverage, Inventory Turnover, LT Debt to Equity, Net Current Assets % TA, Property Plant & Equip Turnover, Quick Ratio, Receivables Turnover, Revenue per Employee, ROA % (Net), ROE % (Net), ROI % (Operating), Total Asset Turnover, and Total Debt to Equity.

Boeing (BA)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	9.15	8.53	8.68	8.01	6.26	6.99	7.84	7.05	5.94	6.09	6.06
Accrued Expenses Turnover	5.01	4.67	4.72	7.48	10.66	11.01	8.35	8	10.33	9.97	11.85
Book Value per Share	7.76	4.72	3.76	2.82	-1.78	11.72	6.01	13.82	13.56	9.67	9.16
Calculated Tax Rate %	35.57	27.02	28.21	26.72	35.72	34.74	32.41	9.41	7.49	-32.18	26.03
Cash & Equivalents Turnover	7.99	8.92	8.82	10.94	11.78	10.09	10.67	12.73	13.35	14.49	36.46
Cash Flow per Share	9.88	5.39	4	7.9	-0.55	12.62	9.73	8.88	4.27	4.82	5.44
Current Ratio	1.27	1.21	1.15	1.07	0.84	0.86	0.77	0.78	0.72	0.94	0.85
EBITDA Margin %	9	10.09	9.44	4.53	8.43	10.93	7.23	7.51	6.35	3.92	9.65
Interest Coverage	13.04	11.13	9.1	5.52	18.34	28.59	12.89	7.5	5.65	1.16	5.41
Inventory Turnover	1.96	1.98	2.51	3.47	4	6.05	6.29	7.58	9.39	7.69	6.94
LT Debt to Equity	1.53	2.85	4.15	5.74	Equity<0	0.83	1.72	0.86	0.96	1.63	1.64
Net Current Assets % TA	13.87	10.67	7.55	3.85	-9.22	-7.22	-12.97	-10.36	-10.63	-2.24	-5.65
Property Plant & Equip Turnover	8.59	7.54	7.26	7.78	7.13	8.33	7.65	6.5	6.2	5.87	6.28
Quick Ratio	0.43	0.42	0.46	0.53	0.3	0.49	0.41	0.41	0.42	0.54	0.44
Receivables Turnover	13.31	11.48	10.84	11.21	10.04	11.33	10.92	10.08	9.83	8.65	8.65
Revenue per Employee	467172	400320	400660	434634	374492	416742	399545	358464	329017	321561	327691
ROA % (Net)	4.61	5.41	5.06	2.27	4.73	7.36	3.96	4.51	3.49	1.36	0.98
ROE % (Net)	82.91	127.94	135.15	314.63	69.12	59.29	28.04	23.02	19.22	9.07	5.31
ROI % (Operating)	37.45	35.67	31.07	17.59	31.53	35.58	17.16	9.74	8.2	1.85	17.49
Total Asset Turnover	0.96	0.93	0.98	1.18	1.08	1.2	1.1	0.96	0.98	0.96	1.07
Total Debt to Equity	1.77	3.52	4.49	6.07	Equity<0	0.91	2.01	0.97	1.08	1.77	1.87

Caterpillar (CAT)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	8.81	8.58	9.63	8.29	10.72	10.21	10.99	9.74	8.51	8.48	9.18
Accrued Expenses Turnover	11.26	11.01	9.22	6.46	10.09	9.82	8.48	7.96	7.78	6.72	6.91
Book Value per Share	26.76	19.9	16.94	13.99	10.12	14.24	10.62	12.57	10.89	8.84	7.95
Calculated Tax Rate %	30.69	25.58	25.81	-47.45	21.31	29.98	28.9	28.71	27	26.95	28.01
Cash & Equivalents Turnover	15.37	18.09	10.07	8.52	26.53	54.43	50.69	46.8	76.67	69.93	56.85
Cash Flow per Share	8.01	10.87	7.93	10.31	7.82	12.43	8.8	4.59	-5.81	2.99	3.44
Current Ratio	1.43	1.33	1.44	1.39	1.21	1.15	1.2	1.19	1.29	1.33	1.29
EBITDA Margin %	18.1	16.89	16.93	13.14	15.21	18.01	18.58	17.54	16.05	15.55	15.55
Interest Coverage	7.41	6.53	3.88	1.13	3.93	4.26	4.58	4.43	4.34	3.01	2.3
Inventory Turnover	3.13	3.61	3.81	3.16	4.81	4.81	5.11	5.37	5.81	5.83	5.17
LT Debt to Equity	1.58	1.94	1.89	2.5	3.75	2.01	2.58	1.86	2.12	2.32	2.12
Net Current Assets % TA	14.29	11.75	15.29	12.49	8.21	5.76	7.55	7.86	10.78	11.44	10
Property Plant & Equip Turnover	4.26	4.47	3.42	2.6	4.55	4.77	4.93	4.64	4.03	3.18	2.95
Quick Ratio	0.82	0.74	0.93	0.97	0.8	0.76	0.8	0.79	0.9	0.92	0.87
Receivables Turnover	3.56	3.46	2.77	2.02	3.02	2.93	2.87	2.59	2.38	2.18	2.24
Revenue per Employee	524130	480723	407580	345325	453407	443666	438901	426935	392204	329093	292100
ROA % (Net)	6.63	6.78	4.35	1.4	5.73	6.62	7.22	6.33	5.1	3.17	2.51
ROE % (Net)	37.25	41.57	27.6	12.07	47.39	44.99	46.26	35.9	29.97	19.03	14.4
ROI % (Operating)	17.77	18.4	12.25	3.96	14.15	16.94	17.4	13.97	11.41	8.8	8.11
Total Asset Turnover	0.77	0.83	0.69	0.51	0.83	0.84	0.85	0.81	0.76	0.66	0.63
Total Debt to Equity	2.29	2.69	2.63	3.62	5.84	3.2	3.98	3.05	3.15	3.26	3.23

Eastman Chemical Company (EMN)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	12.91	13.07	11.66	12.21	13.72	11.62	13.12	13.34	12.94	11.28	11.01
Accrued Expenses Turnover	31.2	32.41	27.75	25.88	33.12	32.45	33.11	29.05	26.51	21.56	18.67
Book Value per Share	19.12	13.66	11.51	10.45	10.72	13.07	12.15	9.89	7.47	6.75	8.22
Calculated Tax Rate %	31.74	31.85	33.18	39.82	23.54	31.7	28.99	37.05	-165.63	EBT<0	5.95
Cash & Equivalents Turnover	15.75	11.1	8.93	8.55	10.52	7.48	10.18	16.63	14.86	18.27	74.41
Cash Flow per Share	7.73	4.47	3.99	5.23	4.33	4.42	3.71	4.76	3.17	1.58	5.19
Current Ratio	1.9	2.07	1.91	2.17	1.71	2.04	2.29	1.83	1.61	1.36	1.25
EBITDA Margin %	13.59	18.12	16.66	11.21	11.23	12.37	12.75	14.12	7.31	1.33	10.6
Interest Coverage	5.59	13.43	8.71	4.06	7.41	8.13	8	7.57	1.52	-	1.7
Inventory Turnover	6.22	7.92	7.6	6.84	9.52	9.24	9.12	9.03	8.75	7.07	6.62
LT Debt to Equity	1.62	0.77	0.98	1.06	0.93	0.74	0.78	1.01	1.74	2	1.62
Net Current Assets % TA	10.59	19.21	16.32	16.95	11.19	19.49	22.08	15.12	11.39	8.56	4.86
Property Plant & Equip Turnover	2.22	2.27	1.85	1.6	2.22	2.31	2.39	2.22	1.99	1.62	1.44
Quick Ratio	0.91	1.32	1.11	1.46	0.88	1.37	1.59	1.12	1	0.85	0.6
Receivables Turnover	9.5	10.4	11.07	13.77	13.26	9.67	10.57	9.84	8.87	8.53	8.09
Revenue per Employee	598508	717800	584200	504700	638821	632407	677273	588250	546835	386667	338854
ROA % (Net)	4.9	11.44	7.62	2.52	6.11	4.93	6.85	9.57	2.8	-4.32	0.99
ROE % (Net)	18.11	39.81	27.9	8.87	18.99	14.59	22.47	39.84	15.23	-23.34	4.61
ROI % (Operating)	14.25	30.48	27.16	10.35	15.46	13.79	18.66	23.35	5.07	-7.67	6.03
Total Asset Turnover	0.91	1.18	1.02	0.93	1.19	1.12	1.25	1.21	1.08	0.93	0.86
Total Debt to Equity	1.63	0.85	0.99	1.06	0.94	0.77	0.78	1.01	1.74	2.49	1.62

Federal Express (FDX)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	25.36	25.68	24.38	24	19.9	17.98	17.95	17.71	17.51	17.71	19.55
Accrued Expenses Turnover	12.72	13.08	13.05	12.96	13.73	13.9	12.83	12.09	11.76	11.66	12.28
Book Value per Share	54.71	46.46	48.01	43.98	43.67	46.71	41.09	37.62	31.75	26.79	24.41
Calculated Tax Rate %	36.42	35.31	35.89	37.49	85.52	44.2	37.29	37.7	37.35	36.47	37.97
Cash & Equivalents Turnover	11.41	16.46	18.37	16.37	18.53	24.36	20.09	21.7	28.17	31.11	51.75
Cash Flow per Share	14.88	15.31	12.83	10.06	8.85	11.24	11.61	12.09	10.36	10.07	6.28
Current Ratio	1.96	1.69	1.7	1.57	1.57	1.35	1.22	1.18	1.11	1.05	1.18
EBITDA Margin %	10.87	12.37	10.79	11.13	7.14	10.2	14.11	14.01	13.25	11.37	12.48
Interest Coverage	41.82	81.69	30.88	28.14	12.66	38.43	61.81	28.98	17.78	12.41	12.47
Inventory Turnover	36.67	35.94	34.54	31.5	31.6	35.06	36.23	38.26	37.06	30.73	28
LT Debt to Equity	0.16	0.08	0.11	0.12	0.14	0.1	0.16	0.14	0.25	0.35	0.23
Net Current Assets % TA	16.46	12.31	12.43	10.6	10.69	7.32	5	4.37	2.62	1.24	3.94
Property Plant & Equip Turnover	2.48	2.6	2.63	2.5	2.64	2.9	3.01	3.16	3.14	2.78	2.65
Quick Ratio	1.73	1.4	1.41	1.31	1.25	1.1	1.01	0.99	0.91	0.86	0.95
Receivables Turnover	9.09	9.17	8.99	9.2	9.16	9.12	9.44	9.48	9.29	8.72	8.79
Revenue per Employee	275588	285660	274853	246340	253550	138288	246252	233338	136042	103258	167813
ROA % (Net)	4.92	7.07	5.55	4.82	0.39	4.52	8.64	8.38	7.33	4.84	5.69
ROE % (Net)	9.72	13.53	10	8.63	0.7	8.25	16.68	17.12	16.44	10.91	12
ROI % (Operating)	13.87	19.08	14.57	12.51	4.56	13	22.4	22.89	20.59	13.72	16.66
Total Asset Turnover	1.4	1.49	1.5	1.41	1.42	1.53	1.51	1.5	1.49	1.43	1.54
Total Debt to Equity	0.17	0.11	0.11	0.14	0.19	0.14	0.21	0.21	0.29	0.45	0.28

Corning (GLW)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	9.1	8.89	9.84	7.73	8.15	9.45	7.83	6.67	7.57	9.2	8.11
Accrued Expenses Turnover	7.28	7.18	6.84	6.57	4.81	3.76	3.7	3.63	3.42	2.8	2.86
Book Value per Share	14.62	13.91	12.41	10.01	8.68	6.06	4.63	3.65	2.71	4.07	3.92
Calculated Tax Rate %	29.88	23.46	15.23	-14.83	-157.91	6.2	5.72	101.05	EBT<0	EBT<0	EBT<0
Cash & Equivalents Turnover	1.66	1.7	1.86	2.44	2.9	3.47	4.14	3.9	4.17	2.68	2.52
Cash Flow per Share	2.14	2.04	2.46	1.34	1.36	1.33	1.16	1.32	0.73	0.1	-0.31
Current Ratio	4.96	4.14	4.46	3.59	2.25	2.11	2.07	1.74	1.4	1.73	2.28
EBITDA Margin %	29.91	35.06	42.78	25.1	36.85	25.23	29.18	24.87	-31.61	-3.88	-60.71
Interest Coverage	13.62	24.2	18.38	6.21	-	-	-	11.15	-	-	-
Inventory Turnover	4.56	5.05	5.44	4.8	4.49	4.9	4.78	4.7	4.87	4.37	3.99
LT Debt to Equity	0.16	0.11	0.12	0.12	0.11	0.16	0.23	0.32	0.58	0.49	0.84
Net Current Assets % TA	26.35	23.63	26.61	18.7	13.33	18.28	18.97	14.71	9.73	10.61	18.57
Property Plant & Equip Turnover	0.75	0.8	0.78	0.67	0.84	1.05	1.05	1.06	1.02	0.84	0.72
Quick Ratio	3.81	3.29	3.69	2.82	1.62	1.74	1.69	1.38	1.06	1.23	1.74
Receivables Turnover	6.7	7.68	7.68	8.53	8.67	7.32	7.53	7.54	6.26	4.2	4.45
Revenue per Employee	278401	273958	253130	229574	219694	209286	211184	176115	155606	150000	136379
ROA % (Net)	6.02	10.45	15.1	9.9	30.42	15.21	15.31	5.6	-21.1	-2	-10.7
ROE % (Net)	8.1	13.87	20.38	13.85	45.71	25.68	28.86	12.41	-46.53	-4.39	-25.77
ROI % (Operating)	5.44	7.5	9.18	2.4	11.62	10.81	10.33	8.8	-19.6	-7.64	-28.32
Total Asset Turnover	0.28	0.29	0.28	0.27	0.34	0.41	0.43	0.44	0.38	0.28	0.26
Total Debt to Equity	0.16	0.11	0.12	0.13	0.12	0.16	0.24	0.32	0.71	0.52	0.89

Honeywell (HON)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	7.93	8.04	8.37	8.35	9.43	9.25	9.8	10.15	10.63	11.13	11.8
Accrued Expenses Turnover	5.34	5.47	5.28	5.08	6.21	6.18	5.8	5.35	5.48	5.35	5.49
Book Value per Share	16.77	13.95	13.62	11.57	9.78	12.35	12.14	13.57	13.24	12.44	10.44
Calculated Tax Rate %	24.65	18.69	28.71	26.73	26.99	26.49	25.85	33.74	24.81	18.4	EBT<0
Cash & Equivalents Turnover	9.02	11.51	12.24	12.7	18.72	22.66	25.52	11.47	7.81	9.3	13.05
Cash Flow per Share	4.48	3.63	5.43	5.24	5.13	5.12	3.91	2.88	2.62	2.55	2.9
Current Ratio	1.35	1.31	1.28	1.25	1.08	1.15	1.21	1.15	1.47	1.7	1.55
EBITDA Margin %	12.7	8.89	11.64	13.22	13.11	12.61	11.84	11	9.3	10.52	-0.14
Interest Coverage	14.18	8.09	9.06	7.94	9.97	9.93	10.93	9.27	7.87	8.49	-
Inventory Turnover	6.66	6.95	6.89	6.36	7.26	7.06	6.9	6.54	6.75	6.19	5.58
LT Debt to Equity	0.49	0.64	0.54	0.71	0.82	0.59	0.4	0.27	0.36	0.46	0.53
Net Current Assets % TA	10.88	9.69	8.71	7.75	2.74	5.16	7.01	4.74	13.14	16.15	13.14
Property Plant & Equip Turnover	7.66	7.58	6.89	6.32	7.35	7.07	6.64	6.15	5.92	5.53	4.96
Quick Ratio	0.92	0.89	0.83	0.81	0.67	0.69	0.69	0.6	0.89	0.97	0.8
Receivables Turnover	5.13	5.11	5	4.98	5.83	5.7	5.83	5.97	6.48	6.69	6.47
Revenue per Employee	284561	276735	256692	253344	284813	283516	265822	238388	234230	213917	206241
ROA % (Net)	7.15	5.32	5.48	6.02	8.04	7.55	6.59	5.22	4.23	4.65	-0.85
ROE % (Net)	24.39	19.25	20.73	26.86	33.94	25.81	19.86	14.71	11.62	13.47	-2.43
ROI % (Operating)	21.26	14.43	18.57	21.13	21.7	23.52	19.66	14.89	9.73	12.83	-3.68
Total Asset Turnover	0.92	0.94	0.9	0.86	1.05	1.07	0.99	0.87	0.85	0.81	0.86
Total Debt to Equity	0.57	0.7	0.62	0.86	1.17	0.83	0.52	0.45	0.47	0.48	0.57

International Business Machines (IBM)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	12.66	13.1	13.11	13.25	13.72	12.33	11.94	10.85	10.73	11.08	11.06
Accrued Expenses Turnover	21.17	21.12	20.95	20.98	22.3	21.38	23.09	25.57	25.69	24.11	21.59
Book Value per Share	16.88	17.31	18.77	17.34	10.06	20.55	18.92	21.03	18.08	16.44	13.23
Calculated Tax Rate %	24.19	24.51	24.79	25.98	26.21	28.1	29.29	34.61	29.76	29.99	29.11
Cash & Equivalents Turnover	9.33	9.47	8.74	7.68	7.45	8.59	8.88	8.06	11.07	14.07	13.86
Cash Flow per Share	17.1	16.58	15.41	15.65	13.8	11.31	9.81	9.32	9.17	8.46	8.1
Current Ratio	1.13	1.21	1.19	1.36	1.15	1.2	1.11	1.3	1.18	1.19	1.21
EBITDA Margin %	25.77	24.41	24.86	24.48	21.71	19.98	19.73	19.01	17.55	17.47	14.84
Interest Coverage	58.41	73.77	65.76	55.23	48.3	293.85	-	-	-	-	46.87
Inventory Turnover	22.21	22.51	21.79	20.01	21.61	20.85	18.8	17.74	19.26	18.43	13.66
LT Debt to Equity	1.28	1.14	0.95	0.97	1.69	0.81	0.48	0.47	0.5	0.61	0.88
Net Current Assets % TA	4.87	7.56	6.66	11.86	6	7.36	4.43	9.94	6.57	6.8	7.36
Property Plant & Equip Turnover	7.48	7.64	7.07	6.73	7.03	6.69	6.48	6.3	6.43	6.12	5.25
Quick Ratio	0.96	0.98	0.98	1.13	0.95	1.01	0.94	1.08	0.97	0.96	0.96
Receivables Turnover	3.47	3.7	3.63	3.52	3.67	3.55	3.57	3.47	3.37	3.17	2.99
Revenue per Employee	240006	246713	234024	218737	235909	231366	231718	248766	260048	250962	242042
ROA % (Net)	14.05	13.79	13.33	12.29	10.7	9.32	9.08	7.38	7.87	7.55	3.87
ROE % (Net)	84.92	73.43	64.94	74.37	58.66	36.57	30.82	25.25	29.19	29.95	15.43
ROI % (Operating)	39.36	39.34	36.15	35.39	28.6	23.52	22.31	17.3	21.01	20.12	13.65
Total Asset Turnover	0.88	0.93	0.9	0.88	0.9	0.88	0.87	0.85	0.9	0.89	0.88
Total Debt to Equity	1.76	1.56	1.24	1.15	2.52	1.24	0.8	0.68	0.77	0.85	1.14

Lockheed Martin Corporation (LMT)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	21.85	23.87	25.05	22.26	20.33	19.1	18.78	19.99	22.42	25.1	21.09
Accrued Expenses Turnover	28.41	26.32	26.04	27.12	26.4	26.77	25.9	26.38	25.64	23.66	22.41
Book Value per Share	0.12	3.12	10.72	11.07	7.29	23.97	16.35	18.21	16.03	15.13	12.87
Calculated Tax Rate %	32.59	26.55	30.87	31.48	33.65	32.05	30.7	31.54	24.92	33.61	9.09
Cash & Equivalents Turnover	17.17	15.92	19.69	19.82	17.7	18.36	19.07	22.53	34.23	16.98	14.56
Cash Flow per Share	4.81	12.66	9.74	8.25	11.03	10.19	8.84	7.25	6.58	4.05	5.14
Current Ratio	1.14	1.16	1.15	1.17	1.01	1.11	1.06	1.12	1.05	1.06	1.08
EBITDA Margin %	11.54	10.74	9.15	9.49	11.61	10.69	9.56	7.75	5.81	7.69	4.3
Interest Coverage	11.58	11.24	15.12	24.54	11.96	28.47	24.4	13.15	6.51	4.9	2.17
Inventory Turnover	15.87	17.61	18.4	20.06	21.04	22.3	20.23	18.32	15.93	12.98	9.14
LT Debt to Equity	157.9	6.45	1.35	1.22	1.24	0.44	0.64	0.61	0.73	0.9	1.06
Net Current Assets % TA	4.4	5.18	4.83	5.05	0.42	3.7	2.16	3.97	1.51	1.94	3.13
Property Plant & Equip Turnover	10.13	10.15	10.1	10.03	9.68	10	9.93	9.89	10	9.43	8.51
Quick Ratio	0.7	0.8	0.76	0.79	0.71	0.8	0.72	0.77	0.65	0.59	0.65
Receivables Turnover	7.45	7.87	7.75	7.96	8.34	8.79	8.64	8.58	8.71	8.27	6.9
Revenue per Employee	392109	378041	346992	322779	291878	299014	283000	275652	272530	244800	212624
ROA % (Net)	7.15	7.28	8.34	8.82	10.29	10.61	9.04	6.85	4.88	4.06	1.87
ROE % (Net)	526.44	112.76	74.67	86.47	50.64	36.35	34.29	24.52	18.33	16.69	8.12
ROI % (Operating)	64.05	49.17	45.76	56.35	49.01	35.46	32.7	23.89	16.6	15.29	8.45
Total Asset Turnover	1.23	1.27	1.31	1.32	1.37	1.46	1.42	1.4	1.37	1.23	1
Total Debt to Equity	161.74	6.45	1.35	1.22	1.33	0.45	0.64	0.63	0.73	0.92	1.29

Marriott (MAR)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	21.21	20.9	19.6	17.28	16.97	18	19.53	19.95	17.55	16.24	13.55
Accrued Expenses Turnover	16.98	18.41	19.36	18.99	19.88	20.73	20.77	21.71	22.01	23.03	22.72
Book Value per Share	-4.13	-2.35	4.32	3.19	3.95	4	6.72	7.9	9.04	8.3	7.57
Calculated Tax Rate %	32.25	42.82	16.34	EBT<0	51.55	39.3	28.77	13.8	14.37	-8.69	6.79
Cash & Equivalents Turnover	124.7	40.69	37.82	87.86	54.38	49.62	61.58	23.81	20.27	42.34	16.36
Cash Flow per Share	3.07	3.12	3.18	2.44	1.79	2.07	2.41	1.94	1.97	0.91	1.06
Current Ratio	0.53	0.52	1.35	1.25	1.33	1.24	1.31	1.01	0.83	0.7	0.79
EBITDA Margin %	9.1	5.24	7.42	-0.99	7.44	11.01	10.1	7.48	7.74	6.75	7.37
Interest Coverage	7.83	3.51	4.32	-	6.33	8.14	12.8	20.56	-	-	-
Inventory Turnover	974.19	14.72	6.97	6.01	6.36	7.98	-	-	-	-	-
LT Debt to Equity	Equity<0	Equity<0	1.7	1.96	2.16	1.95	0.69	0.52	0.2	0.36	0.43
Net Current Assets % TA	-20.47	-20.88	9.81	7.11	9.38	7.78	9.22	0.21	-4.73	-6.54	-5.58
Property Plant & Equip Turnover	8.75	9.98	8.78	7.8	9.14	10.15	6.81	4.9	4.13	3.54	3.01
Quick Ratio	0.4	0.38	0.57	0.41	0.4	0.51	0.52	0.52	0.66	0.52	0.32
Receivables Turnover	12.45	13.62	13.2	12.6	12.39	11.5	12.48	14.18	13.54	14.78	14.63
Revenue per Employee	93279	102924	90877	79839	86786	86263	80966	80991	76141	70615	57670
ROA % (Net)	9.35	2.67	5.43	-4.12	3.99	7.96	7.12	7.8	7.1	6.11	3.13
ROE % (Net)	AvgEqty<0	49.39	33.68	-27.51	25.36	34.49	20.77	18.3	15.09	13.58	7.73
ROI % (Operating)	62.01	18.18	17.75	-3.85	17.42	26.94	21.48	10.71	8.94	7.09	9.67
Total Asset Turnover	1.93	1.66	1.39	1.3	1.42	1.49	1.42	1.35	1.2	1.1	0.95
Total Debt to Equity	Equity<0	Equity<0	1.78	2.01	2.24	2.07	0.7	0.53	0.32	0.38	0.5

The 3M Company (MMM)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	13.44	13.78	13.15	12.68	13.65	12.48	12.5	13.07	13.27	13.49	14.56
Accrued Expenses Turnover	22.75	21.27	19.19	17.98	17.92	13.91	12.01	11.87	11.33	11.33	10.79
Book Value per Share	25.58	22.19	22	17.96	14.24	16.56	13.56	13.39	13.42	10.06	7.68
Calculated Tax Rate %	28.97	27.76	27.66	29.97	31.09	32.12	30.63	34	33	32.87	32.15
Cash & Equivalents Turnover	11.69	10.58	8.31	9.46	13.46	14.63	18.2	11.06	8.69	14.86	26.47
Cash Flow per Share	7.62	7.46	7.25	7.05	6.47	5.95	5.14	5.57	5.47	4.82	3.84
Current Ratio	2.2	2.25	2.01	2.2	1.64	1.83	1.22	1.36	1.44	1.52	1.36
EBITDA Margin %	25.99	25.04	26.4	25.82	25.21	29.7	29.56	28.32	27.87	20.59	24.49
Interest Coverage	49.11	42.03	36.31	26.45	47.65	68.51	65.1	192.65	199.04	66.3	74.29
Inventory Turnover	4.33	4.78	4.77	4.28	4.56	4.67	4.92	5.12	5.36	4.96	4.22
LT Debt to Equity	0.28	0.3	0.27	0.41	0.53	0.35	0.11	0.14	0.08	0.23	0.36
Net Current Assets % TA	21.93	21.5	20.31	21.64	14.71	18.13	7.62	9.15	12.79	14.99	10.45
Property Plant & Equip Turnover	3.72	3.96	3.73	3.33	3.74	3.92	3.99	3.75	3.53	3.25	2.91
Quick Ratio	1.41	1.41	1.34	1.46	0.95	1.13	0.72	0.8	1	0.98	0.77
Receivables Turnover	7.31	7.71	7.55	6.92	7.3	7.05	7.08	6.58	6.17	6.08	5.81
Revenue per Employee	340138	351683	333038	308986	318250	320859	304289	305374	297540	271827	237473
ROA % (Net)	13.53	13.87	14.23	12.1	13.74	17.81	18.42	15.52	15.57	14.6	13.19
ROE % (Net)	26.86	27.56	28.74	28.2	31.91	37.74	38.4	31.24	32.65	34.63	32.68
ROI % (Operating)	29.18	29.51	29.75	27.32	31.31	35.26	35.39	38.81	37.79	36.65	33.2
Total Asset Turnover	0.91	0.96	0.93	0.88	1	1.06	1.1	1.03	1.04	1.11	1.09
Total Debt to Equity	0.35	0.34	0.35	0.46	0.69	0.42	0.36	0.24	0.28	0.38	0.56

Motorola (MSI)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	12.55	5.23	7.88	7.85	8.18	7.94	9.06	9.53	10.21	10.7	11.35
Accrued Expenses Turnover	7.07	4.41	7.75	6.91	7.49	8.76	10.29	8.48	7.43	5.87	5.06
Book Value per Share	11.83	16.36	32.37	29.59	29.23	47.78	50.05	46.66	38.12	37.98	33.98
Calculated Tax Rate %	27.74	-0.41	59.97	EBT<0	EBT<0	EBT<0	29.26	29.46	32.63	30.94	EBT<0
Cash & Equivalents Turnover	5.18	2.69	5.45	7.43	10.34	12.28	12.28	5.14	3.39	3.76	4.24
Cash Flow per Share	3.65	2.54	4.6	1.92	0.75	2.38	10.01	13.04	9.05	8.35	4.11
Current Ratio	2.22	2.3	1.97	1.94	1.63	1.78	2.01	2.23	1.99	1.9	1.75
EBITDA Margin %	17.12	14.35	7.15	3.25	-6.16	1.16	11.3	18.95	12.81	11.41	-4.09
Interest Coverage	19.03	11.59	6.02	-	-	-	-	-	15.74	3.67	-
Inventory Turnover	8.49	4.33	9.27	7.56	7.92	8.89	10.61	9.89	7.8	6.39	6.38
LT Debt to Equity	0.57	0.22	0.2	0.34	0.43	0.26	0.16	0.23	0.34	0.53	0.64
Net Current Assets % TA	32.07	35.56	33.01	30.35	24.2	27.93	40.29	43.15	34.02	26.4	23.51
Property Plant & Equip Turnover	10	6.25	9.93	9.59	12.22	15.43	18.9	16.01	8.33	4.8	3.55
Quick Ratio	1.77	1.9	1.43	1.47	1.09	1.19	1.53	1.68	1.44	1.32	1.12
Receivables Turnover	3.89	2.86	4.98	5.03	5.51	5.11	6.06	6.93	7	6.1	5.92
Revenue per Employee	394283	356652	378078	415925	469744	554879	649682	533957	459374	307477	275041
ROA % (Net)	6.6	5.86	2.47	-0.19	-13.5	-0.13	9.86	13.76	4.85	2.82	-7.7
ROE % (Net)	20.72	14.39	6.13	-0.53	-33.92	-0.3	21.65	30.52	11.74	7.46	-19.94
ROI % (Operating)	21.09	8.4	5.77	-1.08	-14.54	-2.68	19.27	23.75	16.06	5.38	-8.43
Total Asset Turnover	0.65	0.42	0.75	0.82	0.96	1	1.16	1.11	0.99	0.86	0.83
Total Debt to Equity	0.57	0.29	0.26	0.4	0.44	0.28	0.26	0.26	0.4	0.6	0.78

Raytheon (RTN)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	17.06	16.33	17.16	19.15	19.74	20.67	21.56	23.94	23.75	22.51	19.57
Accrued Expenses Turnover	11.49	11.56	12.22	12.83	12.23	10.82	8.96	9.26	9.49	9.18	8.15
Book Value per Share	24.47	24.13	27.17	26	22.72	29.43	24.9	23.99	23.29	21.91	21.73
Calculated Tax Rate %	31.59	29.48	24.22	32.53	32.99	23.91	34.42	34.58	24.18	29.25	29
Cash & Equivalents Turnover	6.77	6.51	8.02	10.15	9.41	8.33	11.08	24.91	33.18	30.06	19.07
Cash Flow per Share	5.86	5.99	5.21	6.98	4.88	2.77	6.21	5.63	4.71	3.8	2.59
Current Ratio	1.57	1.52	1.48	1.42	1.44	1.59	1.42	1.28	1.26	1.71	1.41
EBITDA Margin %	13.47	12.71	11.3	13.42	12.32	11.95	10.72	9.38	6.49	8.81	11.19
Interest Coverage	15.57	18.43	23.7	27.91	39.94	70.55	9.39	6.49	3.72	2.7	3.73
Inventory Turnover	53.26	56.36	57.43	59.03	52.08	39.03	15	10.52	9.05	7.44	6.35
LT Debt to Equity	0.59	0.56	0.37	0.24	0.25	0.18	0.3	0.37	0.44	0.81	0.71
Net Current Assets % TA	12.53	12.3	11.72	9.93	9.74	12.15	10.99	6.84	6.13	11.56	8.7
Property Plant & Equip Turnover	12.2	12.4	12.58	12.36	11.32	10.17	8.44	8.09	7.41	7.09	7.06
Quick Ratio	0.69	0.65	0.61	0.5	0.46	0.58	0.39	0.27	0.18	0.3	0.24
Receivables Turnover	-	-	419.72	221.16	200.09	140.14	67.3	48.49	41.93	31.22	29
Revenue per Employee	359105	350099	349764	331747	316585	295437	284383	273675	255566	232167	219372
ROA % (Net)	7.17	7.42	7.66	8.25	7.16	10.57	5.15	3.59	1.74	1.53	-2.53
ROE % (Net)	23.23	20.81	18.79	20.46	15.42	21.81	11.77	8.19	4.22	4.05	-6.35
ROI % (Operating)	23.34	21.85	20.43	25.83	19.76	15.58	12.2	10.97	8.6	8.01	9.84
Total Asset Turnover	0.93	0.99	1.05	1.06	0.99	0.87	0.81	0.9	0.84	0.76	0.66
Total Debt to Equity	0.59	0.56	0.37	0.24	0.25	0.18	0.36	0.41	0.48	0.81	0.84

Verizon Communications (VZ)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	25.86	27.28	25.76	26.32	23.26	21.04	24.42	26.57	20.44	14.98	13.41
Accrued Expenses Turnover	7.87	7.49	8.38	9.06	8.52	8.36	8.09	6.8	6.16	6.59	7.22
Book Value per Share	11.6	12.69	13.64	14.67	14.68	17.58	16.35	14.36	13.56	12.09	11.89
Calculated Tax Rate %	-6.89	2.84	20.26	10.99	21.7	28.52	23.42	24.94	26.51	26.44	13.61
Cash & Equivalents Turnover	14.04	11.07	24.56	18.29	17.76	42.76	44.13	49	47.57	63.41	55.96
Cash Flow per Share	11.01	10.51	11.79	11.11	9.32	8.88	8.28	7.96	7.86	8.16	8.1
Current Ratio	0.79	1.01	0.73	0.78	1.01	0.76	0.7	0.66	0.84	0.69	0.77
EBITDA Margin %	23.31	25.06	27.4	26.53	30.8	30.66	30.28	36.55	37.78	29	40
Interest Coverage	5.23	4.67	6.02	4.63	11.59	9.38	6.23	6.93	5.78	2.72	3.78
Inventory Turnover	45.93	44.3	25.82	20.22	20.42	23.16	21.25	15.37	16.44	15.64	24.18
LT Debt to Equity	1.44	1.4	1.17	1.32	1.13	0.56	0.59	0.8	0.95	1.18	1.37
Net Current Assets % TA	-2.54	0.08	-3.75	-2.87	0.08	-3.23	-5.16	-5.12	-2.2	-4.99	-3.66
Property Plant & Equip Turnover	1.3	1.26	1.19	1.21	1.13	1.12	1.12	1.01	0.95	0.9	0.91
Quick Ratio	0.6	0.84	0.62	0.52	0.85	0.61	0.51	0.5	0.62	0.48	0.59
Receivables Turnover	9.49	9.41	8.75	8.88	8.28	8.26	8.79	7.92	7.21	6.02	5.04
Revenue per Employee	629932	571815	548174	483661	433622	397740	364231	346138	338515	333589	294662
ROA % (Net)	0.38	1.07	1.14	1.7	3.29	2.94	3.47	4.43	4.71	1.85	2.41
ROE % (Net)	2.52	6.45	6.36	8.76	13.89	11.14	14.05	19.15	21.99	9.31	12.52
ROI % (Operating)	14.89	14.12	15	14.2	19.2	18.7	16.35	18.37	16.81	8.88	13.35
Total Asset Turnover	0.51	0.49	0.48	0.5	0.5	0.5	0.49	0.45	0.43	0.41	0.4
Total Debt to Equity	1.57	1.53	1.37	1.5	1.25	0.62	0.75	0.98	1.05	1.36	1.66

Westinghouse Air Brake Technologies (WAB)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	9.67	9.48	10.38	9.92	10.47	11.83	11.68	11.13	9.54	10.12	10.14
Accrued Expenses Turnover	10.73	11.68	13.61	12.61	15.38	16.49	14.32	15.01	13.99	12.2	8.62
Book Value per Share	13.38	10.9	9.38	8.15	6.74	6.34	4.87	3.95	3.38	2.78	2.29
Calculated Tax Rate %	33.29	33.36	34.11	29.57	36.1	36.57	31.66	35.56	25.11	36.5	32
Cash & Equivalents Turnover	9.51	7.53	7.08	8.48	8.34	6.44	6.6	8.74	9.9	16.04	19.03
Cash Flow per Share	2.48	2.6	1.85	1.69	1.65	1.47	1.56	0.9	0.59	0.64	0.18
Current Ratio	1.98	1.95	2.3	2.26	1.87	2.26	2.24	2	1.99	2.11	1.81
EBITDA Margin %	17.59	15.26	15.34	14.68	15.4	15.08	14.1	11.9	9.68	9.73	9.69
Interest Coverage	27.53	18.04	12.74	10.8	24.98	49.42	81.69	11.66	4.81	4.98	2.93
Inventory Turnover	4.49	4.64	4.29	4.01	5.21	6.16	6.17	7.45	6.53	5.86	5.34
LT Debt to Equity	0.25	0.38	0.42	0.46	0.55	0.24	0.32	0.4	0.48	0.78	0.98
Net Current Assets % TA	22.96	23.83	25.16	24.22	22.37	31.98	31.19	28.87	25.05	25.8	18.67
Property Plant & Equip Turnover	10.23	9.19	7.39	6.85	8.05	7.54	6.4	6.62	5.38	4.75	4.4
Quick Ratio	1.08	1.15	1.4	1.27	1.05	1.52	1.47	1.41	1.26	1.26	0.88
Receivables Turnover	6.48	6.51	6.46	5.82	6.34	6.81	5.66	5.96	6.1	6.06	6.49
Revenue per Employee	257710	227525	226482	241159	215277	225816	204555	197748	167130	160179	157903
ROA % (Net)	11.13	8.59	7.26	7.44	9.77	10.28	9.37	7.2	4.72	3.65	-6.9
ROE % (Net)	21.62	17.5	14.68	16.18	20.62	20.16	19.98	16.13	11.54	10.15	-20.46
ROI % (Operating)	25.77	19.6	16.29	16.36	23.55	25.91	22.55	20.41	12.21	12.37	10.78
Total Asset Turnover	1.06	0.99	0.89	0.91	1.18	1.28	1.2	1.33	1.2	1.15	1.06
Total Debt to Equity	0.25	0.38	0.47	0.5	0.6	0.24	0.32	0.4	0.48	0.78	0.98

Xerox Corporation (XRX)

Ratios	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002
Accounts Payable Turnover	11.37	11.36	12.65	10.48	12.48	13.78	14.61	15.1	16.21	18.08	20.54
Accrued Expenses Turnover	19.28	18.24	18.46	15.27	17.51	17.43	17	16.48	16.06	21.67	26.31
Book Value per Share	9.7	9.14	8.84	8.11	7.21	9.36	7.48	7.74	7.46	5.89	5.56
Calculated Tax Rate %	20.55	24.66	31.41	24.24	EBT<0	27.25	-34.7	-0.59	34.94	30.73	23.81
Cash & Equivalents Turnover	20.79	21.42	8.64	6.04	15.09	13.79	11.68	6.92	5.51	5.85	4.61
Cash Flow per Share	1.98	1.41	2.06	2.54	1.06	2	1.71	1.48	2.09	2.44	2.57
Current Ratio	1.4	1.24	1.35	2.18	1.5	2.09	1.86	2.01	1.73	1.37	1.42
EBITDA Margin %	12.6	12.5	11.08	11.68	5.86	14.91	11.68	11.41	13.73	8.94	9.07
Interest Coverage	4.25	4.4	2.39	2.21	0.75	3.79	2.65	2.79	2.44	2.17	1.63
Inventory Turnover	14.93	14.88	14.74	8.33	8.24	8.07	7.73	7.6	7.84	7.37	6.75
LT Debt to Equity	0.63	0.58	0.59	1.17	1.09	0.81	0.8	0.85	0.99	1.48	2.39
Net Current Assets % TA	7.87	5.08	7.26	21.93	12.03	18.96	18.68	20	18.6	11.25	12.7
Property Plant & Equip Turnover	14.1	13.78	14.52	11.13	11.68	11.06	10.08	9.27	8.74	8.76	8.44
Quick Ratio	1.04	0.91	1.02	1.82	1.12	1.61	1.42	1.5	1.36	1.07	1.1
Receivables Turnover	4.55	4.42	4.49	3.29	3.39	3.26	3.16	3.04	2.85	2.77	2.75
Revenue per Employee	151279	162019	158484	283190	307529	300139	295996	284438	269863	256972	233761
ROA % (Net)	3.96	4.27	2.22	2.09	1	5.02	5.54	4.18	3.46	1.44	0.34
ROE % (Net)	9.89	10.54	6.25	7.3	3.09	14.49	16.94	13.64	14.5	8.2	2.25
ROI % (Operating)	8.54	9.63	7.35	7.22	2.58	13.11	8.78	7.35	9.31	4.6	3.35
Total Asset Turnover	0.74	0.75	0.79	0.65	0.76	0.76	0.73	0.67	0.63	0.63	0.6
Total Debt to Equity	0.72	0.71	0.7	1.31	1.34	0.87	1.01	1.01	1.42	2.39	3.45

APPENDIX F: INDUSTRY COMPARISON COMPANIES USED FOR RQ #3

The following pages outline the comparison companies that were used for the 15 award-winners that were used in Research Question #3. Industry comparison companies were identified through the primary use of NAICS codes and the secondary use of SIC codes where additional filtering needed to take place. NAICS codes consist of 6-digits, whereas SIC codes use only 4-digits. The longer NAICS code therefore allows for greater flexibility and specificity in the number of sectors and subsectors. The companies that had the most complete financial profiles available were chosen.

The award-winning companies against which winner comparisons were made include Boeing (BA), Caterpillar (CAT), Eastman Chemical (EMN), Federal Express (FDX), Corning (GLW), Honeywell (HON), International Business Machines (IBM), Lockheed Martin (LMT), Marriott (parent company for Ritz-Carlton, MAR), 3M (MMM), Motorola (MSI), Raytheon (RTN), Verizon (VZ), Wabtec (acquired Westinghouse, WAB) and Xerox (XRX).

The ratios that were analyzed include (in alphabetical order): Accounts Payable Turnover, Accrued Expenses Turnover, Book Value per Share, Calculated Tax Rate %, Cash & Equivalents Turnover, Cash Flow per Share, Current Ratio, EBITDA Margin %, Interest Coverage, Inventory Turnover, LT Debt to Equity, Net Current Assets % TA, Property Plant & Equip Turnover, Quick Ratio, Receivables Turnover, Revenue per Employee, ROA % (Net), ROE % (Net), ROI % (Operating), Total Asset Turnover, and Total Debt to Equity for the years 2002 – 2012.

Boeing (BA) Comparison Companies

AAR Corp. (NYS: AIR)
Astronics Corp. (NMS: ATRO)
B/E Aerospace, Inc. (NMS: BEAV)
Barnes Group Inc. (NYS: B)
Breeze-Eastern Corp (ASE: BZC)
Butler National Corp. (NBB: BUKS)
CPI Aerostructures, Inc. (ASE: CVU)
Ducommun Inc. (NYS: DCO)
First Aviation Services, Inc. (NBB: FAVS)
GenCorp Inc. (NYS: GY)
General Dynamics Corp. (NYS: GD)
Heico Corp. (NYS: HEI)
LMI Aerospace, Inc. (NMS: LMIA)
Lockheed Martin Corp. (NYS: LMT)
Rockwell Collins, Inc. (NYS: COL)
SIFCO Industries Inc. (ASE: SIF)
Textron Inc. (NYS: TXT)
Triumph Group Inc. (NYS: TGI)
United Technologies Corp. (NYS: UTX)

Caterpillar (CAT) Comparison Companies

AGCO Corp. (NYS: AGCO)
Alamo Group, Inc. (NYS: ALG)
Baker Hughes Inc. (NYS: BHI)
Cameron International Corp (NYS: CAM)
Columbus McKinnon Corp. (NY) (NMS: CMCO)
Dril-Quip, Inc. (NYS: DRQ)
FMC Technologies, Inc. (NYS: FTI)
Joy Global Inc. (NYS: JOY)
Manitowoc Co., Inc. (NYS: MTW)
National Oilwell Varco Inc. (NYS: NOV)
Newpark Resources, Inc. (NYS: NR)
Oil States International, Inc. (NYS: OIS)
Toro Co. (The) (NYS: TTC)

Eastman Chemical (EMN) Comparison Companies

Albemarle Corp. (NYS: ALB)
Axiall Corp (NYS: AXLL)
Calgon Carbon Corp. (NYS: CCC)
Dow Chemical Co. (NYS: DOW)
Du Pont (E.I.) de Nemours & Co (NYS: DD)
Flotek Industries Inc. (NYS: FTK)
Landec Corp. (NMS: LNDC)
Minerals Technologies, Inc. (NYS: MTX)
PolyOne Corp. (NYS: POL)
Praxair, Inc. (NYS: PX)
Schulman (A.), Inc. (NMS: SHLM)
Valhi, Inc. (NYS: VHI)
Westlake Chemical Corp (NYS: WLK)

Federal Express (FDX) Comparison Companies

Air T Inc. (NAS: AIRT)
Iron Mountain Inc. (NYS: IRM)
United Parcel Service Inc. (NYS: UPS)
Alaska Air Group, Inc. (NYS: ALK)
Matson Inc. (NYS: MATX)
Plains All American Pipeline, L.P. (NYS: PAA)
Sunoco Logistics Partners L.P. (NYS: SXL)
American Airlines Group Inc. (NMS: AAL)
Covenant Transportation Group Inc. (NMS: CVTI)
CSX Corp. (NYS: CSX)
Overseas Shipholding Group, Inc. (NBB: OSGI Q)
P.A.M. Transportation Services, Inc. (NMS: PTSI)

Corning (GLW) Comparison Companies

Apogee Enterprises, Inc. (NMS: APOG)
Continental Materials Corp. (ASE: CUO)
Eagle Materials Inc. (NYS: EXP)
Harsco Corp. (NYS: HSC)
Libbey Inc. (ASE: LBY)
Monarch Cement Co. (OTC: MCEM)
Owens Corning (NYS: OC)
Owens-Illinois, Inc. (NYS: OI)
Smith-Midland Corp. (NBB: SMID)
Texas Industries Inc. (NYS: TXI)
U.S. Concrete, Inc. (NAS: USCR)
USG Corp (NYS: USG)

Honeywell (HON) Comparison Companies

Fuel Systems Solutions Inc. (NMS: FSYS)
Federal Mogul Corp. (NMS: FDML)
Clarcor Inc. (NYS: CLC)
Modine Manufacturing Co (NYS: MOD)
Lear Corp. (NYS: LEA)
Autoliv Inc. (NYS: ALV)
Tenneco Inc. (NYS: TEN)
Motorcar Parts of America Inc. (NMS: MPAA)
Borg Warner Inc. (NYS: BWA)
Stoneridge Inc. (NYS: SRI)
Meritor Inc. (NYS: MTOR)
Visteon Corp. (NYS: VC)

International Business Machines (IBM) Comparison Companies

IAC/InterActiveCorp (NMS: IACI)
Cogent Communications Group, Inc. (NMS: CCOI)
MeetMe Inc. (ASE: MEET)
Helios & Matheson Analytics, Inc. (NAS: HMNY)
International Business Machines Corp. (NYS: IBM)
Edgewater Technology Inc. (NMS: EDGW)
LivePerson Inc. (NMS: LPSN)
McKesson Corp. (NYS: MCK)
Axiom Corp. (NMS: ACXM)
ModusLink Global Solutions, Inc. (NMS: MLNK)

Lockheed Martin (LMT) Comparison Companies

AAR Corp (NYS: AIR)
Astronics Corp. (NMS: ATRO)
B/E Aerospace, Inc. (NMS: BEAV)
Barnes Group Inc. (NYS: B)
Boeing Co. (The) (NYS: BA)
Breeze-Eastern Corp (ASE: BZC)
Butler National Corp. (NBB: BUKS)
CPI Aerostructures, Inc. (ASE: CVU)
Ducommun Inc. (NYS: DCO)
First Aviation Services, Inc. (NBB: FAVS)
GenCorp Inc. (NYS: GY)
General Dynamics Corp. (NYS: GD)
Heico Corp. (NYS: HEI)
LMI Aerospace, Inc. (NMS: LMIA)
Rockwell Collins, Inc. (NYS: COL)
SIFCO Industries Inc. (ASE: SIF)
Textron Inc. (NYS: TXT)
Triumph Group Inc. (NYS: TGI)
United Technologies Corp. (NYS: UTX)

Marriott (parent company for Ritz-Carlton, MAR) Comparison Companies

Boyd Gaming Corp. (NYS: BYD)
Dover Downs Gaming & Entertainment, Inc. (NYS: DDE)
MGM Resorts International (NYS: MGM)
Pinnacle Entertainment Inc. (NYS: PNK)
Red Lions Hotels Corp (NYS: RLH)
Starwood Hotels & Resorts Worldwide Inc. (NYS: HOT)
Wynn Resorts Ltd (NMS: WYNN)
Choice Hotels International, Inc. (NYS: CHH)
Full House Resorts, Inc. (NAS: FLL)
Isle of Capri Casinos Inc. (NMS: ISLE)

3M (MMM) Comparison Companies

Pro-Dex Inc. (CO) (NAS: PDEX)
Repro-Med Systems, Inc. (NBB: REPR)
Bovie Medical Corp (ASE: BVX)
ResMed Inc. (NYS: RMD)
Baxter International Inc. (NYS: BAX)
Misonix, Inc. (NMS: MSON)
Teleflex Incorporated (NYS: TFX)
Haemonetics Corp. (NYS: HAE)
ABIOMED, Inc. (NMS: ABMD)
Endologix Inc. (NMS: ELGX)
ICU Medical, Inc. (NMS: ICUI)

Motorola (MSI) Comparison Companies

CalAmp Corp (NMS: CAMP)
Blonder Tongue Laboratories, Inc. (ASE: BDR)
Cobra Electronics Corp. (NMS: COBR)
Dish Network Corp (NMS: DISH)
Wells-Gardner Electronics Corp. (ASE: WGA)
ViaSat, Inc. (NMS: VSAT)
ARRIS Group Inc. (New) (NMS: ARRS)
Orbital Sciences Corp. (NYS: ORB)
ViewCast.com Inc. (NBB: VCST)
Comtech Telecommunications Corp. (NMS: CMTL)

Raytheon (RTN) Comparison Companies

Environmental Tectonics Corp. (NBB: ETCC)
Northrop Grumman Corp (NYS: NOC)
FLIR Systems, Inc. (NMS: FLIR)
L-3 Communications Holdings, Inc. (NYS: LLL)
Applied Energetics Inc. (NBB: AERG)
Tel Instrument Electronics Corp. (ASE: TIK)
Sypris Solutions, Inc. (NMS: SYPR)
Roper Industries, Inc. (NYS: ROP)
ESCO Technologies, Inc. (NYS: ESE)
Electro-Sensors, Inc. (NAS: ELSE)
Danaher Corp. (NYS: DHR)
Powell Industries, Inc. (NMS: POWL)
Wireless Telecom Group, Inc. (ASE: WTT)

Verizon (VZ) Comparison Companies

Telephone & Data Systems, Inc. (NYS: TDS)
Atlantic Tele-Network, Inc. (NMS: ATNI)
General Communication Inc. (NMS: GNCM A)
Hickory Tech Corp. (NMS: HTCO)
New Ulm Telecom Inc. (NBB: NULM)
Shenandoah Telecommunications Co. (NMS: SHEN)
Alteva (ASE: ALTV)
Frontier Communications Corp (NMS: FTR)
Cincinnati Bell Inc. (NYS: CBB)
CenturyLink, Inc. (NYS: CTL)

Wabtec (acquired Westinghouse, WAB) Comparison Companies

Conrad Industries, Inc. (NBB: CNRD)
Greenbrier Companies Inc. (The) (NYS: GBX)
Trinity Industries, Inc. (NYS: TRN)
Harley-Davidson Inc. (NYS: HOG)
Marine Products Corp. (NYS: MPX)
FreightCar America Inc. (NMS: RAIL)
American Railcar Industries Inc. (NMS: ARII)
GenCorp Inc. (NYS: GY)
CPI Aerostructures, Inc. (ASE: CVU)
Breeze-Eastern Corp (ASE: BZC)
Astronics Corp. (NMS: ATRO)
Butler National Corp. (NBB: BUKS)

Xerox (XRX) Comparison Companies

Diebold, Inc. (NYS: DBD)
Dynasil Corp of America (NAS: DYSL)
II-VI Inc. (NMS: IIVI)
Moog, Inc. (NYS: MOG A)
Par Technology Corp. (NYS: PAR)
Standex International Corp. (NYS: SXI)
Tennant Co. (NYS: TNC)
Adept Technology Inc. (NAS: ADEP)
Ballantyne Strong, Inc. (ASE: BTN)
Cyberoptics Corp. (NMS: CYBE)
Envirostar Inc. (ASE: EVI)
LightPath Technologies, Inc. (NAS: LPTH)
Opt-Sciences Corp. (NBB: OPST)

APPENDIX G: STATISTICAL TESTS USED FOR RQ #3

This appendix outlines the specific statistical tests that were conducted to compare the 15 award-winning companies to their industry peers for Research Question #3. The award-winning companies analyzed include Boeing (BA), Caterpillar (CAT), Eastman Chemical (EMN), Federal Express (FDX), Corning (GLW), Honeywell (HON), International Business Machines (IBM), Lockheed Martin (LMT), Marriott (parent company for Ritz-Carlton, MAR), 3M (MMM), Motorola (MSI), Raytheon (RTN), Verizon (VZ), Wabtec (acquired Westinghouse, WAB) and Xerox (XRX).

PTT stands for the parametric “Paired T-Test” and WSRT stands for the nonparametric “Wilcoxon Signed Rank Test”.

Ratios	PROFITABILITY						LIQUIDITY			DEBT		
	ROA %	ROE %	ROI %	EBITDA M %	CTR %	RpE	QR	CR	NCA % TA	LTDtE	TDtE	IC
BA	PTT	PTT	PTT	PTT	WSRT	PTT	WSRT	PTT	WSRT	WSRT	WSRT	WSRT
CAT	PTT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT	PTT	PTT	WSRT	PTT
EMN	PTT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT	PTT	WSRT	WSRT	WSRT
FDX	PTT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT	PTT	WSRT	WSRT	WSRT
GLW	PTT	PTT	WSRT	WSRT	WSRT	PTT	WSRT	WSRT	PTT	WSRT	WSRT	PTT
HON	PTT	PTT	WSRT	WSRT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT
IBM	PTT	PTT	PTT	WSRT	PTT	PTT	WSRT	WSRT	WSRT	PTT	PTT	WSRT
LMT	PTT	WSRT	PTT	PTT	WSRT	PTT	WSRT	PTT	WSRT	WSRT	WSRT	PTT
MAR	PTT	PTT	PTT	WSRT	PTT	PTT	PTT	WSRT	PTT	WSRT	WSRT	PTT
MMM	PTT	WSRT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT	PTT	WSRT	WSRT
MSI	PTT	WSRT	WSRT	WSRT	WSRT	PTT	PTT	PTT	PTT	WSRT	WSRT	WSRT
RTN	PTT	PTT	PTT	PTT	PTT	PTT	PTT	WSRT	PTT	WSRT	WSRT	PTT
VZ	PTT	PTT	WSRT	PTT	PTT	PTT	WSRT	PTT	PTT	WSRT	WSRT	WSRT
WAB	WSRT	WSRT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	WSRT	WSRT	PTT
XRX	PTT	PTT	PTT	PTT	WSRT	PTT	WSRT	PTT	PTT	WSRT	WSRT	WSRT

Ratios	ASSET							PER SHARE	
	TAT	RT	IT	APT	AET	PP&ET	C&ET	CFpS	BVPS
BA	WSRT	PTT	PTT	PTT	PTT	PTT	WSRT	PTT	PTT
CAT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT
EMN	PTT	PTT	PTT	PTT	PTT	WSRT	WSRT	PTT	PTT
FDX	WSRT	PTT	PTT	PTT	PTT	PTT	WSRT	PTT	PTT
GLW	WSRT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT	WSRT
HON	PTT	PTT	WSRT	PTT	WSRT	PTT	WSRT	PTT	PTT
IBM	PTT	WSRT	WSRT	PTT	WSRT	WSRT	WSRT	PTT	WSRT
LMT	PTT	PTT	PTT	PTT	PTT	WSRT	WSRT	PTT	PTT
MAR	PTT	PTT	WSRT	PTT	PTT	PTT	PTT	PTT	WSRT
MMM	PTT	WSRT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT
MSI	PTT	WSRT	PTT	WSRT	PTT	WSRT	WSRT	PTT	PTT
RTN	PTT	PTT	WSRT	PTT	PTT	PTT	WSRT	PTT	PTT
VZ	PTT	PTT	WSRT	PTT	PTT	PTT	WSRT	WSRT	PTT
WAB	PTT	PTT	PTT	PTT	PTT	PTT	WSRT	PTT	PTT
XRX	PTT	WSRT	WSRT	PTT	PTT	PTT	WSRT	PTT	PTT

APPENDIX H: STATISTICAL ANALYSIS RESULTS FOR RQ #3

The following pages include the detailed financial results of the 15 award-winning companies that were used for Research Question #3. These companies include Boeing (BA), Caterpillar (CAT), Eastman Chemical (EMN), Federal Express (FDX), Corning (GLW), Honeywell (HON), International Business Machines (IBM), Lockheed Martin (LMT), Marriott (parent company for Ritz-Carlton, MAR), 3M (MMM), Motorola (MSI), Raytheon (RTN), Verizon (VZ), Wabtec (acquired Westinghouse, WAB) and Xerox (XRX).

Ratios being tested for each company include (in alphabetical order): Accounts Payable Turnover, Accrued Expenses Turnover, Book Value per Share, Calculated Tax Rate %, Cash & Equivalents Turnover, Cash Flow per Share, Current Ratio, EBITDA Margin %, Interest Coverage, Inventory Turnover, LT Debt to Equity, Net Current Assets % TA, Property Plant & Equip Turnover, Quick Ratio, Receivables Turnover, Revenue per Employee, ROA % (Net), ROE % (Net), ROI % (Operating) Total Asset Turnover, and Total Debt to Equity.

The statistical software being used to conduct this analysis is Minitab. For all tests conducted: H_0 : The mean difference between paired observations in the population is zero. H_A : The mean difference between paired observations in the population is not zero. The statistical tests conducted included a Normality Test for Winner & Industry Ratio ($p > .05$ = normally distributed). If both pairs of data were normally distributed, a paired T-Test was conducted, if one or more of the data sets were not normally distributed, a Wilcoxon Signed Rank Test for Paired Data was conducted.

BOEING Profitability Ratios

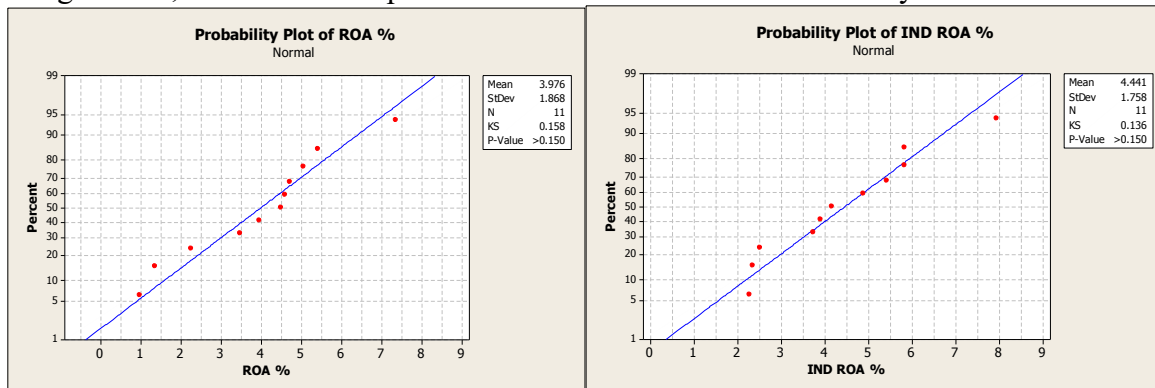
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



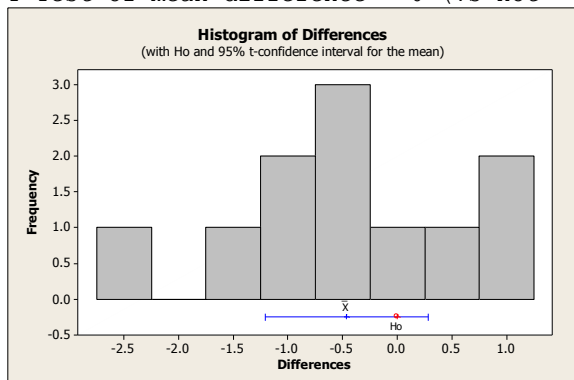
Paired T-Test and CI: BA ROA %, IND ROA %

Paired T for BA ROA % - IND ROA %

	N	Mean	StDev	SE Mean
BA ROA %	11	3.976	1.868	0.563
IND ROA %	11	4.441	1.758	0.530
Difference	11	-0.465	1.110	0.335

95% CI for mean difference: (-1.211, 0.281)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.39 P-Value = 0.195



BOEING Profitability Ratios

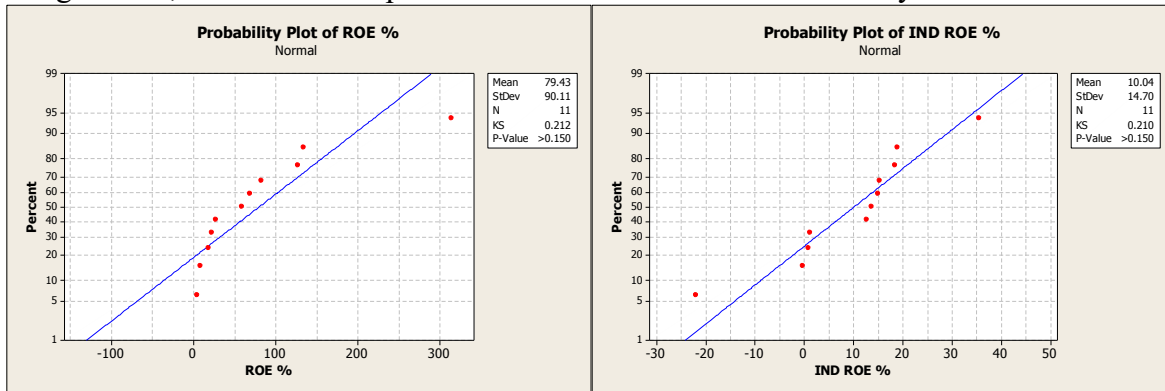
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



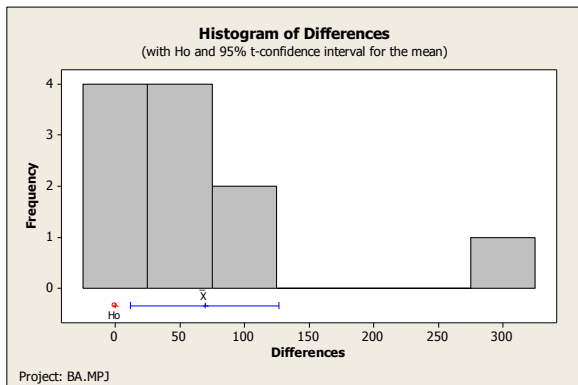
Paired T-Test and CI: ROE %, IND ROE %

Paired T for ROE % - IND ROE %

	N	Mean	StDev	SE Mean
ROE %	11	79.4	90.1	27.2
IND ROE %	11	10.0	14.7	4.4
Difference	11	69.4	85.6	25.8

95% CI for mean difference: (11.9, 126.9)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.69 P-Value = 0.023



BOEING Profitability Ratios

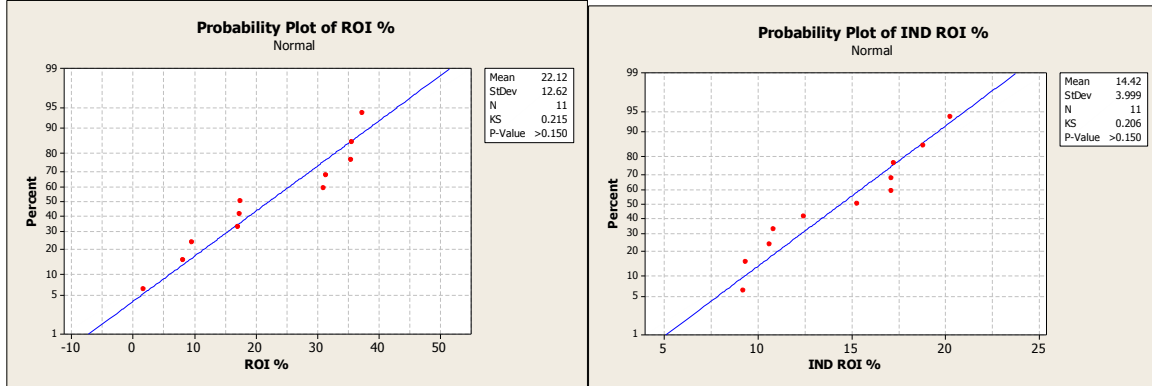
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



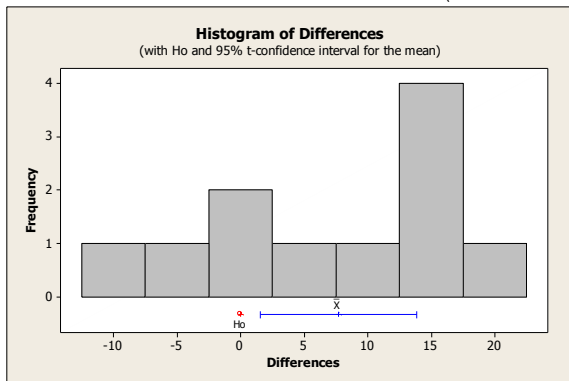
Paired T-Test and CI: BA ROI %, IND ROI %

Paired T for BA ROI % - IND ROI %

	N	Mean	StDev	SE Mean
BA ROI %	11	22.12	12.62	3.81
IND ROI %	11	14.42	4.00	1.21
Difference	11	7.70	9.14	2.76

95% CI for mean difference: (1.56, 13.84)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.79 P-Value = 0.019



BOEING Profitability Ratios

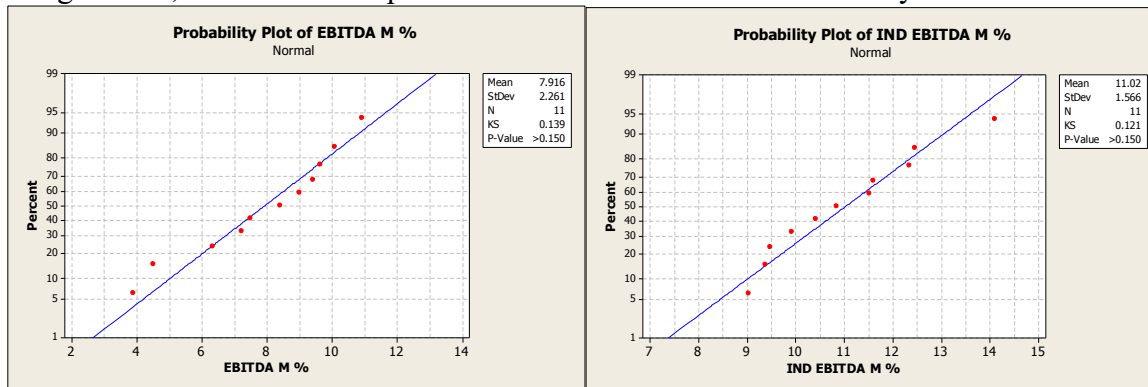
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



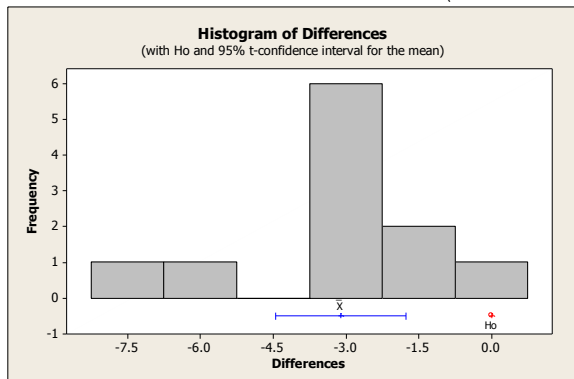
Paired T-Test and CI: BA EBITDA M %, IND EBITDA M %

Paired T for BA EBITDA M % - IND EBITDA M %

	N	Mean	StDev	SE Mean
BA EBITDA M %	11	7.916	2.261	0.682
IND EBITDA M %	11	11.017	1.566	0.472
Difference	11	-3.100	1.994	0.601

95% CI for mean difference: (-4.440, -1.761)

T-Test of mean difference = 0 (vs not = 0): T-Value = -5.16 P-Value = 0.000



BOEING Profitability Ratios

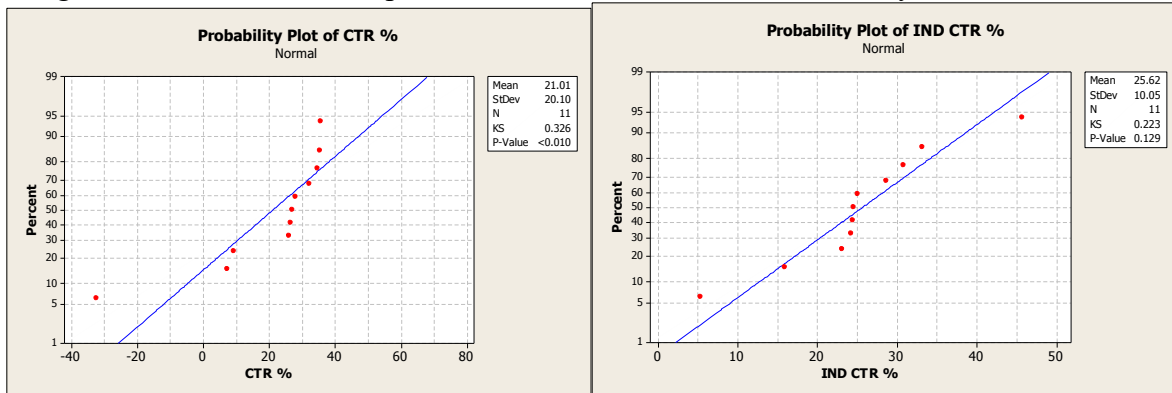
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: CTR %, IND CTR %

Paired test for CTR % - IND CTR %

Test of median = 0.000000 versus median not = 0.000000

	N	N for Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	25.0	0.505	-3.270

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-3.3	95.5	-16.0	5.5

BOEING Profitability Ratios

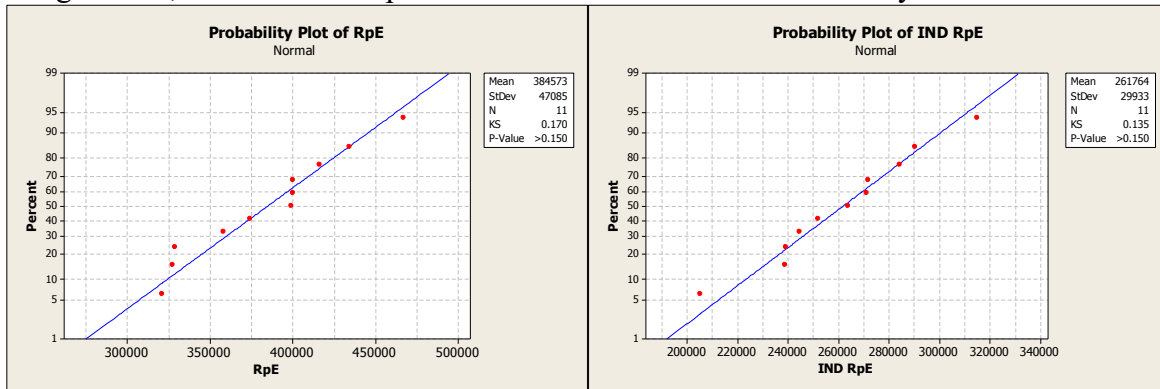
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



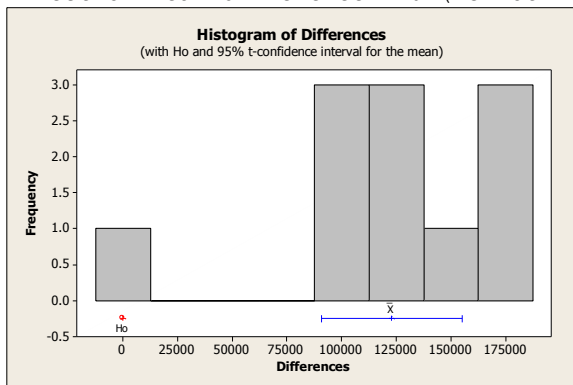
Paired T-Test and CI: BA RpE, IND RpE

Paired T for BA RpE - IND RpE

	N	Mean	StDev	SE Mean
BA RpE	11	384573	47085	14197
IND RpE	11	261764	29933	9025
Difference	11	122808	47957	14460

95% CI for mean difference: (90590, 155026)

T-Test of mean difference = 0 (vs not = 0): T-Value = 8.49 P-Value = 0.000



BOEING Liquidity Ratios

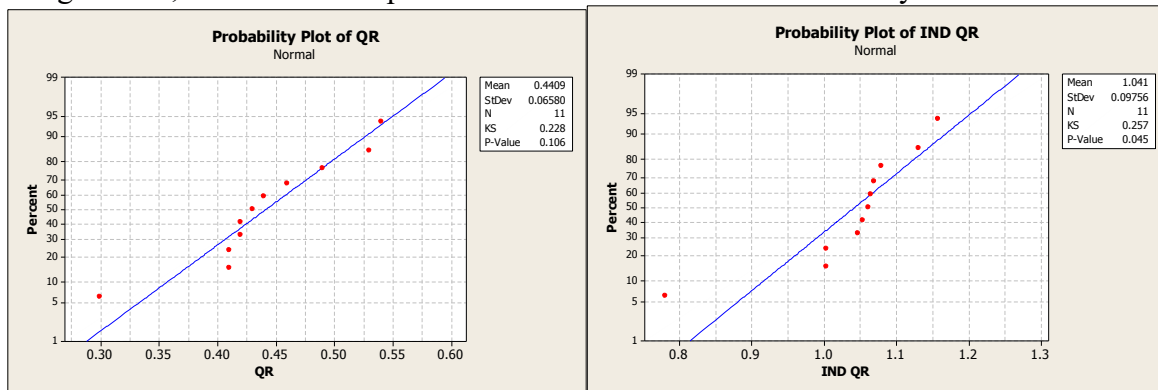
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: QR, IND QR

Paired test for QR - IND QR

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated
Difference	11	11	0.0	0.004	-0.6127

	N	Estimated	Achieved	Confidence Interval	
		Median	Confidence	Lower	Upper
Difference	11	-0.613	95.5	-0.678	-0.519

BOEING Liquidity Ratios

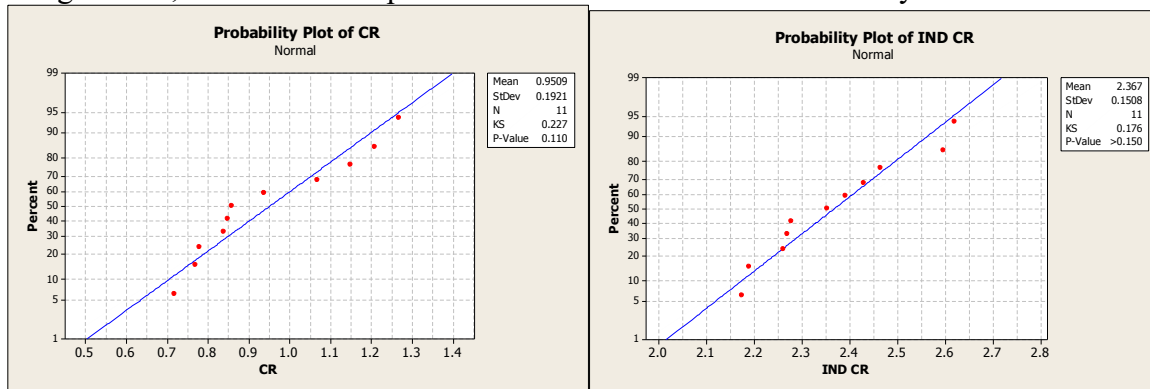
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



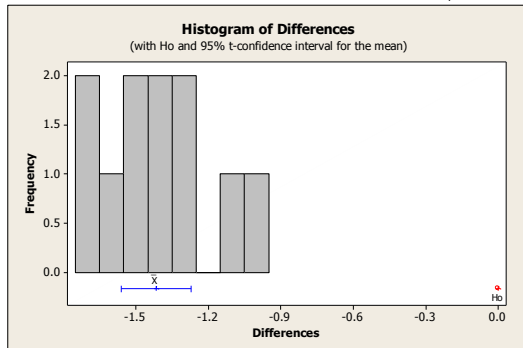
Paired T-Test and CI: BA CR, IND CR

Paired T for BA CR - IND CR

	N	Mean	StDev	SE Mean
BA CR	11	0.9509	0.1921	0.0579
IND CR	11	2.3672	0.1508	0.0455
Difference	11	-1.4163	0.2158	0.0651

95% CI for mean difference: (-1.5612, -1.2713)

T-Test of mean difference = 0 (vs not = 0): T-Value = -21.77 P-Value = 0.000



BOEING Liquidity Ratios

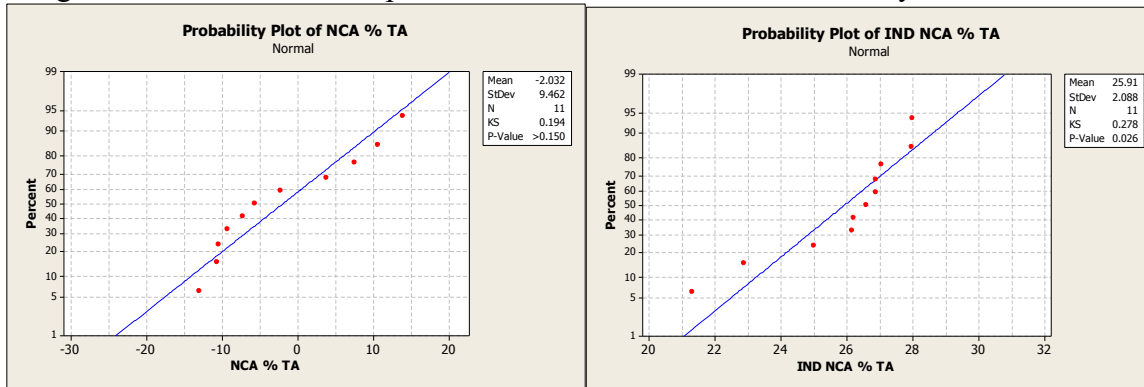
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: NCA % TA, IND NCA % TA

Paired test for NCA % TA - IND NCA % TA

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-28.06

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-28.1	95.5	-36.1	-21.4

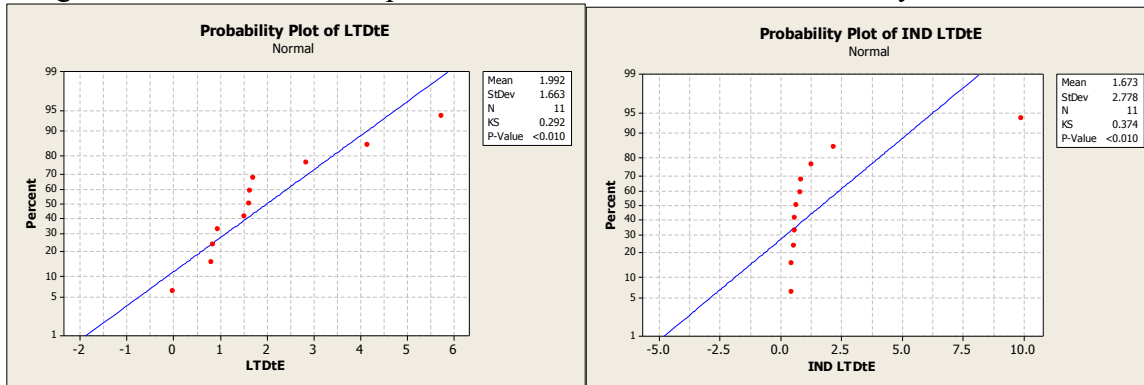
BOEING Debt Management Ratios
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: LTDtE, IND LTDtE

Paired test for LTDtE - IND LTDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	44.0	0.351	0.3692

	N	Estimated Median	Achieved Confidence	Confidence Interval
Difference	11	0.37	95.5	-1.60 2.41

BOEING Debt Management Ratios

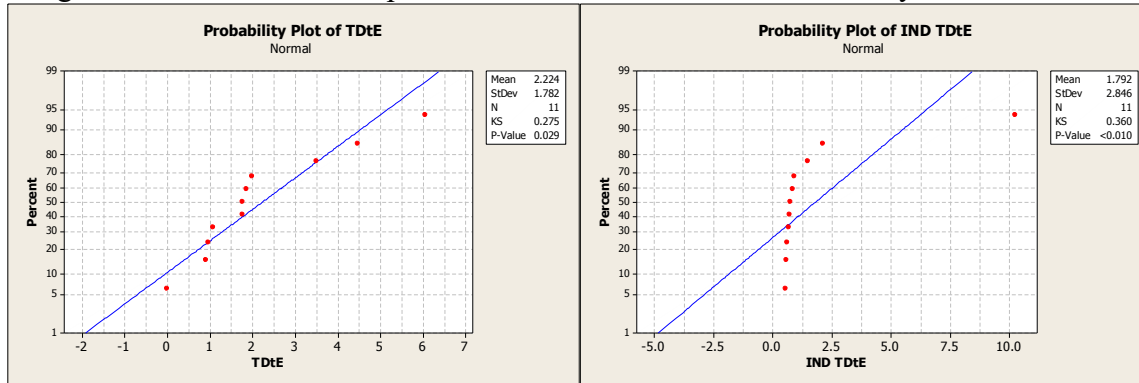
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated
Difference	11	11	Statistic	45.0	0.307
					0.4231

	N	Estimated	Achieved	Confidence Interval	
Difference	11	Median	Confidence	Lower	Upper
		0.42	95.5	-1.53	2.61

BOEING Debt Management Ratios

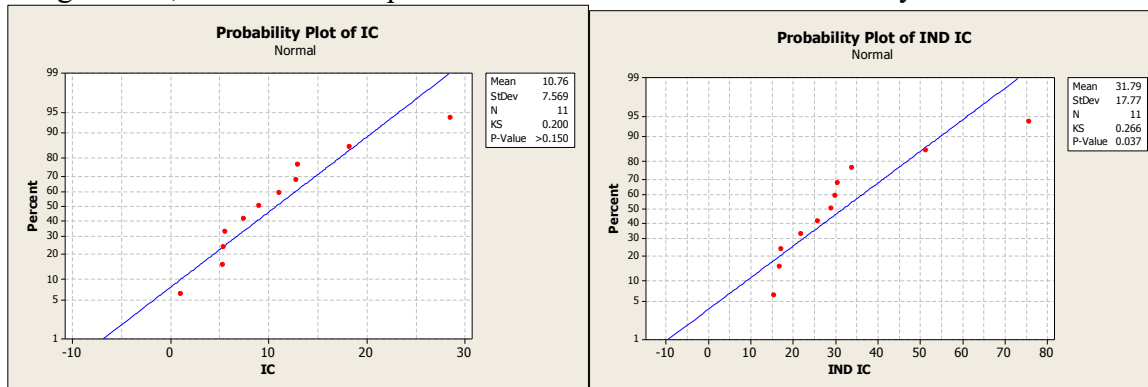
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: IC, IND IC

Paired test for IC - IND IC

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated	Median
Difference	11	11	0.0	0.004	-18.66	

	N	Estimated	Achieved	Confidence	Lower	Upper
		Median	Confidence	Interval		
Difference	11	-18.7	95.5	-35.2	-7.3	

BOEING Asset Management Ratios

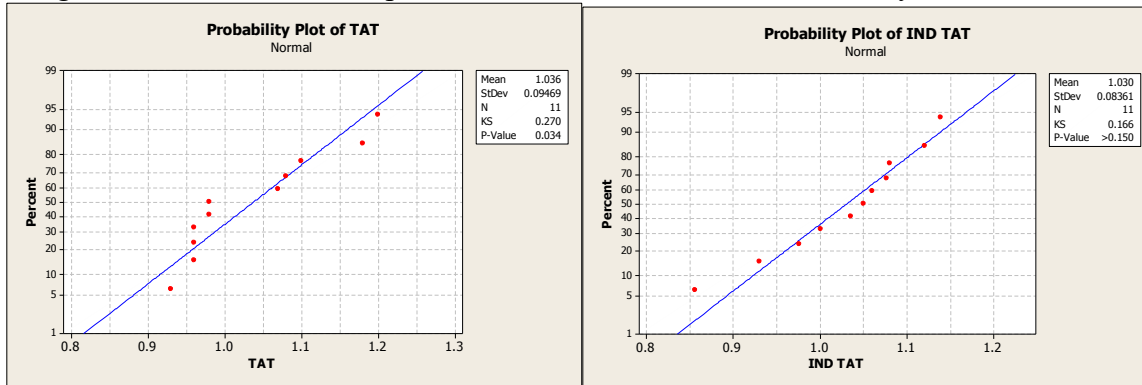
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: TAT, IND TAT

Paired test for TAT - IND TAT

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated
Difference	11	11	Statistic		Median
			32.0	0.965	-0.007500

	N	Estimated	Achieved	Confidence	
Difference	11	Median	Confidence	Lower	Upper
		-0.008	95.5	-0.069	0.086

BOEING Asset Management Ratios

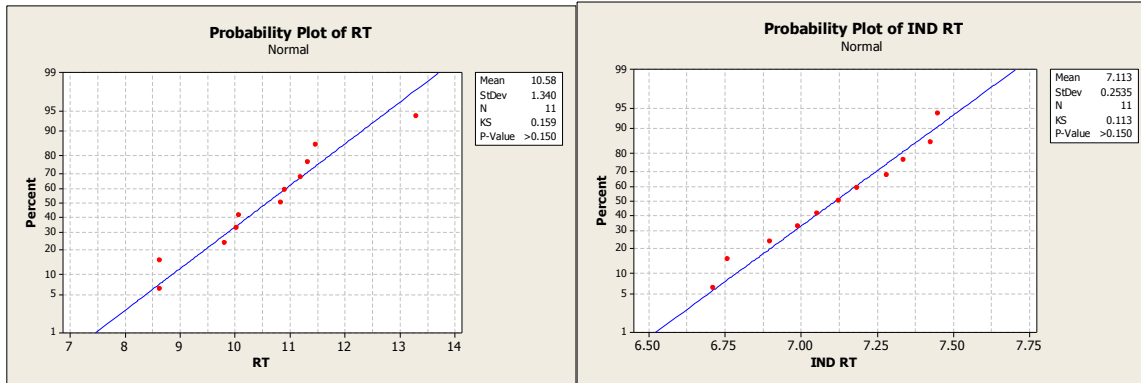
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



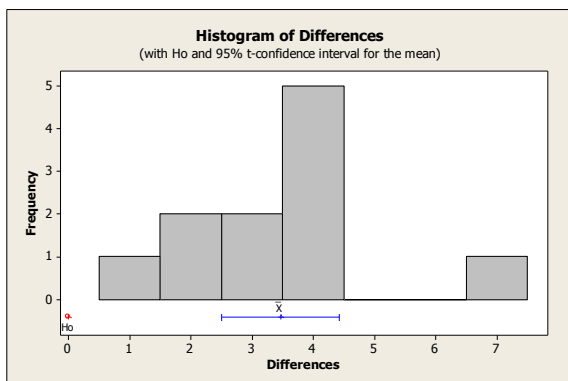
Paired T-Test and CI: BA RT, IND RT

Paired T for BA RT - IND RT

	N	Mean	StDev	SE Mean
BA RT	11	10.576	1.340	0.404
IND RT	11	7.113	0.254	0.076
Difference	11	3.464	1.438	0.434

95% CI for mean difference: (2.498, 4.430)

T-Test of mean difference = 0 (vs not = 0): T-Value = 7.99 P-Value = 0.000



BOEING Asset Management Ratios

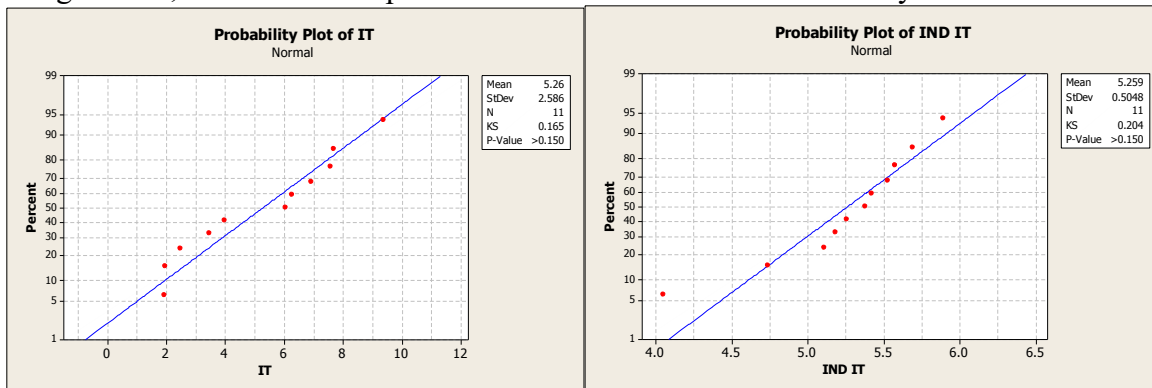
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



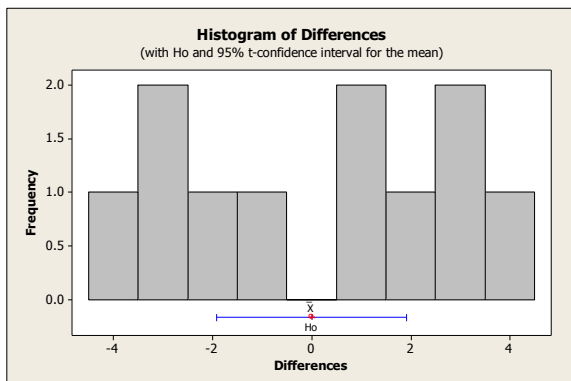
Paired T-Test and CI: BA IT, IND IT

Paired T for BA IT - IND IT

	N	Mean	StDev	SE Mean
BA IT	11	5.260	2.586	0.780
IND IT	11	5.259	0.505	0.152
Difference	11	0.001	2.856	0.861

95% CI for mean difference: (-1.918, 1.919)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.00 P-Value = 0.999



BOEING Asset Management Ratios

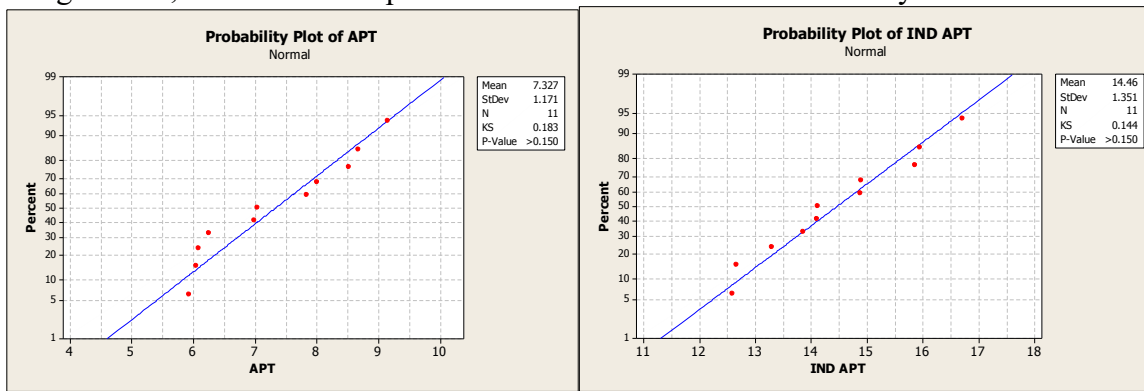
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying of suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



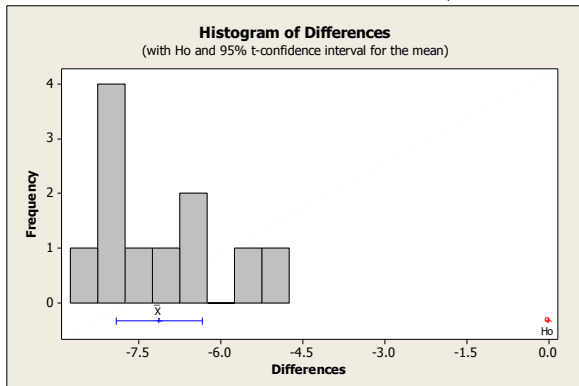
Paired T-Test and CI: BA APT, IND APT

Paired T for BA APT - IND APT

	N	Mean	StDev	SE Mean
BA APT	11	7.327	1.171	0.353
IND APT	11	14.456	1.351	0.407
Difference	11	-7.129	1.178	0.355

95% CI for mean difference: (-7.921, -6.338)

T-Test of mean difference = 0 (vs not = 0): T-Value = -20.07 P-Value = 0.000



BOEING Asset Management Ratios

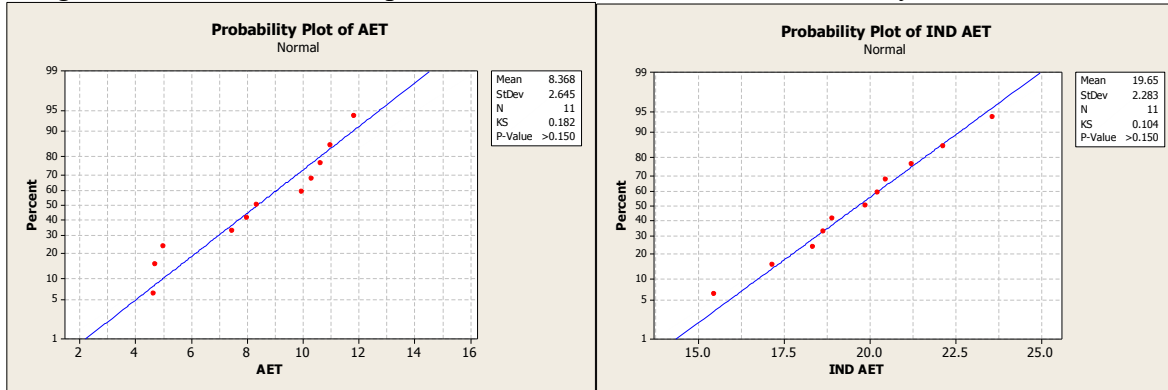
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



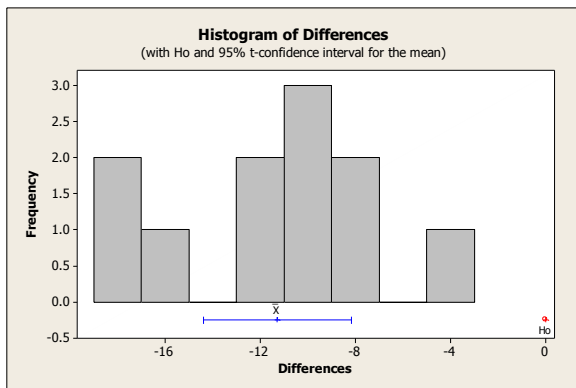
Paired T-Test and CI: BA AET, IND AET

Paired T for BA AET - IND AET

	N	Mean	StDev	SE Mean
BA AET	11	8.368	2.645	0.797
IND AET	11	19.648	2.283	0.688
Difference	11	-11.28	4.64	1.40

95% CI for mean difference: (-14.40, -8.16)

T-Test of mean difference = 0 (vs not = 0): T-Value = -8.06 P-Value = 0.000



BOEING Asset Management Ratios

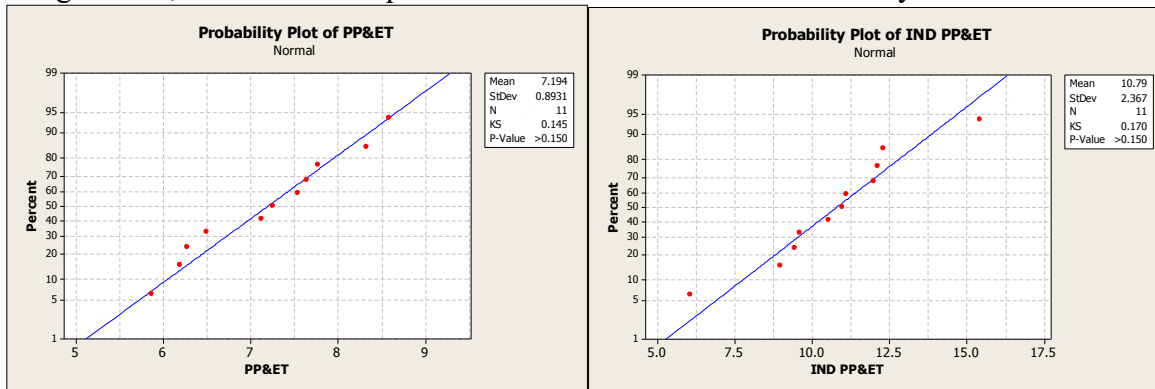
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



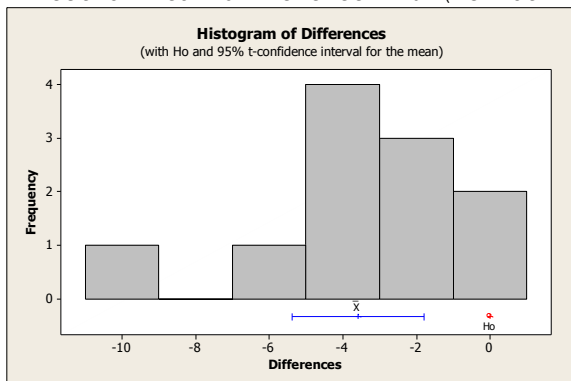
Paired T-Test and CI: BA PP&ET, IND PP&ET

Paired T for BA PP&ET - IND PP&ET

	N	Mean	StDev	SE Mean
BA PP&ET	11	7.194	0.893	0.269
IND PP&ET	11	10.787	2.367	0.714
Difference	11	-3.593	2.670	0.805

95% CI for mean difference: (-5.386, -1.799)

T-Test of mean difference = 0 (vs not = 0): T-Value = -4.46 P-Value = 0.001



BOEING Asset Management Ratios

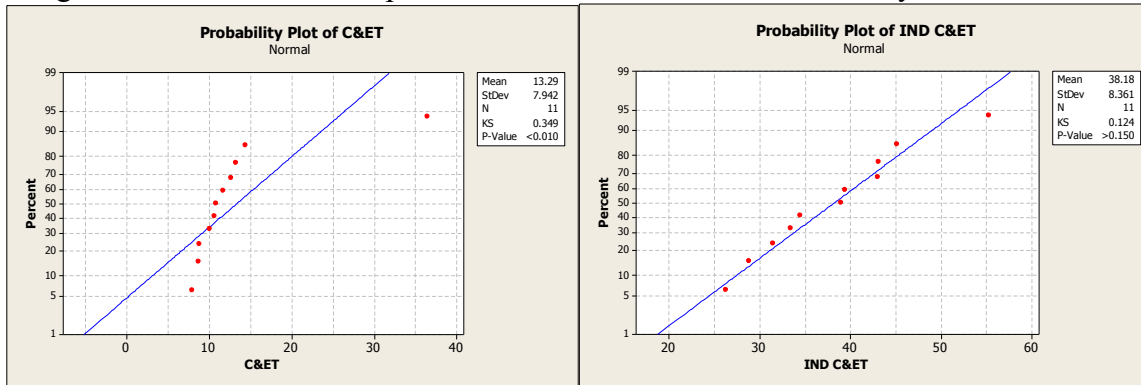
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: C&ET, IND C&ET

Paired test for C&ET - IND C&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated
Difference	11	11	Statistic	0.005	Median
			1.0		-26.27

	N	Estimated	Achieved	Confidence Interval	
Difference	11	Median	Confidence	Lower	Upper
		-26.3	95.5	-32.6	-18.0

BOEING Per Share Ratios

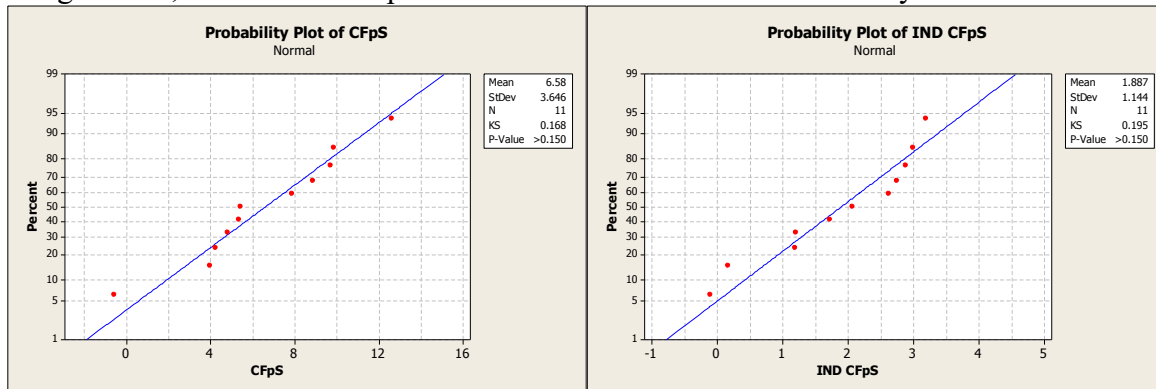
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



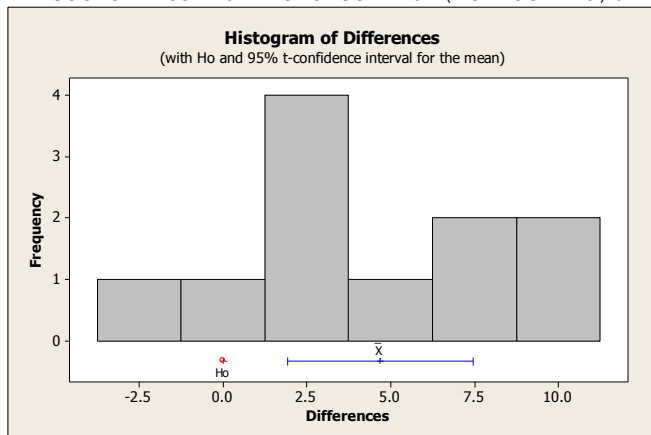
Paired T-Test and CI: BA CFpS, IND CFpS

Paired T for BA CFpS - IND CFpS

	N	Mean	StDev	SE Mean
BA CFpS	11	6.58	3.65	1.10
IND CFpS	11	1.89	1.14	0.34
Difference	11	4.69	4.11	1.24

95% CI for mean difference: (1.93, 7.46)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.78 P-Value = 0.004



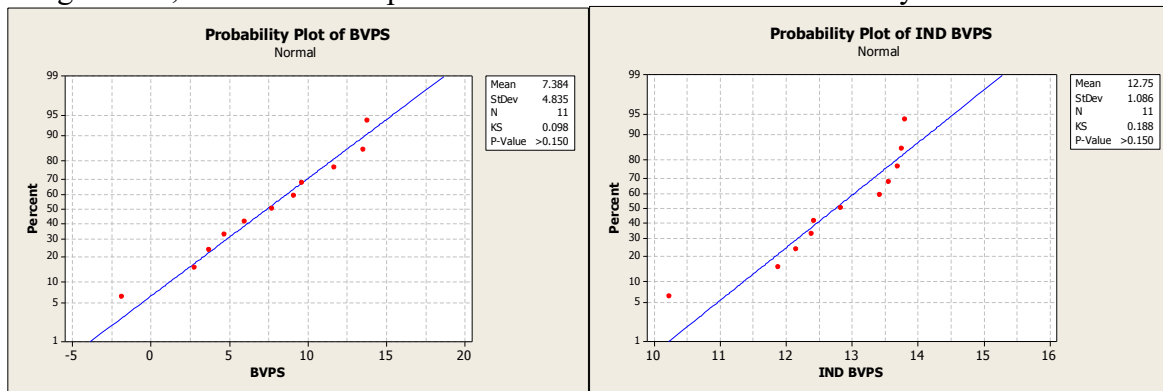
BOEING Per Share Ratios
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



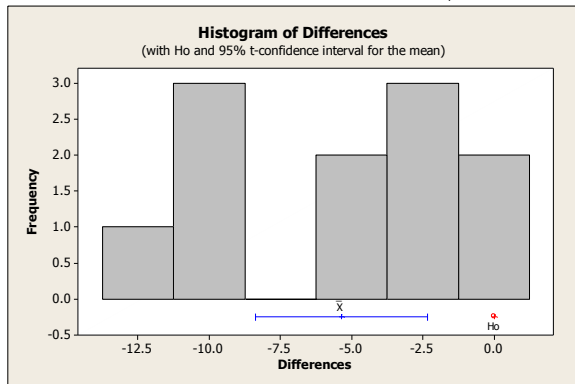
Paired T-Test and CI: BA BVPS, IND BVPS

Paired T for BA BVPS - IND BVPS

	N	Mean	StDev	SE Mean
BA BVPS	11	7.38	4.84	1.46
IND BVPS	11	12.75	1.09	0.33
Difference	11	-5.37	4.50	1.36

95% CI for mean difference: (-8.39, -2.35)

T-Test of mean difference = 0 (vs not = 0): T-Value = -3.96 P-Value = 0.003



CATERPILLAR Profitability Ratios

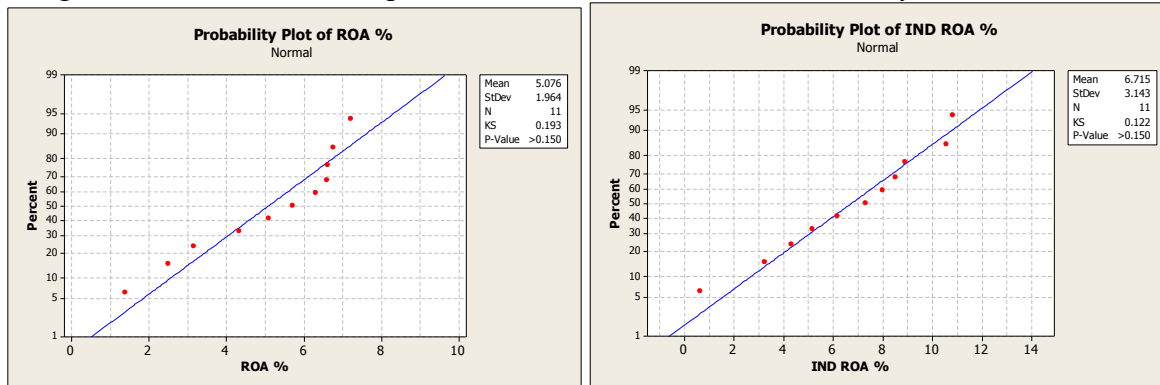
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



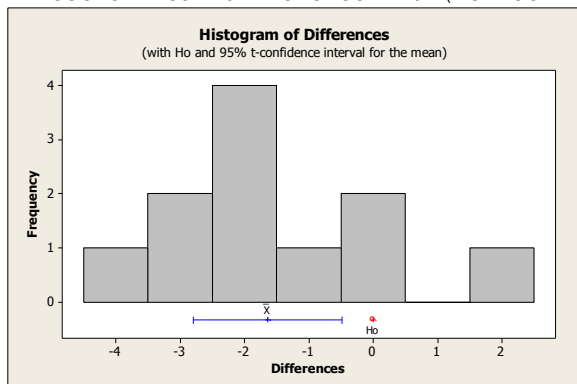
Paired T-Test and CI: CAT ROA %, IND ROA %

Paired T for CAT ROA % - IND ROA %

	N	Mean	StDev	SE Mean
CAT ROA %	11	5.076	1.964	0.592
IND ROA %	11	6.715	3.143	0.948
Difference	11	-1.638	1.719	0.518

95% CI for mean difference: (-2.793, -0.483)

T-Test of mean difference = 0 (vs not = 0): T-Value = -3.16 P-Value = 0.010



CATERPILLAR Profitability Ratios

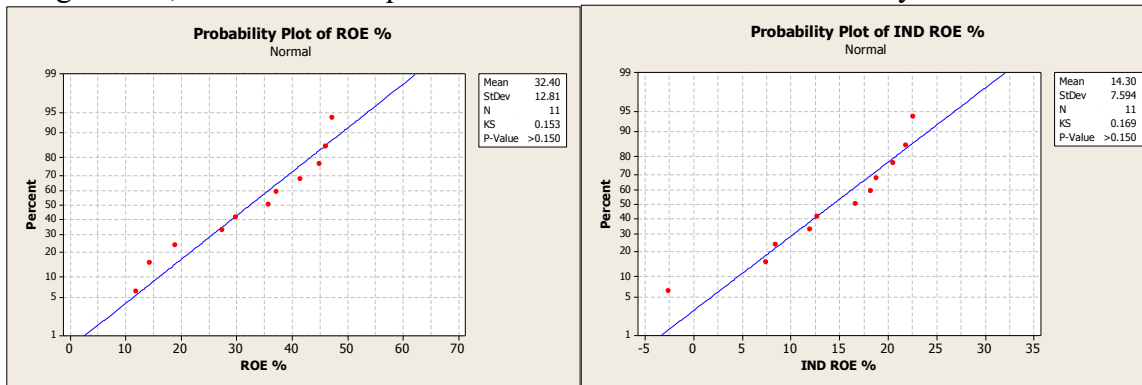
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



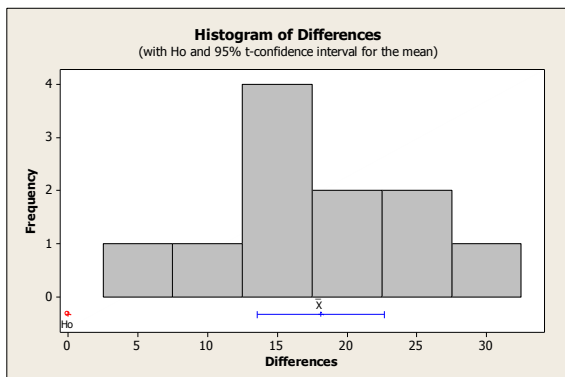
Paired T-Test and CI: CAT ROE %, IND ROE %

Paired T for CAT ROE % - IND ROE %

	N	Mean	StDev	SE Mean
CAT ROE %	11	32.40	12.81	3.86
IND ROE %	11	14.30	7.59	2.29
Difference	11	18.10	6.79	2.05

95% CI for mean difference: (13.54, 22.66)

T-Test of mean difference = 0 (vs not = 0): T-Value = 8.84 P-Value = 0.000



CATERPILLAR Profitability Ratios

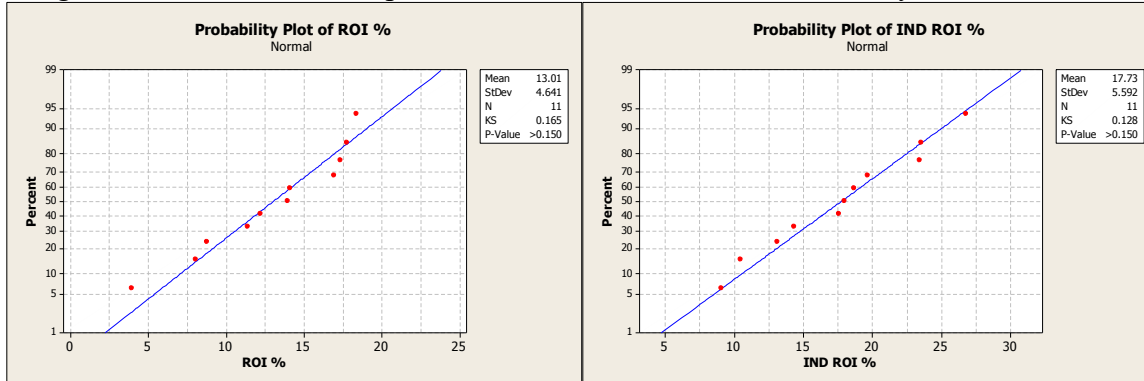
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



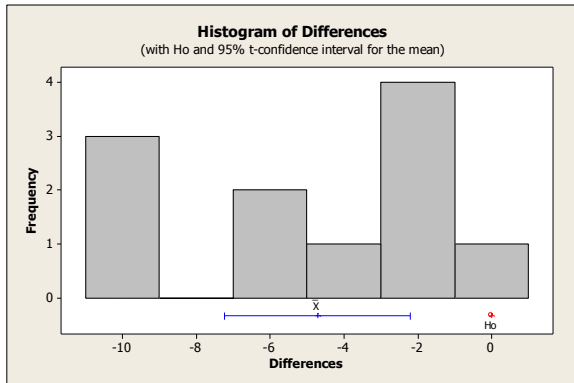
Paired T-Test and CI: CAT ROI %, IND ROI %

Paired T for CAT ROI % - IND ROI %

	N	Mean	StDev	SE Mean
CAT ROI %	11	13.01	4.64	1.40
IND ROI %	11	17.73	5.59	1.69
Difference	11	-4.72	3.75	1.13

95% CI for mean difference: (-7.24, -2.20)

T-Test of mean difference = 0 (vs not = 0): T-Value = -4.17 P-Value = 0.002



CATERPILLAR Profitability Ratios

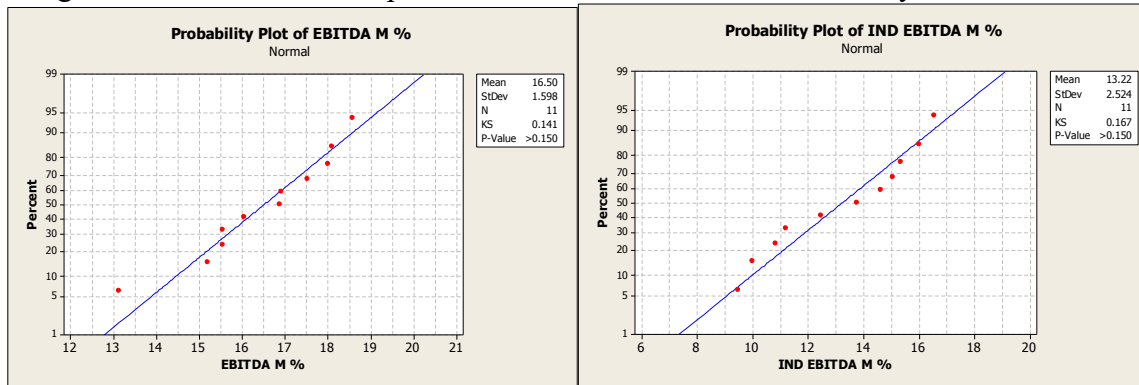
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



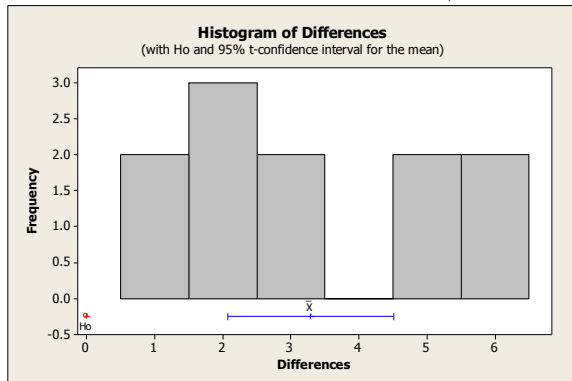
Paired T-Test and CI: CAT EBITDA M %, IND EBITDA M %

Paired T for CAT EBITDA M % - IND EBITDA M %

	N	Mean	StDev	SE Mean
CAT EBITDA M %	11	16.505	1.598	0.482
IND EBITDA M %	11	13.215	2.524	0.761
Difference	11	3.289	1.814	0.547

95% CI for mean difference: (2.071, 4.508)

T-Test of mean difference = 0 (vs not = 0): T-Value = 6.01 P-Value = 0.000



CATERPILLAR Profitability Ratios

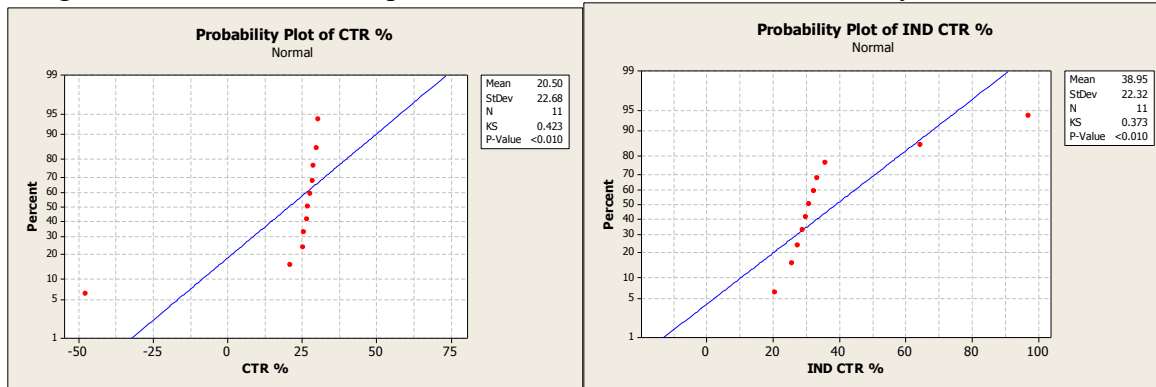
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: CTR %, IND CTR %

Paired test for CTR % - IND CTR %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	13.0	0.083	-7.225

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-7.2	95.5	-41.6	0.3

CATERPILLAR Profitability Ratios

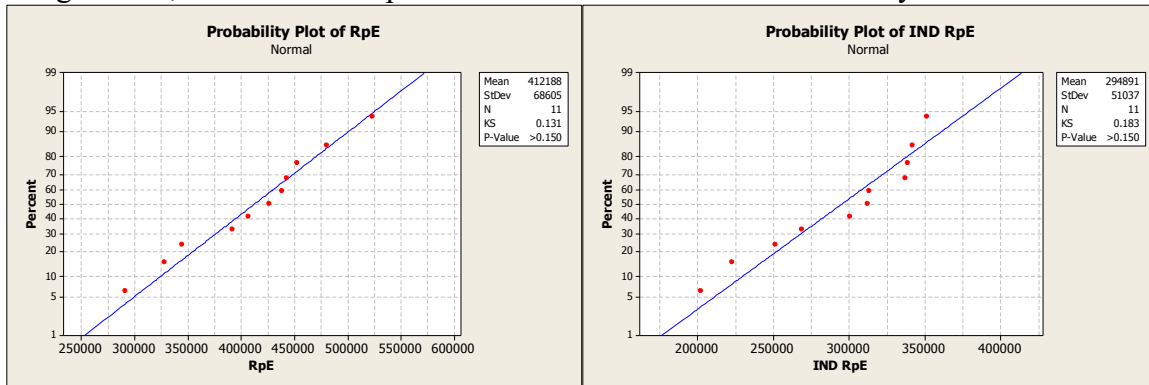
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



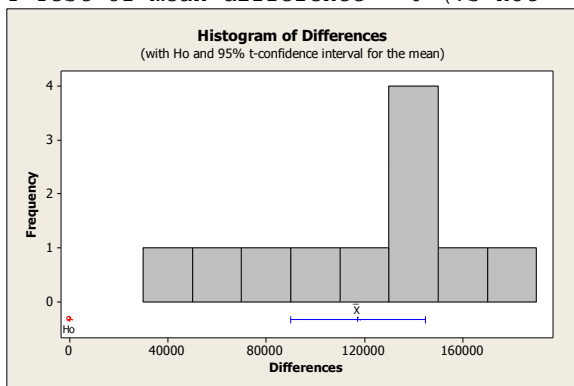
Paired T-Test and CI: CAT RpE, IND RpE

Paired T for CAT RpE - IND RpE

	N	Mean	StDev	SE Mean
CAT RpE	11	412188	68605	20685
IND RpE	11	294891	51037	15388
Difference	11	117297	40674	12264

95% CI for mean difference: (89972, 144622)

T-Test of mean difference = 0 (vs not = 0): T-Value = 9.56 P-Value = 0.000



CATERPILLAR Liquidity Ratios

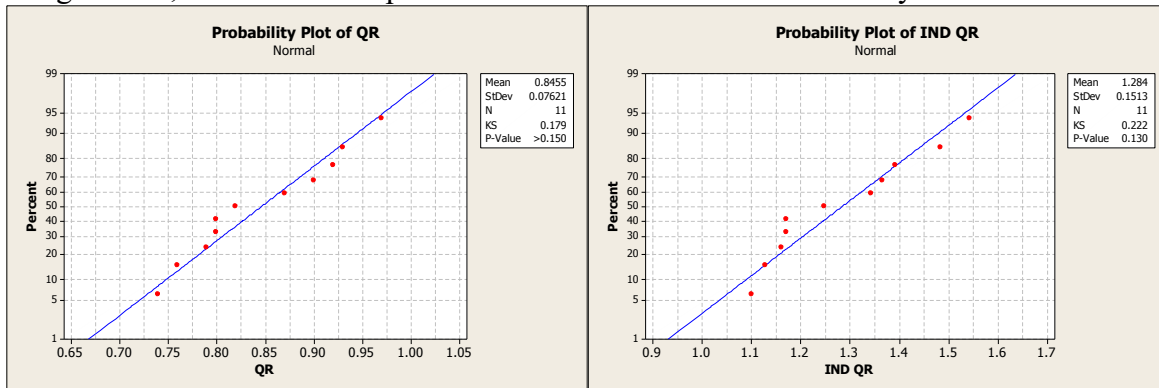
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



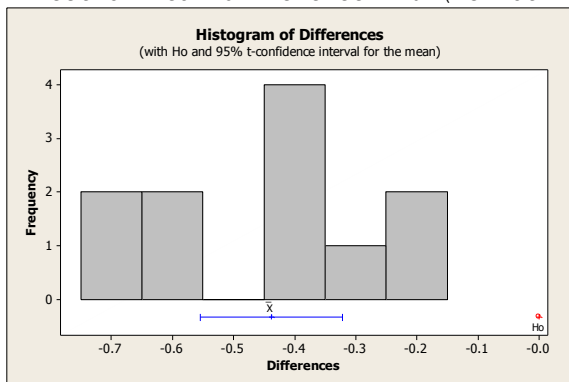
Paired T-Test and CI: CAT QR, IND QR

Paired T for CAT QR - IND QR

	N	Mean	StDev	SE Mean
CAT QR	11	0.8455	0.0762	0.0230
IND QR	11	1.2838	0.1513	0.0456
Difference	11	-0.4383	0.1734	0.0523

95% CI for mean difference: (-0.5548, -0.3218)

T-Test of mean difference = 0 (vs not = 0): T-Value = -8.38 P-Value = 0.000



CATERPILLAR Liquidity Ratios

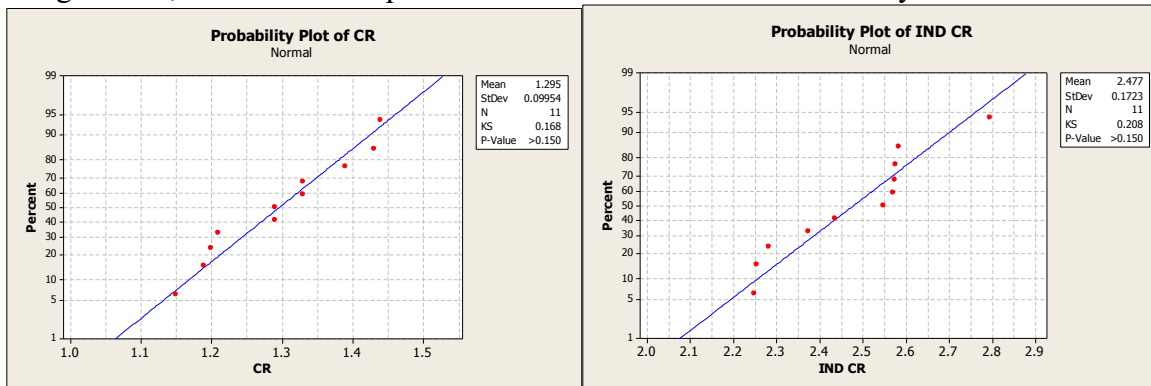
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



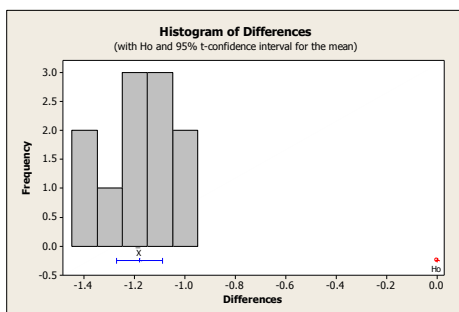
Paired T-Test and CI: CAT CR, IND CR

Paired T for CAT CR - IND CR

	N	Mean	StDev	SE Mean
CAT CR	11	1.2955	0.0995	0.0300
IND CR	11	2.4770	0.1723	0.0519
Difference	11	-1.1815	0.1348	0.0406

95% CI for mean difference: (-1.2721, -1.0910)

T-Test of mean difference = 0 (vs not = 0): T-Value = -29.07 P-Value = 0.000



CATERPILLAR Liquidity Ratios

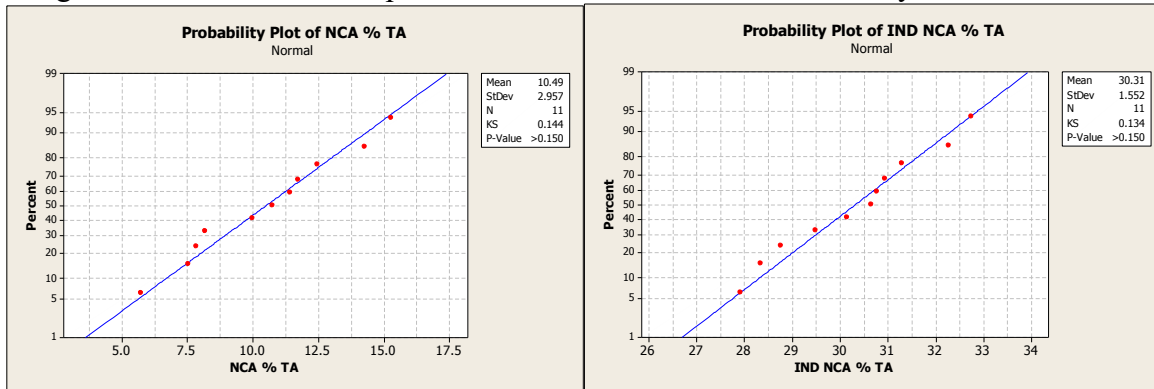
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



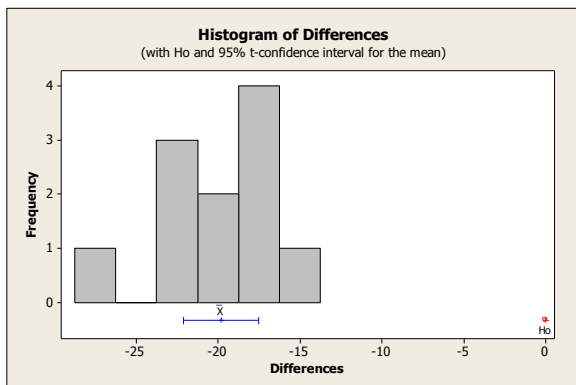
Paired T-Test and CI: CAT NCA % TA, IND NCA % TA

Paired T for CAT NCA % TA - IND NCA % TA

	N	Mean	StDev	SE Mean
CAT NCA % TA	11	10.493	2.957	0.892
IND NCA % TA	11	30.310	1.552	0.468
Difference	11	-19.82	3.40	1.03

95% CI for mean difference: (-22.10, -17.53)

T-Test of mean difference = 0 (vs not = 0): T-Value = -19.32 P-Value = 0.000



CATERPILLAR Debt Management Ratios

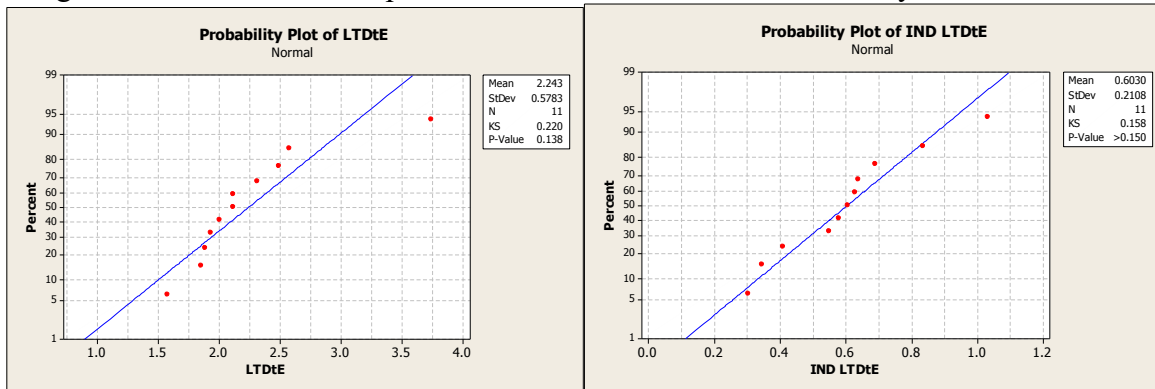
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



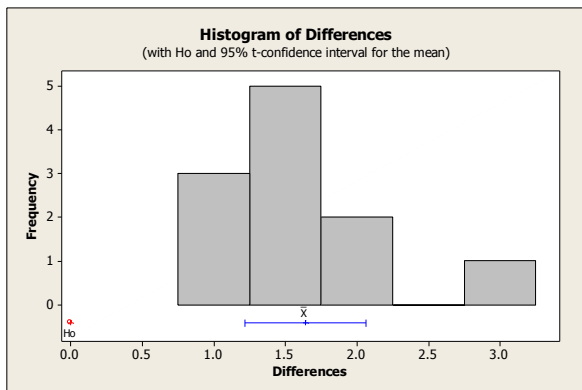
Paired T-Test and CI: LTDtE, IND LTDtE

Paired T for LTDtE - IND LTDtE

	N	Mean	StDev	SE Mean
LTDtE	11	2.243	0.578	0.174
IND LTDtE	11	0.603	0.211	0.064
Difference	11	1.640	0.629	0.190

95% CI for mean difference: (1.217, 2.062)

T-Test of mean difference = 0 (vs not = 0): T-Value = 8.65 P-Value = 0.000



CATERPILLAR Debt Management Ratios

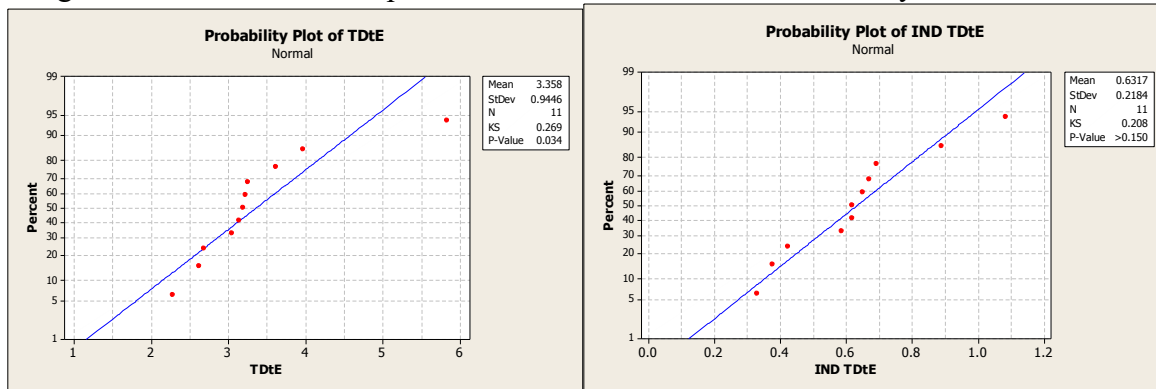
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	66.0	0.004	2.533

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	2.53	95.5	2.08	3.60

CATERPILLAR Debt Management Ratios

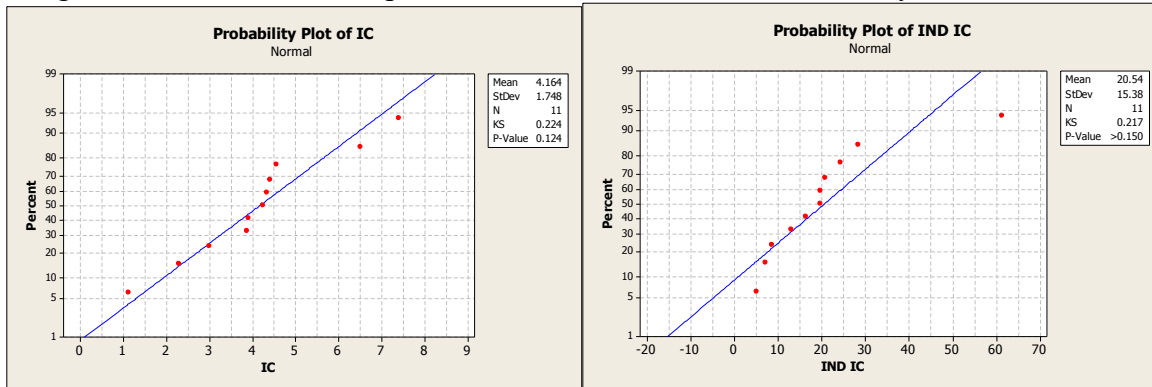
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



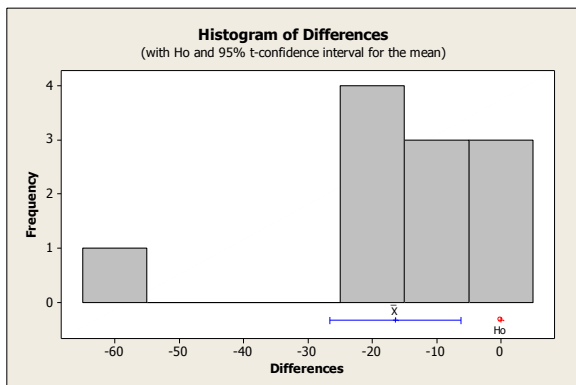
Paired T-Test and CI: IC, IND IC

Paired T for IC - IND IC

	N	Mean	StDev	SE Mean
IC	11	4.16	1.75	0.53
IND IC	11	20.54	15.38	4.64
Difference	11	-16.37	15.17	4.57

95% CI for mean difference: (-26.56, -6.19)

T-Test of mean difference = 0 (vs not = 0): T-Value = -3.58 P-Value = 0.005



CATERPILLAR Asset Management Ratios

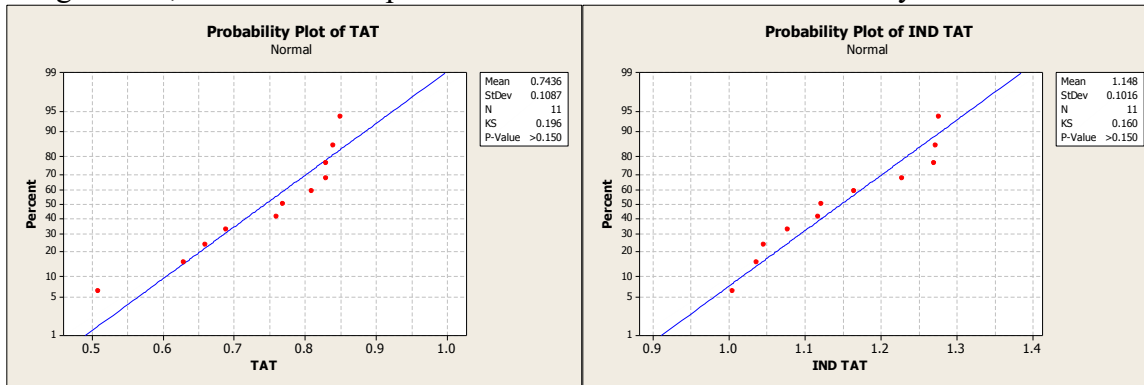
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



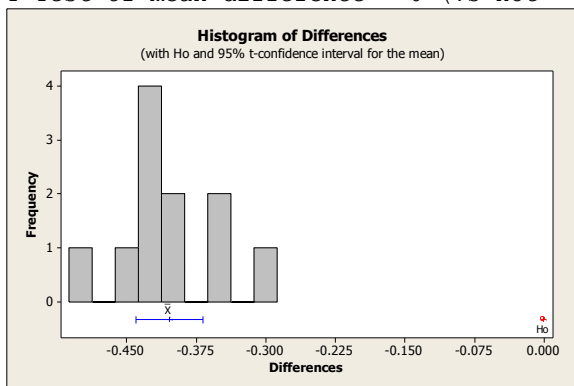
Paired T-Test and CI: CAT TAT, IND TAT

Paired T for CAT TAT - IND TAT

	N	Mean	StDev	SE Mean
CAT TAT	11	0.7436	0.1087	0.0328
IND TAT	11	1.1476	0.1016	0.0306
Difference	11	-0.4039	0.0542	0.0163

95% CI for mean difference: (-0.4403, -0.3675)

T-Test of mean difference = 0 (vs not = 0): T-Value = -24.72 P-Value = 0.000



CATERPILLAR Asset Management Ratios

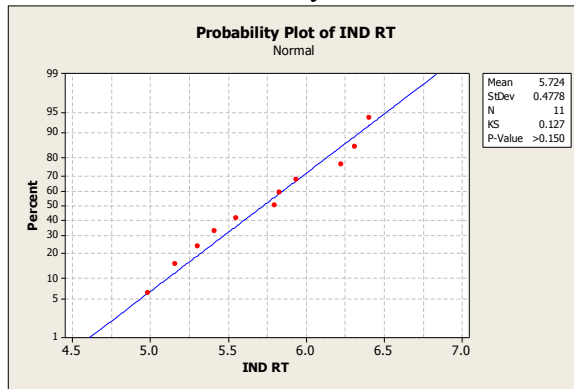
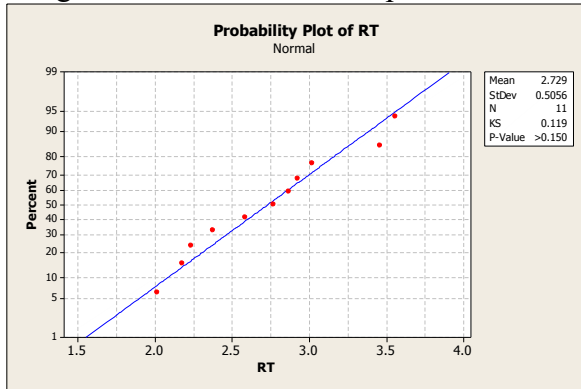
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



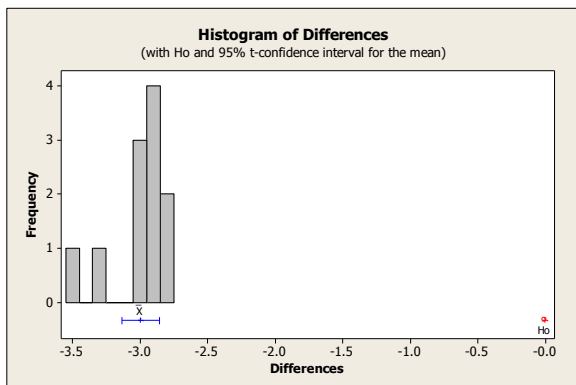
Paired T-Test and CI: CAT RT, IND RT

Paired T for CAT RT - IND RT

	N	Mean	StDev	SE Mean
CAT RT	11	2.729	0.506	0.152
IND RT	11	5.724	0.478	0.144
Difference	11	-2.9945	0.2099	0.0633

95% CI for mean difference: (-3.1355, -2.8534)

T-Test of mean difference = 0 (vs not = 0): T-Value = -47.31 P-Value = 0.000



CATERPILLAR Asset Management Ratios

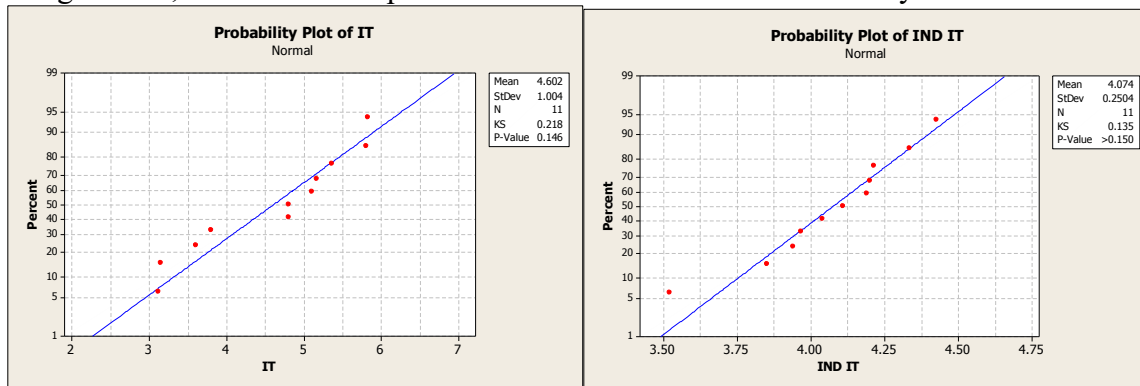
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



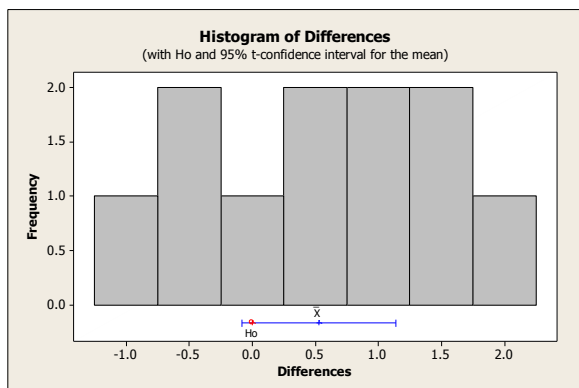
Paired T-Test and CI: CAT IT, IND IT

Paired T for CAT IT - IND IT

	N	Mean	StDev	SE Mean
CAT IT	11	4.602	1.004	0.303
IND IT	11	4.074	0.250	0.075
Difference	11	0.528	0.910	0.274

95% CI for mean difference: (-0.083, 1.139)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.92 P-Value = 0.083



CATERPILLAR Asset Management Ratios

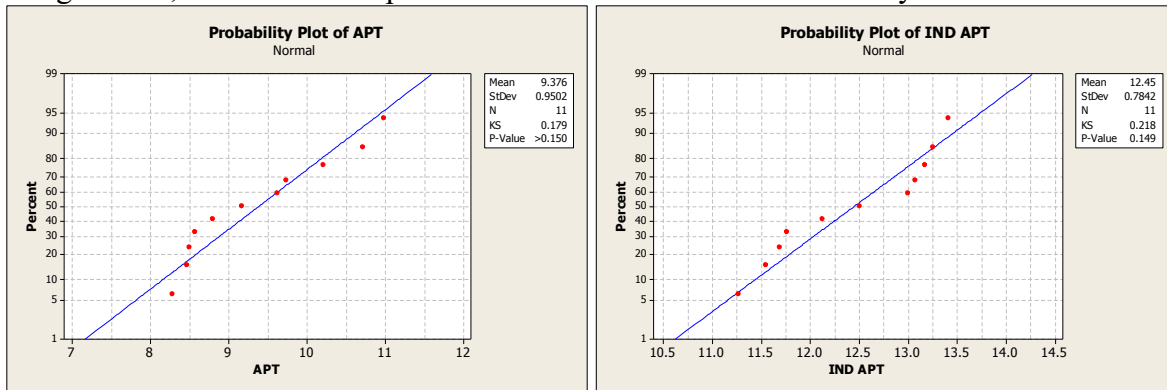
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying off suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



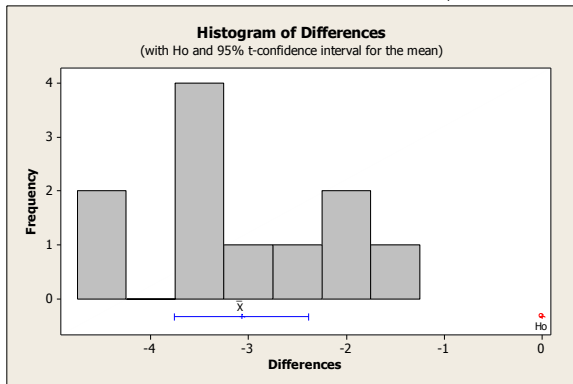
Paired T-Test and CI: CAT APT, IND APT

Paired T for CAT APT - IND APT

	N	Mean	StDev	SE Mean
CAT APT	11	9.376	0.950	0.286
IND APT	11	12.446	0.784	0.236
Difference	11	-3.069	1.017	0.307

95% CI for mean difference: (-3.753, -2.386)

T-Test of mean difference = 0 (vs not = 0): T-Value = -10.01 P-Value = 0.000



CATERPILLAR Asset Management Ratios

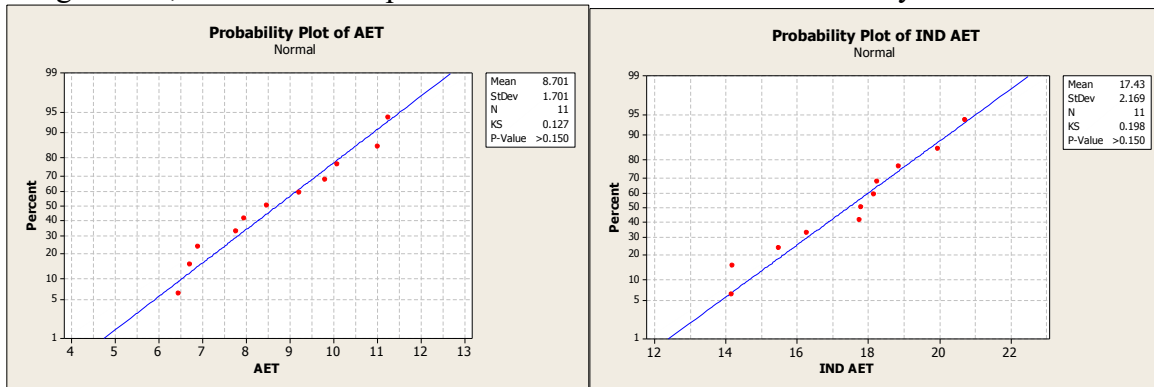
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



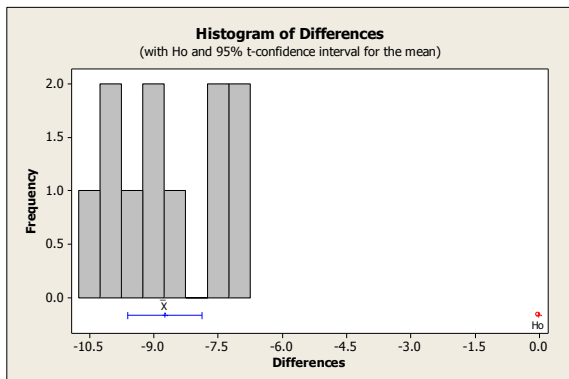
Paired T-Test and CI: CAT AET, IND AET

Paired T for CAT AET - IND AET

	N	Mean	StDev	SE Mean
CAT AET	11	8.701	1.701	0.513
IND AET	11	17.433	2.169	0.654
Difference	11	-8.732	1.293	0.390

95% CI for mean difference: (-9.600, -7.863)

T-Test of mean difference = 0 (vs not = 0): T-Value = -22.41 P-Value = 0.000



CATERPILLAR Asset Management Ratios

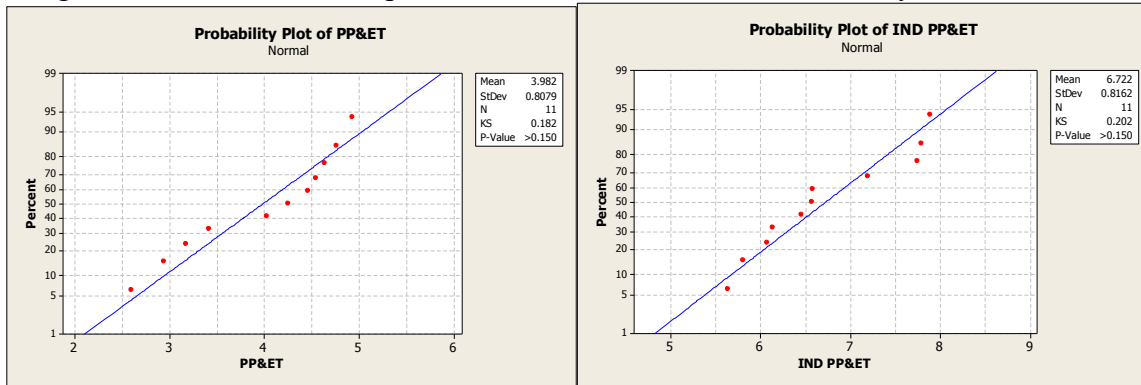
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



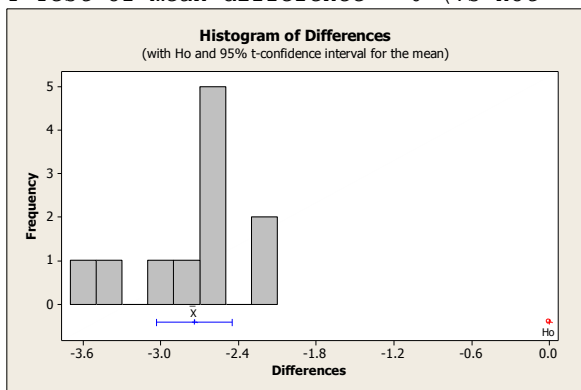
Paired T-Test and CI: CAT PP&ET, IND PP&ET

Paired T for CAT PP&ET - IND PP&ET

	N	Mean	StDev	SE Mean
CAT PP&ET	11	3.982	0.808	0.244
IND PP&ET	11	6.722	0.816	0.246
Difference	11	-2.740	0.432	0.130

95% CI for mean difference: (-3.030, -2.449)

T-Test of mean difference = 0 (vs not = 0): T-Value = -21.02 P-Value = 0.000



CATERPILLAR Asset Management Ratios

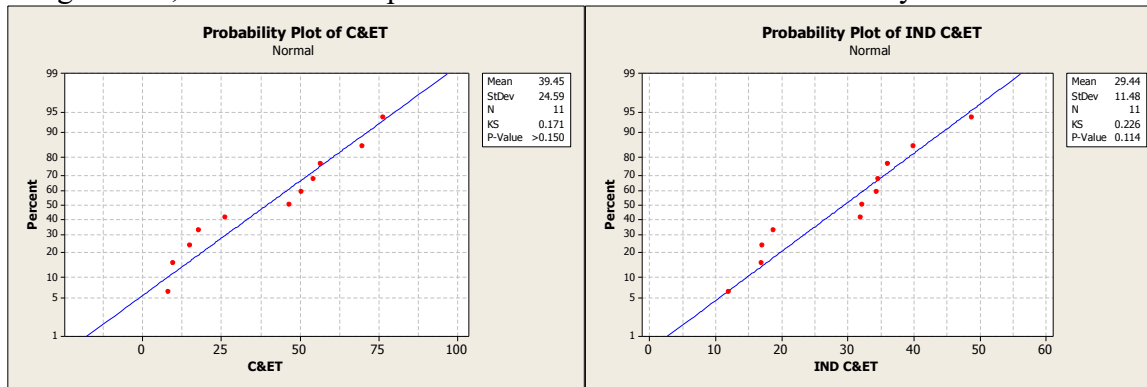
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



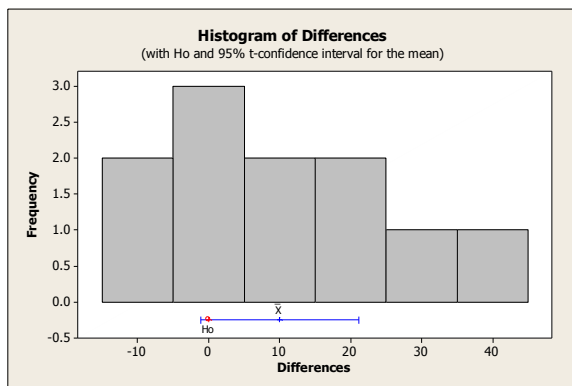
Paired T-Test and CI: CAT C&ET, IND C&ET

Paired T for CAT C&ET - IND C&ET

	N	Mean	StDev	SE Mean
CAT C&ET	11	39.45	24.59	7.41
IND C&ET	11	29.44	11.48	3.46
Difference	11	10.01	16.60	5.01

95% CI for mean difference: (-1.15, 21.16)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.00 P-Value = 0.073



CATERPILLAR Per Share Ratios

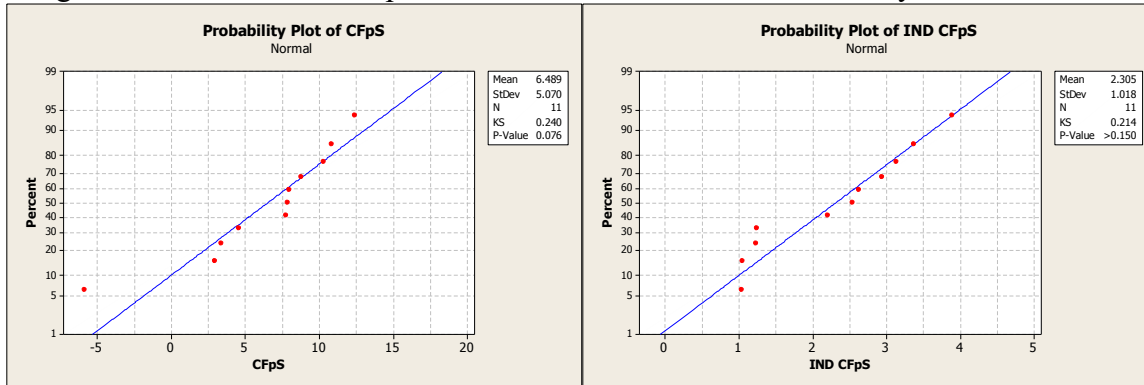
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



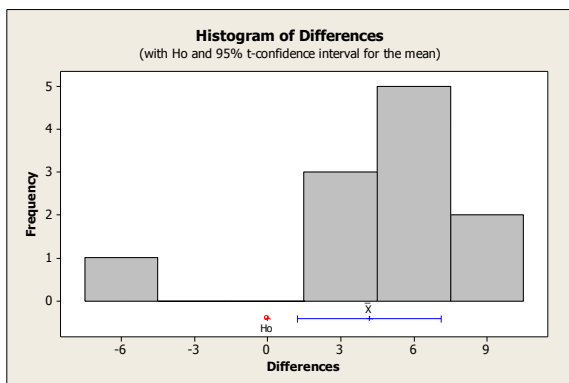
Paired T-Test and CI: CAT CFpS, IND CFpS

Paired T for CAT CFpS - IND CFpS

	N	Mean	StDev	SE Mean
CAT CFpS	11	6.49	5.07	1.53
IND CFpS	11	2.30	1.02	0.31
Difference	11	4.18	4.39	1.32

95% CI for mean difference: (1.23, 7.14)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.16 P-Value = 0.010



CATERPILLAR Per Share Ratios

CATERPILLAR Per Share Ratios

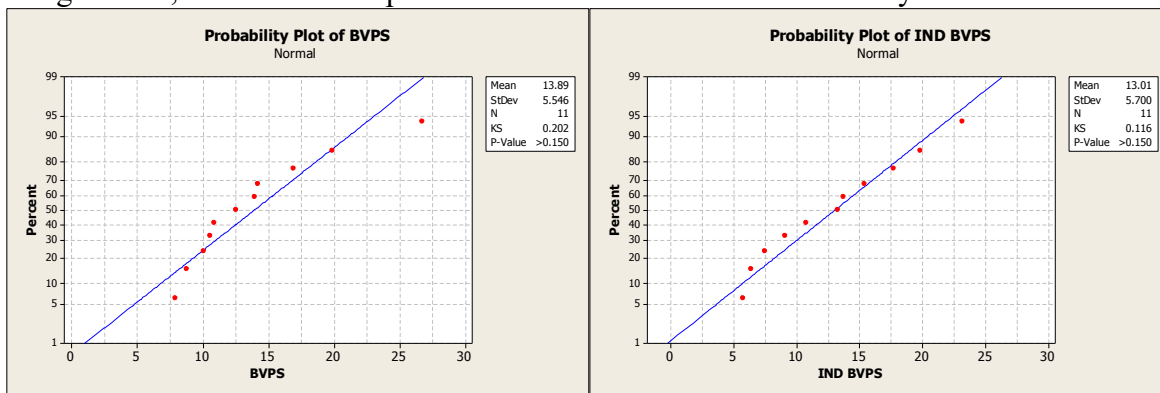
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



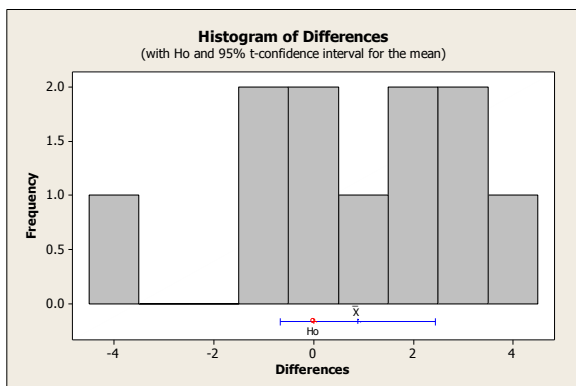
Paired T-Test and CI: CAT BVPS, IND BVPS

Paired T for CAT BVPS - IND BVPS

	N	Mean	StDev	SE Mean
CAT BVPS	11	13.89	5.55	1.67
IND BVPS	11	13.01	5.70	1.72
Difference	11	0.885	2.318	0.699

95% CI for mean difference: (-0.672, 2.443)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.27 P-Value = 0.234



EASTMAN Profitability Ratios

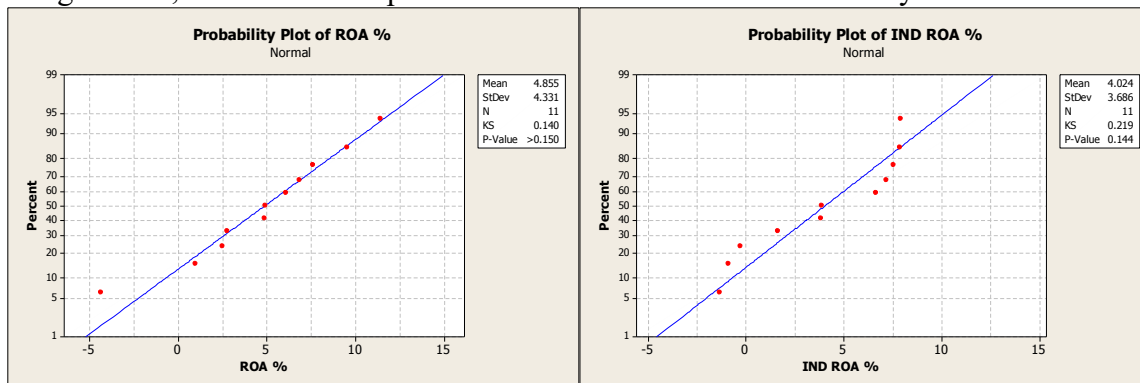
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



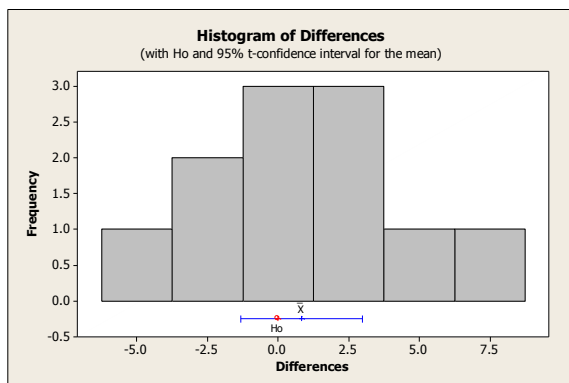
Paired T-Test and CI: EMN ROA %, IND ROA %

Paired T for EMN ROA % - IND ROA %

	N	Mean	StDev	SE Mean
EMN ROA %	11	4.86	4.33	1.31
IND ROA %	11	4.02	3.69	1.11
Difference	11	0.831	3.203	0.966

95% CI for mean difference: (-1.320, 2.983)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.86 P-Value = 0.409



EASTMAN Profitability Ratios

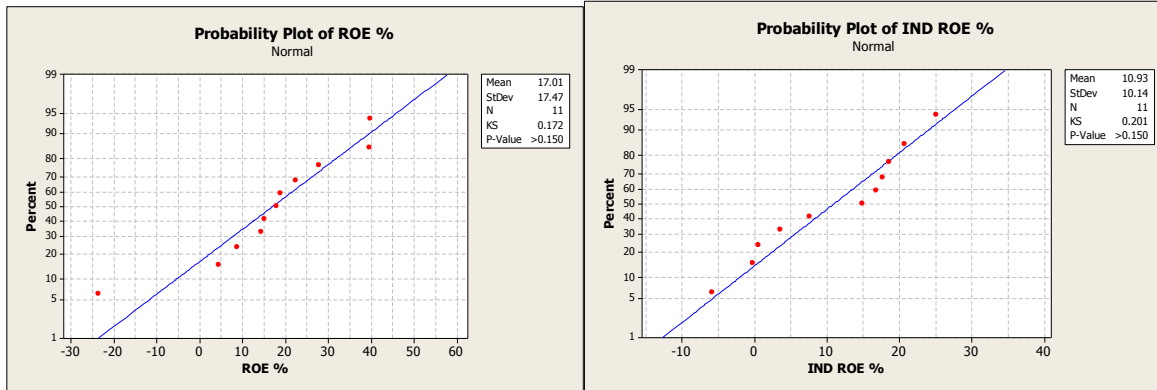
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



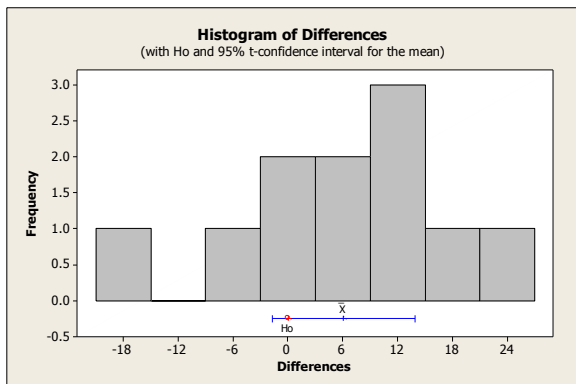
Paired T-Test and CI: EMN ROE %, IND ROE %

Paired T for EMN ROE % - IND ROE %

	N	Mean	StDev	SE Mean
EMN ROE %	11	17.01	17.47	5.27
IND ROE %	11	10.93	10.14	3.06
Difference	11	6.07	11.61	3.50

95% CI for mean difference: (-1.73, 13.87)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.73 P-Value = 0.113



EASTMAN Profitability Ratios

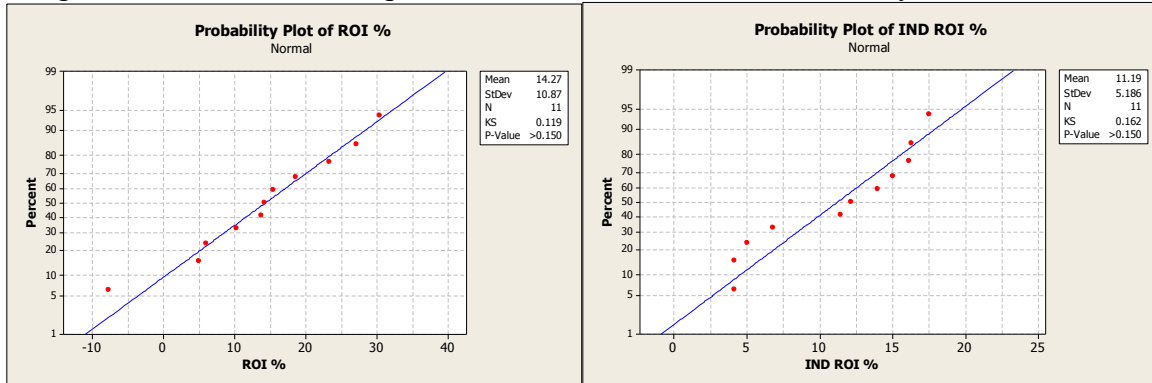
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



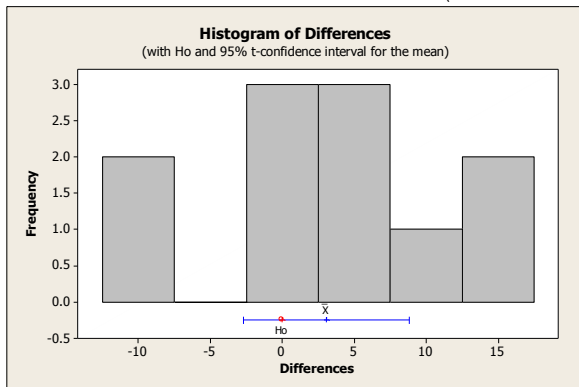
Paired T-Test and CI: EMN ROI %, IND ROI %

Paired T for EMN ROI % - IND ROI %

	N	Mean	StDev	SE Mean
EMN ROI %	11	14.27	10.87	3.28
IND ROI %	11	11.19	5.19	1.56
Difference	11	3.08	8.58	2.59

95% CI for mean difference: (-2.69, 8.84)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.19 P-Value = 0.262



EASTMAN Profitability Ratios

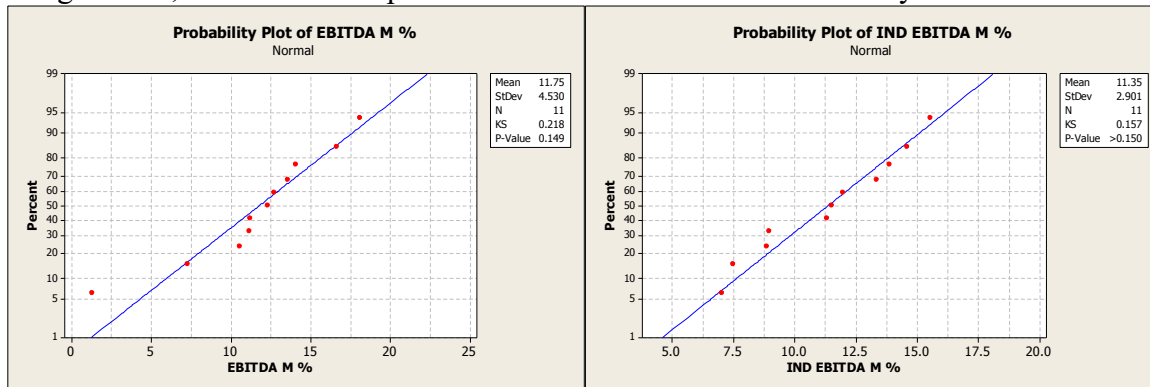
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



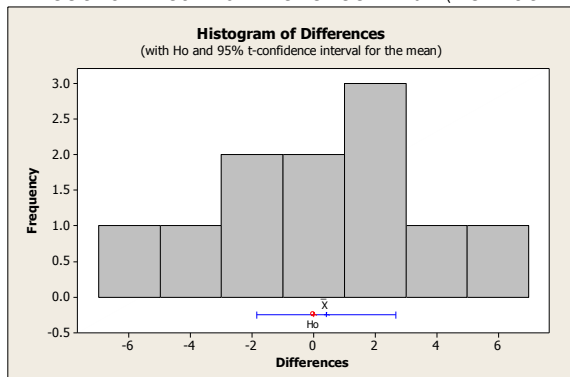
Paired T-Test and CI: EMN EBITDA M %, IND EBITDA M %

Paired T for EMN EBITDA M % - IND EBITDA M %

	N	Mean	StDev	SE Mean
EMN EBITDA M %	11	11.75	4.53	1.37
IND EBITDA M %	11	11.35	2.90	0.87
Difference	11	0.41	3.36	1.01

95% CI for mean difference: (-1.85, 2.67)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.40 P-Value = 0.696



EASTMAN Profitability Ratios

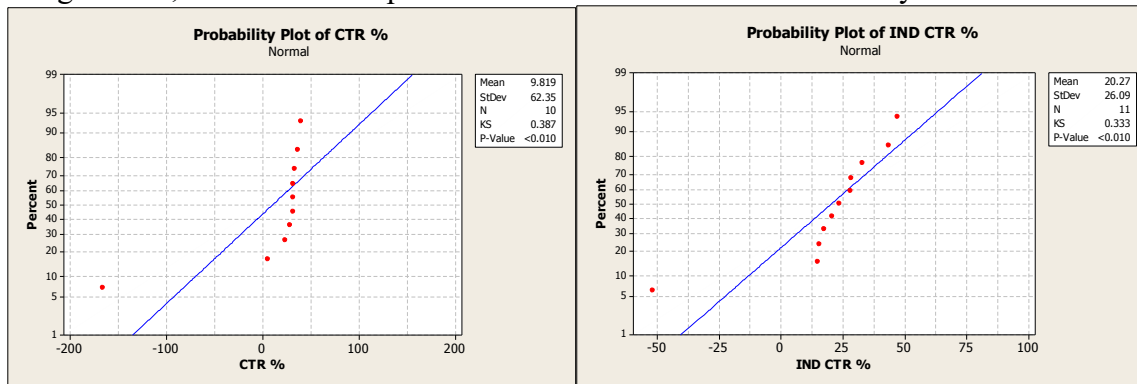
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: CTR %, IND CTR %

Paired test for CTR % - IND CTR %

Test of median = 0.000000 versus median not = 0.000000

	N	N*	N for Test	Wilcoxon Statistic	P	Estimated Median
Difference	10	1	10	26.0	0.919	-1.820

	N	N*	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	10	1	-1.8	94.7	-86.1	11.5

EASTMAN Profitability Ratios

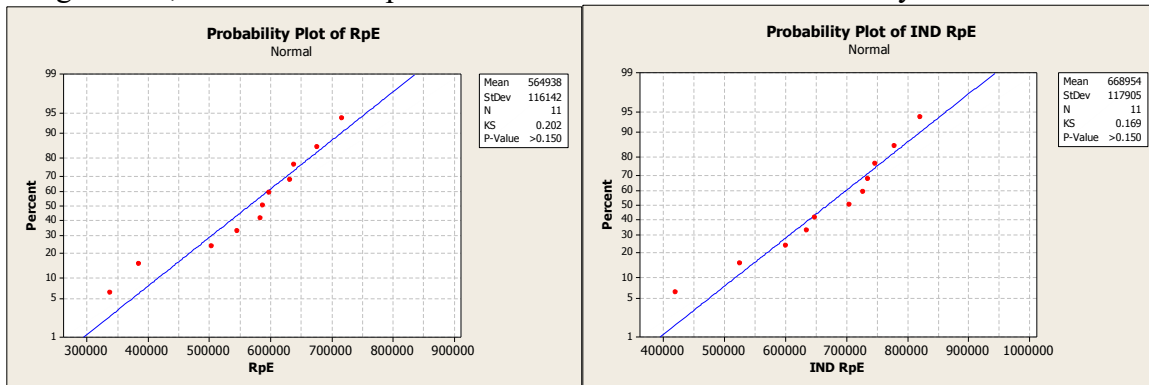
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



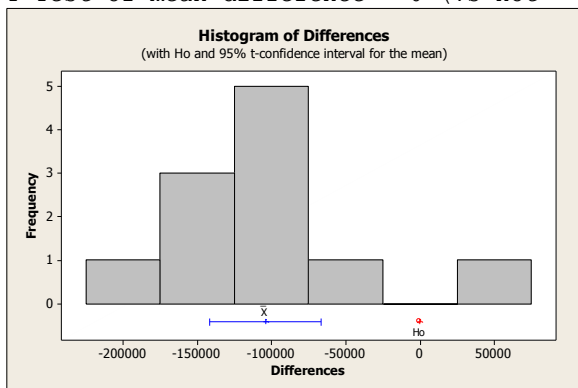
Paired T-Test and CI: EMN RpE, IND RpE

Paired T for EMN RpE - IND RpE

	N	Mean	StDev	SE Mean
EMN RpE	11	564938	116142	35018
IND RpE	11	668954	117905	35550
Difference	11	-104016	55825	16832

95% CI for mean difference: (-141520, -66512)

T-Test of mean difference = 0 (vs not = 0): T-Value = -6.18 P-Value = 0.000



EASTMAN Liquidity Ratios

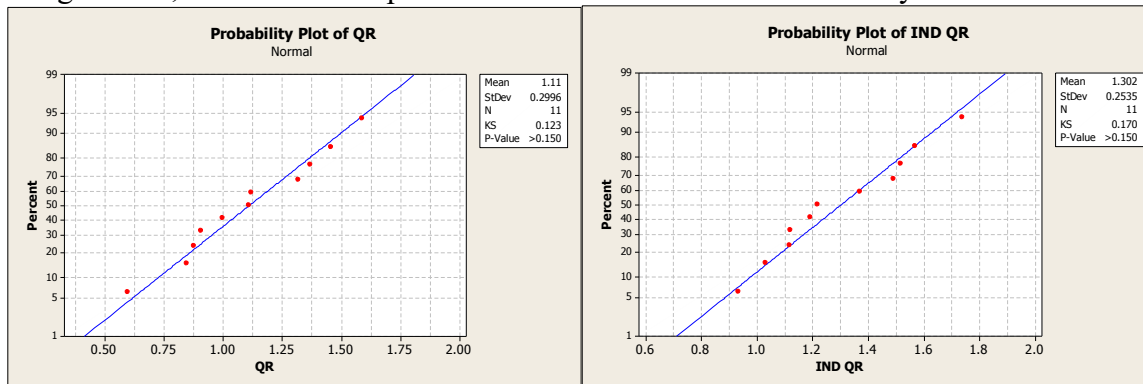
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



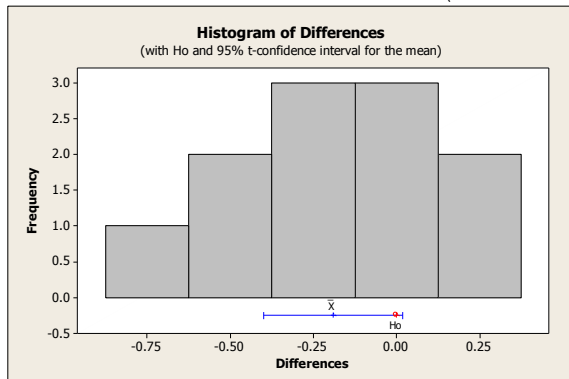
Paired T-Test and CI: EMN QR, IND QR

Paired T for EMN QR - IND QR

	N	Mean	StDev	SE Mean
EMN QR	11	1.1100	0.2996	0.0903
IND QR	11	1.3015	0.2535	0.0764
Difference	11	-0.1915	0.3112	0.0938

95% CI for mean difference: (-0.4006, 0.0175)

T-Test of mean difference = 0 (vs not = 0): T-Value = -2.04 P-Value = 0.068



EASTMAN Liquidity Ratios

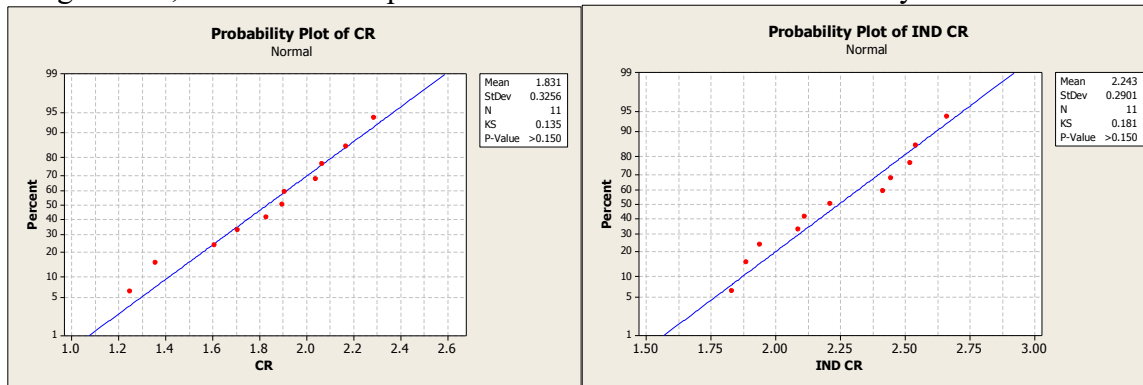
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



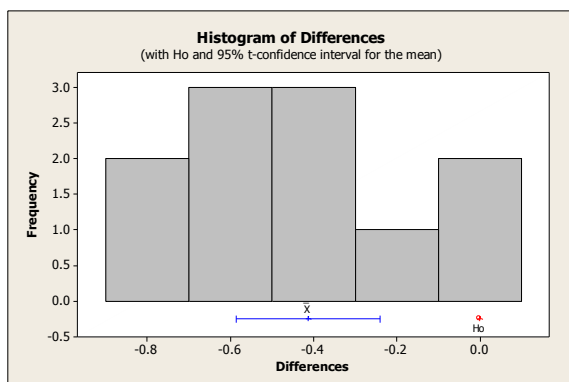
Paired T-Test and CI: EMN CR, IND CR

Paired T for EMN CR - IND CR

	N	Mean	StDev	SE Mean
EMN CR	11	1.8309	0.3256	0.0982
IND CR	11	2.2434	0.2901	0.0875
Difference	11	-0.4124	0.2575	0.0776

95% CI for mean difference: (-0.5854, -0.2394)

T-Test of mean difference = 0 (vs not = 0): T-Value = -5.31 P-Value = 0.000



EASTMAN Liquidity Ratios

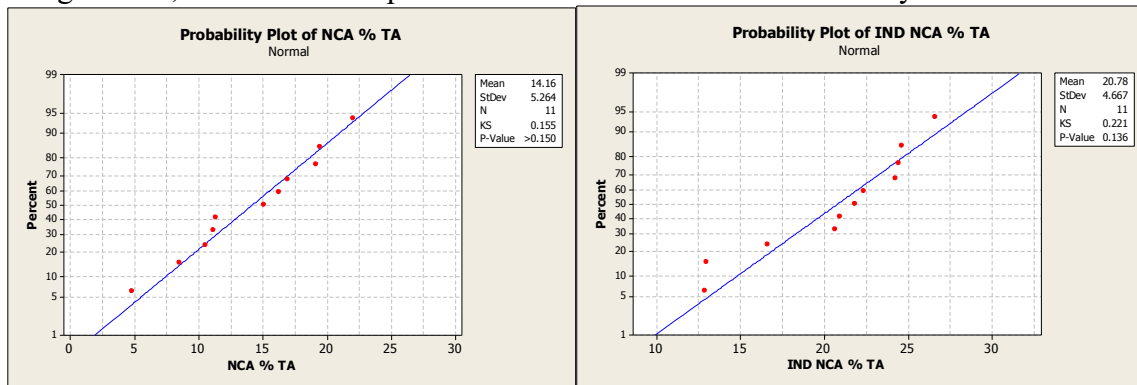
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



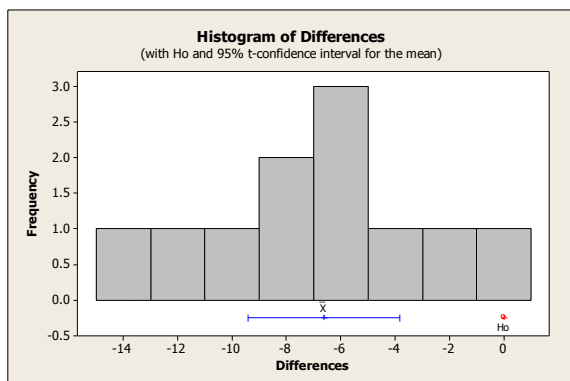
Paired T-Test and CI: EMN NCA % TA, IND NCA % TA

Paired T for EMN NCA % TA - IND NCA % TA

	N	Mean	StDev	SE Mean
EMN NCA % TA	11	14.16	5.26	1.59
IND NCA % TA	11	20.78	4.67	1.41
Difference	11	-6.62	4.15	1.25

95% CI for mean difference: (-9.40, -3.83)

T-Test of mean difference = 0 (vs not = 0): T-Value = -5.29 P-Value = 0.000



EASTMAN Debt Management Ratios

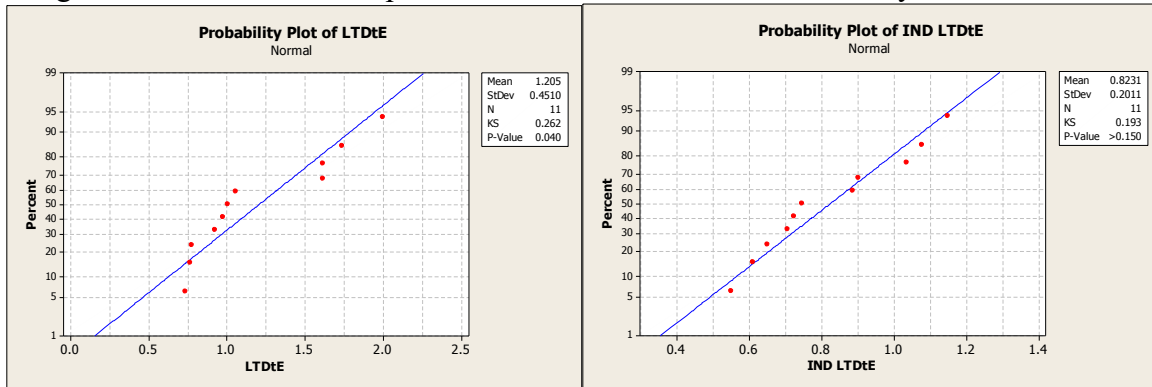
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: LTDtE, IND LTDtE

Paired test for LTDtE - IND LTDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	53.0	0.083	0.3781

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	0.378	95.5	-0.033	0.773

EASTMAN Debt Management Ratios

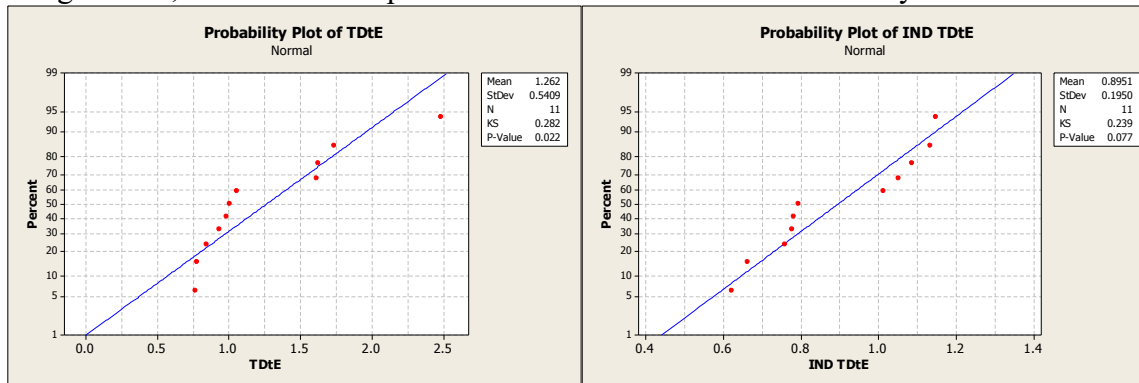
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	53.0	0.083	0.3390

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	0.339	95.5	-0.037	0.781

EASTMAN Debt Management Ratios

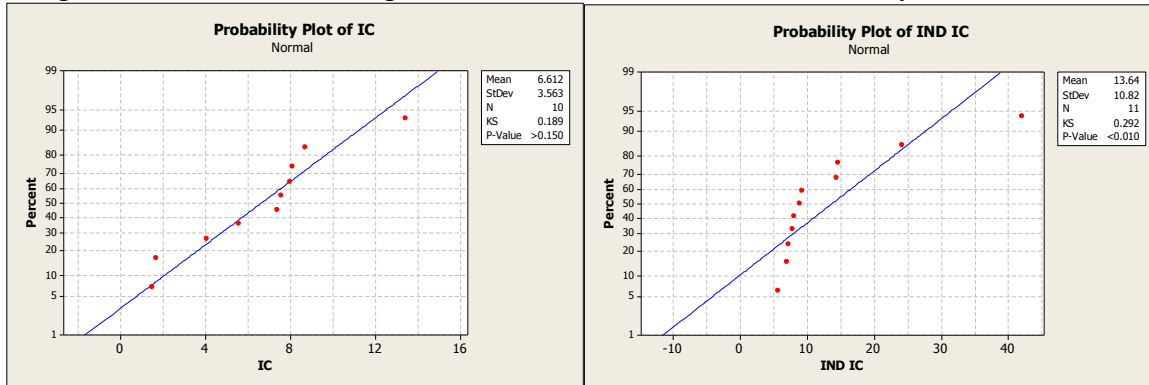
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: IC, IND IC

Paired test for IC - IND IC

Test of median = 0.000000 versus median not = 0.000000

	N	N*	N for Test	Wilcoxon Statistic	P	Estimated Median
Difference	10	1	10	5.0	0.025	-5.898

	N	N*	Estimated Median	Achieved Confidence	Confidence Interval	
					Lower	Upper
Difference	10	1	-5.9	94.7	-17.0	-1.3

EASTMAN Asset Management Ratios

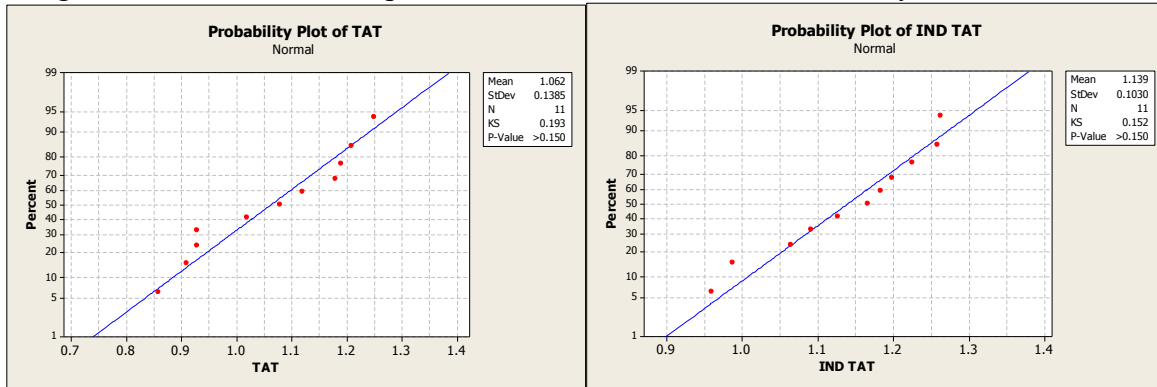
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



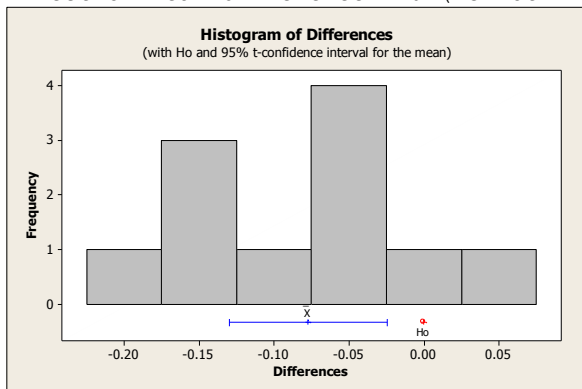
Paired T-Test and CI: EMN TAT, IND TAT

Paired T for EMN TAT - IND TAT

	N	Mean	StDev	SE Mean
EMN TAT	11	1.0618	0.1385	0.0418
IND TAT	11	1.1390	0.1030	0.0311
Difference	11	-0.0772	0.0787	0.0237

95% CI for mean difference: (-0.1300, -0.0243)

T-Test of mean difference = 0 (vs not = 0): T-Value = -3.25 P-Value = 0.009



EASTMAN Asset Management Ratios

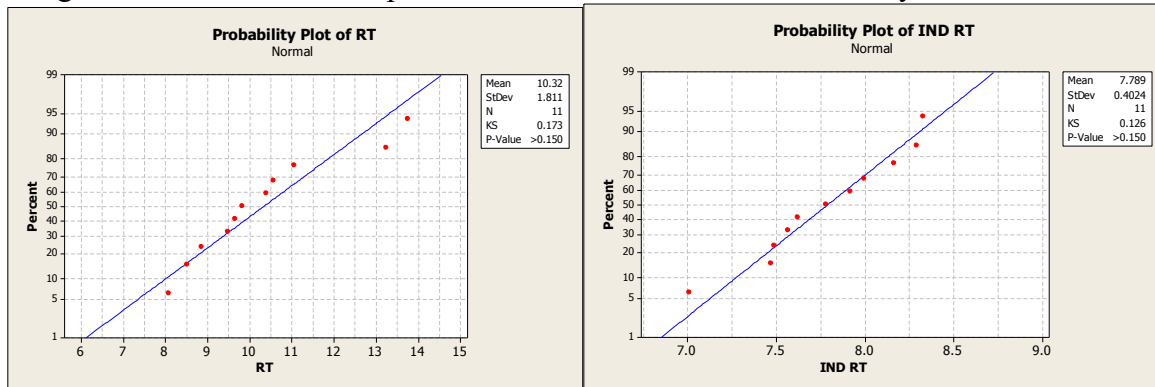
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



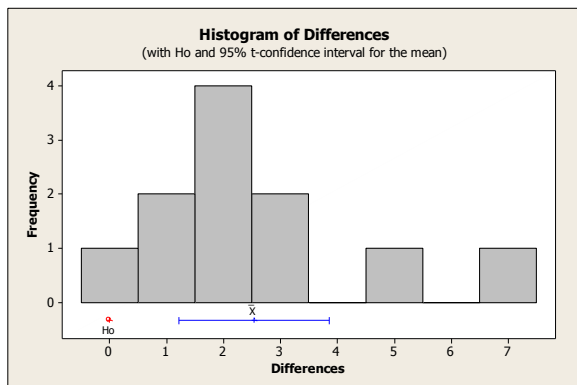
Paired T-Test and CI: EMN RT, IND RT

Paired T for EMN RT - IND RT

	N	Mean	StDev	SE Mean
EMN RT	11	10.325	1.811	0.546
IND RT	11	7.789	0.402	0.121
Difference	11	2.536	1.962	0.591

95% CI for mean difference: (1.218, 3.854)

T-Test of mean difference = 0 (vs not = 0): T-Value = 4.29 P-Value = 0.002



EASTMAN Asset Management Ratios

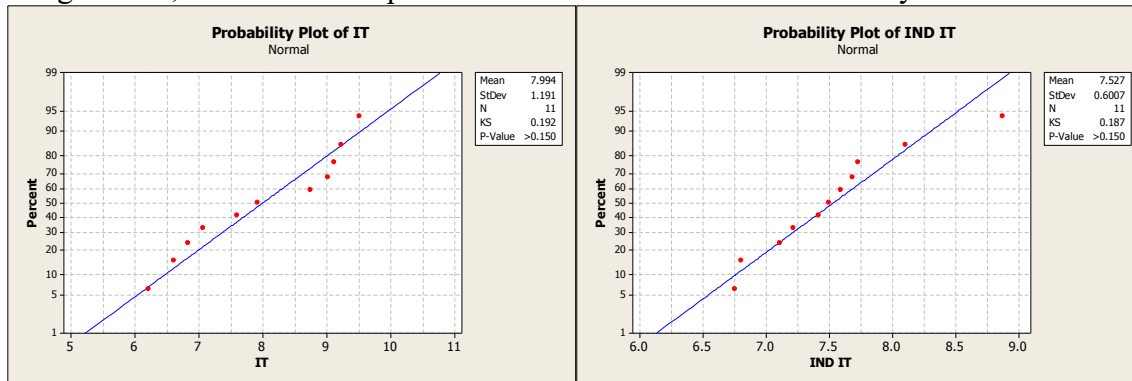
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



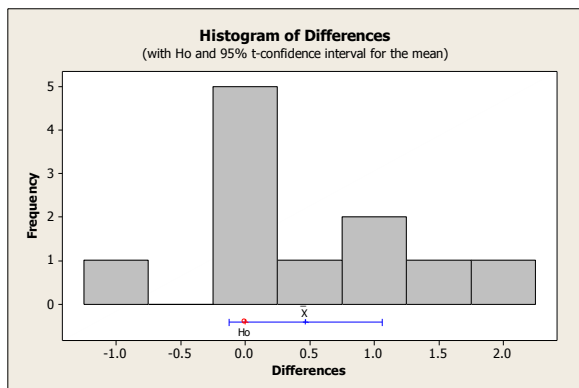
Paired T-Test and CI: EMN IT, IND IT

Paired T for EMN IT - IND IT

	N	Mean	StDev	SE Mean
EMN IT	11	7.994	1.191	0.359
IND IT	11	7.527	0.601	0.181
Difference	11	0.466	0.884	0.266

95% CI for mean difference: (-0.127, 1.060)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.75 P-Value = 0.111



EASTMAN Asset Management Ratios

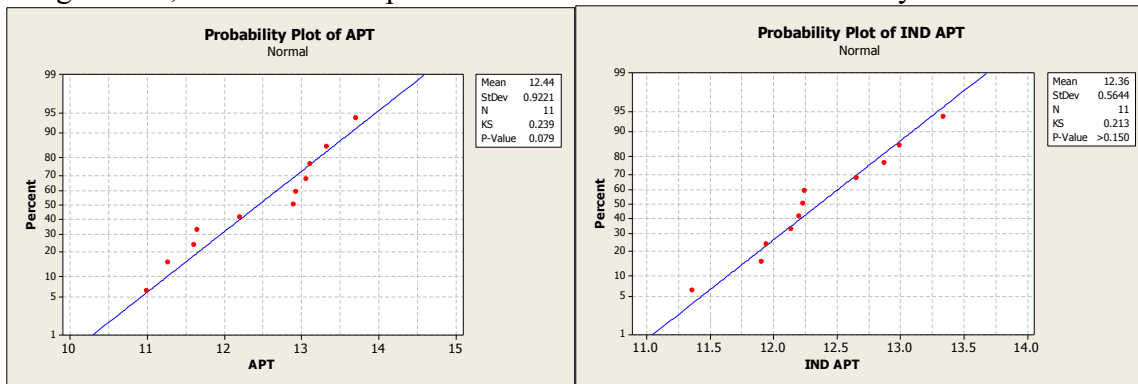
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying of suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



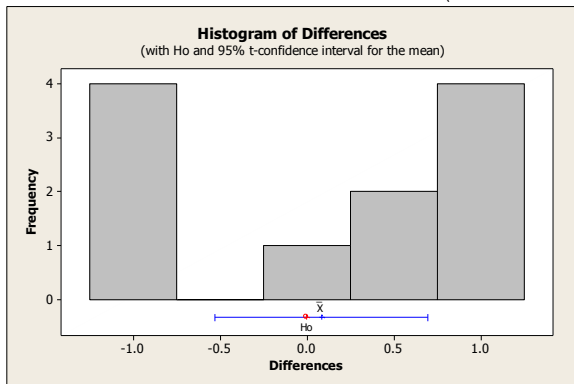
Paired T-Test and CI: EMN APT, IND APT

Paired T for EMN APT - IND APT

	N	Mean	StDev	SE Mean
EMN APT	11	12.444	0.922	0.278
IND APT	11	12.360	0.564	0.170
Difference	11	0.083	0.914	0.275

95% CI for mean difference: (-0.530, 0.697)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.30 P-Value = 0.768



EASTMAN Asset Management Ratios

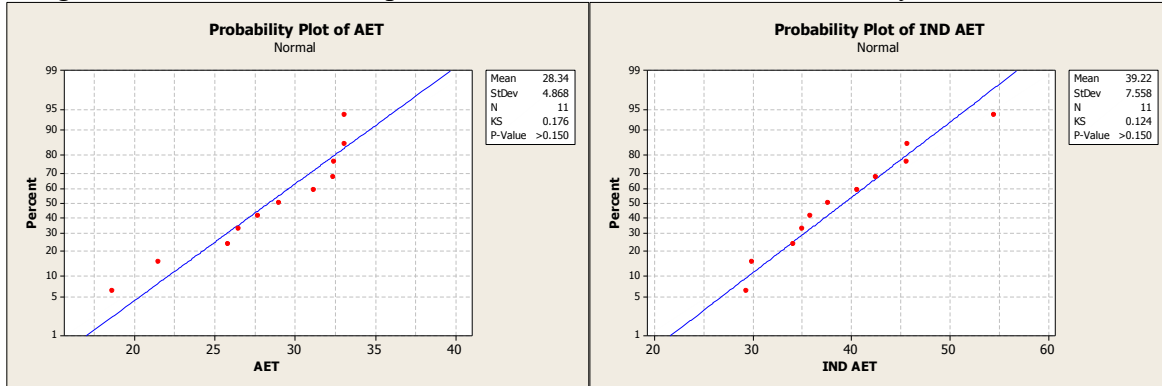
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



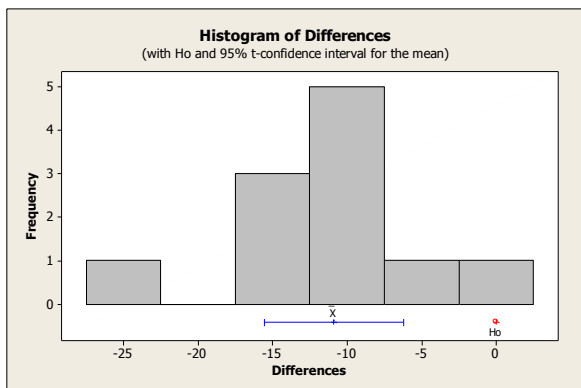
Paired T-Test and CI: EMN AET, IND AET

Paired T for EMN AET - IND AET

	N	Mean	StDev	SE Mean
EMN AET	11	28.34	4.87	1.47
IND AET	11	39.22	7.56	2.28
Difference	11	-10.88	6.99	2.11

95% CI for mean difference: (-15.58, -6.18)

T-Test of mean difference = 0 (vs not = 0): T-Value = -5.16 P-Value = 0.000



EASTMAN Asset Management Ratios

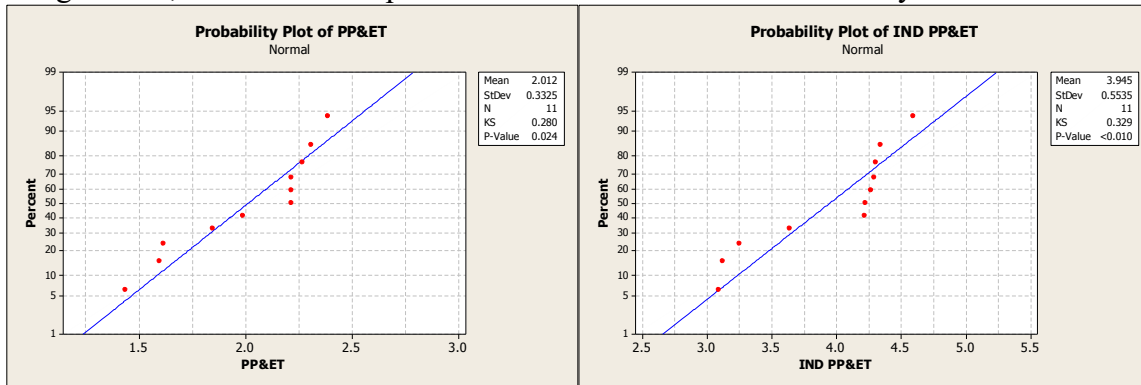
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: PP&ET, IND PP&ET

Paired test for PP&ET - IND PP&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated
Difference	11	11	Statistic	0.0	Median
			0.0	0.004	-1.948

	N	Estimated	Achieved	Confidence Interval	
Difference	11	Median	Confidence	Lower	Upper
		-1.948	95.5	-2.121	-1.761

EASTMAN Asset Management Ratios

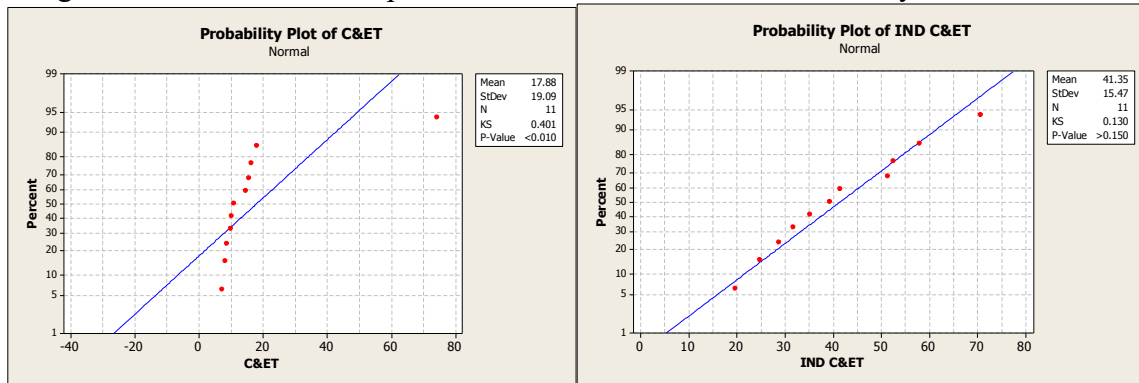
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: C&ET, IND C&ET

Paired test for C&ET - IND C&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	Estimated
Difference	11	11	Statistic	P
			5.0	0.014
				Estimated Median
				-24.13

	N	Estimated	Achieved	Confidence
Difference	11	Median	Confidence	Interval
		-24.1	95.5	Lower Upper
				-38.2 -8.9

EASTMAN Per Share Ratios

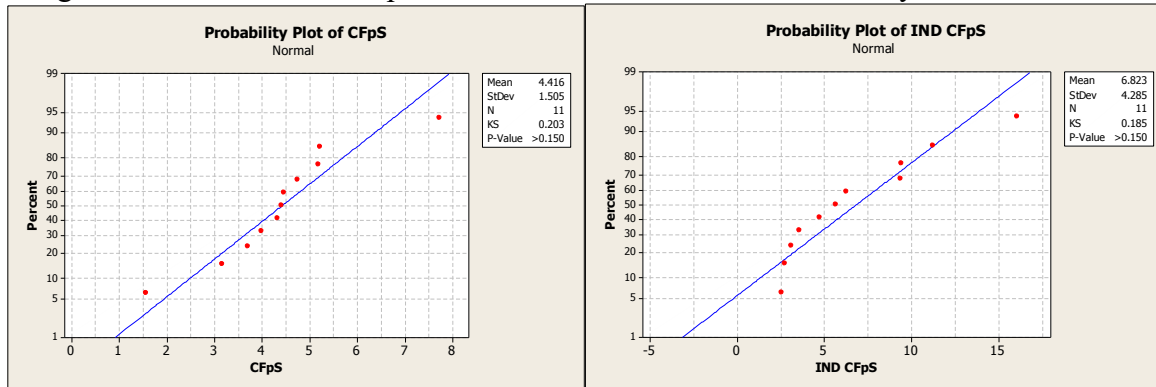
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



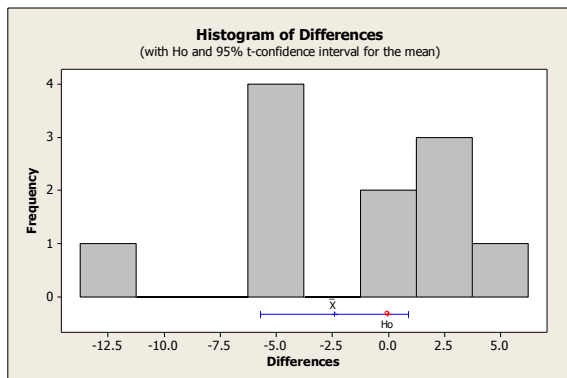
Paired T-Test and CI: EMN CFpS, IND CFpS

Paired T for EMN CFpS - IND CFpS

	N	Mean	StDev	SE Mean
EMN CFpS	11	4.42	1.50	0.45
IND CFpS	11	6.82	4.29	1.29
Difference	11	-2.41	4.91	1.48

95% CI for mean difference: (-5.71, 0.89)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.63 P-Value = 0.135



EASTMAN Per Share Ratios

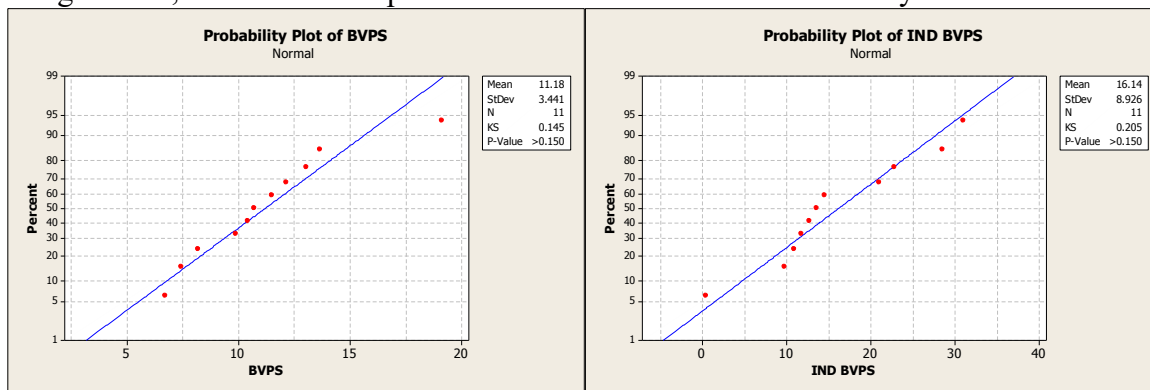
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



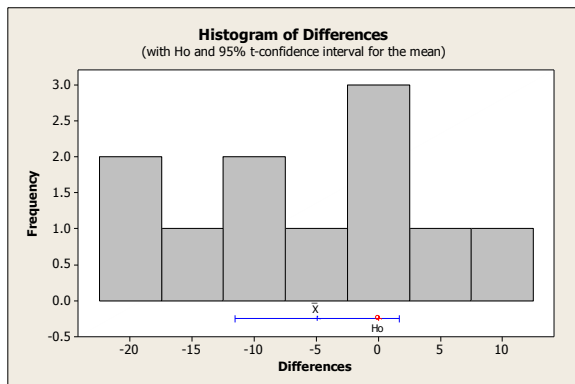
Paired T-Test and CI: EMN BVPS, IND BVPS

Paired T for EMN BVPS - IND BVPS

	N	Mean	StDev	SE Mean
EMN BVPS	11	11.18	3.44	1.04
IND BVPS	11	16.14	8.93	2.69
Difference	11	-4.96	9.87	2.98

95% CI for mean difference: (-11.59, 1.68)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.67 P-Value = 0.127



FEDEX Profitability Ratios

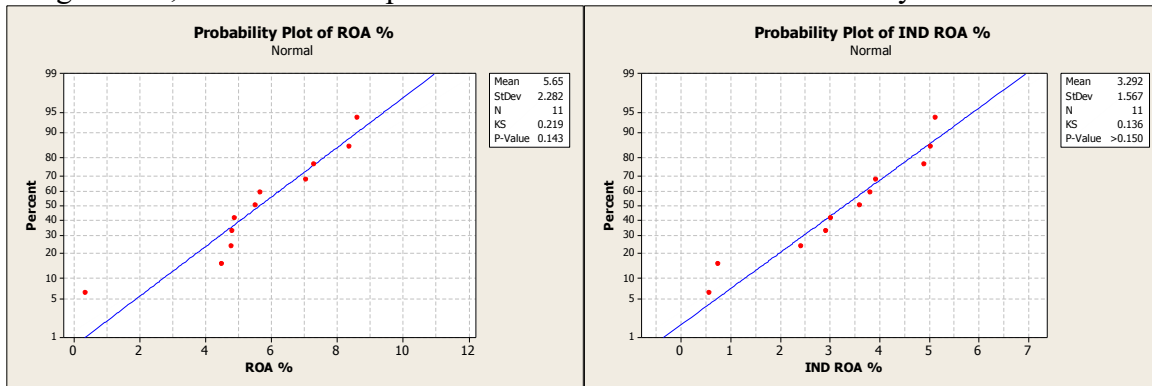
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



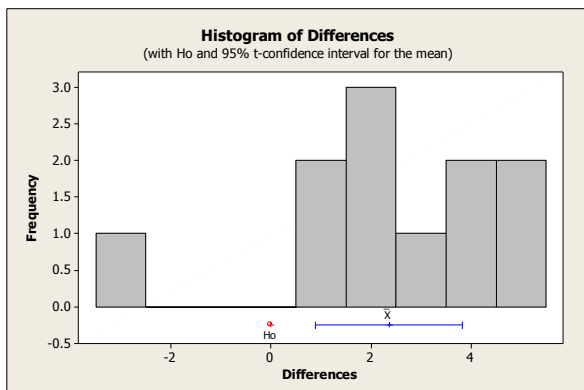
Paired T-Test and CI: FDX ROA %, IND ROA %

Paired T for FDX ROA % - IND ROA %

	N	Mean	StDev	SE Mean
FDX ROA %	11	5.650	2.282	0.688
IND ROA %	11	3.292	1.567	0.472
Difference	11	2.358	2.187	0.659

95% CI for mean difference: (0.888, 3.827)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.58 P-Value = 0.005



FEDEX Profitability Ratios

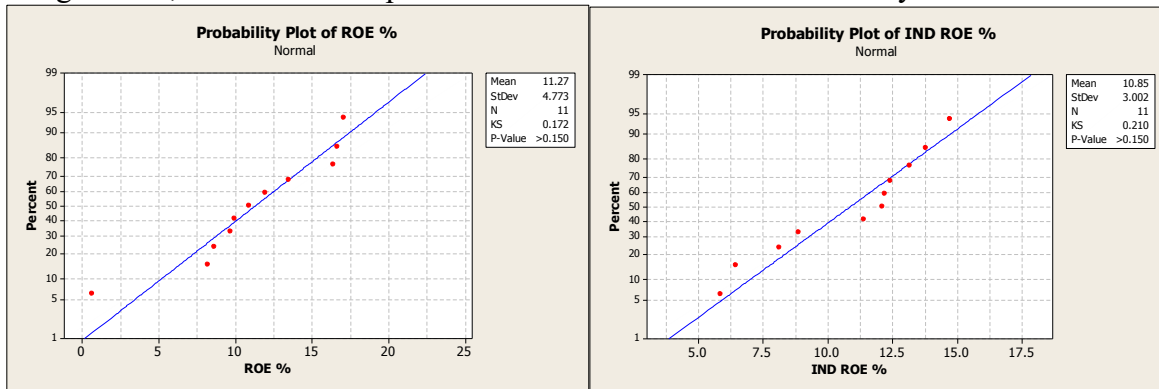
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



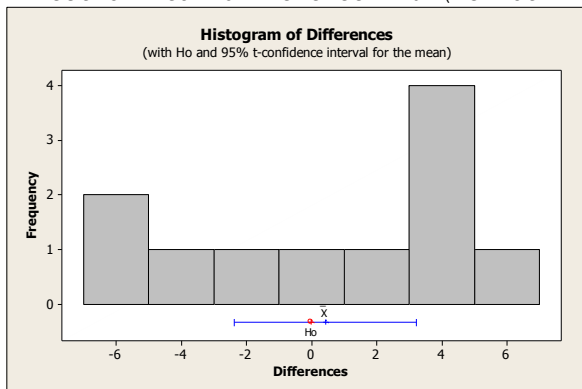
Paired T-Test and CI: FDX ROE %, IND ROE %

Paired T for FDX ROE % - IND ROE %

	N	Mean	StDev	SE Mean
FDX ROE %	11	11.27	4.77	1.44
IND ROE %	11	10.85	3.00	0.91
Difference	11	0.42	4.18	1.26

95% CI for mean difference: (-2.38, 3.23)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.34 P-Value = 0.743



FEDEX Profitability Ratios

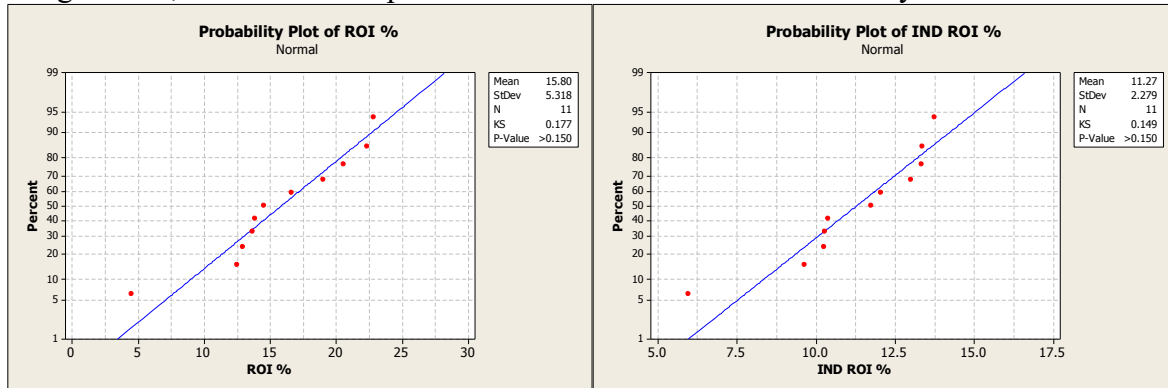
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



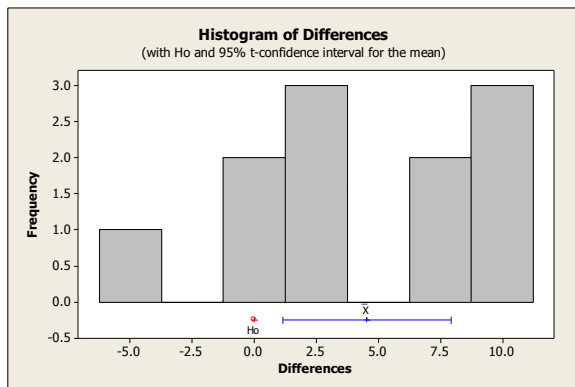
Paired T-Test and CI: FDX ROI %, IND ROI %

Paired T for FDX ROI % - IND ROI %

	N	Mean	StDev	SE Mean
FDX ROI %	11	15.80	5.32	1.60
IND ROI %	11	11.27	2.28	0.69
Difference	11	4.53	5.05	1.52

95% CI for mean difference: (1.14, 7.93)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.98 P-Value = 0.014



FEDEX Profitability Ratios

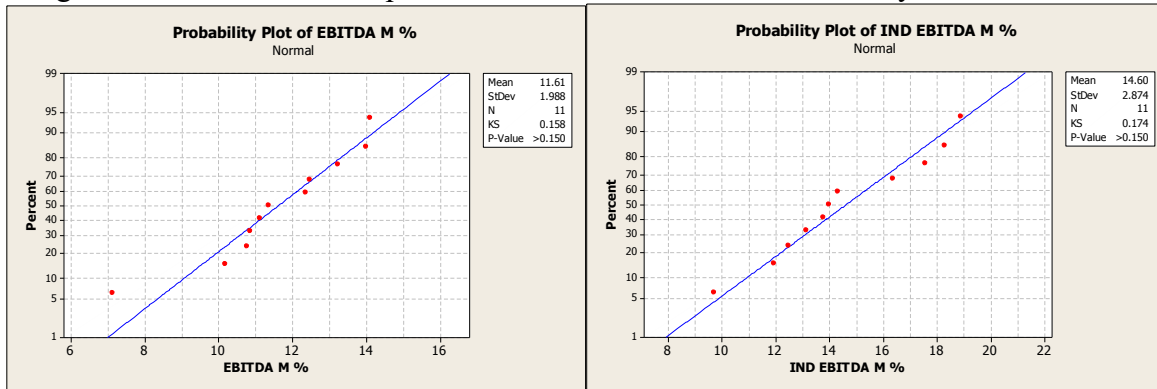
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



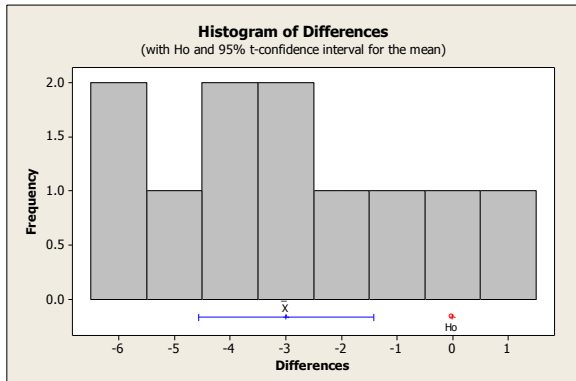
Paired T-Test and CI: FDX EBITDA M %, IND EBITDA M %

Paired T for FDX EBITDA M % - IND EBITDA M %

	N	Mean	StDev	SE Mean
FDX EBITDA M %	11	11.611	1.988	0.599
IND EBITDA M %	11	14.600	2.874	0.867
Difference	11	-2.989	2.346	0.707

95% CI for mean difference: (-4.565, -1.413)

T-Test of mean difference = 0 (vs not = 0): T-Value = -4.23 P-Value = 0.002



FEDEX Profitability Ratios

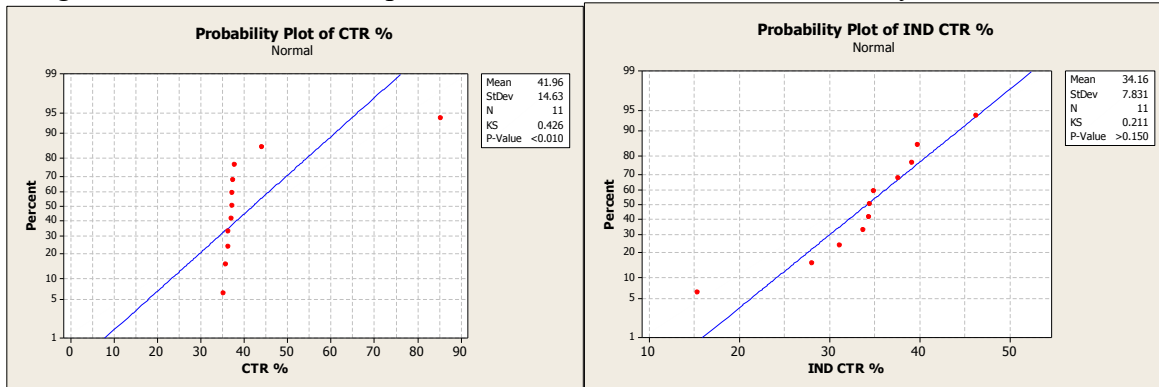
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: CTR %, IND CTR %

Paired test for CTR % - IND CTR %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	49.0	0.168	3.384

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	3.4	95.5	-2.5	22.0

FEDEX Profitability Ratios

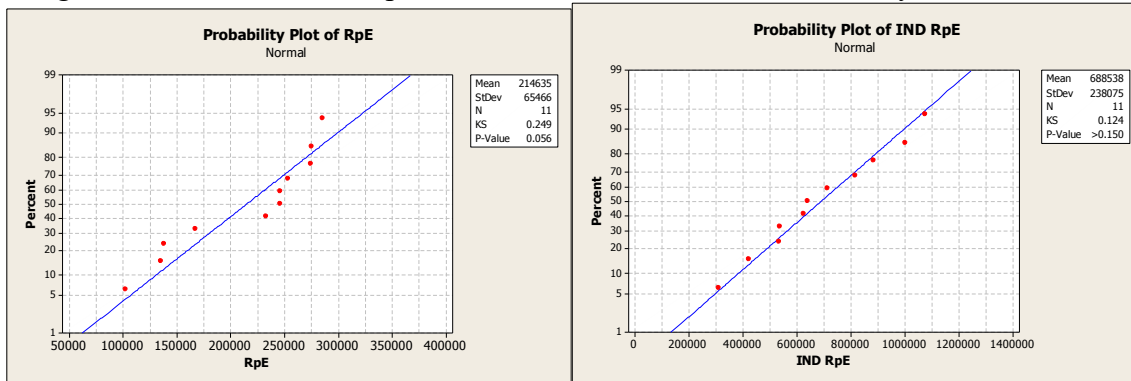
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



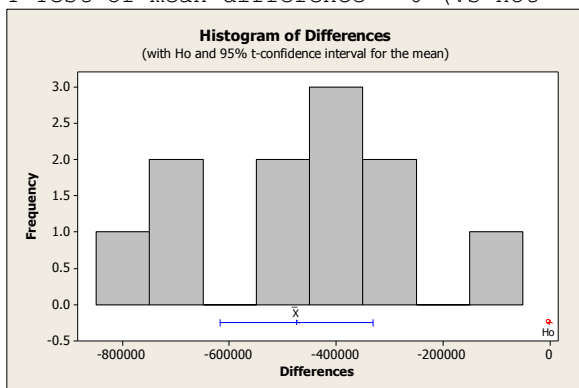
Paired T-Test and CI: FDX RpE, IND RpE

Paired T for FDX RpE - IND RpE

	N	Mean	StDev	SE Mean
FDX RpE	11	214635	65466	19739
IND RpE	11	688538	238075	71782
Difference	11	-473903	212864	64181

95% CI for mean difference: (-616907, -330899)

T-Test of mean difference = 0 (vs not = 0): T-Value = -7.38 P-Value = 0.000



FEDEX Liquidity Ratios

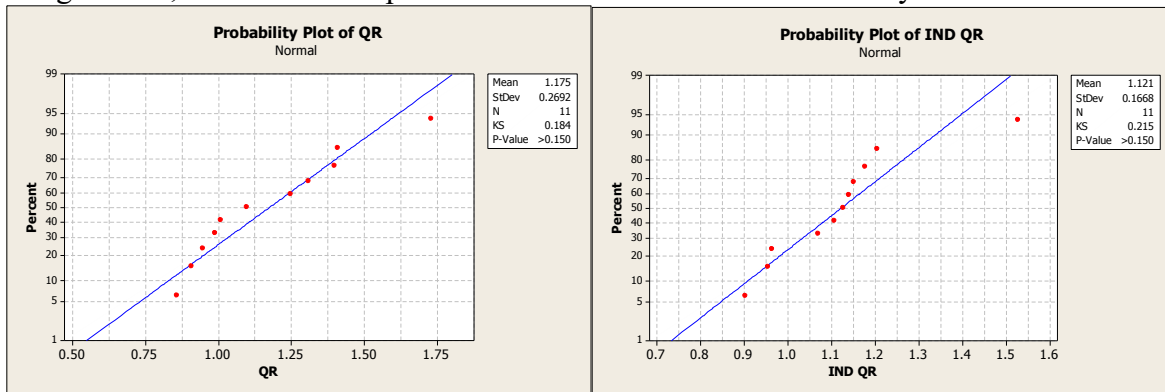
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



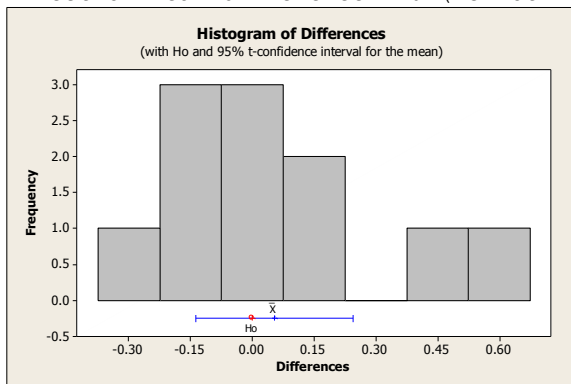
Paired T-Test and CI: FDX QR, IND QR

Paired T for FDX QR - IND QR

	N	Mean	StDev	SE Mean
FDX QR	11	1.1745	0.2692	0.0812
IND QR	11	1.1211	0.1668	0.0503
Difference	11	0.0534	0.2842	0.0857

95% CI for mean difference: (-0.1375, 0.2443)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.62 P-Value = 0.547



FEDEX Liquidity Ratios

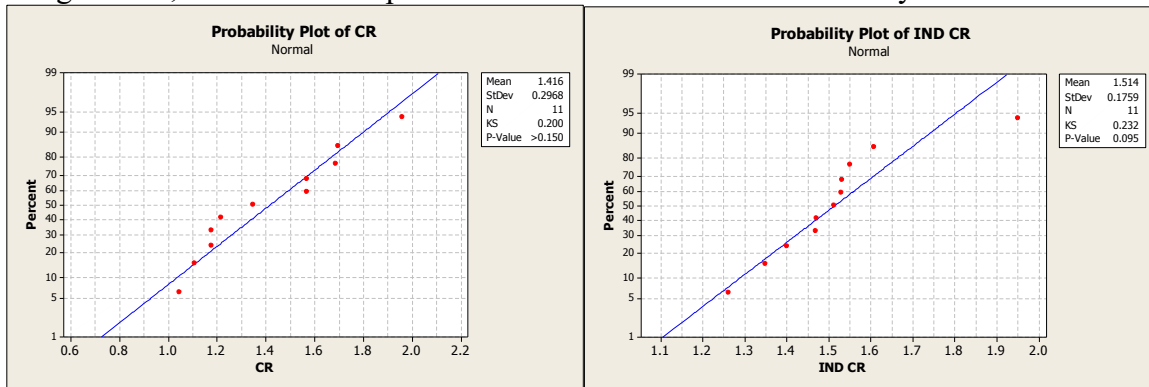
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



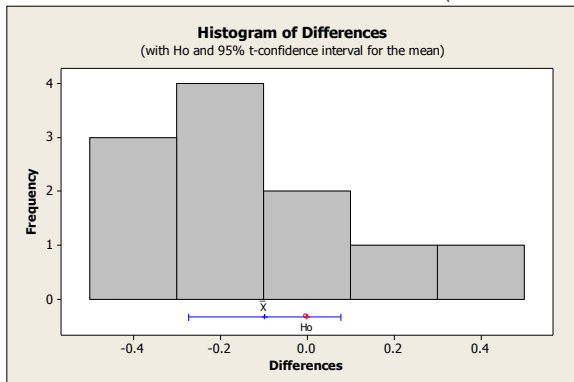
Paired T-Test and CI: FDX CR, IND CR

Paired T for FDX CR - IND CR

	N	Mean	StDev	SE Mean
FDX CR	11	1.4164	0.2968	0.0895
IND CR	11	1.5140	0.1759	0.0530
Difference	11	-0.0977	0.2620	0.0790

95% CI for mean difference: (-0.2737, 0.0784)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.24 P-Value = 0.245



FEDEX Liquidity Ratios

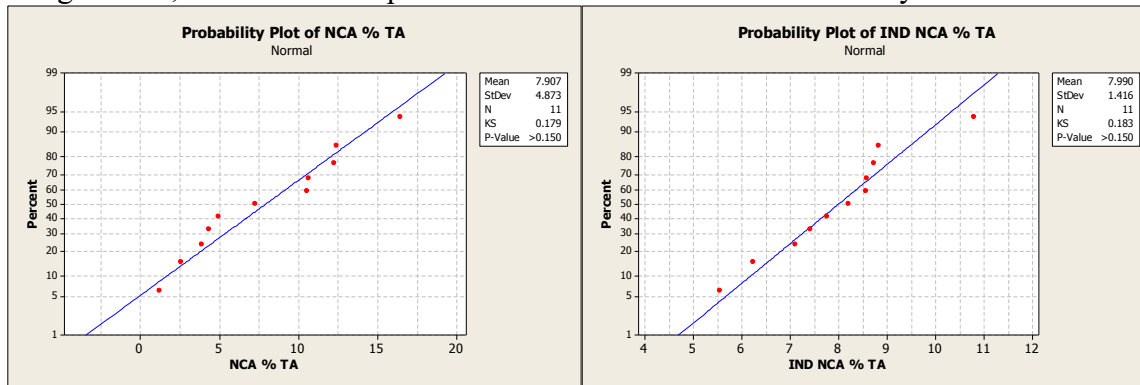
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



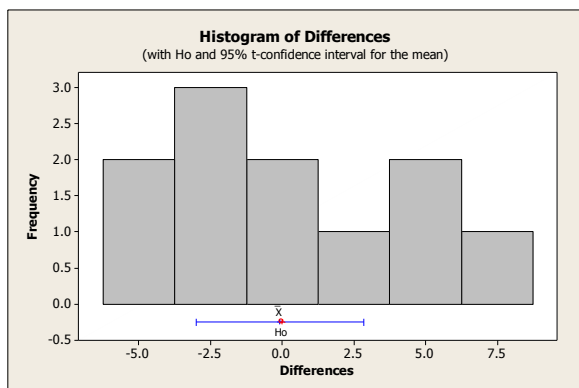
Paired T-Test and CI: FDX NCA % TA, IND NCA % TA

Paired T for FDX NCA % TA - IND NCA % TA

	N	Mean	StDev	SE Mean
FDX NCA % TA	11	7.91	4.87	1.47
IND NCA % TA	11	7.99	1.42	0.43
Difference	11	-0.08	4.34	1.31

95% CI for mean difference: (-3.00, 2.84)

T-Test of mean difference = 0 (vs not = 0): T-Value = -0.06 P-Value = 0.951



FEDEX Debt Management Ratios

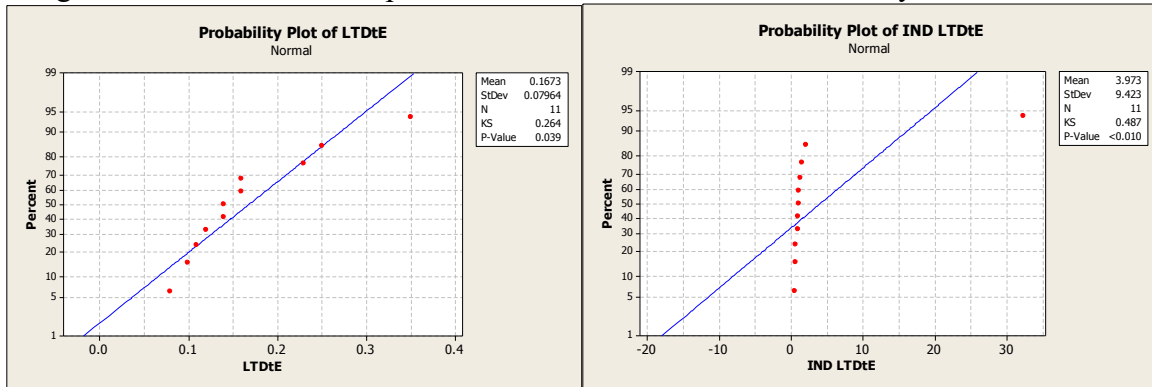
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: LTDtE, IND LTDtE

Paired test for LTDtE - IND LTDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-1.009

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-1.0	95.5	-16.2	-0.7

FEDEX Debt Management Ratios

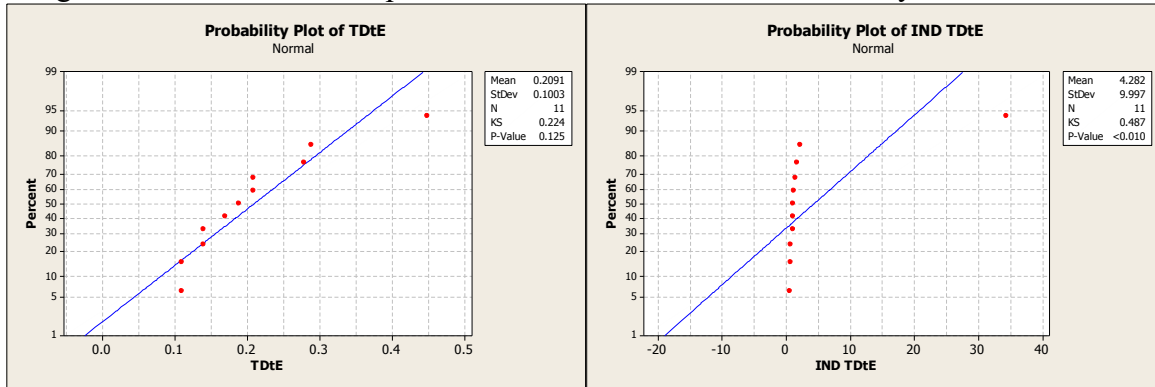
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-1.095

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-1.1	95.5	-17.2	-0.8

FEDEX Debt Management Ratios

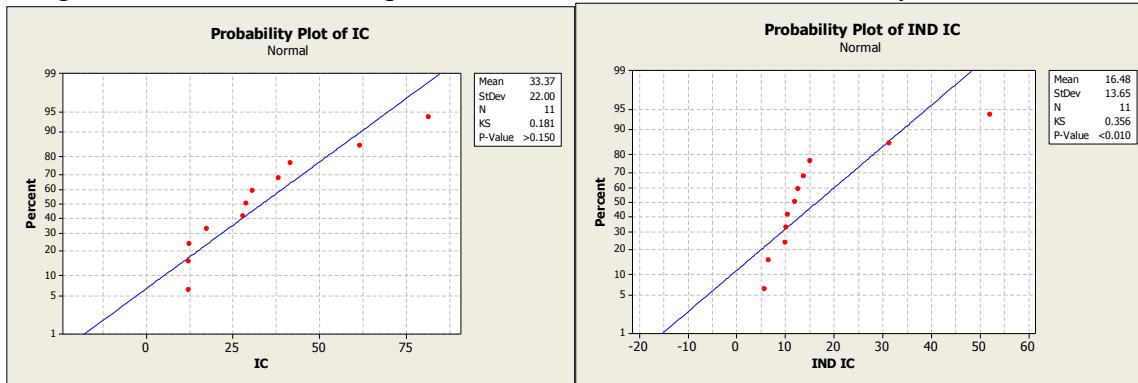
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: IC, IND IC

Paired test for IC - IND IC

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated
Difference	11	11	Statistic		Median
			57.0	0.037	16.74

	N	Estimated	Achieved	Confidence Interval	
Difference	11	Median	Confidence	Lower	Upper
		16.7	95.5	1.6	33.6

FEDEX Asset Management Ratios

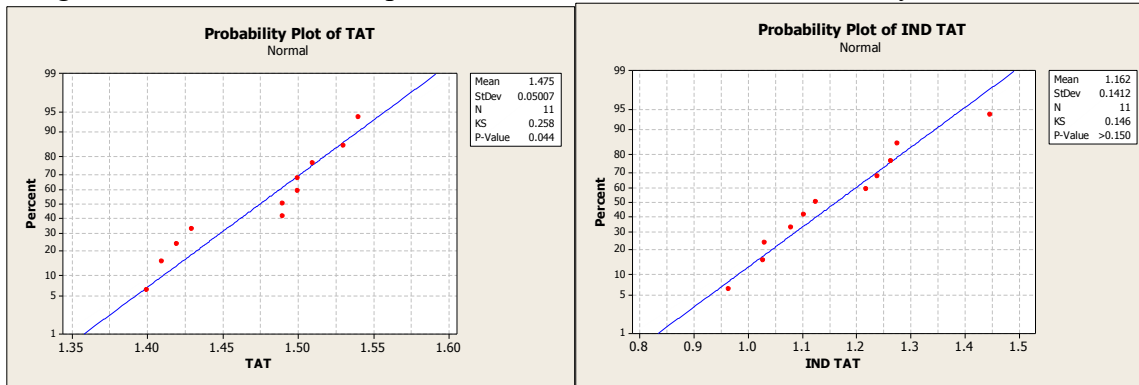
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: TAT, IND TAT

Paired test for TAT - IND TAT

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	Statistic	P	Estimated
Difference	11	11	65.0	0.005	0.3207	

	N	Estimated	Achieved	Confidence Interval	
		Median	Confidence	Lower	Upper
Difference	11	0.321	95.5	0.223	0.416

FEDEX Asset Management Ratios

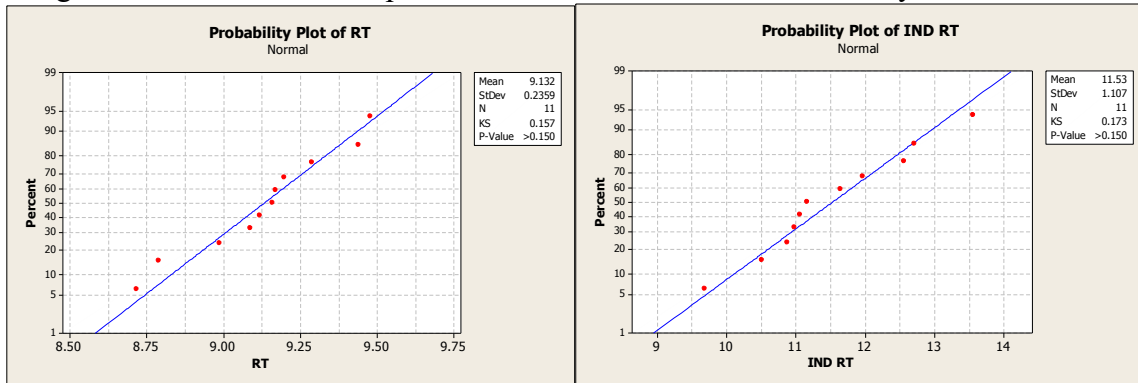
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



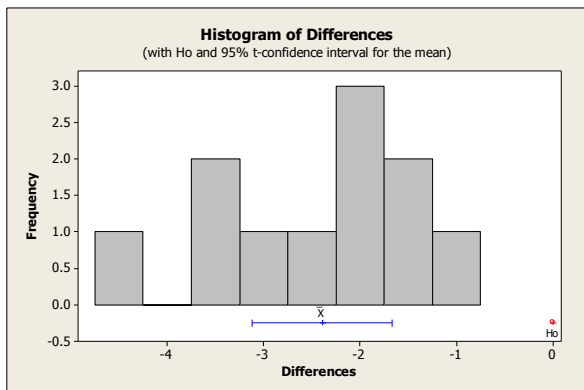
Paired T-Test and CI: FDX RT, IND RT

Paired T for FDX RT - IND RT

	N	Mean	StDev	SE Mean
FDX RT	11	9.132	0.236	0.071
IND RT	11	11.525	1.107	0.334
Difference	11	-2.394	1.078	0.325

95% CI for mean difference: (-3.118, -1.669)

T-Test of mean difference = 0 (vs not = 0): T-Value = -7.37 P-Value = 0.000



FEDEX Asset Management Ratios

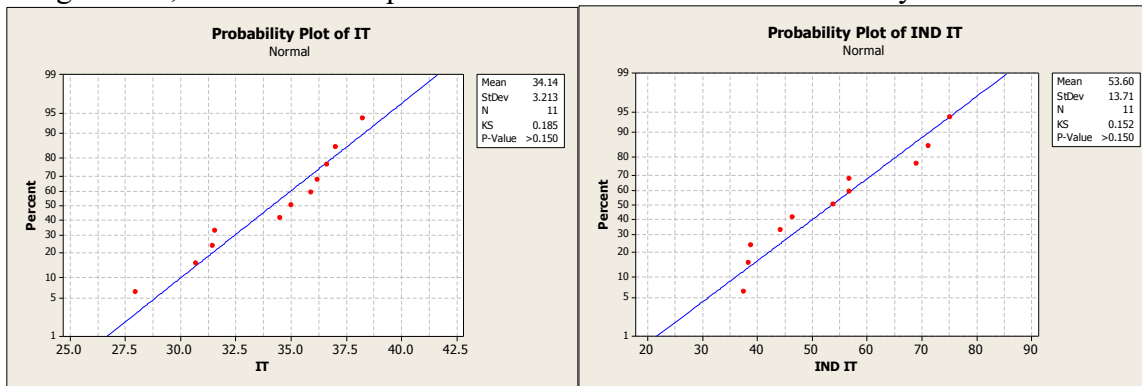
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



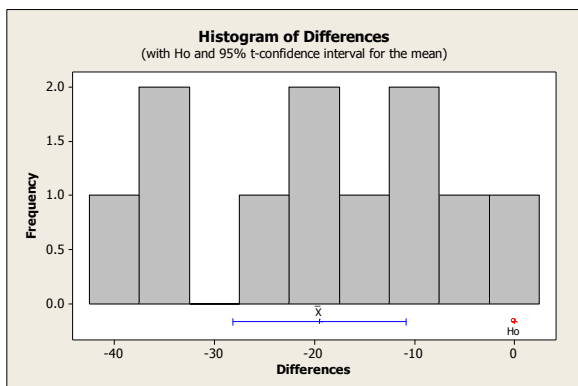
Paired T-Test and CI: FDX IT, IND IT

Paired T for FDX IT - IND IT

	N	Mean	StDev	SE Mean
FDX IT	11	34.14	3.21	0.97
IND IT	11	53.60	13.71	4.13
Difference	11	-19.46	12.91	3.89

95% CI for mean difference: (-28.13, -10.79)

T-Test of mean difference = 0 (vs not = 0): T-Value = -5.00 P-Value = 0.001



FEDEX Asset Management Ratios

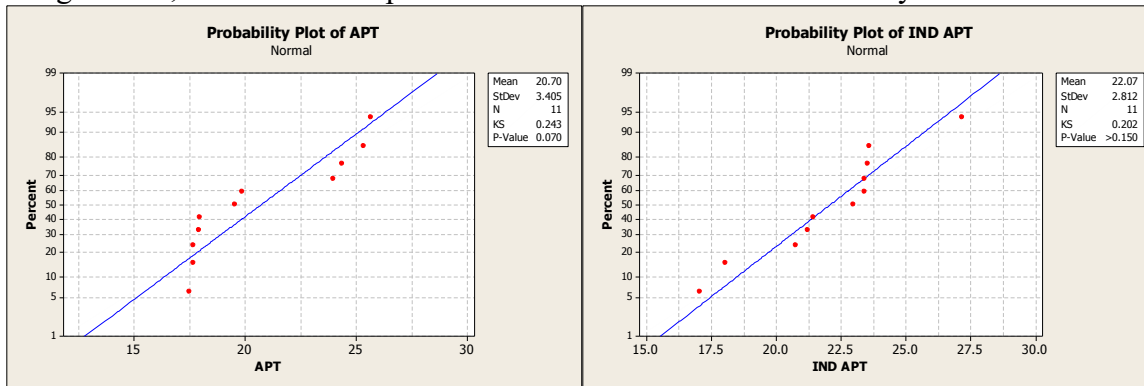
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying off suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



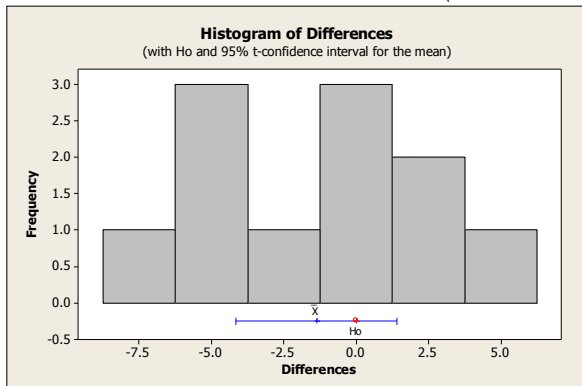
Paired T-Test and CI: APT, IND APT

Paired T for APT - IND APT

	N	Mean	StDev	SE Mean
APT	11	20.70	3.40	1.03
IND APT	11	22.07	2.81	0.85
Difference	11	-1.37	4.14	1.25

95% CI for mean difference: (-4.15, 1.41)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.10 P-Value = 0.299



FEDEX Asset Management Ratios

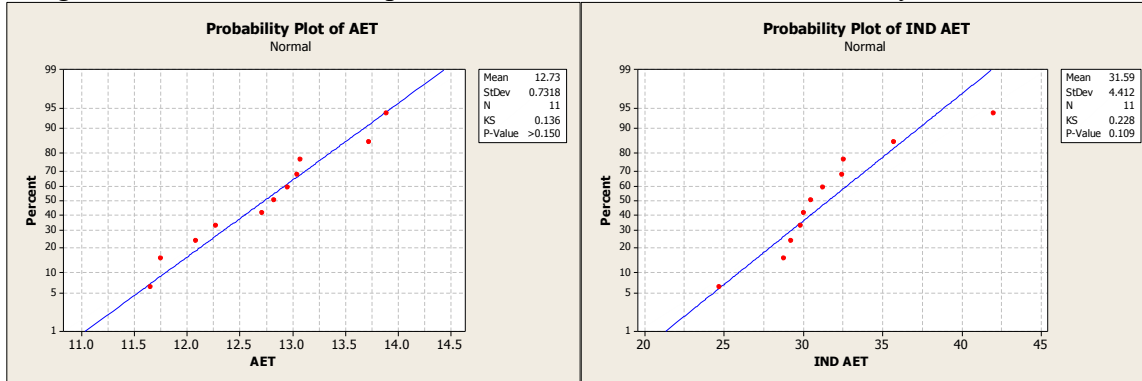
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



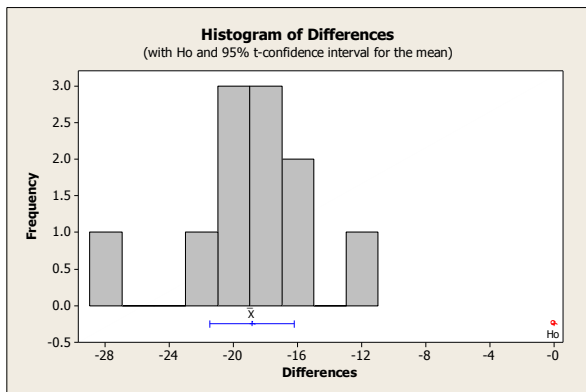
Paired T-Test and CI: FDX AET, IND AET

Paired T for FDX AET - IND AET

	N	Mean	StDev	SE Mean
FDX AET	11	12.73	0.73	0.22
IND AET	11	31.59	4.41	1.33
Difference	11	-18.86	3.95	1.19

95% CI for mean difference: (-21.52, -16.20)

T-Test of mean difference = 0 (vs not = 0): T-Value = -15.82 P-Value = 0.000



FEDEX Asset Management Ratios

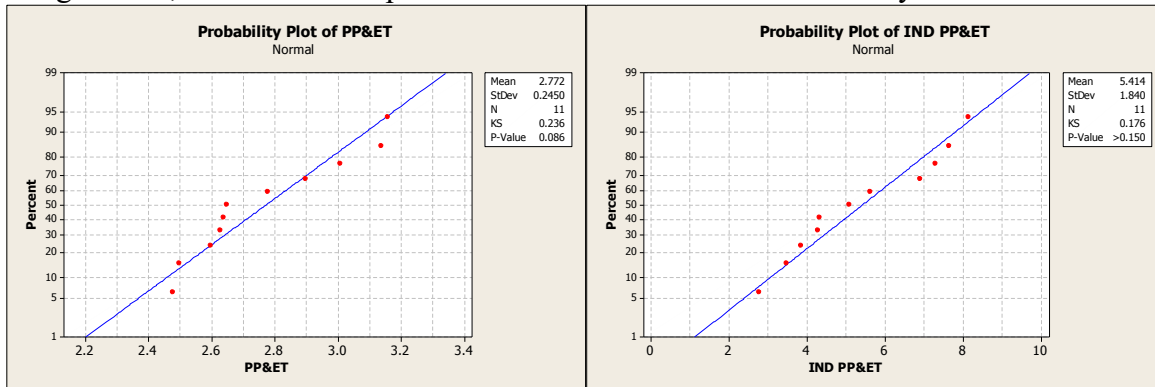
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



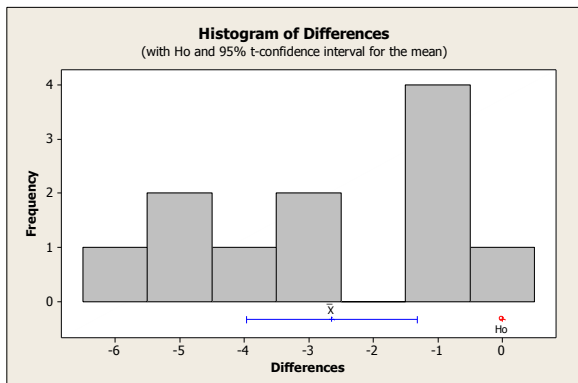
Paired T-Test and CI: FDX PP&ET, IND PP&ET

Paired T for FDX PP&ET - IND PP&ET

	N	Mean	StDev	SE Mean
FDX PP&ET	11	2.772	0.245	0.074
IND PP&ET	11	5.414	1.840	0.555
Difference	11	-2.642	1.974	0.595

95% CI for mean difference: (-3.968, -1.316)

T-Test of mean difference = 0 (vs not = 0): T-Value = -4.44 P-Value = 0.001



FEDEX Asset Management Ratios

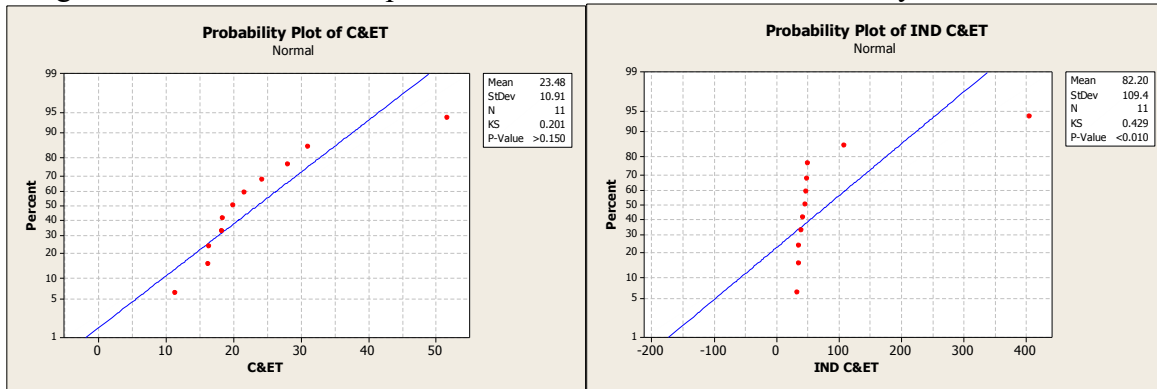
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: C&ET, IND C&ET

Paired test for C&ET - IND C&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	Estimated
			Statistic	P
Difference	11	11	0.0	0.004
				Estimated Median
				-26.63

	N	Estimated	Achieved	Confidence
		Median	Confidence	Interval
Difference	11	-27	95.5	-185 -20

FEDEX Per Share Ratios

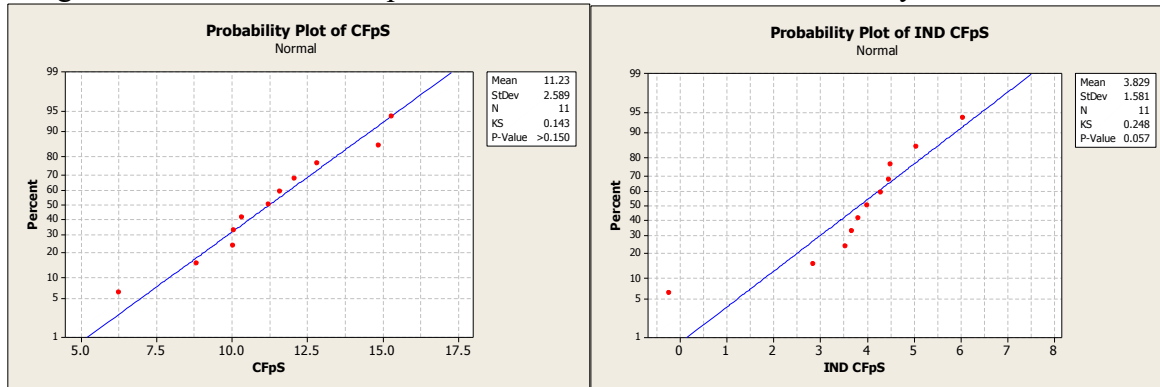
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



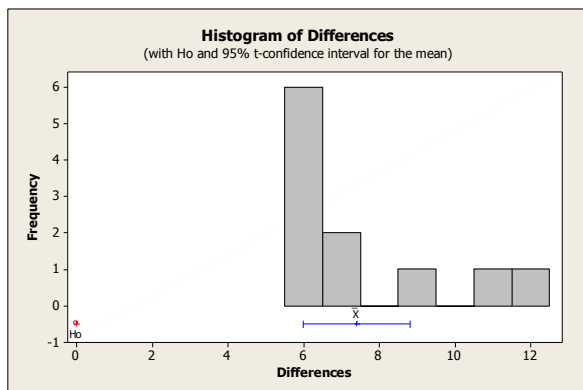
Paired T-Test and CI: CFpS, IND CFpS

Paired T for CFpS - IND CFpS

	N	Mean	StDev	SE Mean
CFpS	11	11.235	2.589	0.781
IND CFpS	11	3.829	1.581	0.477
Difference	11	7.406	2.108	0.636

95% CI for mean difference: (5.989, 8.822)

T-Test of mean difference = 0 (vs not = 0): T-Value = 11.65 P-Value = 0.000



FEDEX Per Share Ratios

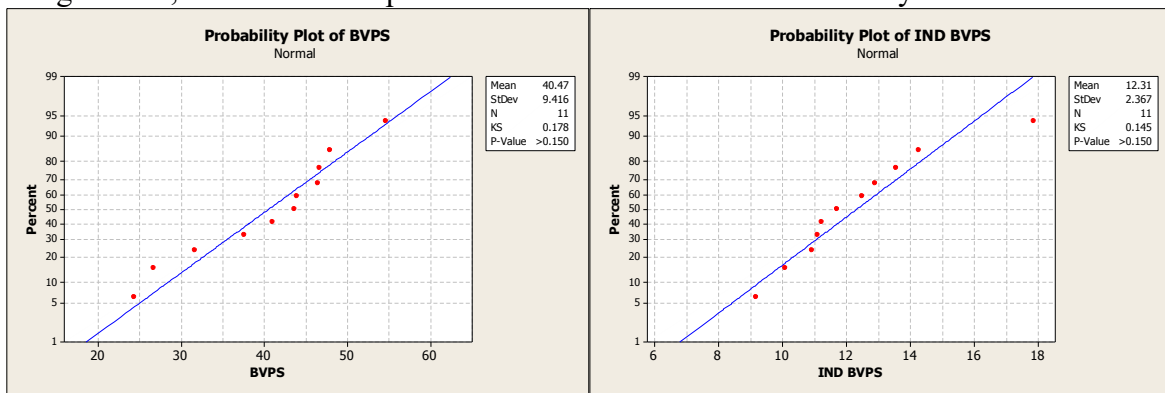
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



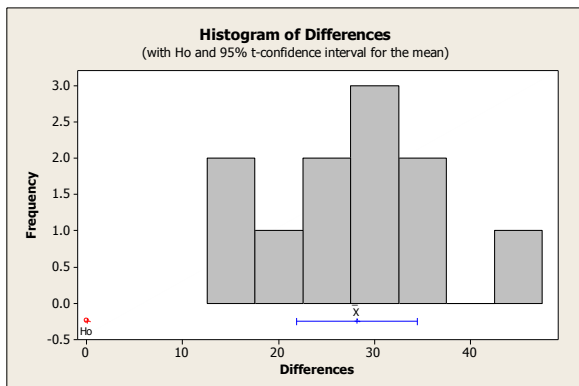
Paired T-Test and CI: FDX BVPS, IND BVPS

Paired T for FDX BVPS - IND BVPS

	N	Mean	StDev	SE Mean
FDX BVPS	11	40.47	9.42	2.84
IND BVPS	11	12.31	2.37	0.71
Difference	11	28.17	9.33	2.81

95% CI for mean difference: (21.90, 34.43)

T-Test of mean difference = 0 (vs not = 0): T-Value = 10.01 P-Value = 0.000



CORNING Profitability Ratios

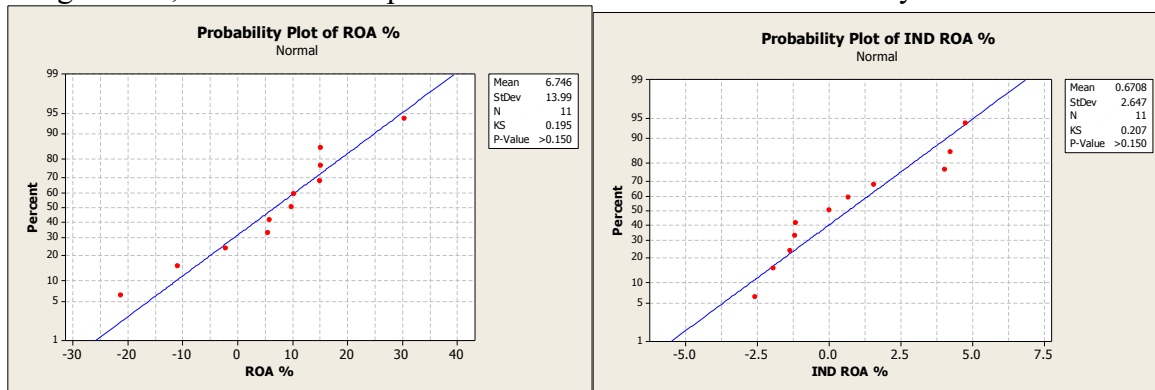
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



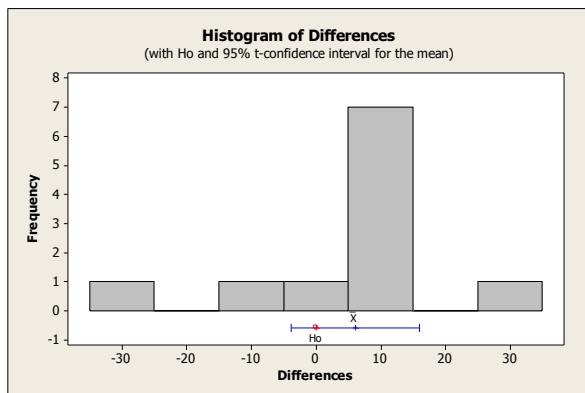
Paired T-Test and CI: GLW ROA %, IND ROA %

Paired T for GLW ROA % - IND ROA %

	N	Mean	StDev	SE Mean
GLW ROA %	11	6.75	13.99	4.22
IND ROA %	11	0.67	2.65	0.80
Difference	11	6.08	14.70	4.43

95% CI for mean difference: (-3.80, 15.95)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.37 P-Value = 0.201



CORNING Profitability Ratios

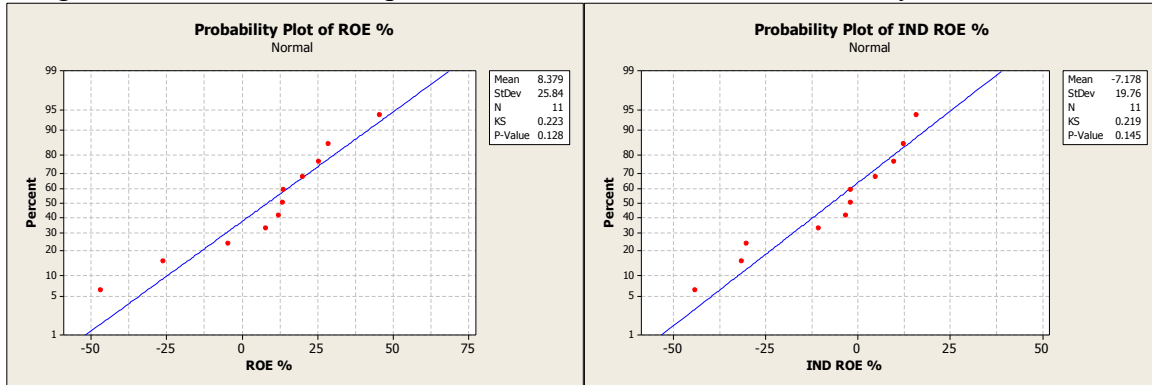
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



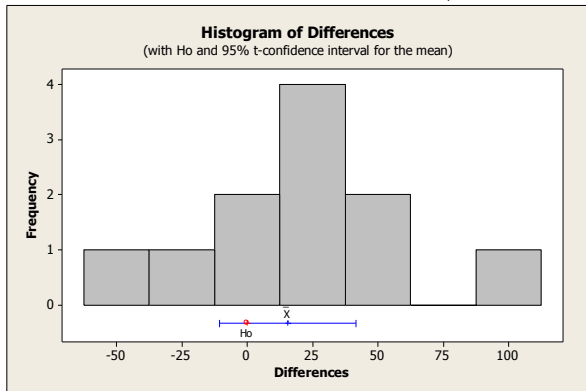
Paired T-Test and CI: GLW ROE %, IND ROE %

Paired T for GLW ROE % - IND ROE %

	N	Mean	StDev	SE Mean
GLW ROE %	11	8.38	25.84	7.79
IND ROE %	11	-7.18	19.76	5.96
Difference	11	15.6	39.0	11.7

95% CI for mean difference: (-10.6, 41.7)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.32 P-Value = 0.215



CORNING Profitability Ratios

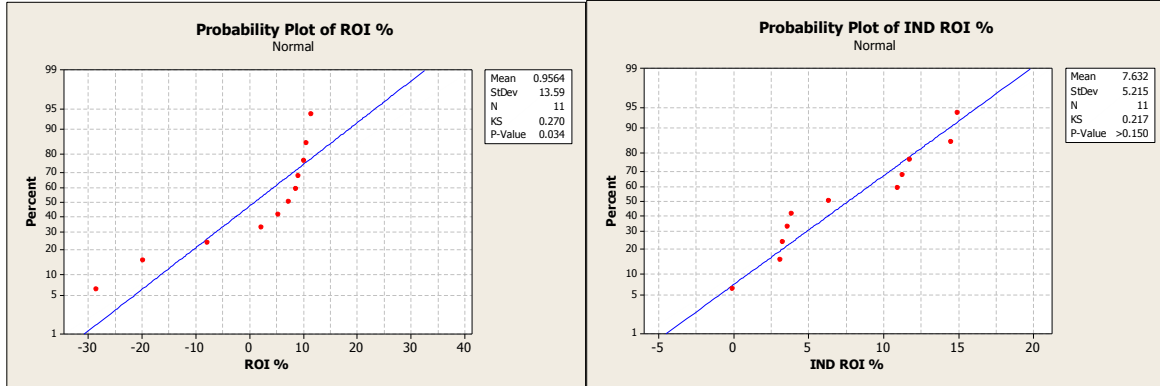
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: ROI %, IND ROI %

Paired test for ROI % - IND ROI %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated
Difference	11	11	25.0	0.505	-1.749

	N	Estimated	Achieved	Confidence Interval	
		Median	Confidence	Lower	Upper
Difference	11	-1.7	95.5	-18.6	3.7

CORNING Profitability Ratios

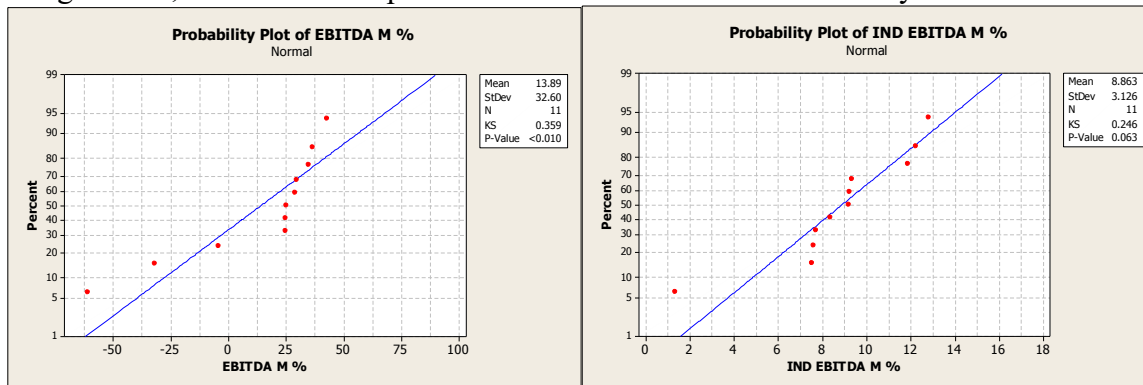
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: EBITDA M %, IND EBITDA M %

Paired test for EBITDA M % - IND EBITDA M %

Test of median = 0.000000 versus median not = 0.000000

	N	for Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	43.0	0.398	15.20

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	15.2	95.5	-20.5	25.4

CORNING Profitability Ratios

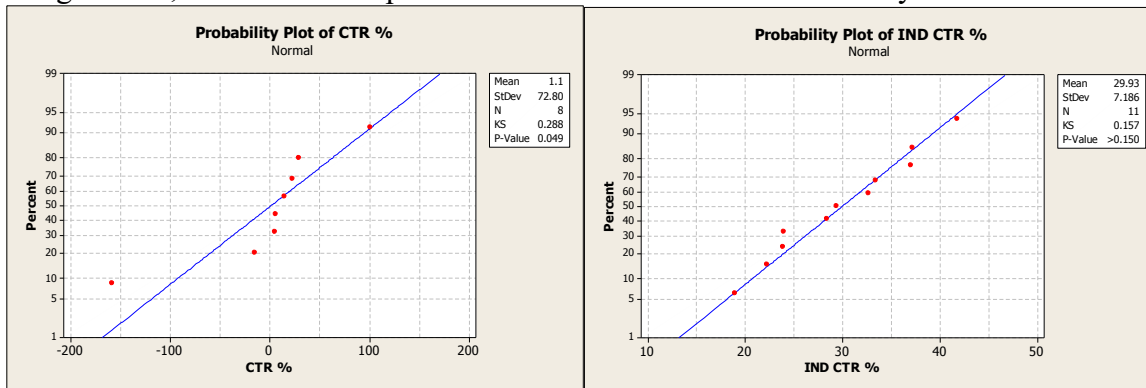
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: CTR %, IND CTR %

Paired test for CTR % - IND CTR %

Test of median = 0.000000 versus median not = 0.000000

	N	N*	N for Test	Wilcoxon Statistic	P	Estimated Median
Difference	8	3	8	7.0	0.141	-21.64

	N	N*	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	8	3	-22	94.1	-101	22

CORNING Profitability Ratios

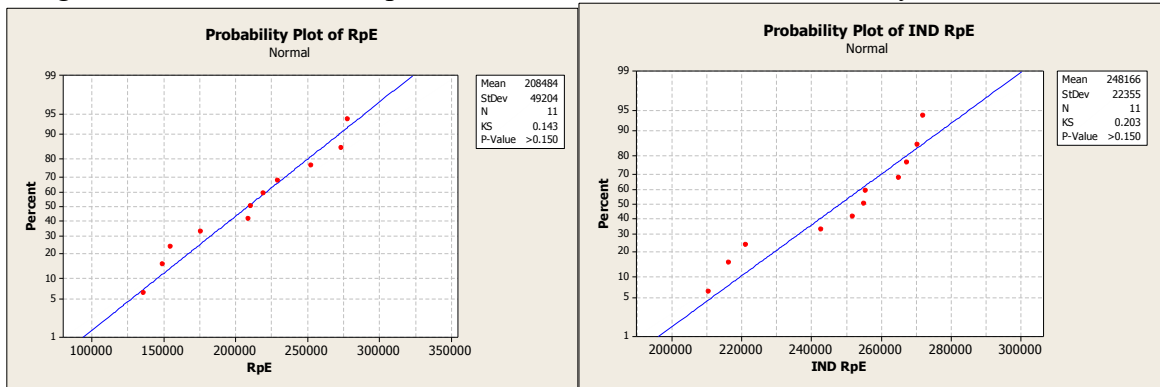
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



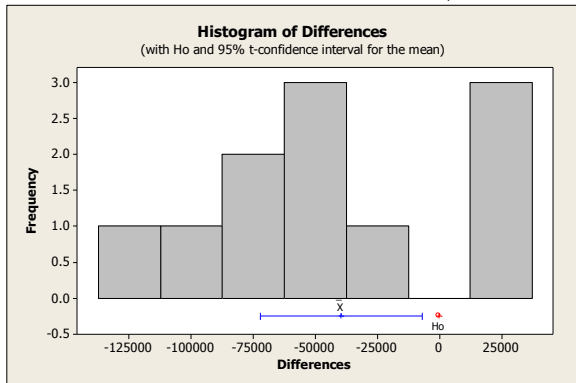
Paired T-Test and CI: GLW RpE, IND RpE

Paired T for GLW RpE - IND RpE

	N	Mean	StDev	SE Mean
GLW RpE	11	208484	49204	14836
IND RpE	11	248166	22355	6740
Difference	11	-39682	48607	14655

95% CI for mean difference: (-72336, -7027)

T-Test of mean difference = 0 (vs not = 0): T-Value = -2.71 P-Value = 0.022



CORNING Liquidity Ratios

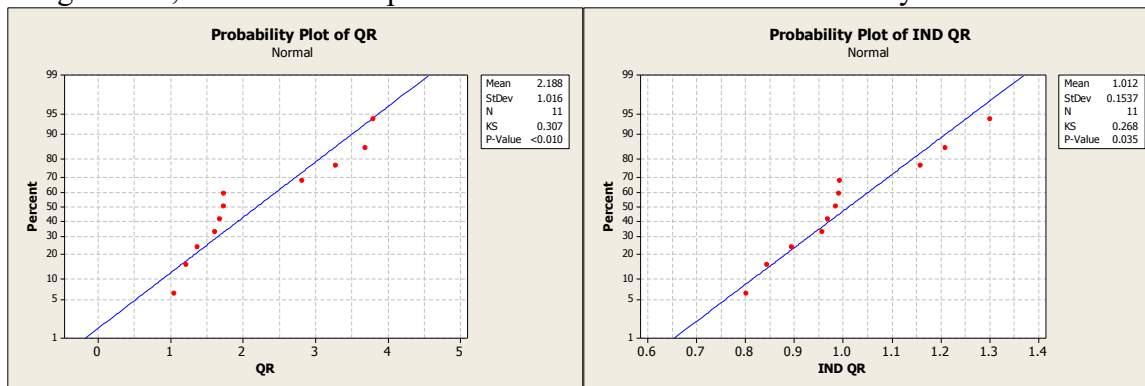
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: QR, IND QR

Paired test for QR - IND QR

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	63.0	0.009	1.202

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	1.20	95.5	0.41	1.85

CORNING Liquidity Ratios

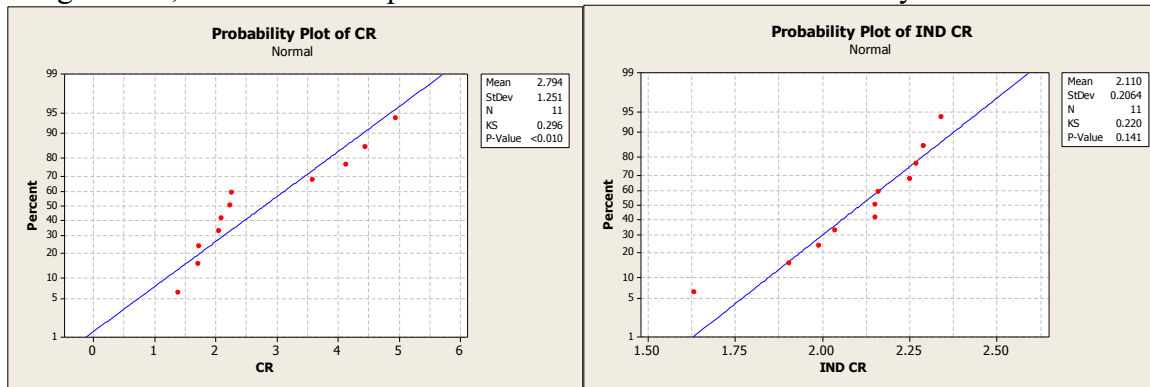
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: CR, IND CR

Paired test for CR - IND CR

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	50.0	0.142	0.7125

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	0.71	95.5	-0.11	1.45

CORNING Liquidity Ratios

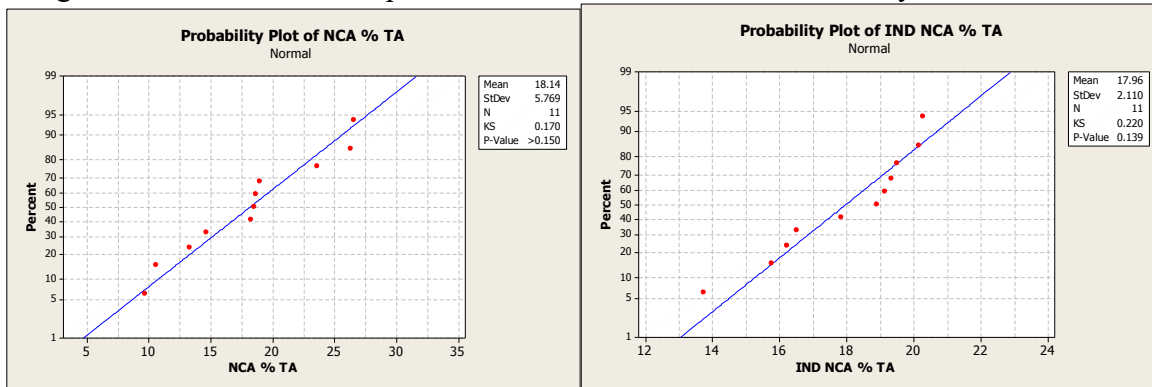
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



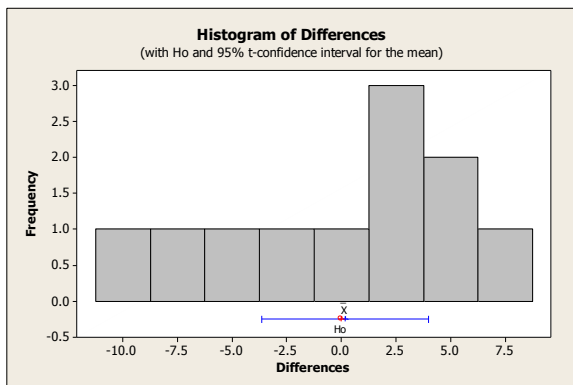
Paired T-Test and CI: GLW NCA % TA, IND NCA % TA

Paired T for GLW NCA % TA - IND NCA % TA

	N	Mean	StDev	SE Mean
GLW NCA % TA	11	18.14	5.77	1.74
IND NCA % TA	11	17.96	2.11	0.64
Difference	11	0.17	5.69	1.71

95% CI for mean difference: (-3.64, 3.99)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.10 P-Value = 0.921



CORNING Debt Management Ratios

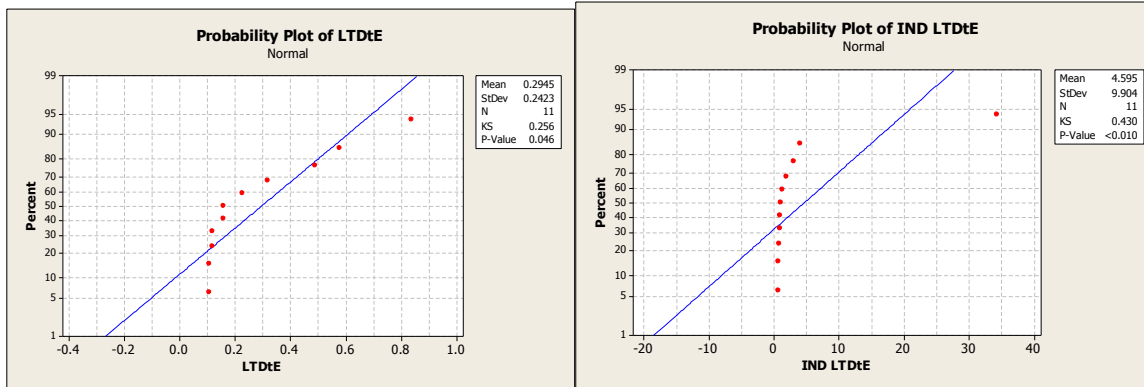
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: LTDtE, IND LTDtE

Paired test for LTDtE - IND LTDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	1.0	0.005	-1.366

	N	Estimated Median	Achieved Confidence	Confidence Interval	Lower	Upper
Difference	11	-1.4	95.5	-17.0	-0.6	

CORNING Debt Management Ratios

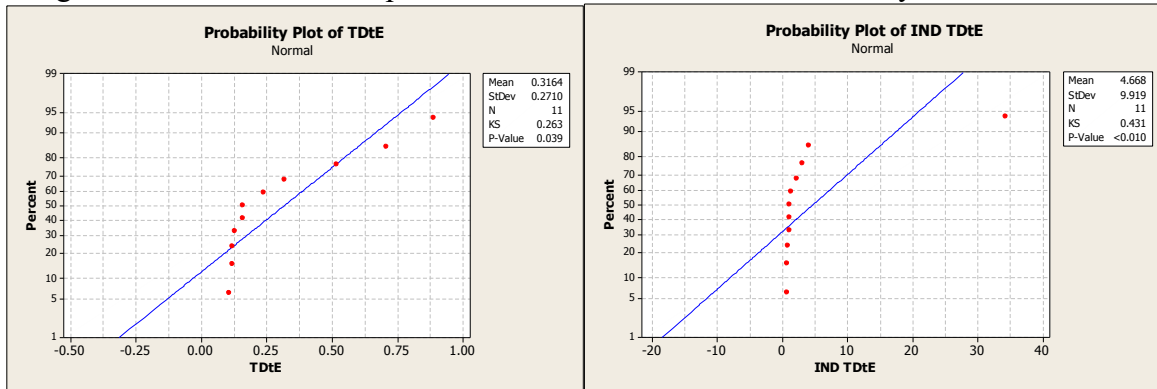
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	1.0	0.005	-1.501

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-1.5	95.5	-17.1	-0.6

CORNING Debt Management Ratios

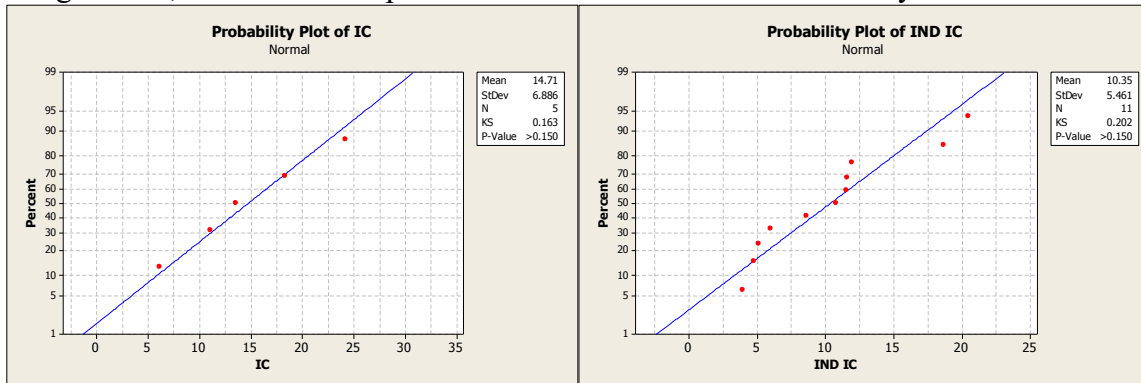
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



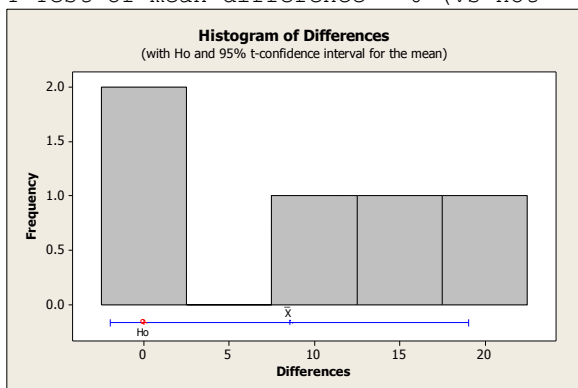
Paired T-Test and CI: GLW IC, IND IC

Paired T for GLW IC - IND IC

	N	Mean	StDev	SE Mean
GLW IC	5	14.71	6.89	3.08
IND IC	5	6.17	2.70	1.21
Difference	5	8.55	8.46	3.78

95% CI for mean difference: (-1.96, 19.05)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.26 P-Value = 0.087



CORNING Asset Management Ratios

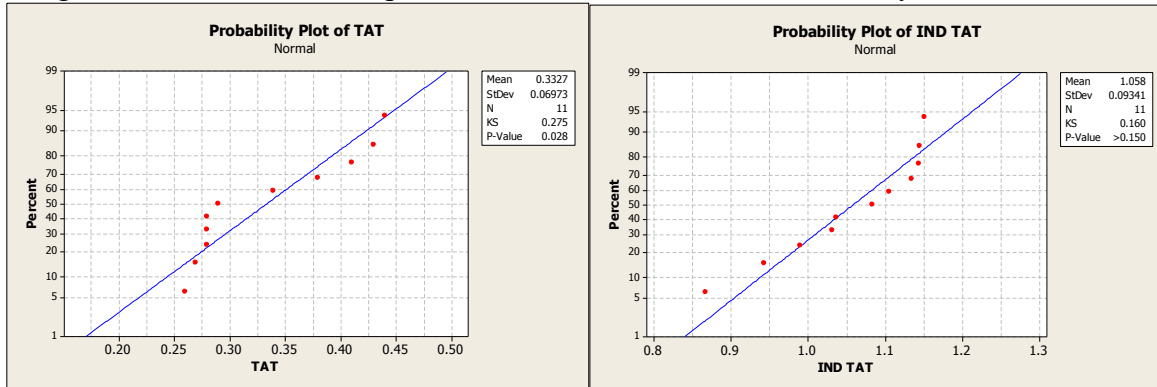
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: TAT, IND TAT

Paired test for TAT - IND TAT

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	Estimated
			Statistic	P
Difference	11	11	0.0	0.004
				Estimated Median
				-0.7298

	N	Estimated	Achieved	Confidence
		Median	Confidence	Interval
				Lower
				Upper
Difference	11	-0.7298	95.5	-0.7638
				-0.6767

CORNING Asset Management Ratios

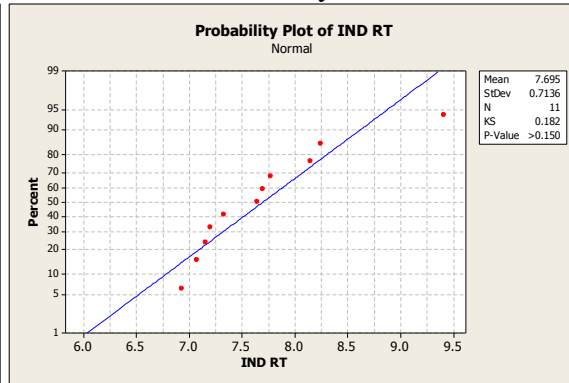
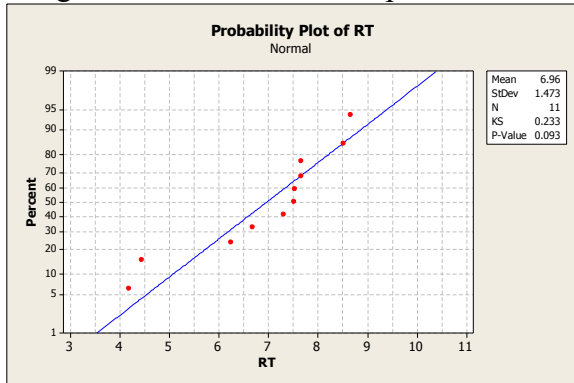
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



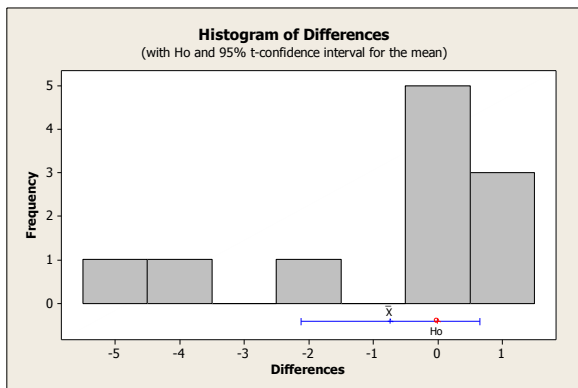
Paired T-Test and CI: GLW RT, IND RT

Paired T for GLW RT - IND RT

	N	Mean	StDev	SE Mean
GLW RT	11	6.960	1.473	0.444
IND RT	11	7.695	0.714	0.215
Difference	11	-0.735	2.067	0.623

95% CI for mean difference: (-2.124, 0.653)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.18 P-Value = 0.265



CORNING Asset Management Ratios

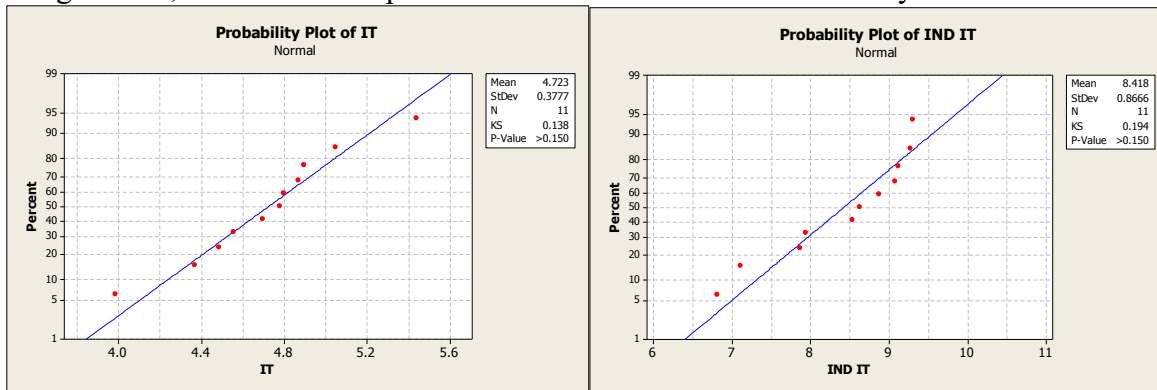
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



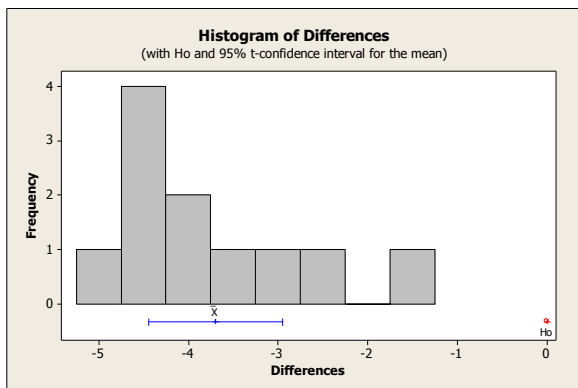
Paired T-Test and CI: GLW IT, IND IT

Paired T for GLW IT - IND IT

	N	Mean	StDev	SE Mean
GLW IT	11	4.723	0.378	0.114
IND IT	11	8.418	0.867	0.261
Difference	11	-3.696	1.108	0.334

95% CI for mean difference: (-4.440, -2.951)

T-Test of mean difference = 0 (vs not = 0): T-Value = -11.06 P-Value = 0.000



CORNING Asset Management Ratios

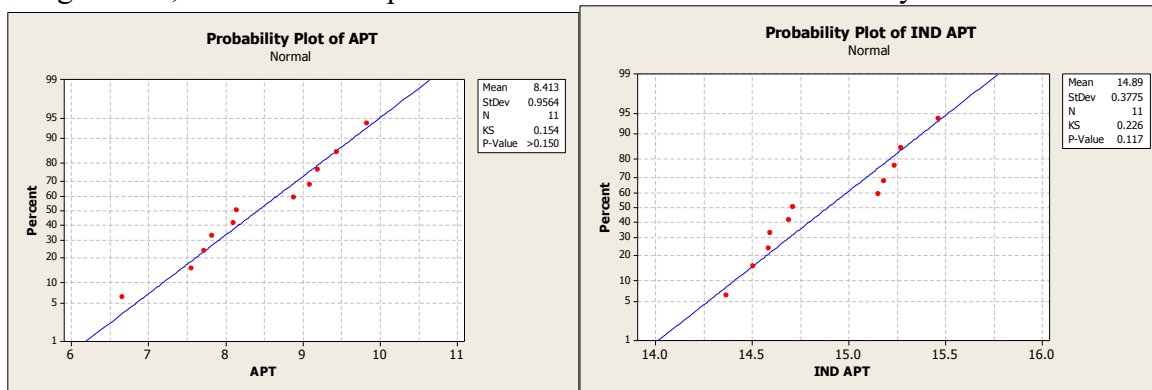
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying off suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



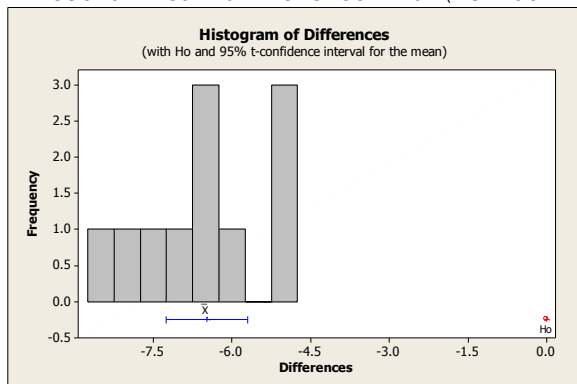
Paired T-Test and CI: GLW APT, IND APT

Paired T for GLW APT - IND APT

	N	Mean	StDev	SE Mean
GLW APT	11	8.413	0.956	0.288
IND APT	11	14.891	0.377	0.114
Difference	11	-6.478	1.157	0.349

95% CI for mean difference: (-7.256, -5.701)

T-Test of mean difference = 0 (vs not = 0): T-Value = -18.57 P-Value = 0.000



CORNING Asset Management Ratios

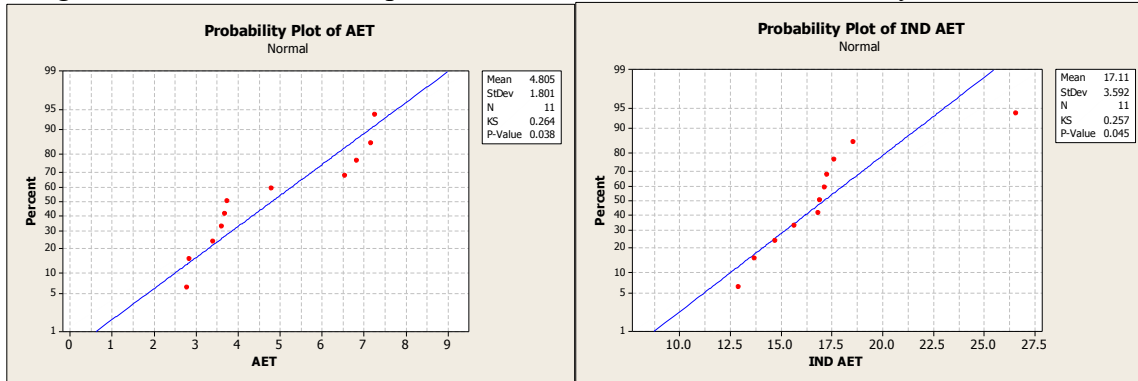
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: AET, IND AET

Paired test for AET - IND AET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated
Difference	11	11	0.0	0.004	-11.69

	N	Estimated	Achieved	Confidence Interval	
Difference	11	-11.69	95.5	-15.06	-9.11

CORNING Asset Management Ratios

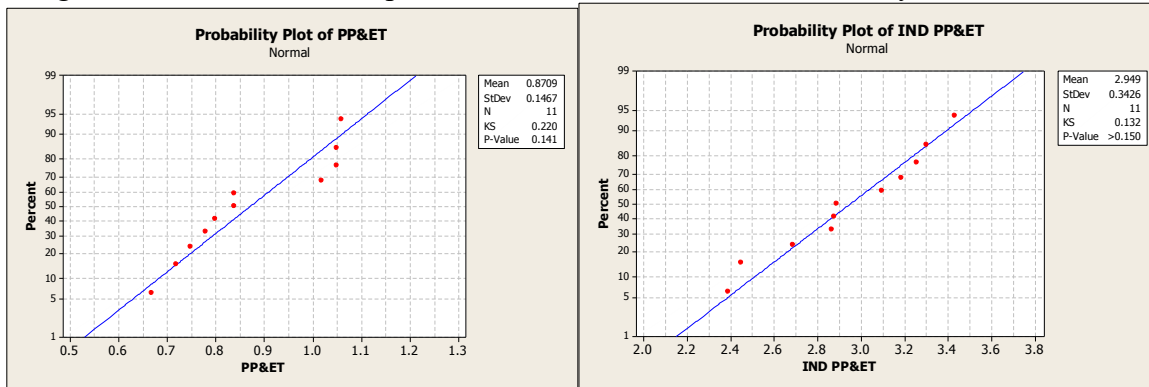
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



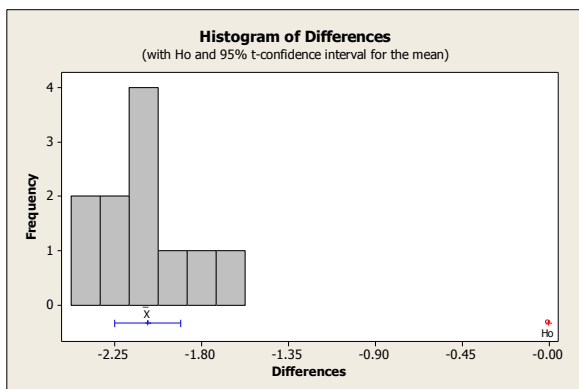
Paired T-Test and CI: GLW PP&ET, IND PP&ET

Paired T for GLW PP&ET - IND PP&ET

	N	Mean	StDev	SE Mean
GLW PP&ET	11	0.871	0.147	0.044
IND PP&ET	11	2.949	0.343	0.103
Difference	11	-2.0780	0.2536	0.0765

95% CI for mean difference: (-2.2484, -1.9077)

T-Test of mean difference = 0 (vs not = 0): T-Value = -27.18 P-Value = 0.000



CORNING Asset Management Ratios

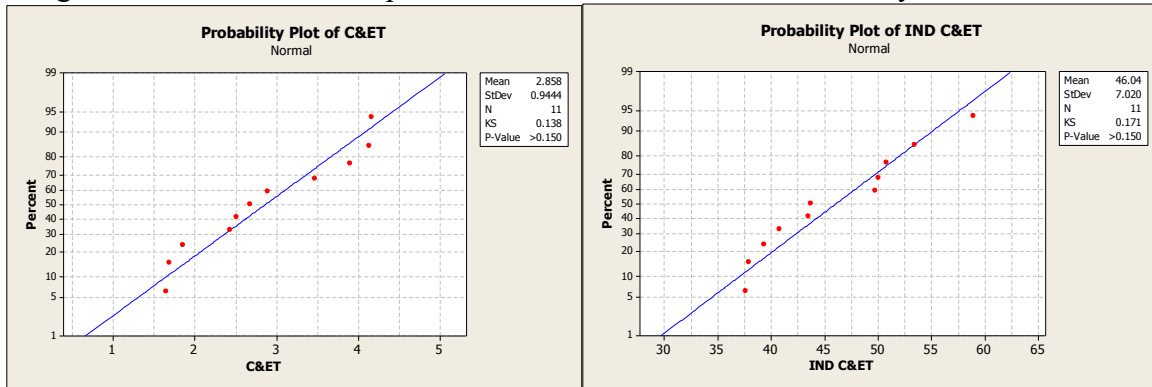
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



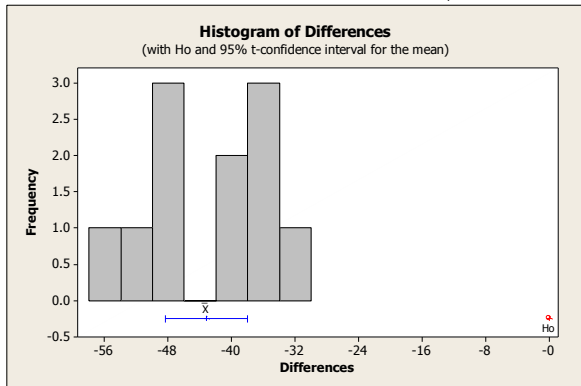
Paired T-Test and CI: GLW C&ET, IND C&ET

Paired T for GLW C&ET - IND C&ET

	N	Mean	StDev	SE Mean
GLW C&ET	11	2.86	0.94	0.28
IND C&ET	11	46.04	7.02	2.12
Difference	11	-43.18	7.67	2.31

95% CI for mean difference: (-48.34, -38.03)

T-Test of mean difference = 0 (vs not = 0): T-Value = -18.67 P-Value = 0.000



CORNING Per Share Ratios

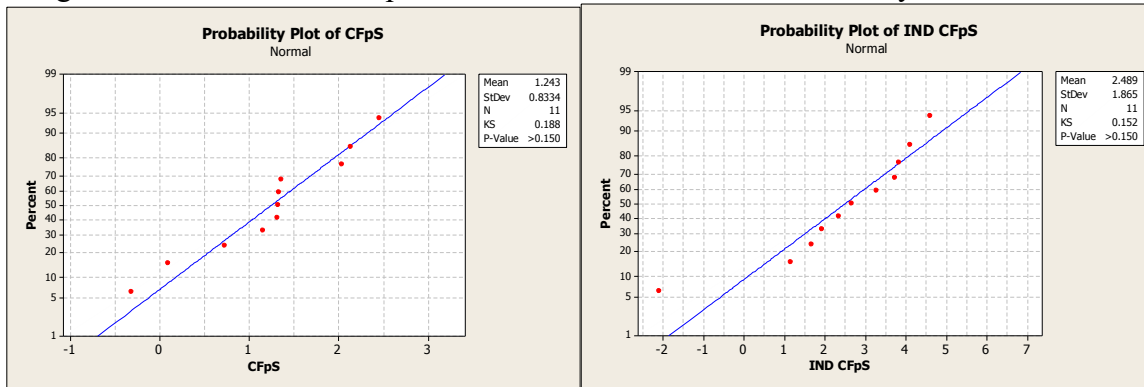
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



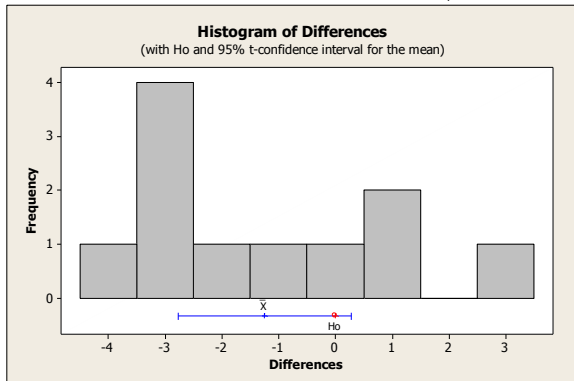
Paired T-Test and CI: GLW CFpS, IND CFpS

Paired T for GLW CFpS - IND CFpS

	N	Mean	StDev	SE Mean
GLW CFpS	11	1.243	0.833	0.251
IND CFpS	11	2.489	1.865	0.562
Difference	11	-1.246	2.266	0.683

95% CI for mean difference: (-2.768, 0.276)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.82 P-Value = 0.098



CORNING Per Share Ratios

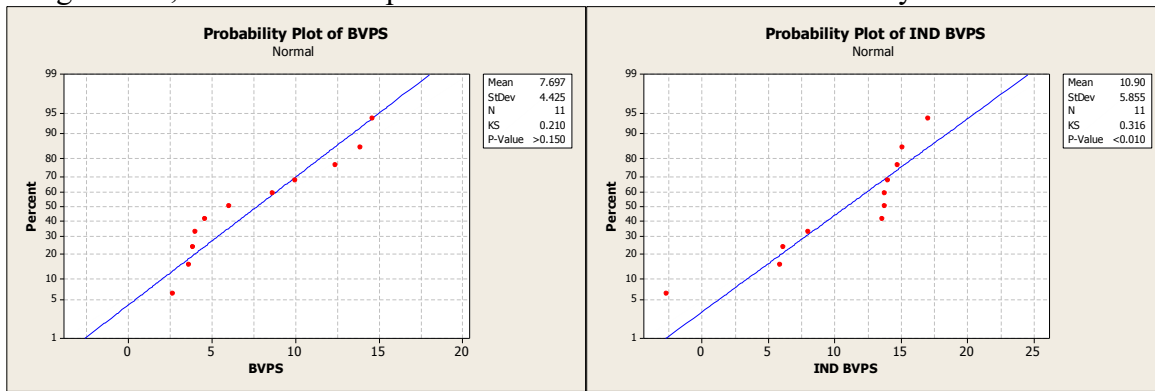
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: BVPS, IND BVPS

Paired test for BVPS - IND BVPS

Test of median = 0.000000 versus median not = 0.000000

	N for	Wilcoxon	Estimated
Difference	11	Test	Median
		Statistic	P
		12.0	0.068

	Estimated	Achieved	Confidence
Difference	Median	Confidence	Interval
			Lower Upper
	-2.85	95.5	-6.64 0.44

HONEYWELL Profitability Ratios

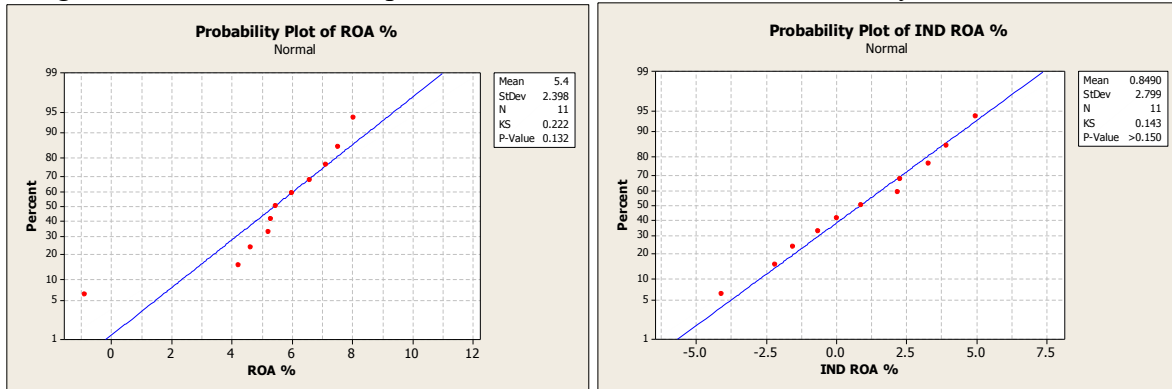
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



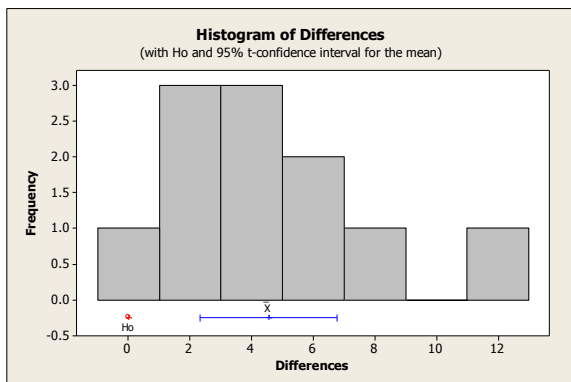
Paired T-Test and CI: ROA %, IND ROA %

Paired T for ROA % - IND ROA %

	N	Mean	StDev	SE Mean
ROA %	11	5.400	2.398	0.723
IND ROA %	11	0.849	2.799	0.844
Difference	11	4.55	3.32	1.00

95% CI for mean difference: (2.32, 6.78)

T-Test of mean difference = 0 (vs not = 0): T-Value = 4.55 P-Value = 0.001



HONEYWELL Profitability Ratios

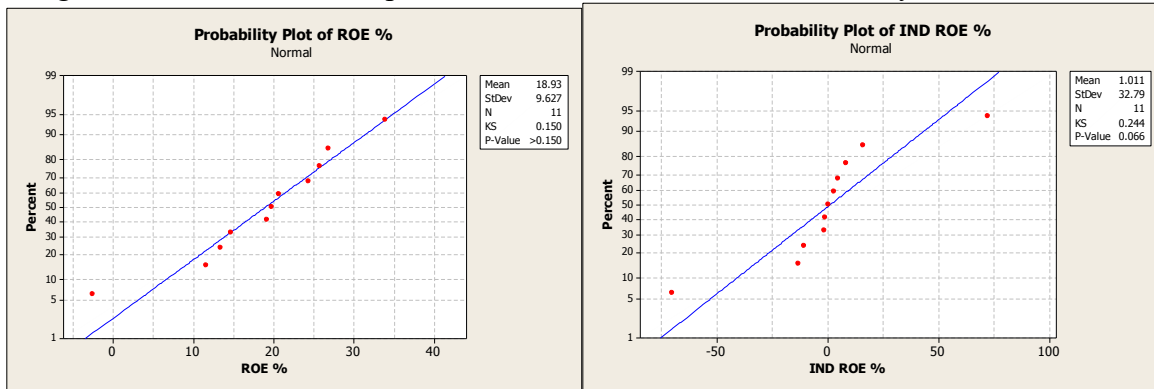
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



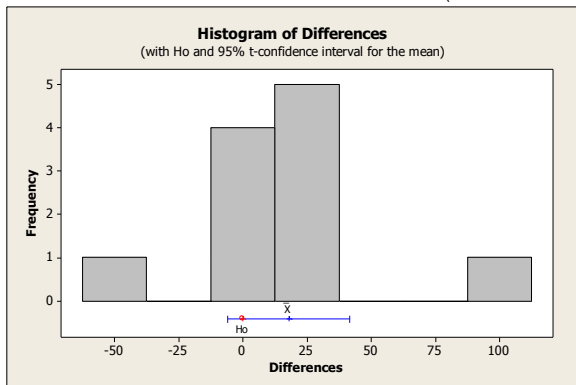
Paired T-Test and CI: ROE %, IND ROE %

Paired T for ROE % - IND ROE %

	N	Mean	StDev	SE Mean
ROE %	11	18.93	9.63	2.90
IND ROE %	11	1.01	32.79	9.89
Difference	11	17.9	35.4	10.7

95% CI for mean difference: (-5.8, 41.7)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.68 P-Value = 0.124



HONEYWELL Profitability Ratios

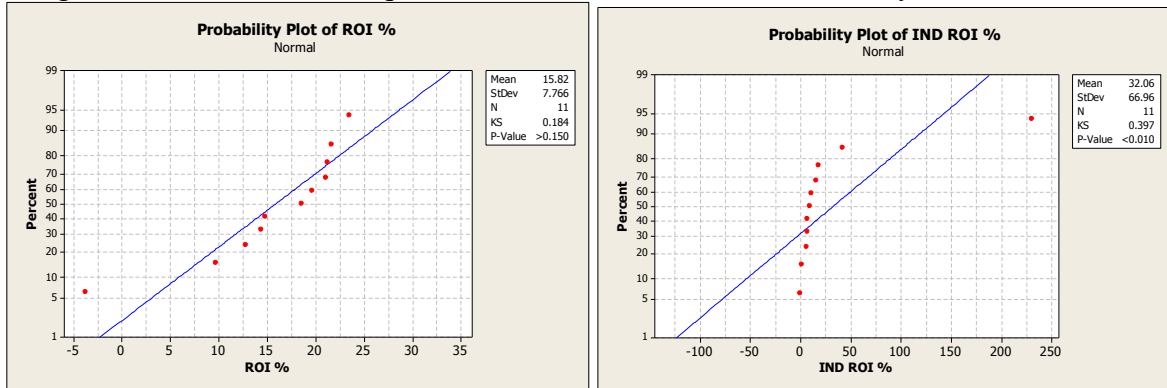
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: ROI %, IND ROI %

Paired test for ROI % - IND ROI %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated
Difference	11	11	37.0	0.756	2.546

	N	Estimated	Achieved	Confidence Interval	
		Median	Confidence	Lower	Upper
Difference	11	3	95.5	-98	12

HONEYWELL Profitability Ratios

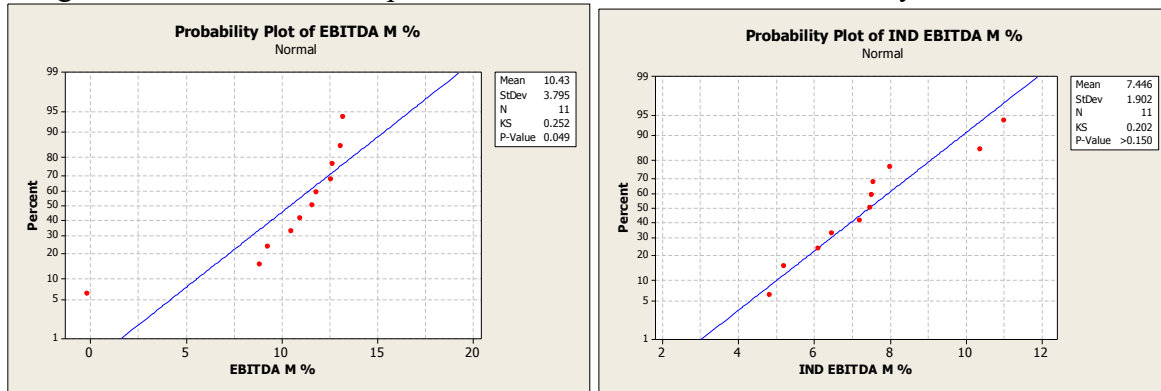
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: EBITDA M %, IND EBITDA M %

Paired test for EBITDA M % - IND EBITDA M %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	56.0	0.045	3.429

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	3.43	95.5	0.29	5.64

HONEYWELL Profitability Ratios

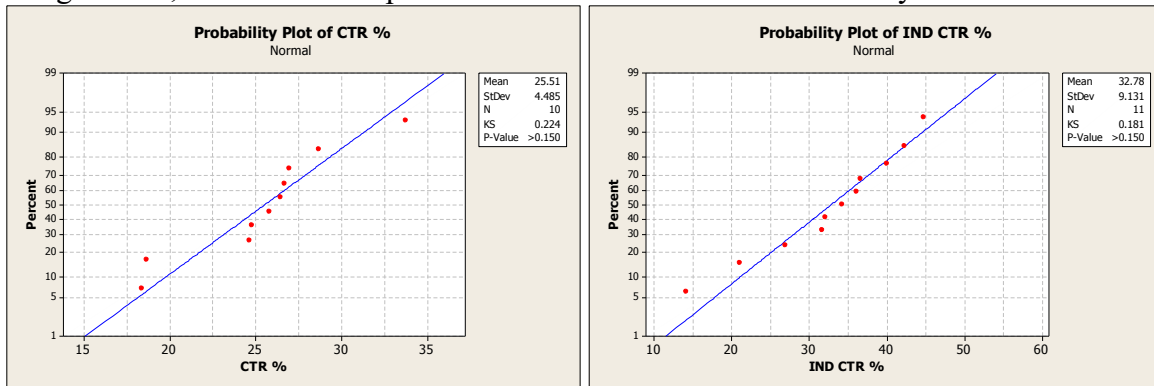
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



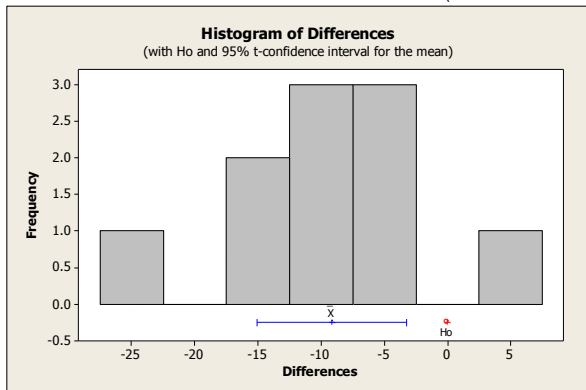
Paired T-Test and CI: HON CTR %, IND CTR %

Paired T for HON CTR % - IND CTR %

	N	Mean	StDev	SE Mean
HON CTR %	10	25.51	4.48	1.42
IND CTR %	10	34.64	7.10	2.25
Difference	10	-9.13	8.27	2.62

95% CI for mean difference: (-15.05, -3.22)

T-Test of mean difference = 0 (vs not = 0): T-Value = -3.49 P-Value = 0.007



HONEYWELL Profitability Ratios

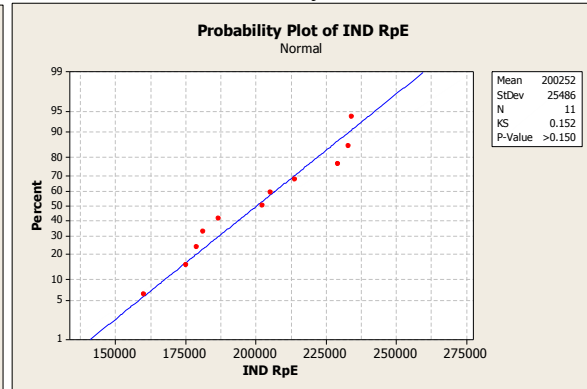
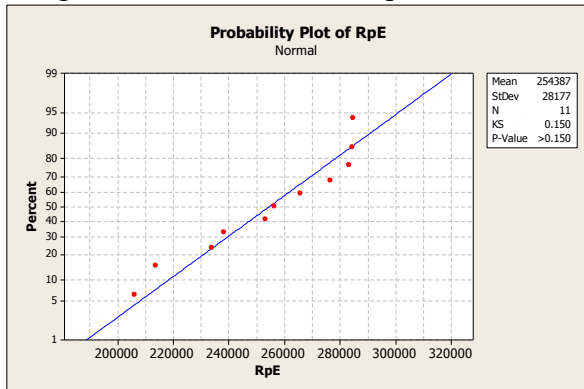
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



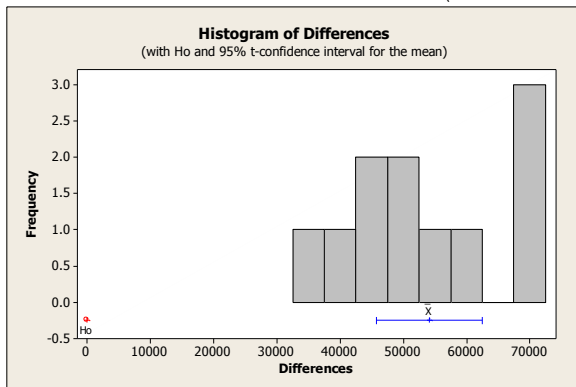
Paired T-Test and CI: HON RpE, IND RpE

Paired T for HON RpE - IND RpE

	N	Mean	StDev	SE Mean
HON RpE	11	254387	28177	8496
IND RpE	11	200252	25486	7684
Difference	11	54135	12469	3759

95% CI for mean difference: (45758, 62511)

T-Test of mean difference = 0 (vs not = 0): T-Value = 14.40 P-Value = 0.000



HONEYWELL Liquidity Ratios

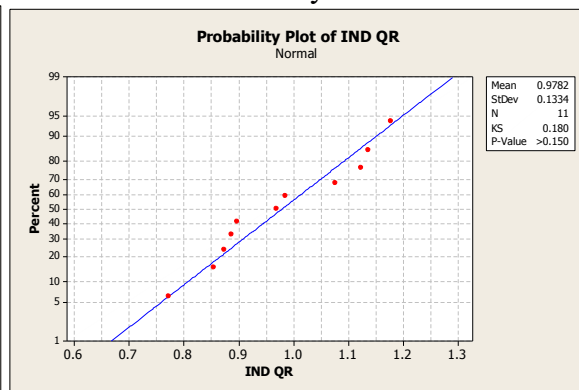
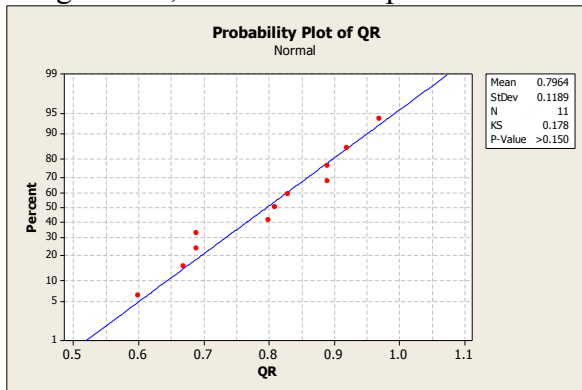
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



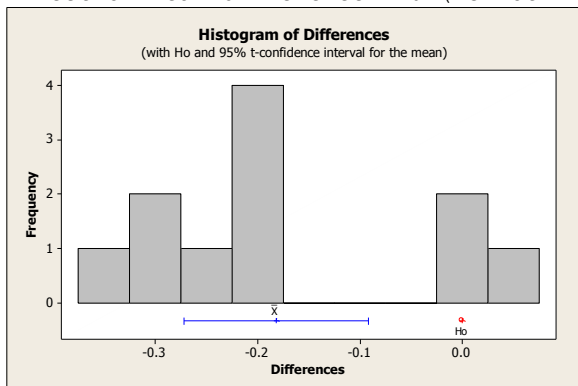
Paired T-Test and CI: HON QR, IND QR

Paired T for HON QR - IND QR

	N	Mean	StDev	SE Mean
HON QR	11	0.7964	0.1189	0.0359
IND QR	11	0.9782	0.1334	0.0402
Difference	11	-0.1818	0.1342	0.0405

95% CI for mean difference: (-0.2720, -0.0916)

T-Test of mean difference = 0 (vs not = 0): T-Value = -4.49 P-Value = 0.001



HONEYWELL Liquidity Ratios

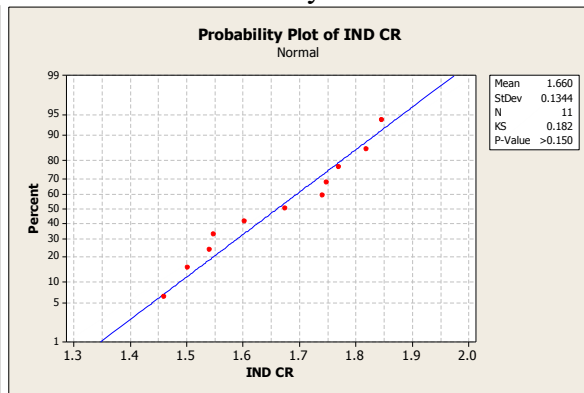
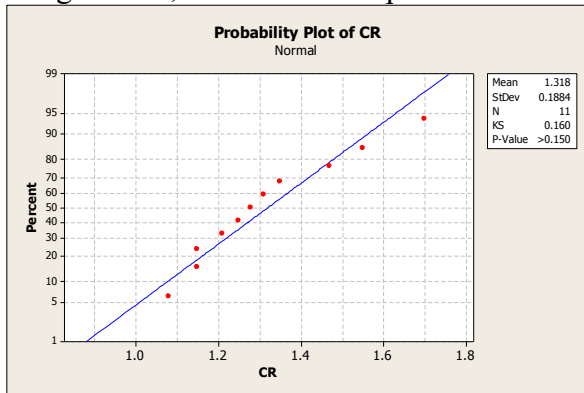
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



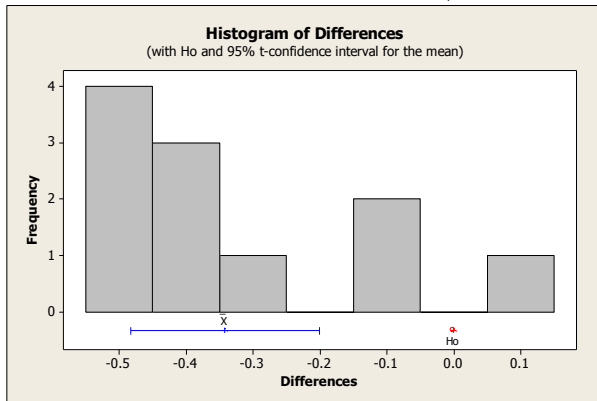
Paired T-Test and CI: HON CR, IND CR

Paired T for HON CR - IND CR

	N	Mean	StDev	SE Mean
HON CR	11	1.3182	0.1884	0.0568
IND CR	11	1.6603	0.1344	0.0405
Difference	11	-0.3421	0.2100	0.0633

95% CI for mean difference: (-0.4832, -0.2010)

T-Test of mean difference = 0 (vs not = 0): T-Value = -5.40 P-Value = 0.000



HONEYWELL Liquidity Ratios

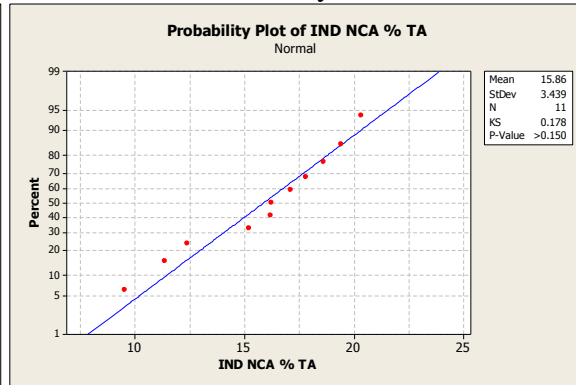
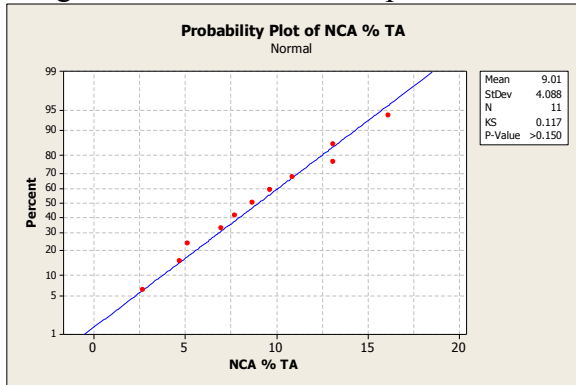
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



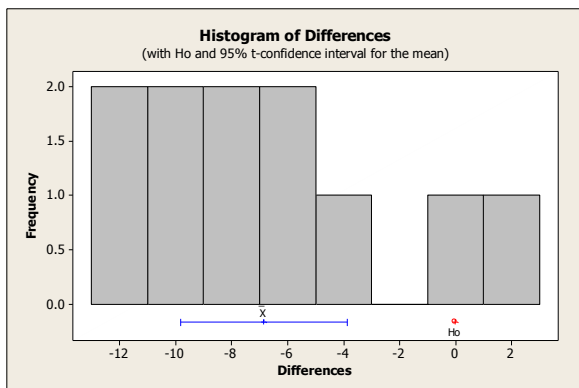
Paired T-Test and CI: HON NCA % TA, IND NCA % TA

Paired T for HON NCA % TA - IND NCA % TA

	N	Mean	StDev	SE Mean
HON NCA % TA	11	9.01	4.09	1.23
IND NCA % TA	11	15.86	3.44	1.04
Difference	11	-6.85	4.42	1.33

95% CI for mean difference: (-9.82, -3.88)

T-Test of mean difference = 0 (vs not = 0): T-Value = -5.14 P-Value = 0.000



HONEYWELL Debt Management

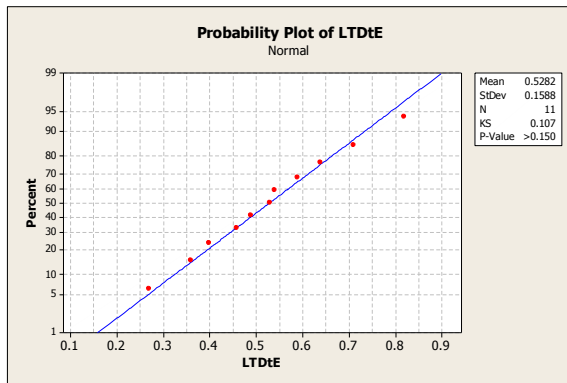
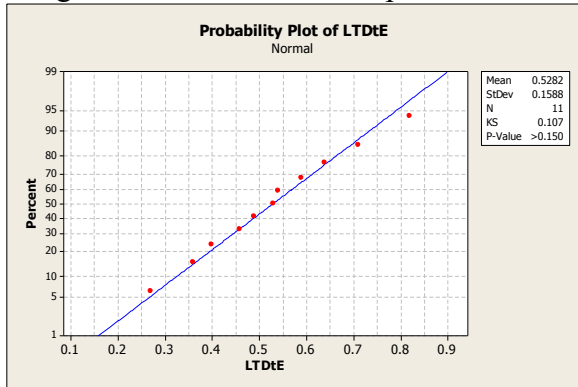
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



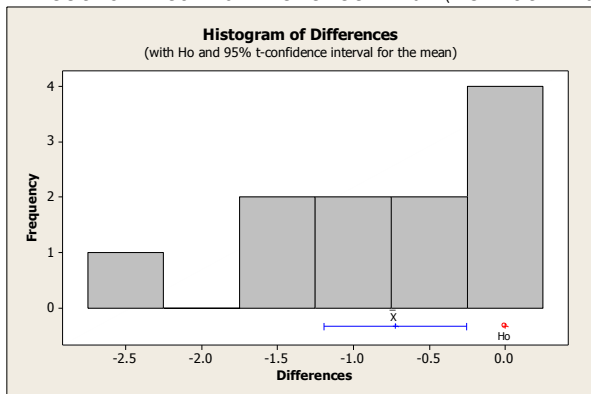
Paired T-Test and CI: HON LTDtE, IND LTDtE

Paired T for HON LTDtE - IND LTDtE

	N	Mean	StDev	SE Mean
HON LTDtE	11	0.528	0.159	0.048
IND LTDtE	11	1.253	0.630	0.190
Difference	11	-0.725	0.700	0.211

95% CI for mean difference: (-1.195, -0.254)

T-Test of mean difference = 0 (vs not = 0): T-Value = -3.43 P-Value = 0.006



HONEYWELL Debt Management

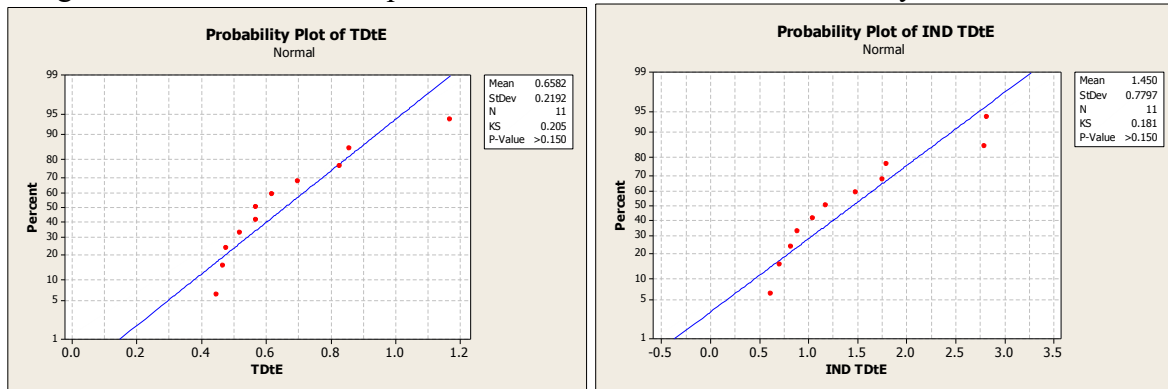
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



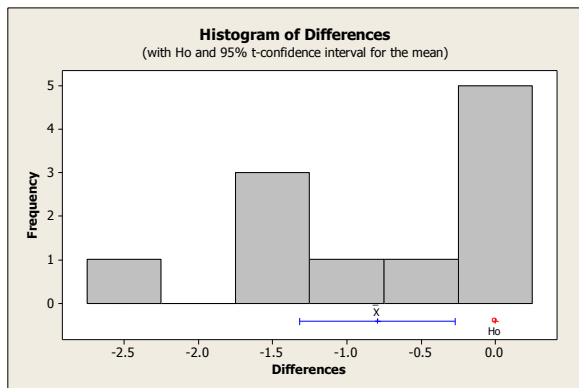
Paired T-Test and CI: HON TDtE, IND TDtE

Paired T for HON TDtE - IND TDtE

	N	Mean	StDev	SE Mean
HON TDtE	11	0.658	0.219	0.066
IND TDtE	11	1.450	0.780	0.235
Difference	11	-0.792	0.781	0.235

95% CI for mean difference: (-1.317, -0.267)

T-Test of mean difference = 0 (vs not = 0): T-Value = -3.36 P-Value = 0.007



HONEYWELL Debt Management

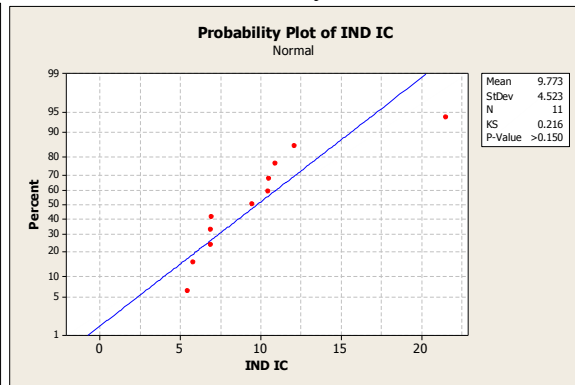
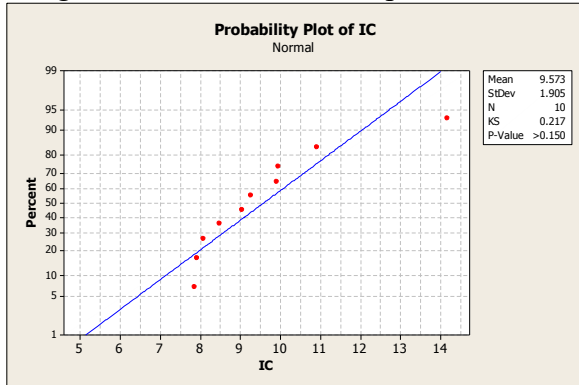
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



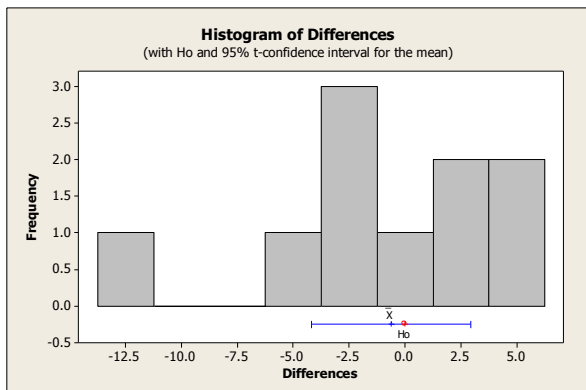
Paired T-Test and CI: IC, IND IC

Paired T for IC - IND IC

	N	Mean	StDev	SE Mean
IC	10	9.57	1.90	0.60
IND IC	10	10.20	4.53	1.43
Difference	10	-0.63	4.97	1.57

95% CI for mean difference: (-4.18, 2.93)

T-Test of mean difference = 0 (vs not = 0): T-Value = -0.40 P-Value = 0.699



HONEYWELL Asset Management Ratios

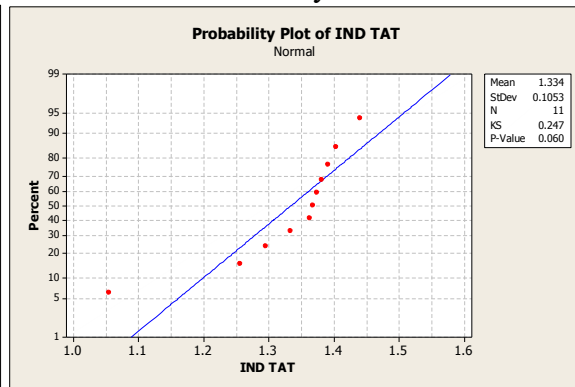
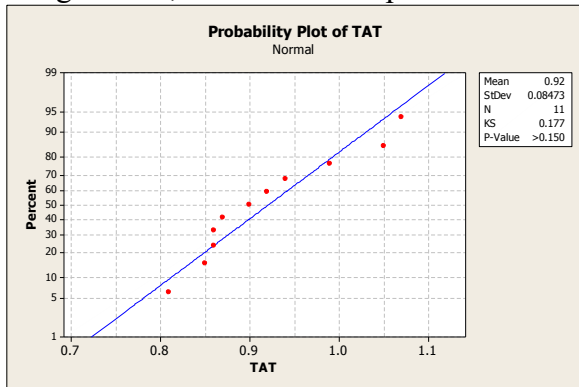
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



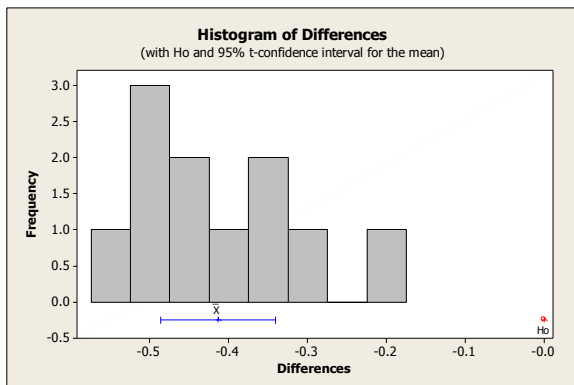
Paired T-Test and CI: TAT, IND TAT

Paired T for TAT - IND TAT

	N	Mean	StDev	SE Mean
TAT	11	0.9200	0.0847	0.0255
IND TAT	11	1.3337	0.1053	0.0317
Difference	11	-0.4137	0.1078	0.0325

95% CI for mean difference: (-0.4861, -0.3413)

T-Test of mean difference = 0 (vs not = 0): T-Value = -12.73 P-Value = 0.000



HONEYWELL Asset Management Ratios

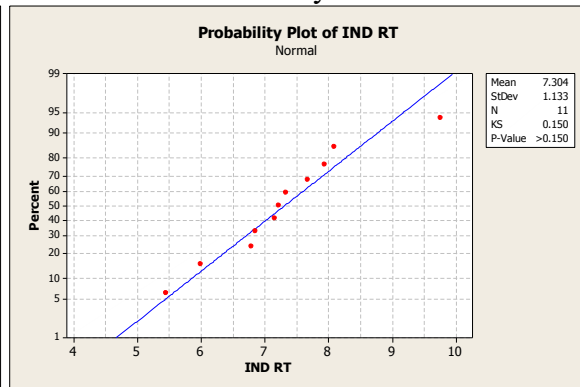
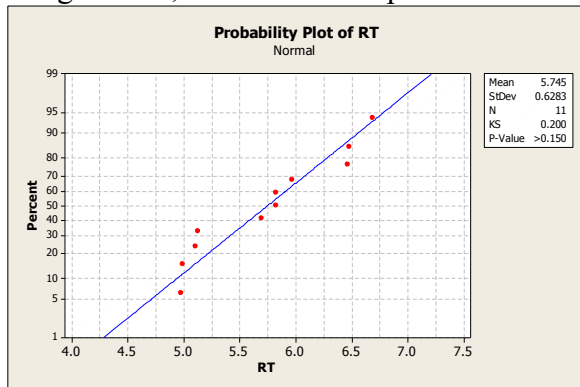
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



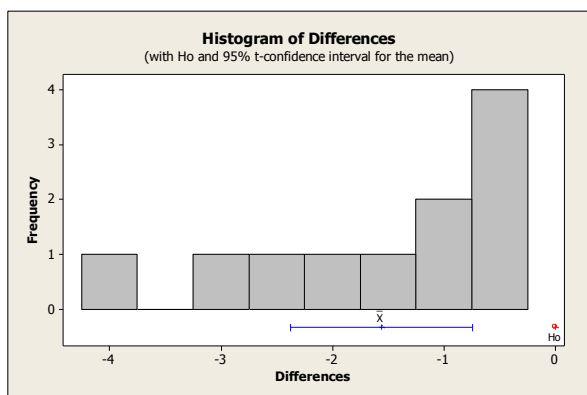
Paired T-Test and CI: HON RT, IND RT

Paired T for HON RT - IND RT

	N	Mean	StDev	SE Mean
HON RT	11	5.745	0.628	0.189
IND RT	11	7.304	1.133	0.342
Difference	11	-1.559	1.219	0.367

95% CI for mean difference: (-2.378, -0.741)

T-Test of mean difference = 0 (vs not = 0): T-Value = -4.24 P-Value = 0.002



HONEYWELL Asset Management Ratios

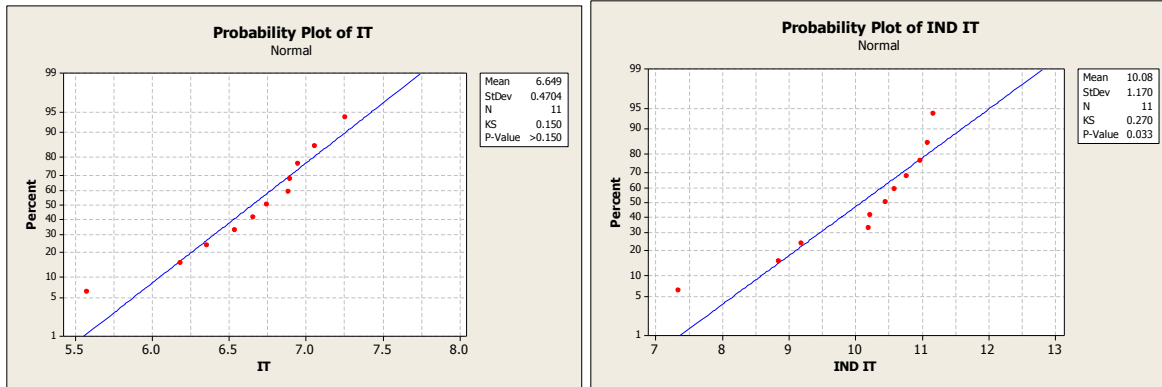
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: IT, IND IT

Paired test for IT - IND IT

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated
Difference	11	11	0.0	0.004	-3.548

	N	Estimated	Achieved	Confidence	
		Median	Confidence	Lower	Upper
Difference	11	-3.55	95.5	-4.41	-2.59

HONEYWELL Asset Management Ratios

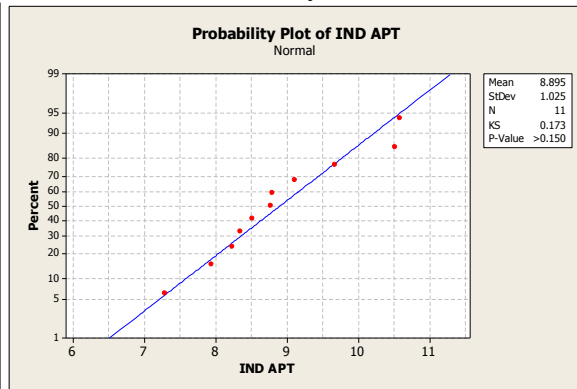
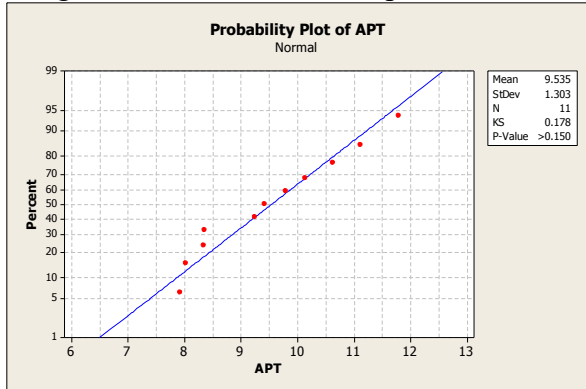
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying off suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER

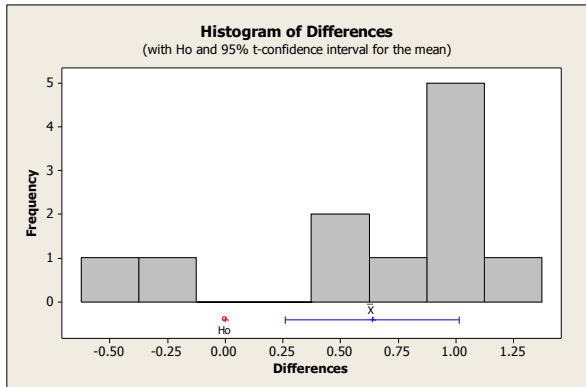


Paired T for HON APT - IND APT

	N	Mean	StDev	SE Mean
HON APT	11	9.535	1.303	0.393
IND APT	11	8.895	1.025	0.309
Difference	11	0.640	0.562	0.170

95% CI for mean difference: (0.262, 1.017)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.77 P-Value = 0.004



HONEYWELL Asset Management Ratios

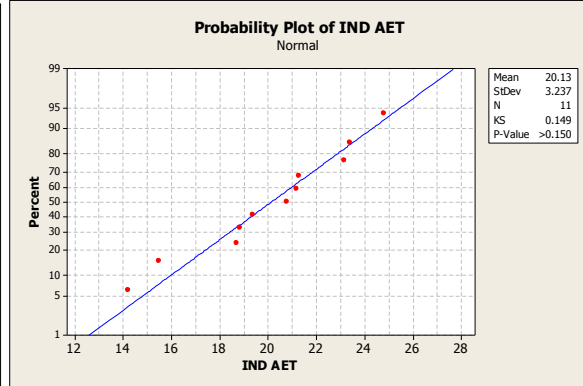
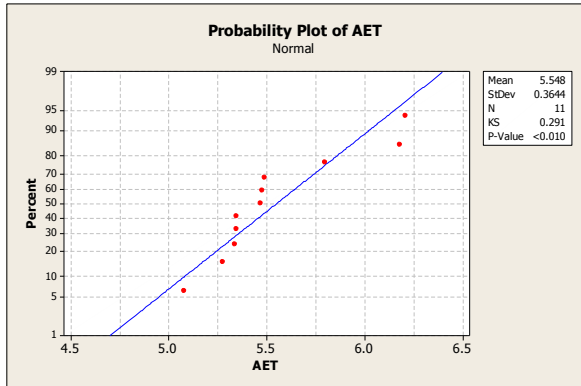
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: AET, IND AET

Paired test for AET - IND AET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	Statistic	P	Estimated
Difference	11	11	0.0	0.004		-14.58

	N	Estimated	Achieved	Confidence	Lower	Upper
Difference	11	-14.58	95.5		-16.81	-12.28

HONEYWELL Asset Management Ratios

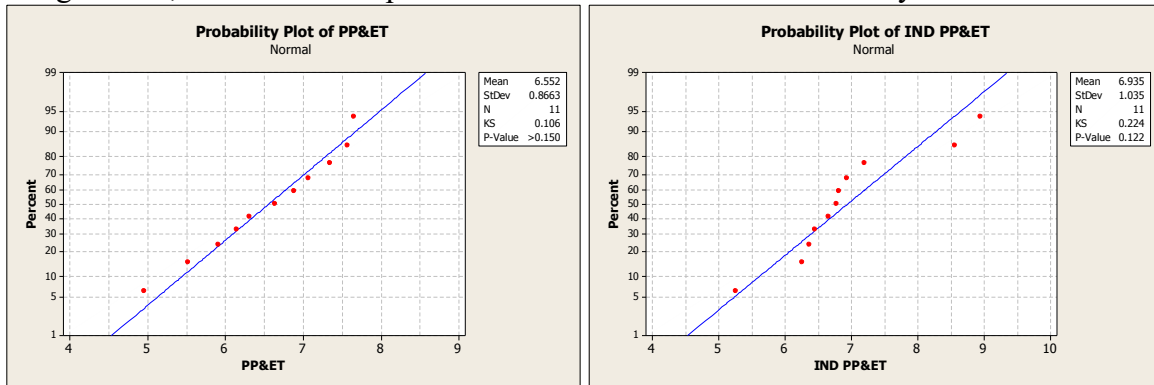
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



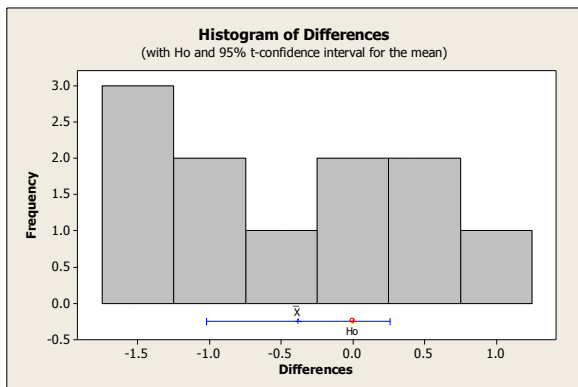
Paired T-Test and CI: HON PP&ET, IND PP&ET

Paired T for HON PP&ET - IND PP&ET

	N	Mean	StDev	SE Mean
HON PP&ET	11	6.552	0.866	0.261
IND PP&ET	11	6.935	1.035	0.312
Difference	11	-0.383	0.954	0.287

95% CI for mean difference: (-1.024, 0.257)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.33 P-Value = 0.212



HONEYWELL Asset Management Ratios

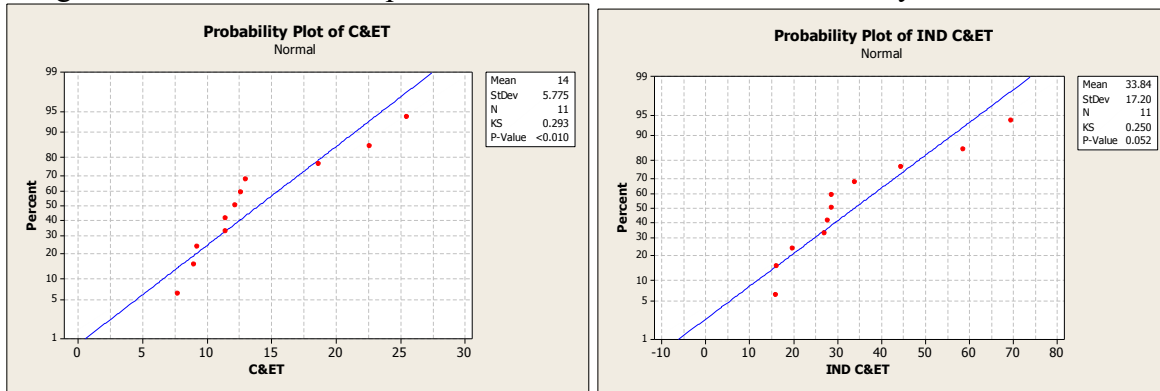
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: C&ET, IND C&ET

Paired test for C&ET - IND C&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-17.55

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-17.6	95.5	-32.9	-9.3

HONEYWELL Per Share Ratios

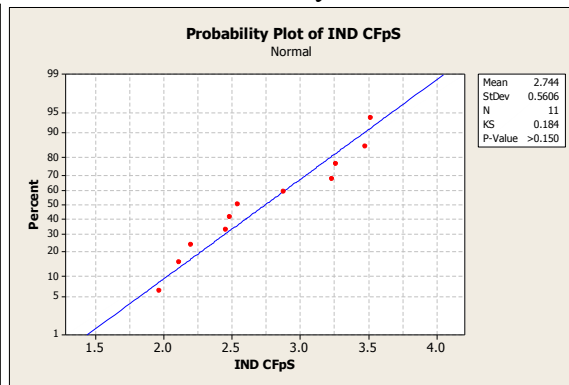
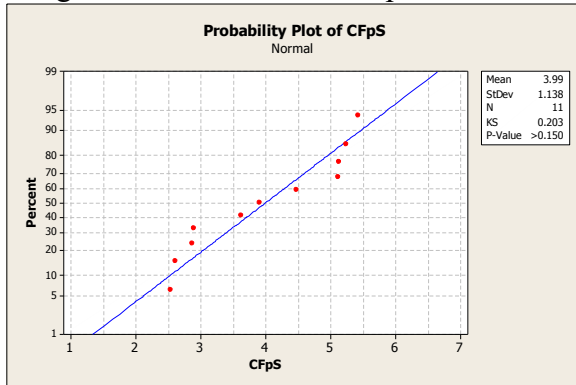
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



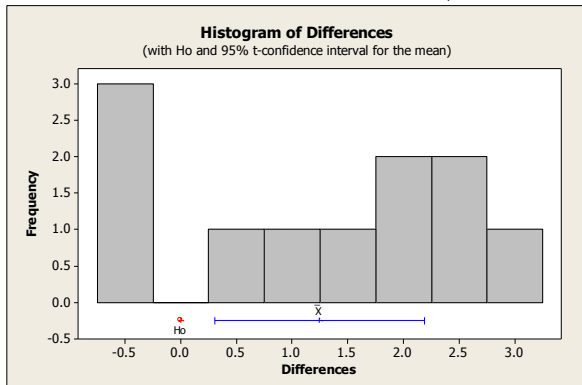
Paired T-Test and CI: HON CFpS, IND CFpS

Paired T for HON CFpS - IND CFpS

	N	Mean	StDev	SE Mean
HON CFpS	11	3.990	1.138	0.343
IND CFpS	11	2.744	0.561	0.169
Difference	11	1.246	1.404	0.423

95% CI for mean difference: (0.303, 2.190)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.94 P-Value = 0.015



HONEYWELL Per Share Ratios

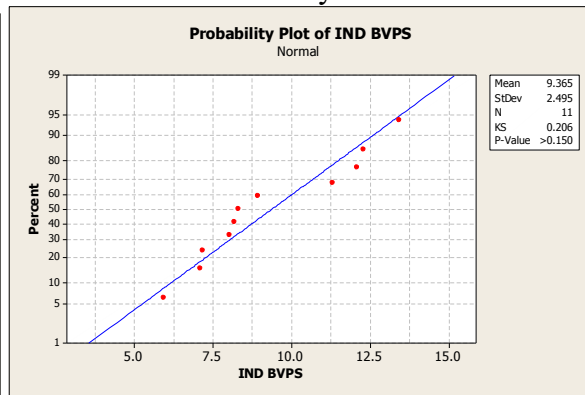
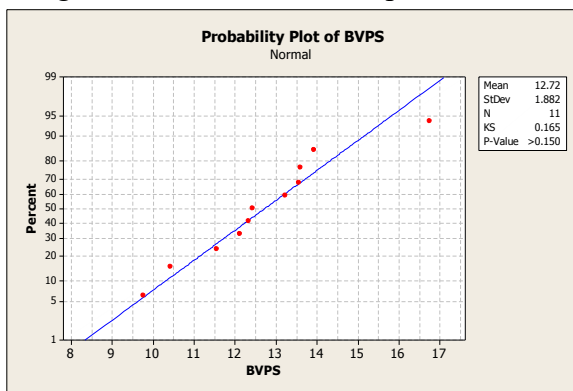
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



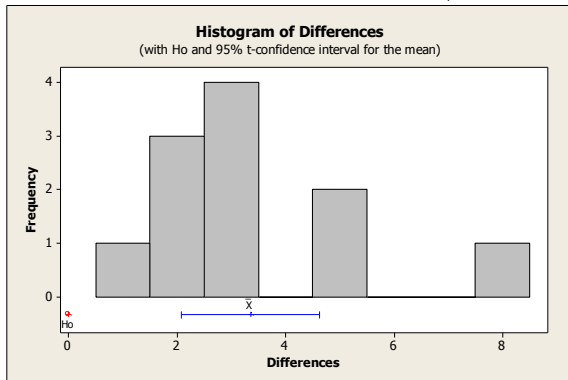
Paired T-Test and CI: HON BVPS, IND BVPS

Paired T for HON BVPS - IND BVPS

	N	Mean	StDev	SE Mean
HON BVPS	11	12.715	1.882	0.568
IND BVPS	11	9.365	2.495	0.752
Difference	11	3.351	1.905	0.574

95% CI for mean difference: (2.071, 4.631)

T-Test of mean difference = 0 (vs not = 0): T-Value = 5.83 P-Value = 0.000



IBM Profitability Ratios

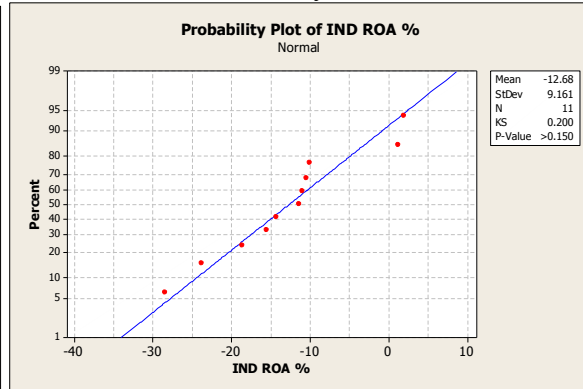
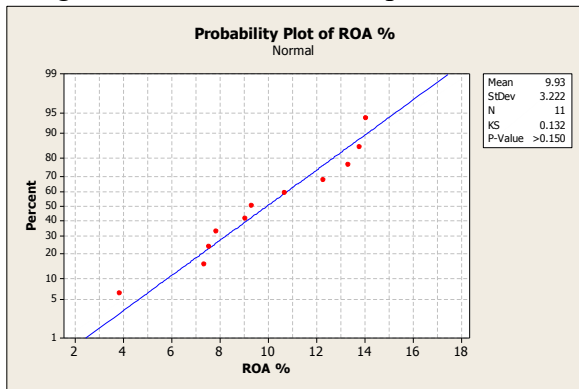
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



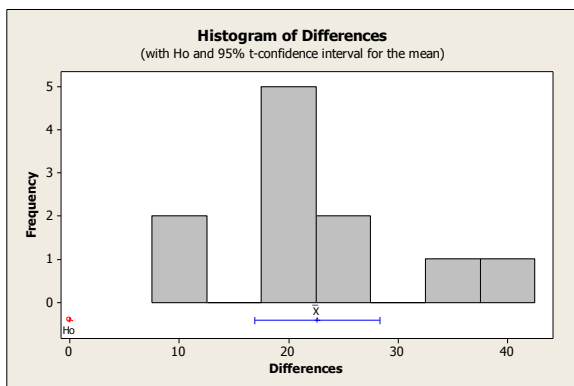
Paired T-Test and CI: IBM ROA %, IND ROA %

Paired T for IBM ROA % - IND ROA %

	N	Mean	StDev	SE Mean
IBM ROA %	11	9.93	3.22	0.97
IND ROA %	11	-12.68	9.16	2.76
Difference	11	22.61	8.51	2.56

95% CI for mean difference: (16.90, 28.33)

T-Test of mean difference = 0 (vs not = 0): T-Value = 8.82 P-Value = 0.000



IBM Profitability Ratios

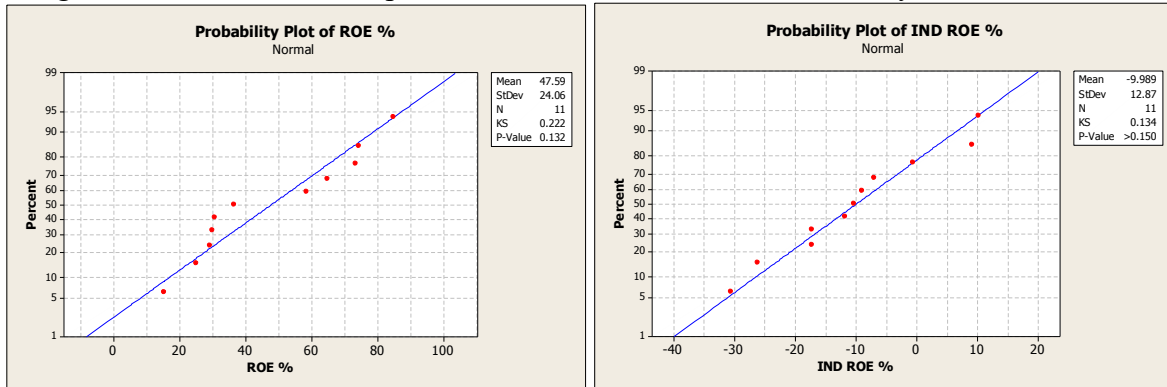
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



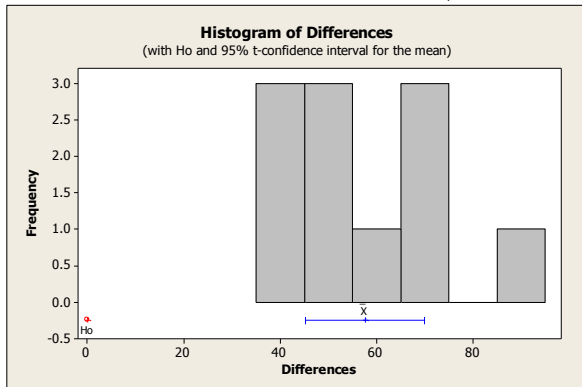
Paired T-Test and CI: IBM ROE %, IND ROE %

Paired T for IBM ROE % - IND ROE %

	N	Mean	StDev	SE Mean
IBM ROE %	11	47.59	24.06	7.25
IND ROE %	11	-9.99	12.87	3.88
Difference	11	57.58	18.27	5.51

95% CI for mean difference: (45.31, 69.86)

T-Test of mean difference = 0 (vs not = 0): T-Value = 10.45 P-Value = 0.000



IBM Profitability Ratios

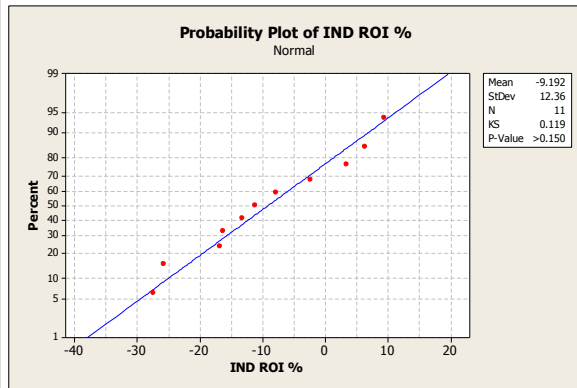
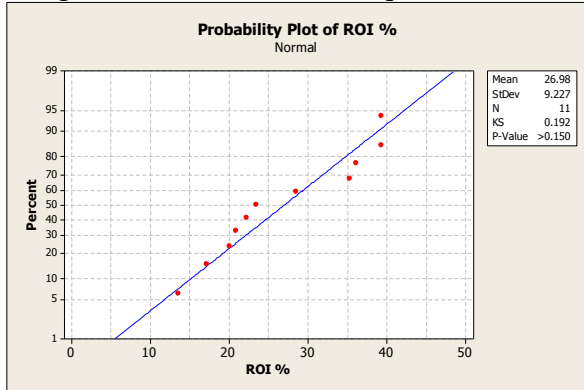
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



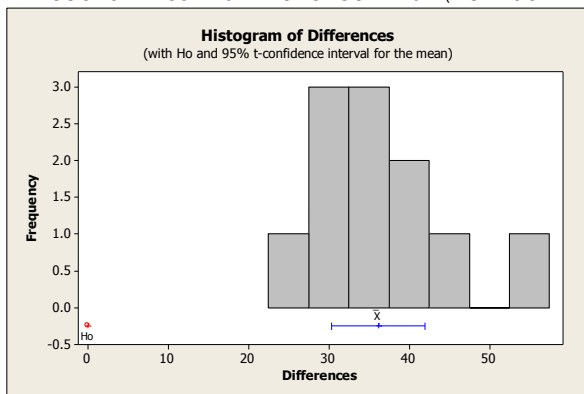
Paired T-Test and CI: IBM ROI %, IND ROI %

Paired T for IBM ROI % - IND ROI %

	N	Mean	StDev	SE Mean
IBM ROI %	11	26.98	9.23	2.78
IND ROI %	11	-9.19	12.36	3.73
Difference	11	36.17	8.66	2.61

95% CI for mean difference: (30.35, 41.99)

T-Test of mean difference = 0 (vs not = 0): T-Value = 13.85 P-Value = 0.000



IBM Profitability Ratios

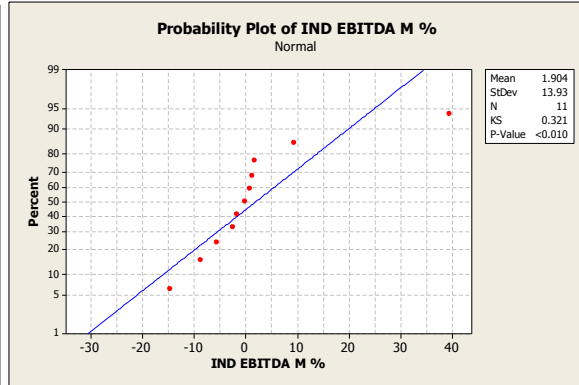
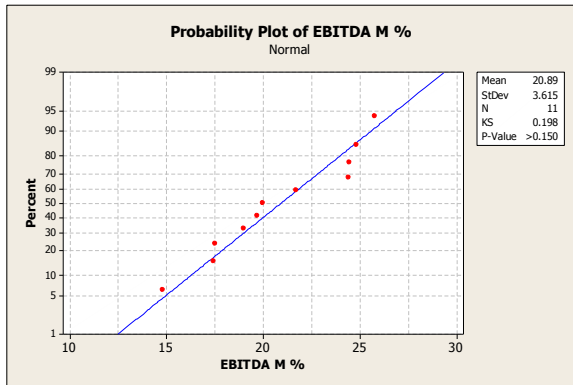
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: EBITDA M %, IND EBITDA M %

Paired test for EBITDA M % - IND EBITDA M %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	60.0	0.018	22.04

	N	Estimated Median	Achieved Confidence	Confidence Interval
Difference	11	22.0	95.5	4.1 26.6

IBM Profitability Ratios

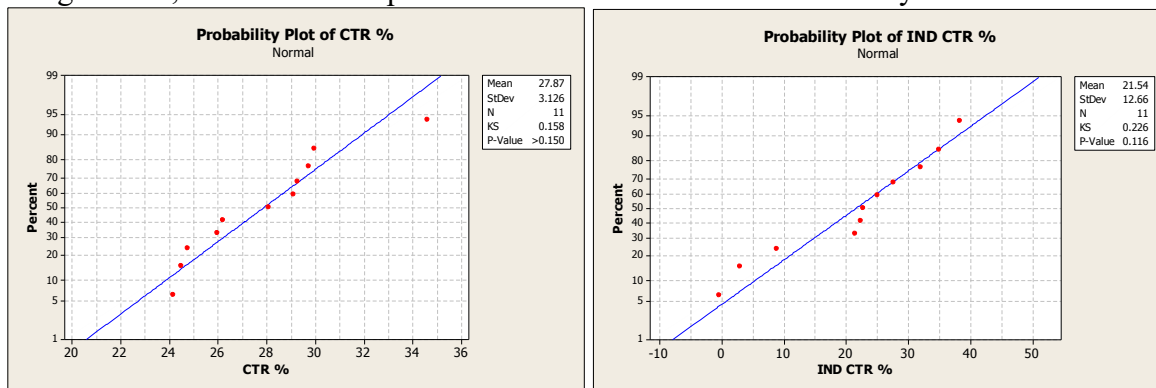
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



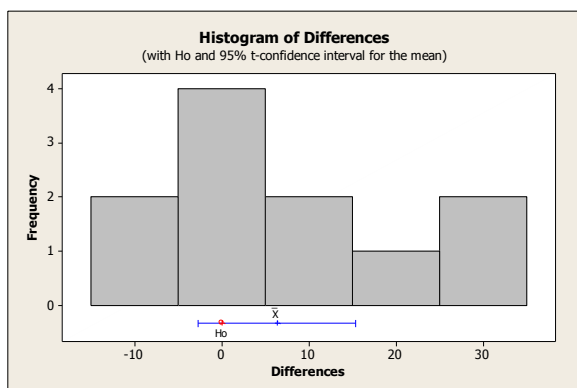
Paired T-Test and CI: IBM CTR %, IND CTR %

Paired T for IBM CTR % - IND CTR %

	N	Mean	StDev	SE Mean
IBM CTR %	11	27.87	3.13	0.94
IND CTR %	11	21.54	12.66	3.82
Difference	11	6.33	13.41	4.04

95% CI for mean difference: (-2.68, 15.34)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.57 P-Value = 0.149



IBM Profitability Ratios

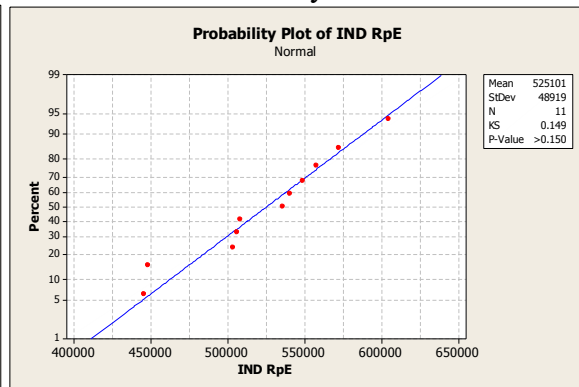
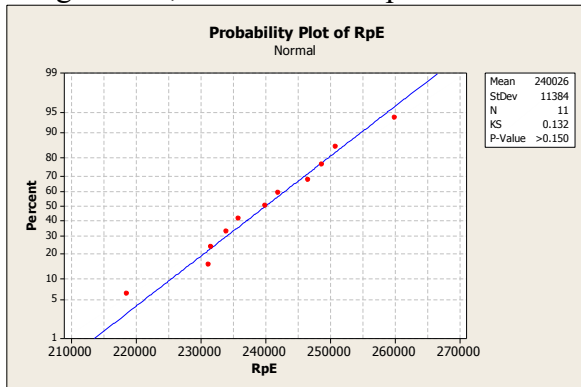
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



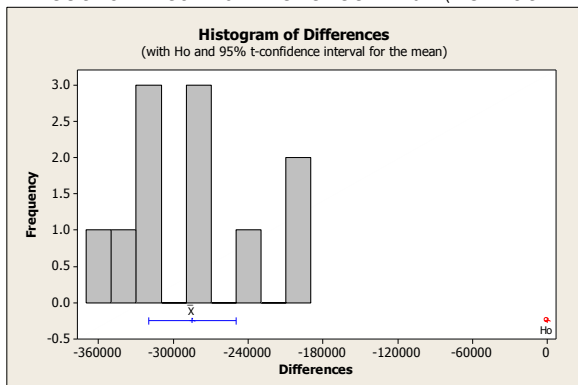
Paired T-Test and CI: IBM RpE, IND RpE

Paired T for IBM RpE - IND RpE

	N	Mean	StDev	SE Mean
IBM RpE	11	240026	11384	3432
IND RpE	11	525101	48919	14750
Difference	11	-285074	52171	15730

95% CI for mean difference: (-320123, -250025)

T-Test of mean difference = 0 (vs not = 0): T-Value = -18.12 P-Value = 0.000



IBM Liquidity Ratios

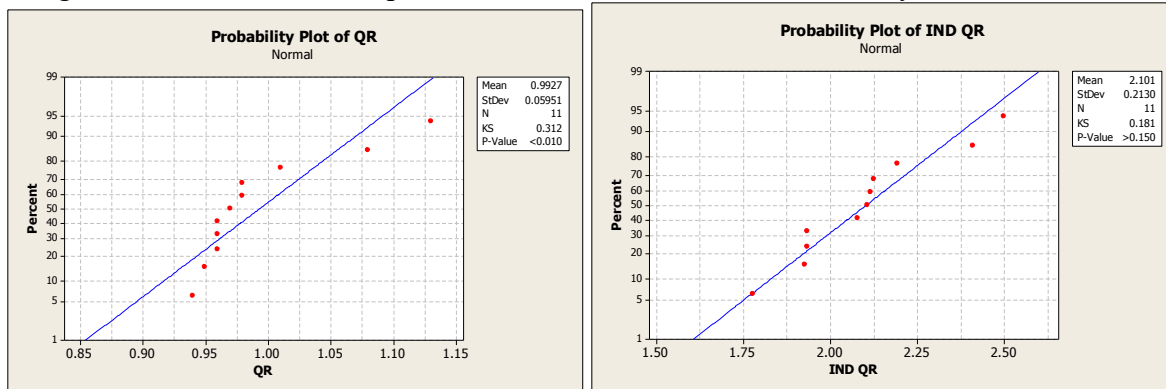
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: QR, IND QR

Paired test for QR - IND QR

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-1.093

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-1.093	95.5	-1.281	-0.946

IBM Liquidity Ratios

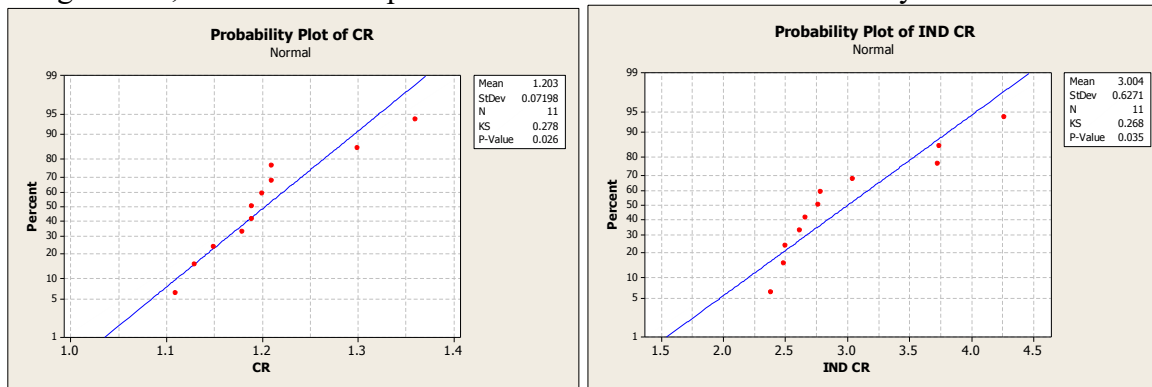
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: CR, IND CR

Paired test for CR - IND CR

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated
Difference	11	11	0.0	0.004	-1.655

	N	Estimated	Achieved	Confidence Interval	
		Median	Confidence	Lower	Upper
Difference	11	-1.655	95.5	-2.243	-1.343

IBM Liquidity Ratios

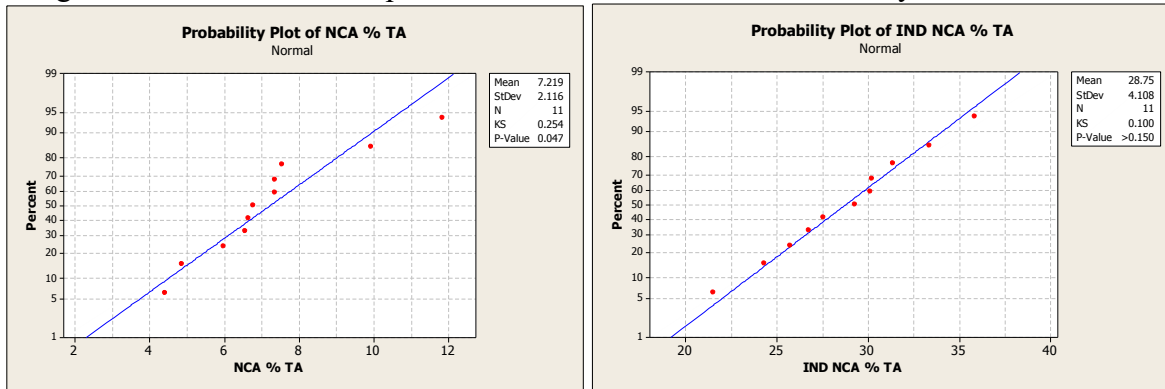
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: NCA % TA, IND NCA % TA

Paired test for NCA % TA - IND NCA % TA

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-21.54

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-21.54	95.5	-24.64	-18.35

IBM Debt Management Ratios

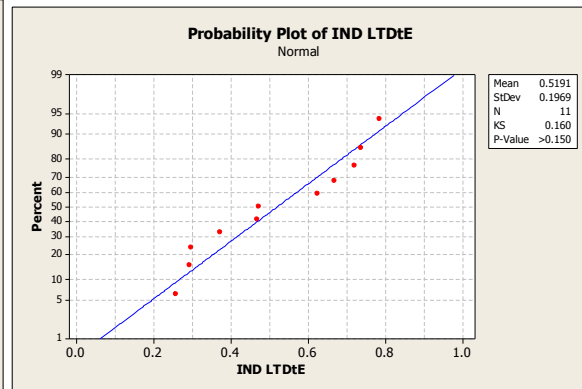
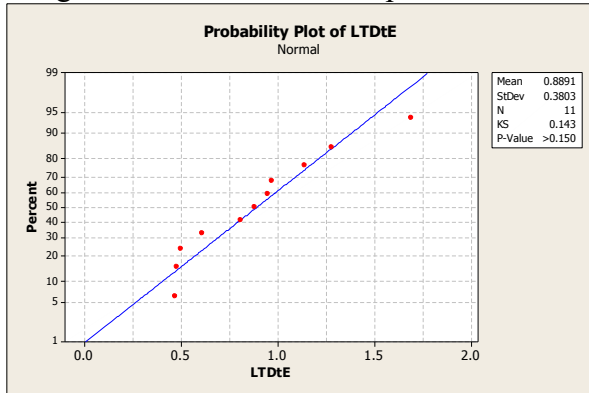
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



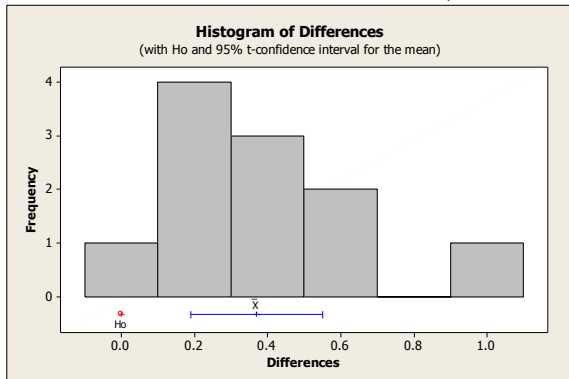
Paired T-Test and CI: IBM LTDtE, IND LTDtE

Paired T for IBM LTDtE - IND LTDtE

	N	Mean	StDev	SE Mean
IBM LTDtE	11	0.889	0.380	0.115
IND LTDtE	11	0.519	0.197	0.059
Difference	11	0.3700	0.2685	0.0809

95% CI for mean difference: (0.1896, 0.5504)

T-Test of mean difference = 0 (vs not = 0): T-Value = 4.57 P-Value = 0.001



IBM Debt Management Ratios

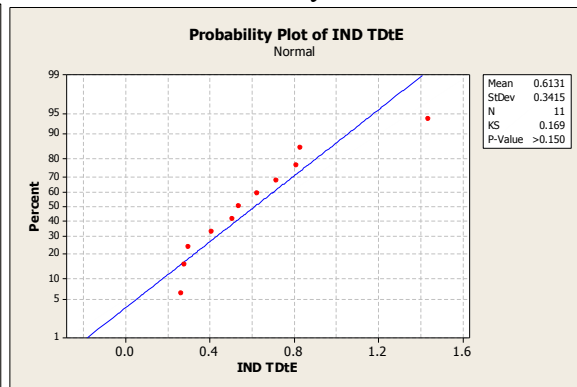
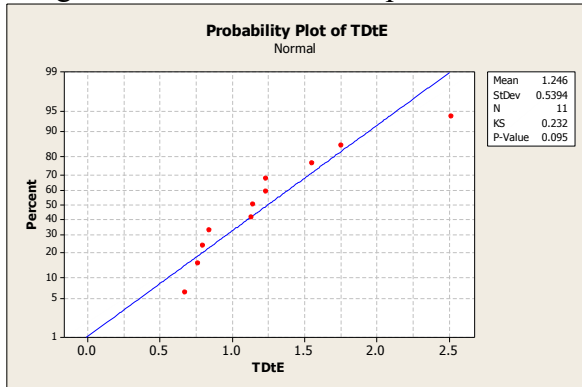
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



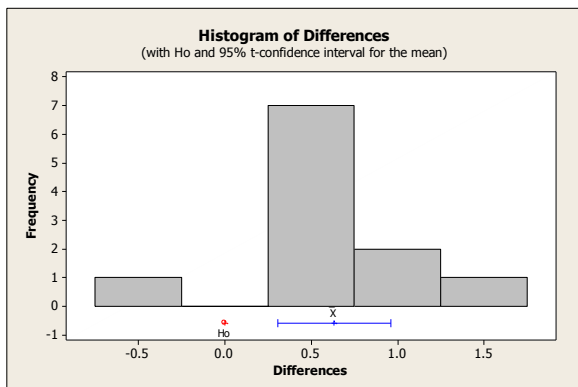
Paired T-Test and CI: IBM TDtE, IND TDtE

Paired T for IBM TDtE - IND TDtE

	N	Mean	StDev	SE Mean
IBM TDtE	11	1.246	0.539	0.163
IND TDtE	11	0.613	0.341	0.103
Difference	11	0.633	0.485	0.146

95% CI for mean difference: (0.307, 0.959)

T-Test of mean difference = 0 (vs not = 0): T-Value = 4.33 P-Value = 0.001



IBM Debt Management Ratios

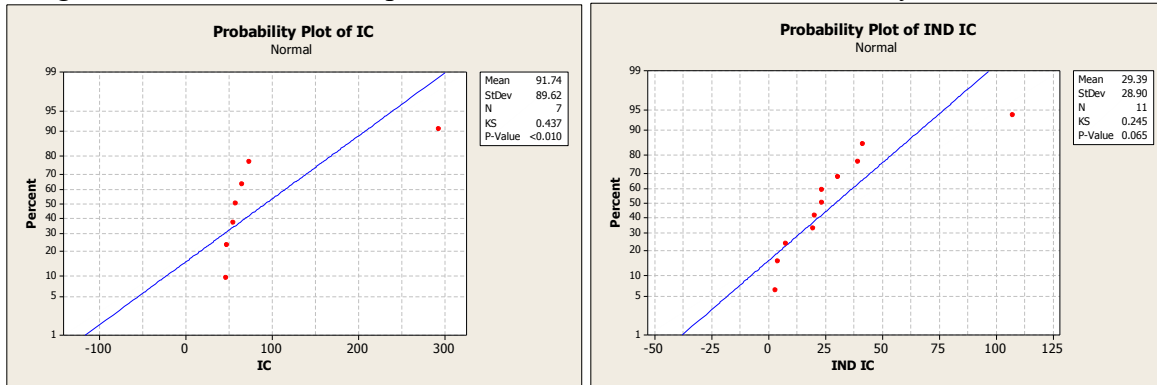
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: IC, IND IC

Paired test for IC - IND IC

Test of median = 0.000000 versus median not = 0.000000

	N	N*	N for Test	Wilcoxon Statistic	P	Estimated Median
Difference	7	4	7	28.0	0.022	31.61

	N	N*	Estimated Median	Achieved Confidence	Confidence Interval	
					Lower	Upper
Difference	7	4	31.6	94.8	23.2	109.2

IBM Asset Management

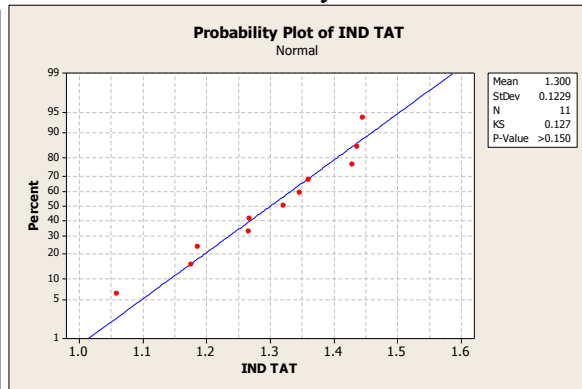
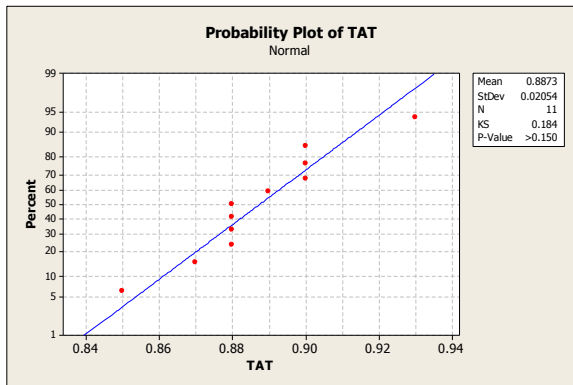
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



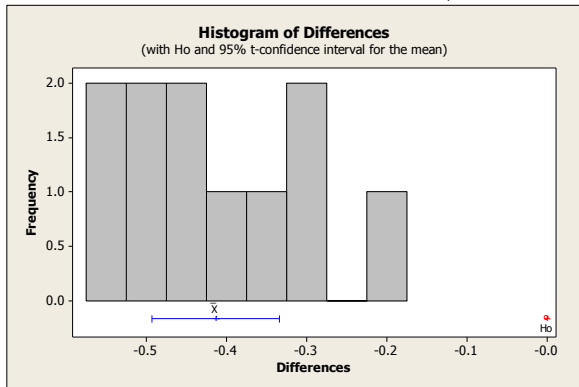
Paired T-Test and CI: IBM TAT, IND TAT

Paired T for IBM TAT - IND TAT

	N	Mean	StDev	SE Mean
IBM TAT	11	0.8873	0.0205	0.0062
IND TAT	11	1.3004	0.1229	0.0371
Difference	11	-0.4131	0.1185	0.0357

95% CI for mean difference: (-0.4927, -0.3335)

T-Test of mean difference = 0 (vs not = 0): T-Value = -11.56 P-Value = 0.000



IBM Asset Management

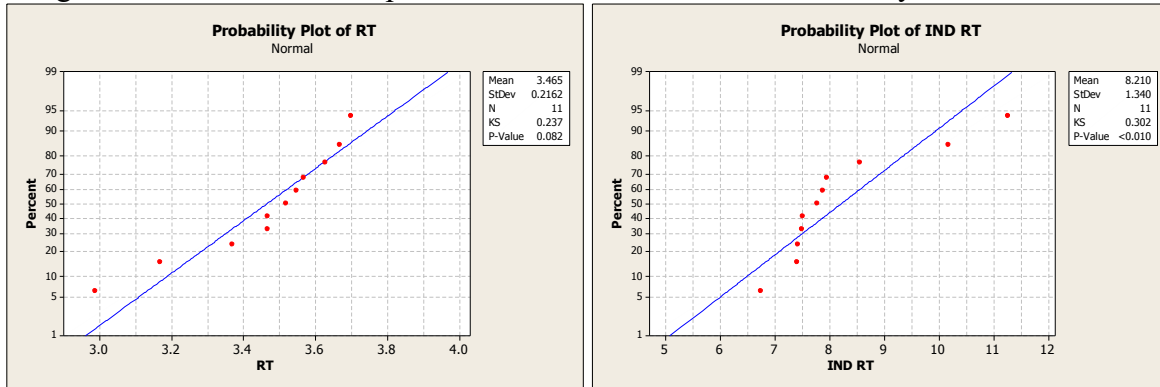
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: RT, IND RT

Paired test for RT - IND RT

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-4.374

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-4.37	95.5	-5.90	-3.86

IBM Asset Management

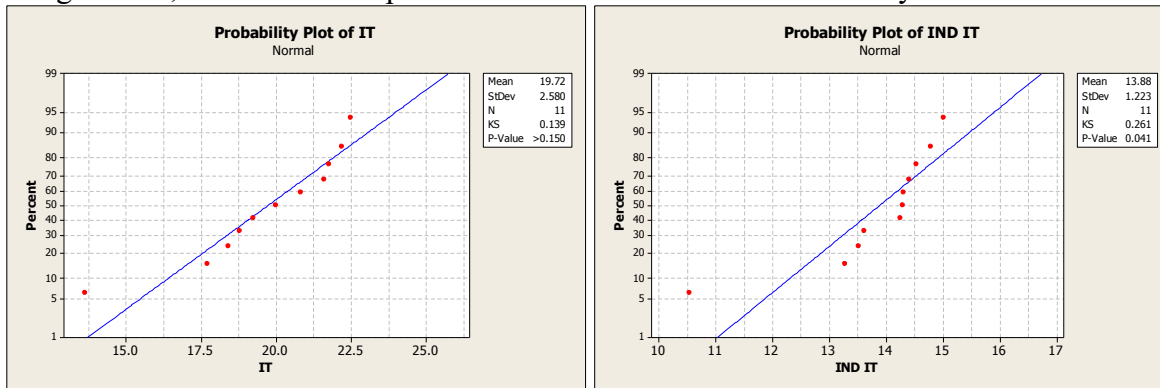
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: IT, IND IT

Paired test for IT - IND IT

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	66.0	0.004	5.844

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	5.84	95.5	4.46	7.23

IBM Asset Management

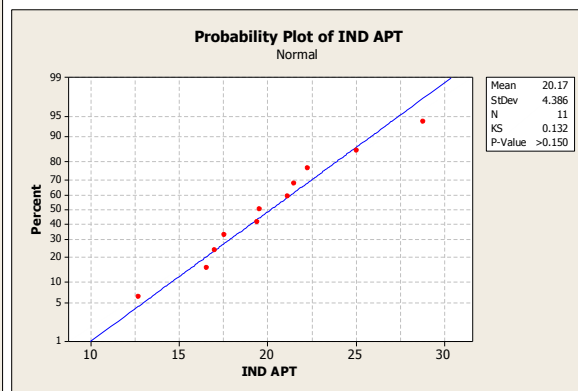
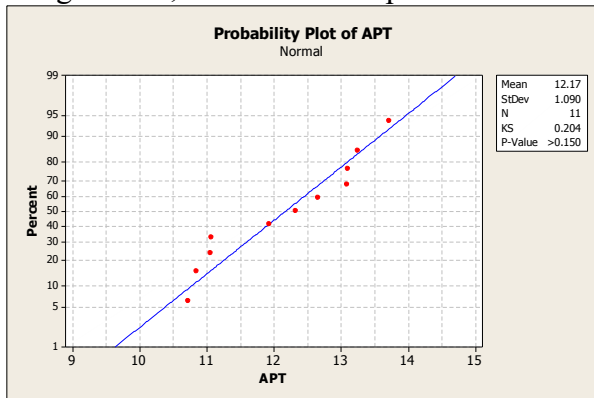
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying off suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



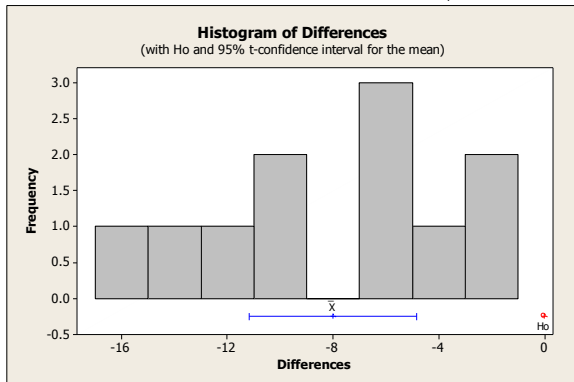
Paired T-Test and CI: IBM APT, IND APT

Paired T for IBM APT - IND APT

	N	Mean	StDev	SE Mean
IBM APT	11	12.17	1.09	0.33
IND APT	11	20.17	4.39	1.32
Difference	11	-8.01	4.72	1.42

95% CI for mean difference: (-11.18, -4.83)

T-Test of mean difference = 0 (vs not = 0): T-Value = -5.62 P-Value = 0.000



IBM Asset Management

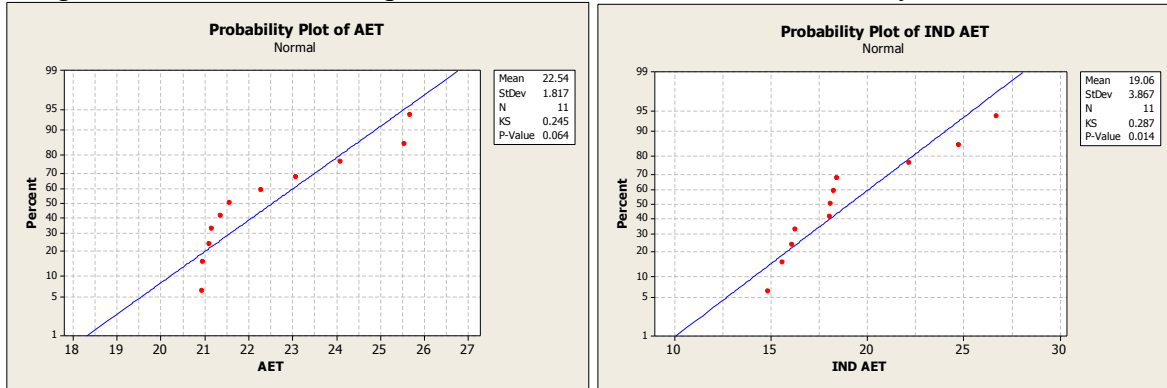
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: AET, IND AET

Paired test for AET - IND AET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated	
Difference	11	11	Statistic	57.0	0.037	Median

	N	Estimated	Achieved	Confidence Interval	
Difference	11	Median	Confidence	Lower	Upper
		3.56	95.5	1.08	6.14

IBM Asset Management

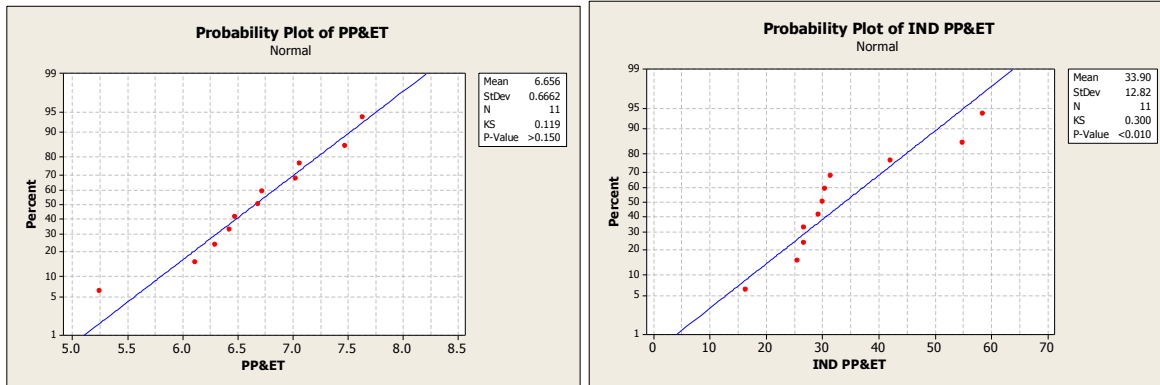
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: PP&ET, IND PP&ET

Paired test for PP&ET - IND PP&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-24.02

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-24.0	95.5	-35.8	-19.8

IBM Asset Management

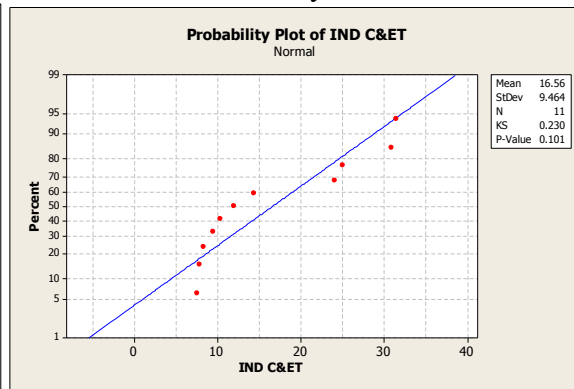
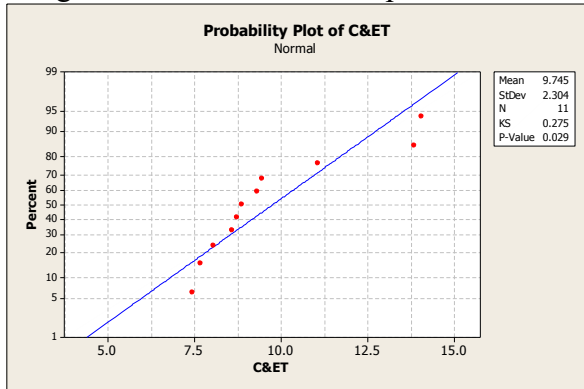
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: C&ET, IND C&ET

Paired test for C&ET - IND C&ET

Test of median = 0.000000 versus median not = 0.000000

	N	N for Difference	Wilcoxon Test	Statistic	P	Estimated Median
Difference	11	11	7.0	0.023	-5.997	

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-6.0	95.5	-12.9	-0.9

IBM Per Share Ratios

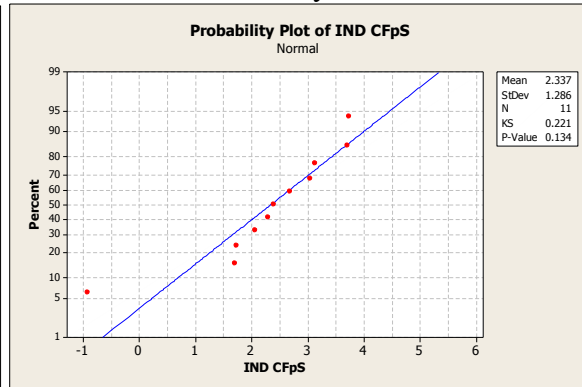
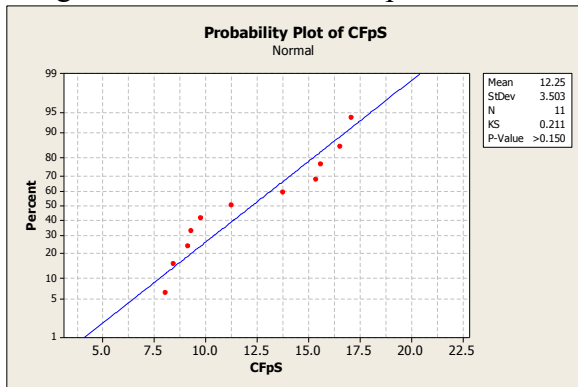
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



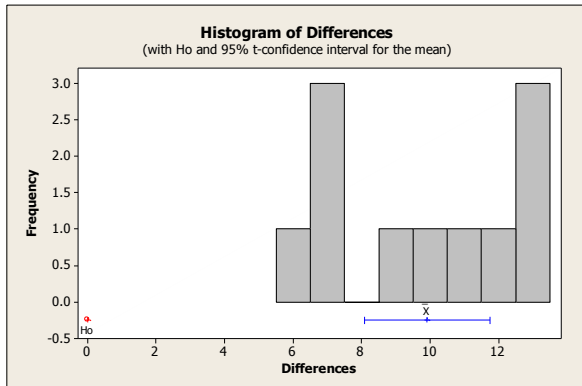
Paired T-Test and CI: IBM CFpS, IND CFpS

Paired T for IBM CFpS - IND CFpS

	N	Mean	StDev	SE Mean
IBM CFpS	11	12.25	3.50	1.06
IND CFpS	11	2.34	1.29	0.39
Difference	11	9.909	2.727	0.822

95% CI for mean difference: (8.078, 11.741)

T-Test of mean difference = 0 (vs not = 0): T-Value = 12.05 P-Value = 0.000



IBM Per Share Ratios

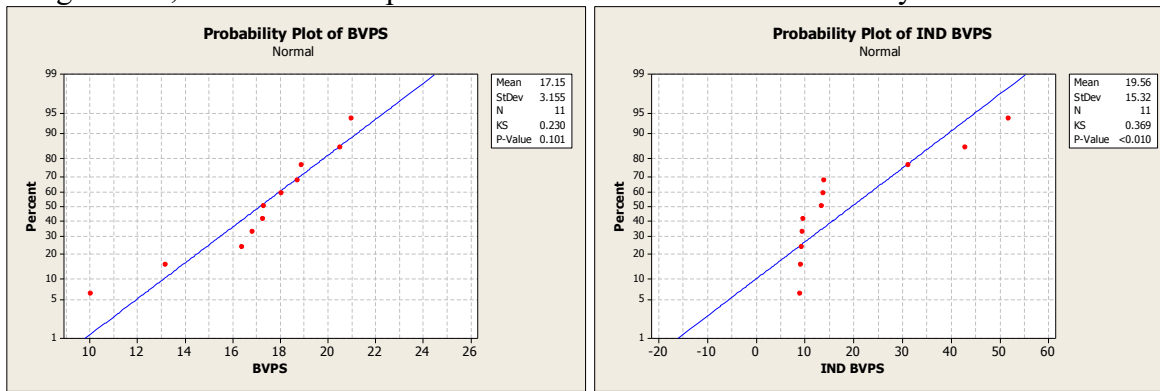
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: BVPS, IND BVPS

Paired test for BVPS - IND BVPS

Test of median = 0.000000 versus median not = 0.000000

	N	for Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	36.0	0.824	3.952

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	4.0	95.5	-13.9	7.7

LOCKHEED MARTIN Profitability Ratios

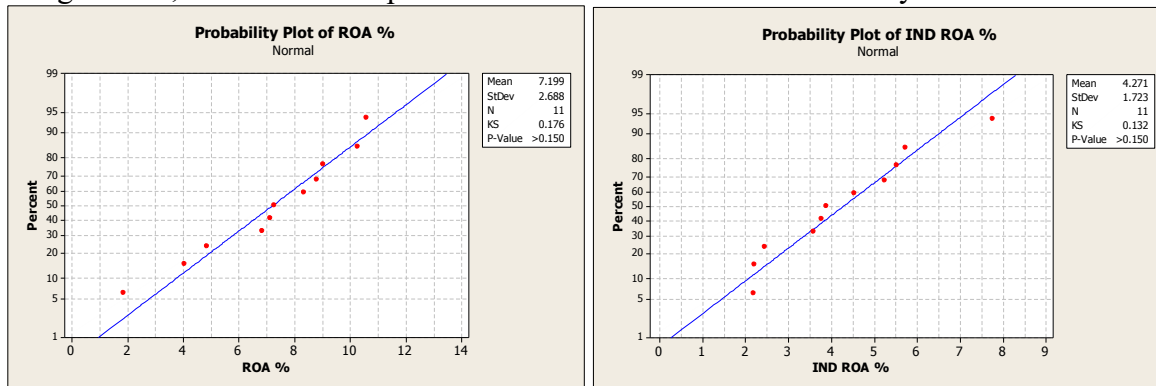
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



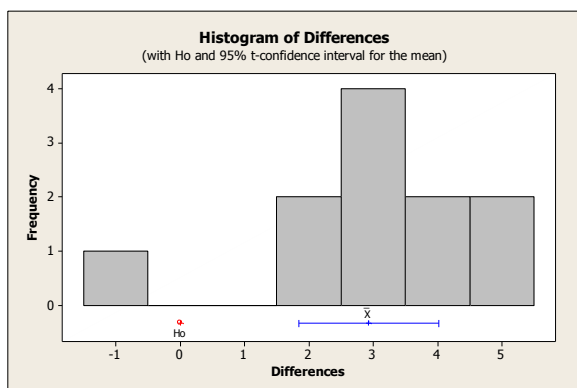
Paired T-Test and CI: LMT ROA %, IND ROA %

Paired T for LMT ROA % - IND ROA %

	N	Mean	StDev	SE Mean
LMT ROA %	11	7.199	2.688	0.811
IND ROA %	11	4.271	1.723	0.519
Difference	11	2.928	1.616	0.487

95% CI for mean difference: (1.842, 4.014)

T-Test of mean difference = 0 (vs not = 0): T-Value = 6.01 P-Value = 0.000



LOCKHEED MARTIN Profitability Ratios

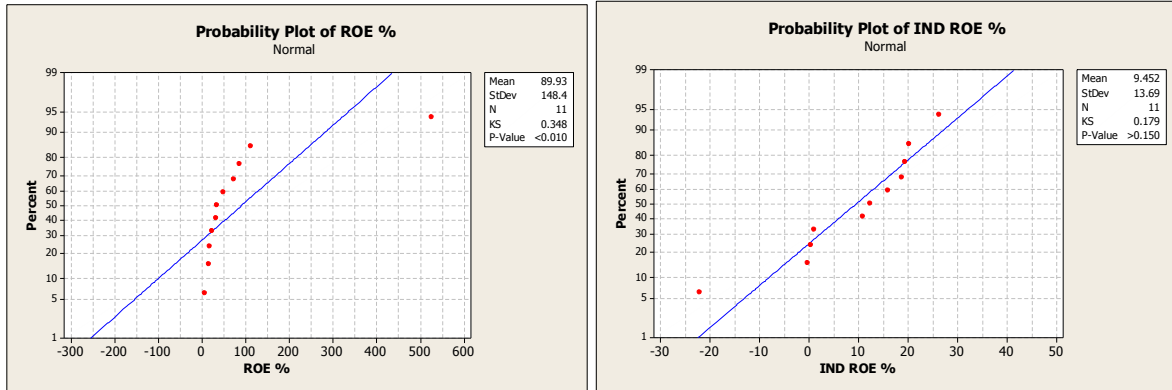
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: ROE %, IND ROE %

Paired test for ROE % - IND ROE %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	66.0	0.004	38.47

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	38	95.5	18	261

LOCKHEED MARTIN Profitability Ratios

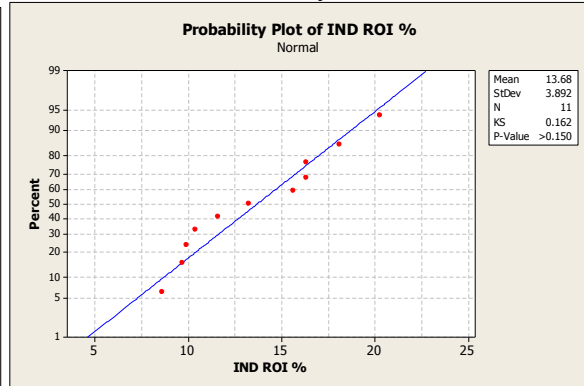
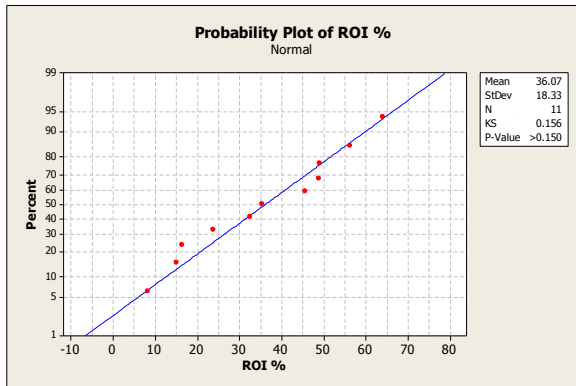
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



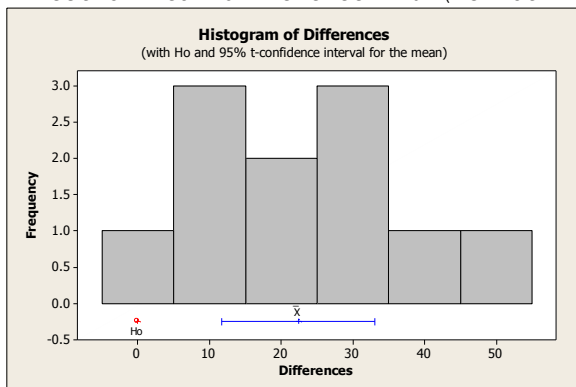
Paired T-Test and CI: LMT ROI %, IND ROI %

Paired T for LMT ROI % - IND ROI %

	N	Mean	StDev	SE Mean
LMT ROI %	11	36.07	18.33	5.53
IND ROI %	11	13.68	3.89	1.17
Difference	11	22.39	15.90	4.80

95% CI for mean difference: (11.70, 33.07)

T-Test of mean difference = 0 (vs not = 0): T-Value = 4.67 P-Value = 0.001



LOCKHEED MARTIN Profitability Ratios

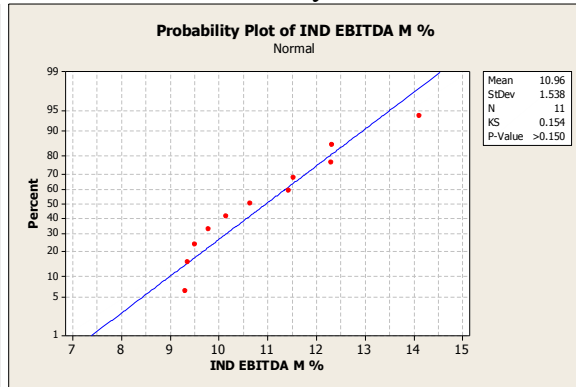
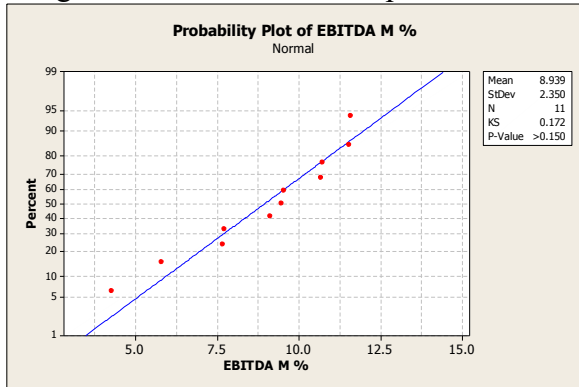
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



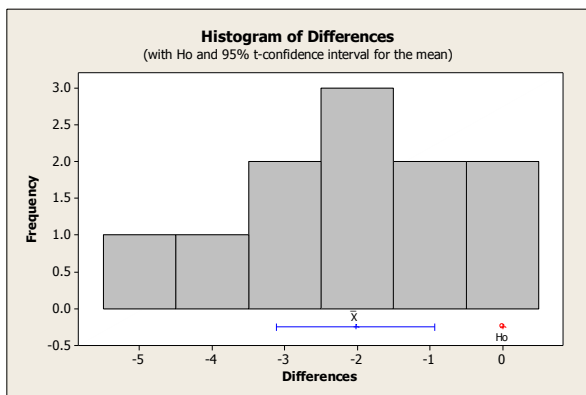
Paired T-Test and CI: LMT EBITDA M %, IND EBITDA M %

Paired T for LMT EBITDA M % - IND EBITDA M %

	N	Mean	StDev	SE Mean
LMT EBITDA M %	11	8.939	2.350	0.709
IND EBITDA M %	11	10.963	1.538	0.464
Difference	11	-2.024	1.628	0.491

95% CI for mean difference: (-3.117, -0.930)

T-Test of mean difference = 0 (vs not = 0): T-Value = -4.12 P-Value = 0.002



LOCKHEED MARTIN Profitability Ratios

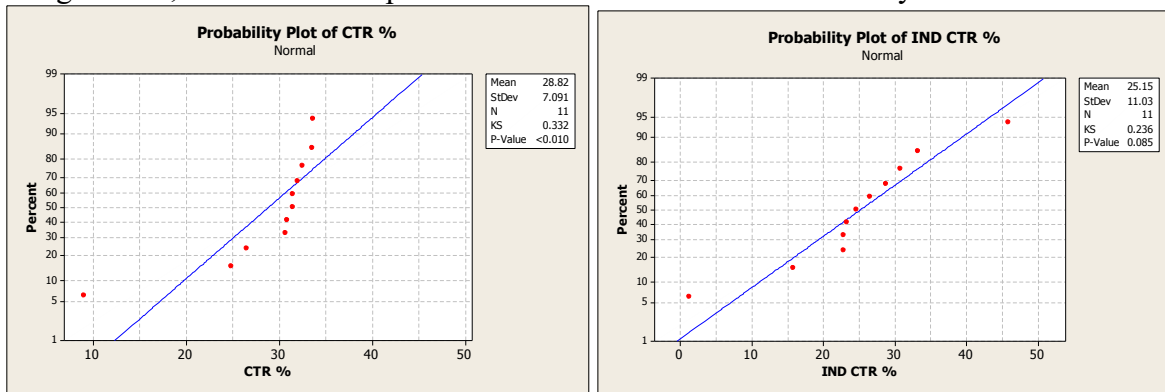
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: CTR %, IND CTR %

Paired test for CTR % - IND CTR %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	44.0	0.351	4.028

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	4.0	95.5	-5.7	11.8

LOCKHEED MARTIN Profitability Ratios

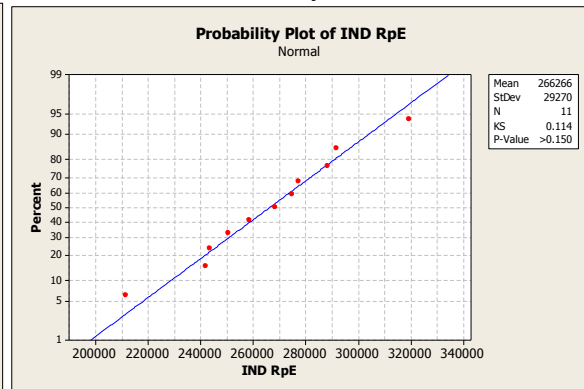
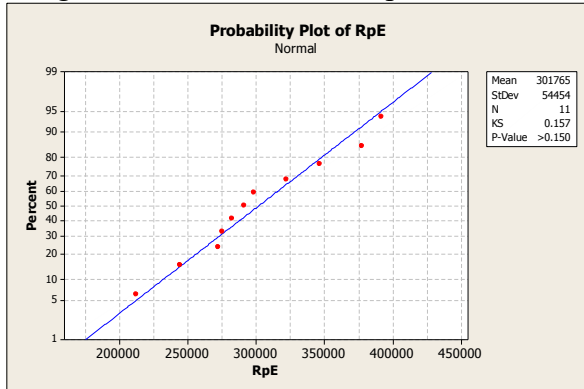
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



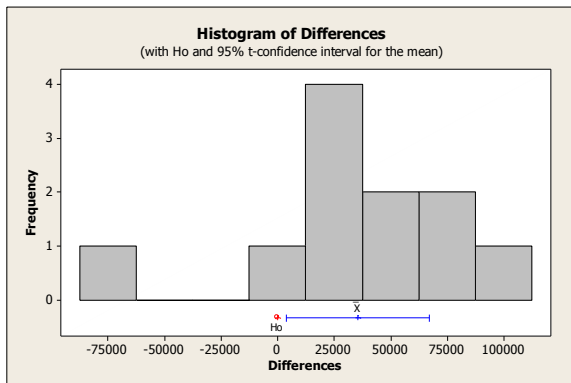
Paired T-Test and CI: LMT RpE, IND RpE

Paired T for LMT RpE - IND RpE

	N	Mean	StDev	SE Mean
LMT RpE	11	301765	54454	16418
IND RpE	11	266266	29270	8825
Difference	11	35499	47072	14193

95% CI for mean difference: (3876, 67123)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.50 P-Value = 0.031



LOCKHEED MARTIN Liquidity Ratios

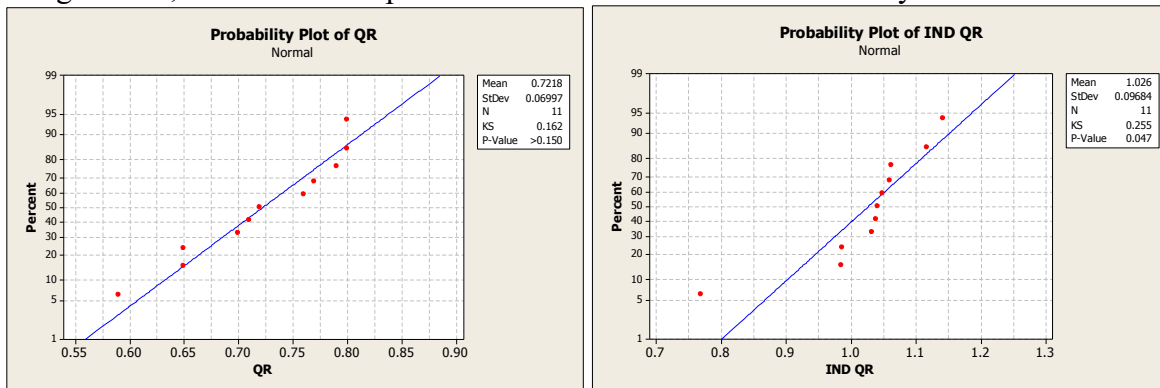
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: QR, IND QR

Paired test for QR - IND QR

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated
Difference	11	11	0.0	0.004	-0.3038

	N	Estimated	Achieved	Confidence Interval	
		Median	Confidence	Lower	Upper
Difference	11	-0.304	95.5	-0.369	-0.226

LOCKHEED MARTIN Liquidity Ratios

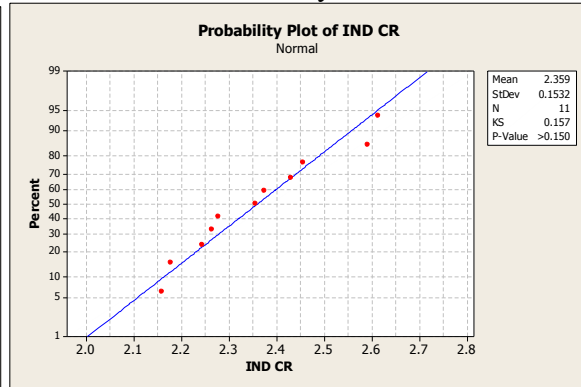
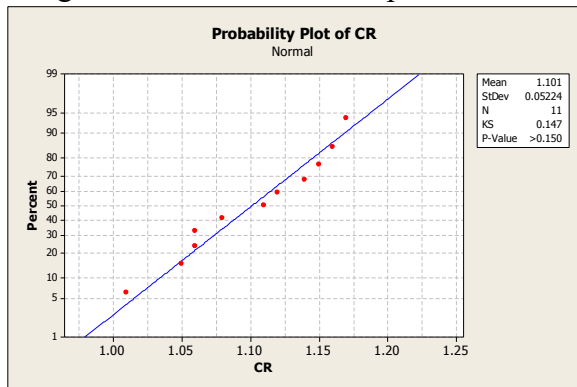
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



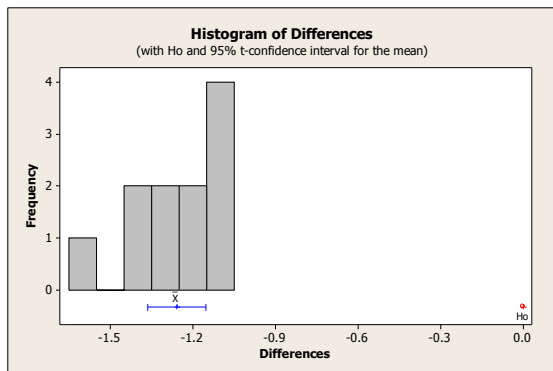
Paired T-Test and CI: LMT CR, IND CR

Paired T for LMT CR - IND CR

	N	Mean	StDev	SE Mean
LMT CR	11	1.1009	0.0522	0.0158
IND CR	11	2.3593	0.1532	0.0462
Difference	11	-1.2584	0.1586	0.0478

95% CI for mean difference: (-1.3649, -1.1518)

T-Test of mean difference = 0 (vs not = 0): T-Value = -26.31 P-Value = 0.000



LOCKHEED MARTIN Liquidity Ratios

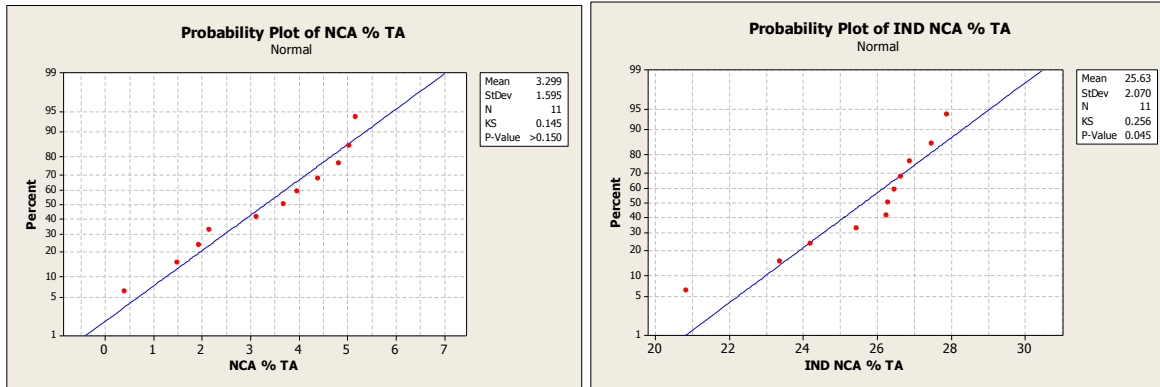
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: NCA % TA, IND NCA % TA

Paired test for NCA % TA - IND NCA % TA

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-22.21

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-22.21	95.5	-24.28	-20.29

LOCKHEED MARTIN Debt Management Ratios

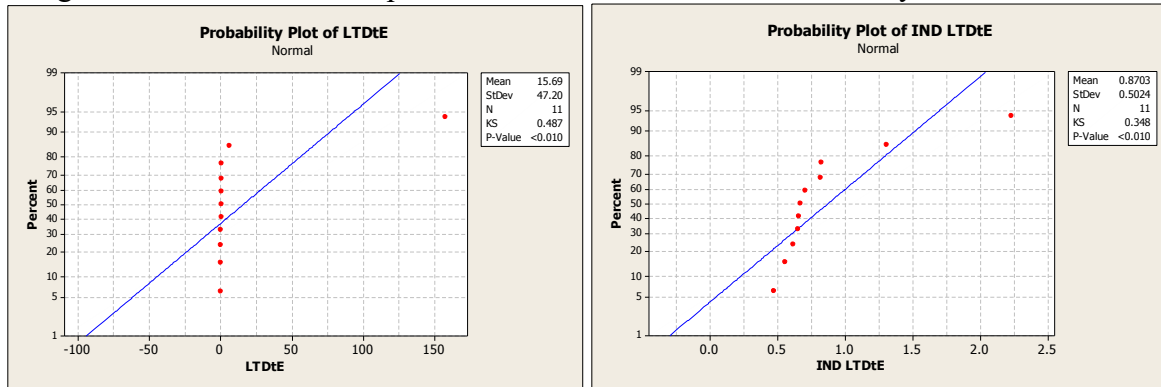
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: LTDtE, IND LTDtE

Paired test for LTDtE - IND LTDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	42.0	0.450	0.3100

	N	Estimated Median	Achieved Confidence	Confidence Interval
Difference	11	0.3	95.5	-0.2 77.9

LOCKHEED MARTIN Debt Management Ratios

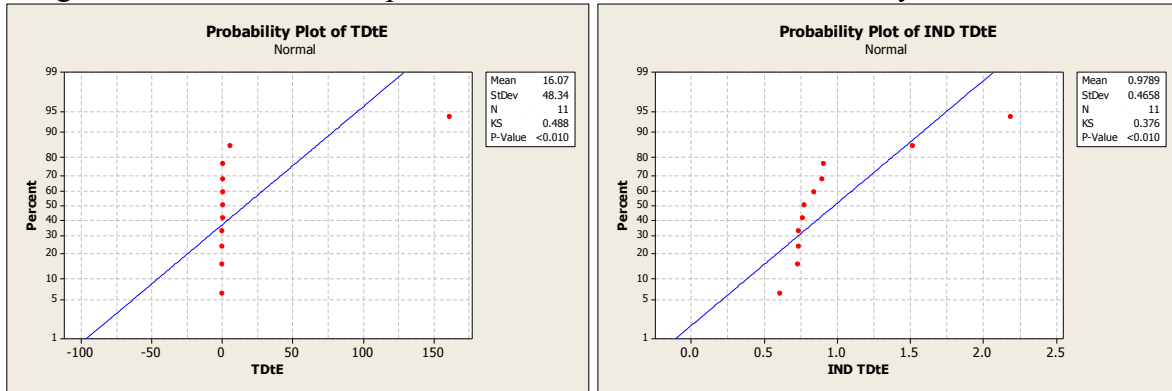
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	42.0	0.450	0.2130

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	0.2	95.5	-0.2	79.8

LOCKHEED MARTIN Debt Management Ratios

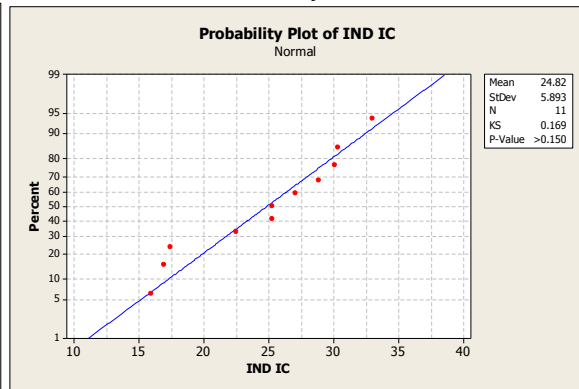
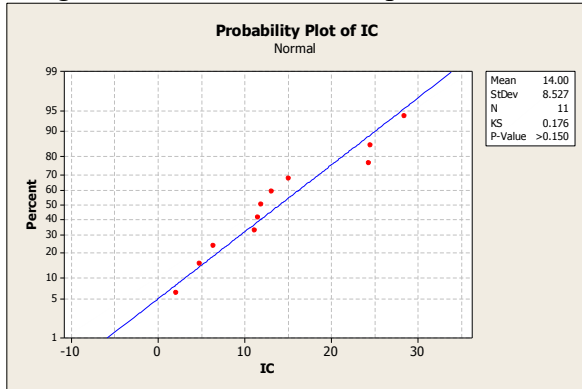
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



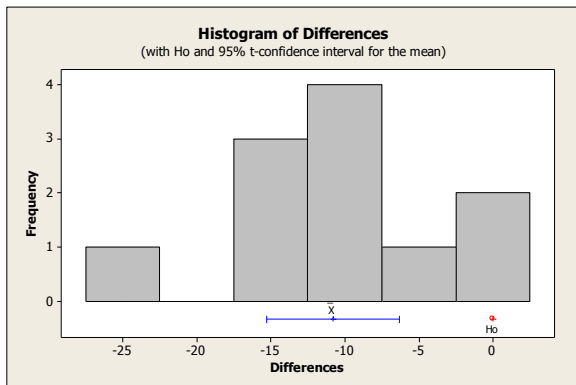
Paired T-Test and CI: LMT IC, IND IC

Paired T for LMT IC - IND IC

	N	Mean	StDev	SE Mean
LMT IC	11	14.00	8.53	2.57
IND IC	11	24.82	5.89	1.78
Difference	11	-10.81	6.69	2.02

95% CI for mean difference: (-15.31, -6.32)

T-Test of mean difference = 0 (vs not = 0): T-Value = -5.36 P-Value = 0.000



LOCKHEED MARTIN Asset Management Ratios

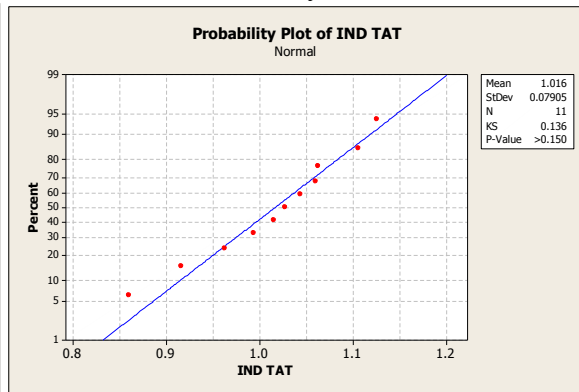
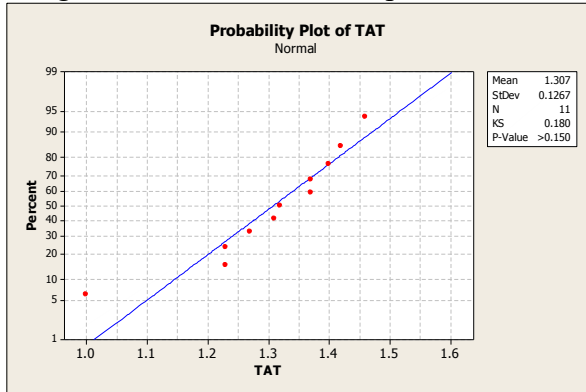
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



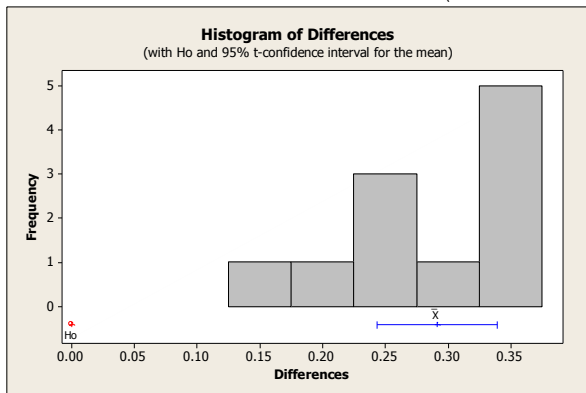
Paired T-Test and CI: LMT TAT, IND TAT

Paired T for LMT TAT - IND TAT

	N	Mean	StDev	SE Mean
LMT TAT	11	1.3073	0.1267	0.0382
IND TAT	11	1.0159	0.0790	0.0238
Difference	11	0.2913	0.0713	0.0215

95% CI for mean difference: (0.2435, 0.3392)

T-Test of mean difference = 0 (vs not = 0): T-Value = 13.56 P-Value = 0.000



LOCKHEED MARTIN Asset Management Ratios

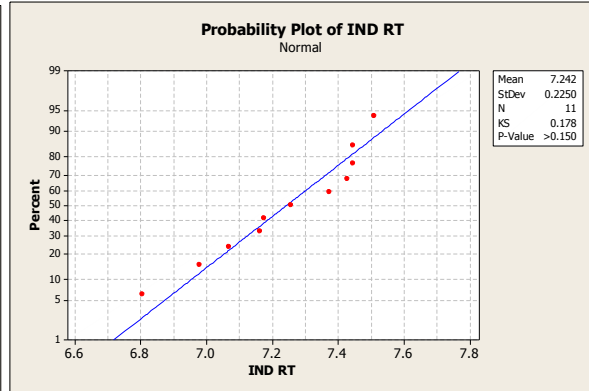
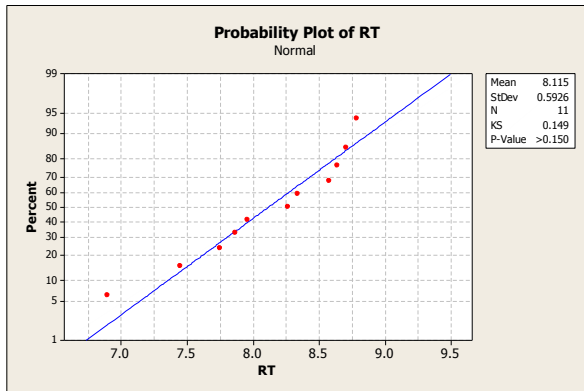
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



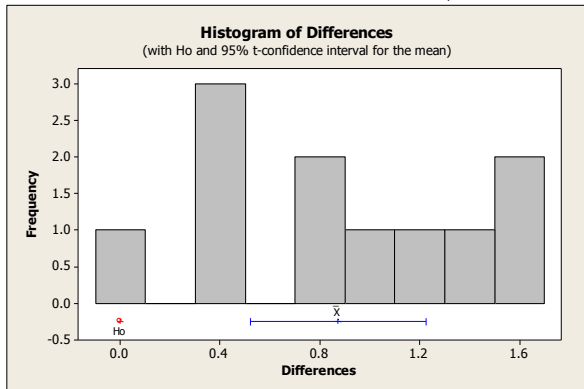
Paired T-Test and CI: LMT RT, IND RT

Paired T for LMT RT - IND RT

	N	Mean	StDev	SE Mean
LMT RT	11	8.115	0.593	0.179
IND RT	11	7.242	0.225	0.068
Difference	11	0.872	0.524	0.158

95% CI for mean difference: (0.520, 1.225)

T-Test of mean difference = 0 (vs not = 0): T-Value = 5.52 P-Value = 0.000



LOCKHEED MARTIN Asset Management Ratios

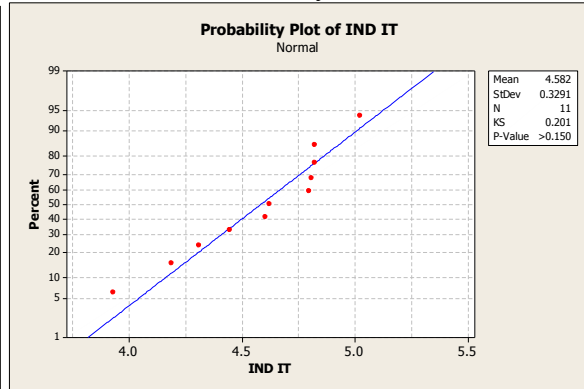
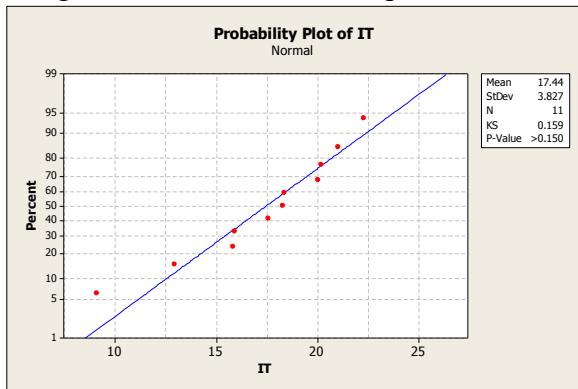
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



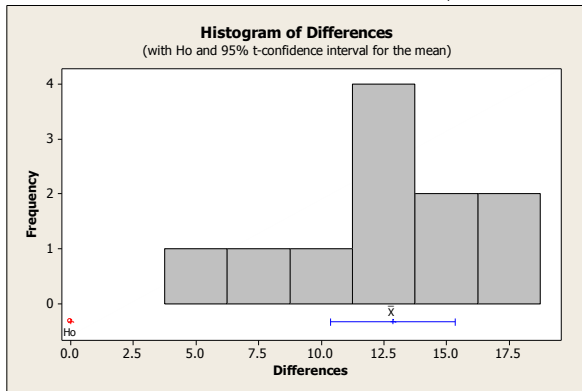
Paired T-Test and CI: LMT IT, IND IT

Paired T for LMT IT - IND IT

	N	Mean	StDev	SE Mean
LMT IT	11	17.44	3.83	1.15
IND IT	11	4.58	0.33	0.10
Difference	11	12.86	3.71	1.12

95% CI for mean difference: (10.37, 15.35)

T-Test of mean difference = 0 (vs not = 0): T-Value = 11.49 P-Value = 0.000



LOCKHEED MARTIN Asset Management Ratios

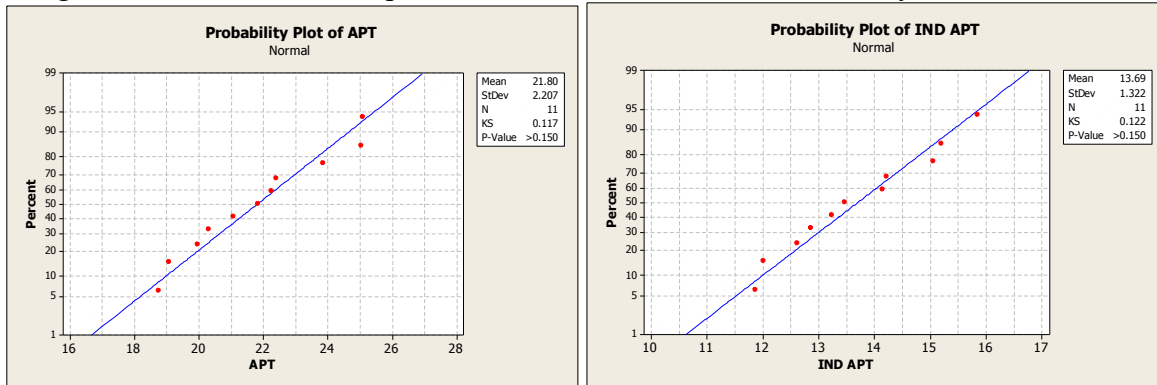
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying of suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



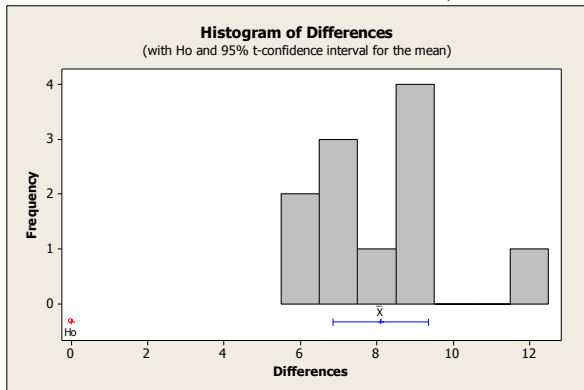
Paired T-Test and CI: LMT APT, IND APT

Paired T for LMT APT - IND APT

	N	Mean	StDev	SE Mean
LMT APT	11	21.804	2.207	0.665
IND APT	11	13.694	1.322	0.398
Difference	11	8.109	1.863	0.562

95% CI for mean difference: (6.858, 9.361)

T-Test of mean difference = 0 (vs not = 0): T-Value = 14.44 P-Value = 0.000



LOCKHEED MARTIN Asset Management Ratios

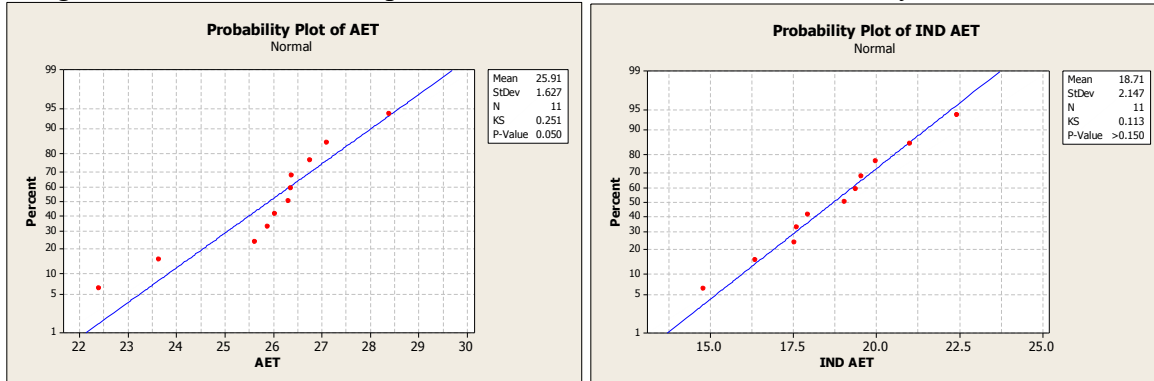
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



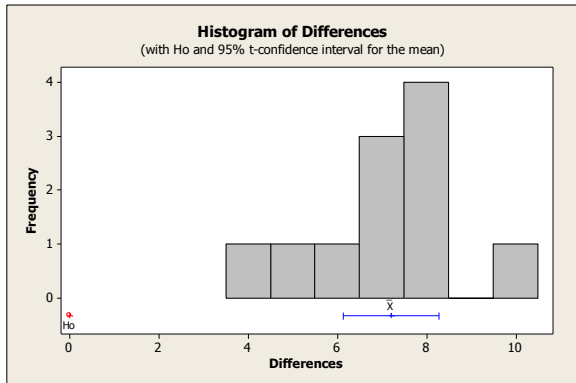
Paired T-Test and CI: LMT AET, IND AET

Paired T for LMT AET - IND AET

	N	Mean	StDev	SE Mean
LMT AET	11	25.914	1.627	0.491
IND AET	11	18.707	2.147	0.647
Difference	11	7.206	1.607	0.484

95% CI for mean difference: (6.127, 8.286)

T-Test of mean difference = 0 (vs not = 0): T-Value = 14.87 P-Value = 0.000



LOCKHEED MARTIN Asset Management Ratios

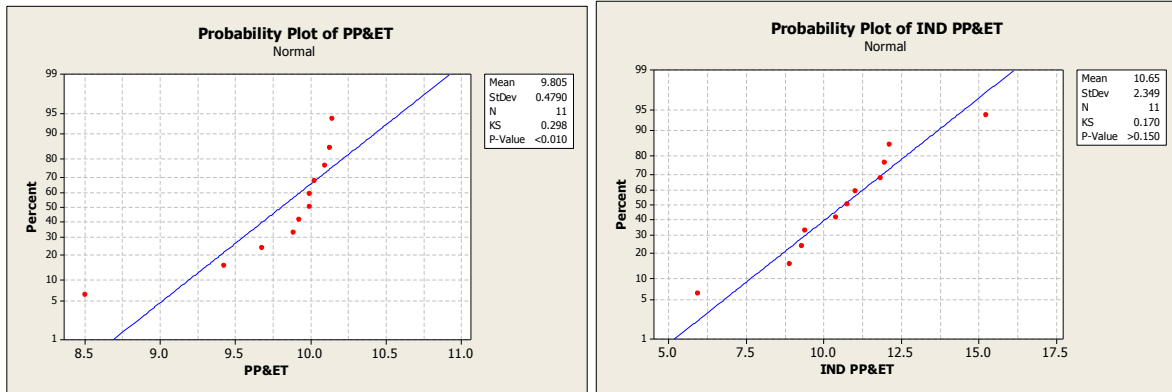
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: PP&ET, IND PP&ET

Paired test for PP&ET - IND PP&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	21.0	0.307	-0.7187

	N	Estimated Median	Achieved Confidence	Confidence Interval	
Difference	11	-0.72	95.5	-2.18	0.61

LOCKHEED MARTIN Asset Management Ratios

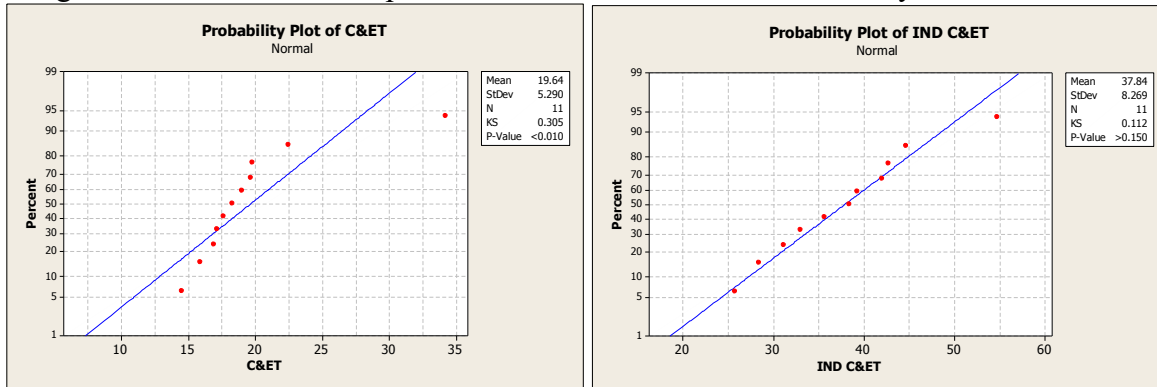
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: C&ET, IND C&ET

Paired test for C&ET - IND C&ET

Test of median = 0.000000 versus median not = 0.000000

	N	N for Difference	Wilcoxon Test	Statistic	P	Estimated Median
Difference	11	11	0.0	0.004		-17.84

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-17.8	95.5	-23.8	-11.9

LOCKHEED MARTIN Per Share Ratios

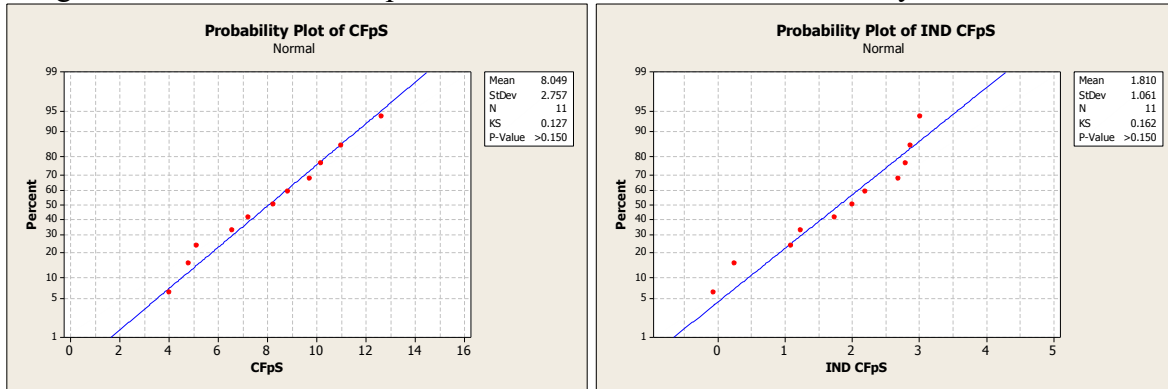
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Paired T-Test and CI: LMT CFpS, IND CFpS

Paired T for LMT CFpS - IND CFpS

	N	Mean	StDev	SE Mean
LMT CFpS	11	8.049	2.757	0.831
IND CFpS	11	1.810	1.061	0.320
Difference	11	6.239	2.702	0.815

95% CI for mean difference: (4.424, 8.055)

T-Test of mean difference = 0 (vs not = 0): T-Value = 7.66 P-Value = 0.000



LOCKHEED MARTIN Per Share Ratios

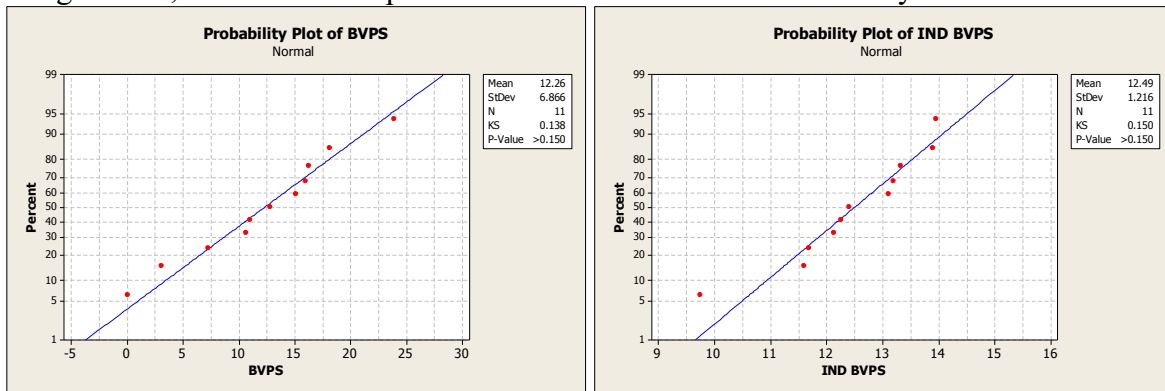
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



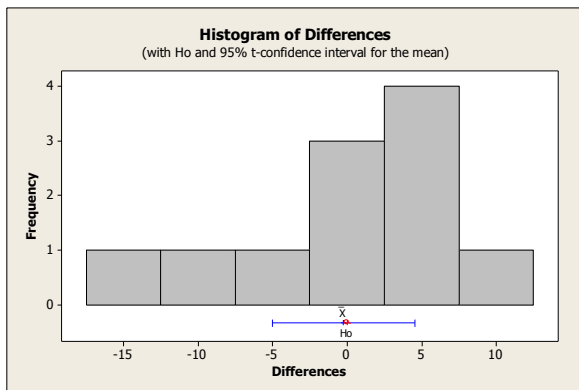
Paired T-Test and CI: LMT BVPS, IND BVPS

Paired T for LMT BVPS - IND BVPS

	N	Mean	StDev	SE Mean
LMT BVPS	11	12.26	6.87	2.07
IND BVPS	11	12.49	1.22	0.37
Difference	11	-0.23	7.15	2.16

95% CI for mean difference: (-5.04, 4.58)

T-Test of mean difference = 0 (vs not = 0): T-Value = -0.11 P-Value = 0.917



MARRIOTT Profitability Ratios

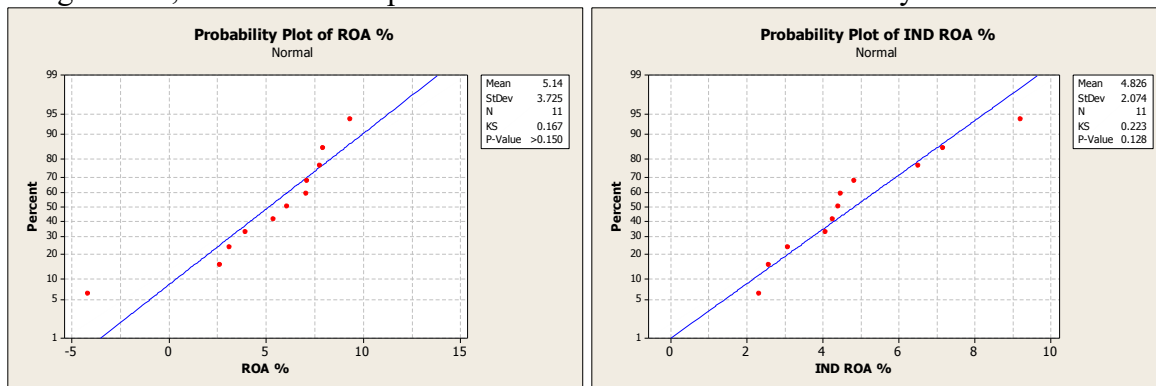
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Paired T-Test and CI: ROA %, IND ROA %

Paired T for ROA % - IND ROA %

	N	Mean	StDev	SE Mean
ROA %	11	5.14	3.72	1.12
IND ROA %	11	4.83	2.07	0.63
Difference	11	0.314	3.281	0.989

95% CI for mean difference: (-1.890, 2.518)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.32 P-Value = 0.758



MARRIOTT Profitability Ratios

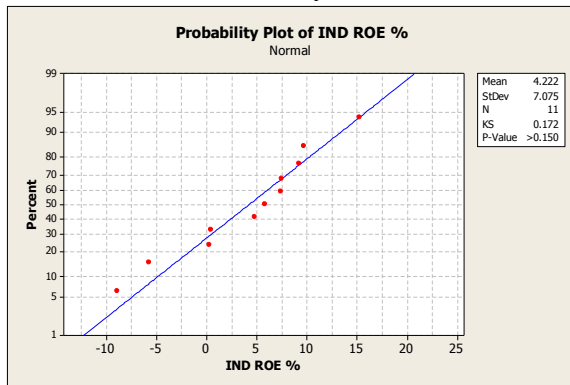
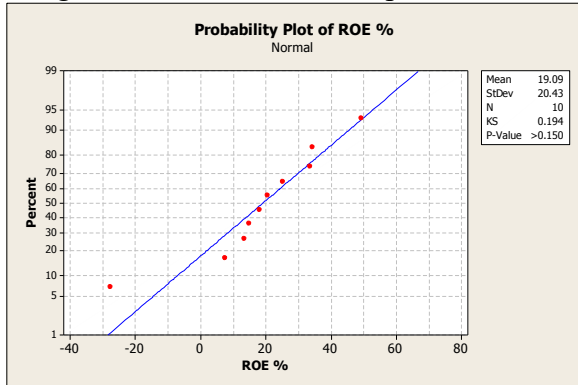
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



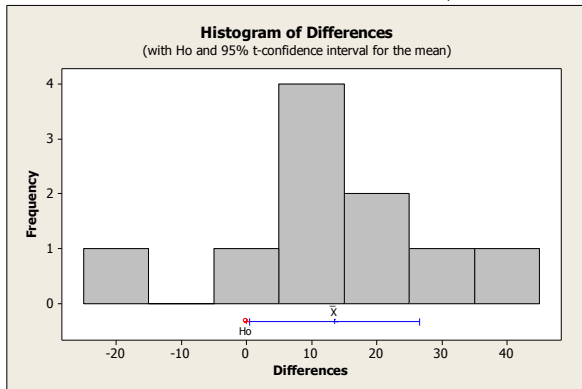
Paired T-Test and CI: ROE %, IND ROE %

Paired T for ROE % - IND ROE %

	N	Mean	StDev	SE Mean
ROE %	10	19.09	20.43	6.46
IND ROE %	10	5.53	5.90	1.87
Difference	10	13.56	18.27	5.78

95% CI for mean difference: (0.49, 26.63)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.35 P-Value = 0.044



MARRIOTT Profitability Ratios

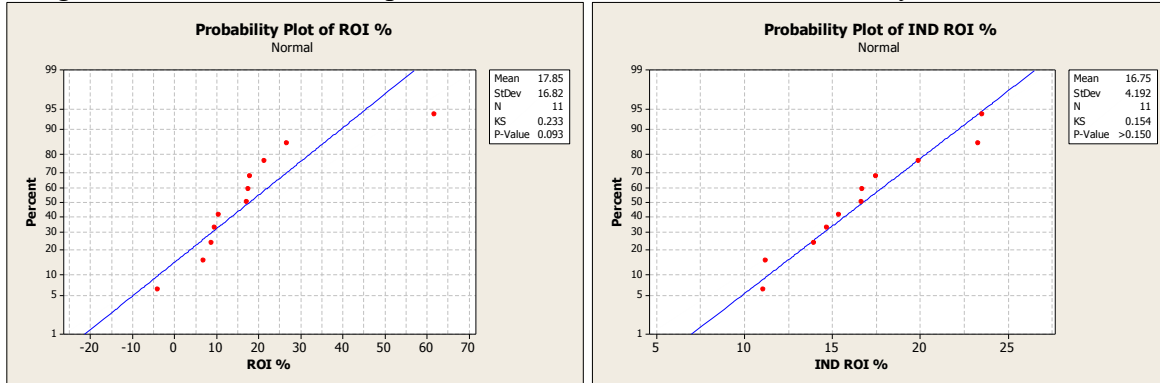
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



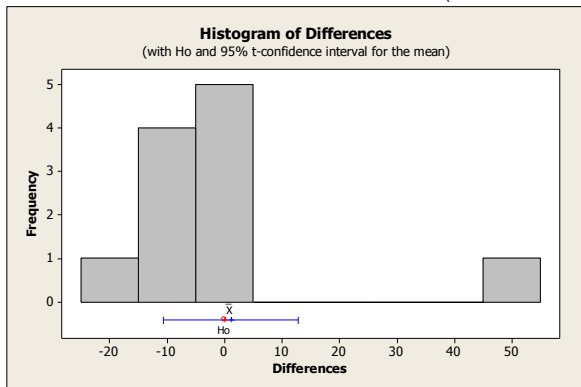
Paired T-Test and CI: ROI %, IND ROI %

Paired T for ROI % - IND ROI %

	N	Mean	StDev	SE Mean
ROI %	11	17.85	16.82	5.07
IND ROI %	11	16.75	4.19	1.26
Difference	11	1.10	17.46	5.26

95% CI for mean difference: (-10.63, 12.82)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.21 P-Value = 0.839



MARRIOTT Profitability Ratios

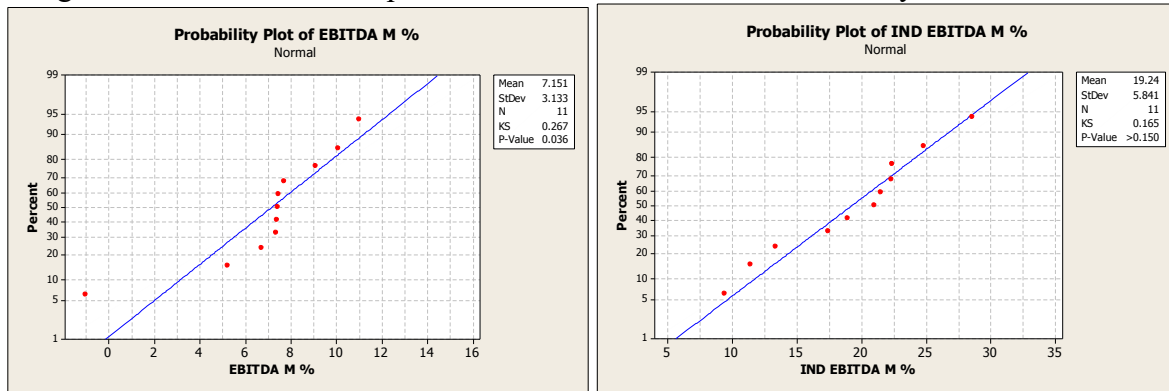
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: EBITDA M %, IND EBITDA M %

Paired test for EBITDA M % - IND EBITDA M %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-12.66

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-12.66	95.5	-15.89	-8.15

MARRIOTT Profitability Ratios

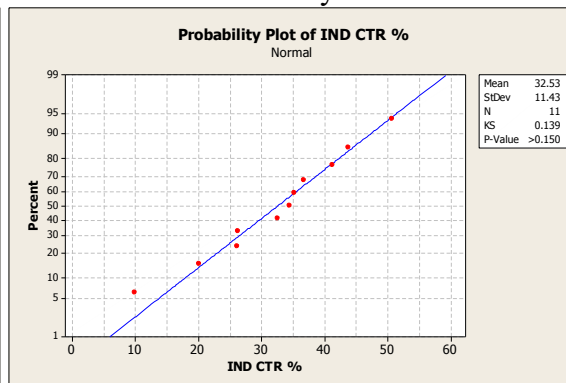
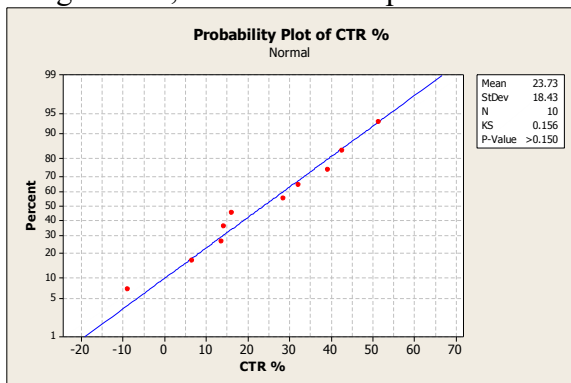
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



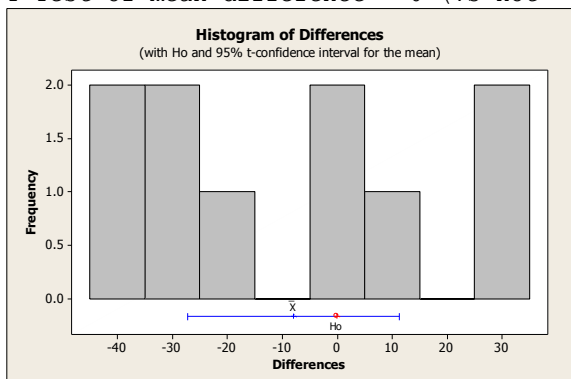
Paired T-Test and CI: CTR %, IND CTR %

Paired T for CTR % - IND CTR %

	N	Mean	StDev	SE Mean
CTR %	10	23.73	18.43	5.83
IND CTR %	10	31.65	11.65	3.68
Difference	10	-7.92	26.98	8.53

95% CI for mean difference: (-27.22, 11.37)

T-Test of mean difference = 0 (vs not = 0): T-Value = -0.93 P-Value = 0.377



MARRIOTT Profitability Ratios

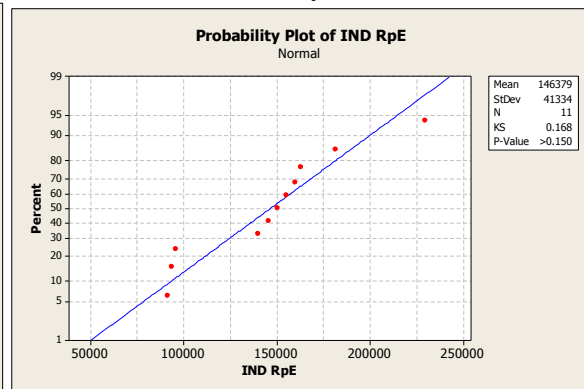
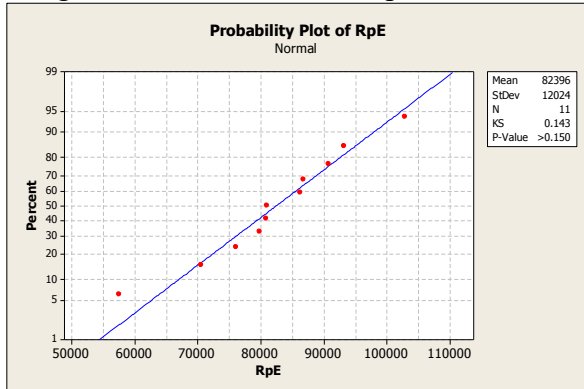
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



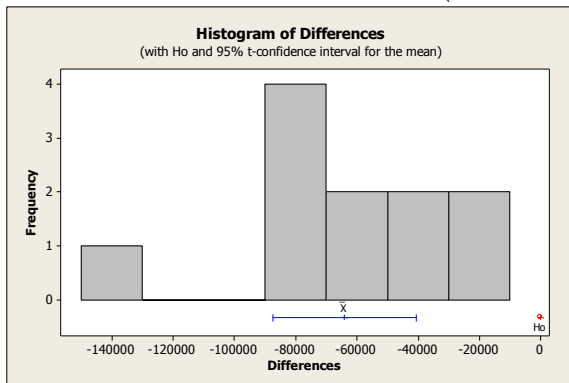
Paired T-Test and CI: RpE, IND RpE

Paired T for RpE - IND RpE

	N	Mean	StDev	SE Mean
RpE	11	82396	12024	3625
IND RpE	11	146379	41334	12463
Difference	11	-63984	34915	10527

95% CI for mean difference: (-87440, -40528)

T-Test of mean difference = 0 (vs not = 0): T-Value = -6.08 P-Value = 0.000



MARRIOTT Liquidity Ratios

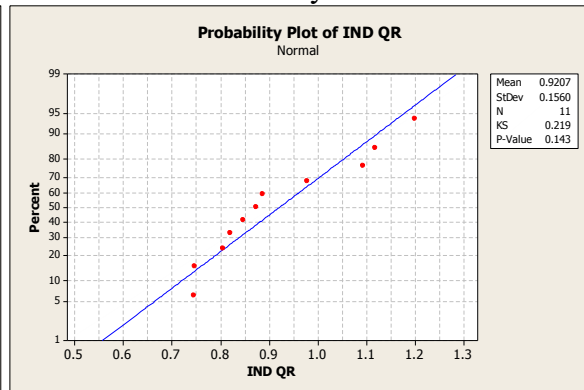
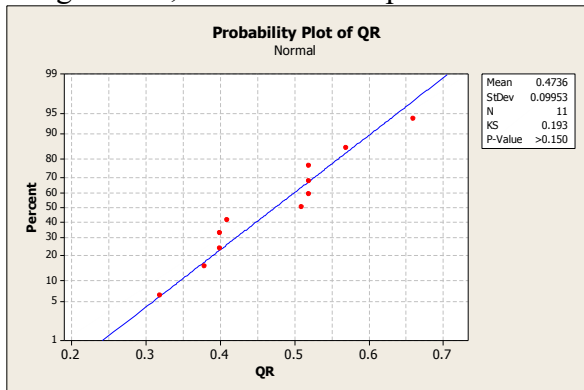
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



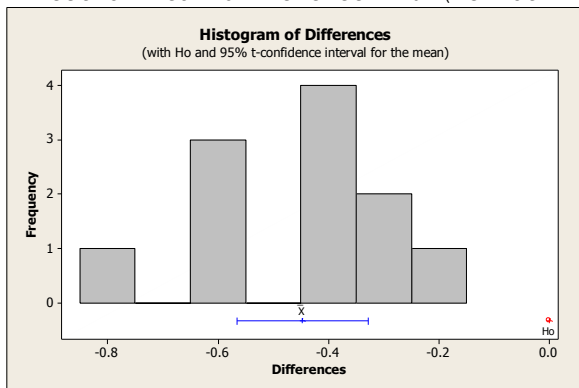
Paired T-Test and CI: QR, IND QR

Paired T for QR - IND QR

	N	Mean	StDev	SE Mean
QR	11	0.4736	0.0995	0.0300
IND QR	11	0.9207	0.1560	0.0470
Difference	11	-0.4470	0.1764	0.0532

95% CI for mean difference: (-0.5656, -0.3285)

T-Test of mean difference = 0 (vs not = 0): T-Value = -8.40 P-Value = 0.000



MARRIOTT Liquidity Ratios

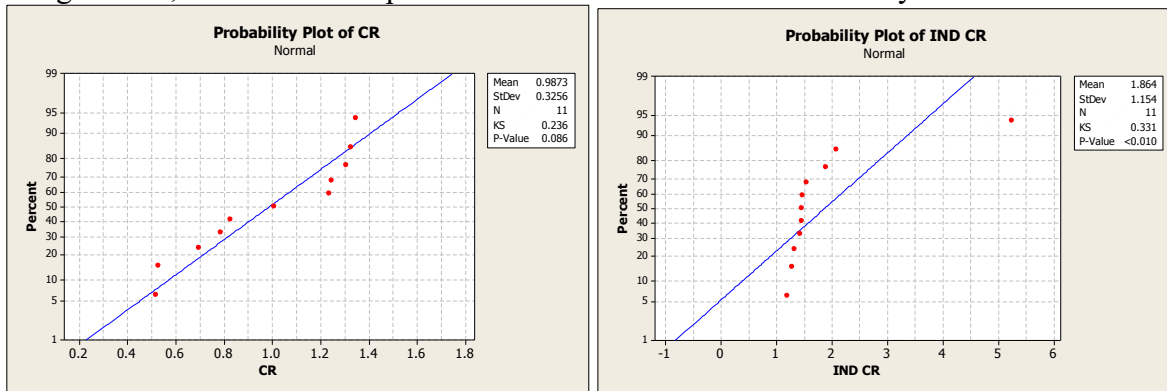
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: CR, IND CR

Paired test for CR - IND CR

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated
Difference	11	11	Statistic	0.0	Median
			0.0	0.004	-0.6048

	N	Estimated	Achieved	Confidence Interval	
Difference	11	Median	Confidence	Lower	Upper
		-0.60	95.5	-2.29	-0.35

MARRIOTT Liquidity Ratios

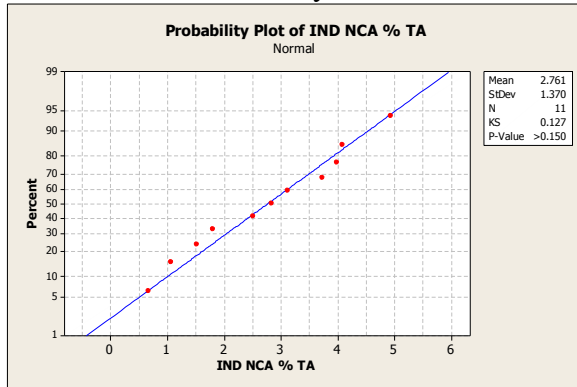
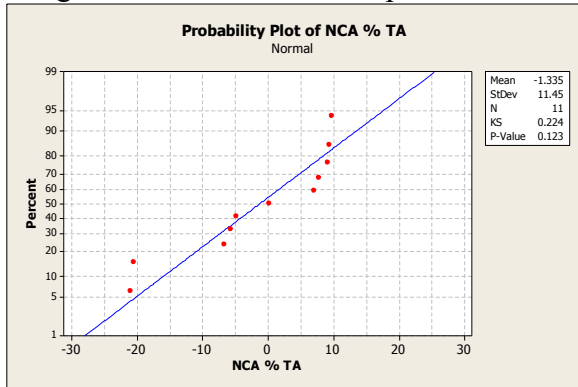
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



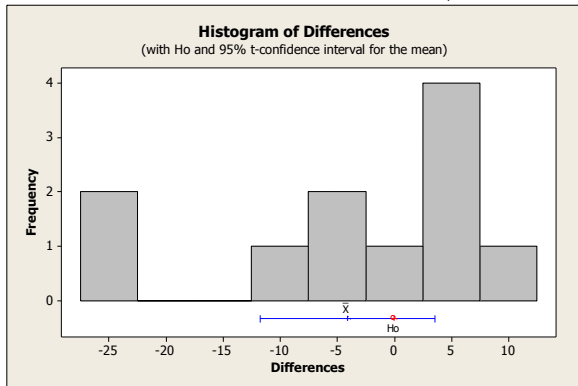
Paired T-Test and CI: NCA % TA, IND NCA % TA

Paired T for NCA % TA - IND NCA % TA

	N	Mean	StDev	SE Mean
NCA % TA	11	-1.34	11.45	3.45
IND NCA % TA	11	2.76	1.37	0.41
Difference	11	-4.10	11.41	3.44

95% CI for mean difference: (-11.76, 3.57)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.19 P-Value = 0.261



MARRIOTT Debt Management Ratios

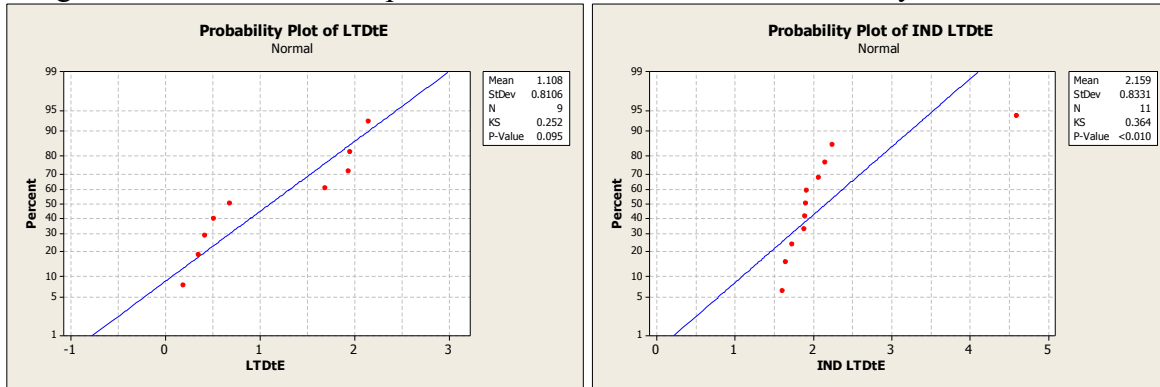
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: LTDtE, IND LTDtE

Paired test for LTDtE - IND LTDtE

Test of median = 0.000000 versus median not = 0.000000

	N	N*	N for Test	Wilcoxon Statistic	P	Estimated Median
Difference	9	2	9	1.0	0.013	-0.7925

	N	N*	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	9	2	-0.79	95.6	-1.38	-0.16

MARRIOTT Debt Management Ratios

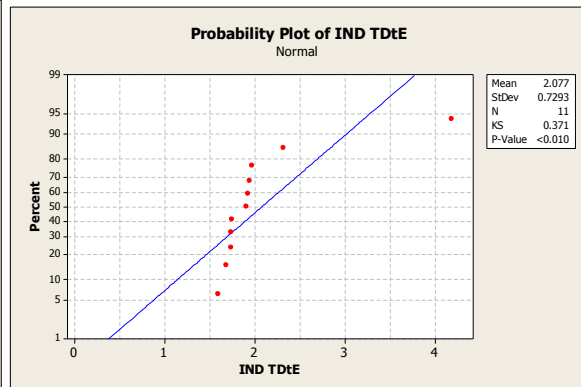
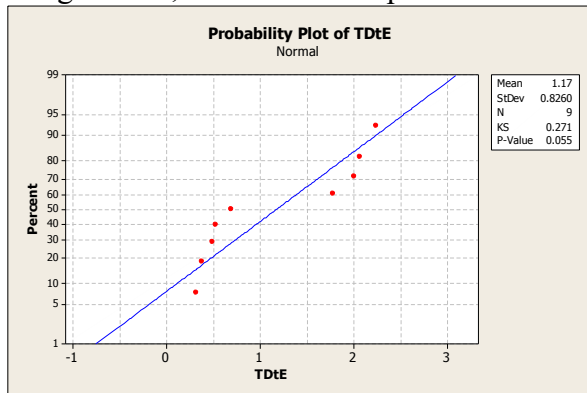
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	N*	N for Test	Wilcoxon Statistic	P	Estimated Median
Difference	9	2	9	4.0	0.033	-0.6561

	N	N*	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	9	2	-0.66	95.6	-1.26	-0.01

MARRIOTT Debt Management Ratios

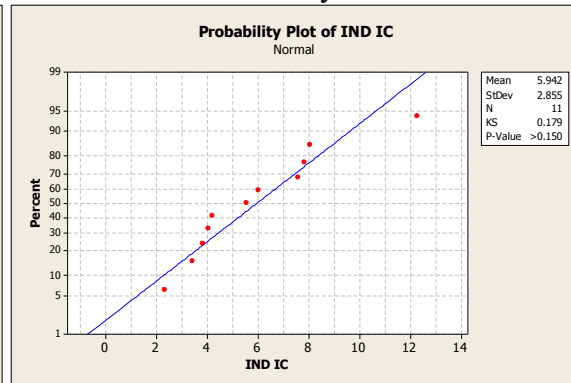
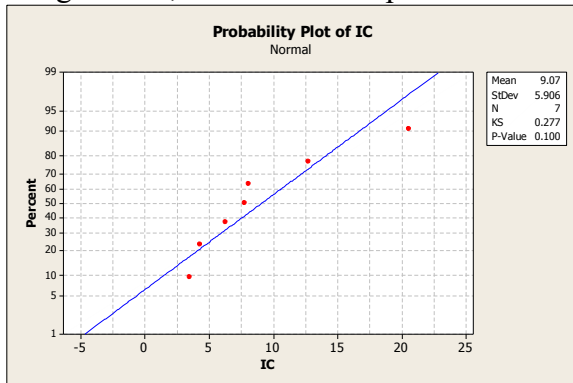
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



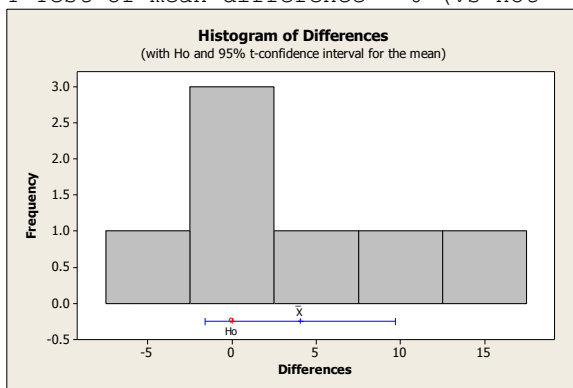
Paired T-Test and CI: IC, IND IC

Paired T for IC - IND IC

	N	Mean	StDev	SE Mean
IC	7	9.07	5.91	2.23
IND IC	7	5.01	1.58	0.60
Difference	7	4.06	6.12	2.31

95% CI for mean difference: (-1.60, 9.72)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.76 P-Value = 0.130



MARRIOTT Asset Management Ratios

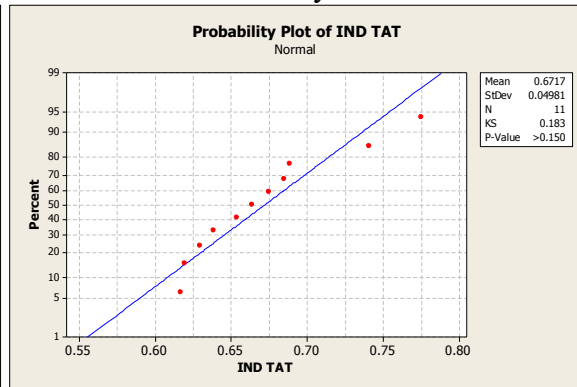
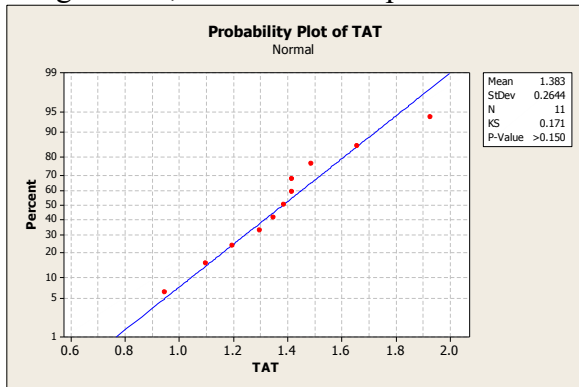
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



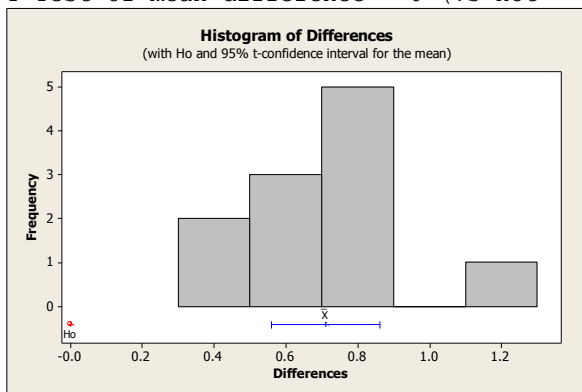
Paired T-Test and CI: TAT, IND TAT

Paired T for TAT - IND TAT

	N	Mean	StDev	SE Mean
TAT	11	1.3827	0.2644	0.0797
IND TAT	11	0.6717	0.0498	0.0150
Difference	11	0.7110	0.2245	0.0677

95% CI for mean difference: (0.5602, 0.8618)

T-Test of mean difference = 0 (vs not = 0): T-Value = 10.50 P-Value = 0.000



MARRIOTT Asset Management Ratios

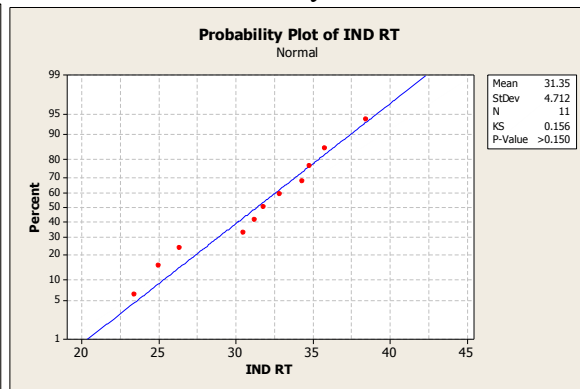
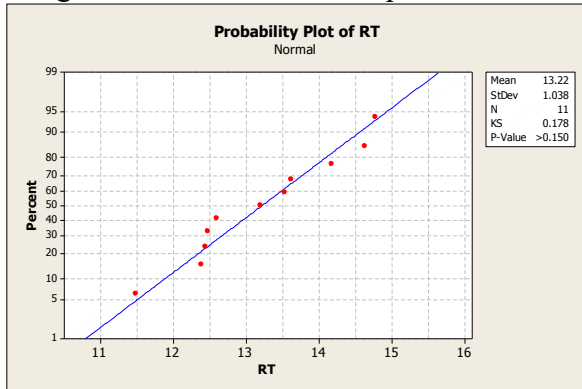
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



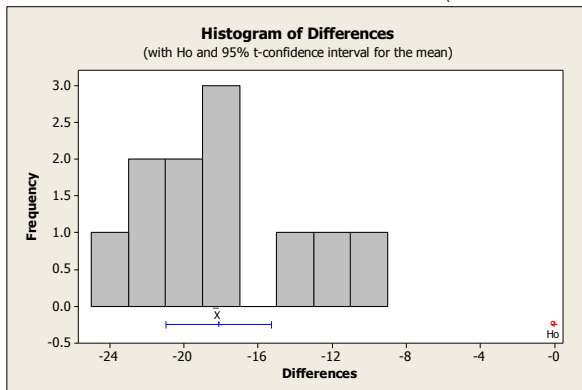
Paired T-Test and CI: RT, IND RT

Paired T for RT - IND RT

	N	Mean	StDev	SE Mean
RT	11	13.22	1.04	0.31
IND RT	11	31.35	4.71	1.42
Difference	11	-18.14	4.25	1.28

95% CI for mean difference: (-20.99, -15.28)

T-Test of mean difference = 0 (vs not = 0): T-Value = -14.16 P-Value = 0.000



MARRIOTT Asset Management Ratios

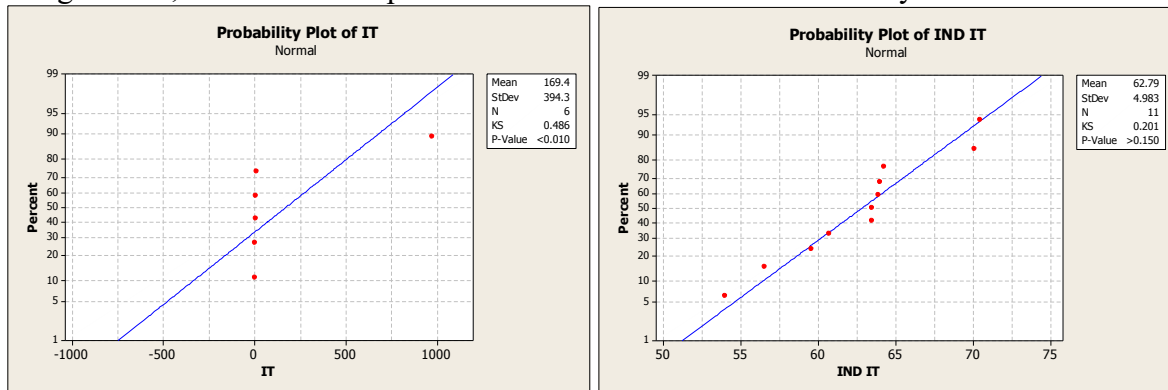
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: IT, IND IT

Paired test for IT - IND IT

Test of median = 0.000000 versus median not = 0.000000

	N	N*	N for Test	Wilcoxon Statistic	P	Estimated Median
Difference	6	5	6	6.0	0.402	-53.42

	N	N*	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	6	5	-53	94.1	-57	427

MARRIOTT Asset Management Ratios

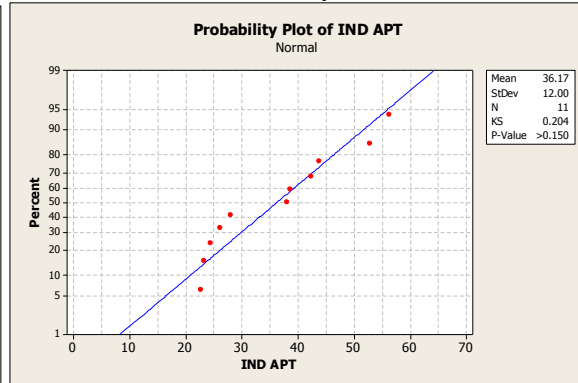
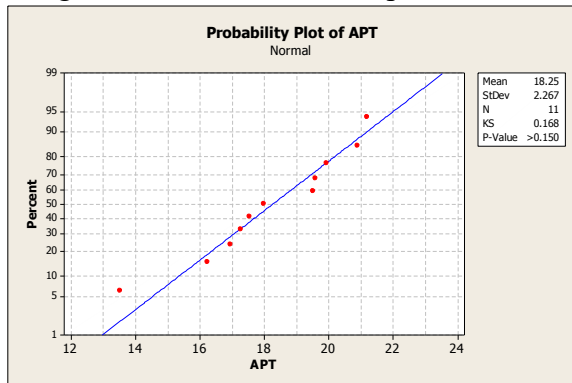
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying off suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



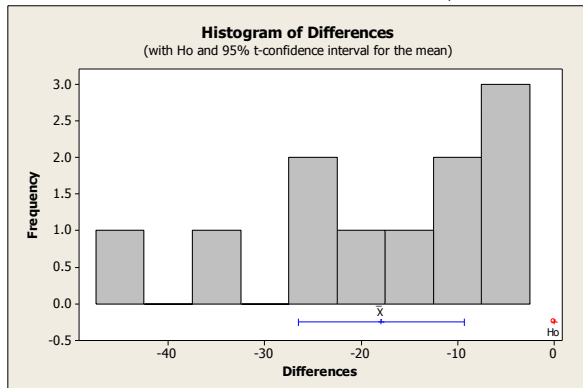
Paired T-Test and CI: APT, IND APT

Paired T for APT - IND APT

	N	Mean	StDev	SE Mean
APT	11	18.25	2.27	0.68
IND APT	11	36.17	12.00	3.62
Difference	11	-17.92	12.82	3.87

95% CI for mean difference: (-26.53, -9.30)

T-Test of mean difference = 0 (vs not = 0): T-Value = -4.63 P-Value = 0.001



MARRIOTT Asset Management Ratios

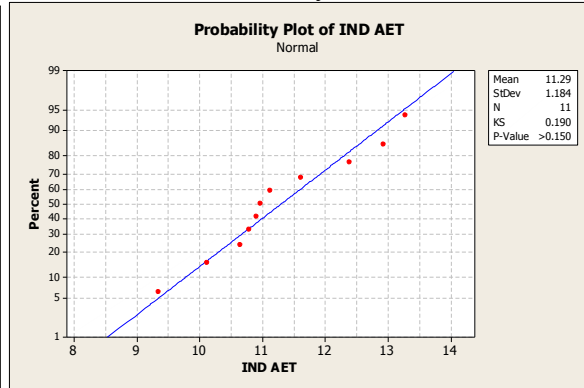
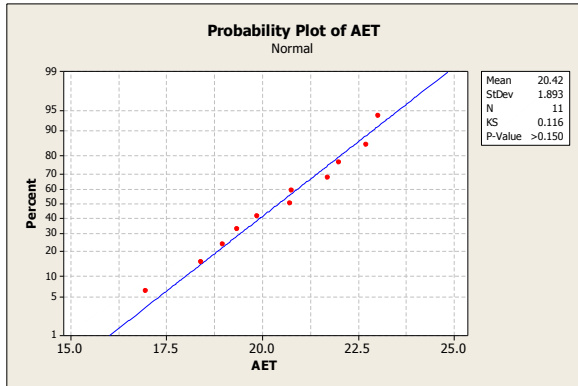
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



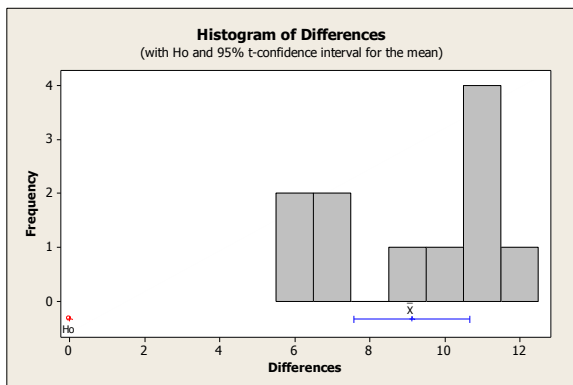
Paired T-Test and CI: AET, IND AET

Paired T for AET - IND AET

	N	Mean	StDev	SE Mean
AET	11	20.417	1.893	0.571
IND AET	11	11.294	1.184	0.357
Difference	11	9.124	2.296	0.692

95% CI for mean difference: (7.581, 10.666)

T-Test of mean difference = 0 (vs not = 0): T-Value = 13.18 P-Value = 0.000



MARRIOTT Asset Management Ratios

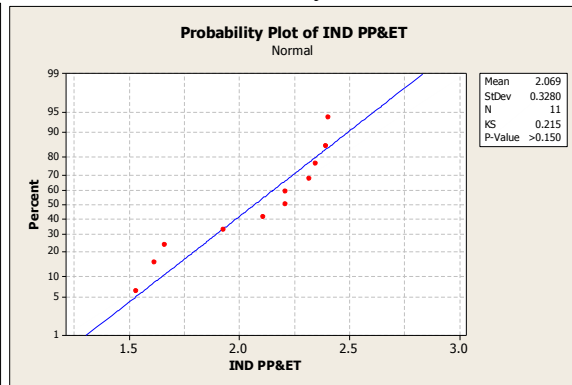
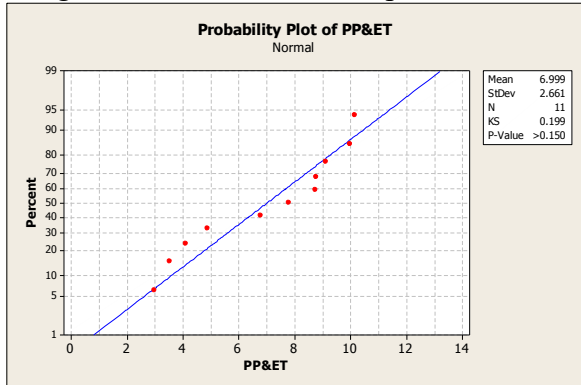
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



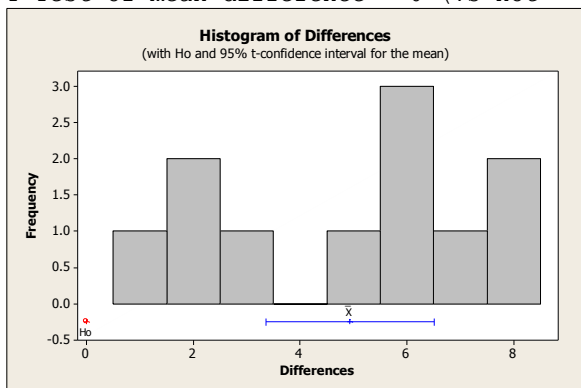
Paired T-Test and CI: PP&ET, IND PP&ET

Paired T for PP&ET - IND PP&ET

	N	Mean	StDev	SE Mean
PP&ET	11	6.999	2.661	0.802
IND PP&ET	11	2.069	0.328	0.099
Difference	11	4.930	2.346	0.707

95% CI for mean difference: (3.354, 6.506)

T-Test of mean difference = 0 (vs not = 0): T-Value = 6.97 P-Value = 0.000



MARRIOTT Asset Management Ratios

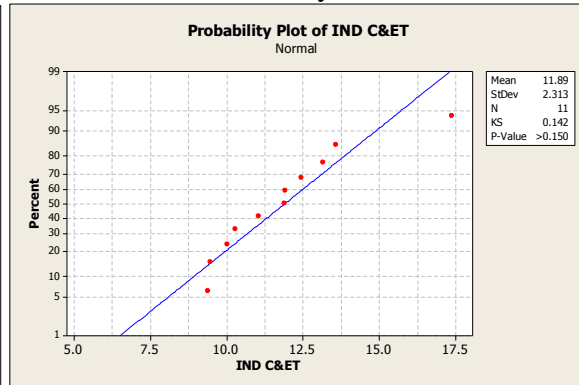
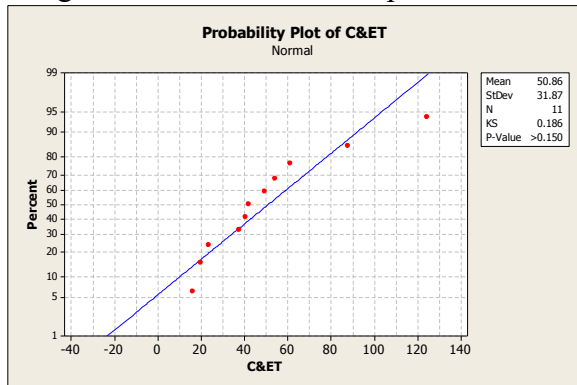
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Histogram of Differences

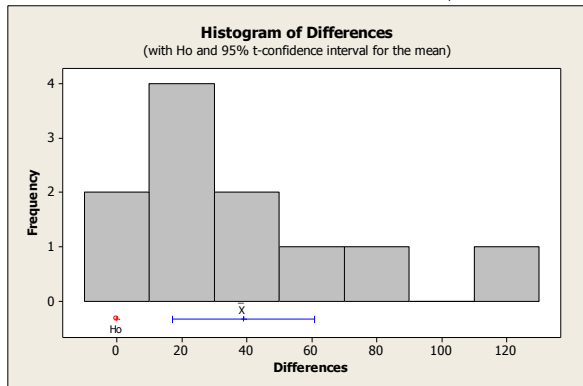
Paired T-Test and CI: C&ET, IND C&ET

Paired T for C&ET - IND C&ET

	N	Mean	StDev	SE Mean
C&ET	11	50.86	31.87	9.61
IND C&ET	11	11.89	2.31	0.70
Difference	11	38.96	32.44	9.78

95% CI for mean difference: (17.17, 60.76)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.98 P-Value = 0.003



MARRIOTT Per Share Ratios

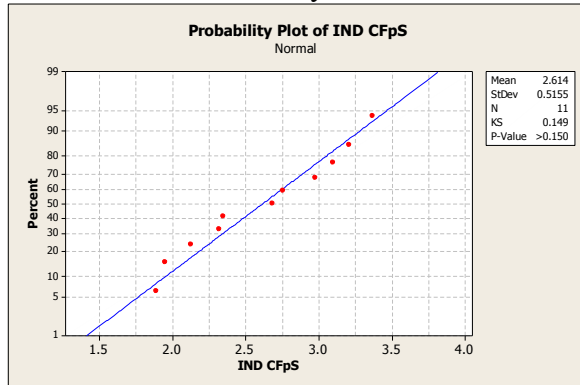
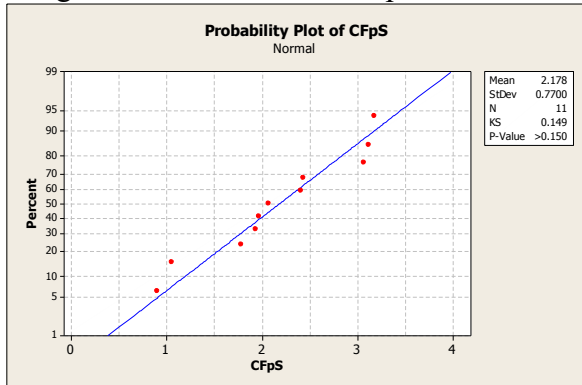
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



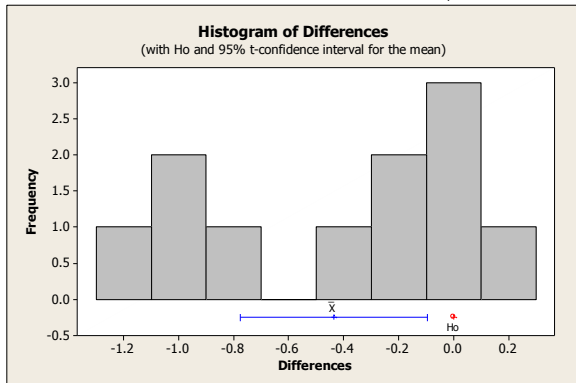
Paired T-Test and CI: CFpS, IND CFpS

Paired T for CFpS - IND CFpS

	N	Mean	StDev	SE Mean
CFpS	11	2.178	0.770	0.232
IND CFpS	11	2.614	0.515	0.155
Difference	11	-0.436	0.507	0.153

95% CI for mean difference: (-0.777, -0.096)

T-Test of mean difference = 0 (vs not = 0): T-Value = -2.85 P-Value = 0.017



MARRIOTT Per Share Ratios

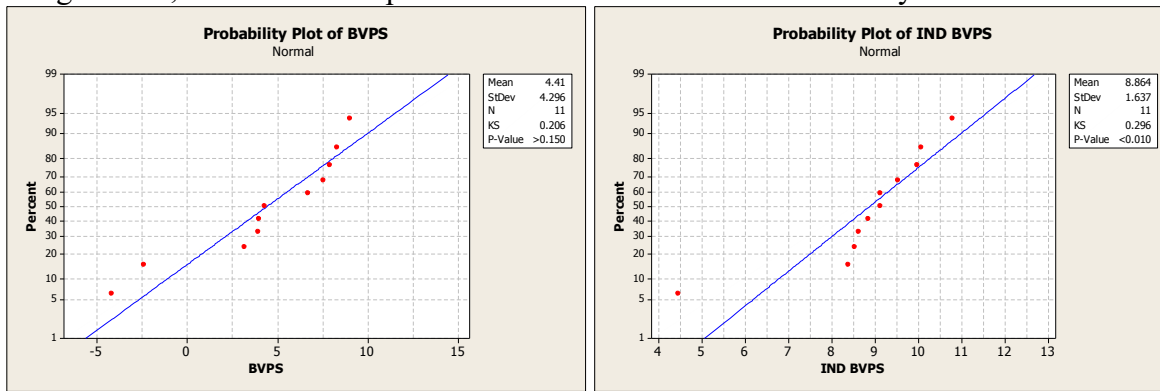
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: BVPS, IND BVPS

Paired test for BVPS - IND BVPS

Test of median = 0.000000 versus median not = 0.000000

	N for	Wilcoxon	Estimated
Difference	11	Test	Median
		Statistic	P
		0.0	0.004

	N	Estimated	Achieved	Confidence
Difference	11	Median	Confidence	Interval
		-4.36	95.5	Lower Upper
				-6.80 -1.92

3M Profitability Ratios

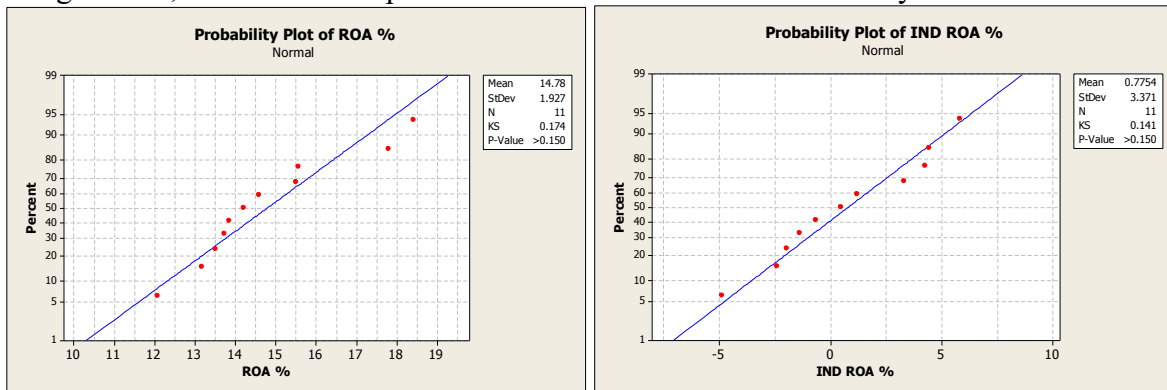
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



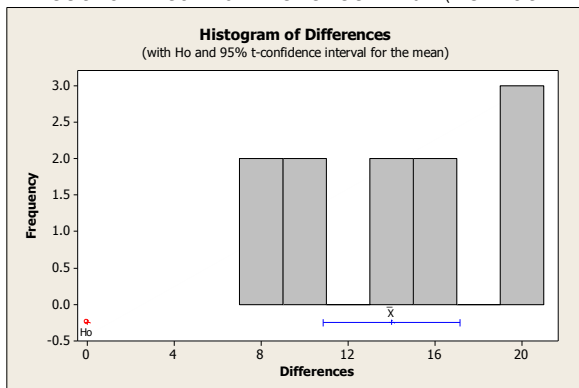
Paired T-Test and CI: ROA %, IND ROA %

Paired T for ROA % - IND ROA %

	N	Mean	StDev	SE Mean
ROA %	11	14.78	1.93	0.58
IND ROA %	11	0.78	3.37	1.02
Difference	11	14.00	4.70	1.42

95% CI for mean difference: (10.84, 17.16)

T-Test of mean difference = 0 (vs not = 0): T-Value = 9.88 P-Value = 0.000



3M Profitability Ratios

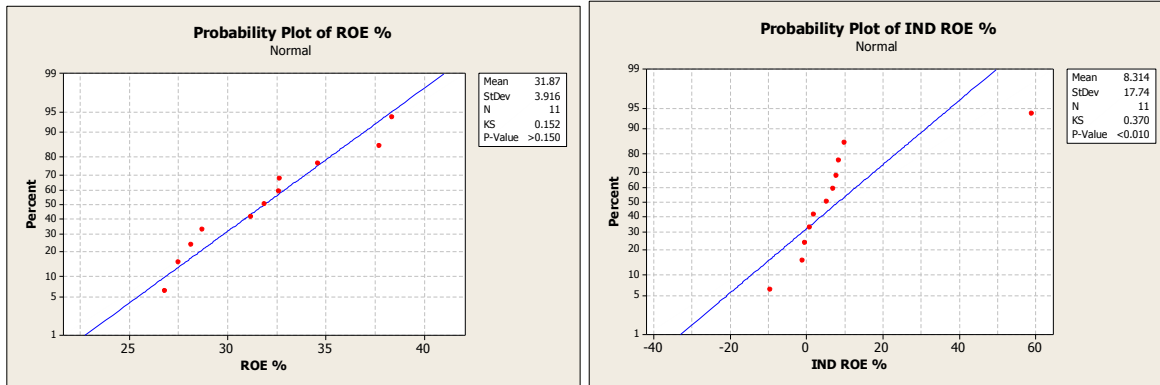
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: ROE %, IND ROE %

Paired test for ROE % - IND ROE %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	60.0	0.018	26.78

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	26.8	95.5	7.4	34.2

3M Profitability Ratios

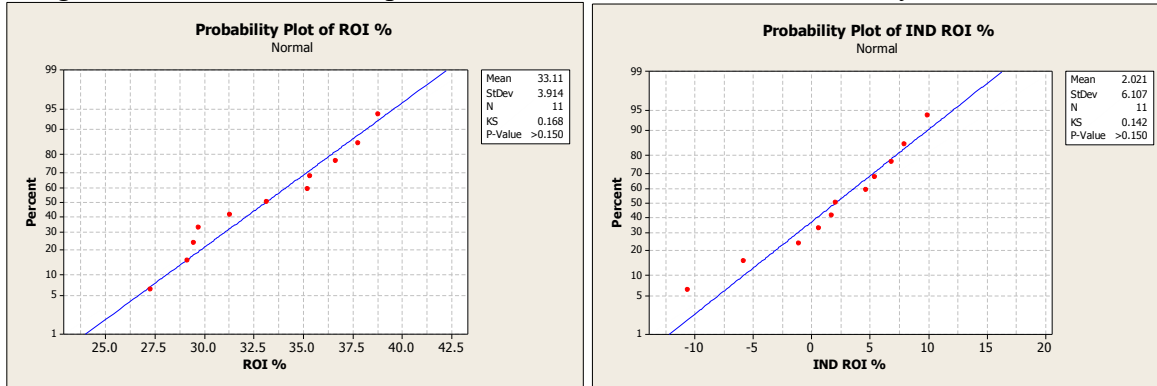
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



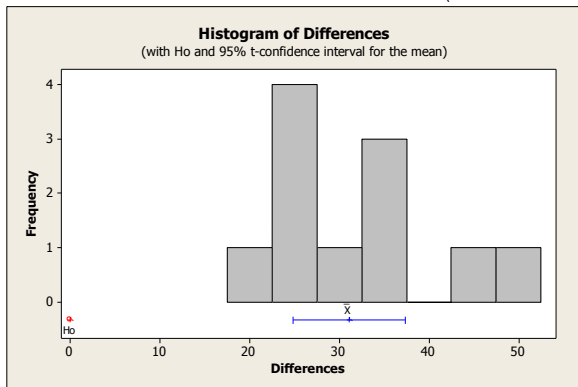
Paired T-Test and CI: ROI %, IND ROI %

Paired T for ROI % - IND ROI %

	N	Mean	StDev	SE Mean
ROI %	11	33.11	3.91	1.18
IND ROI %	11	2.02	6.11	1.84
Difference	11	31.08	9.34	2.82

95% CI for mean difference: (24.81, 37.36)

T-Test of mean difference = 0 (vs not = 0): T-Value = 11.03 P-Value = 0.000



3M Profitability Ratios

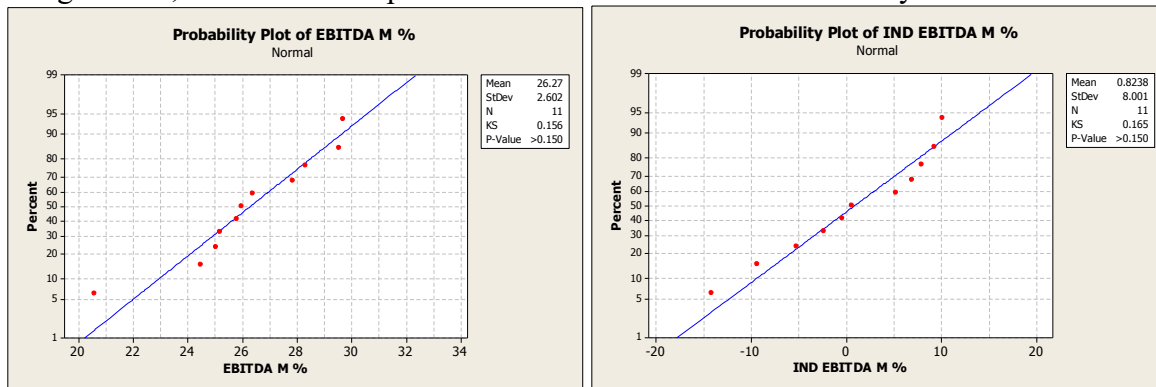
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



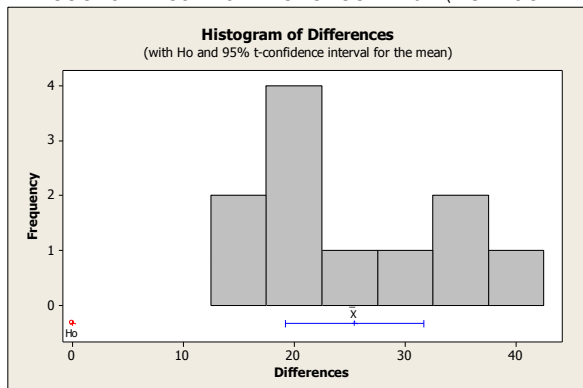
Paired T-Test and CI: EBITDA M %, IND EBITDA M %

Paired T for EBITDA M % - IND EBITDA M %

	N	Mean	StDev	SE Mean
EBITDA M %	11	26.27	2.60	0.78
IND EBITDA M %	11	0.82	8.00	2.41
Difference	11	25.45	9.26	2.79

95% CI for mean difference: (19.23, 31.67)

T-Test of mean difference = 0 (vs not = 0): T-Value = 9.11 P-Value = 0.000



3M Profitability Ratios

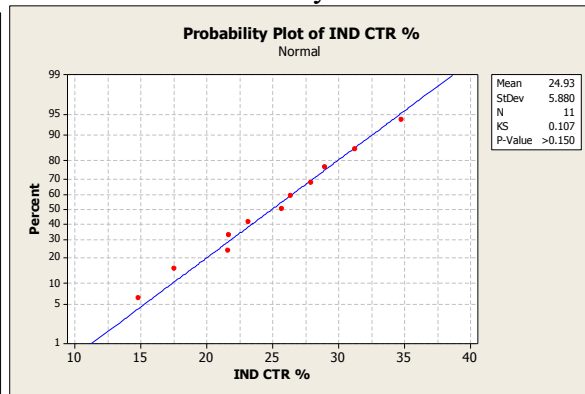
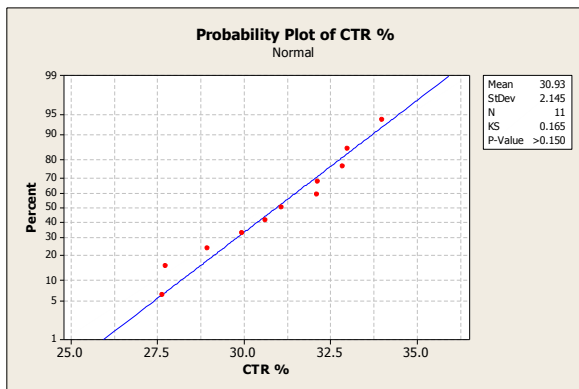
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



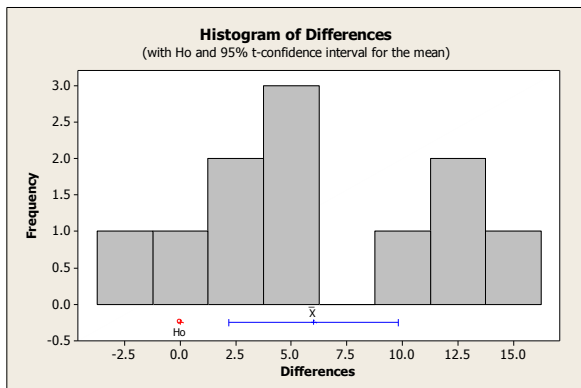
Paired T-Test and CI: CTR %, IND CTR %

Paired T for CTR % - IND CTR %

	N	Mean	StDev	SE Mean
CTR %	11	30.93	2.14	0.65
IND CTR %	11	24.93	5.88	1.77
Difference	11	6.00	5.66	1.71

95% CI for mean difference: (2.20, 9.80)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.52 P-Value = 0.006



3M Profitability Ratios

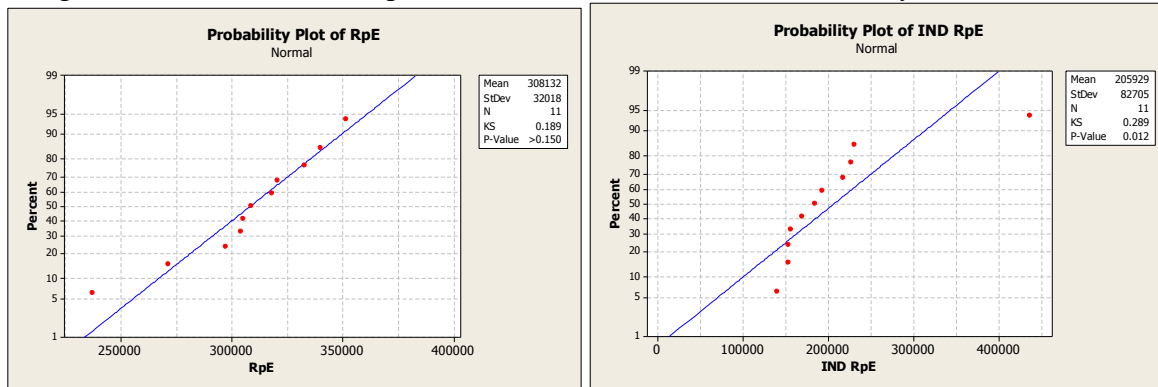
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: RpE, IND RpE

Paired test for RpE - IND RpE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	59.0	0.023	121546

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	121546	95.5	11905	135484

3M Liquidity Ratios

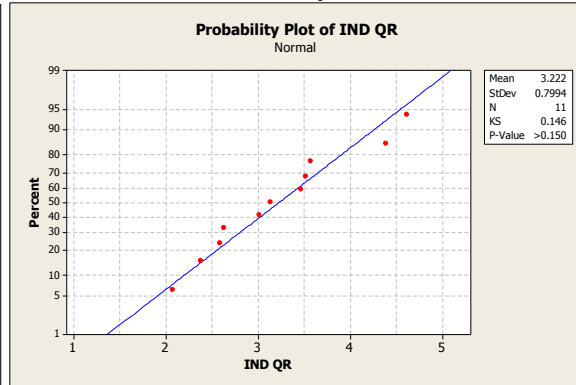
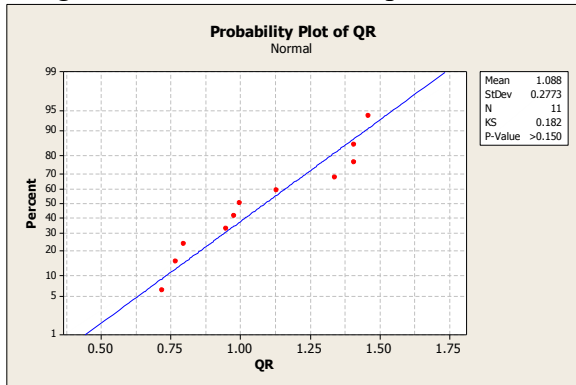
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



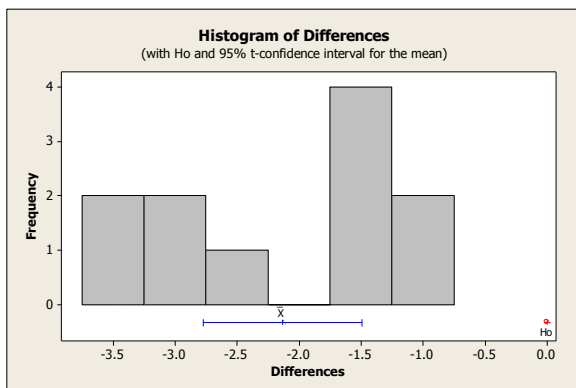
Paired T-Test and CI: QR, IND QR

Paired T for QR - IND QR

	N	Mean	StDev	SE Mean
QR	11	1.088	0.277	0.084
IND QR	11	3.222	0.799	0.241
Difference	11	-2.134	0.952	0.287

95% CI for mean difference: (-2.774, -1.495)

T-Test of mean difference = 0 (vs not = 0): T-Value = -7.44 P-Value = 0.000



3M Liquidity Ratios

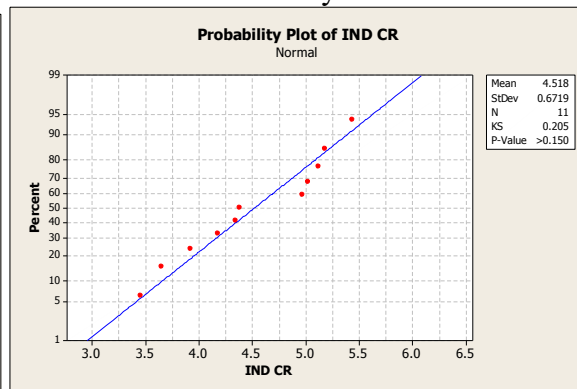
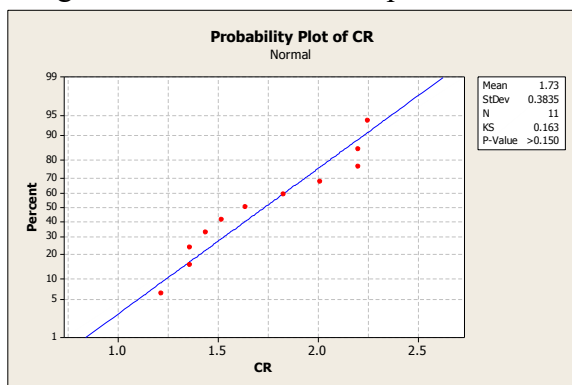
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



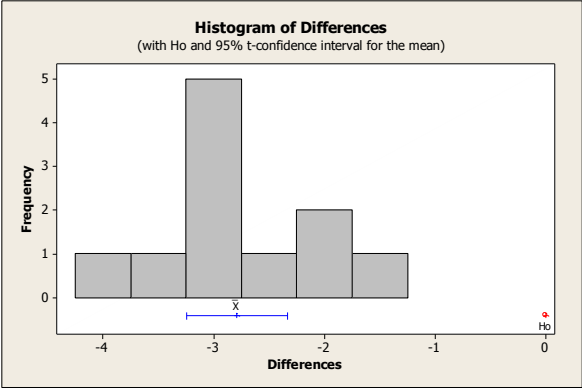
Paired T-Test and CI: CR, IND CR

Paired T for CR - IND CR

	N	Mean	StDev	SE Mean
CR	11	1.730	0.384	0.116
IND CR	11	4.518	0.672	0.203
Difference	11	-2.788	0.675	0.203

95% CI for mean difference: (-3.241, -2.335)

T-Test of mean difference = 0 (vs not = 0): T-Value = -13.70 P-Value = 0.000



3M Liquidity Ratios

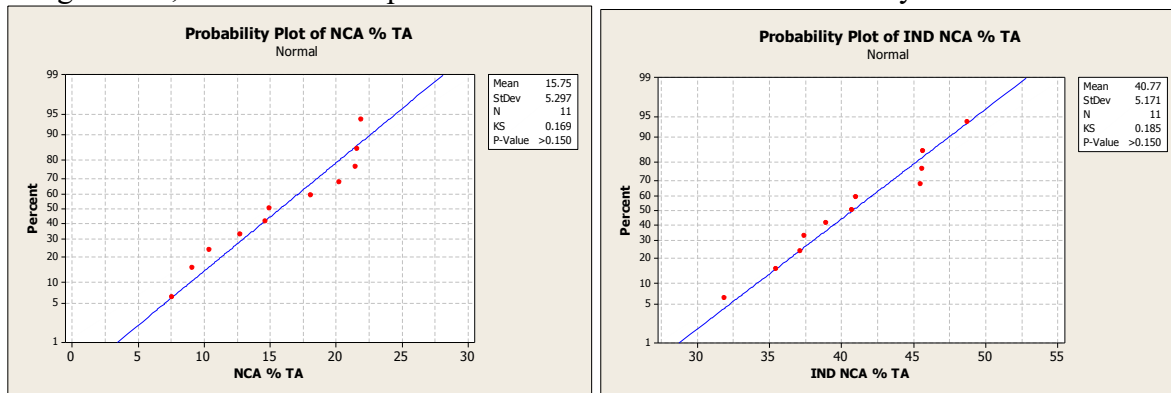
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



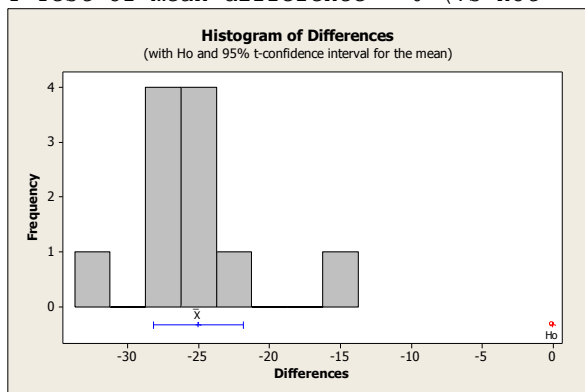
Paired T-Test and CI: NCA % TA, IND NCA % TA

Paired T for NCA % TA - IND NCA % TA

	N	Mean	StDev	SE Mean
NCA % TA	11	15.75	5.30	1.60
IND NCA % TA	11	40.77	5.17	1.56
Difference	11	-25.03	4.71	1.42

95% CI for mean difference: (-28.19, -21.87)

T-Test of mean difference = 0 (vs not = 0): T-Value = -17.64 P-Value = 0.000



3M Debt Management Ratios

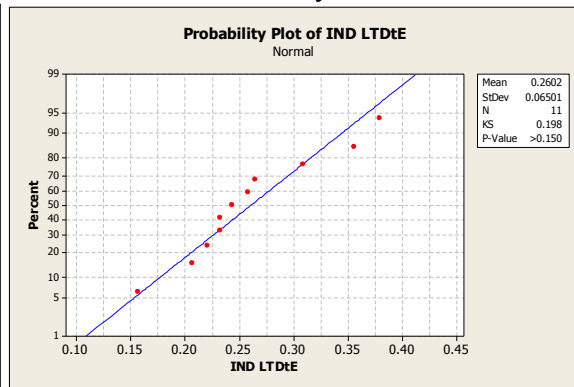
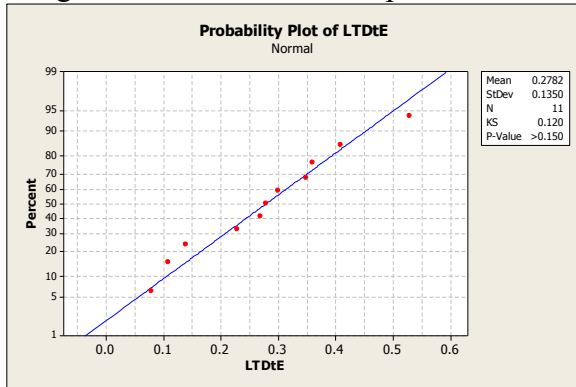
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



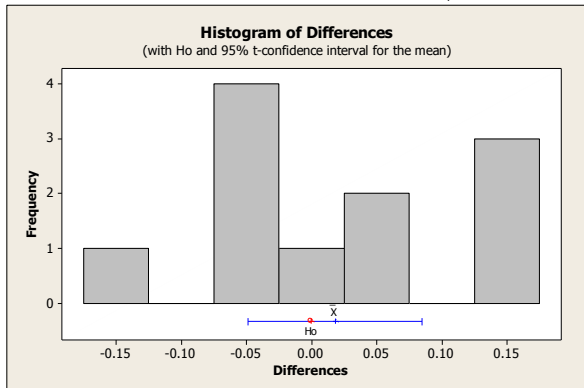
Paired T-Test and CI: LTDtE, IND LTDtE

Paired T for LTDtE - IND LTDtE

	N	Mean	StDev	SE Mean
LTDtE	11	0.2782	0.1350	0.0407
IND LTDtE	11	0.2602	0.0650	0.0196
Difference	11	0.0180	0.0990	0.0298

95% CI for mean difference: (-0.0485, 0.0845)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.60 P-Value = 0.559



3M Debt Management Ratios

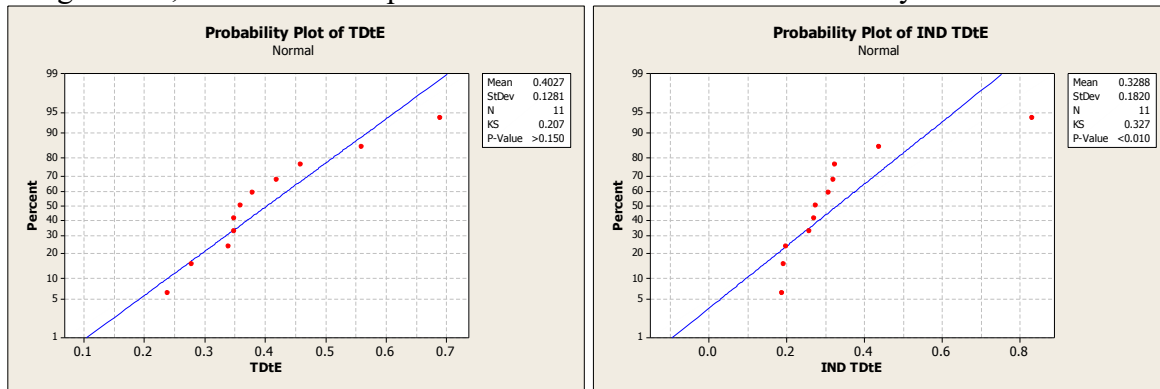
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	52.0	0.100	0.09569

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	0.096	95.5	-0.041	0.164

3M Debt Management Ratios

Asset Management

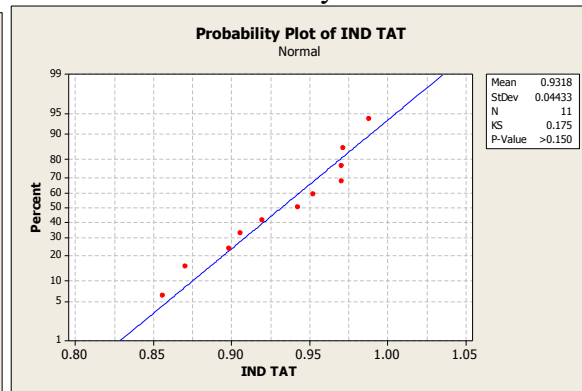
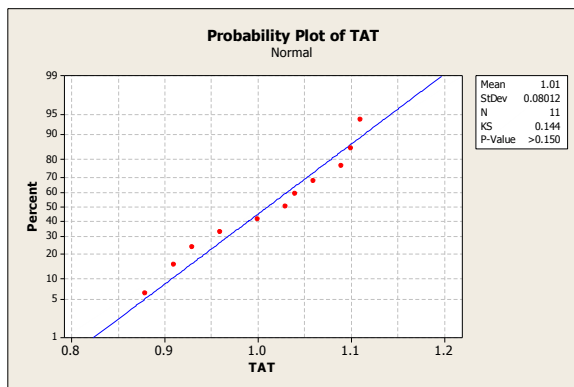
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



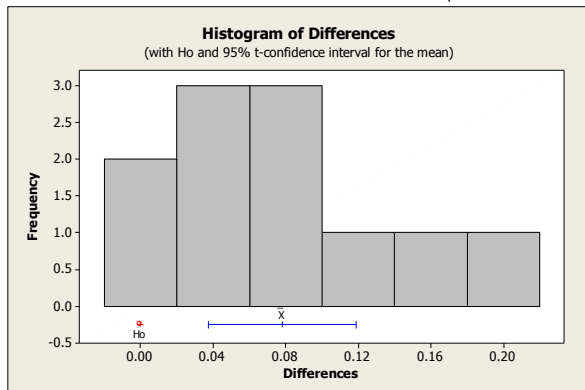
Paired T-Test and CI: TAT, IND TAT

Paired T for TAT - IND TAT

	N	Mean	StDev	SE Mean
TAT	11	1.0100	0.0801	0.0242
IND TAT	11	0.9318	0.0443	0.0134
Difference	11	0.0782	0.0605	0.0182

95% CI for mean difference: (0.0375, 0.1188)

T-Test of mean difference = 0 (vs not = 0): T-Value = 4.28 P-Value = 0.002



3M Debt Management Ratios

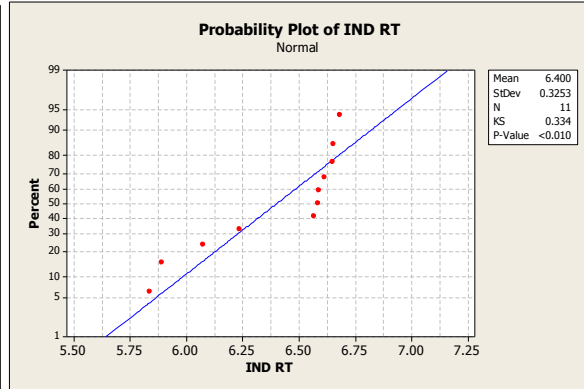
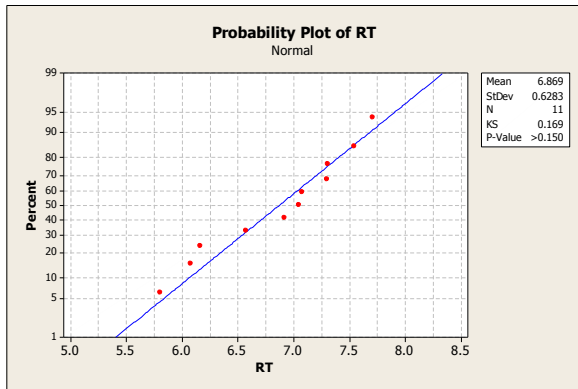
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: RT, IND RT

Paired test for RT - IND RT

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	63.0	0.009	0.4473

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	0.447	95.5	0.184	0.743

3M Debt Management Ratios

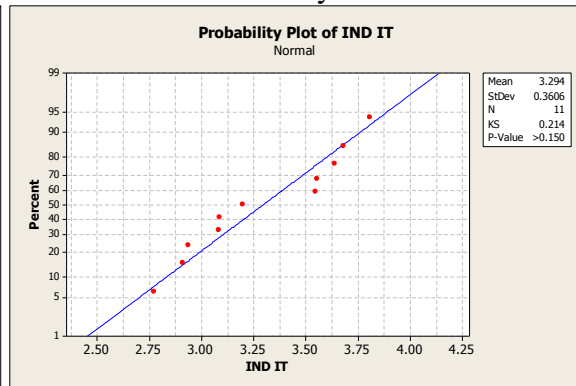
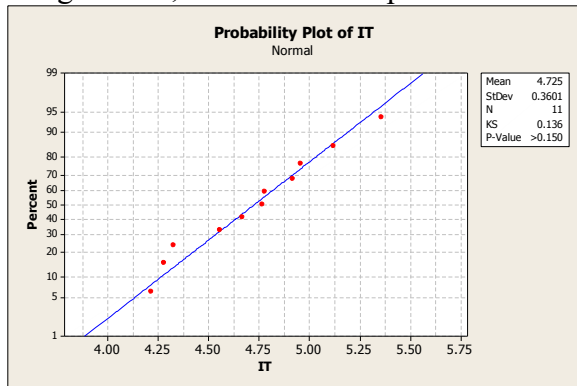
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



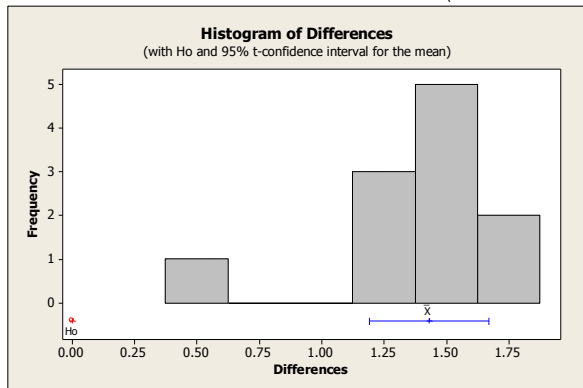
Paired T-Test and CI: IT, IND IT

Paired T for IT - IND IT

	N	Mean	StDev	SE Mean
IT	11	4.725	0.360	0.109
IND IT	11	3.294	0.361	0.109
Difference	11	1.430	0.357	0.108

95% CI for mean difference: (1.190, 1.670)

T-Test of mean difference = 0 (vs not = 0): T-Value = 13.28 P-Value = 0.000



3M Debt Management Ratios

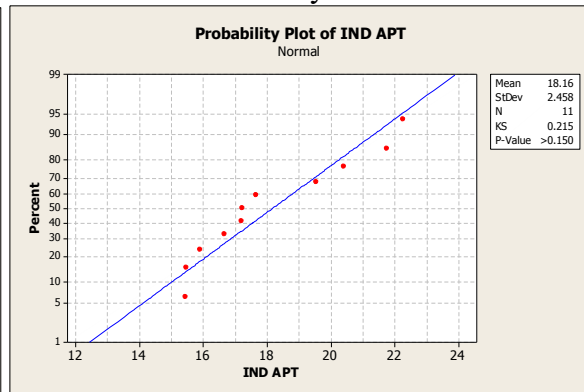
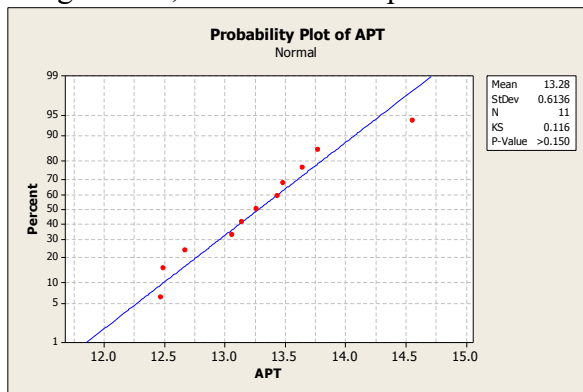
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying off suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



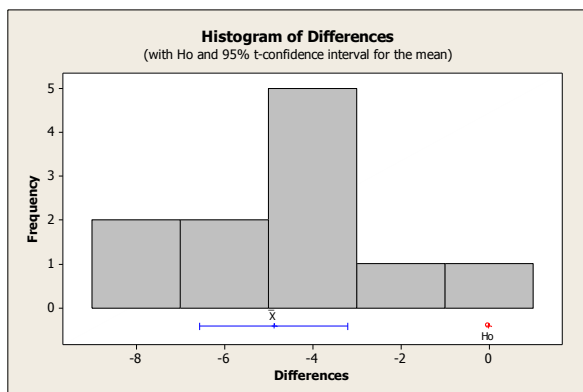
Paired T-Test and CI: APT, IND APT

Paired T for APT - IND APT

	N	Mean	StDev	SE Mean
APT	11	13.279	0.614	0.185
IND APT	11	18.158	2.458	0.741
Difference	11	-4.879	2.507	0.756

95% CI for mean difference: (-6.563, -3.194)

T-Test of mean difference = 0 (vs not = 0): T-Value = -6.45 P-Value = 0.000



3M Debt Management Ratios

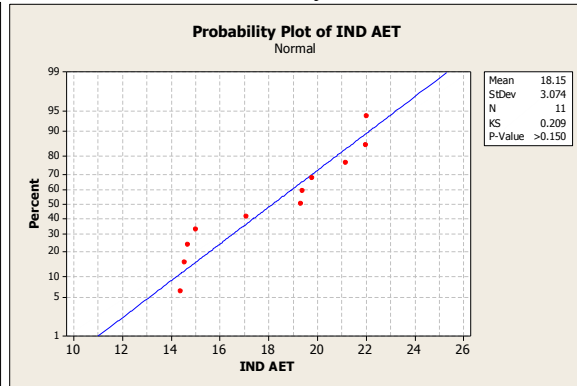
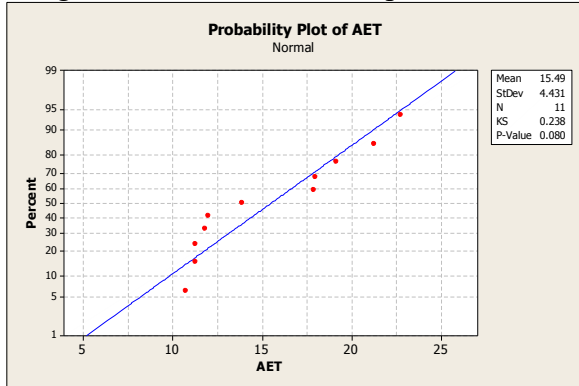
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



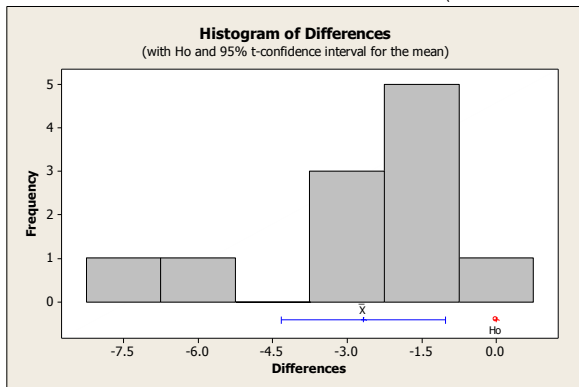
Paired T-Test and CI: AET, IND AET

Paired T for AET - IND AET

	N	Mean	StDev	SE Mean
AET	11	15.49	4.43	1.34
IND AET	11	18.15	3.07	0.93
Difference	11	-2.668	2.463	0.743

95% CI for mean difference: (-4.322, -1.013)

T-Test of mean difference = 0 (vs not = 0): T-Value = -3.59 P-Value = 0.005



3M Debt Management Ratios

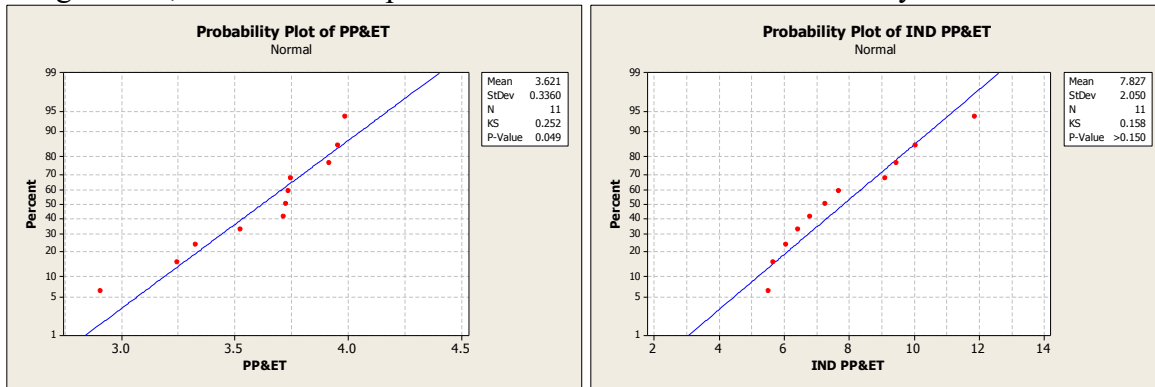
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: PP&ET, IND PP&ET

Paired test for PP&ET - IND PP&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	Statistic	P	Estimated
Difference	11	11	0.0	0.004		-4.037

	N	Estimated	Achieved	Confidence	Lower	Upper
Difference	11	-4.04	95.5	95.5	-5.84	-2.53

3M Debt Management Ratios

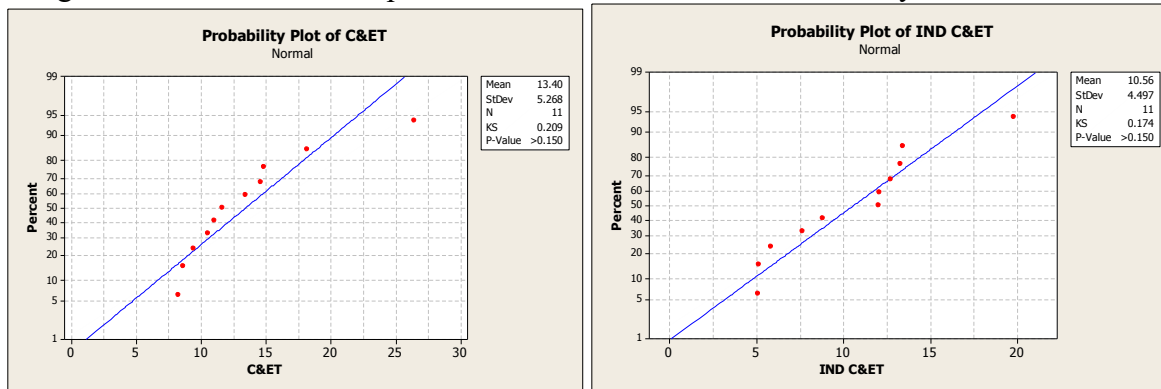
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



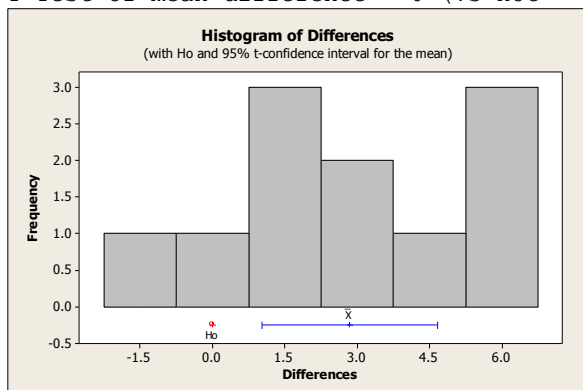
Paired T-Test and CI: C&ET, IND C&ET

Paired T for C&ET - IND C&ET

	N	Mean	StDev	SE Mean
C&ET	11	13.40	5.27	1.59
IND C&ET	11	10.56	4.50	1.36
Difference	11	2.845	2.708	0.816

95% CI for mean difference: (1.026, 4.664)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.49 P-Value = 0.006



3M Per Share Ratios

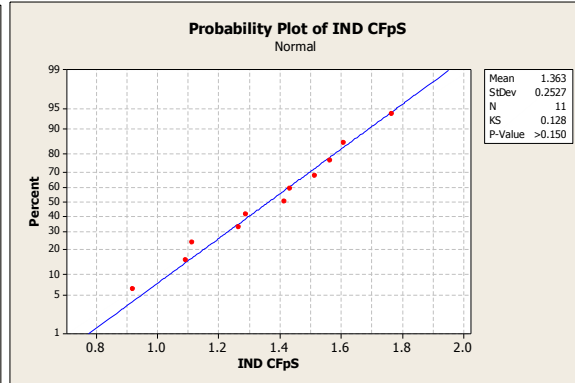
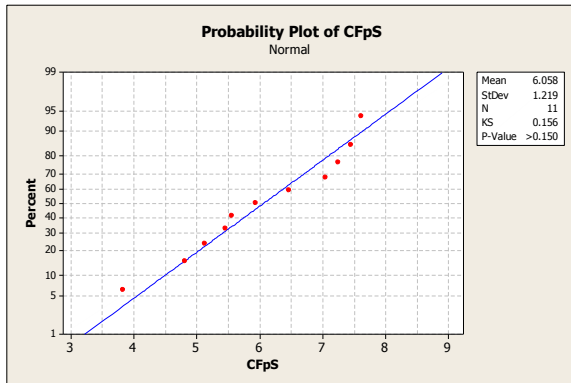
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



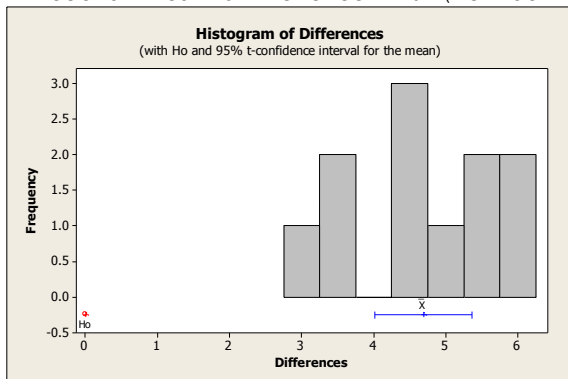
Paired T-Test and CI: CFpS, IND CFpS

Paired T for CFpS - IND CFpS

	N	Mean	StDev	SE Mean
CFpS	11	6.058	1.219	0.368
IND CFpS	11	1.363	0.253	0.076
Difference	11	4.695	1.003	0.302

95% CI for mean difference: (4.021, 5.369)

T-Test of mean difference = 0 (vs not = 0): T-Value = 15.52 P-Value = 0.000



3M Per Share Ratios

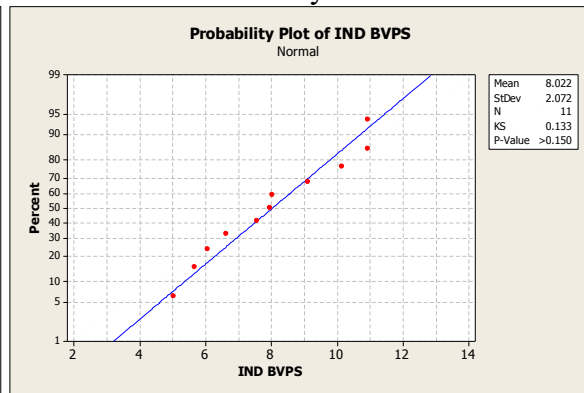
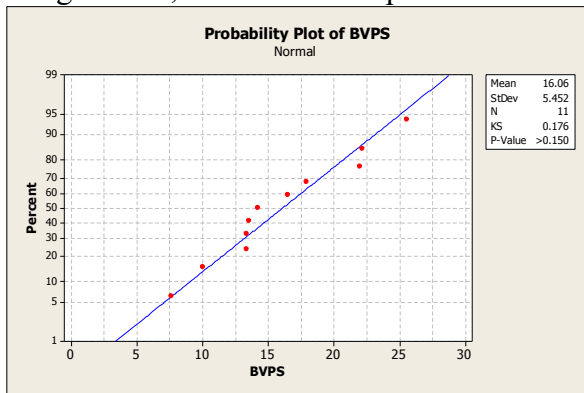
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Paired T-Test and CI: BVPS, IND BVPS

Paired T for BVPS - IND BVPS

	N	Mean	StDev	SE Mean
BVPS	11	16.06	5.45	1.64
IND BVPS	11	8.02	2.07	0.62
Difference	11	8.04	3.49	1.05

95% CI for mean difference: (5.69, 10.38)

T-Test of mean difference = 0 (vs not = 0): T-Value = 7.65 P-Value = 0.000



MOTOROLA Profitability Ratios

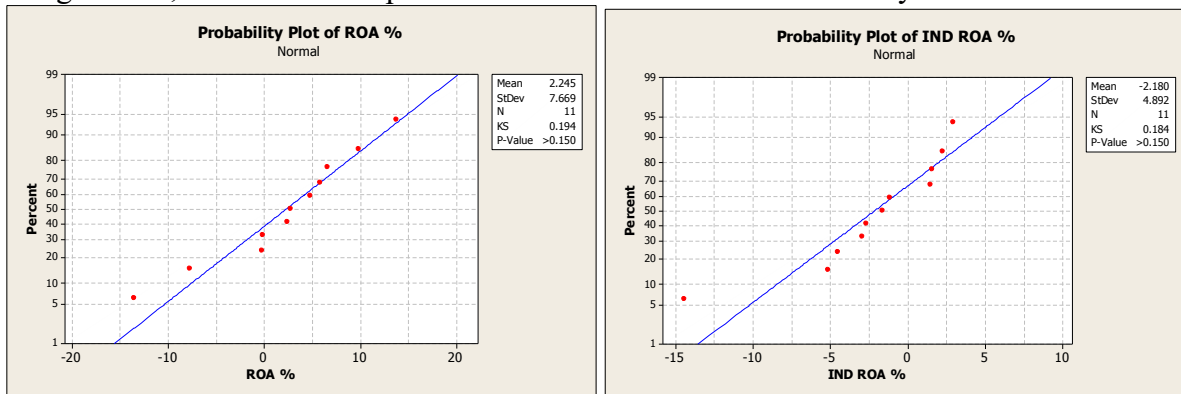
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



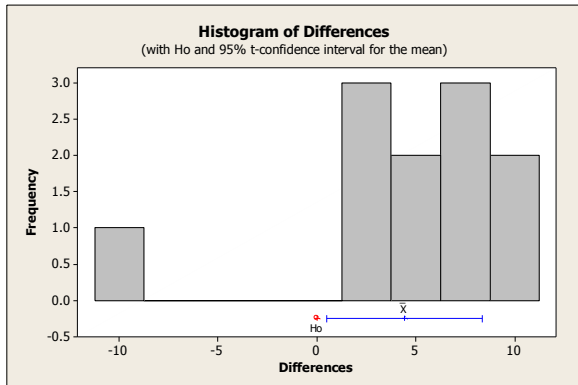
Paired T-Test and CI: ROA %, IND ROA %

Paired T for ROA % - IND ROA %

	N	Mean	StDev	SE Mean
ROA %	11	2.25	7.67	2.31
IND ROA %	11	-2.18	4.89	1.48
Difference	11	4.42	5.87	1.77

95% CI for mean difference: (0.48, 8.37)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.50 P-Value = 0.031



MOTOROLA Profitability Ratios

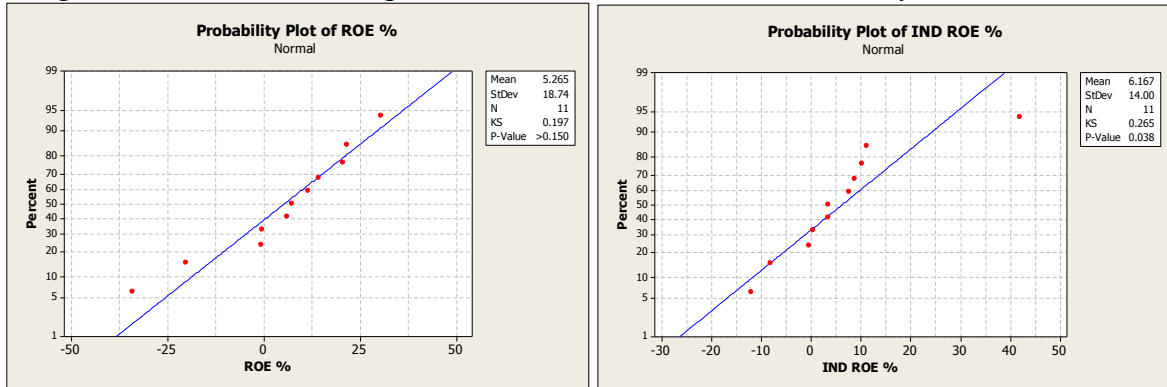
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: ROE %, IND ROE %

Paired test for ROE % - IND ROE %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	35.0	0.894	1.389

	N	Estimated Median	Achieved Confidence	Confidence Interval	
Difference	11	1.4	95.5	-15.5	12.6

MOTOROLA Profitability Ratios

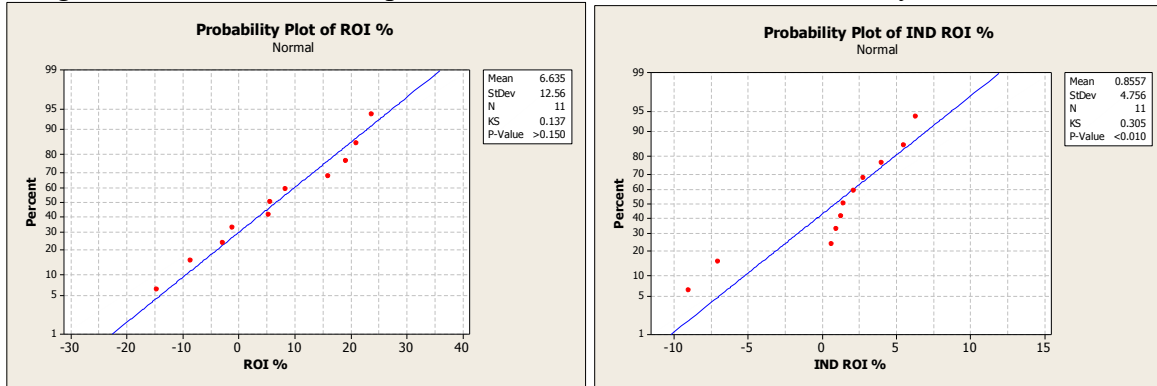
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: ROI %, IND ROI %

Paired test for ROI % - IND ROI %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated	
Difference	11	11	Statistic	50.0	0.142	Median
						6.755

	N	Estimated	Achieved	Confidence Interval	
Difference	11	Median	Confidence	Lower	Upper
		6.8	95.5	-1.6	15.3

MOTOROLA Profitability Ratios

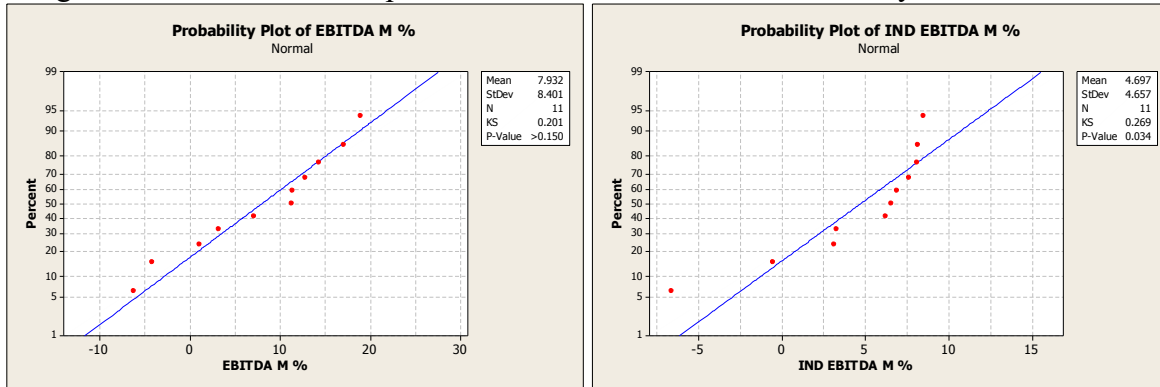
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: EBITDA M %, IND EBITDA M %

Paired test for EBITDA M % - IND EBITDA M %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated
Difference	11	11	Statistic	0.068	Median
			54.0		3.063

	N	Estimated	Achieved	Confidence Interval	
Difference	11	Median	Confidence	Lower	Upper
		3.06	95.5	-0.97	6.98

MOTOROLA Profitability Ratios

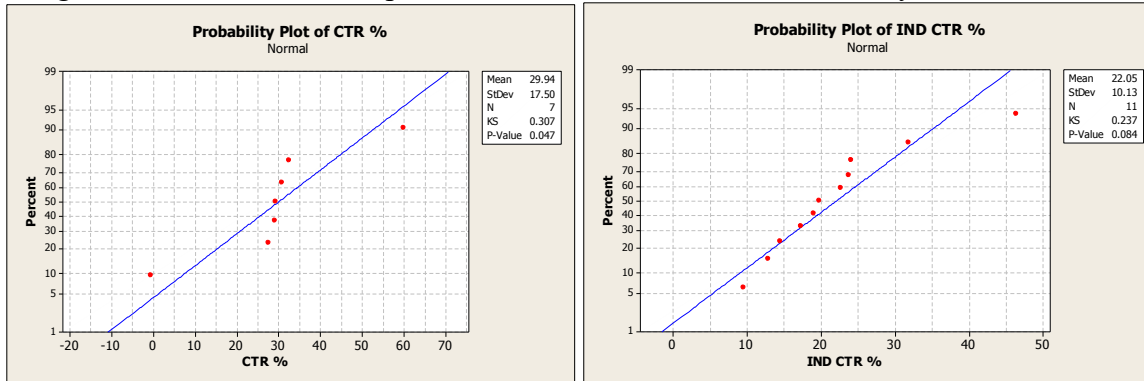
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: CTR %, IND CTR %

Paired test for CTR % - IND CTR %

Test of median = 0.000000 versus median not = 0.000000

	N	N*	N for Test	Wilcoxon Statistic	P	Estimated Median
Difference	7	4	7	22.0	0.205	10.23

	N	N*	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	7	4	10.2	94.8	-5.9	28.6

MOTOROLA Profitability Ratios

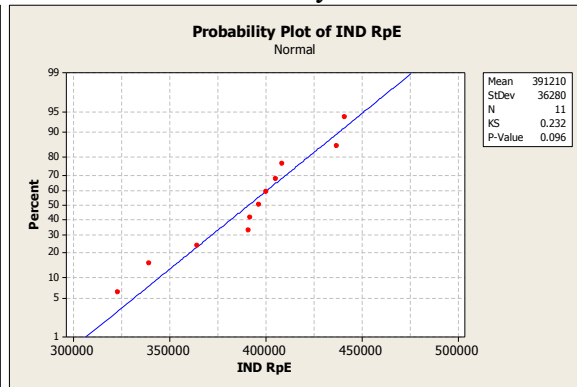
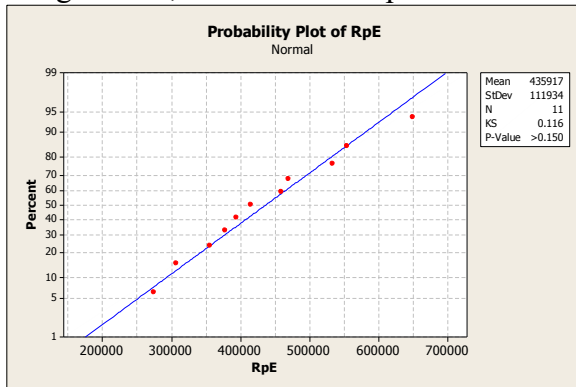
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



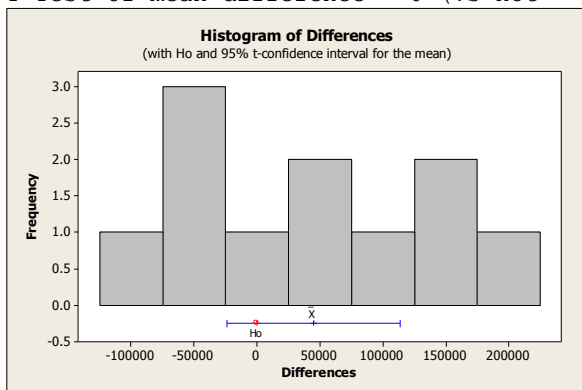
Paired T-Test and CI: RpE, IND RpE

Paired T for RpE - IND RpE

	N	Mean	StDev	SE Mean
RpE	11	435917	111934	33749
IND RpE	11	391210	36280	10939
Difference	11	44708	102684	30960

95% CI for mean difference: (-24276, 113692)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.44 P-Value = 0.179



MOTOROLA Liquidity Ratios

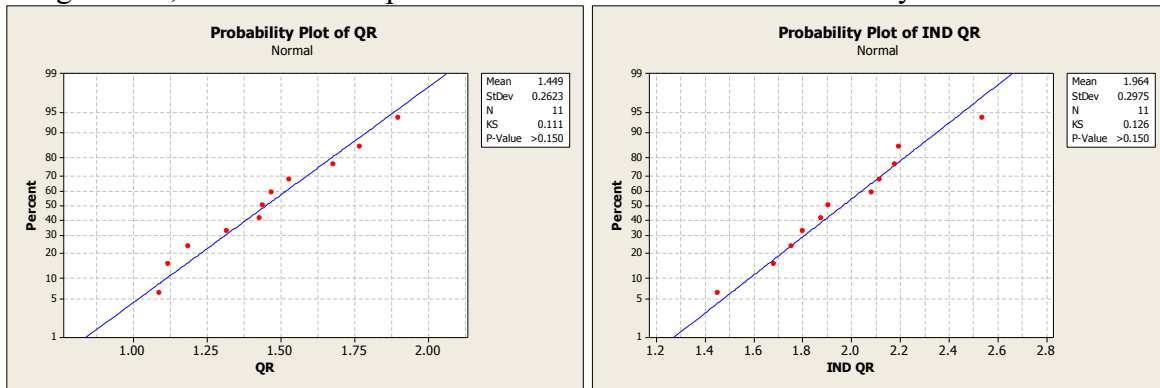
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



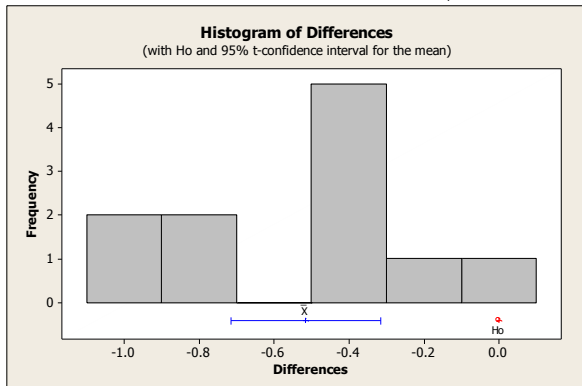
Paired T-Test and CI: QR, IND QR

Paired T for QR - IND QR

	N	Mean	StDev	SE Mean
QR	11	1.4491	0.2623	0.0791
IND QR	11	1.9642	0.2975	0.0897
Difference	11	-0.5151	0.2986	0.0900

95% CI for mean difference: (-0.7157, -0.3145)

T-Test of mean difference = 0 (vs not = 0): T-Value = -5.72 P-Value = 0.000



MOTOROLA Liquidity Ratios

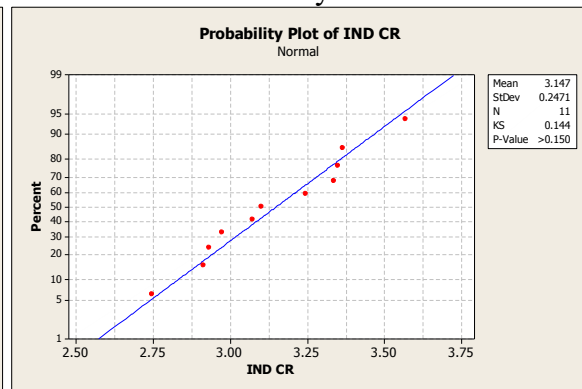
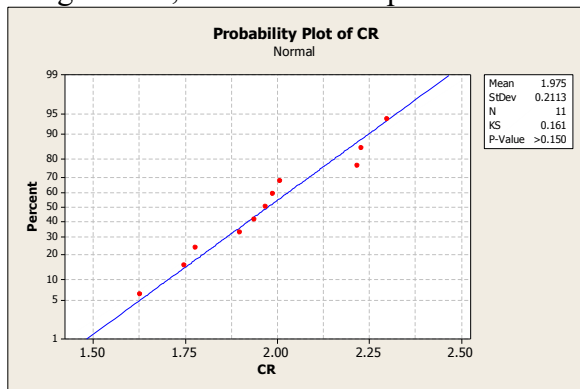
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



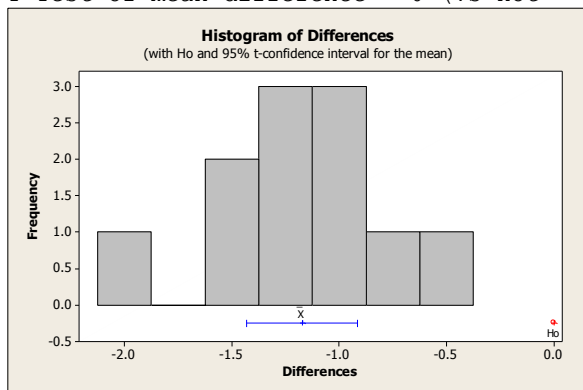
Paired T-Test and CI: CR, IND CR

Paired T for CR - IND CR

	N	Mean	StDev	SE Mean
CR	11	1.9745	0.2113	0.0637
IND CR	11	3.1473	0.2471	0.0745
Difference	11	-1.173	0.384	0.116

95% CI for mean difference: (-1.430, -0.915)

T-Test of mean difference = 0 (vs not = 0): T-Value = -10.14 P-Value = 0.000



MOTOROLA Liquidity Ratios

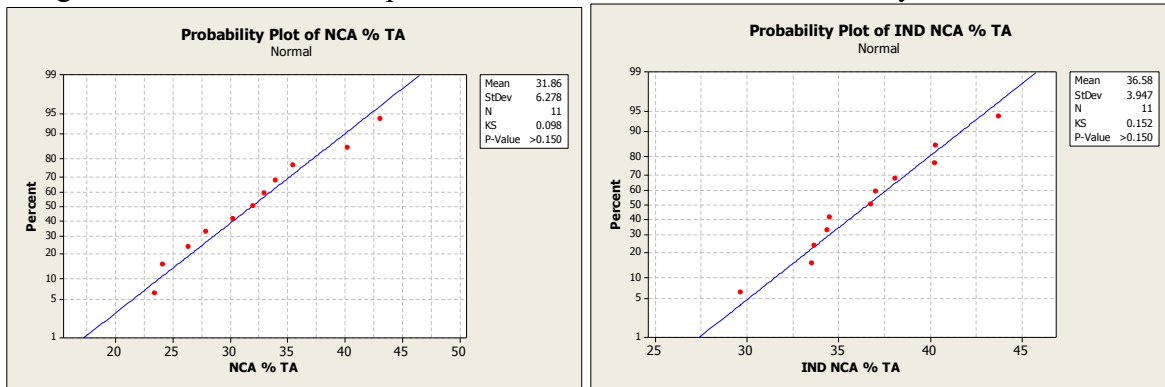
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



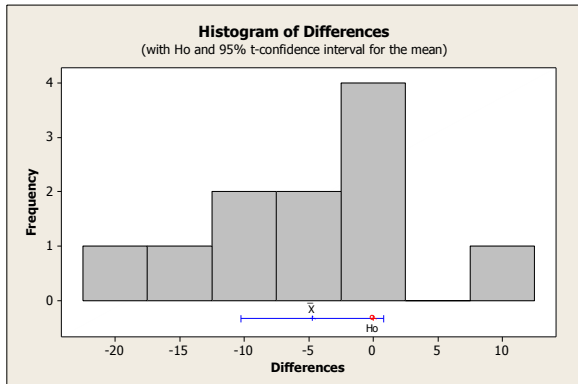
Paired T-Test and CI: NCA % TA, IND NCA % TA

Paired T for NCA % TA - IND NCA % TA

	N	Mean	StDev	SE Mean
NCA % TA	11	31.86	6.28	1.89
IND NCA % TA	11	36.58	3.95	1.19
Difference	11	-4.72	8.22	2.48

95% CI for mean difference: (-10.24, 0.80)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.90 P-Value = 0.086



MOTOROLA Debt Management Ratios

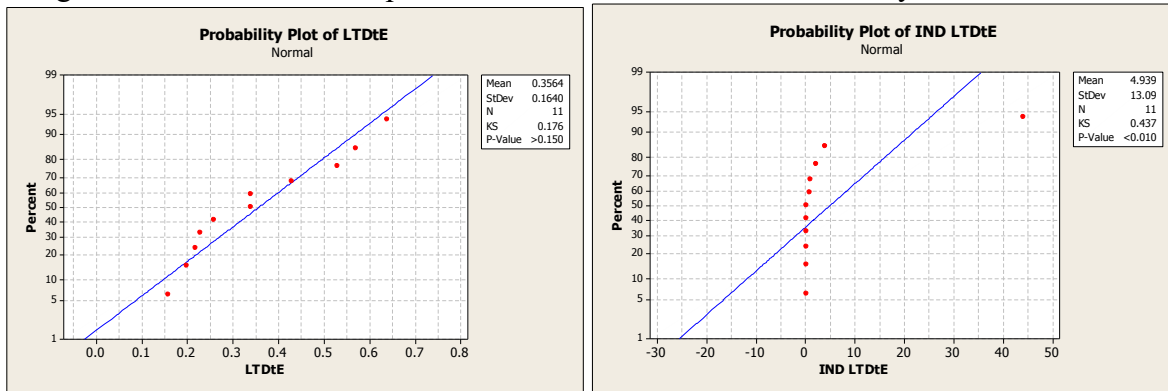
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: LTDtE, IND LTDtE

Paired test for LTDtE - IND LTDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	10	9.0	0.067	-0.5284

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-0.5	95.5	-21.7	0.1

MOTOROLA Debt Management Ratios

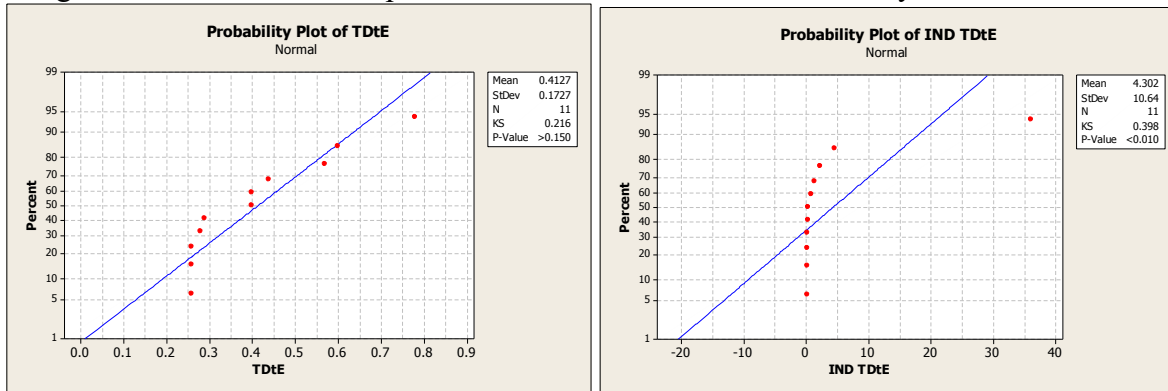
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	17.0	0.168	-0.6141

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-0.6	95.5	-17.6	0.1

MOTOROLA Debt Management Ratios

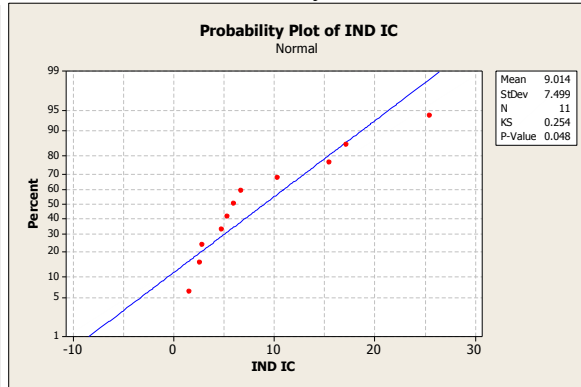
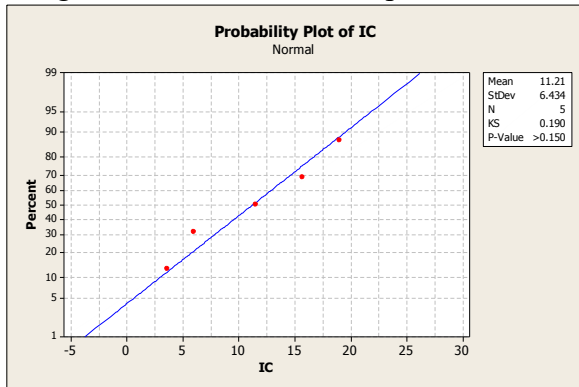
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: IC, IND IC

Paired test for IC - IND IC

Test of median = 0.000000 versus median not = 0.000000

	N	N*	N for Test	Wilcoxon Statistic	P	Estimated Median
Difference	5	6	5	9.0	0.787	0.2006

	N	N*	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	5	6	0.2	94.1	-2.4	14.2

MOTOROLA Asset Management Ratios

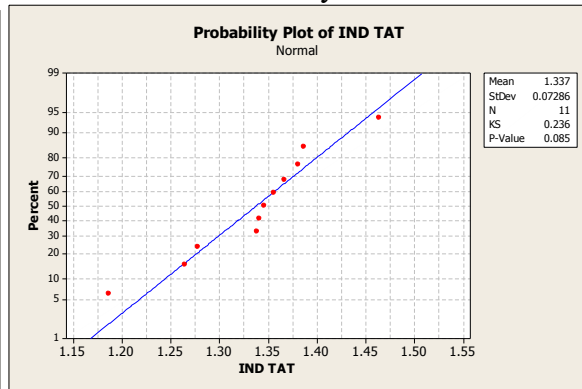
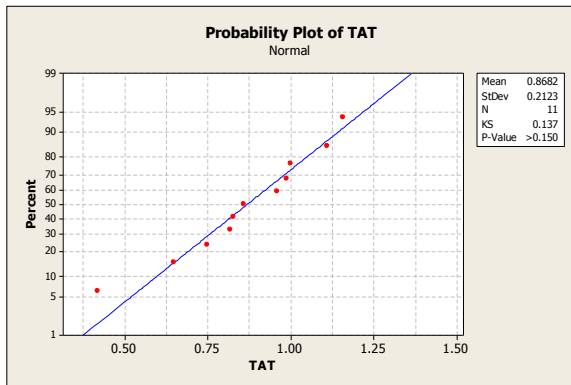
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



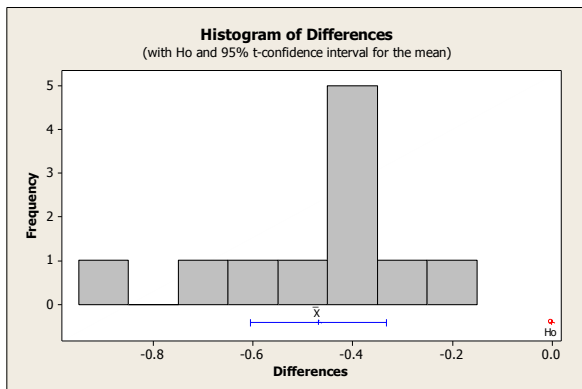
Paired T-Test and CI: TAT, IND TAT

Paired T for TAT - IND TAT

	N	Mean	StDev	SE Mean
TAT	11	0.8682	0.2123	0.0640
IND TAT	11	1.3374	0.0729	0.0220
Difference	11	-0.4692	0.2031	0.0612

95% CI for mean difference: (-0.6056, -0.3327)

T-Test of mean difference = 0 (vs not = 0): T-Value = -7.66 P-Value = 0.000



MOTOROLA Asset Management Ratios

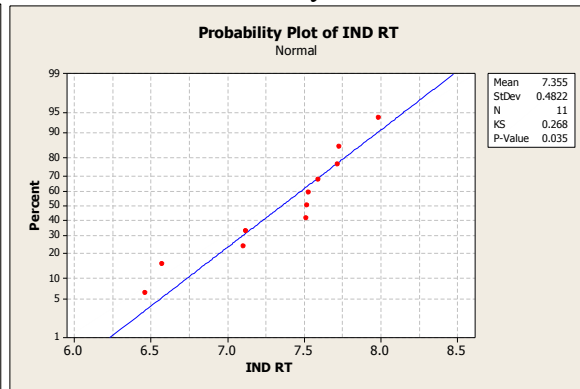
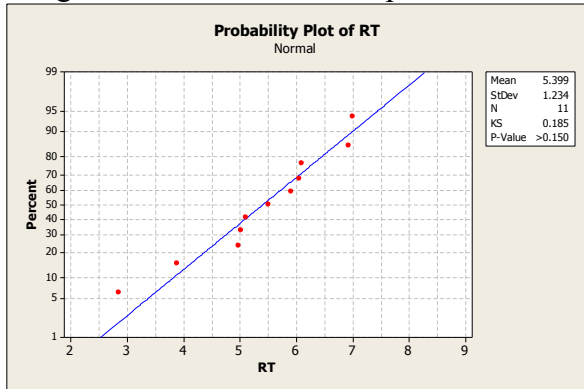
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: RT, IND RT

Paired test for RT - IND RT

Test of median = 0.000000 versus median not = 0.000000

	N	N for Test	Wilcoxon Test Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-1.877

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-1.88	95.5	-2.90	-1.02

MOTOROLA Asset Management Ratios

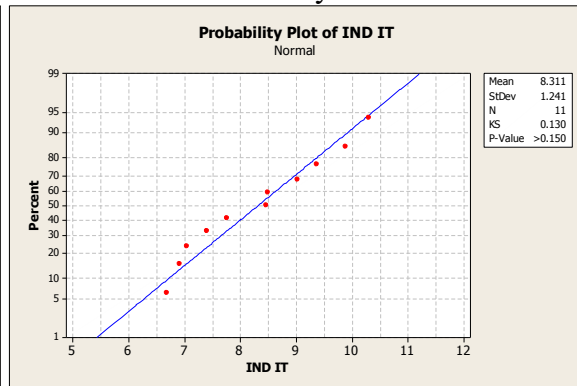
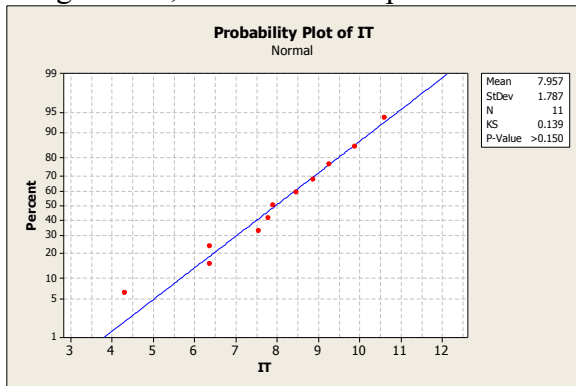
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



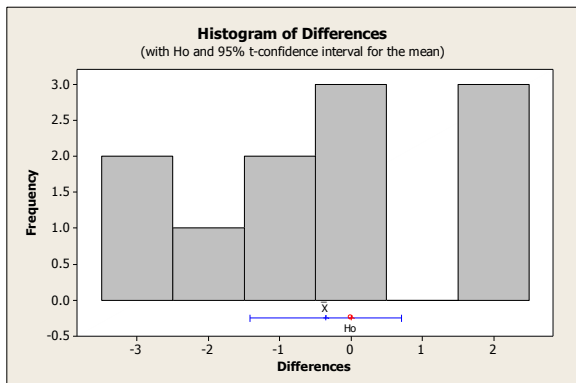
Paired T-Test and CI: IT, IND IT

Paired T for IT - IND IT

	N	Mean	StDev	SE Mean
IT	11	7.957	1.787	0.539
IND IT	11	8.311	1.241	0.374
Difference	11	-0.354	1.582	0.477

95% CI for mean difference: (-1.417, 0.709)

T-Test of mean difference = 0 (vs not = 0): T-Value = -0.74 P-Value = 0.476



MOTOROLA Asset Management Ratios

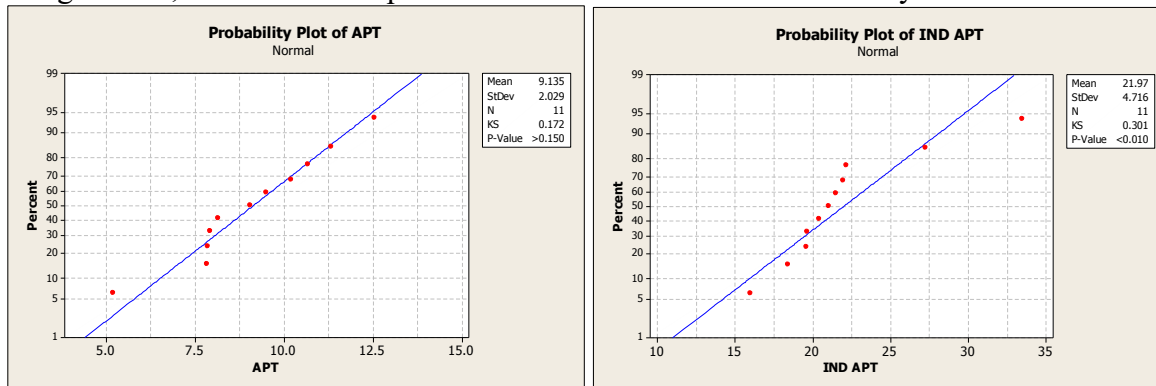
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying off suppliers at a faster rate.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: APT, IND APT

Paired test for APT - IND APT

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-12.55

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-12.55	95.5	-16.90	-9.39

MOTOROLA Asset Management Ratios

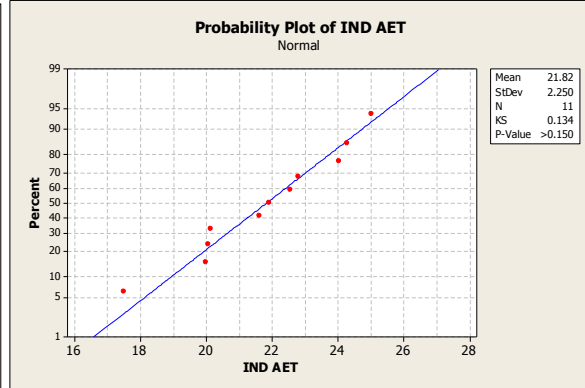
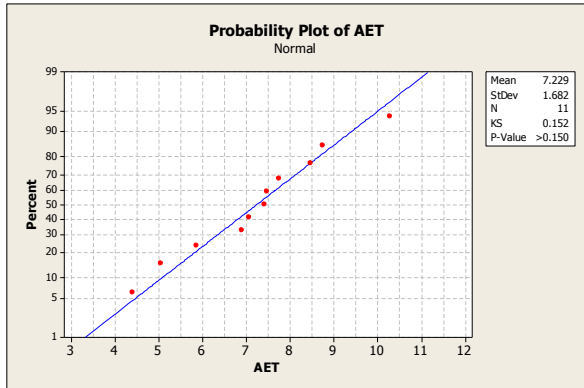
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



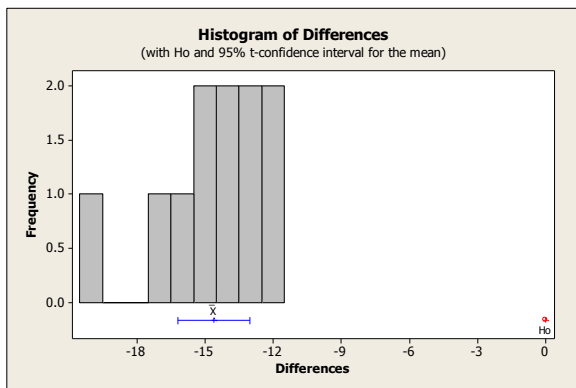
Paired T-Test and CI: AET, IND AET

Paired T for AET - IND AET

	N	Mean	StDev	SE Mean
AET	11	7.229	1.682	0.507
IND AET	11	21.822	2.250	0.678
Difference	11	-14.593	2.360	0.712

95% CI for mean difference: (-16.178, -13.007)

T-Test of mean difference = 0 (vs not = 0): T-Value = -20.51 P-Value = 0.000



MOTOROLA Asset Management Ratios

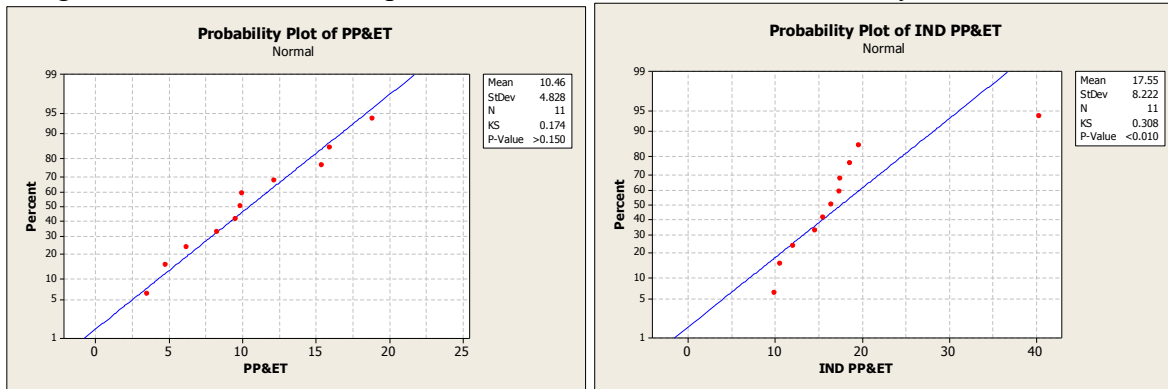
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: PP&ET, IND PP&ET

Paired test for PP&ET - IND PP&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	2.0	0.007	-5.177

	N	Estimated Median	Achieved Confidence	Confidence Interval
Difference	11	-5.2	95.5	-14.5 -2.1

MOTOROLA Asset Management Ratios

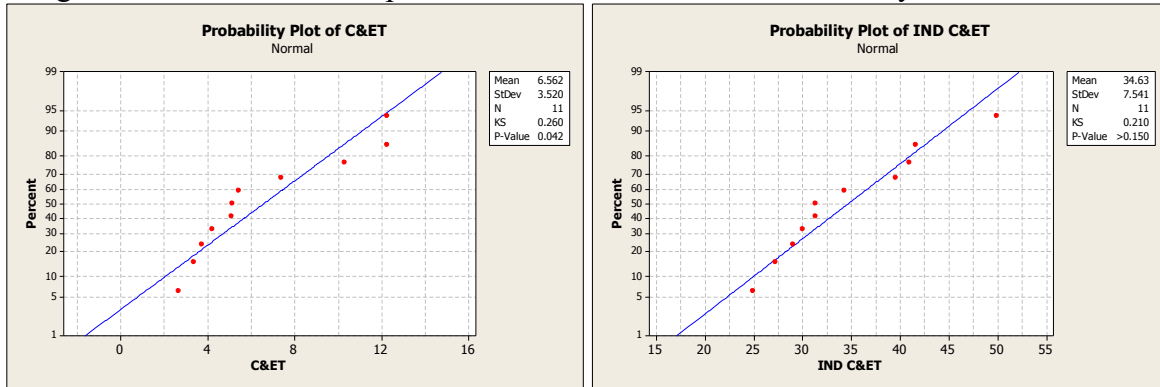
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: C&ET, IND C&ET

Paired test for C&ET - IND C&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	Estimated
Difference	11	11	Statistic	P
			0.0	0.004
				Estimated Median
				-27.24

	N	Estimated	Achieved	Confidence Interval	
Difference	11	Median	Confidence	Lower	Upper
		-27.2	95.5	-35.4	-20.9

MOTOROLA Per Share Ratios

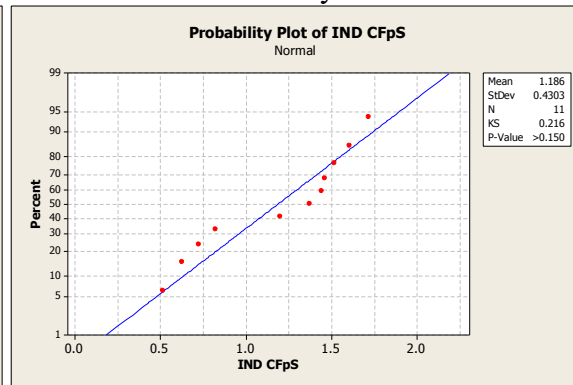
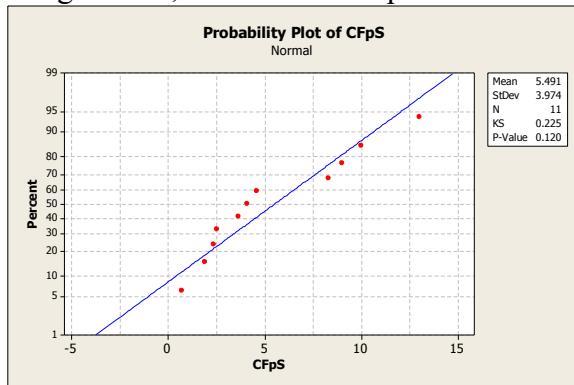
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



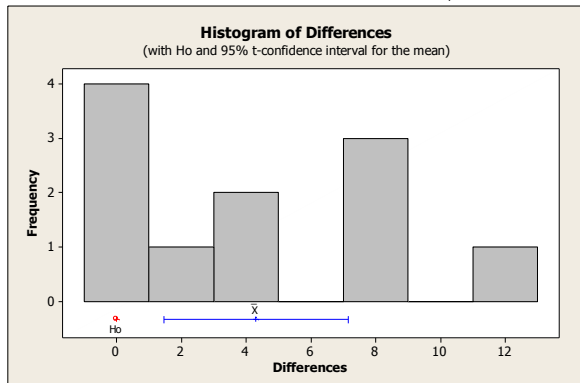
Paired T-Test and CI: CFpS, IND CFpS

Paired T for CFpS - IND CFpS

	N	Mean	StDev	SE Mean
CFpS	11	5.49	3.97	1.20
IND CFpS	11	1.19	0.43	0.13
Difference	11	4.31	4.25	1.28

95% CI for mean difference: (1.45, 7.16)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.36 P-Value = 0.007



MOTOROLA Per Share Ratios

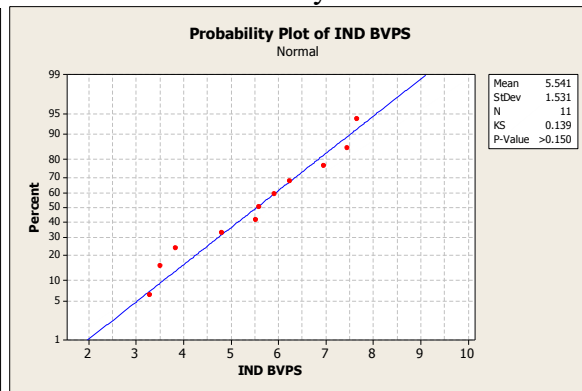
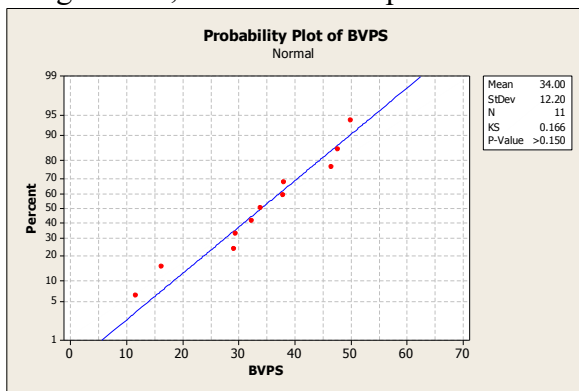
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER

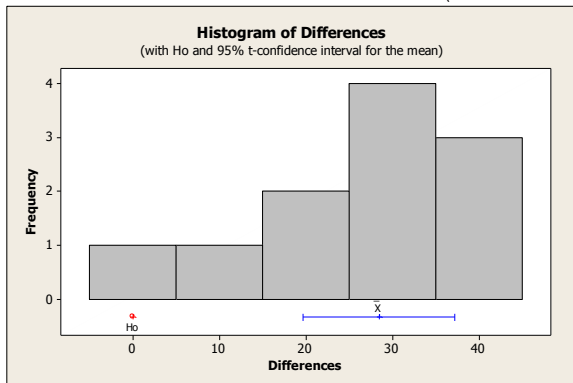


Paired T for BVPS - IND BVPS

	N	Mean	StDev	SE Mean
BVPS	11	34.00	12.20	3.68
IND BVPS	11	5.54	1.53	0.46
Difference	11	28.45	13.08	3.94

95% CI for mean difference: (19.67, 37.24)

T-Test of mean difference = 0 (vs not = 0): T-Value = 7.21 P-Value = 0.000



RAYTHEON Profitability Ratios

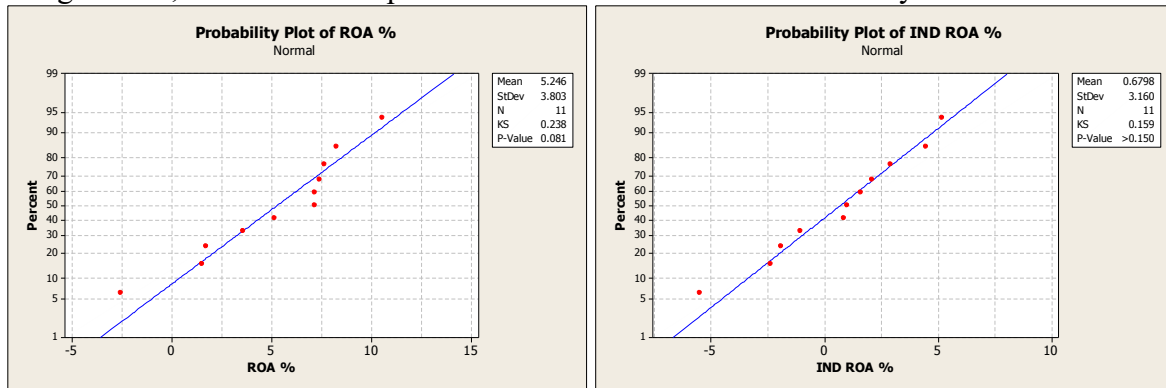
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



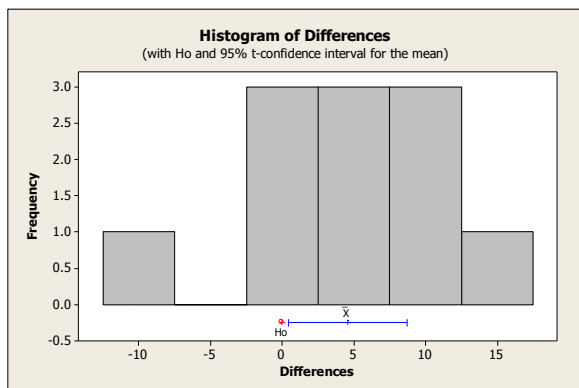
Paired T-Test and CI: ROA %, IND ROA %

Paired T for ROA % - IND ROA %

	N	Mean	StDev	SE Mean
ROA %	11	5.25	3.80	1.15
IND ROA %	11	0.68	3.16	0.95
Difference	11	4.57	6.17	1.86

95% CI for mean difference: (0.42, 8.71)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.45 P-Value = 0.034



RAYTHEON Profitability Ratios

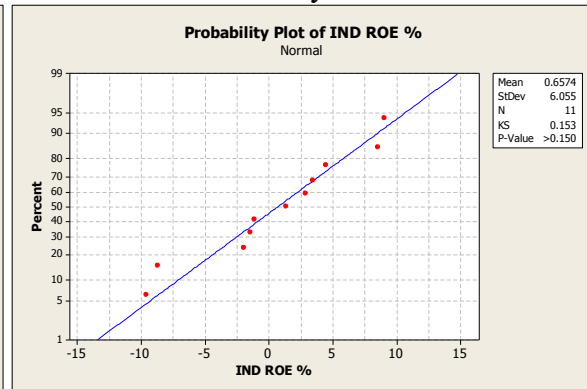
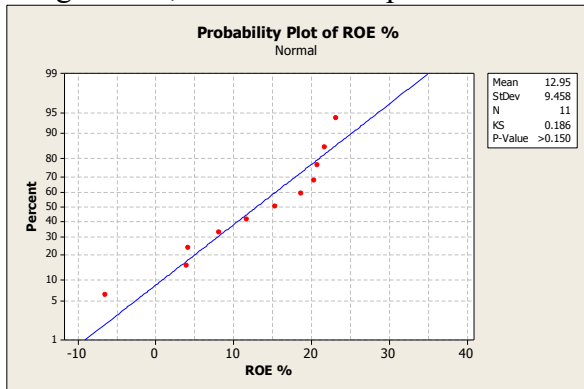
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



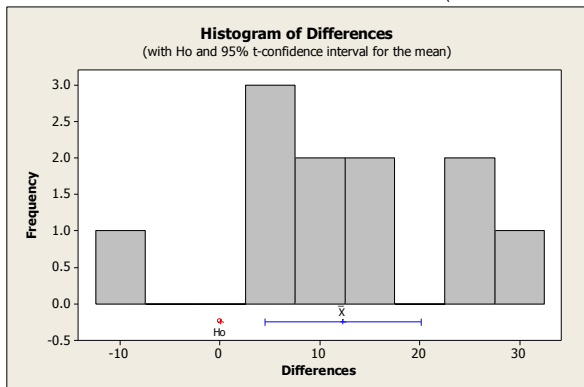
Paired T-Test and CI: ROE %, IND ROE %

Paired T for ROE % - IND ROE %

	N	Mean	StDev	SE Mean
ROE %	11	12.95	9.46	2.85
IND ROE %	11	0.66	6.05	1.83
Difference	11	12.29	11.64	3.51

95% CI for mean difference: (4.47, 20.11)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.50 P-Value = 0.006



RAYTHEON Profitability Ratios

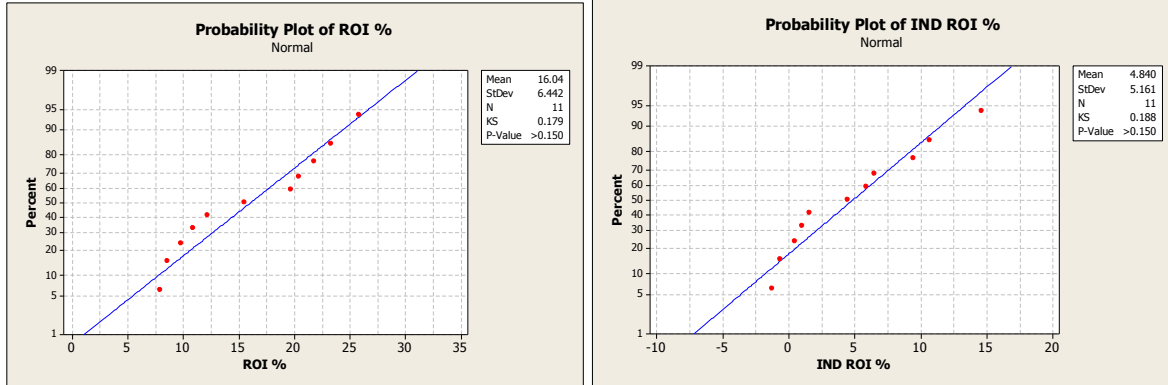
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



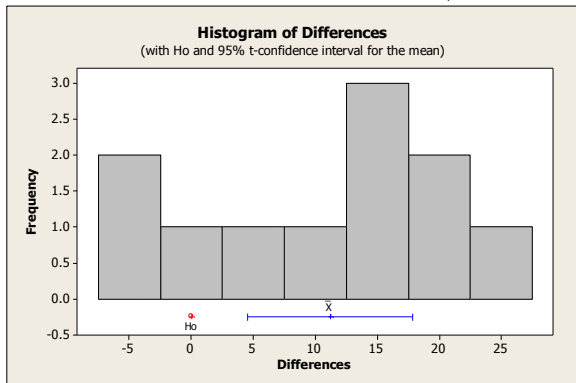
Paired T-Test and CI: ROI %, IND ROI %

Paired T for ROI % - IND ROI %

	N	Mean	StDev	SE Mean
ROI %	11	16.04	6.44	1.94
IND ROI %	11	4.84	5.16	1.56
Difference	11	11.20	9.91	2.99

95% CI for mean difference: (4.54, 17.86)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.75 P-Value = 0.004



RAYTHEON Profitability Ratios

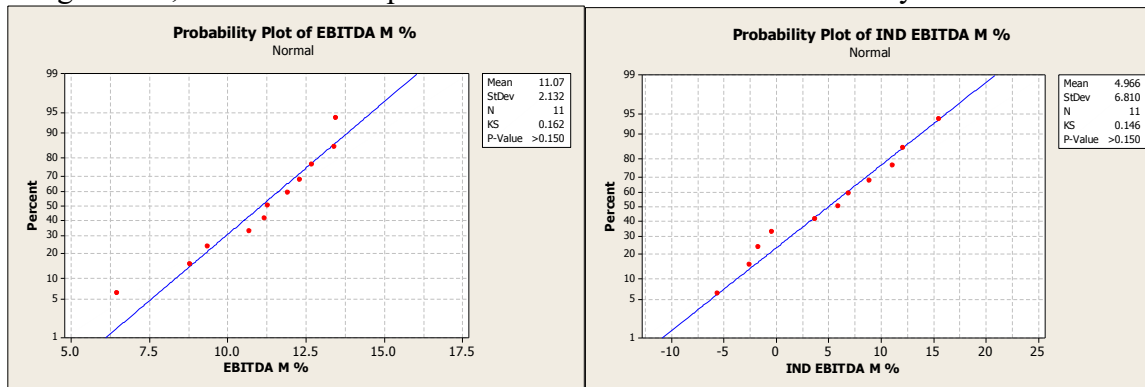
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



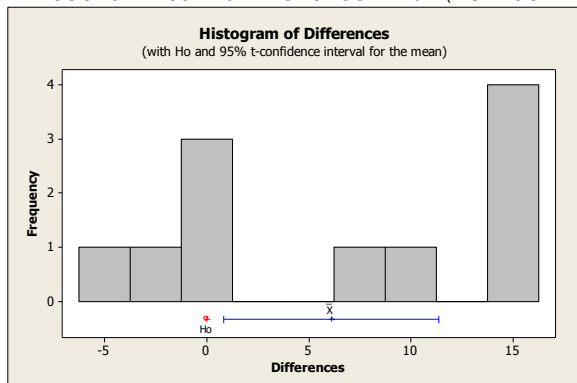
Paired T-Test and CI: EBITDA M %, IND EBITDA M %

Paired T for EBITDA M % - IND EBITDA M %

	N	Mean	StDev	SE Mean
EBITDA M %	11	11.07	2.13	0.64
IND EBITDA M %	11	4.97	6.81	2.05
Difference	11	6.10	7.84	2.36

95% CI for mean difference: (0.83, 11.37)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.58 P-Value = 0.027



RAYTHEON Profitability Ratios

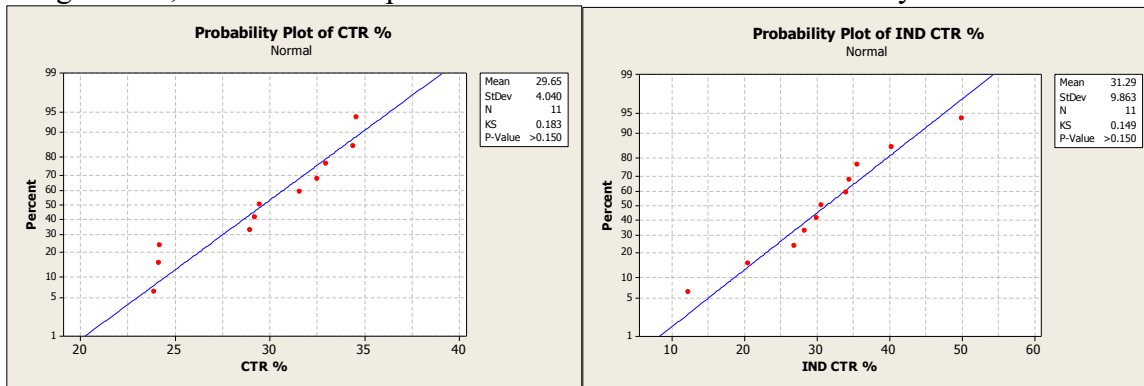
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



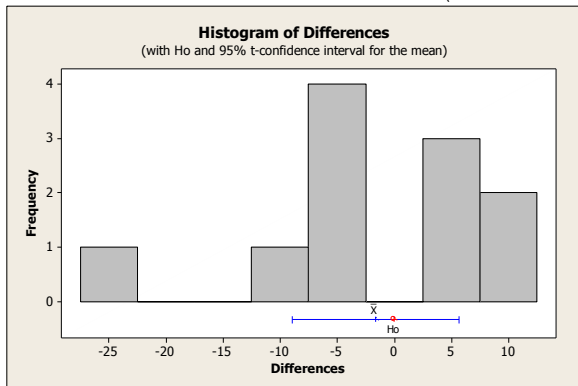
Paired T-Test and CI: CTR %, IND CTR %

Paired T for CTR % - IND CTR %

	N	Mean	StDev	SE Mean
CTR %	11	29.65	4.04	1.22
IND CTR %	11	31.29	9.86	2.97
Difference	11	-1.64	10.86	3.27

95% CI for mean difference: (-8.93, 5.66)

T-Test of mean difference = 0 (vs not = 0): T-Value = -0.50 P-Value = 0.628



RAYTHEON Profitability Ratios

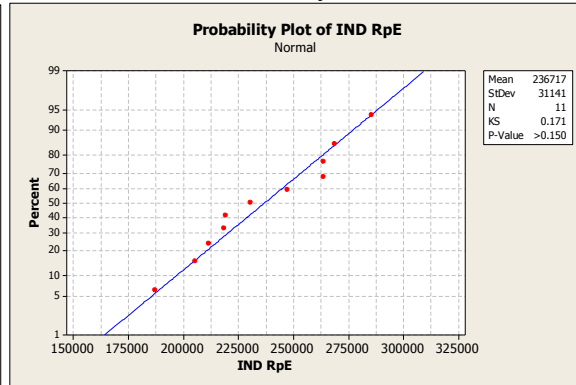
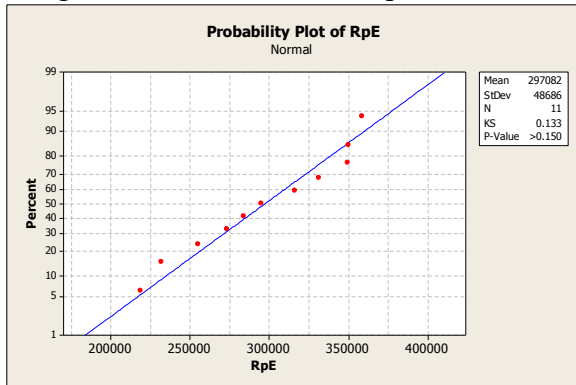
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



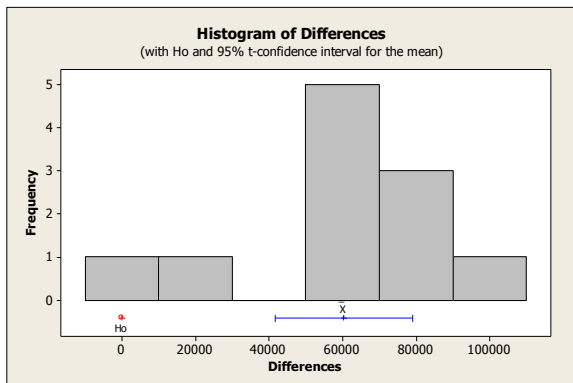
Paired T-Test and CI: RpE, IND RpE

Paired T for RpE - IND RpE

	N	Mean	StDev	SE Mean
RpE	11	297082	48686	14679
IND RpE	11	236717	31141	9389
Difference	11	60365	27908	8414

95% CI for mean difference: (41616, 79113)

T-Test of mean difference = 0 (vs not = 0): T-Value = 7.17 P-Value = 0.000



RAYTHEON Liquidity Ratios

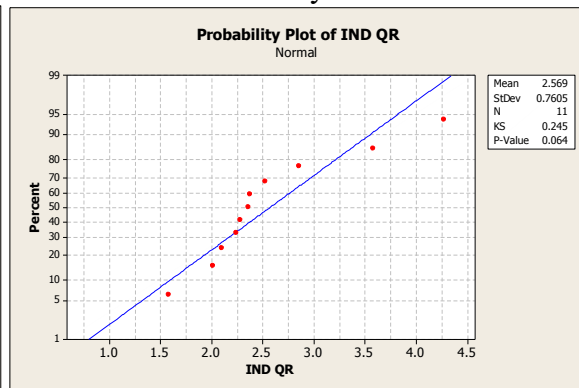
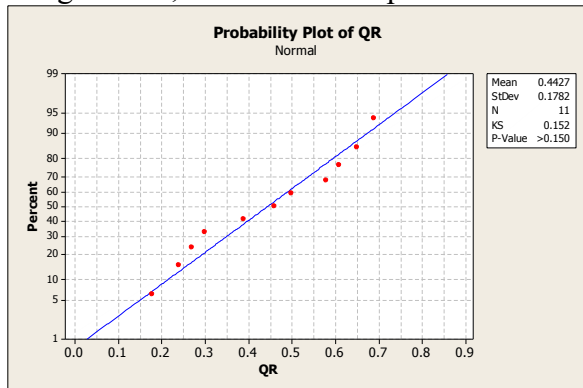
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



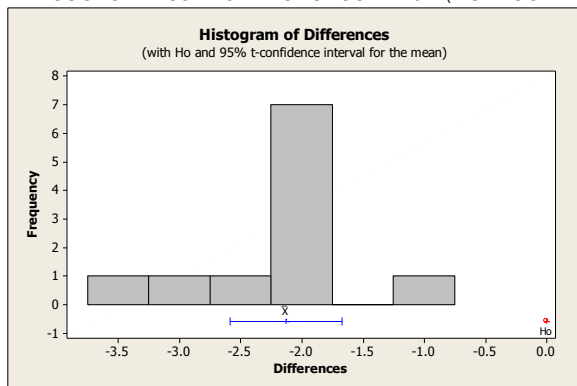
Paired T-Test and CI: QR, IND QR

Paired T for QR - IND QR

	N	Mean	StDev	SE Mean
QR	11	0.443	0.178	0.054
IND QR	11	2.569	0.760	0.229
Difference	11	-2.127	0.683	0.206

95% CI for mean difference: (-2.585, -1.668)

T-Test of mean difference = 0 (vs not = 0): T-Value = -10.33 P-Value = 0.000



RAYTHEON Liquidity Ratios

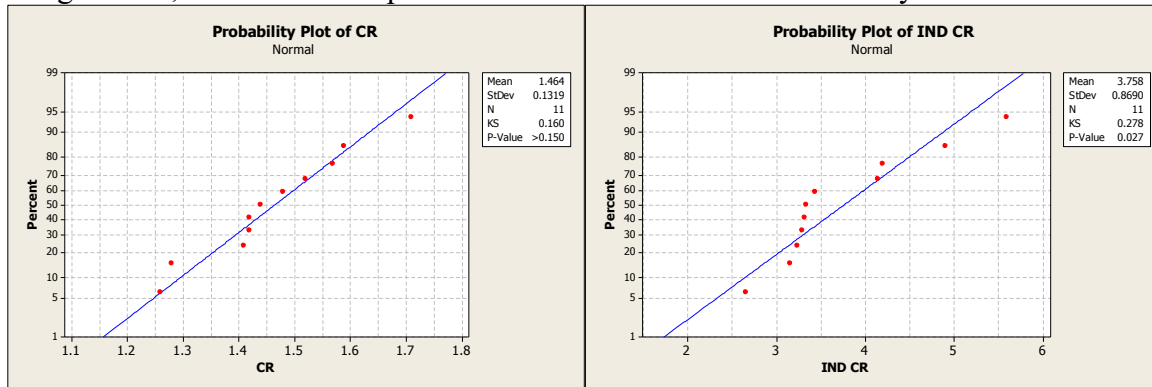
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: CR, IND CR

Paired test for CR - IND CR

Test of median = 0.000000 versus median not = 0.000000

	N	N for Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-2.211

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-2.21	95.5	-2.95	-1.78

RAYTHEON Liquidity Ratios

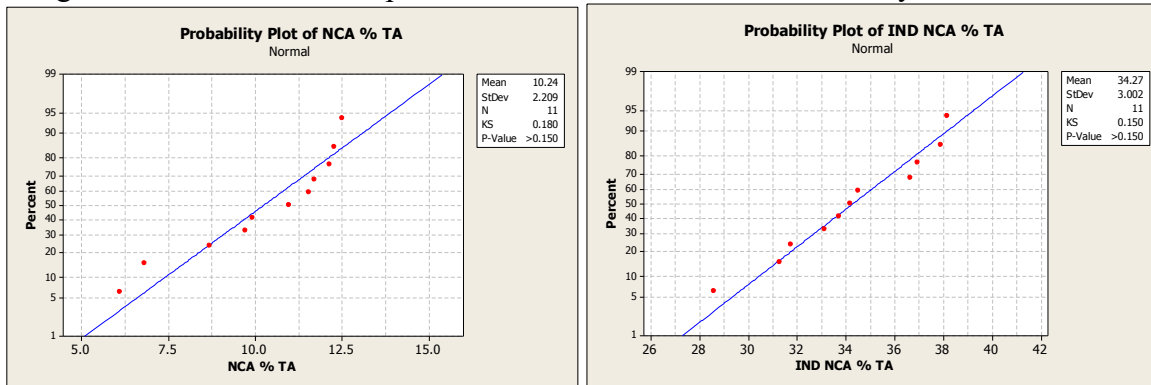
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



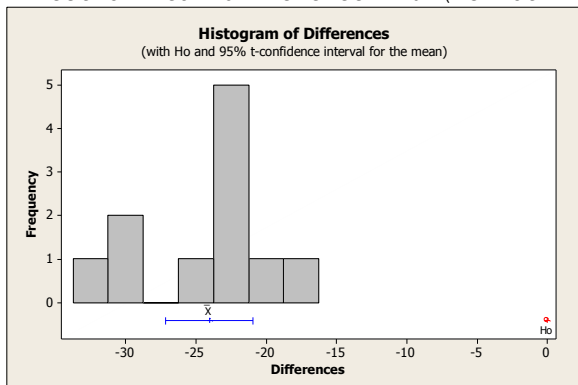
Paired T-Test and CI: NCA % TA, IND NCA % TA

Paired T for NCA % TA - IND NCA % TA

	N	Mean	StDev	SE Mean
NCA % TA	11	10.235	2.209	0.666
IND NCA % TA	11	34.273	3.002	0.905
Difference	11	-24.04	4.63	1.40

95% CI for mean difference: (-27.15, -20.93)

T-Test of mean difference = 0 (vs not = 0): T-Value = -17.22 P-Value = 0.000



RAYTHEON Debt Management Ratios

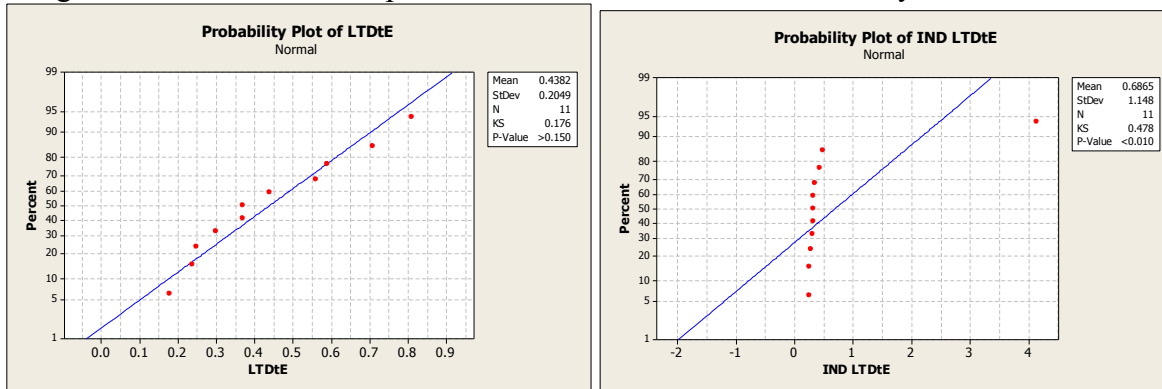
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: LTDtE, IND LTDtE

Paired test for LTDtE - IND LTDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	46.0	0.266	0.09706

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	0.10	95.5	-1.81	0.24

RAYTHEON Debt Management Ratios

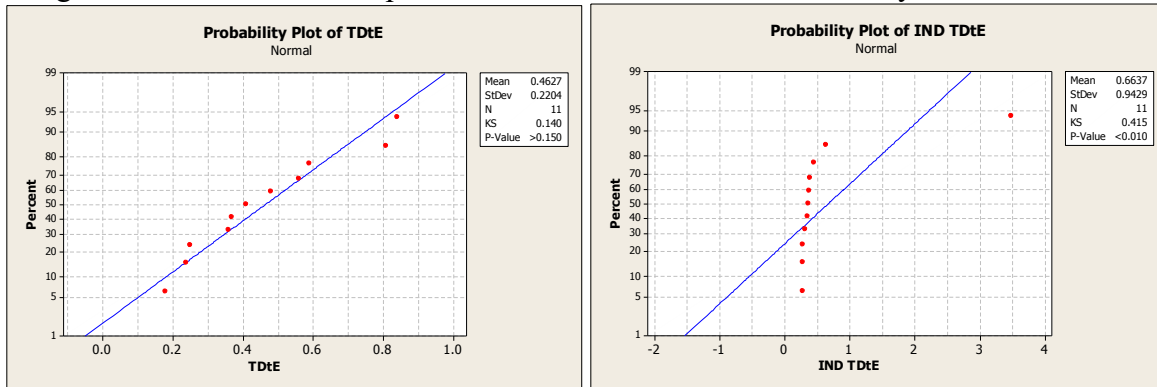
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	47.0	0.230	0.07992

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	0.08	95.5	-1.48	0.21

RAYTHEON Debt Management Ratios

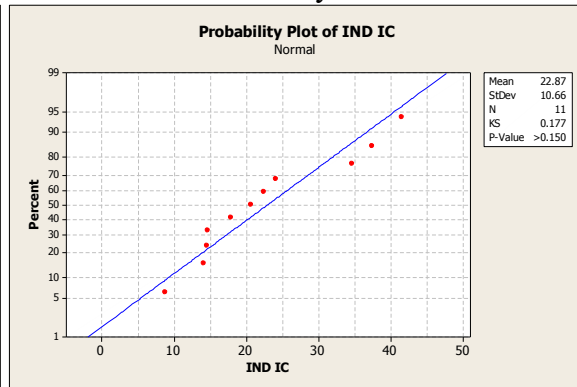
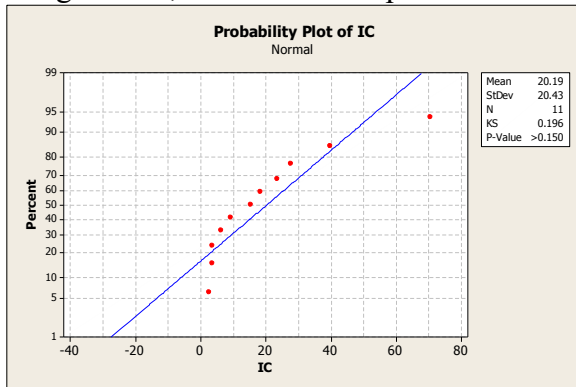
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



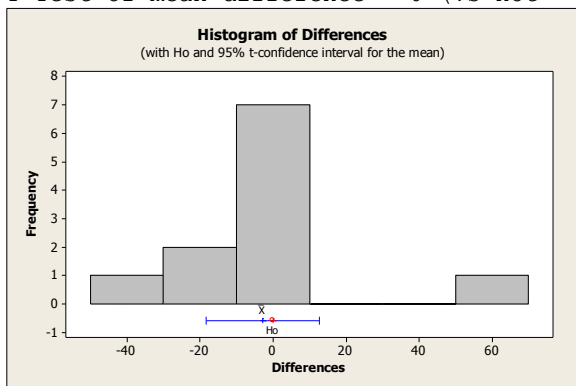
Paired T-Test and CI: IC, IND IC

Paired T for IC - IND IC

	N	Mean	StDev	SE Mean
IC	11	20.19	20.43	6.16
IND IC	11	22.87	10.66	3.21
Difference	11	-2.68	23.05	6.95

95% CI for mean difference: (-18.17, 12.81)

T-Test of mean difference = 0 (vs not = 0): T-Value = -0.39 P-Value = 0.708



RAYTHEON Asset Management Ratios

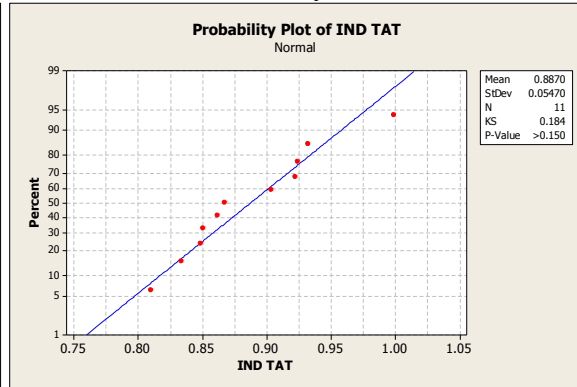
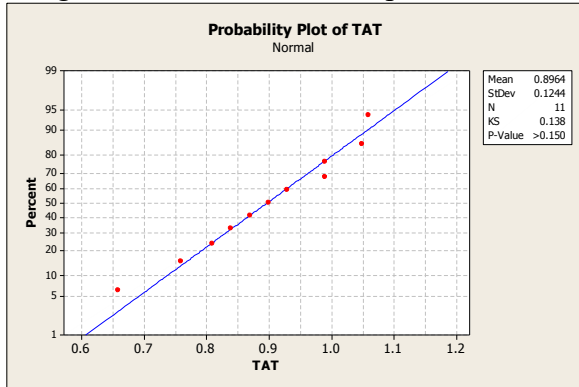
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



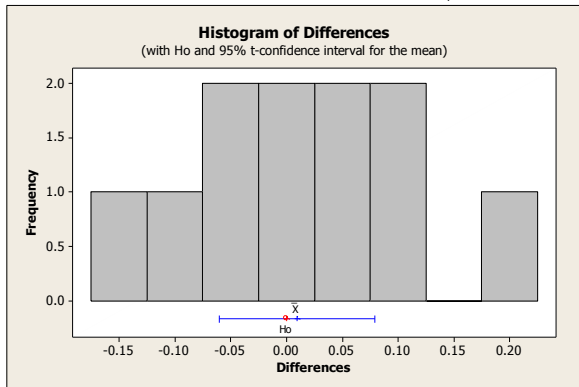
Paired T-Test and CI: TAT, IND TAT

Paired T for TAT - IND TAT

	N	Mean	StDev	SE Mean
TAT	11	0.8964	0.1244	0.0375
IND TAT	11	0.8870	0.0547	0.0165
Difference	11	0.0093	0.1036	0.0312

95% CI for mean difference: (-0.0603, 0.0790)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.30 P-Value = 0.771



RAYTHEON Asset Management Ratios

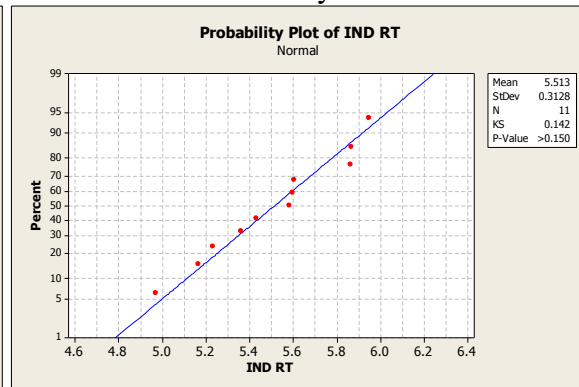
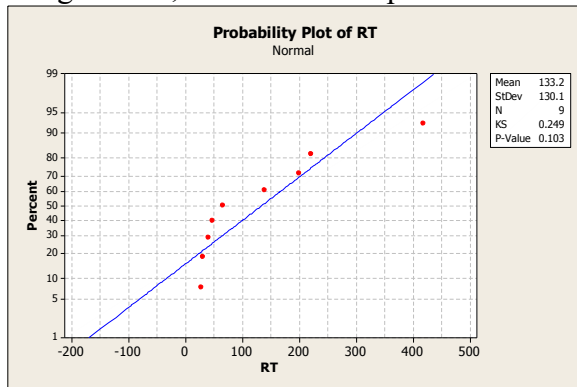
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



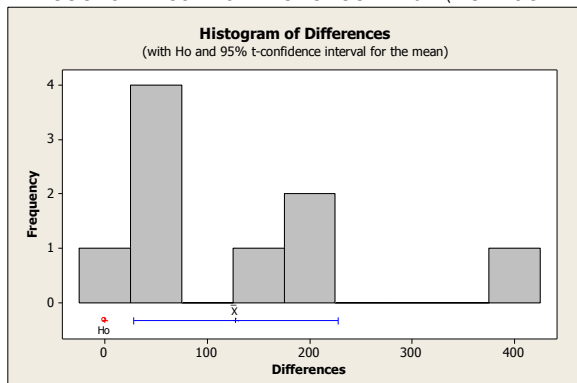
Paired T-Test and CI: RT, IND RT

Paired T for RT - IND RT

	N	Mean	StDev	SE Mean
RT	9	133.2	130.1	43.4
IND RT	9	5.5	0.3	0.1
Difference	9	127.7	130.0	43.3

95% CI for mean difference: (27.8, 227.6)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.95 P-Value = 0.018



RAYTHEON Asset Management Ratios

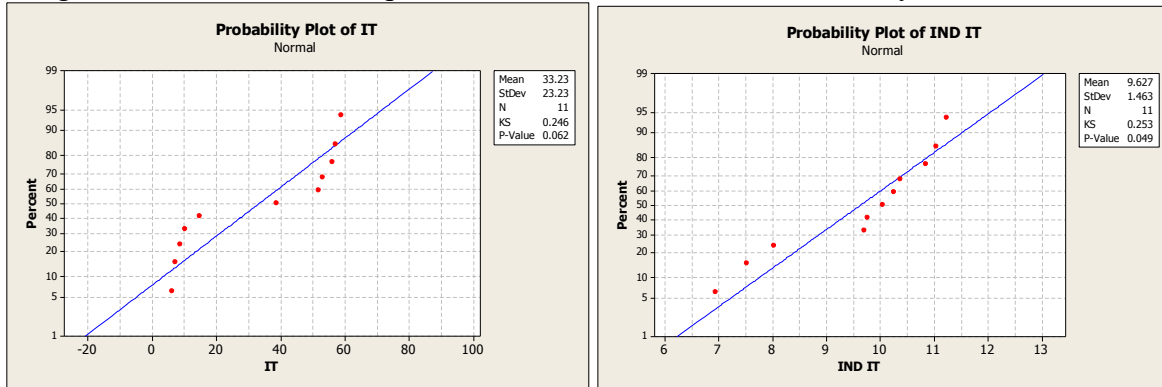
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: IT, IND IT

Paired test for IT - IND IT

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	62.0	0.011	23.13

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	23.1	95.5	2.3	43.6

RAYTHEON Asset Management Ratios

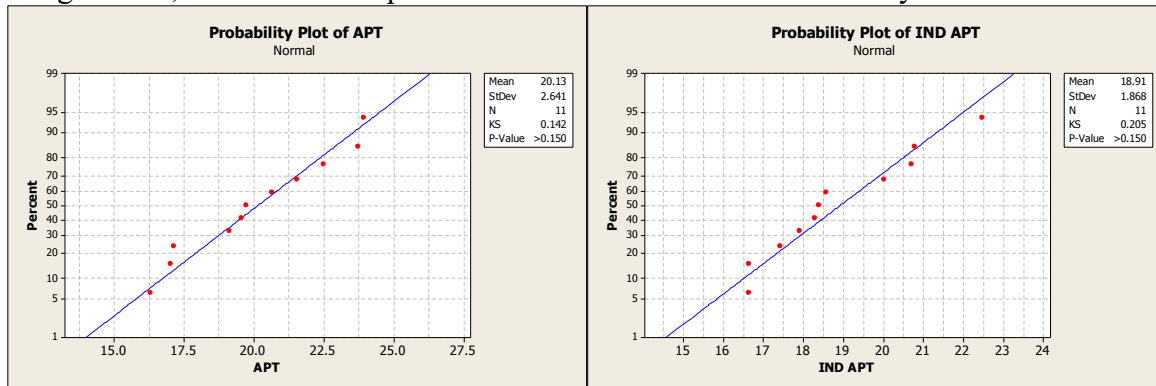
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying off suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



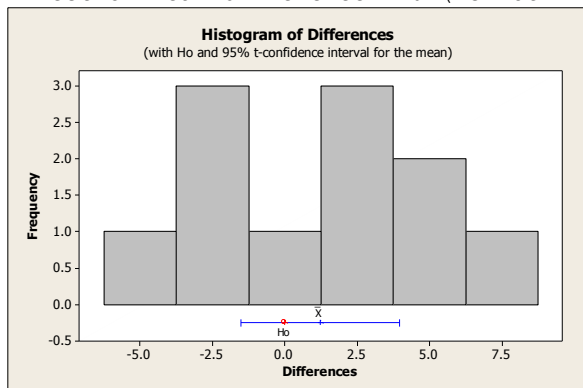
Paired T-Test and CI: APT, IND APT

Paired T for APT - IND APT

	N	Mean	StDev	SE Mean
APT	11	20.131	2.641	0.796
IND APT	11	18.910	1.868	0.563
Difference	11	1.22	4.07	1.23

95% CI for mean difference: (-1.51, 3.95)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.00 P-Value = 0.343



RAYTHEON Asset Management Ratios

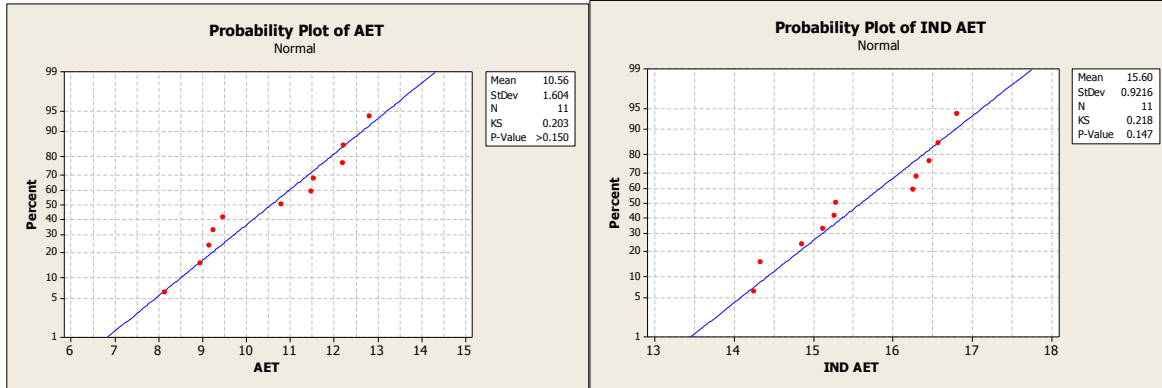
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



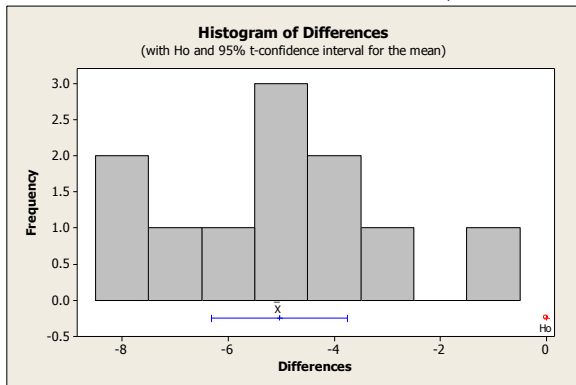
Paired T-Test and CI: AET, IND AET

Paired T for AET - IND AET

	N	Mean	StDev	SE Mean
AET	11	10.563	1.604	0.484
IND AET	11	15.600	0.922	0.278
Difference	11	-5.037	1.904	0.574

95% CI for mean difference: (-6.316, -3.758)

T-Test of mean difference = 0 (vs not = 0): T-Value = -8.78 P-Value = 0.000



RAYTHEON Asset Management Ratios

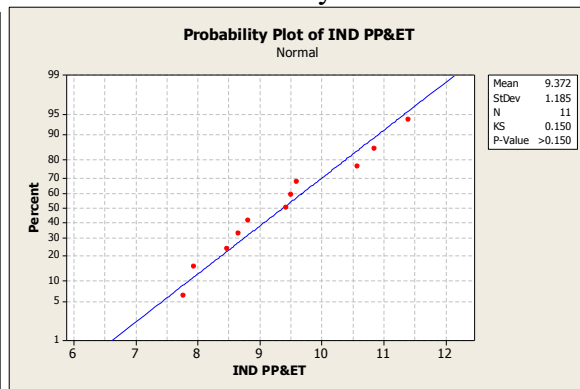
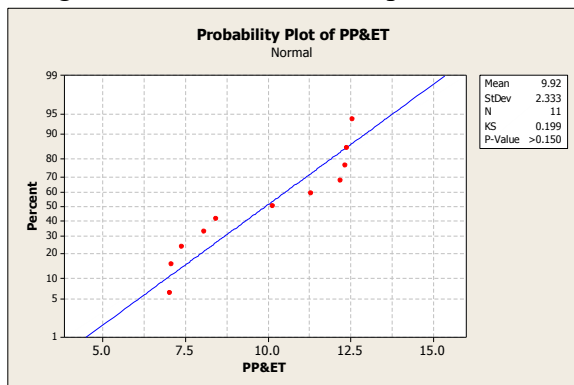
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



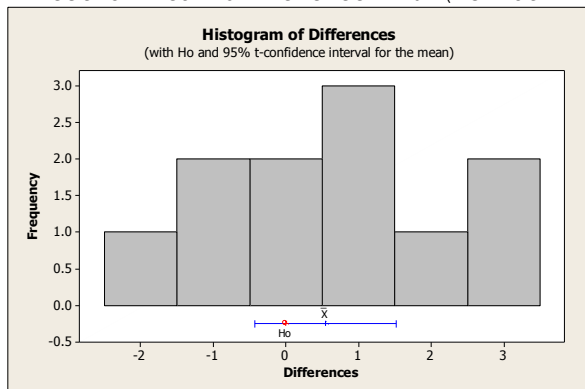
Paired T-Test and CI: PP&ET, IND PP&ET

Paired T for PP&ET - IND PP&ET

	N	Mean	StDev	SE Mean
PP&ET	11	9.920	2.333	0.703
IND PP&ET	11	9.372	1.185	0.357
Difference	11	0.548	1.450	0.437

95% CI for mean difference: (-0.426, 1.522)

T-Test of mean difference = 0 (vs not = 0): T-Value = 1.25 P-Value = 0.238



RAYTHEON Asset Management Ratios

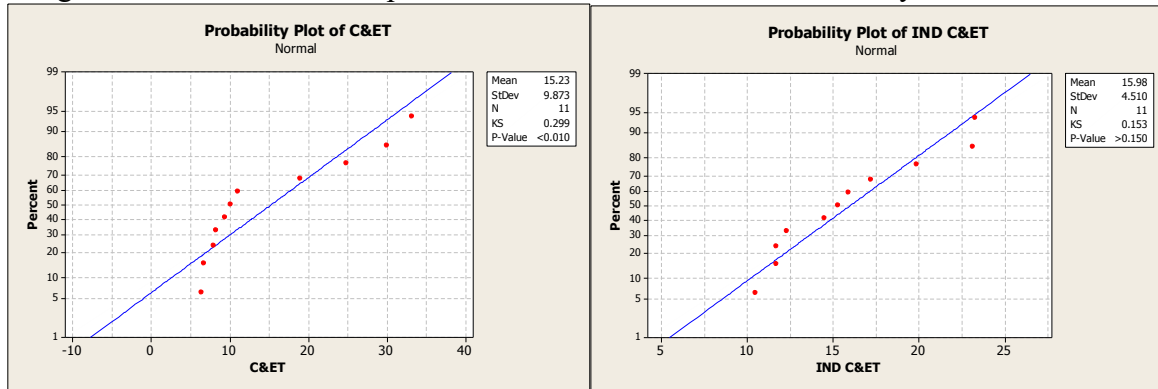
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: C&ET, IND C&ET

Paired test for C&ET - IND C&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	27.0	0.625	-2.305

	N	Estimated Median	Achieved Confidence	Confidence Interval	
Difference	11	-2.3	95.5	-8.8	6.9

RAYTHEON Per Share Ratios

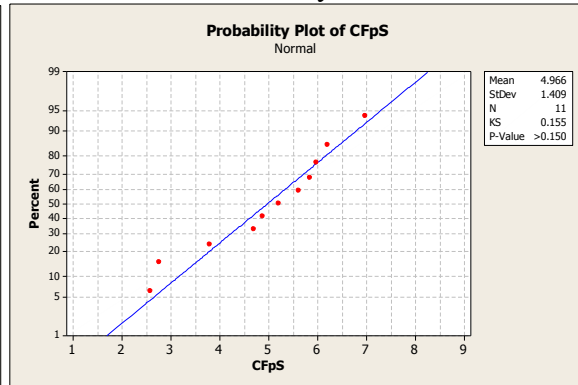
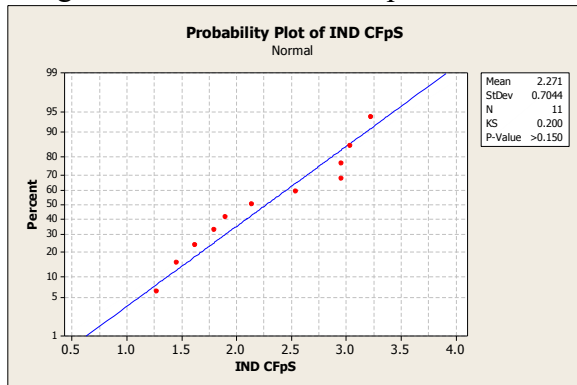
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



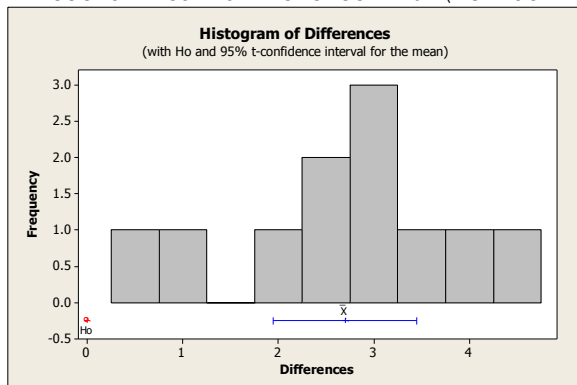
Paired T-Test and CI: CFpS, IND CFpS

Paired T for CFpS - IND CFpS

	N	Mean	StDev	SE Mean
CFpS	11	4.966	1.409	0.425
IND CFpS	11	2.271	0.704	0.212
Difference	11	2.696	1.122	0.338

95% CI for mean difference: (1.942, 3.449)

T-Test of mean difference = 0 (vs not = 0): T-Value = 7.97 P-Value = 0.000



RAYTHEON Per Share Ratios

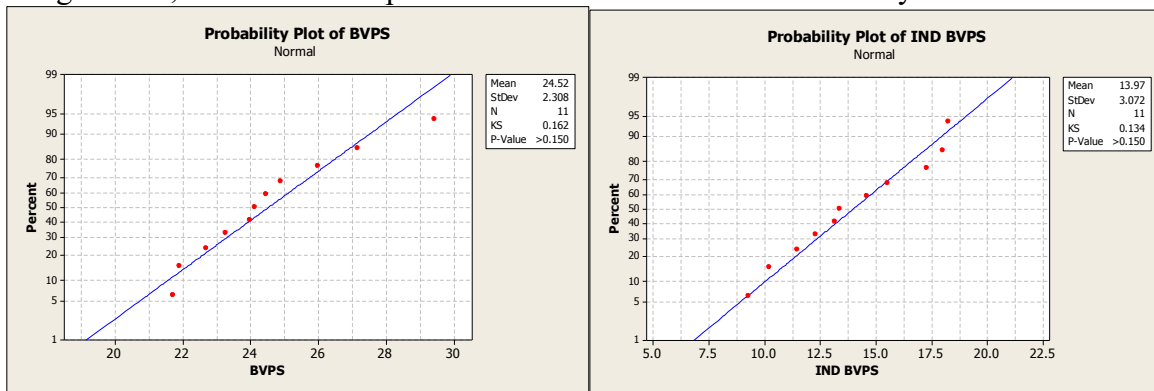
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



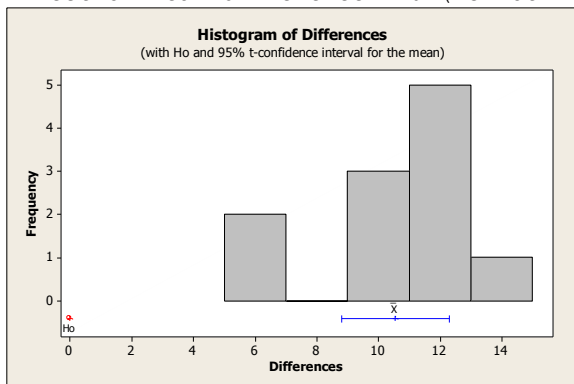
Paired T-Test and CI: BVPS, IND BVPS

Paired T for BVPS - IND BVPS

	N	Mean	StDev	SE Mean
BVPS	11	24.522	2.308	0.696
IND BVPS	11	13.968	3.072	0.926
Difference	11	10.553	2.603	0.785

95% CI for mean difference: (8.805, 12.302)

T-Test of mean difference = 0 (vs not = 0): T-Value = 13.45 P-Value = 0.000



VERIZON Profitability Ratios

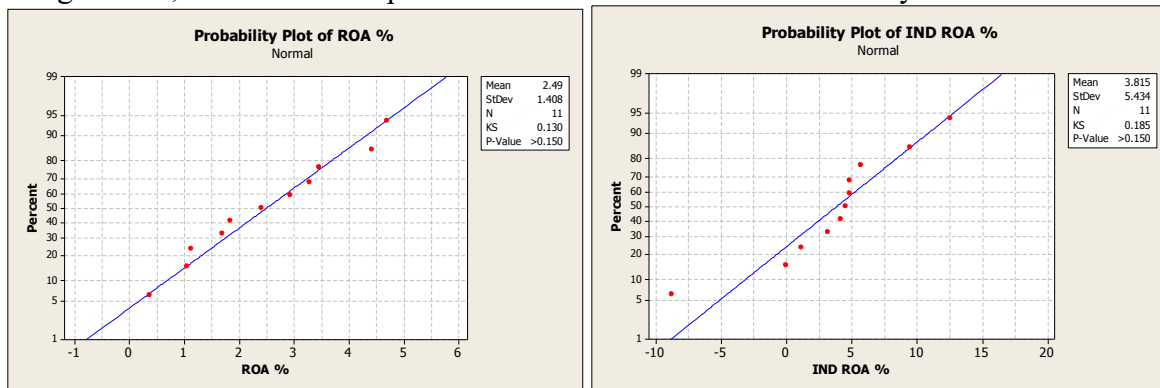
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



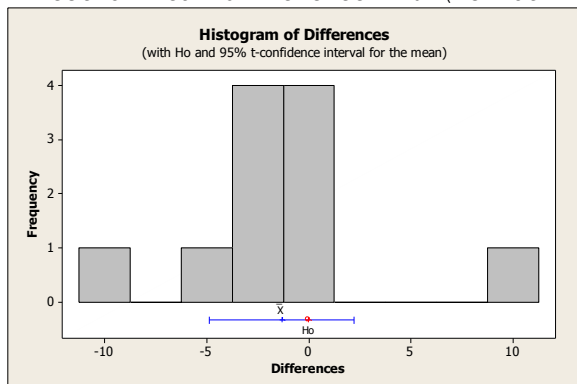
Paired T-Test and CI: ROA %, IND ROA %

Paired T for ROA % - IND ROA %

	N	Mean	StDev	SE Mean
ROA %	11	2.49	1.41	0.42
IND ROA %	11	3.82	5.43	1.64
Difference	11	-1.33	5.29	1.59

95% CI for mean difference: (-4.88, 2.23)

T-Test of mean difference = 0 (vs not = 0): T-Value = -0.83 P-Value = 0.425



VERIZON Profitability Ratios

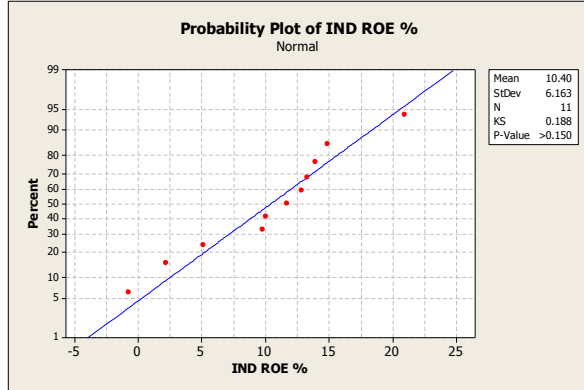
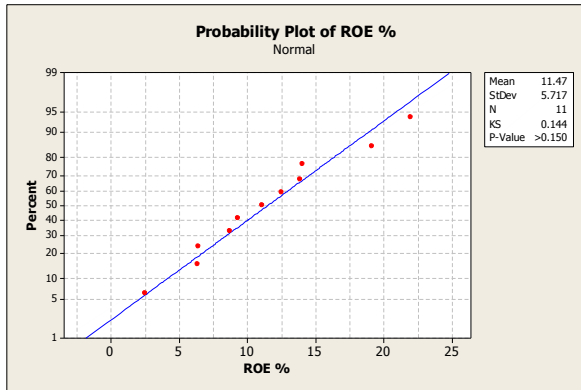
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



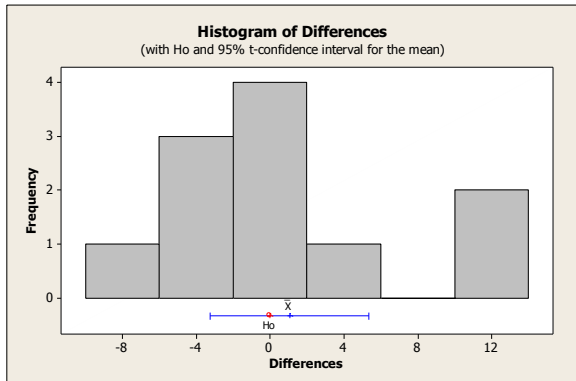
Paired T-Test and CI: ROE %, IND ROE %

Paired T for ROE % - IND ROE %

	N	Mean	StDev	SE Mean
ROE %	11	11.47	5.72	1.72
IND ROE %	11	10.40	6.16	1.86
Difference	11	1.06	6.39	1.93

95% CI for mean difference: (-3.23, 5.36)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.55 P-Value = 0.593



VERIZON Profitability Ratios

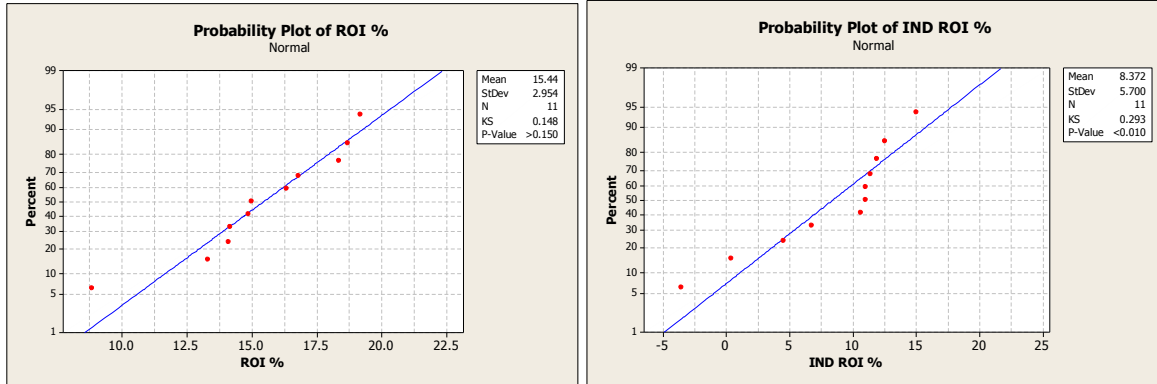
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: ROI %, IND ROI %

Paired test for ROI % - IND ROI %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated
			Statistic		Median
Difference	11	11	61.0	0.014	6.973

	N	Estimated	Achieved	Confidence Interval	
		Median	Confidence	Lower	Upper
Difference	11	6.97	95.5	4.15	11.11

VERIZON Profitability Ratios

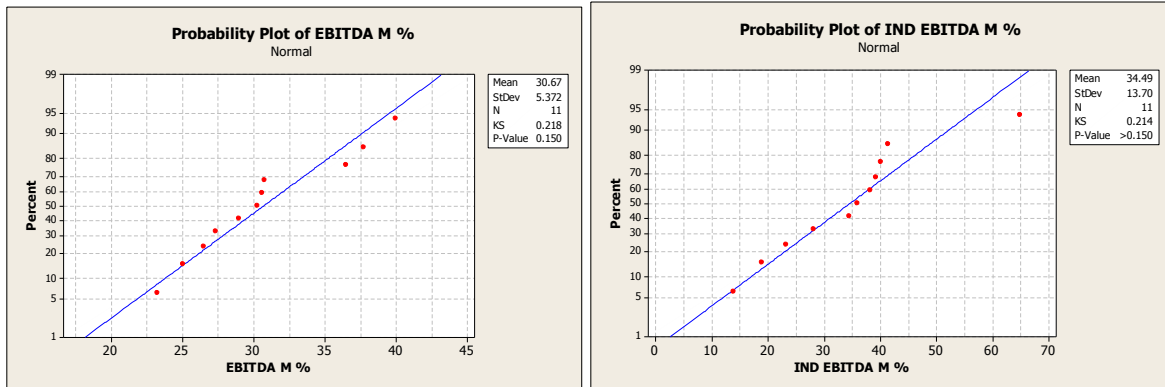
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



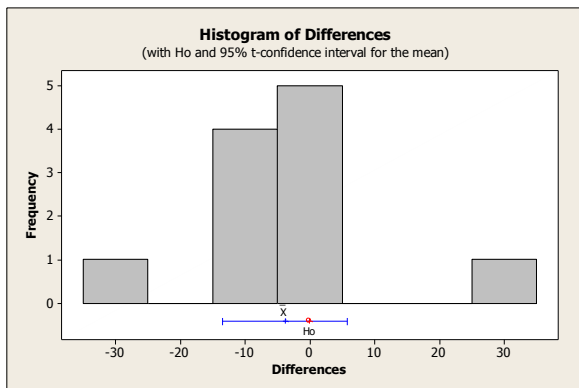
Paired T-Test and CI: EBITDA M %, IND EBITDA M %

Paired T for EBITDA M % - IND EBITDA M %

	N	Mean	StDev	SE Mean
EBITDA M %	11	30.67	5.37	1.62
IND EBITDA M %	11	34.49	13.70	4.13
Difference	11	-3.82	14.37	4.33

95% CI for mean difference: (-13.48, 5.83)

T-Test of mean difference = 0 (vs not = 0): T-Value = -0.88 P-Value = 0.398



VERIZON Profitability Ratios

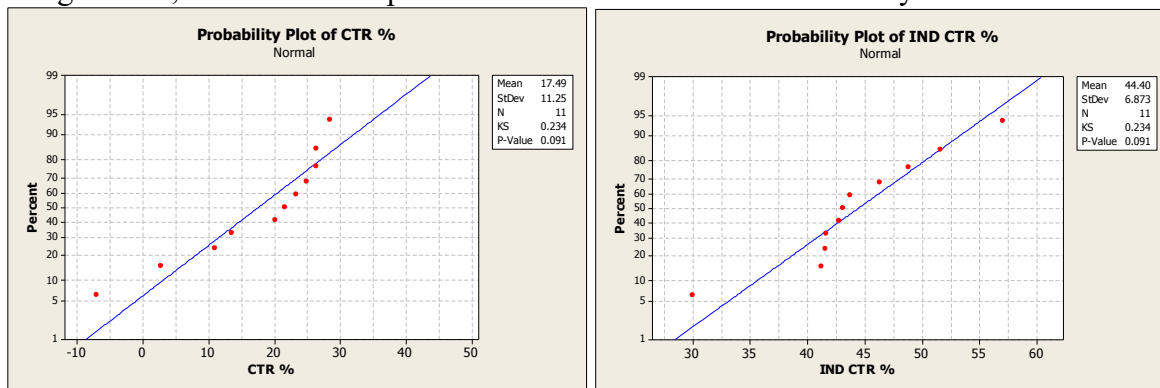
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



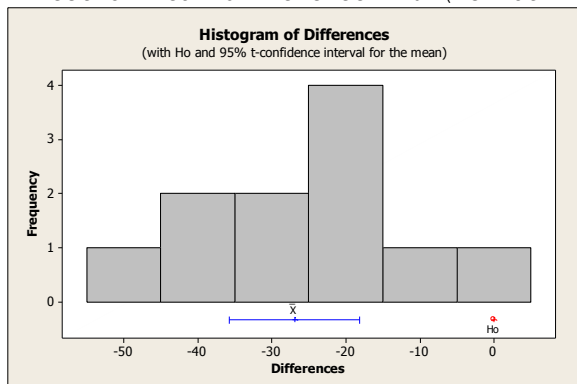
Paired T-Test and CI: CTR %, IND CTR %

Paired T for CTR % - IND CTR %

	N	Mean	StDev	SE Mean
CTR %	11	17.49	11.25	3.39
IND CTR %	11	44.40	6.87	2.07
Difference	11	-26.91	13.14	3.96

95% CI for mean difference: (-35.74, -18.09)

T-Test of mean difference = 0 (vs not = 0): T-Value = -6.79 P-Value = 0.000



VERIZON Profitability Ratios

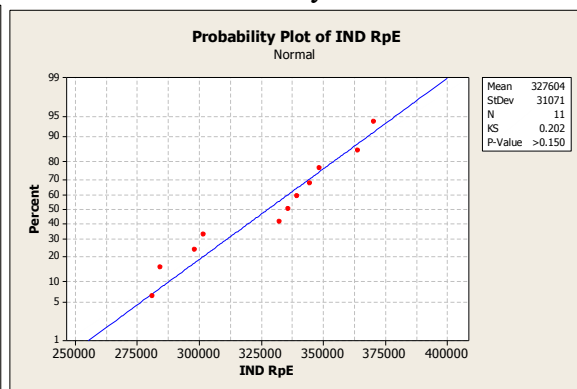
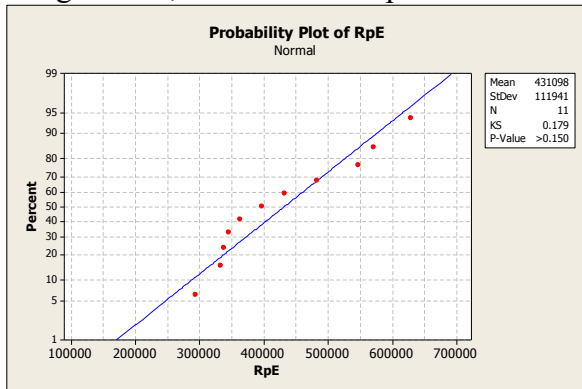
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



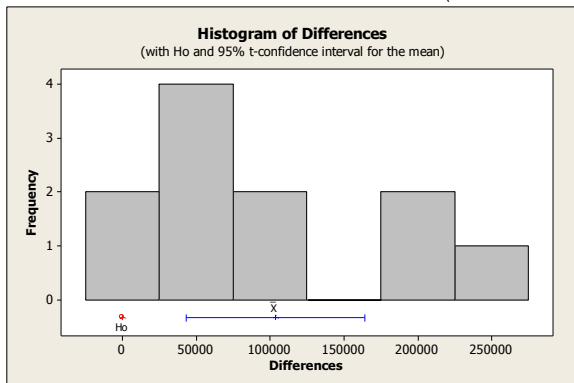
Paired T-Test and CI: RpE, IND RpE

Paired T for RpE - IND RpE

	N	Mean	StDev	SE Mean
RpE	11	431098	111941	33752
IND RpE	11	327604	31071	9368
Difference	11	103494	90001	27136

95% CI for mean difference: (43031, 163958)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.81 P-Value = 0.003



VERIZON Liquidity Ratios

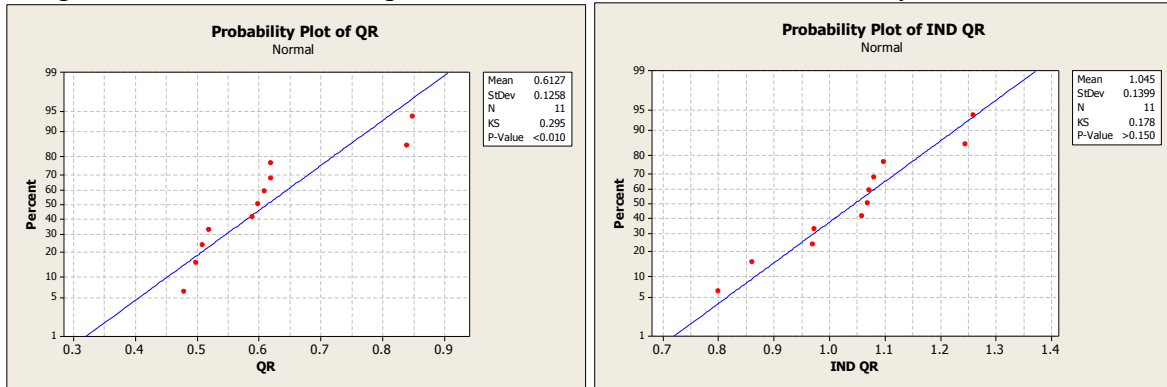
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: QR, IND QR

Paired test for QR - IND QR

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-0.4553

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-0.455	95.5	-0.603	-0.251

VERIZON Liquidity Ratios

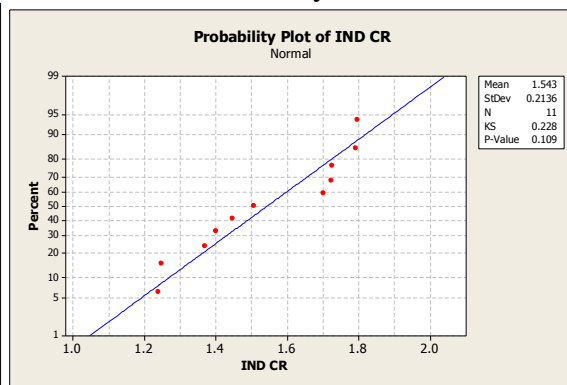
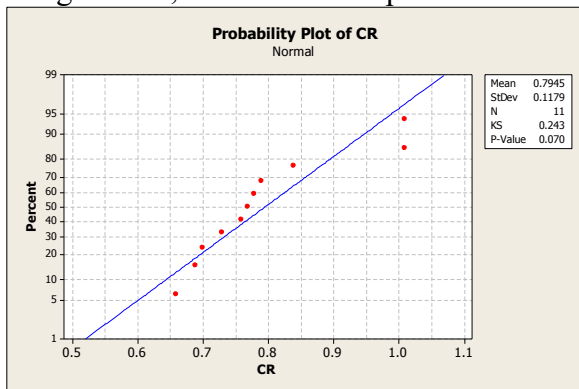
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE

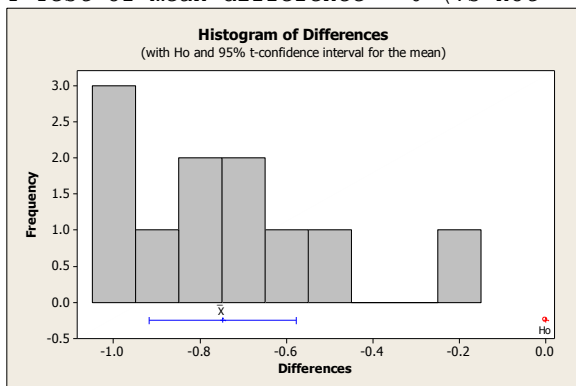


Paired T-Test and CI: CR, IND CR

Paired T for CR - IND CR

	N	Mean	StDev	SE Mean
CR	11	0.7945	0.1179	0.0356
IND CR	11	1.5430	0.2136	0.0644
Difference	11	-0.7485	0.2540	0.0766

95% CI for mean difference: (-0.9191, -0.5778)
T-Test of mean difference = 0 (vs not = 0): T-Value = -9.77 P-Value = 0.000



VERIZON Liquidity Ratios

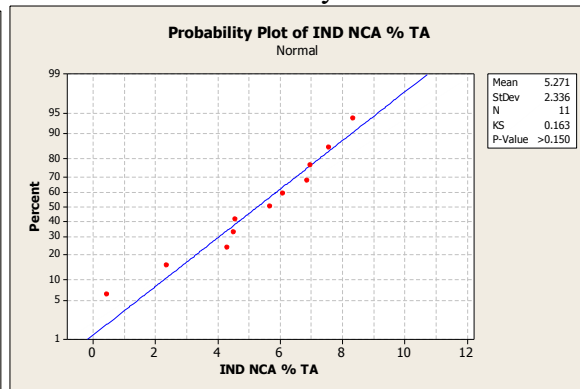
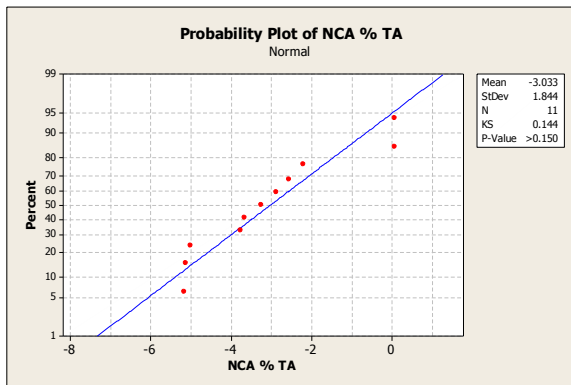
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



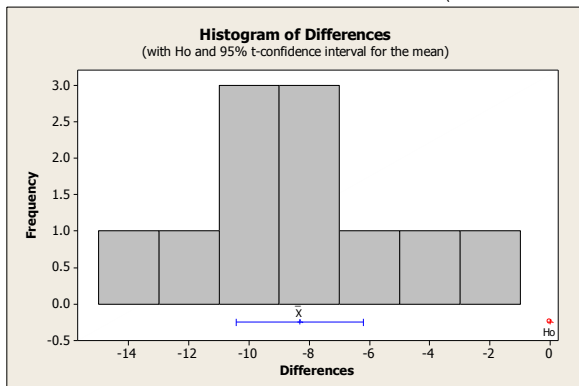
Paired T-Test and CI: NCA % TA, IND NCA % TA

Paired T for NCA % TA - IND NCA % TA

	N	Mean	StDev	SE Mean
NCA % TA	11	-3.033	1.844	0.556
IND NCA % TA	11	5.271	2.336	0.704
Difference	11	-8.304	3.145	0.948

95% CI for mean difference: (-10.417, -6.191)

T-Test of mean difference = 0 (vs not = 0): T-Value = -8.76 P-Value = 0.000



VERIZON Debt Management Ratios

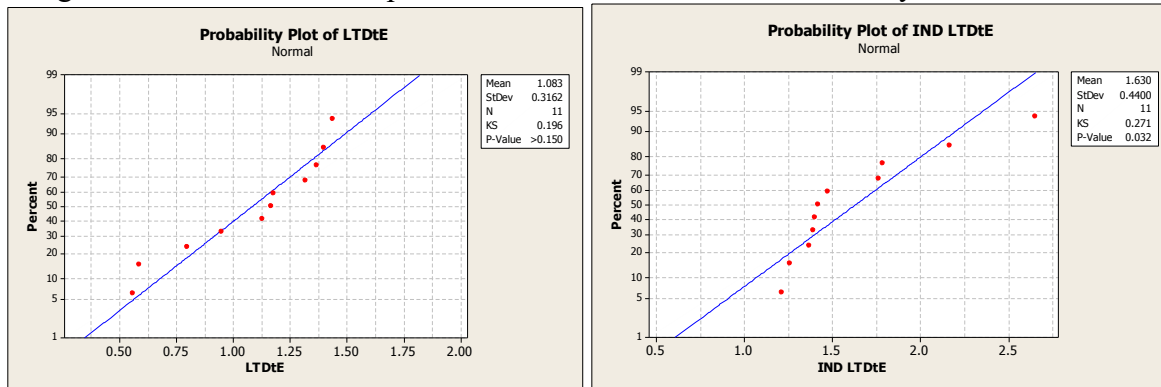
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: LTDtE, IND LTDtE

Paired test for LTDtE - IND LTDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-0.5419

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-0.542	95.5	-0.839	-0.237

VERIZON Debt Management Ratios

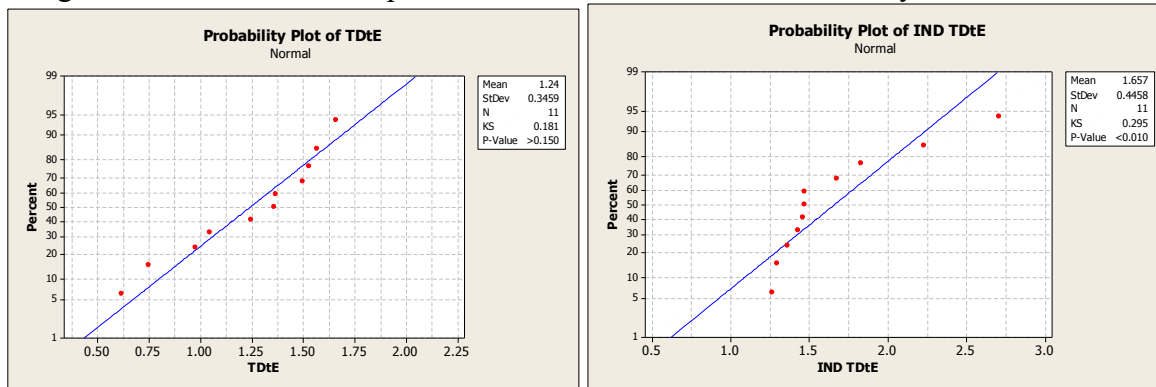
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	7.0	0.023	-0.4228

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-0.423	95.5	-0.735	-0.079

VERIZON Debt Management Ratios

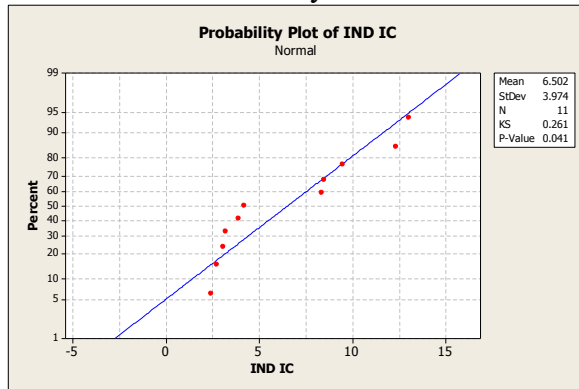
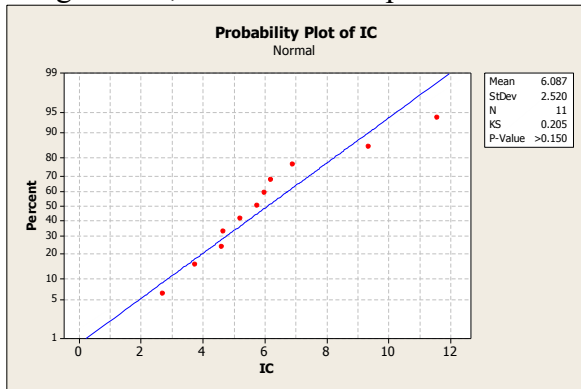
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: IC, IND IC

Paired test for IC - IND IC

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	26.0	0.563	-0.5144

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-0.51	95.5	-2.43	1.23

VERIZON Asset Management Ratios

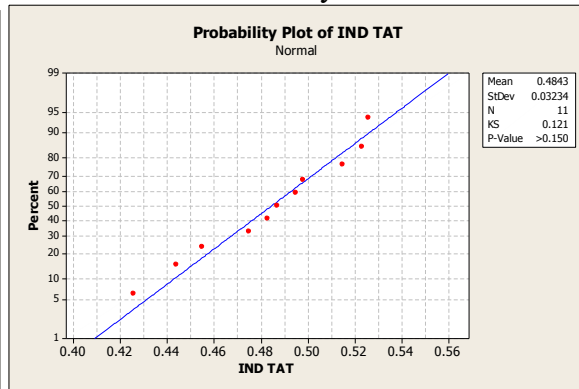
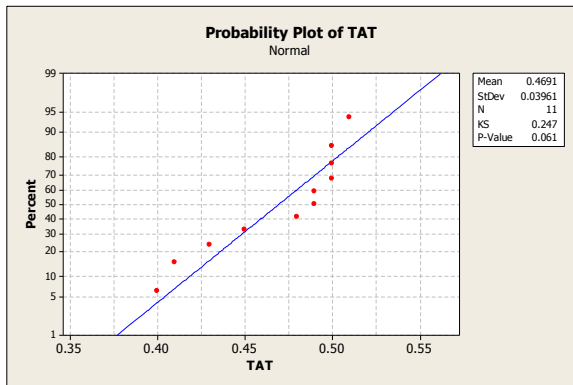
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



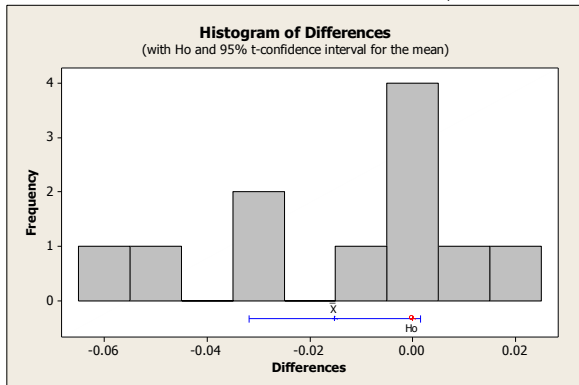
Paired T-Test and CI: TAT, IND TAT

Paired T for TAT - IND TAT

	N	Mean	StDev	SE Mean
TAT	11	0.4691	0.0396	0.0119
IND TAT	11	0.4843	0.0323	0.0098
Difference	11	-0.01518	0.02479	0.00747

95% CI for mean difference: (-0.03183, 0.00147)

T-Test of mean difference = 0 (vs not = 0): T-Value = -2.03 P-Value = 0.070



VERIZON Asset Management Ratios

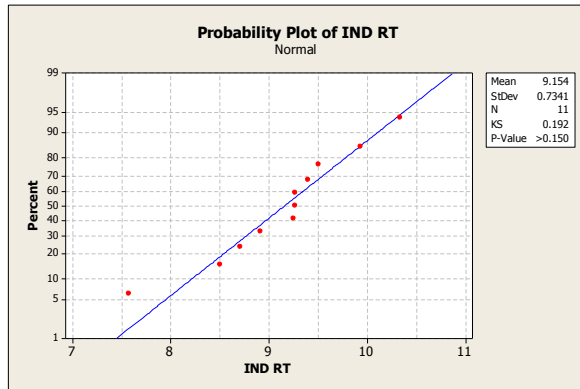
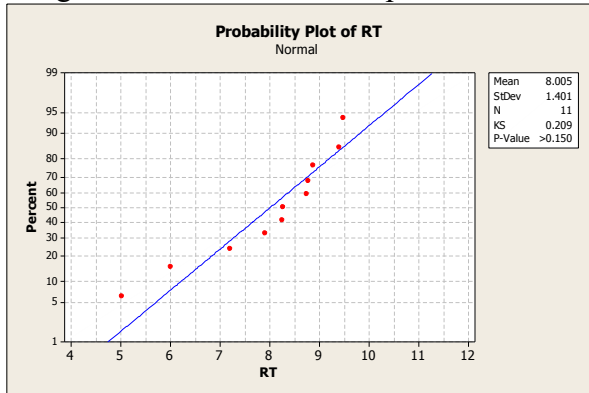
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



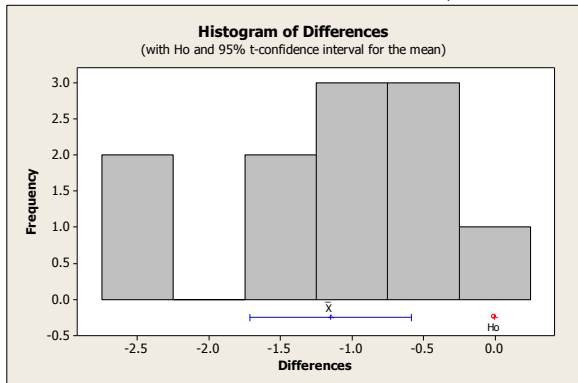
Paired T-Test and CI: RT, IND RT

Paired T for RT - IND RT

	N	Mean	StDev	SE Mean
RT	11	8.005	1.401	0.422
IND RT	11	9.154	0.734	0.221
Difference	11	-1.150	0.838	0.253

95% CI for mean difference: (-1.713, -0.586)

T-Test of mean difference = 0 (vs not = 0): T-Value = -4.55 P-Value = 0.001



VERIZON Asset Management Ratios

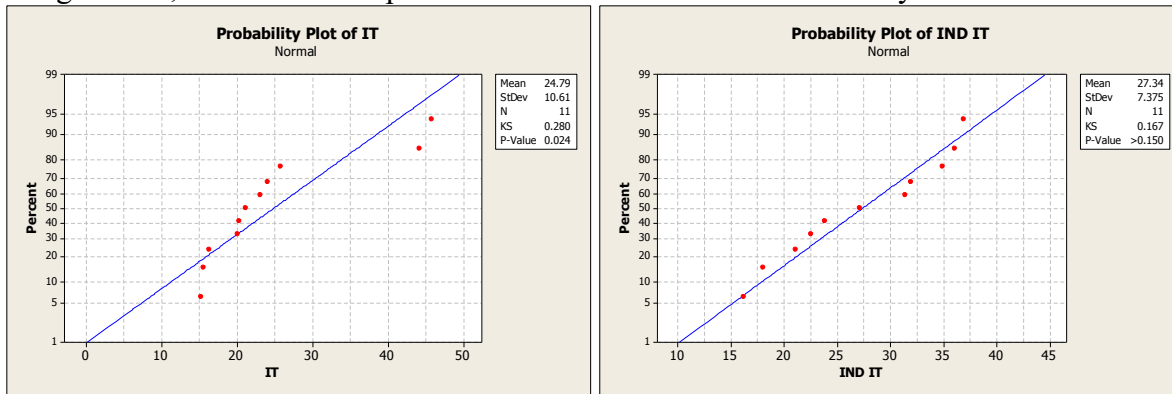
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: IT, IND IT

Paired test for IT - IND IT

Test of median = 0.000000 versus median not = 0.000000

	N	N for Test	Wilcoxon Statistic	Estimated P	Estimated Median
Difference	11	11	25.0	0.505	-4.935

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-4.9	95.5	-14.4	10.7

VERIZON Asset Management Ratios

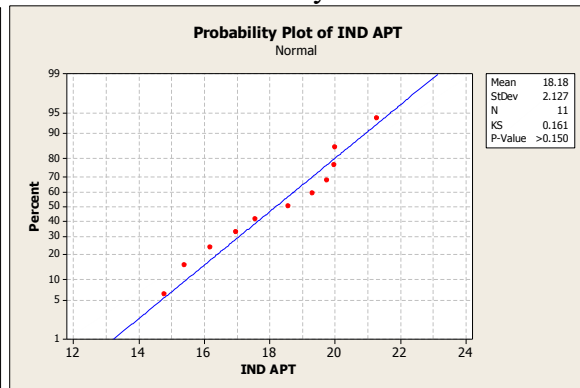
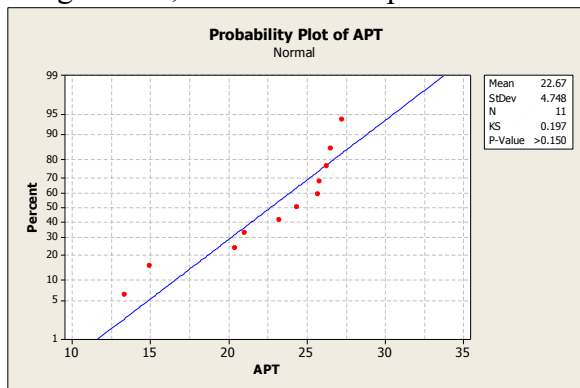
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying off suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



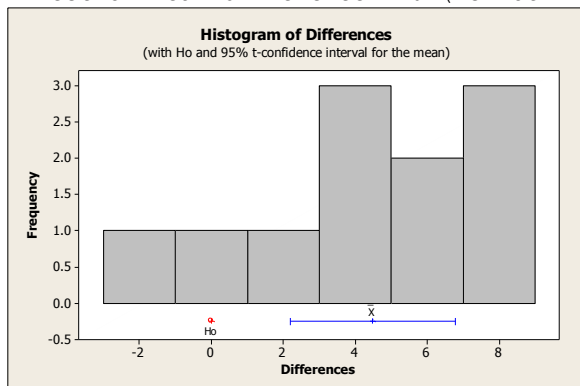
Paired T-Test and CI: APT, IND APT

Paired T for APT - IND APT

	N	Mean	StDev	SE Mean
APT	11	22.67	4.75	1.43
IND APT	11	18.18	2.13	0.64
Difference	11	4.49	3.42	1.03

95% CI for mean difference: (2.19, 6.78)

T-Test of mean difference = 0 (vs not = 0): T-Value = 4.35 P-Value = 0.001



VERIZON Asset Management Ratios

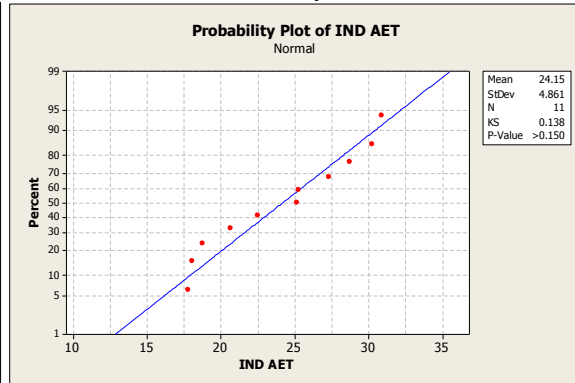
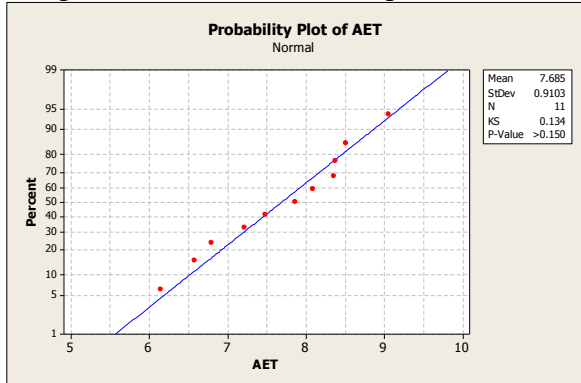
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



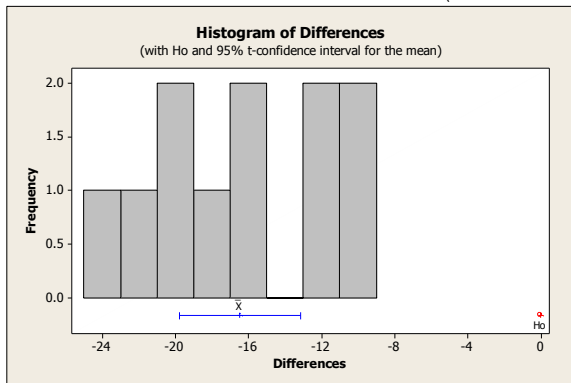
Paired T-Test and CI: AET, IND AET

Paired T for AET - IND AET

	N	Mean	StDev	SE Mean
AET	11	7.69	0.91	0.27
IND AET	11	24.15	4.86	1.47
Difference	11	-16.46	4.92	1.48

95% CI for mean difference: (-19.77, -13.16)

T-Test of mean difference = 0 (vs not = 0): T-Value = -11.09 P-Value = 0.000



VERIZON Asset Management Ratios

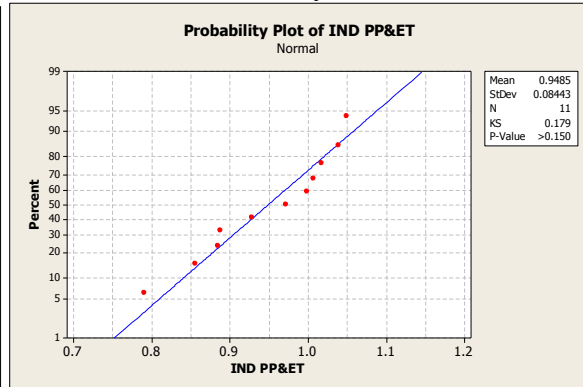
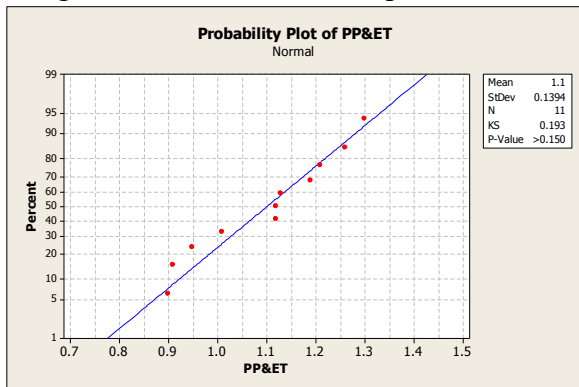
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



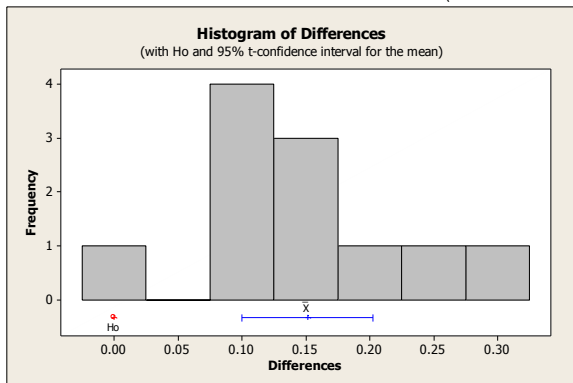
Paired T-Test and CI: PP&ET, IND PP&ET

Paired T for PP&ET - IND PP&ET

	N	Mean	StDev	SE Mean
PP&ET	11	1.1000	0.1394	0.0420
IND PP&ET	11	0.9485	0.0844	0.0255
Difference	11	0.1515	0.0764	0.0230

95% CI for mean difference: (0.1001, 0.2028)

T-Test of mean difference = 0 (vs not = 0): T-Value = 6.57 P-Value = 0.000



VERIZON Asset Management Ratios

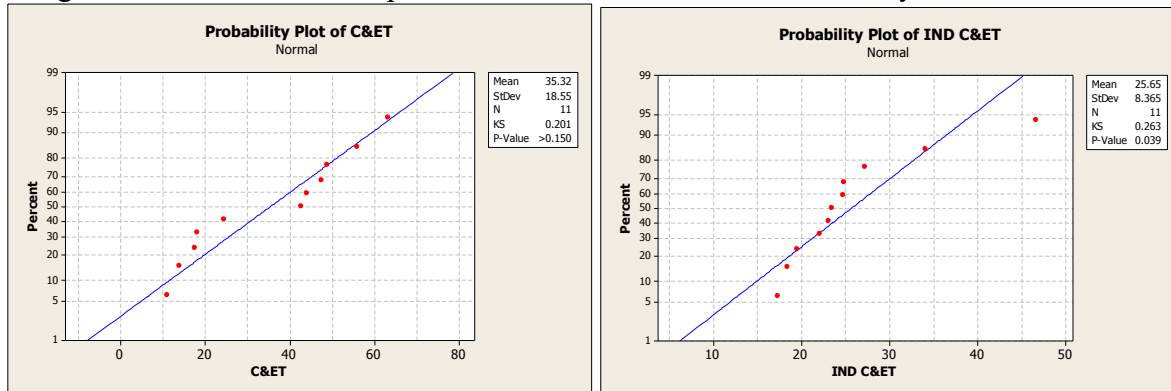
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: C&ET, IND C&ET

Paired test for C&ET - IND C&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	48.0	0.197	9.510

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	9.5	95.5	-8.1	26.8

VERIZON Per Share Ratios

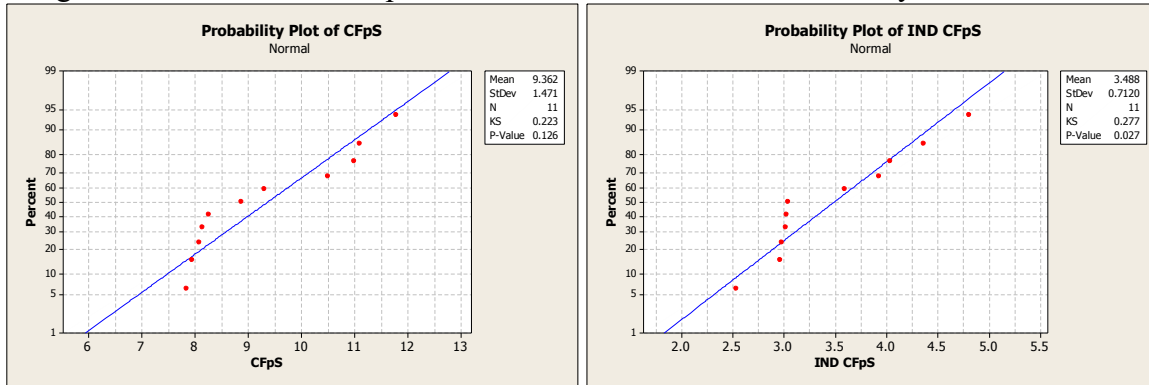
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: CFpS, IND CFpS

Paired test for CFpS - IND CFpS

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	P	Estimated	
Difference	11	11	Statistic	66.0	0.004	Median

	N	Estimated	Achieved	Confidence	
Difference	11	Median	Confidence	Lower	Upper
		5.72	95.5	5.23	6.53

VERIZON Per Share Ratios

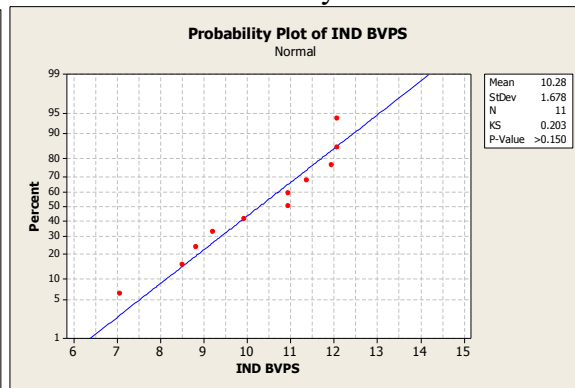
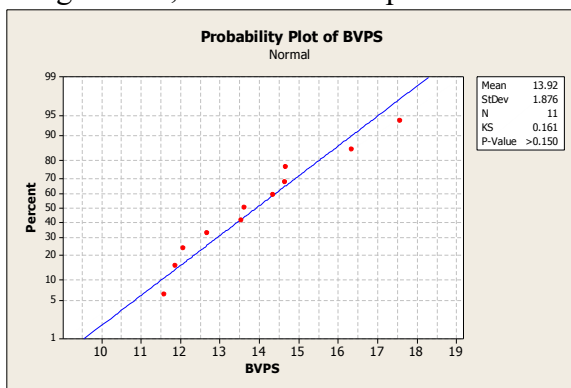
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



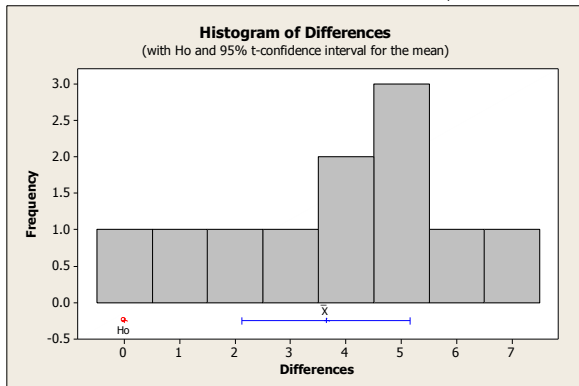
Paired T-Test and CI: BVPS, IND BVPS

Paired T for BVPS - IND BVPS

	N	Mean	StDev	SE Mean
BVPS	11	13.919	1.876	0.566
IND BVPS	11	10.279	1.678	0.506
Difference	11	3.640	2.259	0.681

95% CI for mean difference: (2.122, 5.157)

T-Test of mean difference = 0 (vs not = 0): T-Value = 5.34 P-Value = 0.000



WABTEC Profitability Ratios

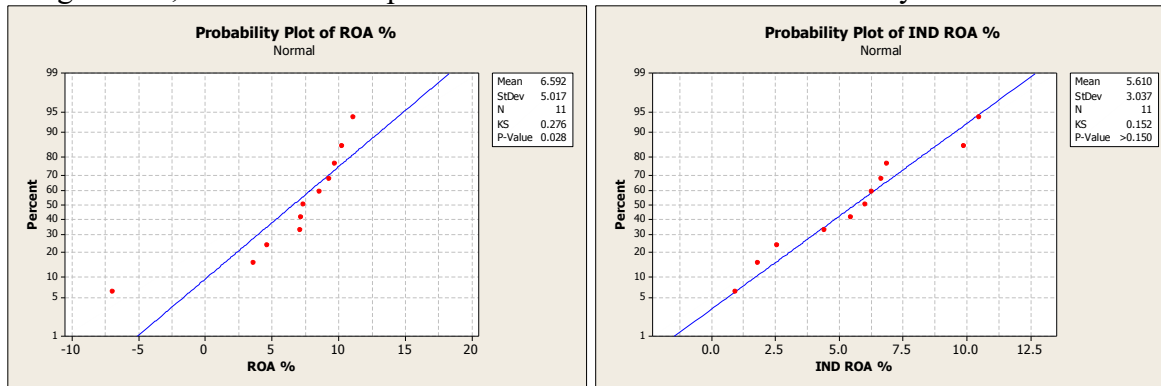
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: ROA %, IND ROA %

Paired test for ROA % - IND ROA %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	49.0	0.168	2.038

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	2.04	95.5	-3.67	3.96

WABTEC Profitability Ratios

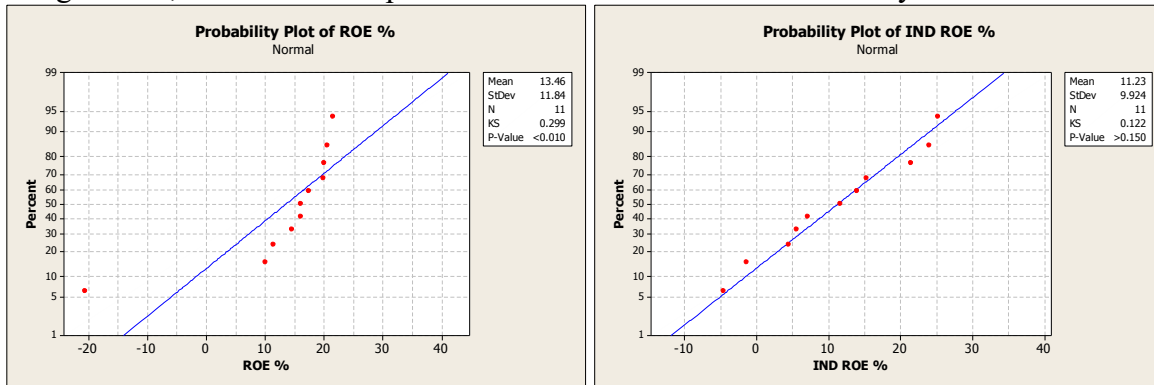
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: ROE %, IND ROE %

Paired test for ROE % - IND ROE %

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	Statistic	P	Estimated
Difference	11	11	45.0	0.307		3.498

	N	Estimated	Achieved	Confidence	Lower	Upper
Difference	11	3.5	95.5		-5.3	10.7

WABTEC Profitability Ratios

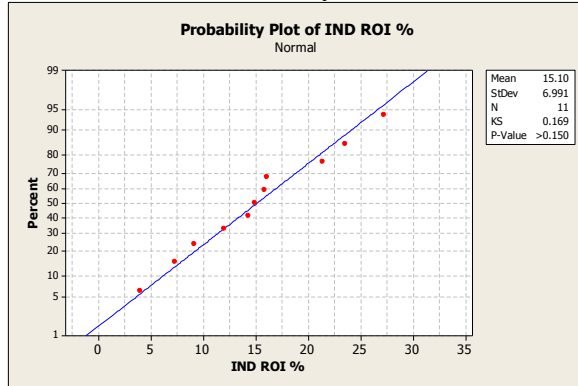
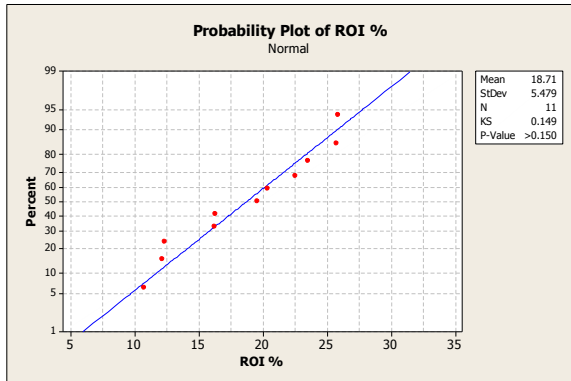
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



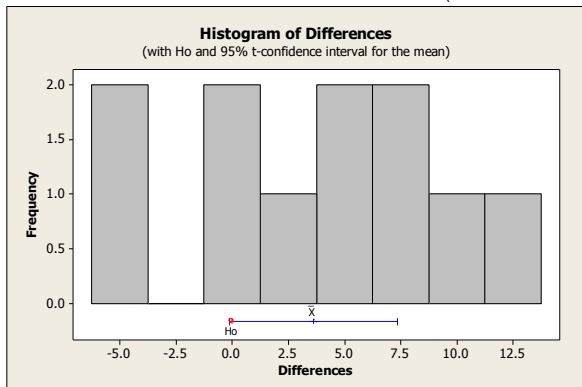
Paired T-Test and CI: ROI %, IND ROI %

Paired T for ROI % - IND ROI %

	N	Mean	StDev	SE Mean
ROI %	11	18.71	5.48	1.65
IND ROI %	11	15.10	6.99	2.11
Difference	11	3.61	5.57	1.68

95% CI for mean difference: (-0.13, 7.35)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.15 P-Value = 0.057



WABTEC Profitability Ratios

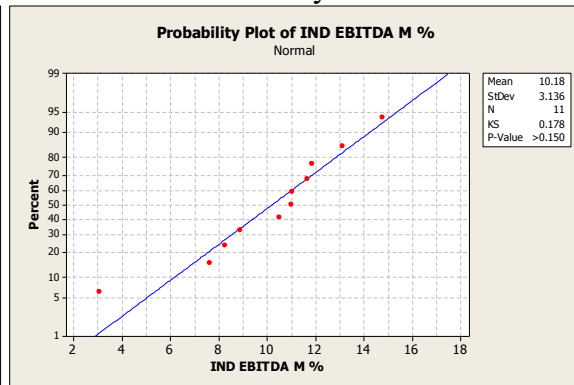
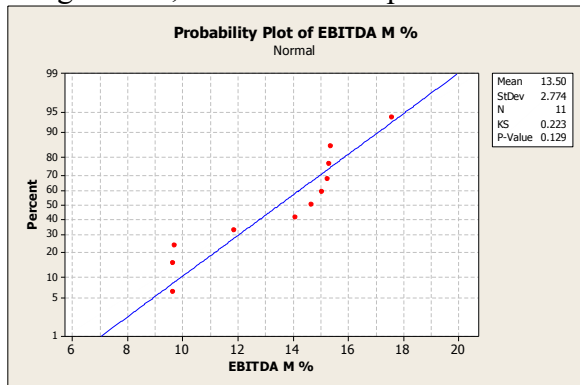
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



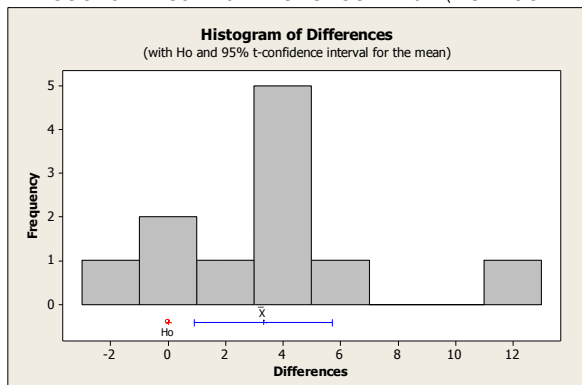
Paired T-Test and CI: EBITDA M %, IND EBITDA M %

Paired T for EBITDA M % - IND EBITDA M %

	N	Mean	StDev	SE Mean
EBITDA M %	11	13.495	2.774	0.836
IND EBITDA M %	11	10.181	3.136	0.945
Difference	11	3.31	3.59	1.08

95% CI for mean difference: (0.90, 5.73)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.06 P-Value = 0.012



WABTEC Profitability Ratios

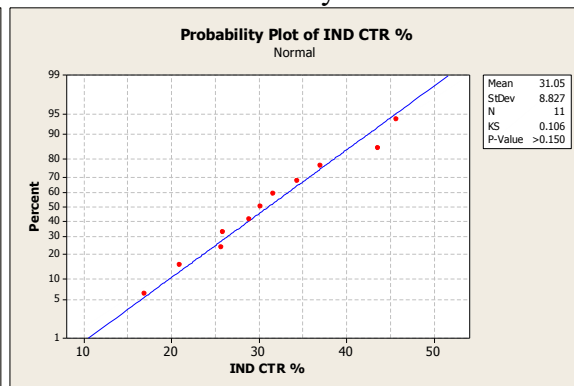
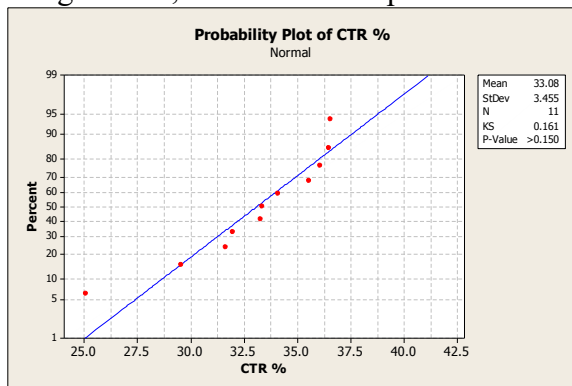
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



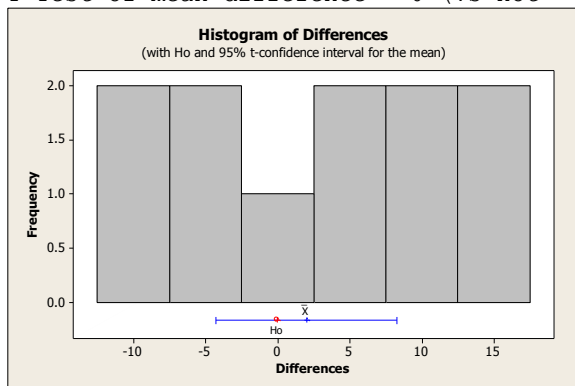
Paired T-Test and CI: CTR %, IND CTR %

Paired T for CTR % - IND CTR %

	N	Mean	StDev	SE Mean
CTR %	11	33.08	3.45	1.04
IND CTR %	11	31.05	8.83	2.66
Difference	11	2.02	9.35	2.82

95% CI for mean difference: (-4.26, 8.30)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.72 P-Value = 0.489



WABTEC Profitability Ratios

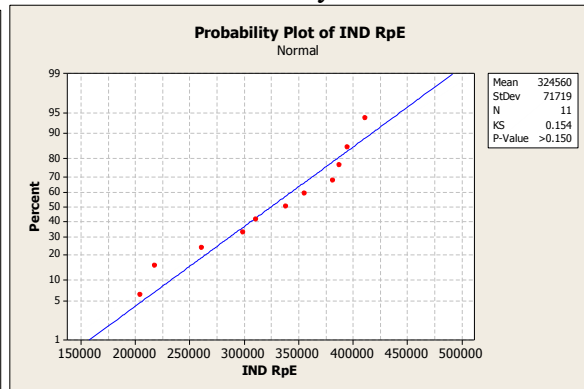
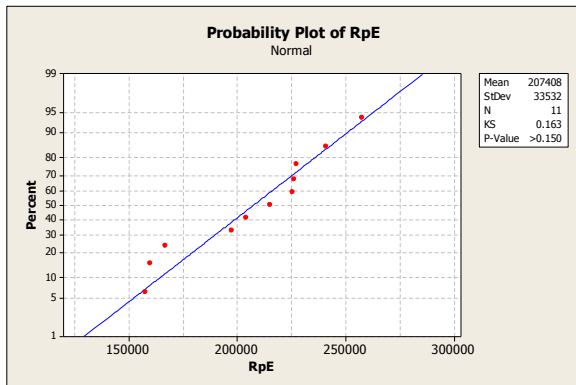
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



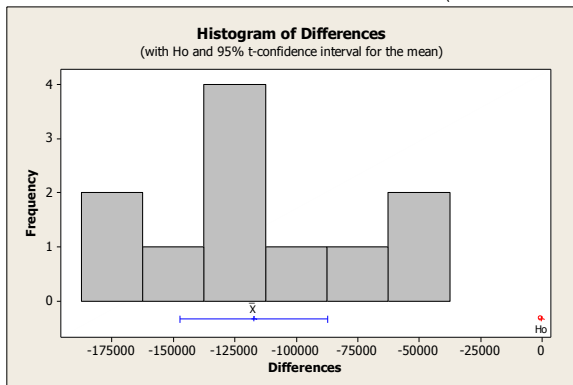
Paired T-Test and CI: RpE, IND RpE

Paired T for RpE - IND RpE

	N	Mean	StDev	SE Mean
RpE	11	207408	33532	10110
IND RpE	11	324560	71719	21624
Difference	11	-117153	44820	13514

95% CI for mean difference: (-147263, -87043)

T-Test of mean difference = 0 (vs not = 0): T-Value = -8.67 P-Value = 0.000



WABTEC Liquidity Ratios

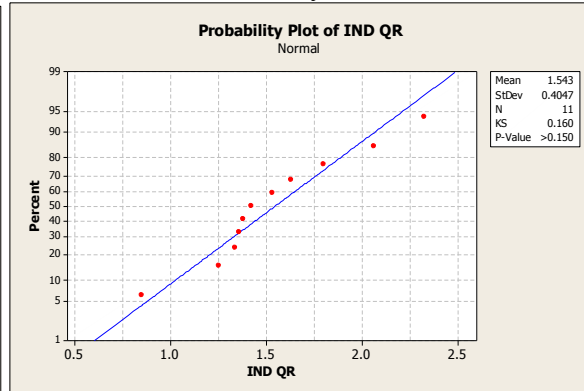
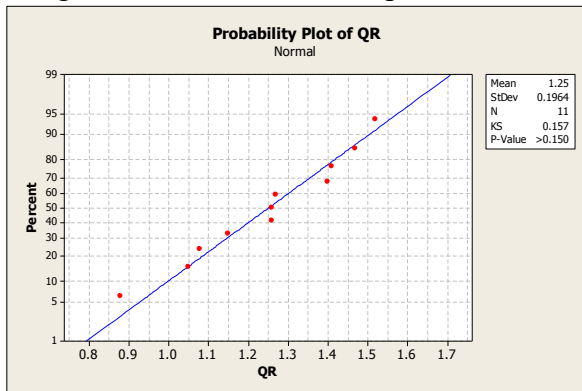
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



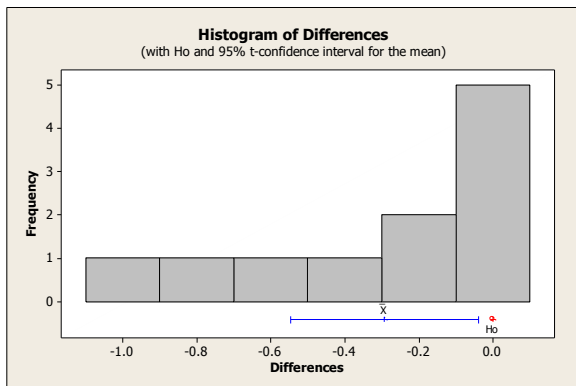
Paired T-Test and CI: QR, IND QR

Paired T for QR - IND QR

	N	Mean	StDev	SE Mean
QR	11	1.250	0.196	0.059
IND QR	11	1.543	0.405	0.122
Difference	11	-0.293	0.378	0.114

95% CI for mean difference: (-0.547, -0.039)

T-Test of mean difference = 0 (vs not = 0): T-Value = -2.57 P-Value = 0.028



WABTEC Liquidity Ratios

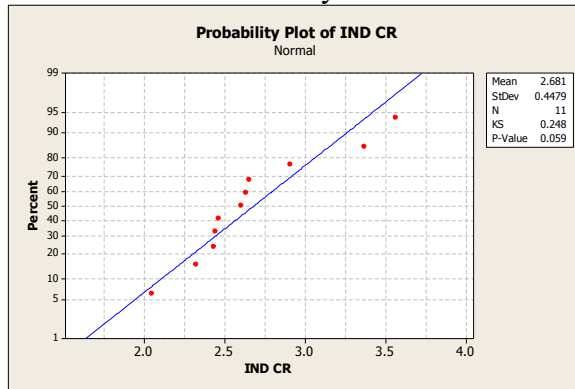
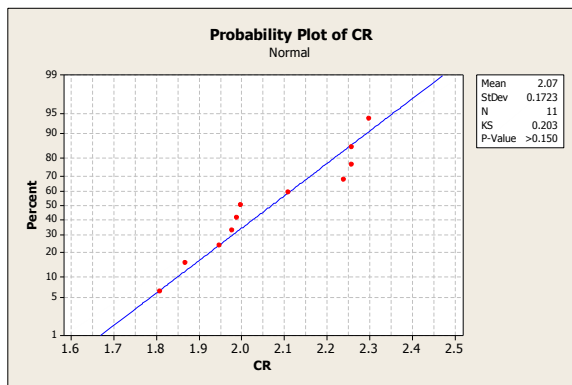
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry? WORSE



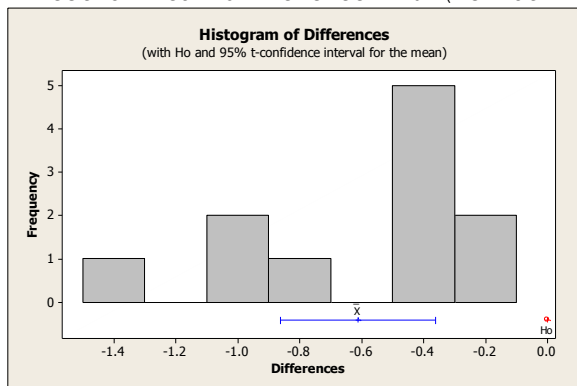
Paired T-Test and CI: CR, IND CR

Paired T for CR - IND CR

	N	Mean	StDev	SE Mean
CR	11	2.070	0.172	0.052
IND CR	11	2.681	0.448	0.135
Difference	11	-0.611	0.372	0.112

95% CI for mean difference: (-0.861, -0.361)

T-Test of mean difference = 0 (vs not = 0): T-Value = -5.44 P-Value = 0.000



WABTEC Liquidity Ratios

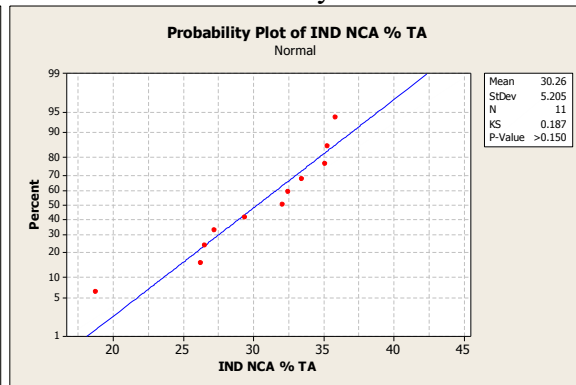
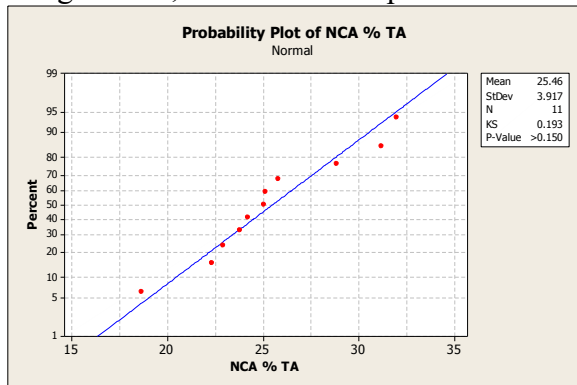
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



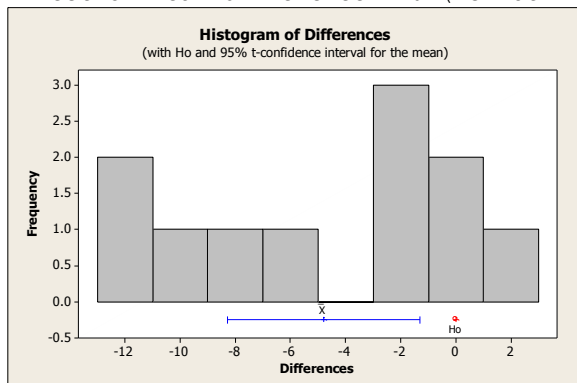
Paired T-Test and CI: NCA % TA, IND NCA % TA

Paired T for NCA % TA - IND NCA % TA

	N	Mean	StDev	SE Mean
NCA % TA	11	25.46	3.92	1.18
IND NCA % TA	11	30.26	5.20	1.57
Difference	11	-4.80	5.20	1.57

95% CI for mean difference: (-8.29, -1.31)

T-Test of mean difference = 0 (vs not = 0): T-Value = -3.06 P-Value = 0.012



WABTEC Debt Management Ratios

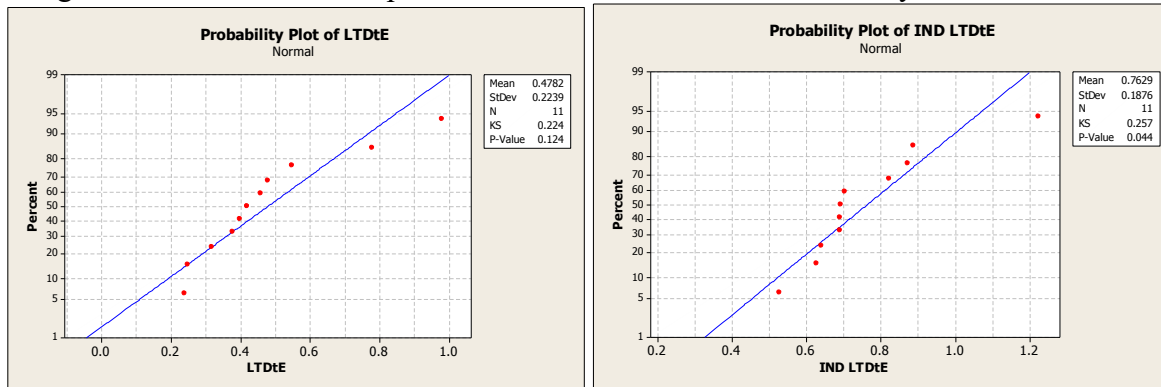
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: LTDtE, IND LTDtE

Paired test for LTDtE - IND LTDtE

Test of median = 0.000000 versus median not = 0.000000

	N	N for Difference	Wilcoxon Test	Statistic	P	Estimated Median
Difference	11	11	10.0	0.045		-0.3564

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	-0.356	95.5	-0.423	-0.002

WABTEC Debt Management Ratios

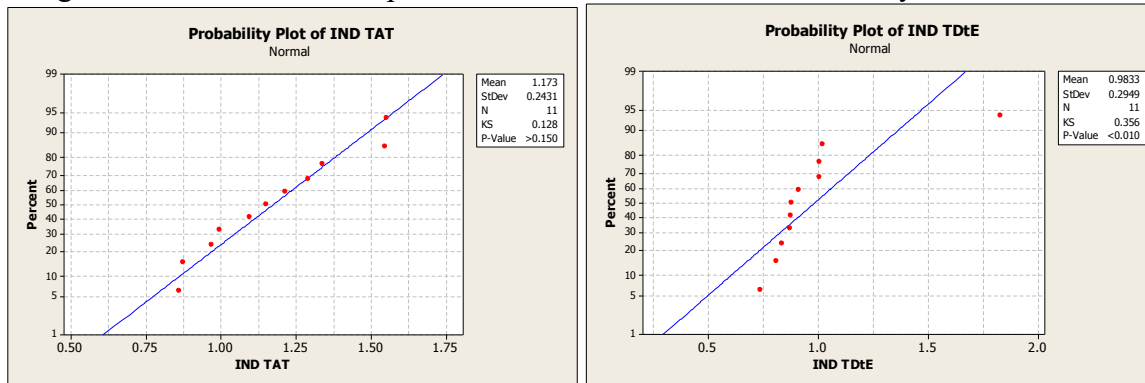
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	for Test	Wilcoxon Test Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-0.4949

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-0.495	95.5	-0.590	-0.316

WABTEC Debt Management Ratios

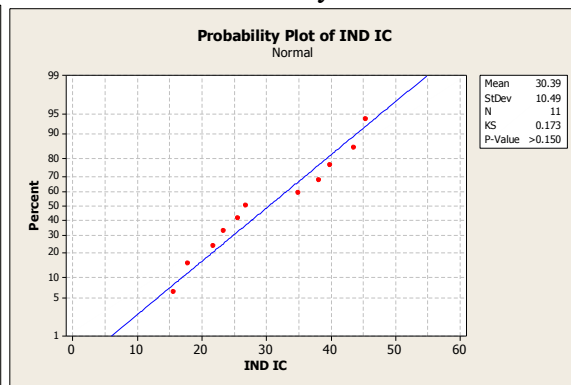
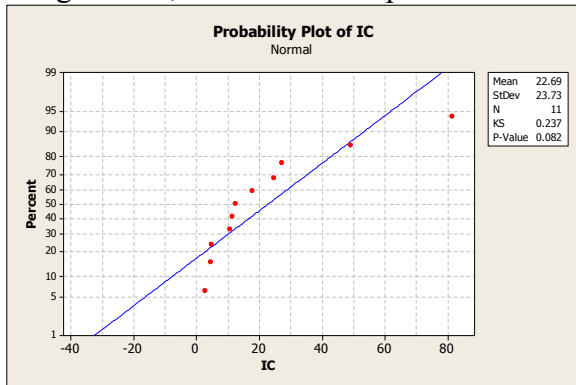
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



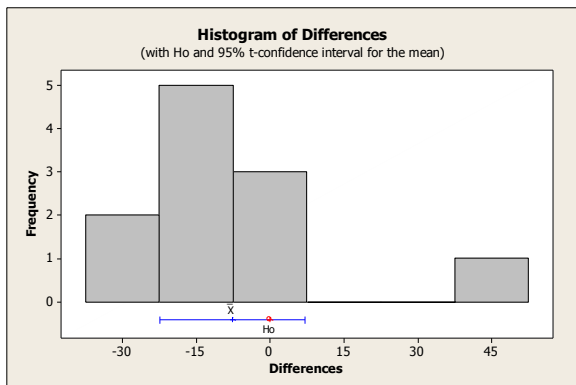
Paired T-Test and CI: IC, IND IC

Paired T for IC - IND IC

	N	Mean	StDev	SE Mean
IC	11	22.69	23.73	7.16
IND IC	11	30.39	10.49	3.16
Difference	11	-7.70	21.98	6.63

95% CI for mean difference: (-22.46, 7.07)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.16 P-Value = 0.272



WABTEC Asset Management Ratios

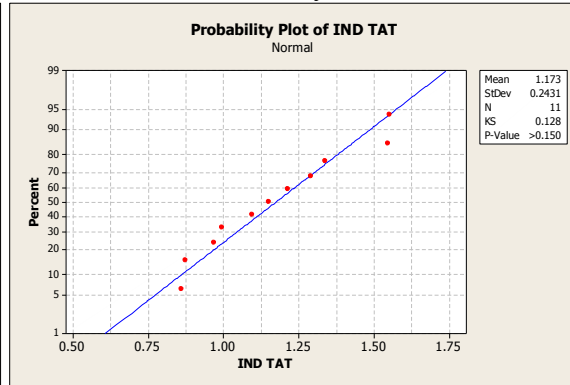
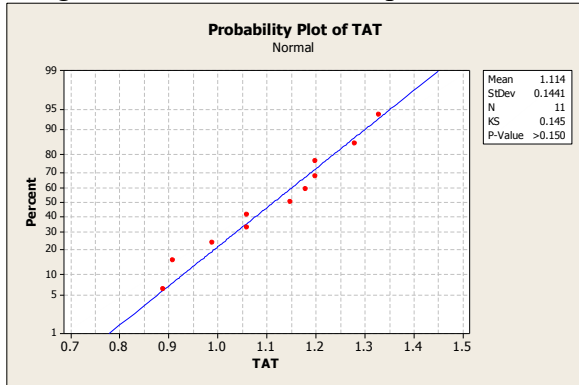
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



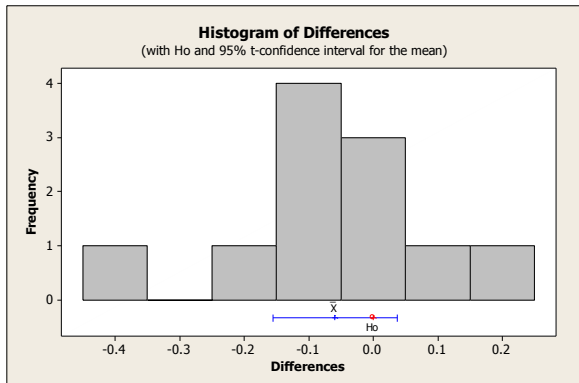
Paired T-Test and CI: TAT, IND TAT

Paired T for TAT - IND TAT

	N	Mean	StDev	SE Mean
TAT	11	1.1136	0.1441	0.0434
IND TAT	11	1.1728	0.2431	0.0733
Difference	11	-0.0591	0.1429	0.0431

95% CI for mean difference: (-0.1552, 0.0369)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.37 P-Value = 0.200



WABTEC Asset Management Ratios

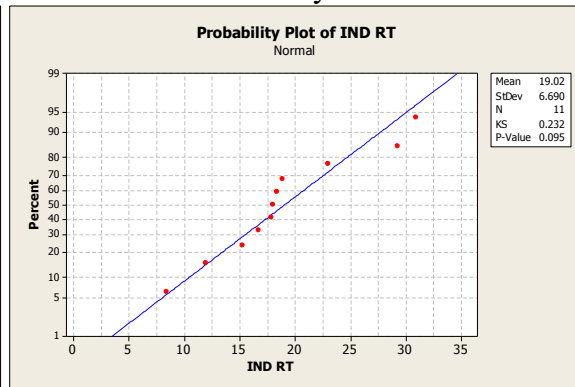
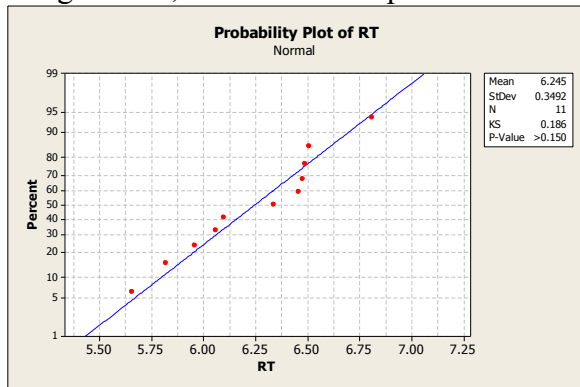
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



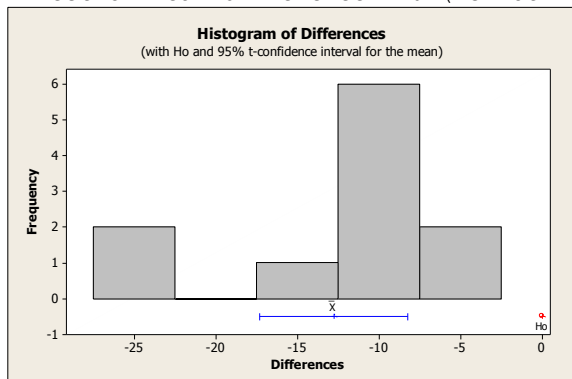
Paired T-Test and CI: RT, IND RT

Paired T for RT - IND RT

	N	Mean	StDev	SE Mean
RT	11	6.24	0.35	0.11
IND RT	11	19.02	6.69	2.02
Difference	11	-12.78	6.78	2.04

95% CI for mean difference: (-17.33, -8.22)

T-Test of mean difference = 0 (vs not = 0): T-Value = -6.25 P-Value = 0.000



WABTEC Asset Management Ratios

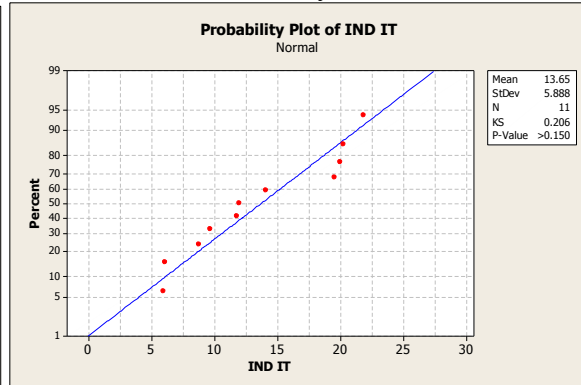
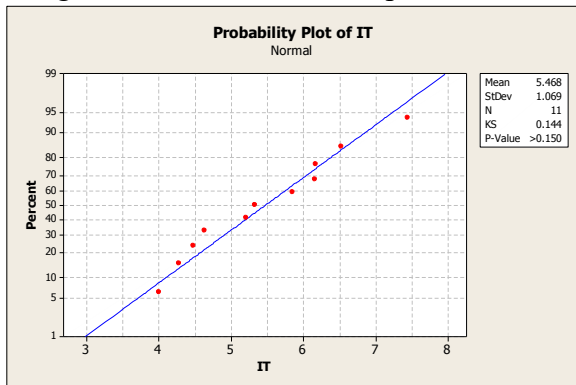
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



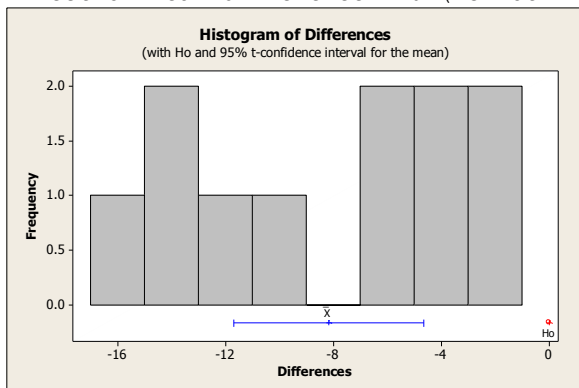
Paired T-Test and CI: IT, IND IT

Paired T for IT - IND IT

	N	Mean	StDev	SE Mean
IT	11	5.47	1.07	0.32
IND IT	11	13.65	5.89	1.78
Difference	11	-8.18	5.24	1.58

95% CI for mean difference: (-11.71, -4.66)

T-Test of mean difference = 0 (vs not = 0): T-Value = -5.18 P-Value = 0.000



WABTEC Asset Management Ratios

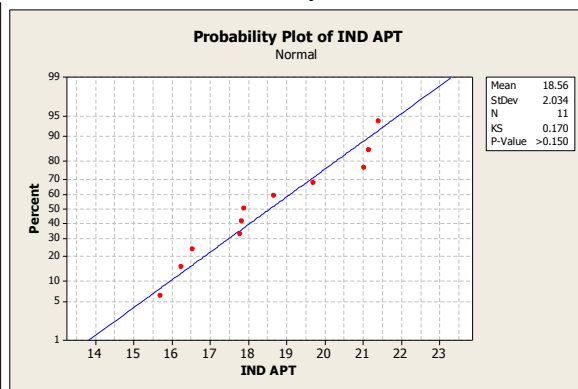
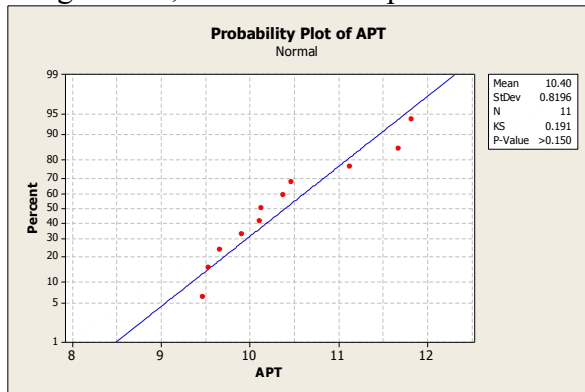
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying off suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



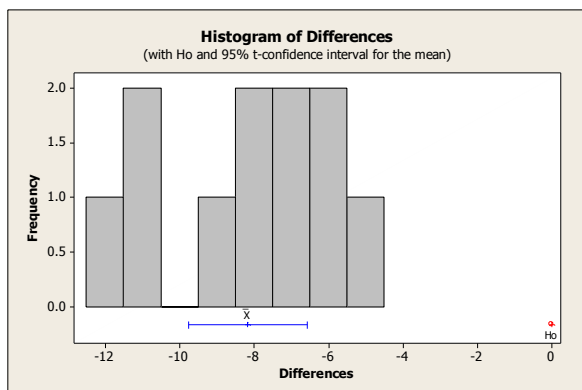
Paired T-Test and CI: APT, IND APT

Paired T for APT - IND APT

	N	Mean	StDev	SE Mean
APT	11	10.396	0.820	0.247
IND APT	11	18.559	2.034	0.613
Difference	11	-8.163	2.365	0.713

95% CI for mean difference: (-9.751, -6.574)

T-Test of mean difference = 0 (vs not = 0): T-Value = -11.45 P-Value = 0.000



WABTEC Asset Management Ratios

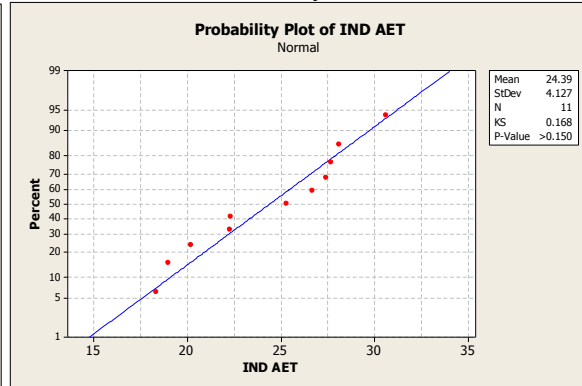
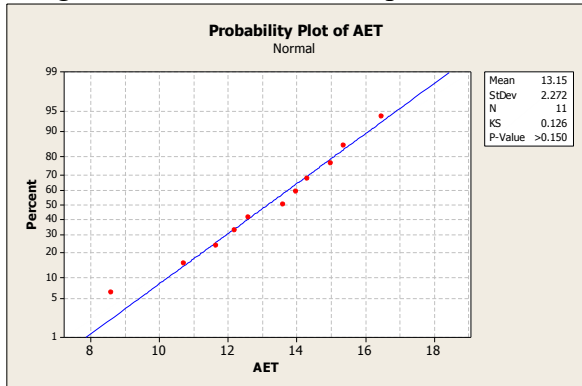
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



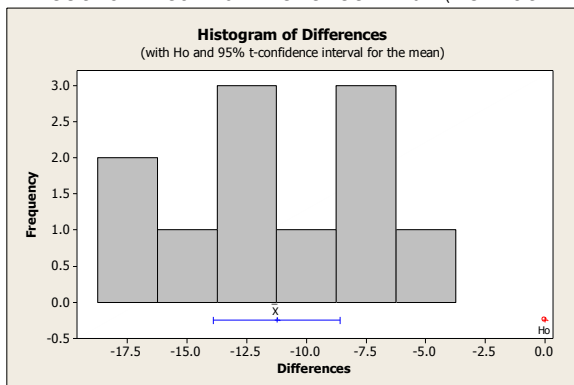
Paired T-Test and CI: AET, IND AET

Paired T for AET - IND AET

	N	Mean	StDev	SE Mean
AET	11	13.15	2.27	0.68
IND AET	11	24.39	4.13	1.24
Difference	11	-11.24	3.97	1.20

95% CI for mean difference: (-13.91, -8.57)

T-Test of mean difference = 0 (vs not = 0): T-Value = -9.39 P-Value = 0.000



WABTEC Asset Management Ratios

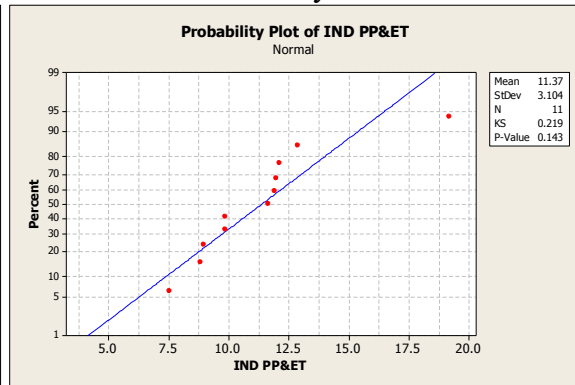
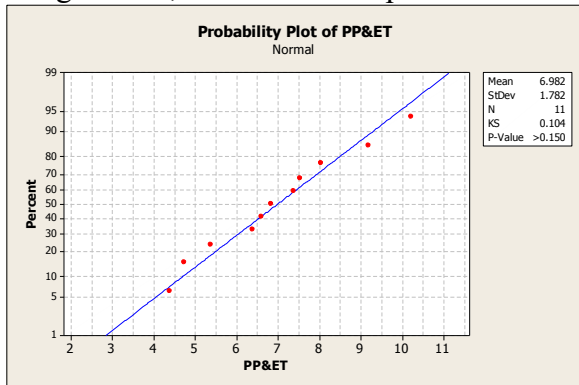
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



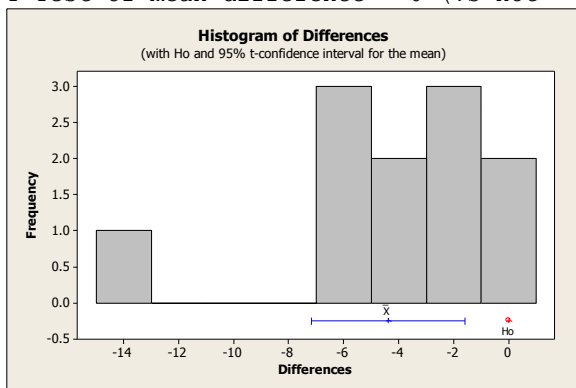
Paired T-Test and CI: PP&ET, IND PP&ET

Paired T for PP&ET - IND PP&ET

	N	Mean	StDev	SE Mean
PP&ET	11	6.982	1.782	0.537
IND PP&ET	11	11.368	3.104	0.936
Difference	11	-4.39	4.15	1.25

95% CI for mean difference: (-7.17, -1.60)

T-Test of mean difference = 0 (vs not = 0): T-Value = -3.51 P-Value = 0.006



WABTEC Asset Management Ratios

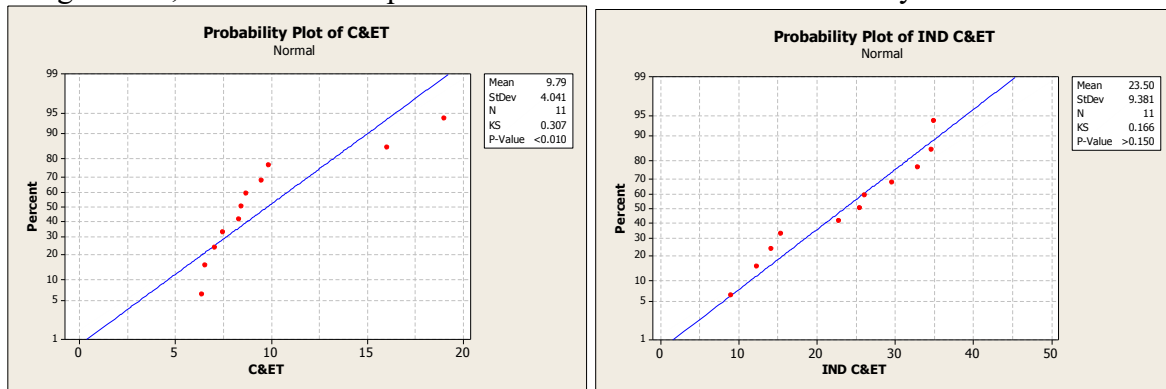
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: C&ET, IND C&ET

Paired test for C&ET - IND C&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon	Estimated
Difference	11	11	Statistic	P
			1.0	0.005
				Estimated Median
				-14.05

	N	Estimated	Achieved	Confidence
Difference	11	Median	Confidence	Interval
		-14.1	95.5	Lower Upper
				-20.9 -6.9

WABTEC Per Share Ratios

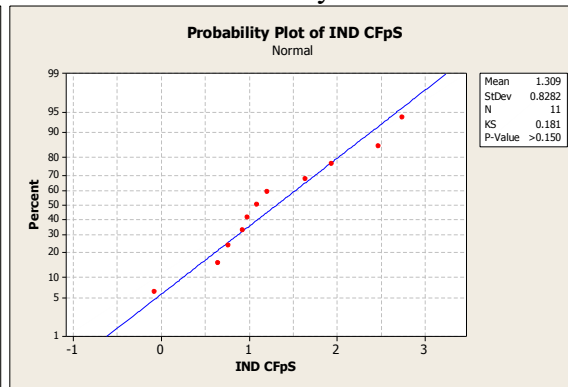
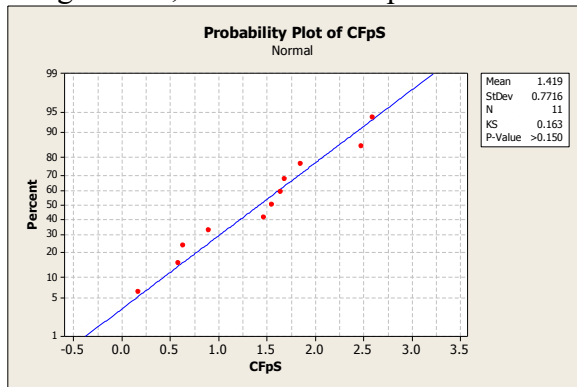
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



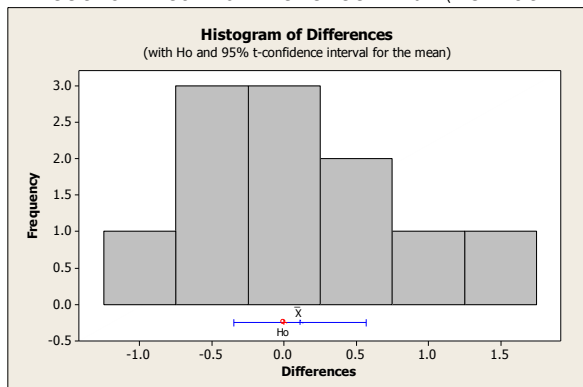
Paired T-Test and CI: CFpS, IND CFpS

Paired T for CFpS - IND CFpS

	N	Mean	StDev	SE Mean
CFpS	11	1.419	0.772	0.233
IND CFpS	11	1.309	0.828	0.250
Difference	11	0.110	0.681	0.205

95% CI for mean difference: (-0.347, 0.567)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.54 P-Value = 0.604



WABTEC Per Share Ratios

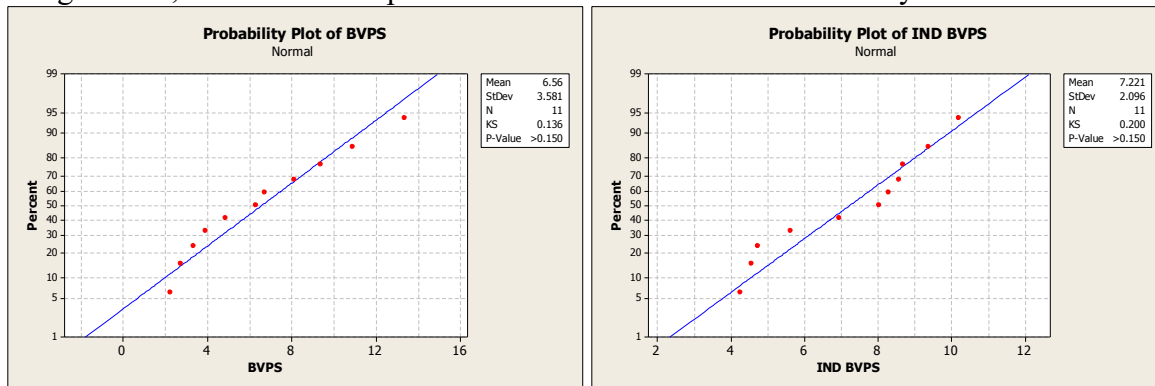
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



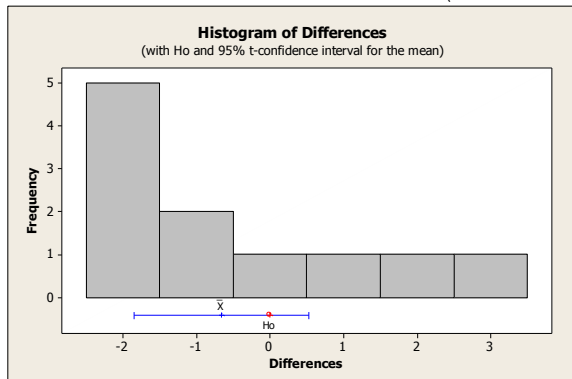
Paired T-Test and CI: BVPS, IND BVPS

Paired T for BVPS - IND BVPS

	N	Mean	StDev	SE Mean
BVPS	11	6.56	3.58	1.08
IND BVPS	11	7.22	2.10	0.63
Difference	11	-0.661	1.773	0.535

95% CI for mean difference: (-1.852, 0.531)

T-Test of mean difference = 0 (vs not = 0): T-Value = -1.24 P-Value = 0.245



XEROX Profitability Ratios

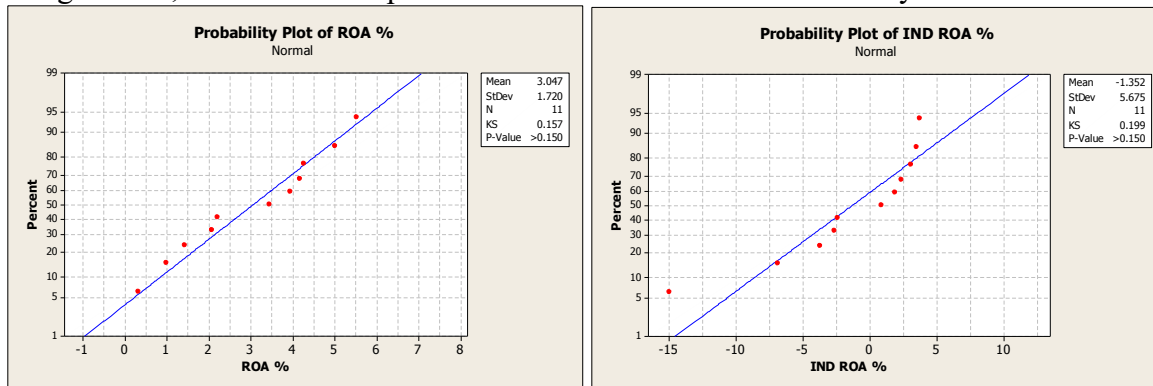
ROA %

Annualized Net Income expressed as a percentage of Average Total Assets. Indicates how effectively assets are being used to produce profit, and how efficient management is at using its assets to generate earnings. When you really think about it, management's most important job is to make wise choices in allocating its resources. Anybody can make a profit by throwing a ton of money at a problem, but very few managers excel at making large profits with little investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



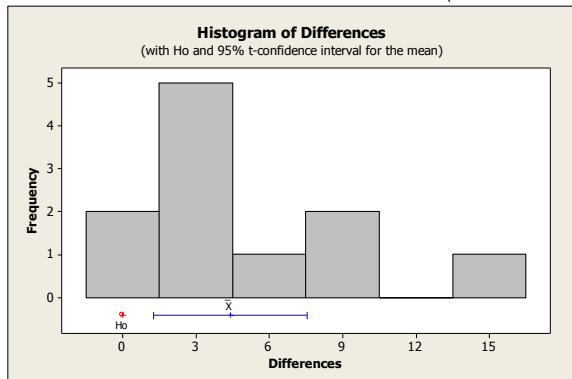
Paired T-Test and CI: ROA %, IND ROA %

Paired T for ROA % - IND ROA %

	N	Mean	StDev	SE Mean
ROA %	11	3.05	1.72	0.52
IND ROA %	11	-1.35	5.67	1.71
Difference	11	4.40	4.68	1.41

95% CI for mean difference: (1.26, 7.54)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.12 P-Value = 0.011



XEROX Profitability Ratios

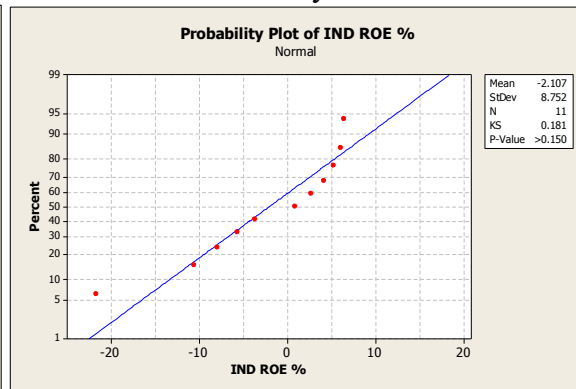
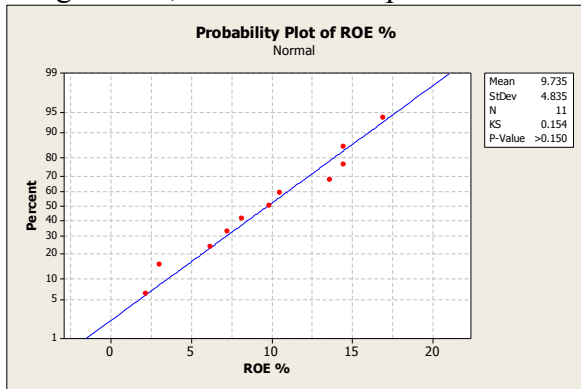
ROE %

Annualized Net Income expressed as a percentage of Average Stockholders' Equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



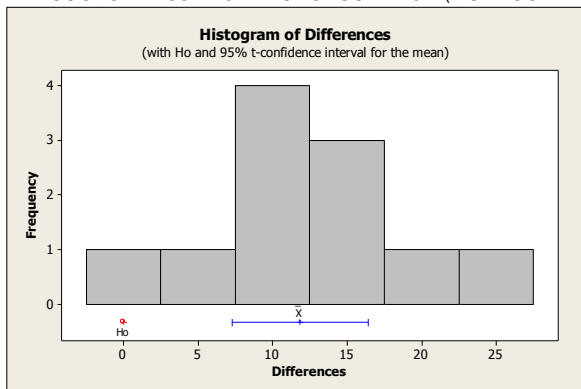
Paired T-Test and CI: ROE %, IND ROE %

Paired T for ROE % - IND ROE %

	N	Mean	StDev	SE Mean
ROE %	11	9.74	4.83	1.46
IND ROE %	11	-2.11	8.75	2.64
Difference	11	11.84	6.78	2.04

95% CI for mean difference: (7.29, 16.40)

T-Test of mean difference = 0 (vs not = 0): T-Value = 5.79 P-Value = 0.000



XEROX Profitability Ratios

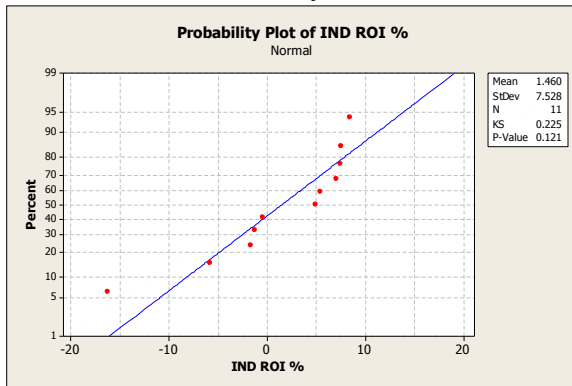
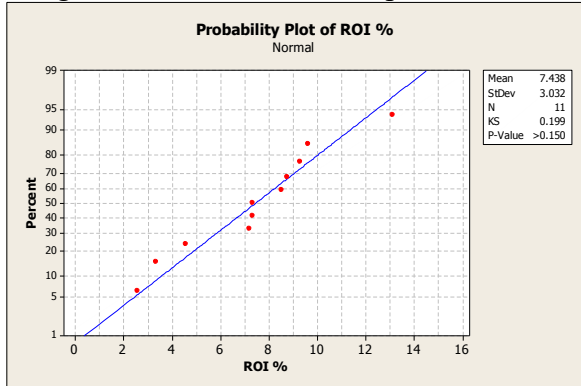
ROI %

Annualized Income expressed as a percentage of Average Invested Capital. A performance measure used to evaluate the efficiency of an investment.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



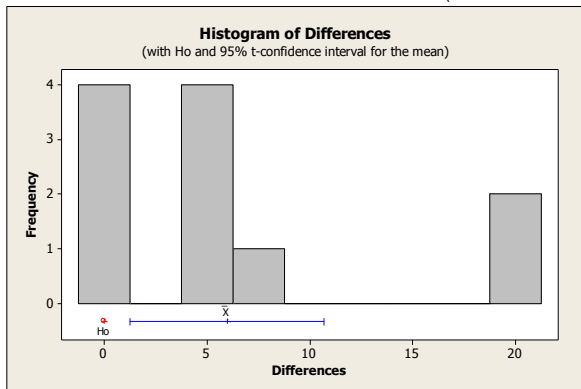
Paired T-Test and CI: ROI %, IND ROI %

Paired T for ROI % - IND ROI %

	N	Mean	StDev	SE Mean
ROI %	11	7.44	3.03	0.91
IND ROI %	11	1.46	7.53	2.27
Difference	11	5.98	7.03	2.12

95% CI for mean difference: (1.25, 10.70)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.82 P-Value = 0.018



XEROX Profitability Ratios

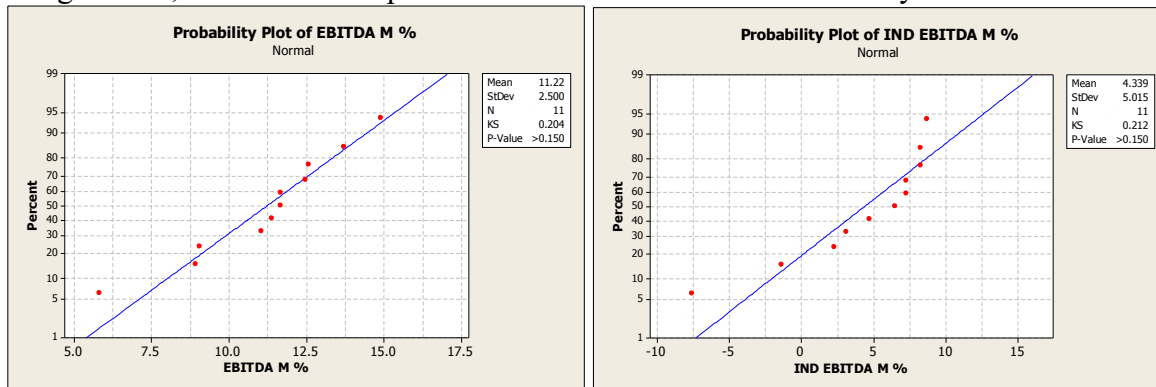
EBITDA Margin %

(Earnings Before Interest, Tax, Depreciation & Amortization) expressed as a percentage of Total Revenue. A measurement of a company's operating profitability. The higher the EBITDA margin, the less operating expenses eat into a company's bottom line, leading to a more profitable operation.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



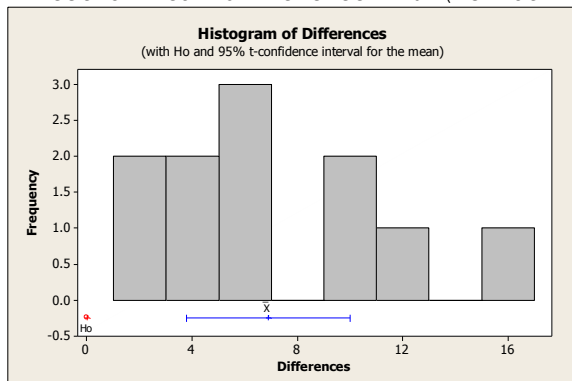
Paired T-Test and CI: EBITDA M %, IND EBITDA M %

Paired T for EBITDA M % - IND EBITDA M %

	N	Mean	StDev	SE Mean
EBITDA M %	11	11.22	2.50	0.75
IND EBITDA M %	11	4.34	5.01	1.51
Difference	11	6.88	4.64	1.40

95% CI for mean difference: (3.77, 10.00)

T-Test of mean difference = 0 (vs not = 0): T-Value = 4.92 P-Value = 0.001



XEROX Profitability Ratios

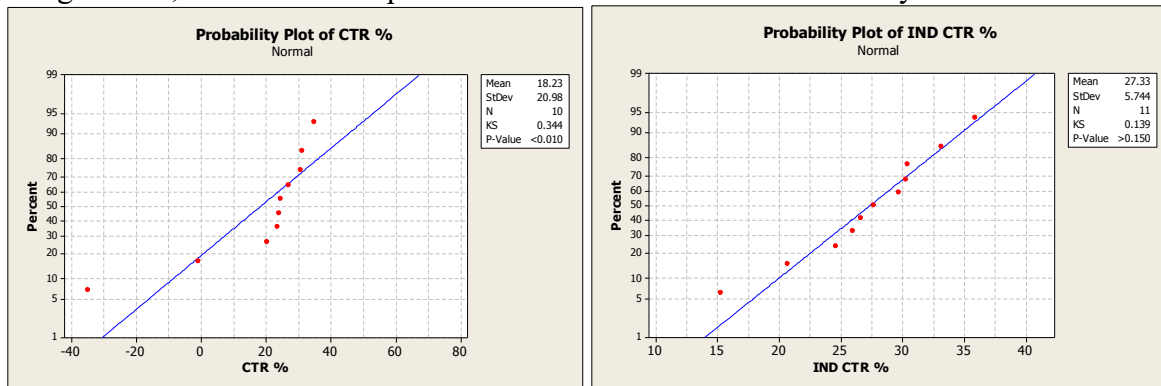
Calculated Tax Rate % (Lower is Better)

Taxation expressed as a percentage of Earnings Before Tax. The percentage at which an individual or corporation is taxed. The tax rate is the tax imposed by the federal government and some states based on an individual's taxable income or a corporation's earnings. In certain municipalities, regional income taxes are also imposed, increasing the tax burden for those residents.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: CTR %, IND CTR %

Paired test for CTR % - IND CTR %

Test of median = 0.000000 versus median not = 0.000000

	N	N*	N for Test	Wilcoxon Statistic	P	Estimated Median
Difference	10	1	10	15.0	0.221	-5.353

	N	N*	Estimated Median	Achieved Confidence	Confidence Interval	
					Lower	Upper
Difference	10	1	-5.4	94.7	-27.8	3.2

XEROX Profitability Ratios

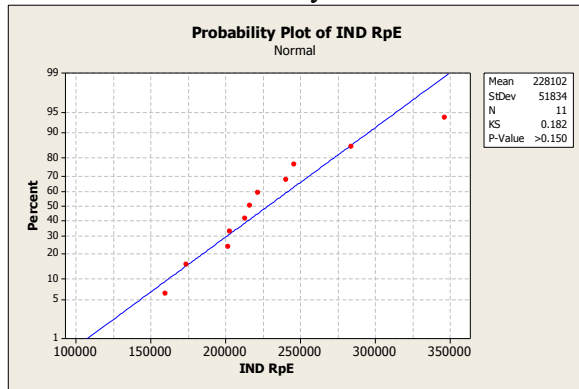
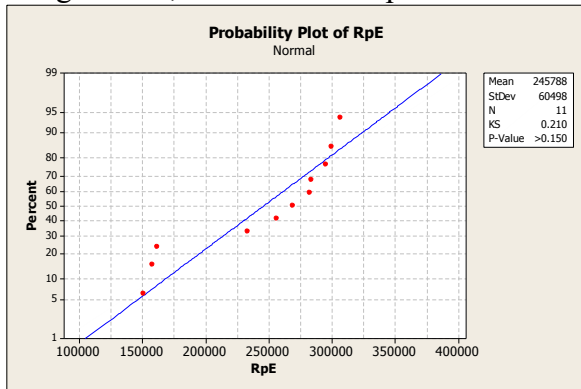
Revenue Per Employee

Annualized Revenue divided by Number of Employees. An important ratio that looks at a company's sales in relation to the number of employees they have. Ideally, a company wants the highest revenue per employee possible, as it denotes higher productivity.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



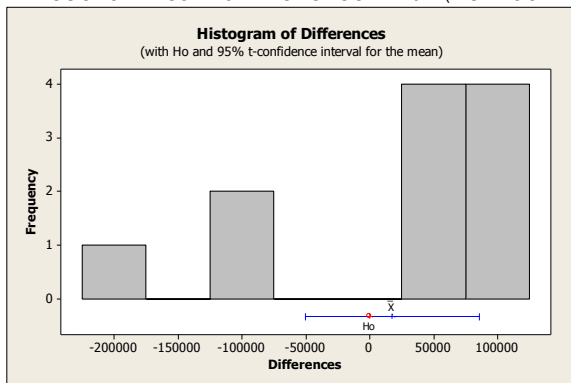
Paired T-Test and CI: RpE, IND RpE

Paired T for RpE - IND RpE

	N	Mean	StDev	SE Mean
RpE	11	245788	60498	18241
IND RpE	11	228102	51834	15628
Difference	11	17686	101308	30545

95% CI for mean difference: (-50374, 85745)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.58 P-Value = 0.575



XEROX Liquidity Ratios

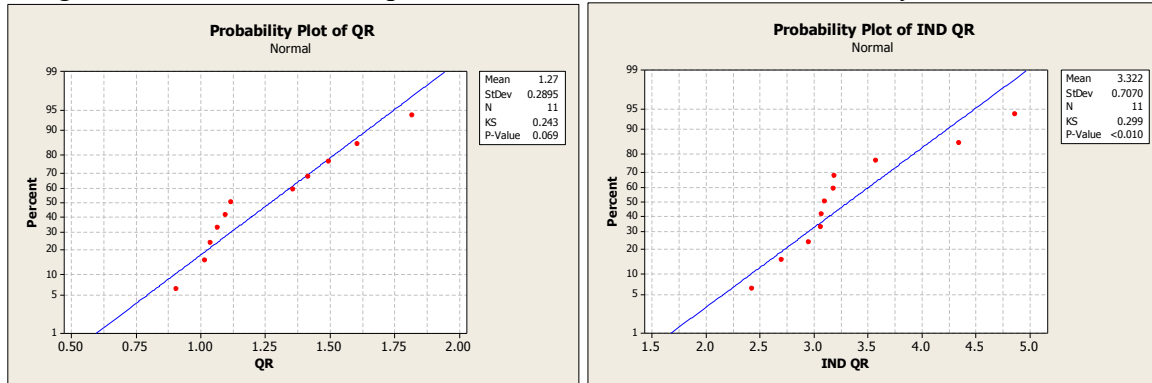
Quick Ratio

This ratio divides Quick Assets by Current Liabilities. An indicator of a company's short-term liquidity. The quick ratio is more conservative than the current ratio because it excludes inventories from current assets. The ratio derives its name presumably from the fact that assets such as cash and marketable securities are quick sources of cash. A ratio of 1 or higher is generally considered satisfactory. It is also called the Acid Test Ratio.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: QR, IND QR

Paired test for QR - IND QR

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-2.002

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-2.002	95.5	-2.488	-1.688

XEROX Liquidity Ratios

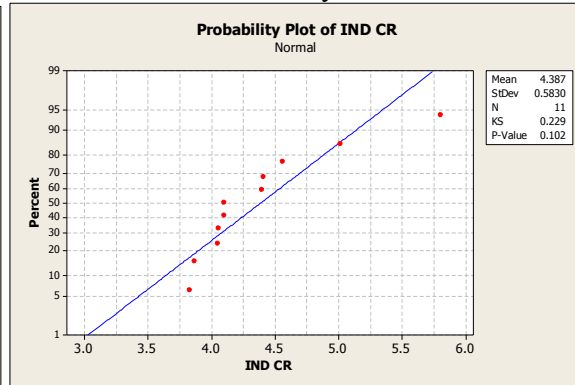
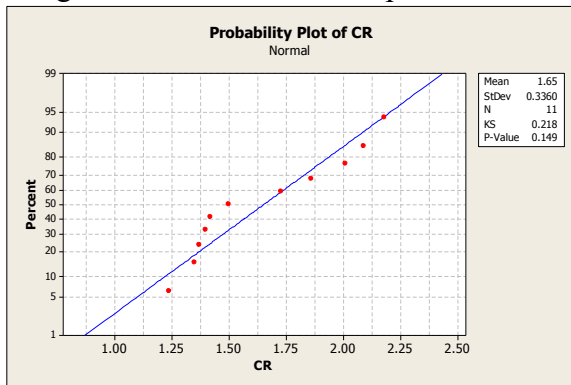
Current Ratio

This ratio divides Current Assets by Current Liabilities. The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities (debt and payables) with its short-term assets (cash, inventory, receivables). The higher the current ratio, the more capable the company is of paying its obligations. A ratio under 1 suggests that the company would be unable to pay off its obligations if they came due at that point. The current ratio can give a sense of the efficiency of a company's operating cycle or its ability to turn its product into cash. This ratio is similar to the acid-test ratio except that the acid-test ratio does not include inventory and prepaids as assets that can be liquidated.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



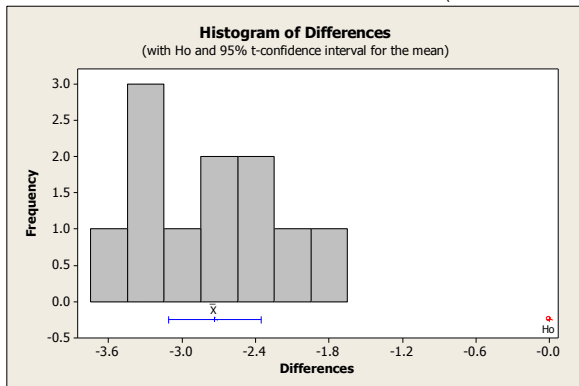
Paired T-Test and CI: CR, IND CR

Paired T for CR - IND CR

	N	Mean	StDev	SE Mean
CR	11	1.650	0.336	0.101
IND CR	11	4.387	0.583	0.176
Difference	11	-2.737	0.563	0.170

95% CI for mean difference: (-3.115, -2.359)

T-Test of mean difference = 0 (vs not = 0): T-Value = -16.12 P-Value = 0.000



XEROX Liquidity Ratios

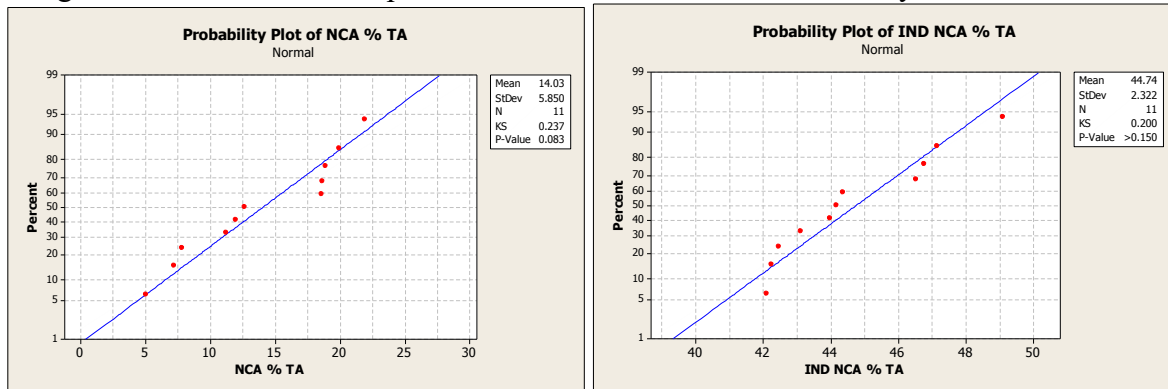
Net Current Assets % TA

Net Current Assets expressed as a percentage of Total Assets. Current assets are anything of value that is highly liquid. Liquid assets would include cash (and equivalents), stocks, bonds and bank deposits. The net liquid assets show how much of a company's liquid assets would be left if all current liabilities were paid off.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



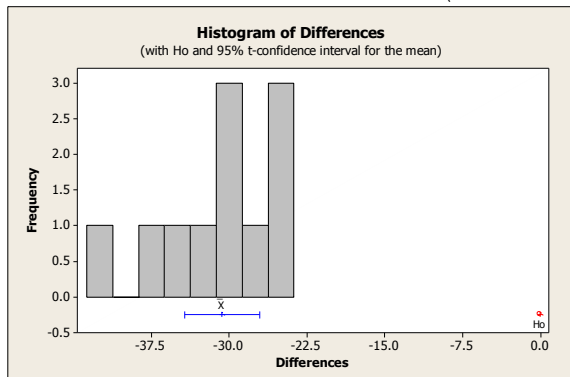
Paired T-Test and CI: NCA % TA, IND NCA % TA

Paired T for NCA % TA - IND NCA % TA

	N	Mean	StDev	SE Mean
NCA % TA	11	14.03	5.85	1.76
IND NCA % TA	11	44.74	2.32	0.70
Difference	11	-30.70	5.39	1.62

95% CI for mean difference: (-34.32, -27.08)

T-Test of mean difference = 0 (vs not = 0): T-Value = -18.90 P-Value = 0.000



XEROX Debt Management Ratios

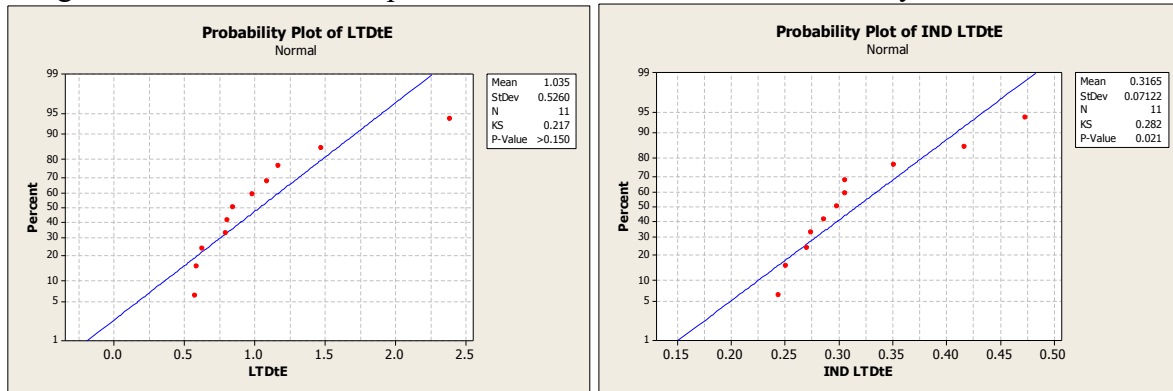
LT Debt to Equity (Lower is Better)

LT Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: LTDtE, IND LTDtE

Paired test for LTDtE - IND LTDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	66.0	0.004	0.6082

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	0.608	95.5	0.436	1.188

XEROX Debt Management Ratios

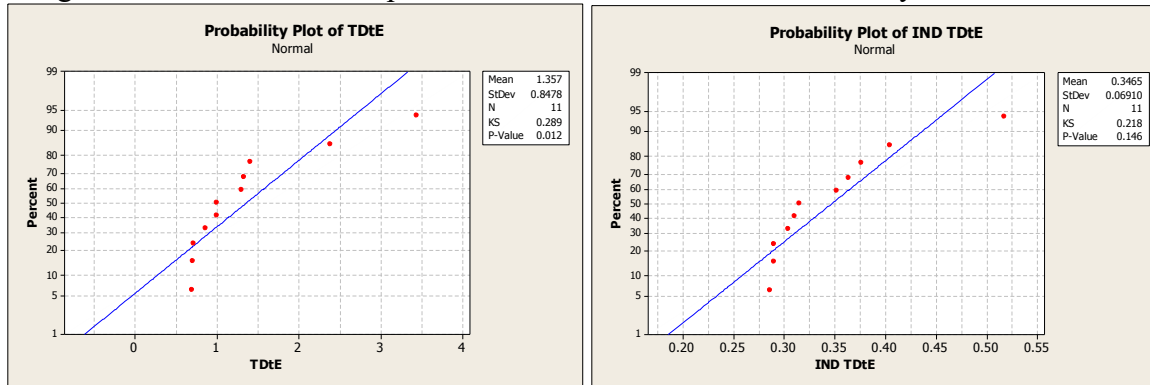
Total Debt to Equity (Lower is Better)

Total Debt (external funding) compared with Equity funding. It indicates what proportion of equity and debt the company is using to finance its assets. A high debt/equity ratio generally means that a company has been aggressive in financing its growth with debt. This can result in volatile earnings as a result of the additional interest expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: TDtE, IND TDtE

Paired test for TDtE - IND TDtE

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	66.0	0.004	0.7660

	N	Estimated Median	Achieved Confidence	Confidence Interval Lower	Confidence Interval Upper
Difference	11	0.77	95.5	0.55	1.78

XEROX Debt Management Ratios

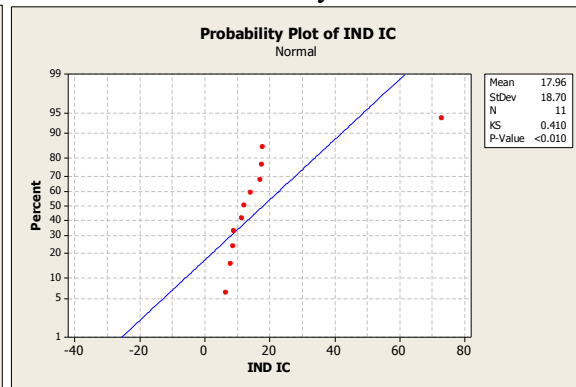
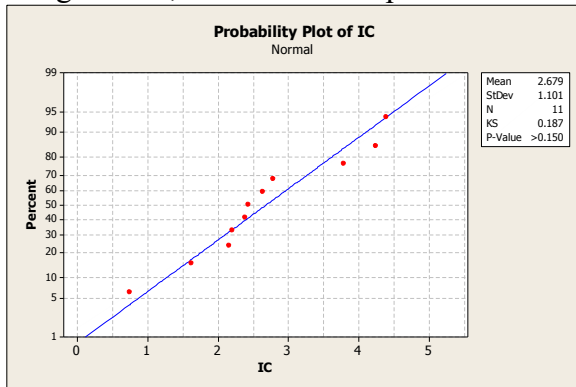
Interest Coverage

How many times Interest Expense is covered by Operating Income. A ratio used to determine how easily a company can pay interest on outstanding debt. The lower the ratio, the more the company is burdened by debt expense.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: IC, IND IC

Paired test for IC - IND IC

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated
Difference	11	11	0.0	0.004	-10.34

	N	Estimated	Achieved	Confidence Interval	
		Median	Confidence	Lower	Upper
Difference	11	-10.3	95.5	-37.9	-7.2

XEROX Asset Management Ratios

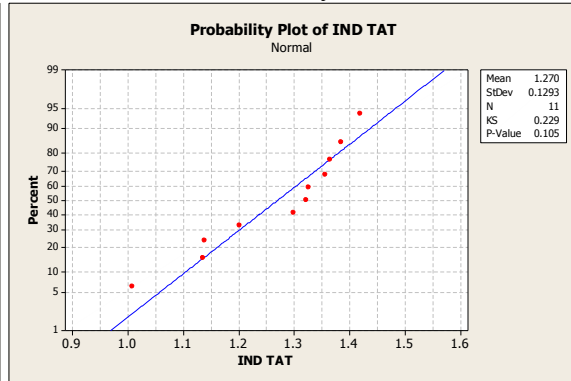
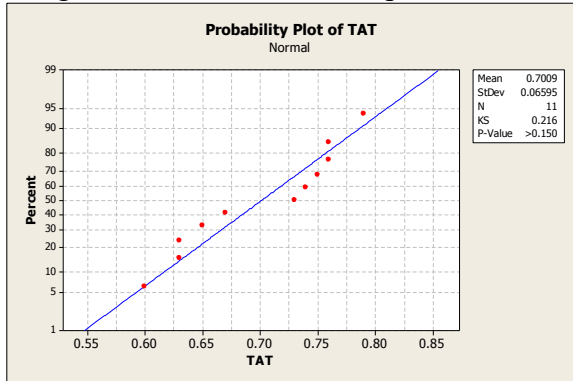
Total Asset Turnover

Annualized Revenue divided by Average Total Assets. The amount of sales or revenues generated per dollar of assets. The Asset Turnover ratio is an indicator of the efficiency with which a company is deploying its assets.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



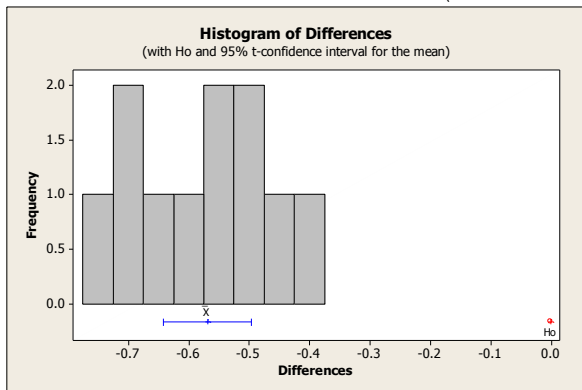
Paired T-Test and CI: TAT, IND TAT

Paired T for TAT - IND TAT

	N	Mean	StDev	SE Mean
TAT	11	0.7009	0.0659	0.0199
IND TAT	11	1.2699	0.1293	0.0390
Difference	11	-0.5690	0.1083	0.0327

95% CI for mean difference: (-0.6417, -0.4962)

T-Test of mean difference = 0 (vs not = 0): T-Value = -17.42 P-Value = 0.000



XEROX Asset Management Ratios

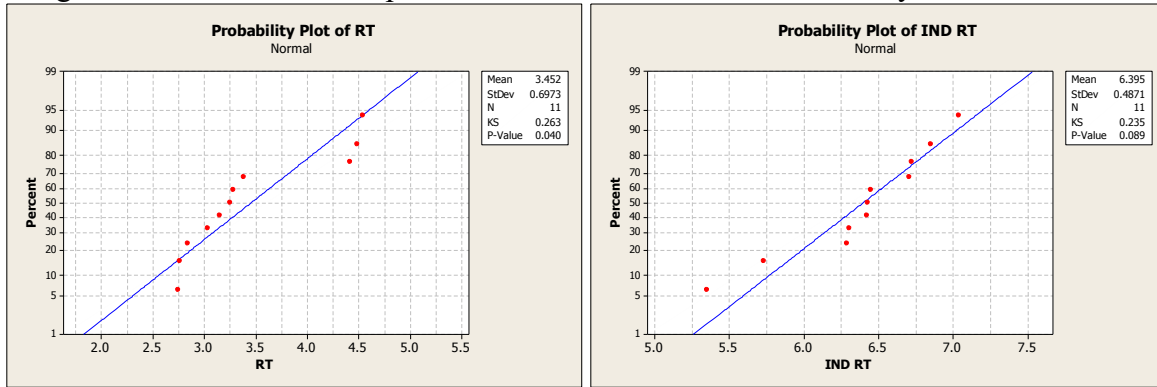
Receivables Turnover

Annualized Revenue divided by Average Receivables (ST). This is an accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. A high ratio implies either that a company operates on a cash basis or that its extension of credit and collection of accounts receivable is efficient.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



Wilcoxon Signed Rank: RT, IND RT

Paired test for RT - IND RT

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	0.0	0.004	-2.942

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	-2.942	95.5	-3.272	-2.635

XEROX Asset Management Ratios

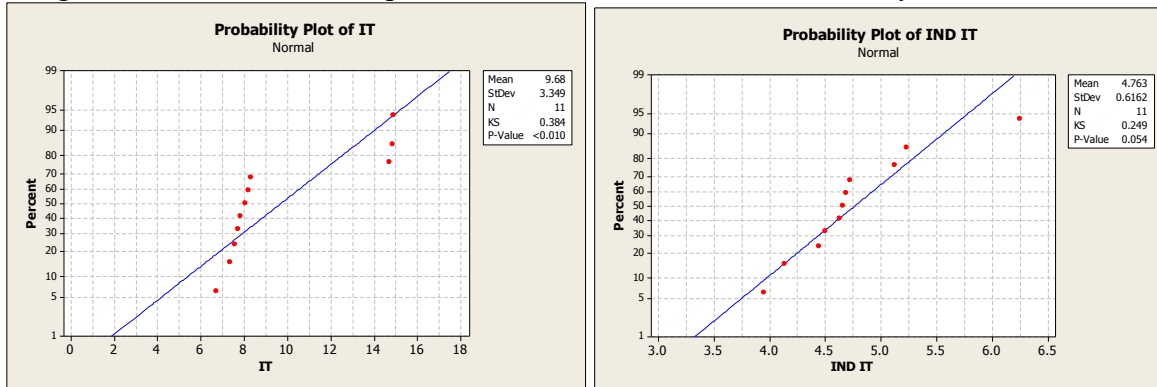
Inventory Turnover

Annualized Cost of Sales divided by Average Inventories. A ratio showing how many times a company's inventory is sold and replaced over a period. This ratio should be compared against industry averages. A low turnover implies poor sales and, therefore, excess inventory. A high ratio implies either strong sales or ineffective buying, and opens the company up to trouble should prices begin to fall.

Normally Distributed? NO

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



Wilcoxon Signed Rank: IT, IND IT

Paired test for IT - IND IT

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Wilcoxon Statistic	P	Estimated Median
Difference	11	11	66.0	0.004	3.687

	N	Estimated Median	Achieved Confidence	Confidence Interval	
				Lower	Upper
Difference	11	3.69	95.5	3.10	6.63

XEROX Asset Management Ratios

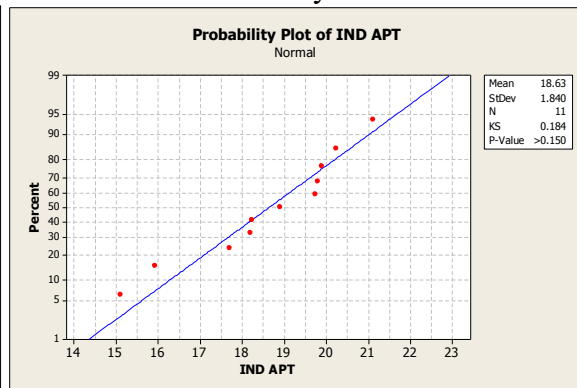
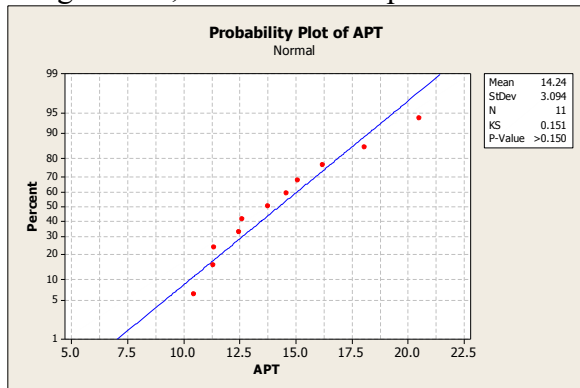
Accounts Payable Turnover

Annualized Revenue divided by Average Accounts Payable. A short-term liquidity measure used to quantify the rate at which a company pays off its suppliers. If the turnover ratio is falling from one period to another, this is a sign that the company is taking longer to pay off its suppliers than it was before. The opposite is true when the turnover ratio is increasing, which means that the company is paying of suppliers at a faster rate.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



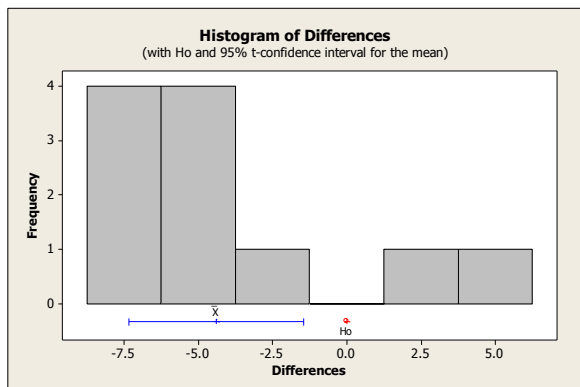
Paired T-Test and CI: APT, IND APT

Paired T for APT - IND APT

	N	Mean	StDev	SE Mean
APT	11	14.242	3.094	0.933
IND APT	11	18.635	1.840	0.555
Difference	11	-4.39	4.39	1.32

95% CI for mean difference: (-7.35, -1.44)

T-Test of mean difference = 0 (vs not = 0): T-Value = -3.32 P-Value = 0.008



XEROX Asset Management Ratios

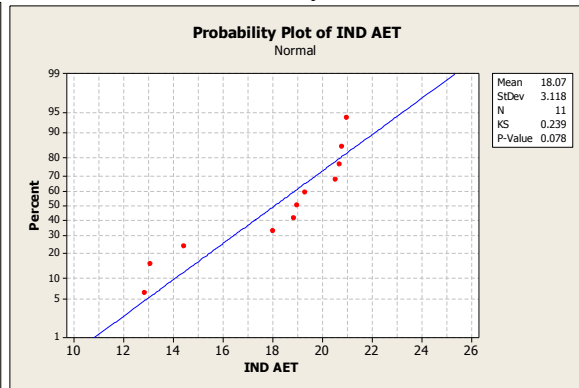
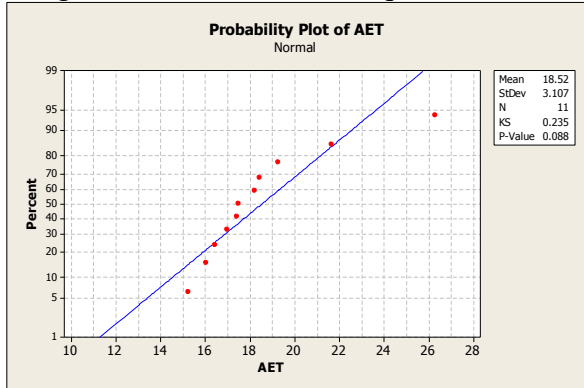
Accrued Expenses Turnover

Annualized Revenue divided by Average Accrued Expenses. The rate at which the company is paying off accrued expenses such as wages, interest, taxes.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



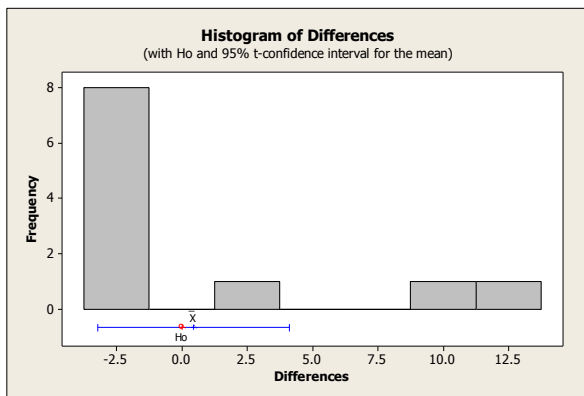
Paired T-Test and CI: AET, IND AET

Paired T for AET - IND AET

	N	Mean	StDev	SE Mean
AET	11	18.519	3.107	0.937
IND AET	11	18.065	3.118	0.940
Difference	11	0.45	5.45	1.64

95% CI for mean difference: (-3.21, 4.12)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.28 P-Value = 0.788



XEROX Asset Management Ratios

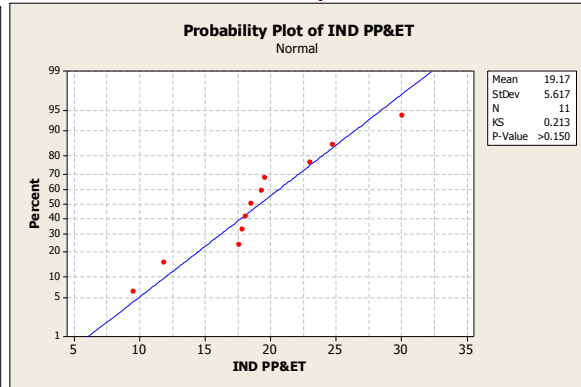
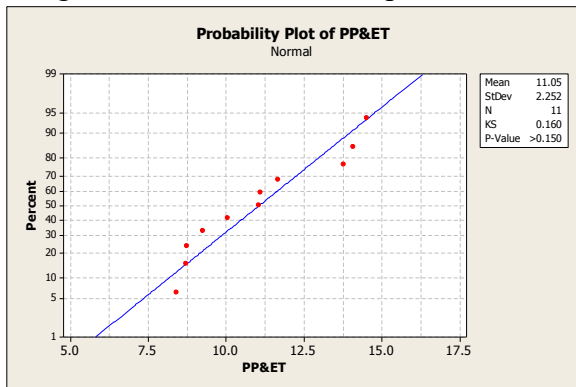
Property Plant & Equip Turnover

Annualized Revenue divided by Average Net Property Plant & Equipment. The rate at which a company generates revenue from fixed assets such as buildings, vehicles, and machinery. The higher the PPE Turnover, the more efficient companies are with their capital investments.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? WORSE



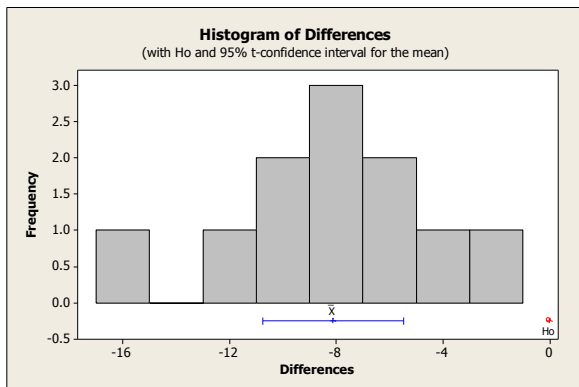
Paired T-Test and CI: PP&ET, IND PP&ET

Paired T for PP&ET - IND PP&ET

	N	Mean	StDev	SE Mean
PP&ET	11	11.05	2.25	0.68
IND PP&ET	11	19.17	5.62	1.69
Difference	11	-8.12	3.93	1.18

95% CI for mean difference: (-10.76, -5.48)

T-Test of mean difference = 0 (vs not = 0): T-Value = -6.86 P-Value = 0.000



XEROX Asset Management Ratios

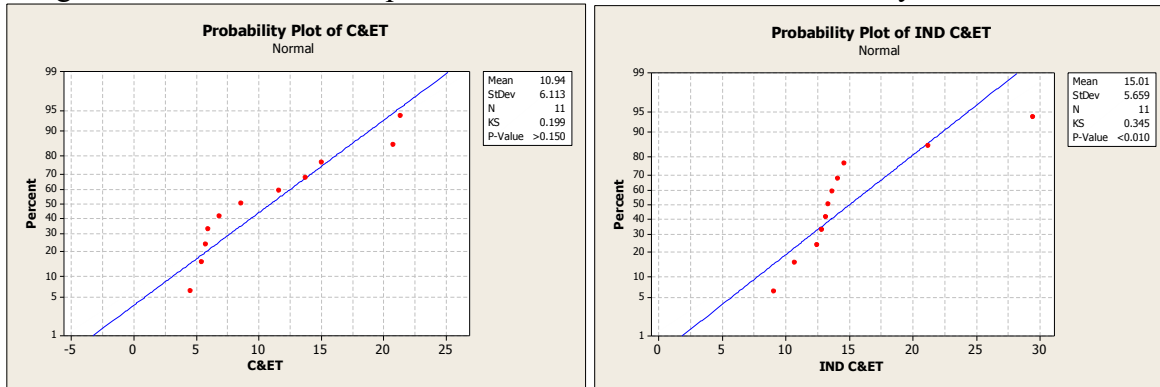
Cash & Equivalents Turnover

Annualized Revenue divided by Average Cash & Equivalents. Cash & Equivalents refers to company's assets that are cash or can be converted into cash immediately. Examples of cash and cash equivalents are bank accounts, marketable securities and Treasury bills. Measures the rate at which a company goes through its cash cycles.

Normally Distributed? NO

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



Wilcoxon Signed Rank: C&ET, IND C&ET

Paired test for C&ET - IND C&ET

Test of median = 0.000000 versus median not = 0.000000

	N	Test	Statistic	P	Estimated Median
Difference	11	11	19.0	0.230	-3.838

	N	Estimated Median	Achieved Confidence	Confidence Interval
Difference	11	-3.8	95.5	-11.5 3.0

XEROX Per Share Ratios

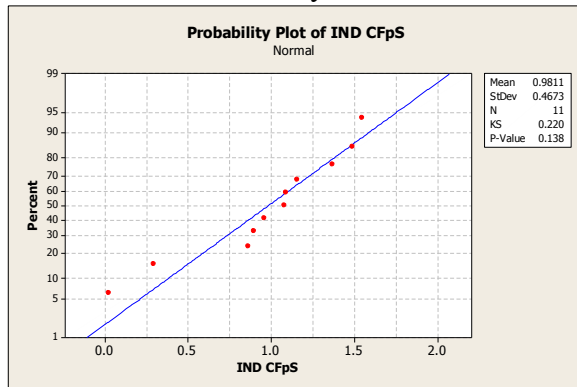
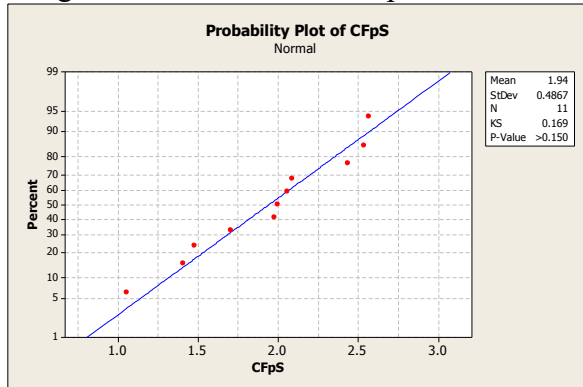
Cash Flow per Share

The Cash Flow from Operations attributable to each Basic Weighted Average Common Share over the period. A measure of a firm's financial strength. A company's earnings per share is the portion of a company's profit that is allocated to each outstanding share of common stock, and, like cash flow per share, serves as an indicator of a company's profitability.

Normally Distributed? YES

Statistically Significant? YES

If significant, did the Winner perform better or worse than the Industry? BETTER



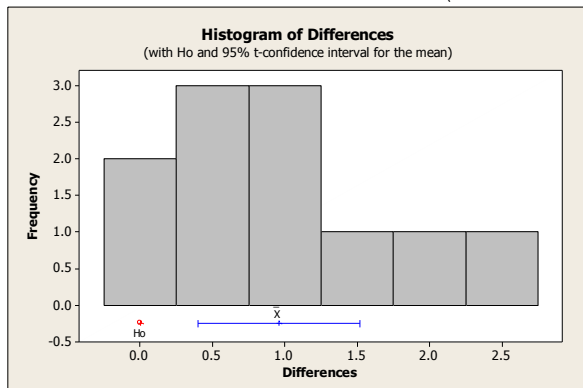
Paired T-Test and CI: CFpS, IND CFpS

Paired T for CFpS - IND CFpS

	N	Mean	StDev	SE Mean
CFpS	11	1.940	0.487	0.147
IND CFpS	11	0.981	0.467	0.141
Difference	11	0.959	0.836	0.252

95% CI for mean difference: (0.397, 1.521)

T-Test of mean difference = 0 (vs not = 0): T-Value = 3.80 P-Value = 0.003



XEROX Per Share Ratios

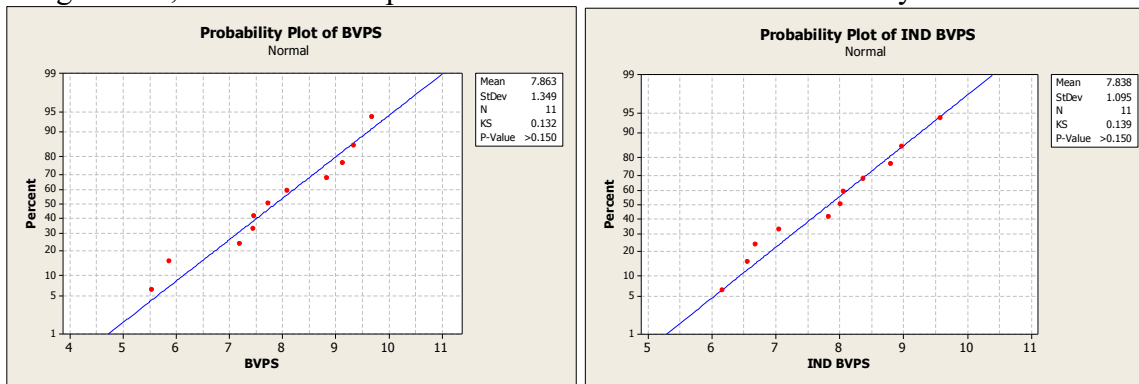
Book Value per Share

The Net Assets attributable to each outstanding Common Share. A measure used by owners of common shares in a firm to determine the level of safety associated with each individual share after all debts are paid accordingly. Should the company decide to dissolve, the book value per common indicates the dollar value remaining for common shareholders after all assets are liquidated and all debtors are paid. In simple terms it would be the amount of money that a holder of a common share would get if a company were to liquidate.

Normally Distributed? YES

Statistically Significant? NO

If significant, did the Winner perform better or worse than the Industry?



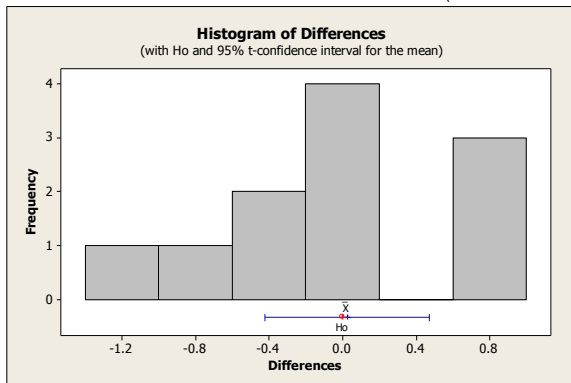
Paired T-Test and CI: BVPS, IND BVPS

Paired T for BVPS - IND BVPS

	N	Mean	StDev	SE Mean
BVPS	11	7.863	1.349	0.407
IND BVPS	11	7.838	1.095	0.330
Difference	11	0.025	0.664	0.200

95% CI for mean difference: (-0.421, 0.471)

T-Test of mean difference = 0 (vs not = 0): T-Value = 0.12 P-Value = 0.903



APPENDIX I: POST-HOC OUTLIER ANALYSIS AND REMOVAL EFFECTS

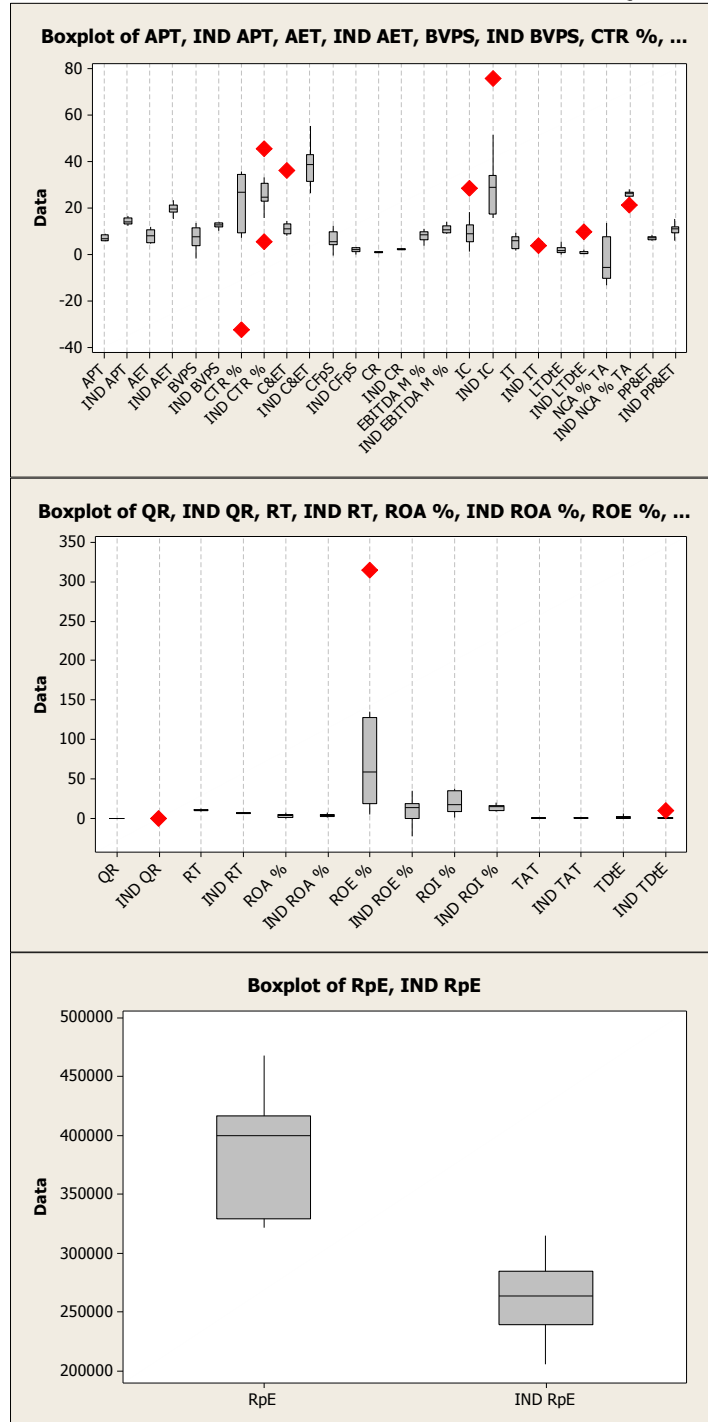
The following pages outline the specific financial results of the 15 award-winning companies that were used for Research Question #3 *after outliers were removed*. These companies include Boeing (BA), Caterpillar (CAT), Eastman Chemical (EMN), Federal Express (FDX), Corning (GLW), Honeywell (HON), International Business Machines (IBM), Lockheed Martin (LMT), Marriott (parent company for Ritz-Carlton, MAR), 3M (MMM), Motorola (MSI), Raytheon (RTN), Verizon (VZ), Wabtec (acquired Westinghouse, WAB) and Xerox (XRX).

Ratios being tested for each company include (in alphabetical order): Accounts Payable Turnover, Accrued Expenses Turnover, Book Value per Share, Calculated Tax Rate %, Cash & Equivalents Turnover, Cash Flow per Share, Current Ratio, EBITDA Margin %, Interest Coverage, Inventory Turnover, LT Debt to Equity, Net Current Assets % TA, Property Plant & Equip Turnover, Quick Ratio, Receivables Turnover, Revenue per Employee, ROA % (Net), ROE % (Net), ROI % (Operating) Total Asset Turnover, and Total Debt to Equity.

The Statistical Software being used to conduct this analysis is Minitab. For all tests conducted: H_0 : The mean difference between paired observations in the population is zero. H_1 : The mean difference between paired observations in the population is not zero. The statistical tests conducted included a Normality Test for Winner & Industry Ratio ($p > .05$ = normally distributed). If both pairs of data were normally distributed, a paired T-Test was conducted, if one or more of the data sets were not normally distributed, a Wilcoxon Signed Rank Test for Paired Data was conducted.

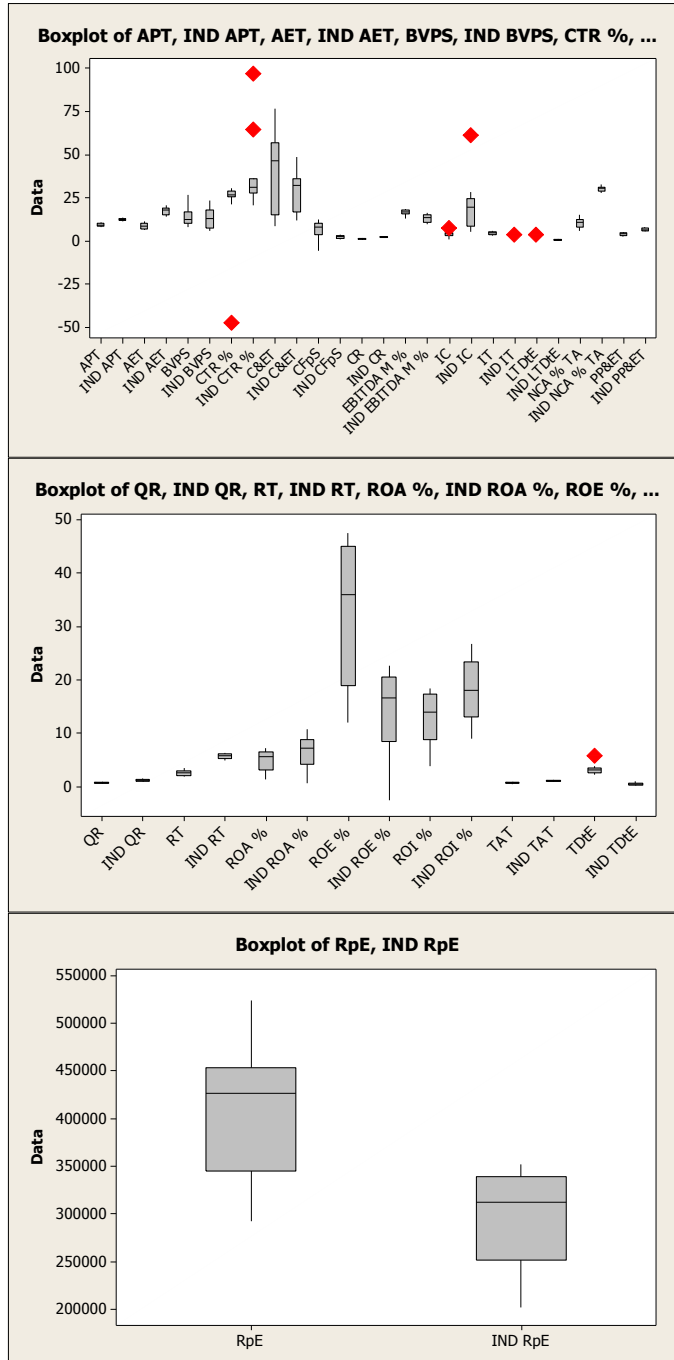
Outlier Identification for BOEING

Outliers were evident for CTR, C&ET, IC, IT, LTDtE, NCA %TA, QR, ROE% TDTE.



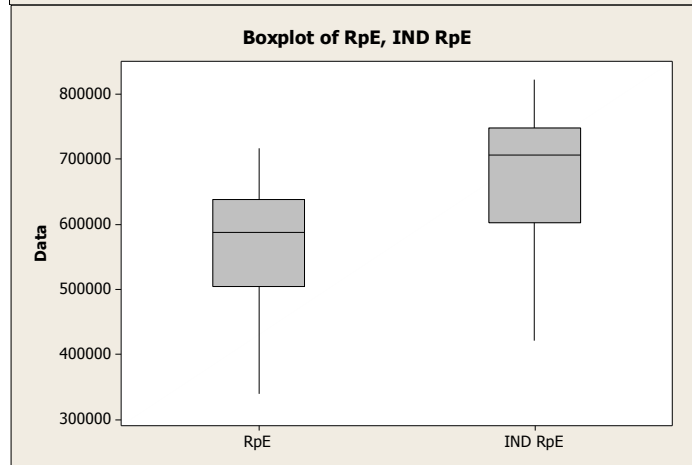
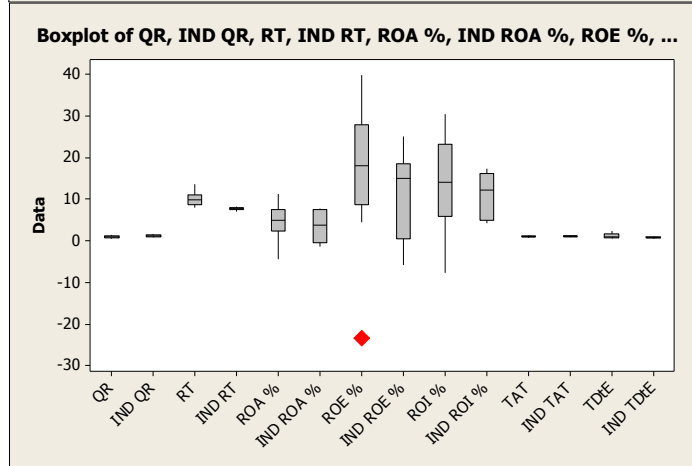
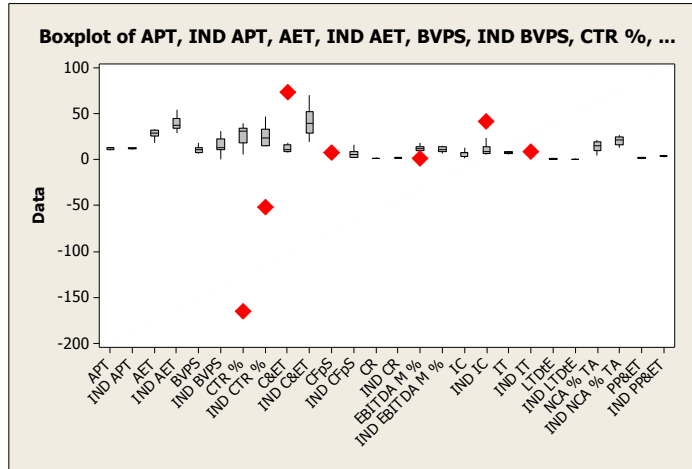
Outlier Identification for CATERPILLAR

Outliers were evident for CTR%, IC, IT, LTDtE, TDtE



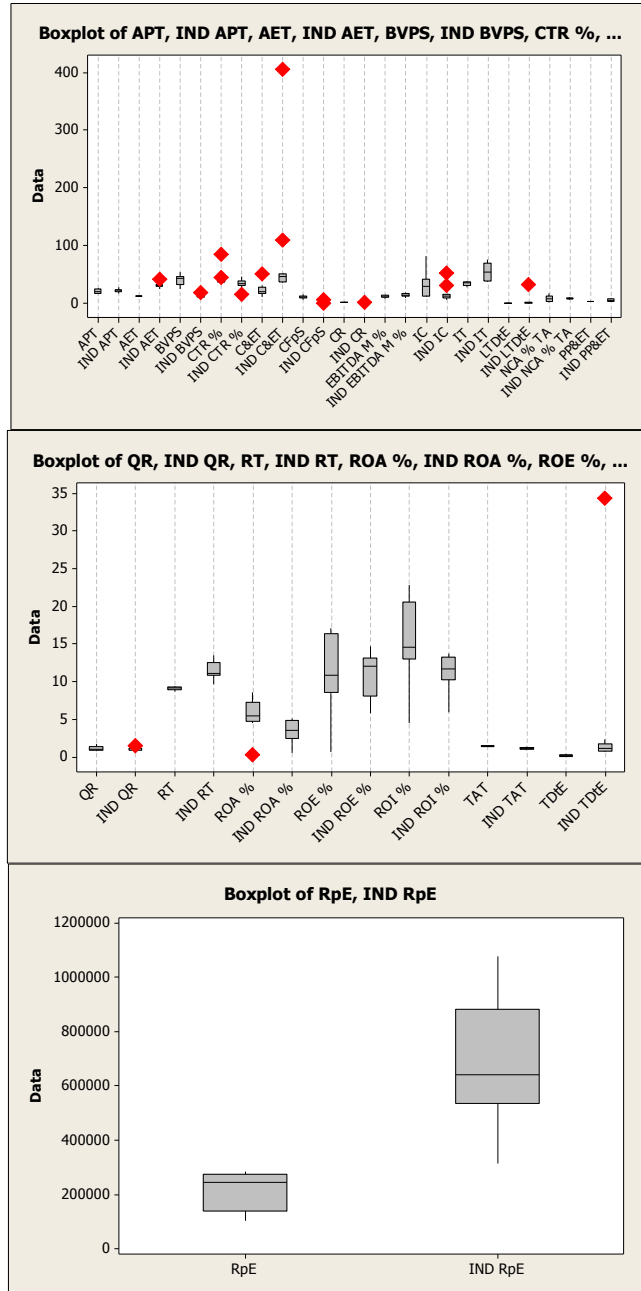
Outlier Identification for EASTMAN

Outliers were evident for CTR, C&ET, CFPS, EBITDA M%, IC, IT, ROE%.



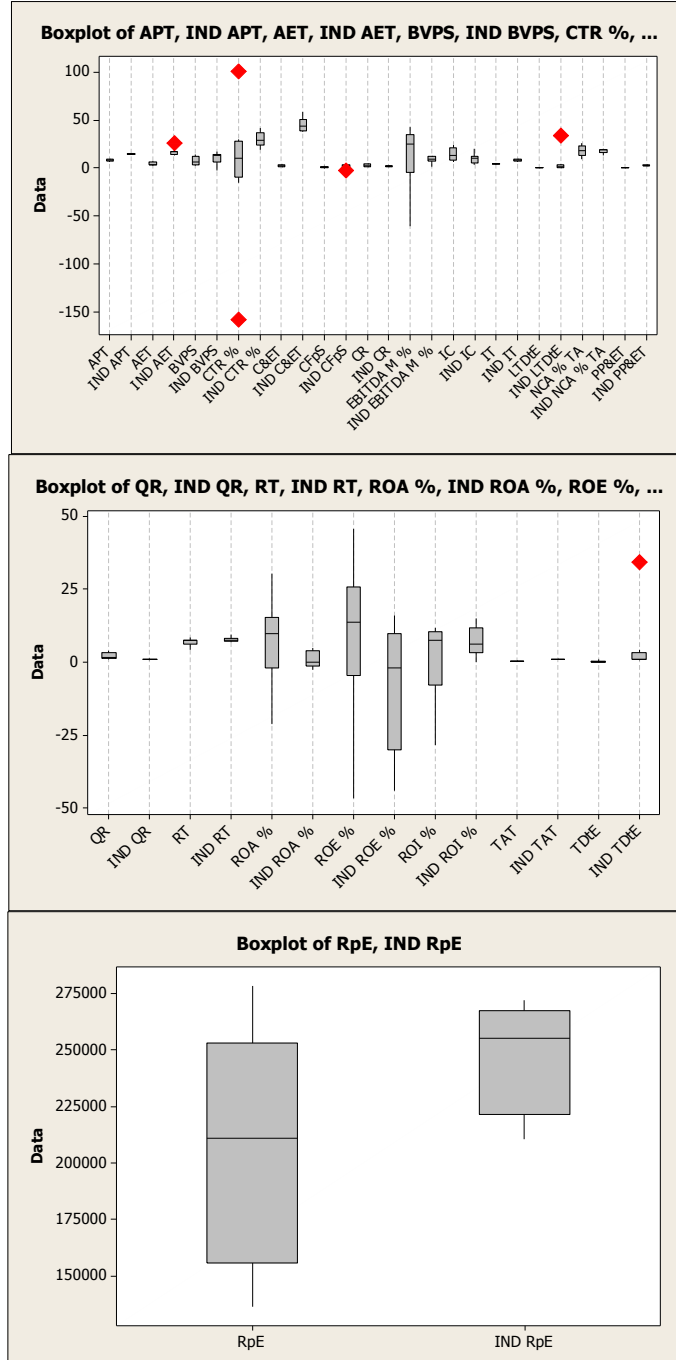
Outlier Identification for FEDEX

Outliers were evident in AET, BVPS, ETR, C&ET, CFPS, CR, IC, LTDtE, QR, ROA, TDtE



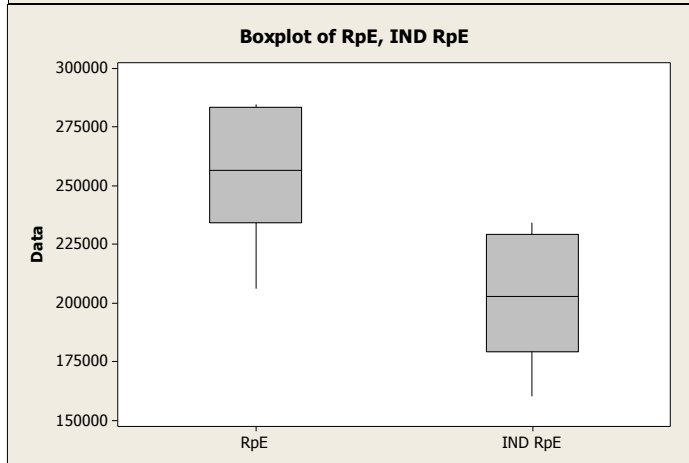
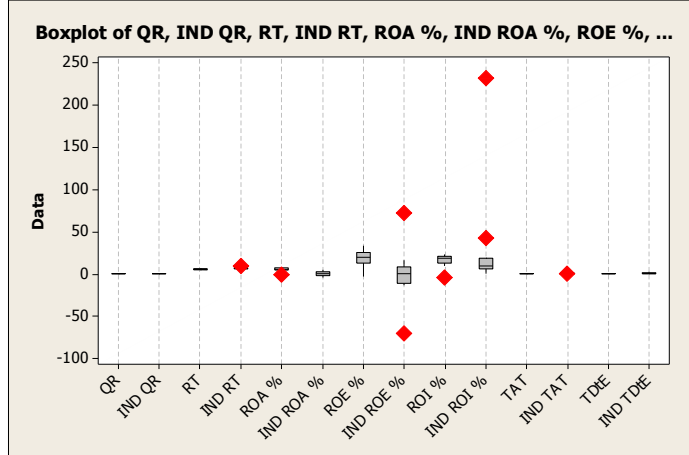
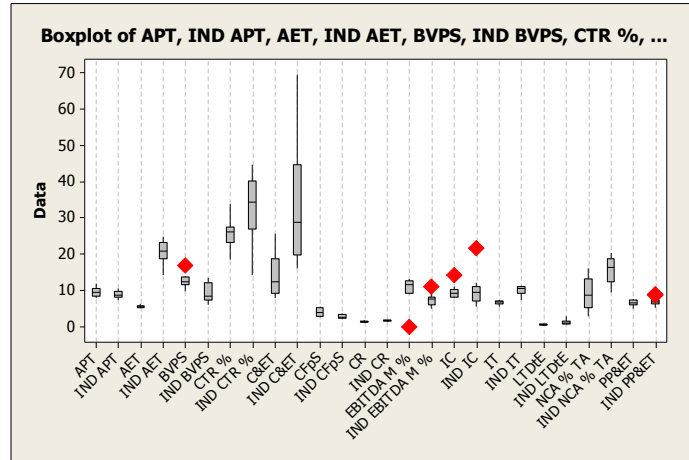
Outlier Identification for CORNING

Outliers were identified for AET, CTR, CFpS, LTDtE, TDtE.



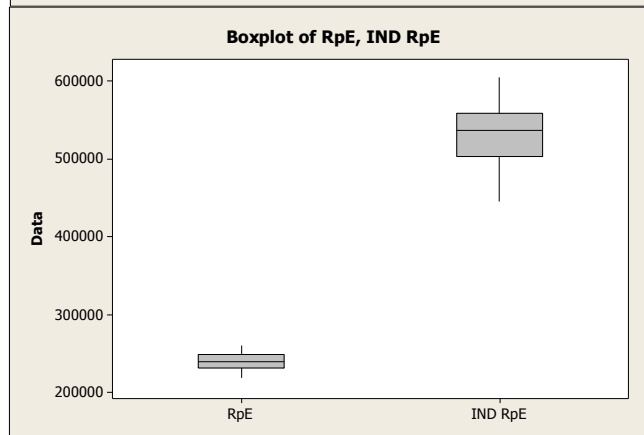
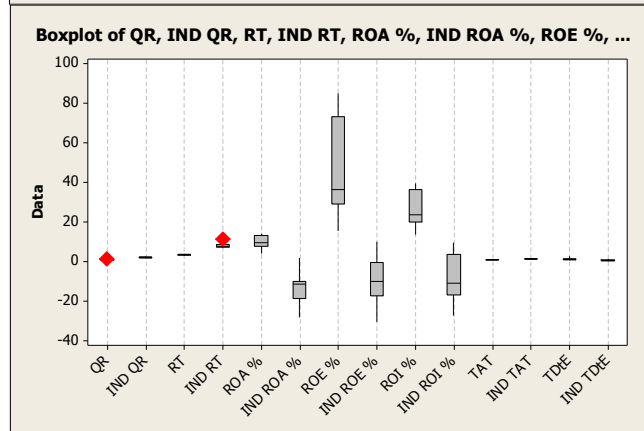
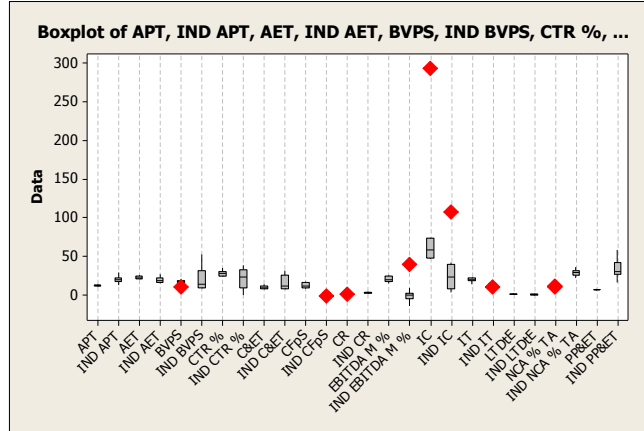
Outlier Identification for HONEYWELL

Outliers were evident for: BVPS, EBITDA M%, IC, PP&T, RT, ROA, ROE, ROI, TAT



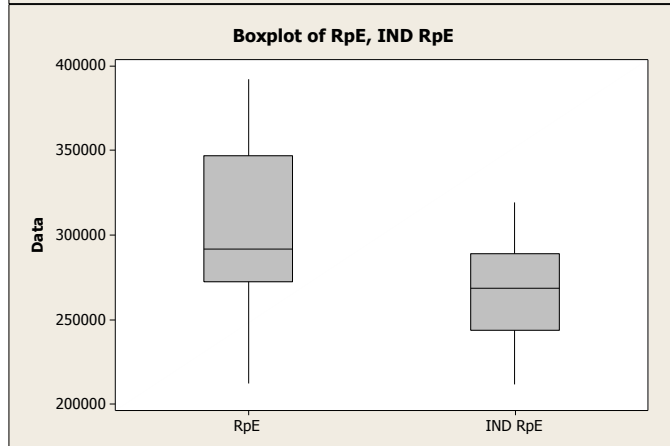
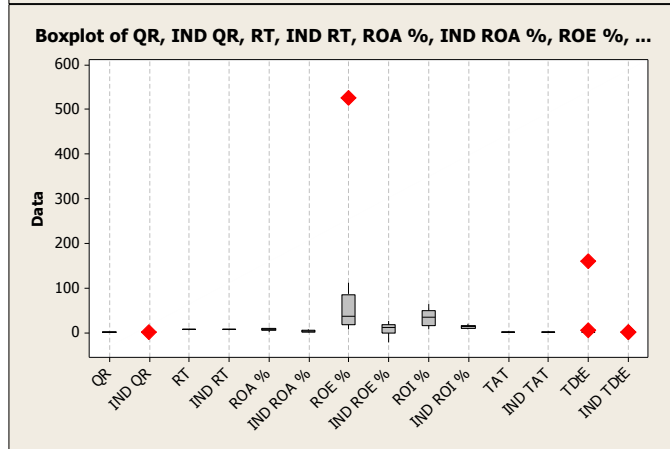
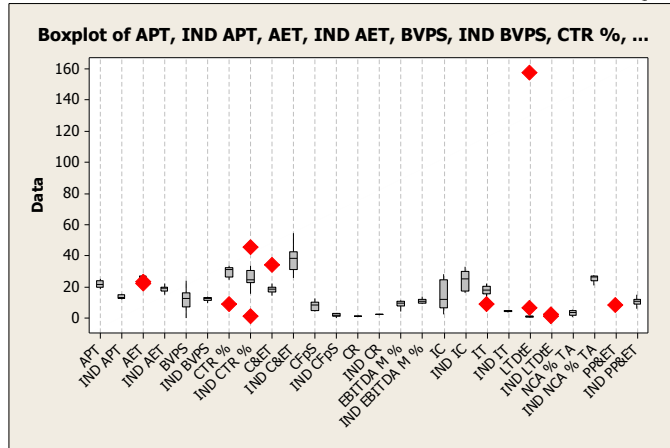
Outlier Identification for IBM

Outliers identified include: BVPS, CFPS, CR, EBITDA, IC, IT, NCA %TA, QR, RT



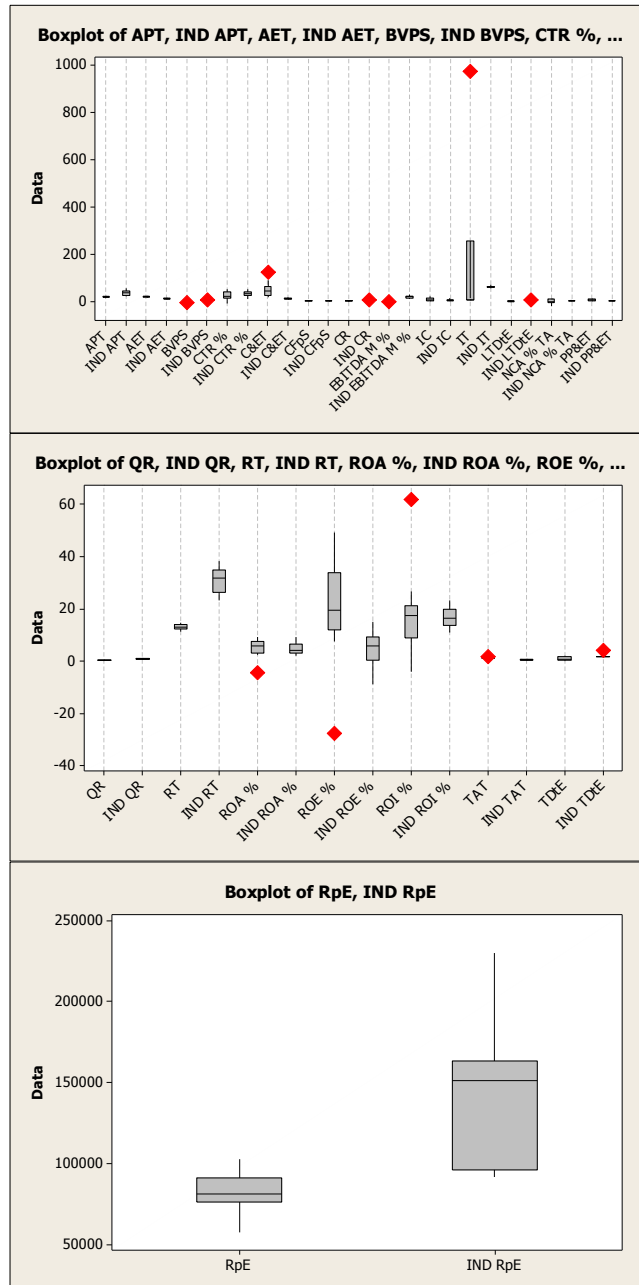
Outlier Identification for LOCKHEED MARTIN

Outliers identified include: AET, CTR%, C&ET, IT, LTDtE, PP&ET, QR, ROE, TDtE



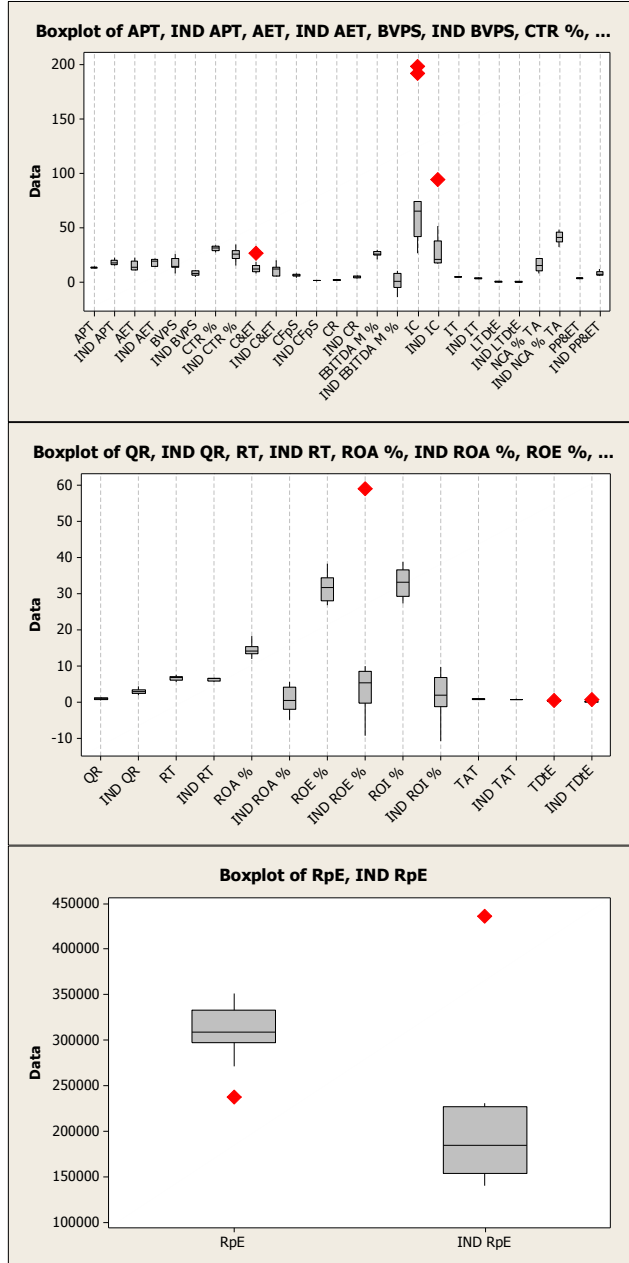
Outlier Identification for MARRIOTT

Outliers were evident for BVPS, C&ET, CR, EBITDA M%, IT, LTDtE, ROA, ROE, ROI, TAT, TDtE



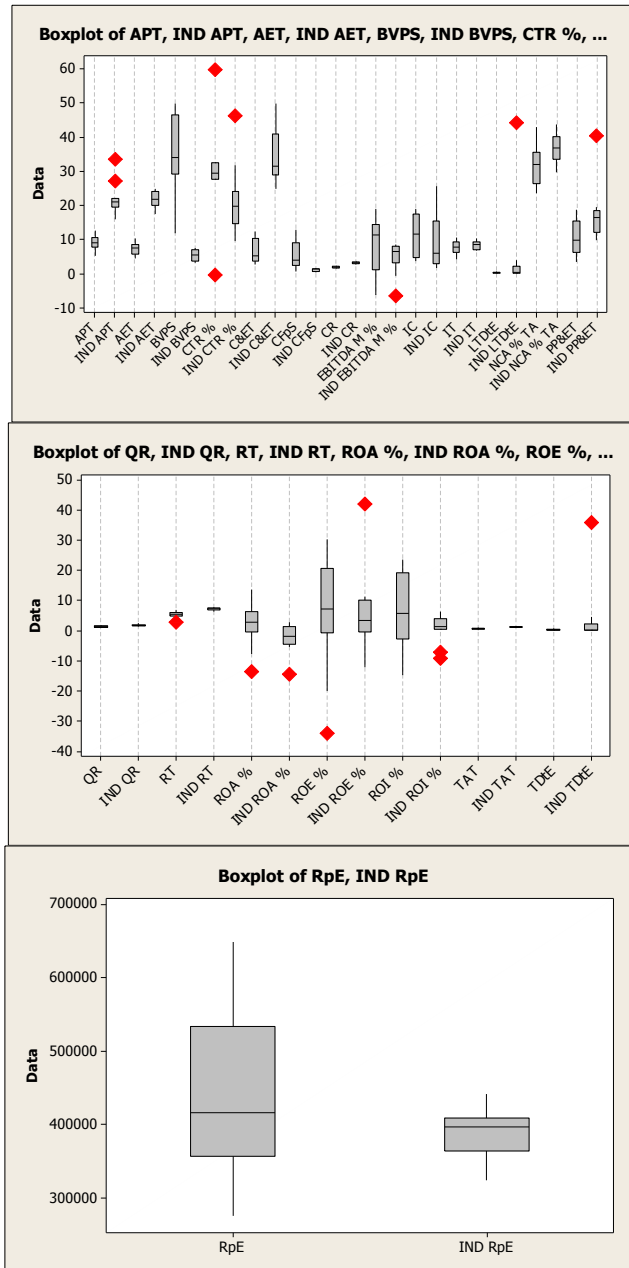
Outlier Identification for 3M

Outliers were evident for: C&ET, IC, ROE, TDtE, RpE



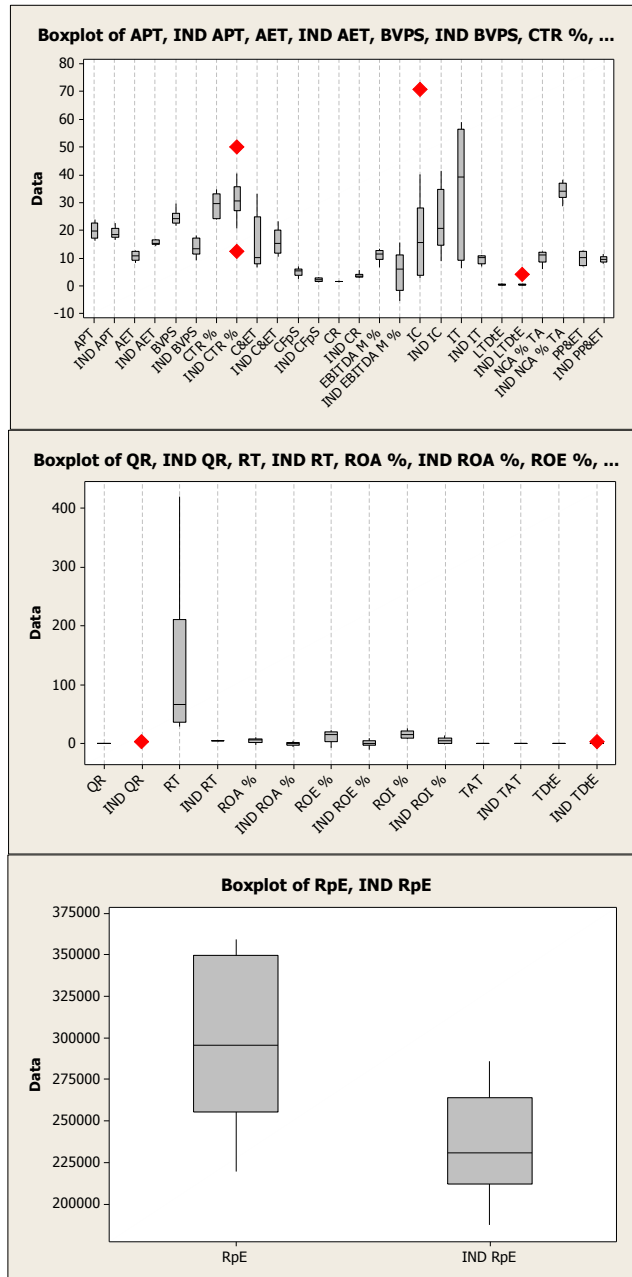
Outlier Identification for MOTOROLA

Outliers were evident for: APT, CTR%, EBITDA M%, LTDtE, PP&ET, RT, ROA, ROE, ROI, TDtE



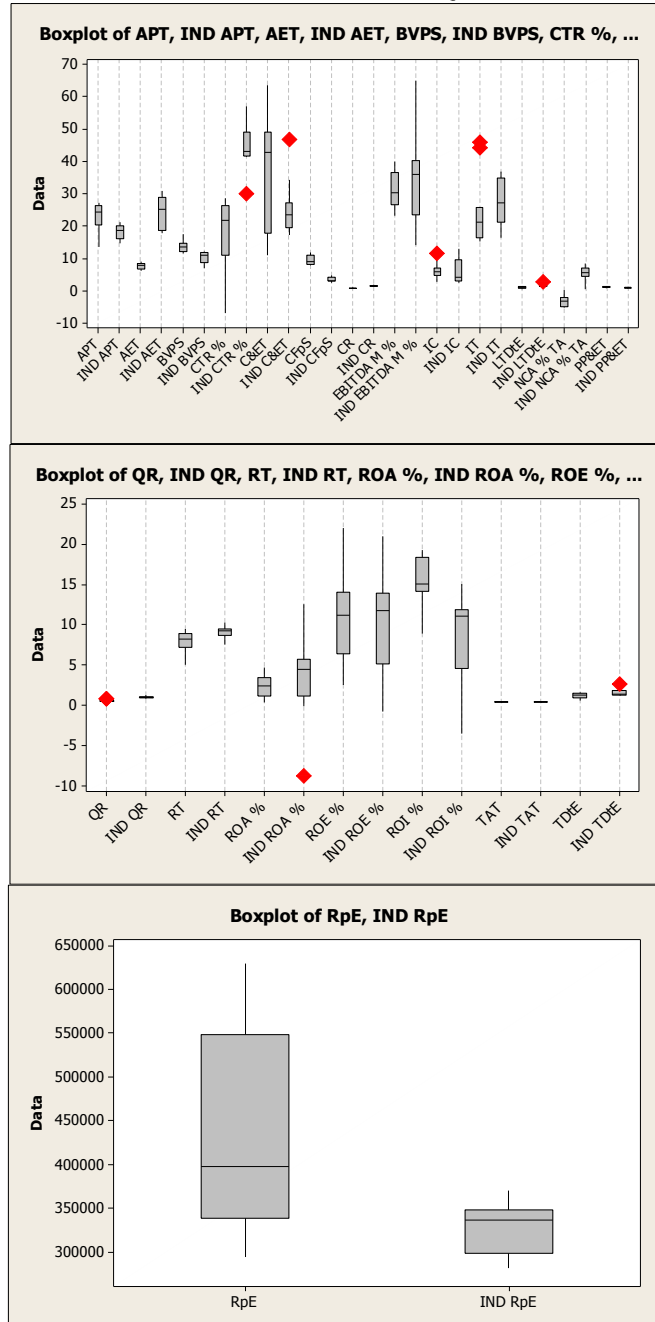
Outlier Identification for RAYTHEON

Outliers were evident for: CTR%, IC, LTDtE, QR, TDtE



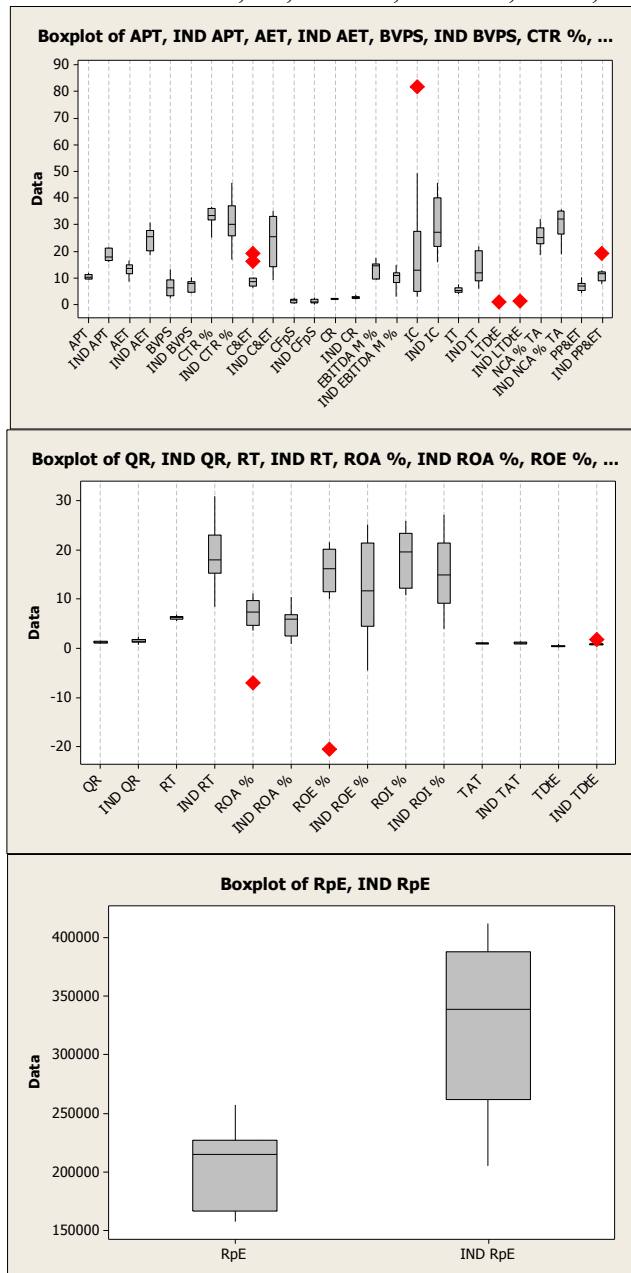
Outlier Identification for VERIZON

Outliers were evident for: CTR, C&ET, IC, IT, LTDtE, QR, ROA, TDtE



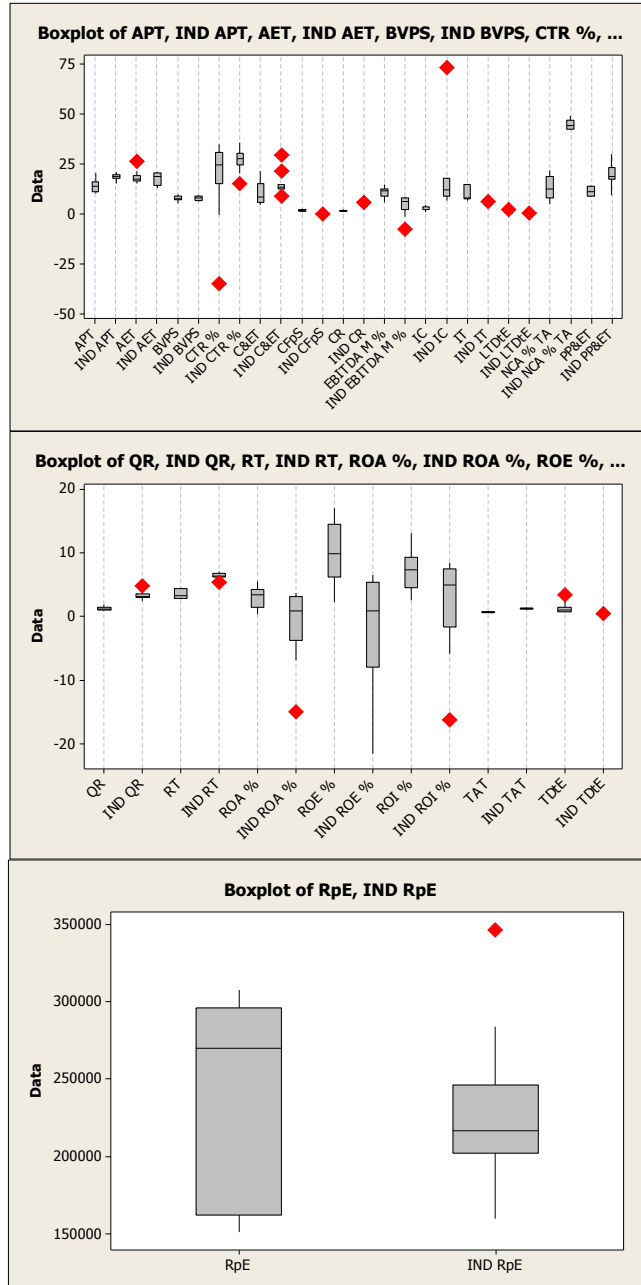
Outlier Identification for WABTEC

Outliers that were evident include: C&ET, IC, LTDtE, PP&ET, ROA, ROE, TDtE



Outlier Identification for XEROX

Outliers were evident for: AET, CTR, C&ET, CFpS, CR, EBITDA, IC, IT, LTDtE, QR, RT, ROA, ROI, TDtE, RpE



*****OUTLIER TRIMMING IDENTIFICATION*****												
Ratios	PROFITABILITY						LIQUIDITY			DEBT		
	ROA %	ROE %	ROI %	BITDA M %	CTR %	RpE	QR	CR	NCA % TA	LTDtE	TDtE	IC
BA		outliers			outliers		outliers		outliers	outliers	outliers	outliers
CAT					outliers					outliers	outliers	outliers
EMN		outliers		outliers	outliers							outliers
FDX	outliers				outliers		outliers	outliers		outliers	outliers	outliers
GLW					outliers					outliers	outliers	
HON	outliers	outliers	outliers	outliers								outliers
IBM				outliers			outliers	outliers	outliers			outliers
LMT		outliers			outliers		outliers			outliers	outliers	
MAR	outliers	outliers	outliers	outliers				outliers		outliers	outliers	
MMM		outliers				outliers					outliers	outliers
MSI	outliers	outliers	outliers	outliers	outliers					outliers	outliers	
RTN					outliers		outliers			outliers	outliers	outliers
VZ	outliers				outliers			outliers		outliers	outliers	outliers
WAB	outliers	outliers								outliers	outliers	outliers
XRX	outliers		outliers	outliers	outliers	outliers	outliers	outliers		outliers	outliers	outliers
SUM	7	8	4	6	10	2	6	5	2	11	12	11

*****OUTLIER TRIMMING IDENTIFICATION*****									
Ratios	ASSET							PER SHARE	
	TAT	RT	IT	APT	AET	PP&ET	C&ET	CFpS	BVPS
BA			outliers				outliers		
CAT			outliers						
EMN			outliers				outliers	outliers	
FDX					outliers		outliers	outliers	outliers
GLW					outliers			outliers	
HON	outliers	outliers				outliers			outliers
IBM		outliers	outliers					outliers	outliers
LMT			outliers		outliers	outliers	outliers		
MAR	outliers		outliers				outliers		outliers
MMM							outliers		
MSI		outliers		outliers		outliers			
RTN									
VZ			outliers				outliers		
WAB						outliers	outliers		
XRX		outliers	outliers		outliers		outliers	outliers	
SUM	2	4	8	1	4	4	9	5	4

	PROFITABILITY						LIQUIDITY			DEBT		
	ROA %	ROE %	ROI %	EBITDA M %	CTR %	RpE	QR	CR	NCA % TA	LTDtE	TDtE	IC
	Return on Assets	Return on Equity	Return on Investment	EBITDA Margin	Calculated Tax Rate	Revenue per Employee	Quick Ratio	Current Ratio	Net Current Assets % Total Assets	Long Term Debt to Equity	Total Debt to Equity	Interest Coverage
BA	NONE	BETTER	BETTER	WORSE	NONE	BETTER	WORSE	WORSE	WORSE	NONE	NONE	WORSE
CAT	WORSE	BETTER	WORSE	BETTER	NONE	BETTER	WORSE	WORSE	WORSE	WORSE	WORSE	WORSE
EMN	NONE	BETTER	NONE	NONE	NONE	WORSE	NONE	WORSE	WORSE	NONE	NONE	WORSE
FDX	BETTER	NONE	BETTER	WORSE	NONE	WORSE	NONE	NONE	NONE	BETTER	BETTER	BETTER
GLW	NONE	NONE	NONE	NONE	WORSE	WORSE	BETTER	NONE	NONE	BETTER	BETTER	NONE
HON	BETTER	BETTER	BETTER	BETTER	BETTER	BETTER	WORSE	WORSE	WORSE	BETTER	BETTER	NONE
IBM	BETTER	BETTER	BETTER	BETTER	NONE	WORSE	WORSE	WORSE	WORSE	WORSE	WORSE	BETTER
LMT	BETTER	BETTER	BETTER	WORSE	NONE	BETTER	WORSE	WORSE	WORSE	NONE	NONE	WORSE
MAR	NONE	BETTER	NONE	WORSE	NONE	WORSE	WORSE	WORSE	NONE	BETTER	BETTER	NONE
MMM	BETTER	BETTER	BETTER	BETTER	WORSE	BETTER	WORSE	WORSE	WORSE	NONE	WORSE	BETTER
MSI	BETTER	NONE	NONE	NONE	WORSE	NONE	WORSE	WORSE	NONE	NONE	NONE	NONE
RTN	BETTER	BETTER	BETTER	BETTER	NONE	BETTER	WORSE	WORSE	WORSE	NONE	NONE	NONE
VZ	WORSE	NONE	BETTER	NONE	BETTER	BETTER	WORSE	WORSE	WORSE	BETTER	BETTER	NONE
WAB	NONE	BETTER	NONE	BETTER	NONE	WORSE	WORSE	WORSE	WORSE	BETTER	BETTER	WORSE
XRX	BETTER	BETTER	BETTER	BETTER	NONE	NONE	WORSE	WORSE	WORSE	WORSE	WORSE	WORSE

	ASSET							PER SHARE	
	TAT	RT	IT	APT	AET	PP&ET	C&ET	CFpS	BVPS
	Total Asset Turnover	Recvbls Turnover	Inventory Turnover	Accts Payable Turnover	Accrued Expenses Turnover	Property, Plant, Equip Turnover	Cash & Equiv Turnover	Cash Flow Per Share	Book Value Per Share
BA	NONE	BETTER	NONE	WORSE	WORSE	WORSE	WORSE	BETTER	WORSE
CAT	WORSE	WORSE	NONE	WORSE	WORSE	WORSE	NONE	BETTER	NONE
EMN	WORSE	BETTER	NONE	NONE	WORSE	WORSE	WORSE	NONE	NONE
FDX	BETTER	WORSE	WORSE	NONE	WORSE	WORSE	WORSE	BETTER	BETTER
GLW	WORSE	NONE	WORSE	WORSE	WORSE	WORSE	WORSE	WORSE	NONE
HON	WORSE	WORSE	WORSE	BETTER	WORSE	NONE	WORSE	BETTER	BETTER
IBM	WORSE	WORSE	BETTER	WORSE	BETTER	WORSE	WORSE	BETTER	NONE
LMT	BETTER	BETTER	BETTER	BETTER	BETTER	NONE	WORSE	BETTER	NONE
MAR	BETTER	WORSE	NONE	WORSE	BETTER	BETTER	BETTER	WORSE	WORSE
MMM	BETTER	BETTER	BETTER	WORSE	WORSE	WORSE	BETTER	BETTER	BETTER
MSI	WORSE	WORSE	NONE	WORSE	WORSE	WORSE	WORSE	BETTER	BETTER
RTN	NONE	BETTER	BETTER	NONE	WORSE	NONE	NONE	BETTER	BETTER
VZ	NONE	WORSE	WORSE	BETTER	WORSE	BETTER	NONE	BETTER	BETTER
WAB	NONE	WORSE	WORSE	WORSE	WORSE	WORSE	WORSE	NONE	NONE
XRX	WORSE	WORSE	BETTER	WORSE	NONE	WORSE	NONE	BETTER	NONE

*****OVERALL RESULTS NOT CHANGED AFTER OUTLIER ANALYSIS (Ref. Chapter 4)*****						
	Better	Worse	None	OVERALL	Sector	Industry
BA	24%	48%	29%	WORSE	Industrial Goods	Aerospace/Defense Products & Services
CAT	19%	62%	19%	WORSE	Industrial Goods	Farm & Construction Machinery
EMN	10%	38%	52%	NONE	Basic Materials	Chemicals - Major Diversified
FDX	38%	33%	29%	BETTER	Services	Air Delivery & Freight Services
GLW	14%	43%	43%	NONE	Technology	Diversified Electronics
HON	52%	38%	10%	BETTER	Industrial Goods	Diversified Machinery
IBM	38%	52%	10%	WORSE	Technology	Information Technology Services
LMT	48%	29%	24%	BETTER	Industrial Goods	Aerospace/Defense Products & Services
MAR	33%	38%	29%	WORSE	Services	Lodging
MMM	57%	38%	5%	BETTER	Industrial Goods	Diversified Machinery
MSI	14%	43%	43%	NONE	Technology	Communication Equipment
RTN	43%	19%	38%	BETTER	Industrial Goods	Aerospace/Defense Products & Services
VZ	43%	33%	24%	BETTER	Technology	Telecom Services - Domestic
WAB	19%	52%	29%	WORSE	Services	Railroads
XRX	29%	48%	24%	WORSE	Technology	Information Technology Services

*****TYPE OF STATISTICAL TEST USED*****												
	PROFITABILITY						LIQUIDITY			DEBT		
Ratios	ROA %	ROE %	ROI %	EBITDA M %	CTR %	RpE	QR	CR	NCA % TA	LTDtE	TDtE	IC
BA	PTT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT	PTT	WSRT	WSRT	PTT
CAT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT
EMN	PTT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT	PTT	WSRT	WSRT	WSRT
FDX	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	WSRT	PTT	PTT
GLW	PTT	PTT	WSRT	WSRT	PTT	PTT	WSRT	WSRT	PTT	WSRT	WSRT	PTT
HON	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT
IBM	PTT	PTT	PTT	PTT	PTT	PTT	WSRT	WSRT	WSRT	PTT	PTT	PTT
LMT	PTT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT	WSRT	PTT	WSRT	PTT
MAR	PTT	PTT	PTT	PTT	PTT	PTT	PTT	WSRT	PTT	WSRT	PTT	PTT
MMM	PTT	WSRT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	WSRT
MSI	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	WSRT	WSRT	WSRT
RTN	PTT	PTT	PTT	PTT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT	PTT
VZ	PTT	PTT	WSRT	PTT	PTT	PTT	WSRT	PTT	PTT	WSRT	WSRT	WSRT
WAB	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT
XRX	PTT	PTT	PTT	PTT	WSRT	PTT	WSRT	PTT	PTT	PTT	PTT	PTT

*****TYPE OF STATISTICAL TEST USED*****									
Ratios	ASSET							PER SHARE	
	TAT	RT	IT	APT	AET	PP&ET	C&ET	CFpS	BVPS
BA	WSRT	PTT	PTT	PTT	PTT	PTT	WSRT	PTT	PTT
CAT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT
EMN	PTT	PTT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT
FDX	WSRT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT
GLW	WSRT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT	WSRT
HON	PTT	PTT	WSRT	PTT	WSRT	PTT	WSRT	PTT	PTT
IBM	PTT	WSRT	PTT	PTT	WSRT	WSRT	WSRT	PTT	WSRT
LMT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT
MAR	PTT	PTT	WSRT	PTT	PTT	PTT	PTT	PTT	PTT
MMM	PTT	WSRT	PTT	PTT	PTT	WSRT	PTT	PTT	PTT
MSI	PTT	WSRT	PTT	PTT	PTT	PTT	WSRT	PTT	PTT
RTN	PTT	PTT	WSRT	PTT	PTT	PTT	WSRT	PTT	PTT
VZ	PTT	PTT	PTT	PTT	PTT	PTT	PTT	WSRT	PTT
WAB	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT	PTT
XRX	PTT	WSRT	WSRT	PTT	PTT	PTT	PTT	PTT	PTT

LIST OF REFERENCES

- 2011 Baldrige Impacts. (n.d.). Retrieved July 14, 2012, from National Institute of Standards and Technology:
[/url?sa=t&rct=j&q=2011+Baldrige+Impacts+NIST&source=web&cd=2&ved=0CGMQFjAB&url=http%3A%2F%2Fwww.baldrige.nist.gov%2FPowerPoint_Files%2F2012_Program_Impacts.pptx&ei=KKACUMHzA-eG2gXssJGxCw&usg=AFQjCNGZMtQAsTUy9kO6LZ2-XbzbolqqMQ](http://www.baldrige.nist.gov/PowerPoint_Files/2012_Program_Impacts.pptx)
- Andreou, A. N., Green, A., & Stankosky, M. (2007). A Framework of Intangible Valuation Areas and Antecedents. *Journal of Intellectual Capital*, 52-75.
- Anonymous. (2011). Climb to the Top. *Quality Progress*, 40.
- Anonymous. (2011). Healthy Returns. *Quality Progress*, 16.
- Ardalan, K. (2001). On Finance Textbooks Treatment of the Goal of the Firm. *Proceedings of the Academy of Educational Leadership* (pp. 11-16). Nashville: Allied Academies International Conference.
- Ariyachandra, T. R., & Frolick, M. N. (2008). Critical Success Factors in Business Performance Management—Striving for Success. *Information Systems Management*, 113-120.
- Balasubramanian, S. K., Mathur, I., & Thakur, R. (2005). The Impact of High-Quality Firm Achievements on SHareholder Value: Focus on Malcolm Baldrige and J.D. Power and Associates Awards. *Journal of the Academy of Marketing Science*, 413-422.
- Baldrige Performance Excellence Program*. (n.d.). Retrieved from National Institute of Standards and Technology: <http://www.nist.gov/baldrige>
- Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does High Esteem Cause Better Performance, Interpersonal Success, Happiness, or Healthier Lifestyles? *Psychological Science in the Public Interest*, 1-44.
- Beard, D. W., & Dess, G. G. (1981). Corporate-Level Strategy, Business-Level Strategy, and Firm Performance. *Academy of Management Journal*, 663-688.
- Bell, R. R., & Elkins, S. A. (2004). A Balanced Scorecard for Leaders: Implications of the Malcolm Baldrige National Quality Award Criteria. *SAM Advanced Management Journal*, 12-17.

- Belohlav, J. A., Cook, L. S., & Heiser, D. R. (2004). Using the Malcolm Baldrige National Quality Award in Teaching: One Criteria, Several Perspectives. *Decision Sciences Journal of Innovative Education*, 153-176.
- Bemowski, K., & Stratton, B. (1995). How Do People Use the Baldrige Award Criteria? *Quality Progress*, 43-48.
- Bititci, U., Garengo, P., Dorfler, V., & Nudurupati, S. (2012). Performance Measurement: Challenges for Tomorrow. *International Journal of Management Reviews*, 305-327.
- Boyne, G. A., & Walker, R. M. (2002). Total Quality Management and Performance: An Evaluation of the Evidence and Lessons for Research on Public Organizations. *Public Performance & Management Review*, 111-131.
- Brandt, D. (2011). Lean Six Sigma and the City. *Industrial Engineer*, 50-53.
- Cannella, J. A., Park, J.-H., & Lee, H.-U. (2008). Top Management Team Functional Background Diversity and Firm Performance: Examining the Roles of Team Member Colocation and Environmental Uncertainty. *Academy of Management Journal*, 768-784.
- Cater, T., & Cater, B. (2009). (In)tangible resources as antecedents of a company's competitive advantage and performance. *Journal for East European Management Studies*, 186-209.
- Cazzell, B., & Ulmer, J. M. (2009). Measuring Excellence: A Closer Look at Malcolm Baldrige National Quality Award Winners in the Manufacturing Category. *Journal of Technology Management & Innovation*, 134-142.
- Chakravarthy, B. S. (1986). Measuring Strategic Performance. *Strategic Management Journal*, 437-458.
- Cheah, J. E. (2005). A Quality Award and Stock Market Reaction: Evidence from Malaysia. *Total Quality Management*, 681-691.
- Cheah, J. E. (2007). Baldrige Award Announcement and Long Memory in Shareholder Wealth. *Total Quality Management*, 209-218.
- Chiarini, A. (2011). Japanese total quality control, TQM, Deming's system of profound knowledge, BPR, Lean and Six Sigma. *International Journal of Lean Six Sigma*, 332-355.

- Cokins, G. (2007). Performance Management: Creating Economic Value. *Industrial Management*, 14-19.
- Collins, J., & Porras, J. (1994). *Built to Last: Successful Habits of Visionary Companies*. HarperBusiness.
- Committee, B. C. (n.d.). *National Bureau of Economic Research*. Retrieved from CAMBRIDGE September 20, 2010: <http://www.nber.org/cycles/sept2010.html>
- Curkovic, S., Melnyk, S., Calantone, R., & Handfield, R. (2000). Validating the Malcolm Baldrige National Quality Award Framework Through Structural Equation Modelling. *International Journal of Business Research*, 765-791.
- Curkovic, S., Vickery, S., & Droge, C. (2000). Quality-Related Action Programs: Their Impact on Quality Performance and Firm Performance. *Decision Sciences*, 885-905.
- De Feo, J. A. (2001). How the Future Will Impact Quality. *Quality*, 40-48.
- DeBaylo, P. W. (1999). Ten Reasons Why the Baldrige Model Works. *Association for Quality & Participation*, 24-28.
- Decision Analyst. (2012, June). *Economic Index*. Retrieved 7 31, 2012, from Decision Analyst: http://www.decisionanalyst.com/publ_data/2012/EconomicIndex062012.dai
- Delcea, C., Scarlat, E., & Maracine, V. (2012). Grey Relational Analysis Between Firm's Current Situation and Its Possible Causes. *Grey Systems: Theory and Application*, 229-239.
- Deming, W. E. (1982). *Out of the Crisis*. Cambridge: Massachusetts Institute of Technology.
- Dictionary, M.-W. (2013). Retrieved from <http://www.merriam-webster.com/>
- Easton, G. S., & Jarrell, S. L. (1998). The Effects of Total Quality Management on Corporate Performance: An Empirical Investigation. *Journal of Business*, 253-307.
- Ebeling, C. E. (2010). *An Introduction to Reliability and Maintainability Engineering, 2nd Ed.* Canada: Waveland Press.
- Effectuate*. (2012, June). Retrieved from Merriam-Webster Online Dictionary: <http://www.m-w.com>

- Elshennawy, A. K., Lee, C. H., & Hines, M. L. (1989). Ergonomic Issues in Quality Control. *Computers Industrial Engineering*, 514-518.
- Ettorre, B. (1996). Is the Baldrige Still Meaningful? *American Management Association*, 28-31.
- Evans, J. R., & Jack, E. P. (2003). Validating Key Results Linkages in the Baldrige Performance Excellence Model. *American Society for Quality*, 1-11.
- Evans, J. R., & Lindsay, W. M. (2011). *Managing for Quality and Performance Excellence*. Mason: South-Western Cengage Learning.
- Evans, J. R., Ford, M. W., Masterson, S. S., & Hertz, H. S. (2012). Beyond Performance Excellence: Research Insights from Baldrige Recipient Feedback. *Total Quality Management*, 489-506.
- Fale, S. F. (2012, October). Agility Ability: In a time of extraordinary upheaval, organizations must build agility into their DNA using iterative practices and robust risk and change management. *PMI Network*, pp. 54-66.
- Financial Dictionary. (2013). *Dictionary*. Retrieved from Investopedia: <http://www.investopedia.com/dictionary/#axzz2IBCublko>
- Fisher, C., Pearson, M. M., Goolsby, J. R., & Onken, M. H. (2010). Developing measurements of success for performing musical groups. *Journal of Services Marketing*, 325-334.
- Forsyth, D. R., & Schlenker, B. R. (1976). Attributing the Causes of Group Performance: Effects of Performance Quality, Task Importance, and Future Testing. *University of Florida*, 220-236.
- Foster, P. M., & Chenoweth, J. (2011). *Comparison of Baldrige Award Applicants and Recipients with Peer Hospitals on a National Balanced Scorecard*. Thomson Reuters.
- Gautam, A. (2012). Defeating Volatility. *ICIS Chemical Business*, 36-38.
- Ghemawat, P., Jain, D. C., Martin, R., Prahalad, D., Das, S., Mahajan, V., et al. (2012). Commentaries on Surviving 2012: An action plan for the year ahead. *The Economic Times*.
- Goodpaster, K. E., Maines, T. D., & Weimerskirch, A. M. (2004). A Baldrige Process for Ethics? *Science and Engineering Ethics*, 243-258.

- Gradig, R. M., & Harris, J. K. (1994). The Baldrige award: A Quest for Excellence? *Review of Business*, 20-30.
- Grant, R. M. (2003). Strategic Planning in a Turbulent Environment: Evidence from the Oil Majors. *Strategic Management Journal*, 491-517.
- Hagel, J., Brown, J. S., & Davison, L. (2010, March 5). *The Best Way to Measure Company Performance*. Retrieved July 15, 2012, from BloombergBusinessweek: http://www.businessweek.com/managing/content/mar2010/ca2010035_629229.htm
- Hart, C., & Schlesinger, L. (1991). Total Quality Management and the Human Resource Professional: Applying the Baldrige Framework to Human Resources. *Human Resource Management*, 433-454.
- Hart, S. L. (1995). A Natural-Resource-Based View of the Firm. *The Academy of Management Review*, 986-1014.
- Helton, B. R. (1995). The Baldrige Play. *Quality Progress*, 43-46.
- Hendricks, K. B., & Singhal, V. R. (1996). Quality Awards and the Market Value of the Firm: An Empirical Investigation. *Management Science*, 415-436.
- Hendricks, K. B., & Singhal, V. R. (1997). Does Implementing an Effective TQM Program Actually Improve Operating Performance? Empirical Evidence From Firms that Have Won Quality Awards. *Management Science*, 1258-1274.
- Hendricks, K. B., & Singhal, V. R. (2001). The Long-Run Stock Price Performance of Firms with Effective TQM Programs. *Management Science*, 359-368.
- Hirschel, H. L. (2012). *Balanced Scorecard Yields Better Results in Continuous Process Improvement Cultures*. Golden Gate University: Dissertation, Doctor of Business Administration.
- Hoisington, S., Spong, D., & Fredendall, L. (2012). Commentaries on "Management System Design for Sustainable Excellence: Framework, Practices, and Considerations". *Quality Management Journal*, 22-26.
- Horne, J. (2009). *The Effect on Corporate Performance of Firms that Won the Malcolm Baldrige National Quality Award*. Nova Southeastern University.

- Hossain, M. M., & Prybutok, V. R. (2008). *Integration of the Business Performance Management Framework and the Malcolm Baldrige National Quality Award Framework to Address Enhanced Competitiveness*. Retrieved from Decision Sciences: www.decisionsciences.org/Proceedings/DSI2008/docs/346-8350.pdf
- Hubler, D. (2012). Sequestration Fears Making for a Long, Hot Summer. *Washington Technology*.
- Hui, K. H., & Chuan, T. K. (2002). Nine Approaches to Organizational Excellence. *Journal of Organizational Excellence*, 53-65.
- Jacob, R. A., Madu, C. N., & Tang, C. (2012). Financial Performance of Baldrige Award Winners: A Review and Synthesis. *International Journal of Quality & Reliability Management*, 233-240.
- Jacob, R., Madu, C. N., & Tang, C. (2004). An Empirical Assessment of the Financial Performance of Malcolm Baldrige Award Winners. *Quality and Reliability Corner*, 897-914.
- James, M. E., & Johnson, D. R. (2009). *An Assessment of the International Competitiveness of Jamaican Manufacturing Firms*. Cambridge: The Business Review.
- Kaplan, R. S., & Norton, D. P. (2007). Using the Balanced Scorecard as a Strategic Management System. *Harvard Business Review*, 2-14.
- Kim, Y.-K., & Oh, H.-J. (2012). Causality Analysis on Health Care Evaluation Criteria for State-Operated Mental Hospitals in Korea Using Malcolm Baldrige National Quality Award Model. *Community Mental Health Journal*, 643-651.
- Kirca, A. H., Hult, G. T., Roth, K., Cavusgil, S. T., Perry, M. Z., Akdeniz, M. B., et al. (2011). Firm-Specific Assets, Multinationality, and Financial Performance: A Meta-Analytic Review and Theoretical Integration. *Academy of Management Journal*, 47-72.
- Kotter, J. P. (2012, November). Accelerate! A new system that allows the traditional hierarchy to operate in concert with a companywide "strategic network" holds the key to nimble change. *Harvard Business Review*, pp. 46-58.
- Kumar, R. (2011). *Research Methodology*. London: SAGE Publications, Ltd.

- Lakhal, L. (2009). Impact of Quality on Competitive Advantage and Organizational Performance. *Journal of the Operational Research Society*, 637-645.
- Latham, J. R. (2012). Management System Design for Sustainable Excellence: Framework, Practices and Considerations. *The Quality Management Journal*, 7-20.
- Lee, S. M., Rho, B. H., & Lee, S. J. (2003). Impact of Malcolm Baldrige National Quality Award Criteria on Organizational Quality Performance. *International Journal of Production Research*, 2003-2020.
- Lee, S. M., Zuckweiler, K. M., & Trimi, S. (2006). Modernization of the Malcolm Baldrige National Quality Award. *International Journal of Production Research*, 5090-5106.
- Leedy, P. D., & Ormrod, J. E. (2013). *Practical Research: Planning and Design*. Boston: Pearson.
- Lin, W.-T., & Liu, Y. (2012). Successor Characteristics, Change in the Degree of Firm Internationalization, and Firm Performance: The Moderating Role of Environmental Uncertainty. *Journal of Management & Organization*, 16-35.
- Link, A. N., & Scott, J. T. (2006). An Economic Evaluation of the Baldrige National Quality Program. *Economic Innovation*, 83-100.
- Loth, R. (2012). *Profitability Indicator Ratios: Introduction*. Retrieved from Investopedia: <http://www.investopedia.com>
- Lubatkin, M. (1983). Mergers and the Performance of the Acquiring Firm. *The Academy of Management Review*, 218-225.
- Luftig, D. J. (2012). *What is Business Performance Excellence?* Retrieved July 15, 2012, from Center for Business Performance Improvement, University of Colorado at Boulder: <http://csscu.com/index.php/bpe/bpe-articles-t/40-what-is-business-performance-excellence>
- Mackey, A., Mackey, T. B., & Barney, J. B. (2007). Corporate Social Responsibility and Firm Performance: Investor Preferences and Corporate Strategies. *Academy of Management Review*, 817-835.

- Maiga, A. S., & Jacobs, F. A. (2005). Antecedents and Consequences of Quality Performance. *Behavioral Research in Accounting*, 111-131.
- Mauri, A. J., & Michaels, M. P. (1998). Firm and Industry Effects Within Strategic Management: An Empirical Examination. *Strategic Management Journal*, 211-219.
- McIntyre, R. P., Claxton, R. P., Anselmi, K., & Wheatley, E. W. (2000). Cognitive Style as an Antecedent to Adaptiveness, Customer Orientation, and Self-Perceived Selling Performance. *Journal of Business and Psychology*, 179-196.
- Medcof, J. W. (2001). Resource-Based Strategy and Managerial Power in Networks of Internationally Dispersed Technology Units. *Strategic Management Journal*, 999-1012.
- Mendenhall, W., & Terry, S. (2007). *Statistics for Engineering and The Sciences 5th Ed.* Upper Saddle River, NJ: Pearson Prentice Hall.
- Mergent Online. (n.d.). *Company Financials*. Retrieved May 9, 2014, from Ratios: <http://www.mergentonline.com.ezproxy.net.ucf.edu/companyfinancials.php?pagetype=ratios&compnumber=5271>
- Miriam-Webster. (n.d.). "*Process*". Retrieved May 11, 2014, from m-w.com: <http://www.merriam-webster.com/dictionary/process>
- Mitchell, R. J., Shepherd, D. A., & Sharfman, M. P. (2011). Erratic Strategic Decisions: When and Why Managers are Inconsistent in Strategic Decision Making. *Strategic Management Journal*, 683-704.
- Molina-Azorin, J. F., Tari, J. J., Claver-Cortez, E., & Lopez-Gamero, M. D. (2009). Quality Management, Environmental Management and Firm Performance: A Review of Empirical Studies and Issues of Integration. *International Journal of Management Reviews*, 197-222.
- Mollick, E. (2012). People and Process, Suits and Innovators: The Role of Individuals in Firm Performance. *Strategic Management Journal*, 1001-1015.
- Morgan, D. (2011, April 28). *Most Americans say U.S. in Recession Despite Data: Poll*. Retrieved from Reuters: <http://www.reuters.com/article/2011/04/28/us-usa-economy-gallup-idUSTRE73R3WW20110428?feedType=RSS&feedName=domesticNews>

- Moriarty, J. P. (2011). A Theory of Benchmarking. *Benchmarking: An International Journal*, 588-610.
- Murse, T. (2010, October 14). *When Did the Great Recession End?* Retrieved from About.com: <http://usgovinfo.about.com/od/moneymatters/a/When-Did-The-Great-Recession-End.htm>
- Nadkarno, S., & Herrmann, P. (2010). CEO Personality, Strategic Flexibility, and Firm Performance: The Case of the Indian Business Process Outsourcing Industry. *Academy of Management Journal*, 1050-1073.
- Natarajan, R., & Barger, B. (2008). Improving Performance Through The Baldrige Organizational Profile: An Application in Business Education. *Academy of Educational Leadership Journal*, 63-82.
- NBER. (2008, December 11). *Business Cycle Dating Committee*. Retrieved from National Bureau of Economic Research: <http://www.nber.org/cycles/dec2008.html>
- NBER. (2010, September 20). *Business Cycle Dating Committee*. Retrieved from National Bureau of Economic Research: <http://www.nber.org/cycles/sept2010.html>
- NIST. (1998). *Malcolm Baldrige National Quality Award: Ten Years of Business Excellence for America*. Gaithersburg: NIST.
- NIST. (2010, February 18). *History*. Retrieved from Baldrige Performance Excellence Program: <http://www.nist.gov/baldrige/about/history.cfm>
- NIST. (n.d.). *2011-2012 Criteria for Performance Excellence*. Retrieved from National Institute of Standards and Technology, Department of Commerce: Web Site: <http://www.nist.gov/baldrige>
- NIST. (2012). *Baldrige Stock Studies*. Retrieved from Baldrige Performance Excellence Program: http://www.nist.gov/baldrige/publications/archive/stock_studies.cfm
- NIST. (2012, July 12). *Criteria for Performance Excellence*. Retrieved from Baldrige Performance Excellence Program: <http://www.nist.gov/baldrige/publications/criteria.cfm>
- NIST. (n.d.). *Baldrige Award Recipients' Contacts and Profiles*. Retrieved from Baldrige Performance Excellence Program: http://patapsco.nist.gov/Award_Recipients/index.cfm

- NIST. (n.d.). *Baldrige Frequently Asked Questions*. Retrieved May 9, 2014, from nist.gov:
http://www.nist.gov/baldrige/about/baldrige_faqs.cfm
- Pannirselvam, G. P., & Ferguson, L. A. (2001). A Study of the Relationships Between the Baldrige Categories. *The International Journal of Quality & Reliability Management*, 14-24.
- Peavler, R. (2012). *Use Profitability Ratios in Financial Ratio Analysis*. Retrieved July 15, 2012, from About.com:
http://bizfinance.about.com/od/financialratios/a/Profitability_Ratios.htm
- Peters, T., & Waterman Jr., R. H. (1982). *In Search of Excellence*. HarperCollins.
- Pinsent, W. (2009, November 22). *Decoding DuPont Analysis*. Retrieved July 15, 2012, from Investopedia: <http://www.investopedia.com/articles/fundamental-analysis/08/dupont-analysis.asp#axzz20WdIgZU5>
- Porter, R. L. (2010). *Competitive Actions of New Technology Firms: The Red Queen Effect and New Firm Performance*. University of Central Florida.
- Powell, T. C. (1992). Research Notes and Communications Strategic Planning as Competitive Advantage. *Strategic Management Journal*, 551-558.
- Powell, T. C., Lovallo, D., & Caringal, C. (2006). Causal Ambiguity, Management Perception, and Firm Performance. *Academy of Management Review*, 175-196.
- Profitability Ratios*. (2012). Retrieved June 27, 2012, from Investopedia:
<http://www.investopedia.com/terms/p/profitabilityratios.asp#axzz1z1dd23of>
- Prybutok, V., Zhang, X., & Peak, D. (2011). Assessing the Effectiveness of the Malcolm Baldrige National Quality Award Model with Municipal Government. *Socio-Economic Planning Sciences*, 118-129.
- Przasnyski, Z. H., & Tai, L. S. (2002). Stock performance of Malcolm Baldrige National Quality Award Winning Companies. *Total Quality Management*, 475-488.
- Quality Progress. (2011). Healthy Returns. p. 16.

- Reio, J. T., & Callahan, J. L. (2004). Affect, Curiosity, and Socialization-Related Learning: A Path Analysis of Antecedents to Job Performance. *Journal of Business and Psychology*, 3-22.
- Rodin, W. A., & Beruvides, M. G. (2012). A Cost of Quality Economic Analysis of a Six Sigma Program at a Government Contractor. *Engineering Management Journal*, 30-39.
- Ross, S. A., Westerfield, R. W., & Jordan, B. D. (2010). *Fundamentals of Corporate Finance*. New York: McGraw-Hill/Irwin.
- Ruggless, R. (2010). K&N Wins Baldrige Award. *Nation's Restaurant News*, 44.
- Samson, D., & Terziowski, M. (1999). The Relationship Between Total Quality Management Practices and Operational Performance. *Journal of Operations Management*, 393-409.
- Sanger, M. B. (2012). Does Measuring Performance Lead to Better Performance? *Journal of Policy Analysis and Measurement*, 1-22.
- Sarasvathy, S. D. (2001). Causation and Effectuation: Toward a Theoretical Shift from Economic Inevitability to Entrepreneurial Contingency. *The Academy of Management Review*, 26(2), 243-263.
- Saravanan, R., & Rao, K. (2007). The Impact of Total Quality Service Age on Quality and Operational Performance: An Empirical Study. *The TQM Magazine*, 197-205.
- Schaefer, C. (2011). *Baldrige 20/20: An Executive's Guide to the Criteria for Performance Excellence*. Gaithersburg: National Institute of Standards and Technology, U.S. Department of Commerce.
- Slywotzky, A. (2002). *The Art of Profitability*. Warner Books.
- Stephens, P. R., Evans, J. R., & Matthews, C. H. (2005). Importance and Implementation of Baldrige Practices for Small Businesses. *The Quality Management Journal*, 21-38.
- Stewart, T. A. (1999, January 11). A Conversation with Joseph Juran. *Fortune*, pp. 168-169.
- Sum, A. (2011, July 7). *Ringling Out the Lost Economic Decade of 2000-2010: Part Two*. Retrieved from Huff Post Business: http://www.huffingtonpost.com/andrew-sum/ringing-out-the-lost-econ_b_805426.html

- Sun, H. (2011). A Structural Analysis of Quality Management Practices in Hong Kong-based Manufacturing Companies. *International Journal of Management*, 694-703.
- Taggar, S., & Seijts, G. H. (2003). Leader and Staff Role Efficacy as Antecedents of Collective-Efficacy and Team Performance. *Human Performance*, 131-156.
- Tamimi, N., & Sebastianelli, R. (1996). How Firms Define and Measure Quality. *Production and Inventory Management Journal*, 34-39.
- Tanninen, K., Puumalainen, K., & Sandstrom, J. (2010). The Power of TQM: Analysis of its Effects on Profitability, Productivity, and Customer Satisfaction. *Total Quality Management*, 171-184.
- Torok, R. M., & Cordon, P. J. (2002). *Operational Profitability: Systematic Approaches for Continuous Improvement, Second Edition*. Canada: John Wiley & Sons.
- Trombly, R. (2002). Running Lean Running Strong: Lean Manufacturing Processes Lead to a Stronger, More Efficient Business. *Industrial Distribution*, 53-56.
- Tuck, C. E. (2005). A Quality Award and Stock Market Reaction: Evidence from Malaysia. *Total Quality Management*, 681-691.
- Tuck, C. E. (2005). A Quality Award and Stock Market Reaction: Evidence from the European Union. *Total Quality Management*, 979-986.
- U.S. Department of Commerce. (n.d.). *Baldrige Performance Excellence Program*. Retrieved from National Institute of Standards and Technology: www.nist.gov/baldrige
- Van Der Stede, W. A., Chow, C. W., & Lin, T. W. (2006). Strategy, Choice of Performance Measures, and Performance. *Behavioral Research in Accounting*, 185-205.
- Van Iddekinge, C. H., Ferris, G. R., & Heffner, T. S. (2009). Test of a Multistage Model of Distal and Proximal Antecedents of Leader Performance. *Personnel Psychology*, 463-495.
- Varadarajan, P. R., & Ramanujam, V. (1987). Diversification and Performance: A Reexamination Using a Two-Dimensional Conceptualization of Diversity in Firms. *Academy of Management Journal*, 380-393.

- Wang, H., & Qian, C. (2011). Corporate Philanthropy and Corporate Financial Performance: Roles of Stakeholder Response and Political Access. *Academy of Management Journal*, 1159-1181.
- Weinstein, L. (2009). Achieving Top Quality. *Strategic Finance*, 46-51.
- What is Performance Excellence?* (2010, February 17). Retrieved from National Institute of Standards and Technology:
http://www.nist.gov/baldrige/about/performance_excellence.cfm#
- Wikipedia. (n.d.). *2008–2012 Global Recession*. Retrieved August 2012, 6, from Wikipedia, the free encyclopedia: http://en.wikipedia.org/wiki/2008%E2%80%932012_global_recession
- Wikipedia. (n.d.). *List of Recessions in the United States*. Retrieved from Wikipedia:
http://en.wikipedia.org/wiki/List_of_recessions_in_the_United_States
- Williams, R., Bertsch, B., Van Der Wiele, A., Van Iwaarden, J., & Dale, B. (2006). Self-Assessment Against Business Excellence Models: A Critique and Perspective. *Total Quality Management*, 1287-1300.
- Wilson, D. D., & Collier, D. A. (2000). An Empirical Investigation of the Malcolm National Quality Award Causal Model. *Decision Sciences*, 361-390.
- Wilson, J. P., Walsh, M. A., & Needy, K. L. (2003). An Examination of the Economic Benefits of ISO 9000 and the Baldrige Award to Manufacturing Firms. *Engineering Management Journal*, 3-10.
- Winn, B. A. (1998). Organizational Quality: An Examination of the Malcolm Baldrige National Quality Framework. *Research in Higher Education*, 491-512.
- Wisner, J. D., & Eakins, S. G. (1994). A Performance Assessment of the US Baldrige Quality Award Winners. *International Journal of Quality & Reliability Management*, 8-25.
- Yaoli, C. (2009). Construction of Supply Chain Quality Performance Measurement System Based on the Excellent Performance Criteria. *IITA International Conference on Services Science, Management and Engineering* (pp. 89-91). IEEE Computer Society.
- Zahra, S. A. (1999). The Dynamic Firm: The Role of Technology, Strategy, Organization, and Regions. *The Academy of Management Review*;, 861-863.