The Islamic University – Gaza
Research and Postgraduate Affairs
Faculty of Commerce
Master of Business Administration

الجامعـــــة الإســـلاميــة – غـزة
شؤون البحث العلمي والدراسات العليـا
كـــليــــة التـجـــــارة
ماجـــسـتــيـــر إدارة الأعـــمــــال

"An Investigation Into The Role of Conventional and Liquidity-Augmented Fama and French Three Factor Models in Palestine Exchange "

اختبار دور نموذج فاما وفرنش التقليدي و المعدل للعوامل الثلاثة في بورصة فلسطين

Mahmoud Yousuf Al-Saftawi

Supervised by

Dr. Wael Hamdi Al-Daya

A thesis submitted in partial fulfilment of the requirements for the degree of Master of Business Administration

May / 2016

إقـــــــــرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان:

"An Investigation Into The Role of Conventional and Liquidity-Augmented Fama and French Three Factor Models in Palestine Exchange "

اختبار دور نموذج فاما وفرنش التقليدي و المعدل للعوامل الثلاثة في بورصة فلسطين

أقر بأن ما اشتملت عليه هذه الرسالة إنما هو نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيثما ورد، وأن هذه الرسالة ككل أو أي جزء منها لم يقدم من قبل الاخرين لنيل درجة أو لقب علمي أو بحثي لدى أي مؤسسة تعليمية أو بحثية أخرى.

Declaration

I understand the nature of plagiarism, and I am aware of the University’s policy on this.

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted by others elsewhere for any other degree or qualification.

Student's name:	**محمود يوسف هاشم الصفطاوي**	**اسم الطالب:**
Signature:		**التوقيع:**
Date:	**14/5/2016**	**التاريخ:**

بسم الله الرحمن الرحيم

الجامعة الإسلامية – غزة
The Islamic University - Gaza

مكتب نائب الرئيس للبحث العلمي والدراسات العليا هاتف داخلي 1150

Ref الرقم ج س غ/35/
2016/05/14
Date التاريخ

نتيجة الحكم على أطروحة ماجستير

بناءً على موافقة شئون البحث العلمي والدراسات العليا بالجامعة الإسلامية بغزة على تشكيل لجنة الحكم على أطروحة الباحث/ **محمود يوسف هاشم الصفطاوي** لنيل درجة الماجستير في **كلية *التجارة*/ قسم إدارة الأعمال** وموضوعها:

اختبار دور نموذج فاما وفرنش التقليدي و المعدل للعوامل الثلاثة في بورصة فلسطين

An Investigation Into The Role of Conventional and Liquidity-Augmented Fama and French Three Factor Models in Palestine Exchange

وبعد المناقشة العلنية التي تمت اليوم السبت 07 شعبان 1437 هـ، الموافق 2016/05/14م الساعة الواحدة بمبنى القدس، اجتمعت لجنة الحكم على الأطروحة والمكونة من:

د. وائل حمدي الداية	**مشرفاً و رئيساً**	....
أ.د. يوسف حسين عاشور	**مناقشاً داخلياً**	....
د. بهاء الدين أحمد العريني	**مناقشاً خارجياً**	....

وبعد المداولة أوصت اللجنة بمنح الباحث درجة الماجستير في **كلية *التجارة*/ قسم إدارة الأعمال.**

واللجنة إذ تمنحه هذه الدرجة فإنها توصيه بتقوى الله ولزوم طاعته وأن يسخر علمه في خدمة دينه ووطنه.

والله ولي التوفيق ،،،

نائب الرئيس لشئون البحث العلمي والدراسات العليا

أ.د. عبدالرؤوف على المناعمة

P.O. Box 108, Rimal, Gaza, Palestine fax: +970 (8) 286 0800 فاكس Tel: +970 (8) 286 0700 هاتف ص.ب. 108 الرمال. غزة. فلسطين
public@iugaza.edu.ps www.iugaza.edu.ps

بسم الله الرحمن الرحيم

وَعَلَى اللَّهِ فَلْيَتَوَكَّلِ الْمُتَوَكِّلُونَ

[سورة إبراهيم: 12]

صدق الله العظيم

Abstract

This study aims to examine the role of liquidity in asset pricing models as a risk factor, similar to small minus big (SMB) and high minus low (HML) in the framework of Fama-French model and clarifying the time-series variations in stock returns over the period from April 2007 to March 2015 in Palestine exchange. The study includes a sample of **39** companies with complete required data. Eight developed hypotheses were tested by using multivariate regression analysis method, through **SPSS** and **STATA** softwares, based on extracted cross-sectional low frequency (yearly and monthly) - data. The explanatory factors are those of Fama-French model, market risk premium-**MKT**; size risk premium-$\mathbf{SMB_t}$; value risk premium-$\mathbf{VMG_t}$; and illiquidity risk premium-$\mathbf{IML_t}$; while the expected rate of return is measured by the monthly equally-weighted average rate of returns on the intersection related portfolios based on monthly closing prices, including risk free rate or not, regarding to the absence of risk free rate in Palestine exchange. The main argument is that the incorporation of MKT, SMB and VMG factors in the Fama-French three factor model framework show the model superiority to capture the cross-section of average returns, clarifying the time-series variations in stock returns with adjusted $\mathbf{R^2}$ in average 68% over the two variants of the augmented Fama-French three-factor models. The results show significant and strong relationship between response and explanatory factors included in this study and recommend investors in Palestine exchange may consider the conventional Fama and French model referring to the proposed synthetic risk free as a base in their investment evaluation in the essence of safe investment.

Keywords: *Market Efficiency, PEX, Anomalies, FF3 Model, Liquidity-Augmented FF3 Model.*

الملخص

تهدف هذه الدراسة إلى اختبار دور السيولة في نماذج تسعير الأصول كعامل مخاطرة، وذلك على غرار علاوة الحجم، علاوة القيمة في نموذج فاما وفرنش التقليدي ، تفسير التباين في عوائد الأسهم المدرجة في بورصة فلسطين خلال الفترة ما بين شهر إبريل لعام 2007 لغاية شهر مارس من العام 2015. اشتملت عينة الدارسة على 39 شركة وذلك لاستيفائها البيانات المطلوبة. تم اختبار ثماني فرضيات باستخدام تحليل الانحدار الخطي متعدد المتغيرات **multivariate regression** باستخدام برنامجي **STATA & SPSS** ، وذلك بعد الحصول على بيانات التداول السنوية والشهرية اللازمة من بورصة فلسطين للأوراق المالية. كانت المتغيرات المستقلة للدراسة هي أولاُ: علاوة المخاطرة المرتبطة بالسوق ، ثانياُ: علاوة المخاطرة المرتبطة بحجم الشركة ، ثالثاُ: علاوة المخاطرة المرتبطة بقيمة الشركة ، رابعاُ: علاوة المخاطرة المرتبطة بضعف سيولة السهم ، كما تم احتساب معدل العوائد المتوقعة للاسهم المدرجة والتي تمثل المتغيرات التابعة في نماذج الدراسة من خلال حساب متوسط اهذه العوائد في المحافظ قيد الدراسة ، وذلك بناءا على اسعار الإغلاق الشهرية . أظهرت النتائج أن النماذج الثلاثة مقبولة مع افضلية نموذج فاما وفرنش التقليدي، الذي يأخذ بعين الاعتبار علاوة مخاطرة السوق، علاوة الحجم و علاوة القيمة ، حيث أظهرت النتائج انه يفسر 68% من التباين في عوائد الأسهم على حساب النموذجين الآخرين. كما أظهرت النتائج وجود علاقة قوية ودالة احصائيا بين المتغيرات المستقلة والتابعة في النماذج الثلاثة قيد الاختبار، ولذلك توصي الدراسة باستخدام نموذج فاما وفرنش التقليدي مع الاخذ بعين الاعتبار العائد الخالي من المخاطر والذي اقترحته الدراسة، وذلك حتى يكون الاستثمار محدد بهامش امان للمستثمرين .

كلمات مفتاحية: *كفاءة السوق ، بورصة فلسطين ، نموذج فاما وفرنش ، نموذج فاما وفرنش المعدل.*

Epigraph

The essence of investment management is the management of risks, not the management of returns.

Benjamin Graham

Dedication

This thesis is dedicated to: my parents " for their endless love, support, and encouragement; my wife Nadya "her loving support and boundless patience made all of this possible"; my brothers Wael,Ahmed; my sisters and best friends Asaad Herzallah, Nader Habashy and Aamer Al-Qedra " your friendship makes my life a wonderful experience ".

أهدي هذه الأطروحة إلى روح أمي الطاهرة التي لطالما خبأت لي دعوة في جوف السماء، ورفيق دربي أبي "لحبهم وتشجيعهم ودعمهم الذي لا نهاية له" إلى زوجتي نادية "لحبها وصبرها الذي لا حدود له والذي جعل ذلك ممكنا" إلى أخوتي وائل وأحمد والى أخواتي الساكنات في حنايا الفؤاد وأصدقائي أسعد حرزالله، نادر حبشي و عامر القدرة "لدعمهم وتجربتي الفريدة معهم"

Acknowledgment

To Dr. Wael Hamdi Al-Daya

Without his guidance, and support I could not achieve this thesis. I have been extremely lucky to have a supervisor who cared so much about my work. Dr. Daya, you are an excellent supervisor and have inspired me to continue with an open and positive mind. I appreciate all your hard work, it’s meant so much to me.

I am grateful for the helpful suggestions and guidance of my dissertation committee: Prof. Yousif Ashour and Dr. Bahaaeddin A.M. AL Areeni

I would like to thank:

- Mr. Thameen Kayed, Mr. Basem Allouh and Palestine Exchange, for their support and providing all necessary data.

Table of Contents

List of Tables

List of Figures

List of Appendices

List of Abbreviations

APT	arpitrage
BGt	return on big size and growth portfolio
BIt	return on big size and illiquid portfolio
BLt	return on big size and liquid portfolio
bi	market risk premium coefficient
BVt	return on big size and value portfolio
C.FF3	conventional Fama & French model
CAPM	capital asset pricing model
CCAPM	consumption capital asset pricing model
ICAPM	Interemporal capital asset pricing model
CML	capital market line
COEC	cost of equity capital
Cov	covariance
EMH	efficient market hypotheses
GIt	return on growth and illiquid portfolio
GLt	return on growth and liquid portfolio
hi	value premium coefficient
ICAPM	Interemporal capital asset pricing model
IML	illiquid minus liquid= illiquidity premium
IML.s	illiquidity premium after controlling size
IML.v	illiquidity premium after controlling value
IPt	inflation premium
li	illiquidity premium coefficient

ln	natural logarithm
ME	market equity
MKT	market factor
MM	market model
MRP	market risk premium
MPT	modern portfolio theory
Rft	risk free rate
rho or ρ	correlation coefficient
Rmt	market return
Rmt – Rft	excess market return
Rpt	portfolio return
Rpt – Rft	excess portfolio return
S.LIQ	referring to augmented fama and French (size & liquidity)
SGt	return on small size and growth portfolio
SIt	return on small size and illiquid portfolio
si	size premium coefficient
SLt	return on small size and liquid portfolio
SMBt	small minus big = size premium
SMB.v	size premium after controlling value
SMB.L	size premium after controlling liquidity
SML	security market line
SVt	return on small size and value portfolio
t	A point in time or a time period
V.LIQ	referring to augmented fama and French (value& liquidity)
VIt	return on value and illiquid portfolio

VLt	return on value and liquid portfolio
VMG	value minus growth = value premium
$VMG._L$	value premium after controlling liquidity
VMG.s	value premium after controlling size
αi	intercept
β	systematic risk beta
ε p,t	residuals

Chapter 1

Introduction

Chapter 1
Introduction

1.1 Background

This chapter introduces the background of the dissertation. In addition, the chapter contains the problem statement and the thesis objectives. Furthermore, it describes the limitations of the study, the outline of the thesis as well as the definitions of specific terms.

The exchange markets play an important role in the economies of developed and emerging countries alike, as one of fiscal policy tools used in mobilizing domestic savings and attracting foreign investments, furthermore their active role in financing economic development plans. According to Bailey (2005), a market from an economic perspective, is any set of arrangements that enables voluntary agreements to be reached among its participants.

The performance of exchange markets is considered as an indicator of the economy strength, stability, and efficiency. Accordingly, it has critical tasks which perform to send messages for many groups like stockholders, lenders, companies' management, financial analysts, government and other stakeholders such as Employees of the companies and employees unions, customers, suppliers and creditors. All these groups give huge consideration regarding the information which could affect one or many aspects of their concerns. For this reason, the stock market's management works to implement rules and systems which provides enough, correct, and transparent information. As a result, various parties can benefit from these information fairly and without any possibility, that any party, to make unusual profits.

"Underlying the widespread interest in anomaly research is always the unasked question “Can anyone consistently beat the market?” Harry Roberts and then Eugene Fama, the famed fathers of the efficient market hypothesis, first formally asked this question when they classified market efficiency into three forms based on sets of information: a weak form where the history of prices cannot be used to generate positive risk adjusted returns; a semi strong form where public information cannot be used to outperform the market; and a strong form where private information cannot be used to outperform the market" (Zacks, 2011, p. xiv).

" The extent to which asset prices in the future can be predicted on the basis of currently available information is a matter of great significance to practical investors as well as academic model builders. For academic researchers, the objectives are to obtain an understanding of the determination of prices and to find ways of assessing the efficiency of asset markets. For investors, the objective is to exploit their knowledge to obtain the best rates of return from their portfolios of assets" (Bailey, 2005, p. 78). Thus, "market participants will ensure that prices are always accurate based on publicly available information. The implicit assumption here is that trading based on nonpublic information, that is, insider trading, is illegal" (Gray, 2003). "Because these people may have access to material, nonpublic information, they have to report their transactions for public scrutiny. It is illegal for them to trade based on material nonpublic information. However, regulators cannot always know whether insiders illegally use nonpublic information in their transactions, so they don't prosecute insiders unless insiders trade right before major corporate announcements, such as mergers, acquisitions, or quarterly earnings, furthermore insiders know that they will get caught if they trade days before major announcements and also know that they have a free pass if they trade months before major announcement.In the same context they have access to nonpublic detailed information about recent and imminent developments in their companies, so they have the expertise to judge the effects of material nonpublic information on their business results and stock returns. In fact, it wouldn't be an exaggeration to claim there's no one out there who's more informed than an insider is. Moreover, insiders have the essential background to utilize this advantage" (Zacks, 2011, pp. 147,148).

"Markets are said to be "semi-strong" form efficient if the prices are unbiased based on all publicly available information. If prices are unbiased based on all information {public and private}, then markets are "strong" form efficient" (Gray, 2003, p. 2).

There is substantial empirical evidence that stock returns can be better explained by a combination of risk factors rather than by a single-factor model. Starting in the late seventies and early eighties, a number of factors contributing to the explanation of the cross-section of average returns were detected. These include size Banz (1981), E. F. Fama and French (1992). The seminal studies based on firm specific characteristics, Fama & French (1992, 1993, 1996) show that a combination of size and book-to-market effect has better ability to capture the cross-section of stock returns than the market beta alone. It was demonstrated that U.S. equity returns were predictably related to market, size and value factors. They found that the three factors accounted for more than 90% of the variance in a diversified portfolio of U.S. equities, and that was a significant risk premium associated with exposure to those size and value factors. In a series of Fama and French's papers, they argued that CAPM fails to explain cross section of stock returns. To refute CAPM, they suggested additional two risk factors to the CAPM's market factor: size and value factors, which would be necessary to describe pervasive risks in stock returns. In this respect, Fama and French's three-factor model is now the most popular improvement over CAPM in corporate finance and investment management.

Amihud and Mendelson (1986) Paved the way to numerous studies suggesting that liquidity may be the relevant factor that explains stock returns after the three Fama–French factors were accounted for.

In the same context this study reflects the interest of many studies on the explicit role of liquidity in asset pricing models (Chan & Faff, 2003, 2005; Jun, Marathe, & Shawky, 2003; Lam & Tam, 2011; Liu, 2006; Marshall, 2006; Rahim & Nor, 2006; Uddin, 2009). Most of them investigate the role of liquidity as a risk factor, similar to SMB and HML in the framework of Fama-French model.

Fama & French three factor model (FF3) was applied to various exchange markets with numerous conclusive results showing reasonable predictive power of FF3 factors in asset returns as mentioned in (Agarwalla, Jacob, & Varma, 2014; Al-Mwalla & Karasneh, 2011; Aldaarmi, Abbodb, & Salameh, 2015; Drew & Veeraraghavan, 2002; E. F. Fama & French, 1996; Gregory, Tharyan, & Christidis, 2013; Hasnaoui & Ibrahim, 2013; Kilsgård & Wittorf, 2011). To signify the importance of the anomalies subject, a tremendous invistigations in exchange markets were dedicated to quantifying the trade-of between risk and expected returns of financial secureties and extrapolate the existence of Anomalies in various financial markets and how they priced as a risk premium, as illustrated in Appendix (1.61),Appendix (1.62) and Appendix (1.63) respectively.

The purpose of this study is to explain unexpected price behaviour in Palestine exchange "PEX", termed ***anomalies***, that refers to situations when a security or group of securities performs contrary to the notion of efficient markets, where security prices are said to reflect all available information at any point in time, which can potentially be exploited by investors to earn abnormal returns which specifies how stocks are expected to be priced under a set of ideal or theoretical conditions.

Since anomalies yield predictable positive risk-adjusted returns, proper risk measurement is critical to the identification of anomalies. Identifying a real anomaly, therefore, requires ensuring that the risk of the investment strategy is correctly measured and statistically reliable. Accordingly, this study investigate the suitability of the proposed models in interpretation the variation in stocks returns and examine the explanatory power of the liquidity-augmented Fama & French models to extrapolate the anomalies in stock returns. These anomalies are measured by (market risk premium -**MKT**, size risk premium -**SMB**, value risk premium-**VMG**, and illiquidity risk premium-**IML**) factors.

1.2 Problem Statement

The academic research of finance has witnessed a lot of changing during the past decades. Empirical research and more sophisticated evidence from econometric tests were paved the way into how financial markets work; furthermore, "modern Portfolio Theory MPT was enriched with a multi factor perspective leading to more complexity and accuracy at the same time. Moreover, market efficiency and stock return predictability do not seem to be purely contrasting ideas anymore" (Scheurle, 2010). Practically, the share price in the exchange market represents the realizable market value of the investment that every investor is seeking to maximize, through purchasing and selling securities, according to the level of pricing efficiency in exchange market, so determining the real value of shares is the cornerstone in the investment decision through evaluating stocks to identify the variation between market prices and real values by using different models to appraise those shares, referring to a benchmark to **risk free rate (Rft)** which does not exist in Palestine exchange "PEX", so the study propose a synthetic risk-free rate depending on monthly LIBOR plus monthly inflation rate (LIBOR (2015); PCBS, 2015) ,and it will compare the results referring to **Rft** or without **,** accordingly the researcher expects that stock returns are influenced by four factors, which are not investigated in the Palestine Exchange "PEX" so far, so the six main questions of this study are:

- What is the effect of market risk premium factor**-MKT** on the related model portfolios return?
- What is the effect of size risk premium factor**-SMB** (stands for “small (cap) minus big”) **on** the related model portfolios return?
- What is the effect of value risk premium factor**-VMG** (stands for “value stocks minus growth”) **on** the related model portfolios return?
- What is the effect of illiquidity risk premium factor**-IML** (stands for “illiquid stocks minus liquid”) **on** the related model portfolios return?
- Which model is the best to extrapolate the anomalies in stock returns in" PEX" , the conventional FF3 or liquidity- augmented FF3?
- Which model is the best to extrapolate the anomalies in stock returns in "PEX ", the proposed model based on **Rft** or without **Rft?**

1.3 Variables

The explanatory factors in this study are those of Fama-French model and the illiquidity risk premium as proposed in this study.

1.3.1 Dependent Variables

- **[Rpt - Rft] or Rpt** = the dependent variables in this study are the monthly equally-weighted average rate of returns on the test portfolios minus the risk-free rate of returns or without subtracting the risk-free rate, regarding to the absence of risk free rate **(Rft)** in "PEX ".

Table (1.1): Dependent Variables Describtion

#	Portfolio R	Describtion
Panel A: Conventional Fama and French three factor –(size &value), C.FF3 model dependent variables		
1	***SV***	monthly EWAR on the intersection portfolio for small size (S) & value (V) (low M/B)
2	***SG***	monthly EWAR on the intersection portfolio for small size & growth (high M/B) stocks
3	***BV***	monthly EWAR on the intersection portfolio for big size & value (low M/B) stocks
4	***BG***	monthly EWAR on the intersection portfolio for big size & growth (high M/B) stocks
Panel B: Augmented Fama and French three factor –(size&liquidity), S.LIQ model dependent variables		
1	***SI***	monthly EWAR on the intersection portfolio for small size & illiquid stocks
2	***SL***	monthly EWAR on the intersection portfolio for small size & liquid stocks
3	***BI***	monthly EWAR on the intersection portfolio for big size & illiquid stocks
4	***BL***	monthly EWAR on the intersection portfolio for big size & liquid stocks
Panel C: Augmented Fama and French three factor –(value&liquidity), V.LIQ model dependent variables		
1	***VI***	monthly EWAR on the intersection portfolio for value (low M/B) & illiquid stocks
2	***VL***	monthly EWAR on the intersection portfolio for value (low M/B) & liquid stocks
3	***GI***	monthly EWAR on the intersection portfolio for growth (high M/B) & illiquid stocks
4	***GL***	monthly EWAR on the intersection portfolio for growth (high M/B) & liquid stocks
EWAR		refers to equally-weighted average rate of returns

Source: author, 2016

1.3.2 Independent Variables

1. **Rmt - Rft** = market excess return = **MKT** market factor = **MRPt** market risk premium. Or **Rmt** = the return on the market index, regarding to the absence of **Rft** in "PEX "
2. **SMBt** = stands for "small (cap) minus big" and represents the premium for investing in the portfolios of small capitalization stocks compared to large (cap) portfolios during time period t = **SRPt** size risk premium**,** so **SMBt** is defined as the price of the company's stock multiplied by the number of outstanding shares at the end of March of year $_{t+1}$.
3. **VMGt** = (low M/B) ,stands for "value stocks minus growth" and indicates the premium for taking a long position on portfolios of low market-to-book stocks **(value stocks)** and short position on the portfolios of high M/B stocks **(growth stocks)** during time period t = **VRPt** value risk premium **,** so **VMGt** is derived by dividing the company's market value of equity (ME) at the end of December year t, with its book value of equity (BE) at the end of December year t.
4. **IMLt** = stands for "illiquid stocks minus liquid" and represents the premium for investing in the portfolios with low stock-turnover ratio compared to high stock-turnover ratio portfolios during time period t = **IRPt** illiquidity risk premium **,** so

IMLt is defined as the average of company's monthly stock turnover from April year t to March of year$_{t+1}$. essentially reflects the inverse relationship, the premium that investors would require for holding less liquid stocks because they anticipate the payment of higher trading costs when reselling the stocks in the future (Datar, Y Naik, & Radcliffe, 1998; Rahim & Nor, 2006).

- **M/B =** the numerator refers to the market value of equity or market price, and the denominator refers to the book value of equity.

$$BVPS = \frac{Total\ common\ stockholders\ equity}{Number\ of\ subscribed\ \ common\ shares} \qquad (1.1)$$

Where $BVPS$ ***is BV PER SHARE***, considering that in case of holding companies, book value per ordinary share = (total shareholders' equity less non-controlling interest in equity of consolidated subsidiaries, divided by the number of outstanding ordinary shares at any period end). Minority interest (or non-controlling interest) is the portion of a subsidiary corporation's stock that is not owned by the parent corporation.

1.4 Hypotheses Development

Numerous studies examined the effectiveness of the capital asset pricing model CAPM that developed by Sharpe (1964), Lintner (1965),Mossin (1966) , and in recent years, additional factors were included to provide a more reliable explanation of the cross-section of average returns. One major innovation was proposed by E. F. Fama and French (1993) show that a combination of size and book-to-market effect has better ability to capture the cross-section of stock returns than the market beta alone. It was demonstrated that U.S. equity returns were predictably related to market, size and value factors.

Liu (2006), stated that liquidity is generally described as the ability to trade large quantities quickly at low cost with little price impact. This description highlights **four** dimensions to liquidity, namely, **trading quantity**, **trading speed**, **trading cost**, and **price impact**. For at least the last ten years, researchers have examined the importance of liquidity in explaining the cross-section of asset returns, and empirical studies have employed several liquidity measures. Amihud and Mendelson (1986), by their insights suggesting that liquidity may be the relevant factor that explains stock returns after the three Fama and French factors, were accounted for. The rationale behind is that illiquidity can be measured as costs of immediate execution and an investor willing to transact at a favorable price faces a tradeoff : he may either wait to transact at a favorable price or insist to execute a transaction immediately at a current bid or ask price. He found a positive return-illiquidity relation. Since that study, many other researchers continue to investigate the return-illiquidity (liquidity) relation, but evidence over the past two decades is generally inconsistent and mixed.

Amihud (2002), showed that there is a significant relation between liquidity and expected stock returns. He finds a negative return-liquidity relation even in the presence of size, beta, and momentum. The use of time-series models is important, because it allows for an investigation of whether mimicking portfolios for risk factors captures shared variation in stock returns and identifies whether the model is well specified. In addition, Brennan, Chordia, and Subrahmanyam (1998) investigate whether expected returns are explained by a number of firm characteristics including market liquidity, measured using trading volume. They utilize two risk adjustment measures, based on Connor and Korajczyk (1988) and E. F. Fama and French (1993) . They find a negative and significant relationship between returns and trading volume for both NYSE and NASDAQ stocks. Finally a recent analysis by Lam and Tam (2011) shows that liquidity is indeed an important factor for asset pricing even after accounting for other well-established risk factors.

Motivated by these studies, the study addresses the question of whether liquidity is an important variable to capture the shared time-series variation in stock returns by investigating whether the effect of liquidity on stock return remains after controlling for the well-known stock return factors using Palestinian Exchange PEX (2015) data. This study deviates slightly from previous studies in that instead of incorporating liquidity as an additional risk factor, it incorporates liquidity as an alternative to conventional Fama-French factors, to test two variants of 3-factor models. Accordingly, the study hypotheses are:

- **H_1**: The tested model jointly $\boldsymbol{\alpha_i} \neq$ **0**, not all α_i coefficients obtained from multiple factor models are equivalent to zero ($\alpha_i \neq 0$).
- **H_2**: There is a significant effect of the market risk premium factor (**MKT)** on each of related four tested portfolios, ***the Coefficient of the MKT, bi ≠ 0***
- **H_3**: There is a significant effect of the size risk premium factor **(SMB)** on each of related four tested portfolios,***the Coefficient of the SMB, si ≠ 0***
- **H_4**: There is a significant effect of the valuerisk premium factor **(VMG)** on each of related four tested portfolios, ***the Coefficient of the VMG, hi ≠ 0***
- **H_5**: There is a significant effect of the illiquidity risk premium factor **(I ML)** on each of related four tested portfolios, ***the Coefficient of the IML, li ≠ 0***
- **H_6**: The conventional Fama & French model based on **MKT**, **SMB** and **VMG** is the best model to explain most of the time-series variations in stock returns over the period from April 2007 to March 2015 in "PEX" referring to **risk free rate (Rft)** or without **Rft.**
- **H_7**: The liquidity-augmented Fama & French model based on **MKT**, **SMB** and **IML is** the best model to explain most of the time-series variations in stock returns over the period from April 2007 to March 2015 in "PEX" referring to **risk free rate (Rft) or** without **Rft.**
- **H_8 :** The liquidity-augmented Fama & French model based on **MKT**, **VMG** and **IML is** the best model to explain most of the time-series variations in stock returns over the period from April 2007 to March 2015 in "PEX" referring to **risk free rate (Rft)** or without **Rft**

1.5 Study Objectives

1.5.1 Main Objective:

The main objective of this study is to examine whether the asset pricing model can explain most of the time-series variations in stock returns and the role of liquidity in pricing stock returns over the period from April 2007 to March 2015 in "PEX". This asset pricing model includes the following factors: (1) the market risk factor ***MKT*** (2) the market size of the company, measured by the market value of its equity (MVE) or market capitalization ***SML*** (3) the market value of the company, measured by the market-to-book ratio (M/B) ***VMG*** (4) liquidity factor measured by stock turnover ratio ***IML***.

1.5.2 Sub Objectives:

- Determining the existence of anomalies in "PEX".
- Analyzing the relationship between risk and return related to "PEX".
- Investigating the impact of ***MKT***, ***SMB***, ***VMG***, and ***IML*** on the monthly equally-weighted average rate of returns for the tested portfolios.
- Recommending suggestions to develop the "PEX".

1.6 Study Importance

The main contribution of this study is the testing of multidimintional Fama-French Size-Value model and multidimintional liquidity-based 3-factor models which apparently is an effort that does not seem to have been attempted in any studies before in "PEX", so this study is unique according to four reasons:

- To the best of our knowledge this study is the first in "PEX "used this method.
- The second reason is exploring, and analyzing new prospective about the risk and return which are related to "PEX".
- The third reason is the expected results of this study that will help those in charge of the Palestine Exchange "PEX" to put measures that help to organize the market to achieve required balance between stock returns and risks to reduce the volatility in stock prices and then to maintain the stability of the market.
- Finally investors and investment portfolios managers can benefit from this study in the assessment of their investment strategies regarding to the extrapolation power of tested models.

1.7 Study Limitations

- The limited number of listed companies in "PEX", because the portfolios construction need at least two stocks intersected in the dependent tested portfolios.
- Thin trading in "PEX"and the lack of an active movement on buying and selling stocks.
- "PEX" is an emerging and very small market , and was in operation for slightly more than 18 years .
- The absence of sovereign or treasury (governmental) financial instruments.

- The limited number of companies that have a full monthly trading data during the study period from April 2007 to March 2015, where the average was 24 companies.
- Five companies from all listed in "PEX" have approximately (70-85) percent of the market capitalization of listed companies.

Chapter Two
Anomalies and Expected Rate of Return

Chapter 2
Anomalies and Expected Rate of Return

2.1 Introduction

In this chapter the theories of the different models used in the study are presented as well as how both their dependent- and explanatory variables are created and estimated. In addition this chapter presents the proposed risk free rate in Palestine. Understanding the reciprocal relationship between risk and return has become a cornerstone of stocks pricing valuation, as well as the basis of risk management, which must be familiar with the financial markets in order to develop their strategies in risk, especially in the pricing of risk premiums as well as accurately. Sehgal, Subramaniam, and Deisting (2014), mentioned that the CAPM which was the foundation of all asset pricing models indicates that the risk return relation is linear; the relevant risk is systematic in nature and measured by beta. Empirical work followed has observed that the CAPM beta fails to explain returns on various characteristic sorted portfolios.

Abu-Rub and Sharba (2011), indicated the importance of investigating in the presence of security price anomalies in "PEX" and how it became an active field of research in financial markets, in particular, in those markets where empirical finance had received considerable attention from academic journals.

The price-earnings, small-firm, market-to-book, momentum, and long-term reversal Effects are currently among the most puzzling phenomena in empirical finance. There are several interpretations of these effects. First note that to some extent, some of these phenomena may be related. The feature that small firms, low-market-to-book firms, and recent “losers” seem to have in common is a stock price that has fallen considerably in recent months or years. Indeed, a firm can become a small firm or a low-market-to-book firm by suffering a sharp drop in price. These groups therefore may contain a relatively high proportion of distressed firms that have suffered recent difficulties (Bodie, 2013).

2.2 Risk and Return

The relation between risk and return is at the very heart of finance theory and practice. Womack and Zhang (2003), stated that most investors are comfortable with the notion that taking higher levels of risk is necessary to expect to earn higher returns. To understand this, imagine an investment that is expected to generate $1 million per year in perpetuity. How much is someone likely to pay for such an asset? The answer depends on the uncertainty or riskiness of the cash flows. With complete certainty that the cash flows will all be paid when promised, an investor would discount the asset at the risk-free rate. As the degree of uncertainty increases, the return required to justify the risk will be much higher, resulting in a much lower price the investor would be willing to pay, simply because of the higher required discount rate.Furthermore, economists have made the assumption that investors are risk-averse, meaning that they are willing to sacrifice some return and accept even less than the expected present value of the future returns to reduce risk. If this assumption is true, we would expect investors to demand a higher return to justify the additional risk accepted by holders of riskier assets. So Market risk or value at risk can be defined as: the risk related to the uncertainty of earnings on the trading portfolio caused by changes in market conditions such as the price of an asset, interest rates, market volatility, and market liquidity (Choi, 2003).

"The word return is often modified by an adjective, including the expected return, the required return, and the realized return. The expected return is the anticipated flow of income and/or price appreciation. An investment may offer a return from either of two sources. The first source is the flow of income that may be generated by the investment. A savings account generates interest income. The second source of return is capital appreciation. If an investor buys stock and its price subsequently increases, the investor receives a capital gain. All investments offer the investor potential income and/ or capital appreciation. Some investments, like the savings account, offer only income, whereas other investments, such as an investment in land, may offer only capital appreciation" (Mayo, 2013).

2.2.1 Systematic Versus Un-Systematic Risk

Usually, stock prices and dividends fluctuate due to two types of criteria:
1. ***Firm-specific risk*** is caused by such random events as lawsuits, strikes, successful and unsuccessful marketing programs, winning or losing a major contract, and other events that are unique to a particular firm. Because these events are random, their effects on a portfolio can be eliminated by diversification, so bad events in one firm will be offset by good events in another. For that reason, this type of risk is referred to as, **idiosyncratic**, **unique**, **un-systematic** or **diversifiable risk**.

2. ***Market-risk,*** this type of risk stems from factors that systematically affect most firms: war, inflation, recessions, and high interest rates. Because most stocks are affected by these factors, market risk cannot be eliminated by diversification, this type of risk is also called **systematic**, or **nondiversifiable risk** (Brigham & Ehrhardt, 2013).

2.3 Information Quality and Market Efficiency

Over the history of financial research, scholars have focused on rational investors and how they make decisions in the presence of information. If investors are indeed rational, their decision choices can be understood using mathematical models relating their choices to fundamental information. This focus on rational investors has led researchers to make the fundamental assumption that markets are efficient and that prices reflect fundamental values (Baker & Nofsinger, 2010).
Efficient market hypothesis is one of the important paradigms of traditional finance theories.E. Fama (1970), defined efficient market as a market with large numbers of rational profit maximizing individuals actively competing with each other and doing attempts to predict future market values of individual securities, and where all important relevant information is almost freely available to all investors. Relevant information includes past information, publicly available information and private information. In finance, the efficient market hypothesis **EMH**, or the joint hypothesis problem, asserts that financial markets are "informationally efficient". In consequence of this, one cannot consistently achieve returns in excess of average market returns on a risk-adjusted basis, given the information available at the time the investment is made. There are three major versions of the hypothesis: "weak", "semi-strong", and

"strong". The weak-form EMH claims that prices on traded assets (e.g., stocks, bonds, or property) already reflect all past publicly available information. The semi-strong-form EMH claims both that prices reflect all publicly available information and that prices instantly change to reflect new public information. The strong-form EMH additionally claims that prices instantly reflect even hidden or "insider" information.

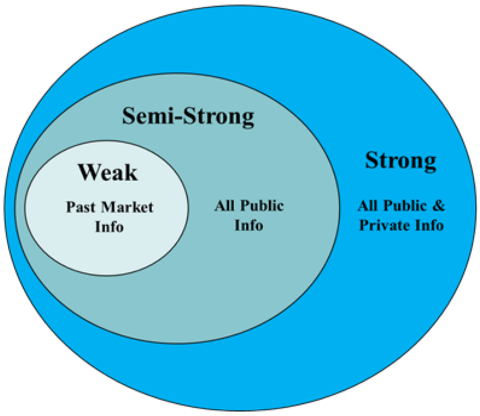

Figure (2.1): Types of market efficiency, Source: author, 2016

2.3.1 Efficient Market Hypothesis-EMH

Mathematically, the efficient markets hypothesis (EMH) is the assertion that the current price of a security equals the expected value of all future cash flows to be received from owning that security (Baker & Nofsinger, 2010).The efficient markets hypothesis (EMH), popularly known as the Random Walk Theory, states that current stock prices fully reflect all available information about the value of the firm, and there is no way to earn excess profits by using this information. It deals with one of the most fundamental and exciting issues in finance why prices change in securities markets and how these changes take place (Alkhatib & Harasheh, 2014).

Brigham and Ehrhardt (2013) mentioned that a stock's intrinsic value is the present value of its expected future cash flows,if the price of a stock is lower than its intrinsic value, then an investor would receive an expected return greater than the return required as compensation for risk. The market forces would drive the mispriced stock's price up. If this process continues until its expected return equals it required return, then we say that there is market equilibrium:

Market equilibrium: Expected return = Required return

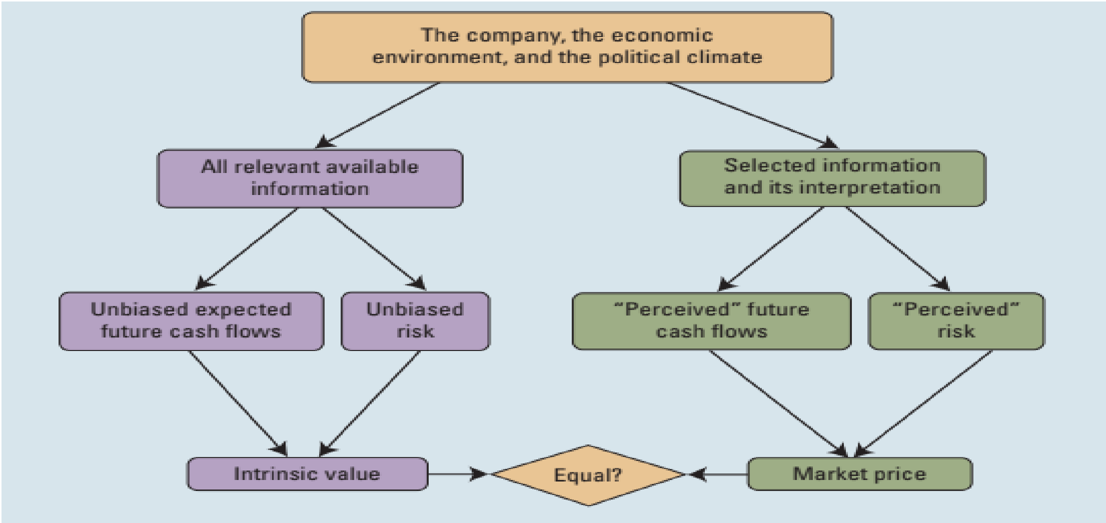

Figure (2.2): Determinants of Intrinsic Values and Market Prices (Brigham & Ehrhardt, 2013, p. 264)

We can also express market equilibrium in terms of prices:

Market equilibrium: Market price = Intrinsic value

New information about the risk-free rate, the market's degree of risk aversion, or a stock's expected cash flows (size, timing, or risk) will cause a stock's price to change.

2.3.2 Modern Portfolio Theory MPT

In the mid-fifties of the last century, Markowitz (1952) shed the light on the subject of risk and return , the most significant concept in making decisions on investment that was received a lot of attention in recent decades. He was the first that come up with a parametric optimization model which meanwhile has become the foundation for Modern Portfolio Theory MPT. A decade later, (Sharpe, 1964) , (Lintner, 1965) , and (Mossin, 1966) built on his work to develop the capital asset pricing model (CAPM). The efficient market hypothesis states that financial markets are semi-strong efficient or informationally efficient. Consequently, an investor cannot consistently achieve returns in excess of average market returns on a risk-adjusted basis. This is a key part of traditional finance theory which assumes that the investor is rational (Homo economicus). However, theoretical implications from MPT and the efficient markets hypothesis do not allow for stock market anomalies that were increasingly observed since the 1980s. A stock market anomaly is a market situation that cannot be explained by traditional finance theory. To some degree it is a persistent situation and not an arbitrage opportunity which, as soon as spotted, disappears because everyone aims to exploit it. A stock market anomaly persists although people trade on it and can make consistent gains.

One important use of portfolio risk concepts is to select **efficient portfolios**, which defined as those portfolios that provide the highest expected return for any degree of risk or the lowest degree of risk for any expected return (Brigham & Ehrhardt, 2013). Berk and DeMarzo (2014), stated that an efficient portfolio cannot be diversified further—that is, there is no way to reduce the risk of the portfolio without lowering its expected return. The best way to identify an efficient portfolio is one of the key questions in modern finance, because diversification improves with the number of stocks held in a portfolio, an efficient portfolio should be a large portfolio containing many different stocks. Thus, a natural candidate for an efficient portfolio is the **market portfolio**, which is a portfolio of all stocks and securities traded in the capital markets. It is common in practice to use the S&P 500 portfolio as an approximation for the market portfolio, under the assumption that the S&P 500 is large enough to be essentially fully diversified.

The risk of a portfolio declines as the number of stocks in the portfolio increases. If we added enough partially correlated stocks, could we completely eliminate risk? The answer is "no," but as Figure (2.3) illustrate, adding stocks to a portfolio reduces its risk to an extent that depends on the degree of correlation among the stocks. The smaller the stocks' correlation coefficients, as Figure (2.4) illustrate, the lower the portfolio's risk. If we could find stocks with correlations of −1.0, all risk could be eliminated. However, in the real world the correlations among the individual stocks are generally positive but less than +1.0, so some (but not all) risk can be eliminated. In general, there are higher correlations between the returns on two companies in the same industry than for two companies in different industries. There are also higher correlations among similar "style" companies, such as large versus small and growth versus value. Thus, to minimize risk, portfolios should be diversified across industries and styles (Brigham & Ehrhardt, 2013).

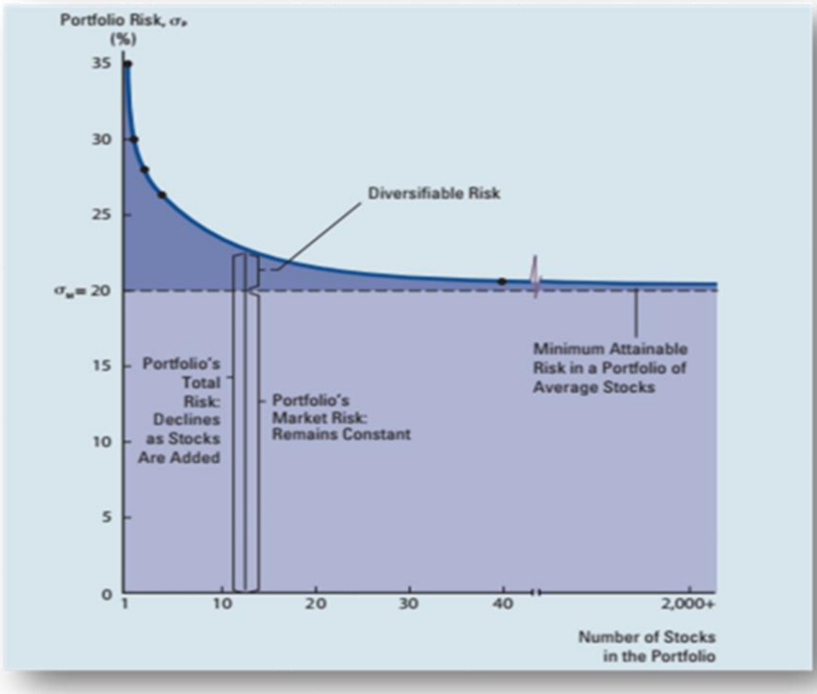

Figure (2.3): Effects of Portfolio Size on Portfolio Risk for Average Stocks (Brigham & Ehrhardt, 2013, p. 250)

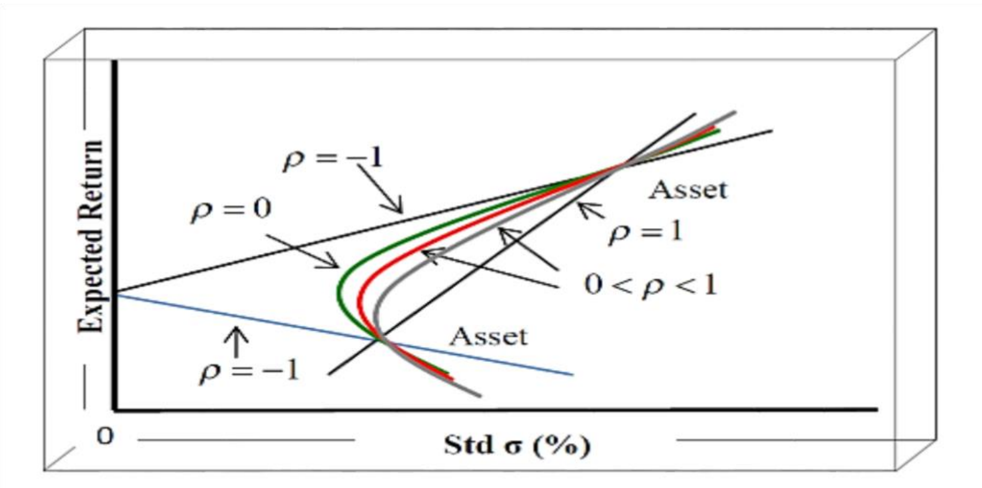

Figure (2.4): Investment opportunity sets for asset A and asset B with various correlation coefficients (Masoud & Suleiman AbuSabha, 2014, p. 5)

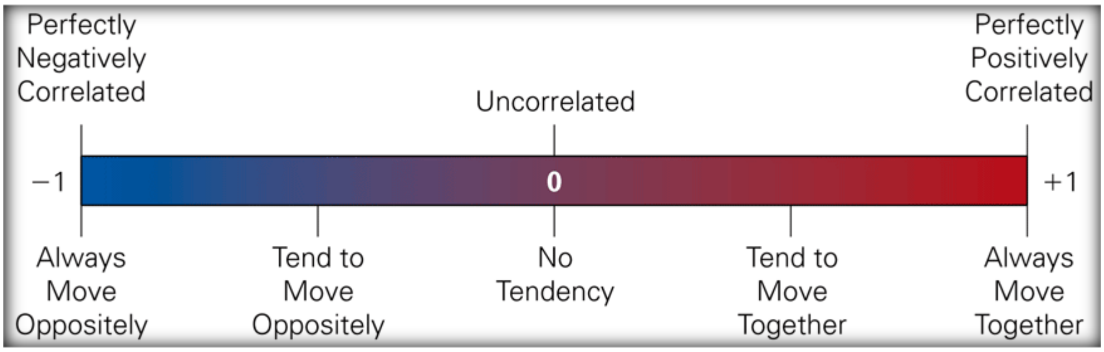

Figure (2.5): Correlation range among stocks (Berk & DeMarzo, 2014, p. 355)

The rational investor, who is the presumed CAPM protagonist, wants to earn a certain return and tries to identify a portfolio of minimal risk which satisfies this goal. As shown in Figure (2.6), where the points represent the expected returns (Er) on vertical axis and the volatilities (σ) on horizontal axis of the portfolios.

A portfolio is called mean-variance efficient (or just efficient), if for a given volatility there is no portfolio with a higher return. The set of efficient portfolios in the mean-variance diagram is called the efficient frontier and has the shape of a hyperbola. It is the upper boundary of all portfolios in the meanvariance diagram from Figure (2.6) and Figure (2.7), this is exactly the set of portfolios, that the rational investor is looking for: they maximize the expected return for a given risk, and they minimize the risk for a given return (Schulmerich, Leporcher, & Eu, 2014).

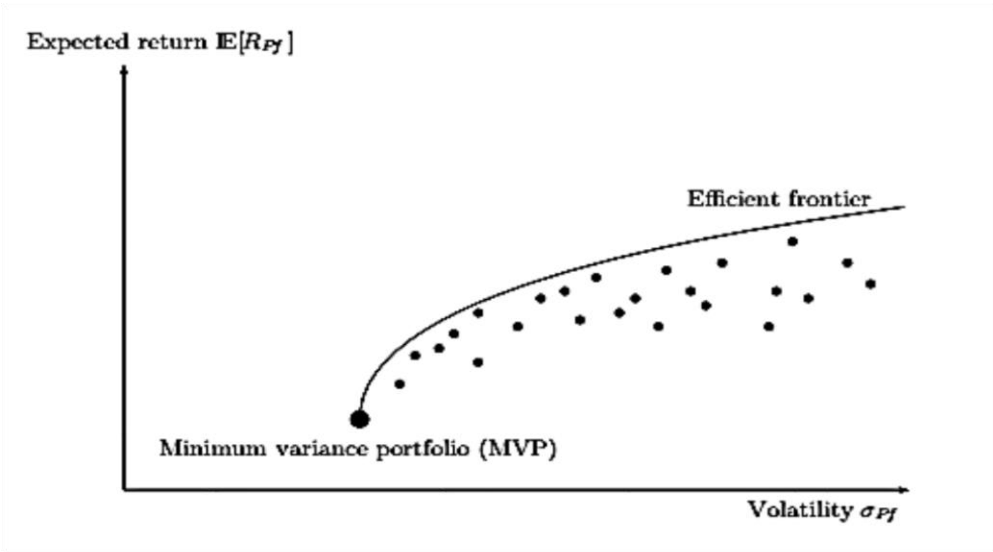

Figure (2.6): Mean-variance diagram with efficient frontier.(Schulmerich et al., 2014, p. 115)

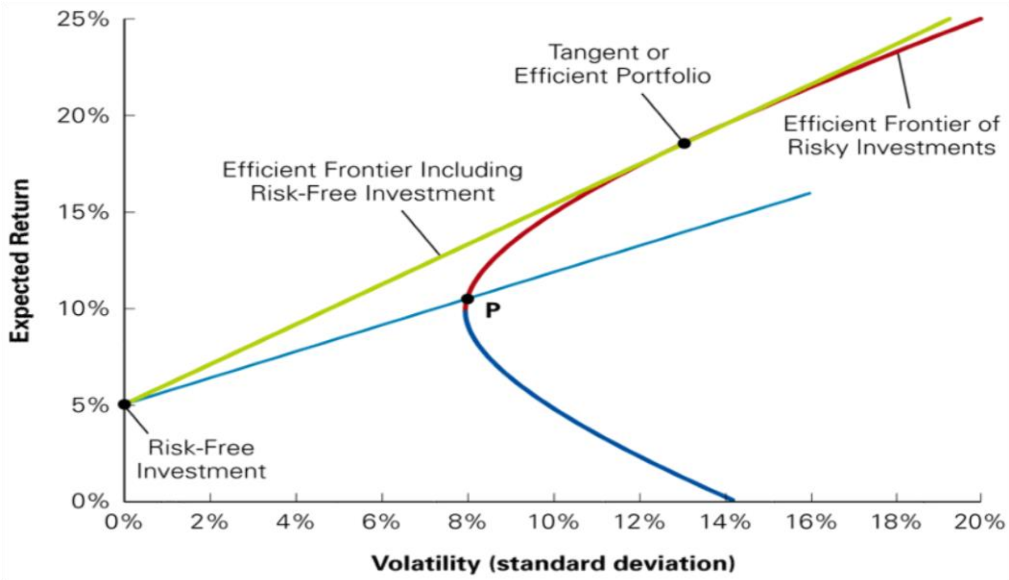

Figure (2.7): The Tangent or Efficient Portfolio (Berk & DeMarzo, 2014, p. 374)

2.3.3 The Capital Market Line and the Security Market Line CML, SML

As shown in Figure (2.8), the capital market line CML shows the tradeoff between total risk (σ) and return for a portfolio that consists of the risk free asset and the market portfolio. The security market line (SML) shows the tradeoff between systematic risk (β) and return for an individual asset or portfolio. The CAPM's Security Market Line (SML) equation shows the relationship between a security's market risk and its required rate of return. The return required for any security i is equal to the risk-free rate plus the market risk premium multiplied by the security's beta: ri = rRF + (MRP) βi and the slope of SML as Figure (2.9) shown, is equal to the market risk premium related to systematic risk that captured by (β) (Brigham & Ehrhardt, 2013). The risk premium of a security is determined by its systematic risk and does not depend on its diversifiable risk.(Berk & DeMarzo, 2014)

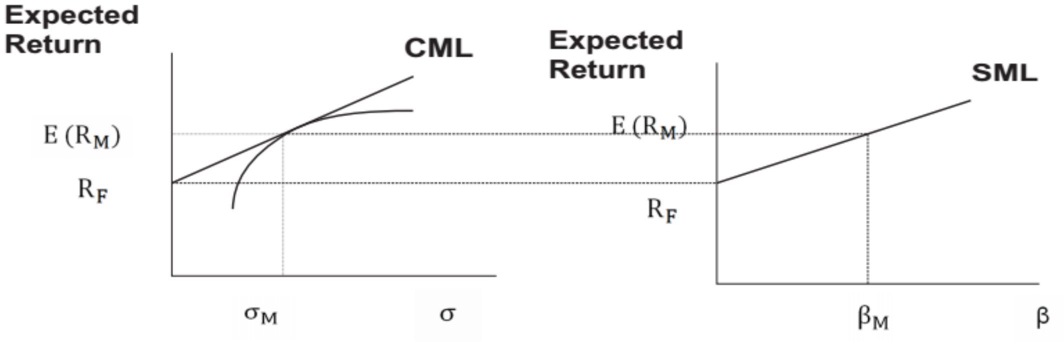

Figure (2.8): relationship between CML and SML (Moy, 2013)

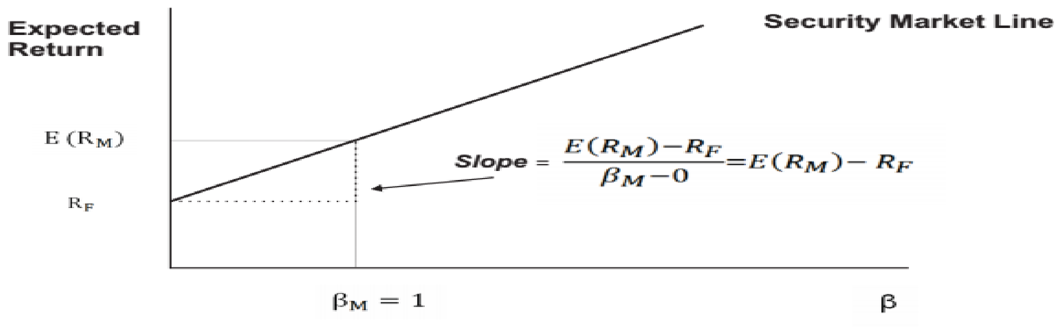

Figure (2.9): The slope of the SML (Moy, 2013)

2.3.4 Profiting From Non-Zero Alpha Stocks

Berk and DeMarzo (2014), stated that as stock prices change, so do expected returns. Recall that a stock's total return is equal to its dividend yield plus the capital gain rate. All else equal, an increase in the current stock price will lower the stock's dividend yield and future capital gain rate, thereby lowering its expected return. Thus, as savvy investors attempt to trade to improve their portfolios, they raise the price and lower the expected return of the positive-alpha stocks, and they depress the price and raise the expected return of the negative-alpha stocks, until the stocks are once again on the security market line and the market portfolio is efficient as illustrated in Figure (2.10). Notice that the actions of investors have two important consequences. **First**, while the CAPM conclusion that the market is always efficient may not literally be true, competition among savvy investors who try to "beat the market" and earn a positive alpha should keep the market portfolio close to efficient much of the time. In that sense, we can view the CAPM as an approximate description of a competitive market. **Second**, there may be trading strategies that take advantage of non-zero alpha stocks, and by doing so actually can beat the market.

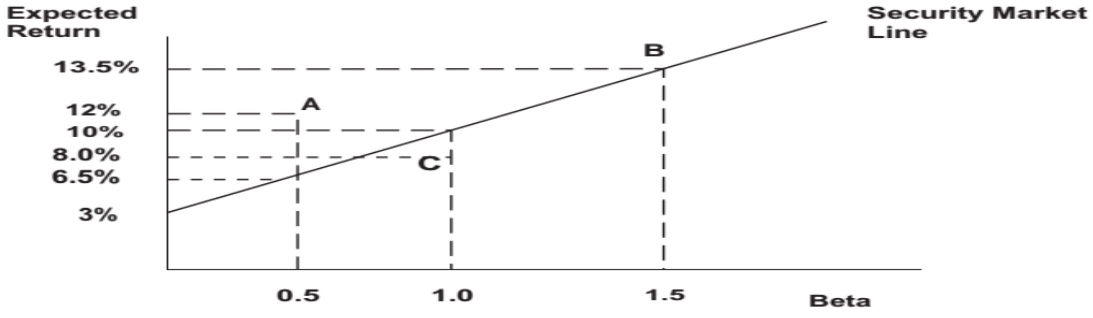

Figure (2.10): Advantage & Disadvantage of Non-Zero Alpha (Moy, 2013)

Bailey (2005), supposed as an example, assets A and B in depicted in Figure (2.11), Asset A lies above the SML; it has a mean rate of return higher than that predicted by the CAPM. This is commonly understood to imply that asset A is **underpriced** or **undervalued**. In response, an adherent of the CAPM would wish to purchase asset A, believing that its price will rise as the market tends towards equilibrium. Similar reasoning can be applied to asset B, the mean rate of which is lower than that predicted by the CAPM. Asset B is **overpriced** or **overvalued**. The CAPM predicts that investors will sell B, believing that its price will fall as the market tends towards equilibrium. In a sense, asset A yields more than it should (where should is not normative but refers to the CAPM prediction); and asset B yields less than it should. Divergences occur such as those depicted by A and B; call this CAPM disequilibrium. Notice that CAPM disequilibrium is different from the notion of disequilibrium as an imbalance of demand and supply. Asset markets could be in equilibrium in the sense that the existing stocks are willingly held at the current market prices (i.e. demand equals supply) but in disequilibrium in the sense depicted in figure (2.11).

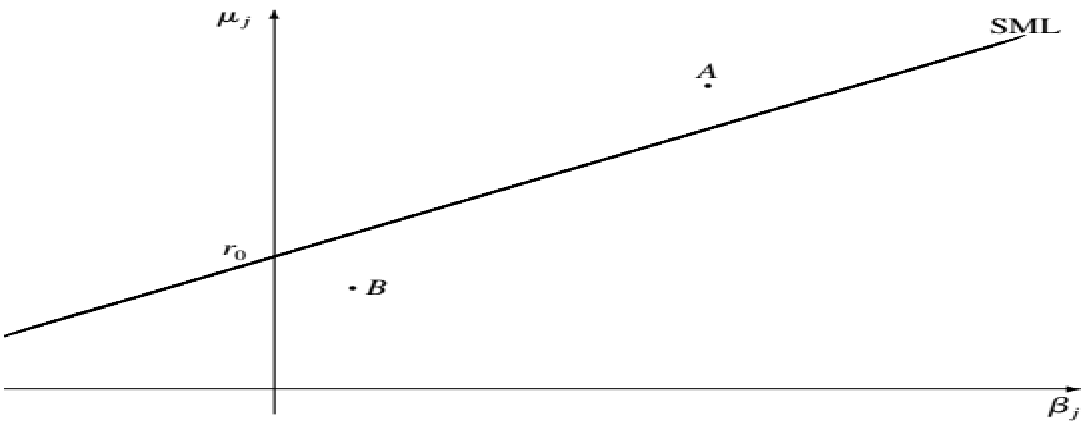

Figure (2.11): Disequilibrium in the CAPM (Bailey, 2005, p. 153)

In the same context Berk and DeMarzo (2014) stated that in order to profit by buying a positive-alpha stock, there must be someone willing to sell it. Under the CAPM assumption of homogeneous expectations, which states that all investors have the same information, it would seem that all investors would be aware that the stock had a positive alpha and none would be willing to sell. Of course, the assumption of homogeneous expectations is not necessarily a good description of the real world. In reality, investors have different information and spend varying amounts of effort researching stocks. However, even differences in the quality of investors' information will not necessarily be enough to generate trade in this situation. An important conclusion of the CAPM is that investors should hold the market portfolio (combined with risk-free investments), and this investment advice does not depend on the quality of an investor's information or trading skill. Even naïve investors with no information can follow this investment advice

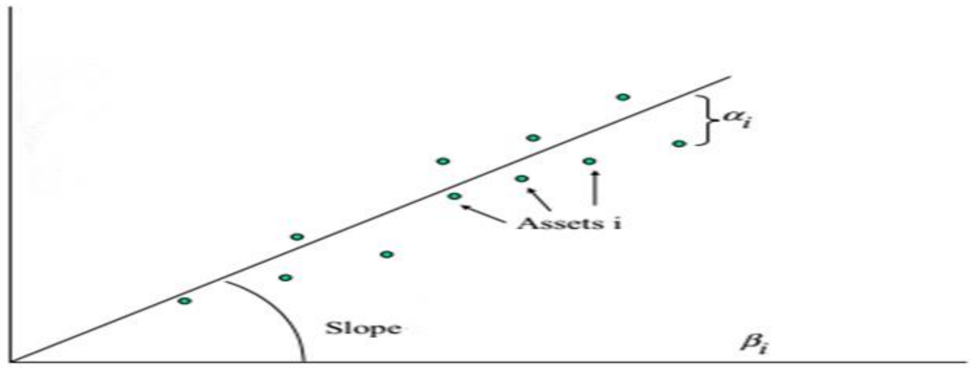

Figure (2.12): Cross Sectional Regression Model (Cochrane, 2000, p. 220)

2.4 Systematic Risk and Asset Pricing Models

The central idea of modem financial economics is that the average return of a stock is the payoff to the shareholder for taking on risk. Factor models express this risk-reward relationship. Factors are explanatory variables that represent different types of risk. A factor model shows that the average stock return is proportional to the stock's exposure to the risk that the factor represents (the factor exposure) and to the payoff for each unit of exposure to the risk. The factor premium measures how much investors are willing to pay for each factor, whereas the factor exposure measures how sensitive the stock return is to a factor. (Chincarini, 2006). While there are several competing risk and return models in finance, they all share some common views about risk. **First**, they all define risk in terms of variance in actual returns around an expected return; thus, an investment is riskless when actual returns are always equal to the expected return. **Second**, they all argue that risk has to be measured from the perspective of the marginal investor in an asset, and that this marginal investor is well diversified. Therefore, the argument goes, it is only the risk that an investment adds on to a diversified portfolio that should be measured and compensated (Damodaran, 2002).

CAPM theory, at its most basic, claims an ex ante positive relationship between an asset's undiversifiable risk and its expected returns: assets which have more undiversifiable risk (higher βs) are less desirable and should sell for lower prices and pay higher expected returns. In the cross section of security returns, the systematic risk (β) and total risk (σ) measures are statistically very highly correlated. The same risk_return relationship should thus hold whether risk is measured as total risk σ or as (relative) systematic risk β (Danthine & Donaldson, 2014).

2.4.1 The Arbitrage Pricing Theory APT

Arbitrage plays a central role in financial markets and in theories of asset prices. Arbitrage strategies are roughly speaking patterns of trades motivated by the prospect of profiting from discrepancies between the prices of different assets but without bearing any price risk. This quest for profit has an important influence on market prices, for, in a precise sense, observed market prices reflect the absence of arbitrage opportunities (sometimes referred to as the arbitrage principle). If arbitrage opportunities are not absent, then investors could design strategies that yield unlimited profits with certainty and with zero initial capital outlays. Their attempts to exploit arbitrage opportunities are predicted to affect market prices (even though the actions of each investor are, in isolation, assumed not to influence prices): the prices of assets in excess demand rise; those in excess supply fall, that the ensuing price changes eradicate potential arbitrage profits (Bailey, 2005).

Brigham and Ehrhardt (2013), announced that the **primary** theoretical advantage of the APT is that it permits several economic factors to influence individual stock returns, whereas the CAPM assumes that the effect of all factors, except those that are unique to the firm, can be captured in a single measure: the variability of the stock with respect to the market portfolio. **Also**, the APT requires fewer assumptions than the CAPM and hence is more general. **Finally**, the APT does not assume that all investors hold the market portfolio, a CAPM requirement that is clearly not met in practice. However, the APT faces several major hurdles in implementation, the most severe of which is that the theory does not actually identify the relevant factors. The APT does not tell us what factors influence returns, nor does it indicate how many factors should appear in the model. There is some empirical evidence that only three or four factors are relevant: perhaps inflation, industrial production, the spread between low- and high-grade bonds, and the term structure of interest rates but no one knows for sure.

2.4.2 Single Factor Models

Factor models of asset prices postulate that rates of return can be expressed as linear functions of a small number of factors. The simplest, single factor model is written as,

$$\boldsymbol{r_j = b_{j0} + b_{j1}F_1 + \varepsilon_j \qquad j = 1, 2, \ldots\ldots, n} \tag{2.1}$$

Where $\boldsymbol{r_j}$ is the rate of return on asset (or portfolio) $\boldsymbol{j}$, $\boldsymbol{F1}$ denotes the factor's value, $\boldsymbol{b_{j0}}$ and $\boldsymbol{b_{j1}}$ are parameters and $\boldsymbol{\varepsilon_j}$ denotes an unobserved random error as figure (2.13) shown. The rate of return on asset $\boldsymbol{j}$, $\boldsymbol{r_j}$, could be replaced by the excess return, $\boldsymbol{r_j} – \boldsymbol{r_0}$, over a risk-free rate, $\boldsymbol{r_0}$, without affecting the analysis in any substantive way. The slope parameter, $\boldsymbol{b_{j1}}$, is sometimes referred to as the factor loading (Bailey, 2005). Berk and DeMarzo (2014), defined the **excess return** as the difference between the average return for the investment and the average return for a risk-free investment, and measures the average risk premium investors earned for bearing the risk of the investment.

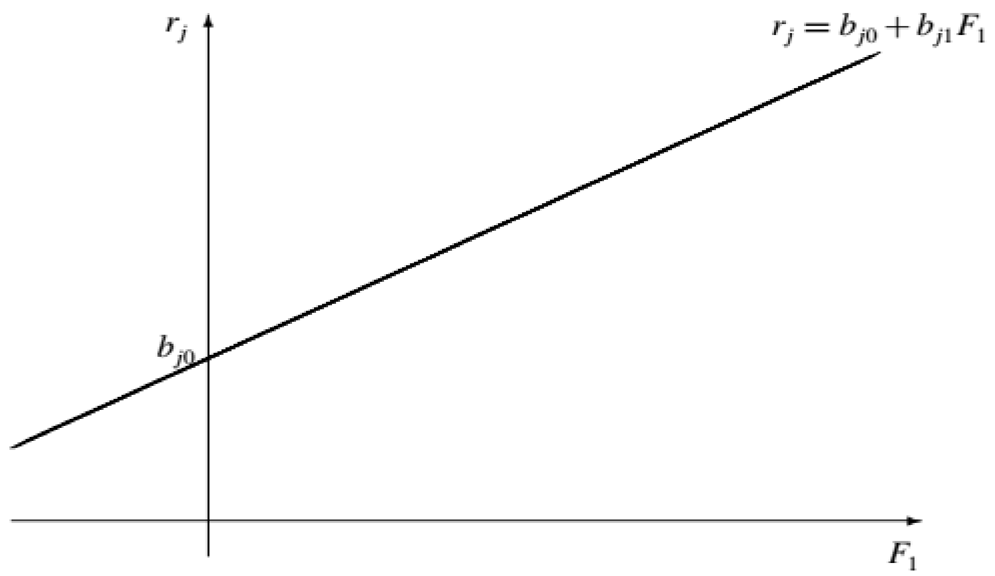

Figure (2.13): A single-factor model (Bailey, 2005, p. 185)

2.4.2.1 Market Model MM or Single Index Model

The Market Model was proposed by Markowitz (1959) .Until the 1980s, the standard market model assumed constant expected returns. The first empirical evidence, which showed evidence that returns were predictable to some extent, was therefore interpreted as a sign of market inefficiency.Campbell, Lo, and MacKinlay (1997), defined the market model as a statistical model which relates the return of any given security to the return of the market portfolio. The model's linear specification follows from the assumed joint normality of asset returns. For any security i:

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \varepsilon_{i,t} \tag{2.2}$$

$$E\left[\varepsilon_{i,t}\right] = 0 \qquad Var = \left[\varepsilon_{i,t}\right] = \sigma^2_{\varepsilon i}$$

Where $r_{i,t}$ and $r_{m,t}$ are the period-t returns on security i and the market portfolio, respectively. The intercept of this equation (denoted by the Greek letter alpha, or α_i) is the security's expected excess return when the market excess return is zero. The slope coefficient, βi, is the security beta. Beta is the security's sensitivity to the index: it is the amount by which the security return tends to increase or decrease for every 1% increase or decrease in the returnon the index. $\varepsilon_{i,t}$ is the zero-mean, firm-specific surprise in the security return in time *t*,also called the **residual.** The benefit from using the market model will depend upon the R^2 of the market model regression. The higher the R^2, the greater is the variance reduction of the abnormal return, and the larger is the gain.

2.4.2.2 The Capital Asset Pricing Model CAPM

One of the important problems of modern financial economics is the quantification of the tradeoff between risk and expected return. Although common sense suggests that risky investments such as the stock market will generally yield higher returns than investments free of risk, it was only with the development of the Capital Asset Pricing Model (CAPM) that economists were able to quantify risk and the reward for bearing it (Campbell et al., 1997). All asset pricing models emphasize risk-return tradeoffs. They state that riskier assets should have lower prices, giving them higher expected returns. Different asset pricing models emphasize different risks. The capital asset pricing model (CAPM) is the most popular model of expected returns and makes several assumptions about investors. Investors are rational, like higher portfolio returns, and dislike portfolio variance. They choose to optimally diversify, holding varying proportions of the risk-free asset and the market portfolio. The appropriate risk emphasized by the CAPM is the level of covariance a security has with the value of the overall market portfolio held by all investors (Baker & Nofsinger, 2010).

CAPM was defined as Pratt and Grabowski (2008) indicated that it's a model in which the cost of capital for any stock or portfolio of stocks equals a risk-free rate plus a risk premium that is proportionate to the systematic risk of the stock or portfolio.

Markowitz (1959), laid the groundwork for the CAPM, he cast the investor's portfolio selection problem in terms of expected return and variance of return. He argued that investors would optimally hold a mean-variance efficient portfolio, that is, a portfolio with the highest expected return for a given level of variance.

The capital asset pricing model **CAPM** of Sharpe (1964), Lintner (1965),Mossin (1966) ,and Black (1972) marks the birth of asset pricing theory (resulting in a Nobel Prize for Sharpe in 1990). Before their breakthrough, there were no asset pricing models built from first principles about the nature of tastes and investment opportunities and with clear testable predictions about risk and return. The **CAPM** is the major analytical tool for explaining the relationship between expected return and risk used in financial economics.They built on Markowitz's work to develop economy-wide implications and they showed that if investors have homogeneous expectations and optimally hold mean-variance efficient portfolios then, in the absence of market frictions, the portfolio of all invested wealth, or the market portfolio, will itself be a mean-variance efficient portfolio. The CAPM model measures the risk of an asset by covariance of asset's return with the return of all invested wealth, known as market return. The main implications of the model are that expected return should be linearly related to an asset covariance with the return on market portfolio, the model assumes that there are no sources of risk except the systematic market risk. This risk is measured by a factor called beta, the principle of risk compensation is that higher beta risk is associated with higher return.

Ang (2014), mentioned that when the market does poorly, stocks that have high exposures to the market factor (stocks with high betas, βi, MKT) also tend to do badly. That is, high beta stocks tend to tank in parallel when the market tanks. But over the long run, the CAPM predicts that stocks with high betas will have higher average returns than the market portfolio to compensate investors for losses when bad times hit, defined by the CAPM theory as low returns of the market.

Brigham and Ehrhardt (2013) defined the market risk premium, $\boldsymbol{MRP_t}$, as the extra rate of return that investors require to invest in the stock market rather than purchase risk-free securities, which represents the additional compensation investors require for the additional risk as illustrated in Figure (2.14) .The size of the market risk premium depends on the degree of risk aversion that investors have on average. When investors are very risk averse, the market risk premium is high; when investors are less concerned about risk, the market risk premium is low. The assumptions underlying the CAPM's development are summarized in the following list: (Schulmerich et al., 2014)

- All investors have homogeneous expectations, i.e., they expect the same probability distribution of returns.
- All investors want to invest in an optimal portfolio based on Markowitz's mean-variance framework, i.e., for a given expected return, they target the portfolio with the lowest volatility.
- All investors can lend and borrow any amount of money at the risk-free rate.
- All investors have the same one-period horizon.
- All assets are infinitely divisible.
- There are no taxes and transaction costs.
- There is no inflation or any change in interest rates, or inflation is fully anticipated. Capital markets are efficient, i.e., they are in equilibrium.

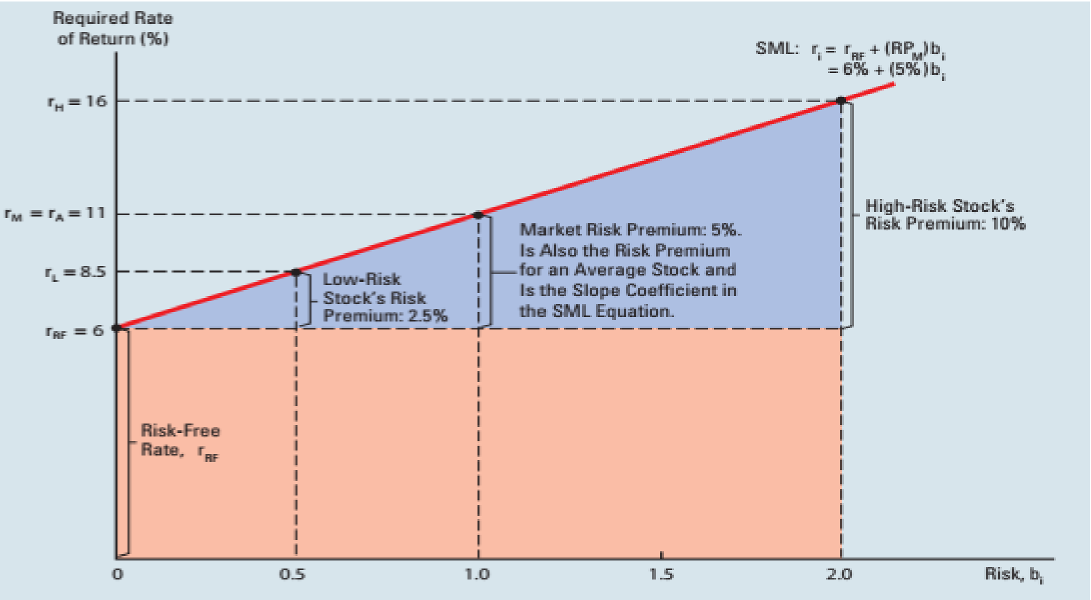

Figure (2.14): The Security Market Line SML (Brigham & Ehrhardt, 2013, p. 260)

The previous assumptions and investor's behaviour framework were put in a single equation to reflect the risk-return relationship. The Sharpe and Lintner derivations of the CAPM assume the existence of lending and borrowing at a riskfree rate of interest. For this version of the CAPM the expected return of asset i,

$$\left(r_{i,t} - rf_t\right) = \alpha_i + \left(r_{m,t} - rf_t\right)\beta_i + \varepsilon_{i,t} \tag{2.3}$$

Where:

$r_{i,t}$: is the expected rate of return on security (i)

$r_{f,t}$: is the risk free rate of return.

$r_{m,t}$: is the expected rate of return on market portfolio.

$(r_{m,t} - r_{f,t})$ = MRP_t market risk premium.

β_i : is the security (i) beta, which is equal to the covariance between security's returns and market returns divided by the variance of the market return **or** it’s equal to the standard deviation of security's returns divided by the standard deviation of the market returns and multiplied by *rho* or correlation coefficient between security's returns and market returns .

$$\beta_I = \frac{COV(r_i, r_m)}{Var\,(r_m)} \;\; or = \;\rho_{I,M}\frac{\sigma_I}{\sigma_M} \tag{2.4}$$

A beta value more than 1 means that the stock is more risky than the market portfolio, while a beta value less than 1 indicates that the stock is less risky than the market. A positive beta represents a positive relationship between the stock return and the market return but a negative beta denotes a negative relationship between the stock return and the market return. Asset risk premium is referred to the difference between its return and the risk free rate, while the market risk premium is the difference between the market return and the risk free rate. The variance of the residuals $\varepsilon_{i,t}$ reflects the unsystematic risk in asset i. In practice the CAPM is typically estimated using ordinary least squares regression with five years of monthly data. A wealth of empirical evidence was published showing that the basic assumptions of the CAPM regressions with respect to parameter stability and residual IID-NESS (The I.I.D. means every residual is independent and identically distributed), are strongly refuted.(Meyers, 2010)

The constant α_i, referred to as the stock's **alpha**, measures the historical performance of the security relative to the expected return predicted by the security market line, it is the distance the stock's average return is above or below the SML. Thus, α_i can interpret as a risk-adjusted measure of the stock's historical performance.According to the CAPM, α_i should not be significantly different from zero (Berk & DeMarzo, 2014).

Empirical tests of the Sharpe-Lintner CAPM have focused on three implications:

- The intercept is zero.
- Beta completely captures the cross-sectional variation of expected excess returns.
- The market risk premium, MRP_t is positive.

The CAPM wsa also challenged by various anomalies which take the form of other factors that marginalize the market excess return factor in explaining the pattern of excess security returns (Danthine & Donaldson, 2014).

2.4.3 Multiple Factor Models

The CAPM, due to Sharpe (1964) and Lintner (1965) , is an equilibrium theory where the expected return of a given asset is a linear function of its covariance with the return of the market portfolio. The Arbitrage Pricing Theory (APT) was introduced by Ross (1976) as an alternative to the Capital Asset Pricing Model, where in the absence of asymptotic arbitrage, the expected return of a given asset is determined by its covariances with multiple factors. The APT can be more general than the CAPM in that it allows for multiple risk factors. Also, unlike the CAPM, the APT does not require the identification of the market portfolio. However, this generality is not without costs. In its most general form the APT provides an approximate relation for expected asset returns with an unknown number of unidentified factors, assumes that numerous factors drive the return to a security, accordingly, the number and nature of factors is left unspecified (Campbell et al., 1997) . According to the APT, the expected return on the stock is the weighted average of beta loadings on a number of factor portfolios, where the weights on each factor are the expected return on a portfolio whose beta with factor j is 1 and with all others is 0 (Baker & Nofsinger, 2010).

For most applications the single factor model is too restrictive; several factors are allowed to affect the rates of return on assets. The generalization to two factors takes the form

$$r_j = b_{j0} + b_{j1}F_1 + b_{j2}F_2 + \varepsilon_j \qquad j = 1, 2, \ldots\ldots, n \qquad (2.5)$$

with factor loadings b_{j1} and b_{j2}. There are two systematic influences on the rate of return from each asset. Apart from this, the interpretation is exactly the same as for the single-factor model. The single-factor and two-factor models are convenient for expositional purposes because their predictions extend to the multifactor model:

$$r_j = b_{j0} + b_{j1}F_1 + b_{j2}F_2 + \cdots + b_{jk} + \varepsilon_j \qquad j = 1, 2, \ldots, n \qquad (2.6)$$

there are K distinct factors. A restriction must be placed on the number of factors in the APT. In particular, K must not be too large. More precisely, K should be small relative to n, the number of assets: $\mathbf{K < n}$. The properties of the random errors are assumed to carry over to the multifactor models that is,

$$E[\varepsilon_j|F_1] = 0, E[\varepsilon_j|F_2] = 0, \ldots, E[\varepsilon_j|F_K] = 0 \text{ for each asset } j.$$

Finally, multifactor models have a distinct advantage over single factor models in that it is much easier to identify a collection of portfolios that captures systematic risk than just a single portfolio. They also have an important disadvantage, however: We must estimate the expected return of each portfolio. Because expected returns are not easy to estimate, each portfolio we add to the collection increases the difficulty of implementing the model (Berk & DeMarzo, 2014).

2.4.3.1 The Fama and French Three Factor Model FF3

The Fama and French three factor asset pricing model was developed as a response to poor performance of the CAPM in explaining realized returns. E. F. Fama and French (1993), argue that anomalies relating to the CAPM are captured by the three factor model. They base their model on the fact that average excess portfolio returns are sensible to three factors namely: (1) excess market portfolio return; (2) the difference between the excess return on a portfolio of small stocks and the excess return on a portfolio of big stocks (Size factor, SMB, small minus big); and (3) the difference between the excess return on a portfolio of high book to market stocks and the excess return on a portfolio of low book to market stocks (Value factor, HML, high minus low). The model is written as

$$\left(r_{p,t} - rf_t\right) = \alpha_p + \beta_p\left(r_{m,t} - rf_t\right) + s_i(SMB_t) + h_i(HML_t) + \varepsilon_{p,t} \qquad \textbf{(2.7)}$$

Where:

- $r_{p,t}$ = the realized return on portfolio at month t
- rf_t = the risk free rate at month t.
- $(r_{p,t} - rf_t)$ = portfolio excess returns
- α_p = the intercept.
- $r_{m,t}$ = the realized return on the market at month t.
- $(r_{m,t} - rf_t)$ = market excess return = MRP_t market premium
- SMB_t , meant to mimic the risk factor in returns related to size, = SRP_t size premium and stands for "small (cap) minus big" and represents the premium for investing in the portfolios of small capitalization stocks compared to large (cap) portfolios during time period t. The SMB factor was designed to capture the outperformance of small firms relative to large firms.
- HML_t, meant to mimic the risk factor in returns related to value, = VRP_t value premium and stands for high (BE/ME) = value companies minus low (BE/ME) = growth companies and indicates the premium for taking a long position on portfolios of value companies stocks and short position on the portfolios of growth companies stocks during time period t. The value effect refers to the phenomenon that value stocks outperform growth stocks, on average.
- β, s_i , *and* h_i: the slope coefficients in the time series regressions are respectively for MRP_t, SMB_t, **and** HML_t **factors.**
- $\varepsilon_{p,t}$: is the error in estimation.

The SMB and HML factor loadings are given by s_i and h_i, respectively. If a stock co-moves neither with small nor large stocks, it's a medium-size stock, and s_i would be zero. As it starts moving with small stocks s_i becomes positive, and if it moves together with large stocks, s_i is negative. Likewise, h_i measures how much a stock is acting like other value stocks: positive h_i indicates that the stock has a value orientation, and negative h_i indicates that the stock is acting like a growth stock. The market itself is neither small nor big and neither value nor growth, so the market has zero s_i and h_i loadings. Factor exposures typically are determined from the time series regression of stock returns on factor premiums. Since the regression coefficients (the factor exposures) measure the sensitivity of the dependent variable (the stock return) to the change in the independent variables (the factor premiums), factor exposures sometimes are called factor sensitivities. They are also sometimes referred to as factor loadings.

Meyers (2010), indicated that Fama and French proposed a three factor linear beta model to explain the empirical performance of small and high book to market stocks. The intuition behind the factors they propose is the following. If small firms earn higher average returns than large firms as a compensation for risk, then the return differential between a portfolios of small firms and a portfolio of large firms would mimic the factor related to size provided the two portfolios have similar exposures to other sources of risk. Similarly, if value firms earn higher average returns than growth firms as a compensation for risk, then the return differential between a portfolio of value firms and a portfolio of growth firms, would mimic the factor related to book-to-market provided the two portfolios have similar exposure to other sources of risk.

As Ang (2014) mentioned, the SMB and HML factors are long–short factors. They are mimicking portfolios that consist of simultaneous \$1 long and \$1 short positions in different stocks. That is,

$$SMB = \underbrace{\text{\$1 in small caps}}_{\text{Long}} - \underbrace{\text{\$1 in large caps}}_{\text{Short}}$$

and so SMB is designed to capture the outperformance of small companies versus large companies. The HML factor picks up the outperformance of value stocks versus growth stocks:

$$HML = \underbrace{\text{\$1 in value stocks}}_{\text{Long}} - \underbrace{\text{\$1 in growth stocks}}_{\text{Short}}.$$

The notion of going short or taking a short position is a common one in finance. In its simplest form this refers to the action of selling an asset. For an investor who owns an asset that is sold, the action is trivial enough. What may appear more puzzling is the action of selling an asset that the investor does not own. This is the act of making a ***short-sale*** or ***selling short*** (Bailey, 2005). In practice, short sales typically reflect a desire of some investors to bet against the stock. We refer to a positive investment in a security as a long position in the security. But it is also possible to invest a negative amount in a stock, called a short position, by engaging in a short sale, a transaction in which you sell a stock today that you do not own, with the obligation to buy it back in the future. If a stock's expected total return is below that of other investments with comparable risk, investors who own the stock will choose to sell it and invest elsewhere. But what if you don't own the stock, can you profit in this situation? The answer is yes, by short selling the stock. To short sell a stock, you must contact your broker, who will try to borrow the stock from someone who currently owns it. When you short sell a stock, first you receive the current share price. Then, while your short position remains open, you must pay any dividends made. Finally, you must pay the future stock price to close your position. These cash flows are exactly the reverse of those from buying a stock. Because the cash flows are reversed, if you short sell a stock, rather than receiving its return, you must pay its return to the person you borrowed the stock from. But if this return is less than you expect to earn by investing your money in an alternative investment with equivalent risk, the strategy has a positive NPV and is attractive. Short selling is profitable if you expect a stock's price to decline in the future. Recall that when you borrow a stock to short sell it, you are obligated to buy and return it in the future. So when the stock price declines, you receive more upfront for the shares than the cost to replace them in the future. But short selling can be advantageous even if you expect the stock's price to rise, as long as you invest the proceeds in another stock with an even higher expected return. That said, short selling can greatly increase the risk of the portfolio. (Berk & DeMarzo, 2014).

According to Chincarini (2006) there were two ways to construct Fama & French model . The **first** one named unidimintional (**univariate sorts)** zero investment portfolio, the **second** is multidimintional **(bivariate sorts** [2x2, 2x3, 3x3, 5x5, 10x10,etc], or **three way sorts**[2x2x2, 2x3x3, 2x3x4, 2x4x4, etc]) zero investment portfolio. A **unidimintional** zero investment portfolio construct zero investment portfolios based on a **factor** and study the characteristics of the portfolio. Typically, we will split the universe of stocks conditional on a particular factor exposure into thirds, quintiles, or deciles as figure (2.15) shown. Of course, any other division of the stocks is acceptable. Usually, a portfolio is created from the first division, and another portfolio is created from the last division. The returns of the (***low risk exposur division***) are subtracted from those of the (***high risk exposur one***). These are the returns to a hypothetical zero-investment portfolio in which the (***high risk exposured division***) is bought and the (***low risk exposured division***) is shorted. It is called zero investment because, theoretically, no capital needs to be used to create the portfolio. The returns of this portfolio measure the benefits (***premium*** from using this factor to pick stocks. Suppose that the factor of interest is the B/M ratio. The first task is to rank the universe of stocks by their B/M ratio exposure in each historical period. The stocks can be ranked monthly, quarterly, or yearly. The stocks should be ranked for every month for some historical period, say, 5 to 10 years of historical data to the present. The next step is to create an equal weighted portfolio of stocks in the first quintile and an equal weighted portfolio of stocks in the fifth quintile. The first quintile is just the 20% of stocks ranked lowest (growth companies) according to the factor, which in this case is the B/M ratio. The fifth quintile is the highest 20% (value companies) of stocks ranked according to the B/M ratio.In our case by using B/M ratio, the last division is the high risk exposured (value companies)(according to our ranking from lowest to highest .If we were using M/B ratio, ranking from lowest to highest, the top division became the high risk exposured (value companies) and so forth.The next step is to compute the returns of the two portfolios for each monthly period. Of course, these portfolios will change over time on a monthly, quarterly, or yearly basis depending on the choice of rebalancing period. The final step is to calculate statistics on the historical returns of the fifth quintile portfolio (***high risk exposure* – *value companies***) minus the first quintile portfolio (***low risk exposure* – *growth companies***). This procedure should be repeated for every factor that we are interested in using as a predictor of stock returns. After the zero investment portfolio returns were calculated, one can do a statistical test of whether the average portfolio return is significantly different from zero.

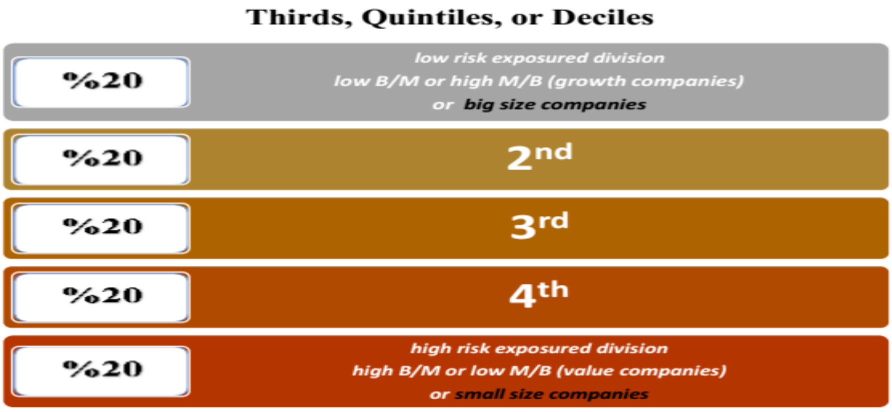

Figure (2.15): Fama and French unidimintional Investing Ranking Method, source: author, 2016**.**

A multidimintional Zero investment portfolios also can be created, by considering many **factors** simultaneously. This approach is more rigorous than the unidimensional approach because we can examine the joint significance of factors. Construction of the zero investment portfolio proceeds almost in the same way as before.

The Multidimintional Fama-French Size-Value Portfolios and Factors

The Fama French methodology involves a cross classification of stocks on two dimensions , size, measured by market capitalization, and value, measured by the ratio of book value per share to market price per share B/M ratio. This classification is tabulated below in table (2.1):

Table (2.1): Size & Value intercection matrix

	(Value as measured by B/M ratio)		
(Size = M.CAP)	**High**	**Medium**	**Low**
Small	***SH***	***SM***	***SL***
Big	***BH***	***BM***	***BL***

Source: author, 2016

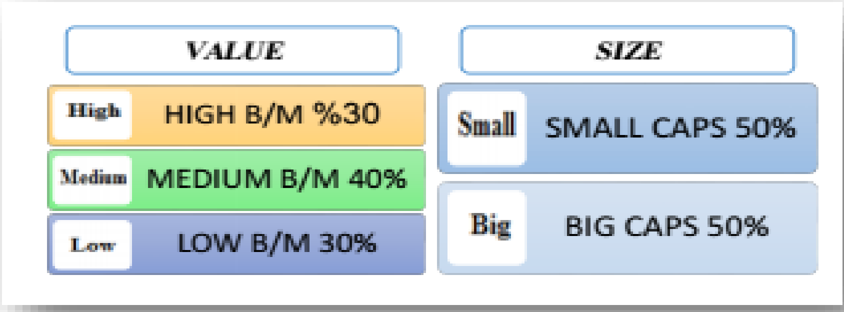

Figure (2.16): Size &Value Portfolio Breakpoints, source: author, 2016

As illustrated in Figure (2.16), they rank all stocks by each factor of interest. There were two factors, size and B/M ratio, and then each stock will be assigned two rankings, one by size and the other by B/M ratio, according to (**2x3**) portfolio intersection constructionas as figure (2.16) shown. Based on these rankings, they grouped stocks into two groups. From the size factor, there will be two portfolios starting from the smallest to the largest. From the B/M ratio, there will be three portfolios from the highest to the lowest. By taking intersections of these Portfolios, they obtained six portfolios. Given six portfolios, the method to create the zero investment portfolios depends on what they were interested in. If they were interested in whether small size and high B/M ratio together influence stock returns, they create the zero investment portfolio by taking a long position on a small high portfolio and a short position on a large low portfolio. Once the zero investment portfolio is constructed, statistical test can be calculated to determine whether the joint effect of the factors is significant.

The portfolio ***BH*** can be regarded as the intersection of big and high, while ***BM*** is the intersection of big and medium, and so forth.

$$\boldsymbol{SMB_t} = \left(\frac{[\boldsymbol{SH_t} + \boldsymbol{SM_t} + \boldsymbol{SL_t}] - [\boldsymbol{BH_t} + \boldsymbol{BM_t} + \boldsymbol{BL_t}]}{\mathbf{3}}\right) \qquad \textbf{(2.8)}$$

SMB (small minus big), meant to mimic the risk factor in returns related to size, is the difference, each month, between the simple average of the returns on the three small stock portfolios (*S/L*, *S/M*, and *S/H*) and the simple average of the returns on the three big stock portfolios (*B/L*, *B/M*, and *B/H*). The SMB factor is thus designed to capture the effect of size while being largely free of the influence of value.

Similarly, the value factor **HML** (High minus Low) is the difference, each month, between the simple average of the returns on the two value stock portfolios (*S/H*, and *B/H*) and the simple average of the returns on the two growth stock portfolios (*S/L*, and *B/L*). The HML factor is thus designed to capture the effect of value while being largely free of the influence of size

$$HML_t = \left(\frac{[SH_t + BH_t] - [SL_t + BL_t]}{2}\right) \tag{2.9}$$

The formulas above show how the SMB and HML returns are obtained. The return of SMB in a month t is the arithmetic average of the returns of the small cap portfolios minus the arithmetic average of the returns of the large cap portfolios. The return of HML in a month t is calculated in a similar way. However, HML does not use the **medium** portfolios as Figure (2.17) shown, which consist of stocks which are neither value stocks nor growth stocks. The factor MKT is constructed from the weighted returns of all stocks belonging to one of the six Fama French Portfolios.

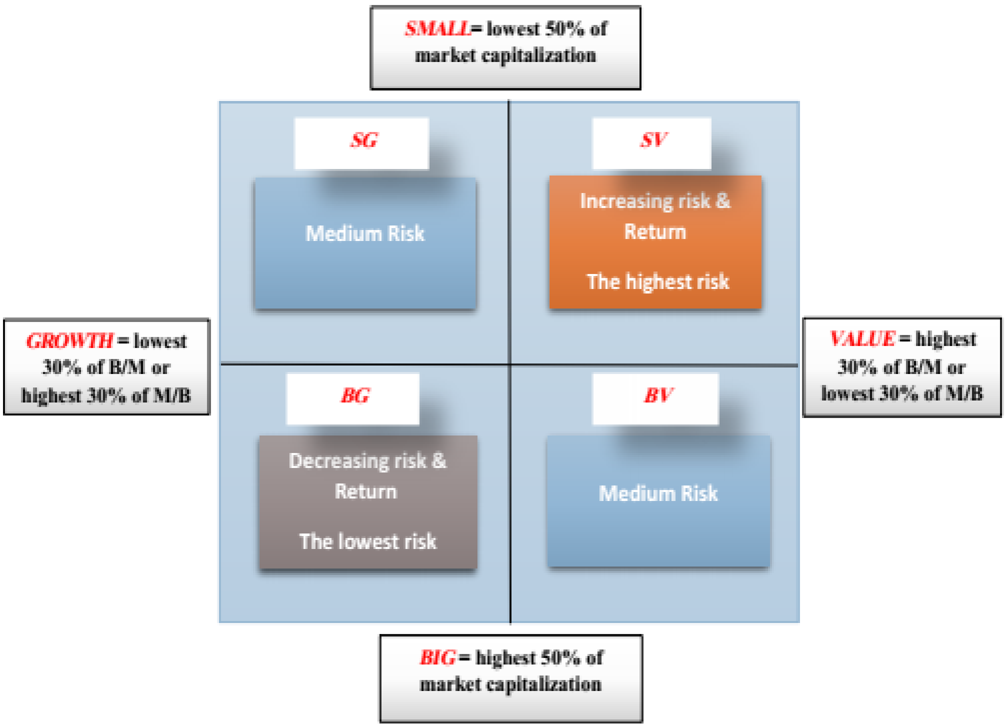

Figure (2.17): Fama and French Multidimintional Investing Model, source: author, 2016

In summary, the Fama French model performs remarkably well at explaining the average return difference between small and large, and value and growth portfolios. The natural question that arises is what drives the superior performance of the Fama French model in explaining average stock returns. One possible explanation is that the Fama–French factors HML and SMB proxy for sources of risk not captured by the return on the market portfolio. This explanation is consistent with a multifactor asset pricing model like the Intertemporal Capital Asset Pricing Model (ICAPM), which states that if investment opportunities change over time, then variables other than the market return will be important factors driving stock returns. Therefore, one possible interpretation of the HML and SMB portfolios is that they proxy for variables that describe how investment opportunities change over time (Meyers, 2010).

2.5 Anomalies or Market Inefficiency Concept

In financial markets, anomalies refer to situations when a security or group of securities performs contrary to the notion of efficient markets, where security prices are said to reflect all available information at any point in time. So named because they are difficult to explain by conventional means and, hence, are often regarded as evidence of inefficiency. E. F. Fama and French (1996), mentioned that average returns on common stocks are related to firm characteristics like size, earnings/price, cash flow/price, book-to-market equity, past sales growth, long-term past return, and short-term past return and because these patterns in average returns apparently are not explained by the CAPM, they are called anomalies. Chincarini (2006, p. 33), indicated that investment professionals and academics have observsd patterns in historical financial data that contradict the theory of efficient markets called Anomalies. An anomaly suggests that investors habitually fail to consider and correctly interpret all the information relevant to the investment decision, or that institutional barriers prevent them from acting on certain information , or that even with all the relevant information staring them in the face , they persist in making irrational choices. Similary , Bailey (2005, p. 94) stated that "for a phenomenon to be an anomaly there has to be ‘conventional wisdom’ that the phenomenon violates. The conventional wisdom in this context is that certain patterns of asset prices should be observed. The phrase ‘should be observed’ is the warning that a model is lurking near, though perhaps below, the surface". In the same context if markets are efficient, then the expected abnormal return is zero. On the other hand, if the abnormal return is nonzero and it is possible to predict the direction of the deviation, then the pricing constitutes an anomaly (Gray, 2003). There are several types of anomalies that contradict each definition of market efficiency from weak form to strong form.

2.5.1 Weak Form Anomalies

In weak-form efficiency, future prices cannot be predicted by analyzing prices from the past. Excess returns cannot be earned in the long run by using investment strategies based on historical share prices or other historical data. Typical tests of weak-form market efficiency try to determine whether past prices can be used to predict future prices of individual stocks .Technical analysis techniques will not be able to consistently produce excess returns, though some forms of fundamental analysis may still provide excess returns. Share prices exhibit no serial dependencies, meaning that there are no "patterns" to asset prices. This implies that future price movements are determined entirely by information not contained in the price series. Hence, prices must follow a random walk. This 'soft' EMH does not require that prices remain at or near equilibrium, but only that market participants not be able to systematically profit from market "inefficiencies".

2.5.2 Semistrong Form Anomalies

In semi-strong form efficiency, it is implied that share prices adjust to publicly available new information very rapidly and in an unbiased fashion, such that no excess returns can be earned by trading on that information. Semi-strong form efficiency implies that neither fundamental analysis nor technical analysis techniques will be able to reliably produce excess returns. There is a host of anomalies that provide evidence that market prices do not reflect all public information and that therefore the market is not semistrong-form efficient.

2.5.3 Strong Form Anomalies

In strong-form efficiency, share prices reflect all information, public and private, and no one can earn excess returns. If there are legal barriers to private information becoming public, as with insider trading laws, strong-form efficiency is impossible, except in the case where the laws are universally ignored. The strong form of market efficiency is probably the hardest kind to believe in, because it means that market prices already reflect all information, both public and private.

2.6 Well-Known Anomalies

Akhter, Sandhu, and Butt (2015), stated that a market in which prices at any time fully reflect all available information is called efficient market. Finance literature, especially related to capital markets ,(Akhter et al., 2015; McGuckian, 2013) differentiates anomalies into three categories, namely fundamental, technical and calendar.

2.6.1 Fundamental

Anomalies of this nature involve the fundamental characteristics of the companies traded on stock markets. Investment returns can be forecasted to a certain extent according to the specific features of a company (McGuckian, 2013). These anomalies are associated with fundamental data, which are the data obtained from a firm's income statements, balance sheets, and cash-flow statements.

2.6.1.1 Size Effect

In finance it refers to the observation that smaller firms have higher returns than larger ones, on average, over long horizons (Cakici & Topyan, 2014). Banz (1981) for the first time, evaluated the relationship between the total market value of the common stock of a firm and its return and showed that the common stock of small firms had higher risk-adjusted returns than the common stock of large firms.Chincarini (2006), indicated that firm size might be a proxy for risk and, therefore, a potentially important return predictor, in another context, small-cap outperformance, may, however, be an instance of the ***neglected firm effect***, in which firms with low analyst coverage or low institutional ownership tend to have higher risk-adjusted returns.

2.6.1.2 Value Effect

"Value"stocks have market values that are small relative to the accountant's book value. This category of stocks has given large average returns. "Growth" stocks are the opposite of value and have had low average returns (Cochrane, 2000). Stattman (1980) is the first who documented the relationship between value effect and returns. Modern academic research into the value effect began with Basu (1977) and the last few decades have seen an explosion of papers offering various explanations for the value premium.In other words value firms refers to firms with (high B/M) or (low M/B) that outperform growth firms with (low B/M) or (high M/B).

2.6.2 Technical

In finance technical analysis is essentially a term used to describe the investment techniques that attempt to forecast securities prices by studying past prices and statistics. These statistics and charts built on previous performance data are analysed to indicate possible future price movements and potentially profitable trading strategies. Technical analysis and strategies are founded upon methods which utilise correlations, aggregate return autocorrelation, moving averages, variance measures, mean reversion, momentum, price figures and trading volume indicators (McGuckian, 2013).

2.6.2.1 Momentum Effect

Another standard investment factor is momentum. This burst onto the academic scene with Jegadeesh and Titman (1993) in the same year that Fama and French were capturing size and value factors. Investors can gain the advantage by using the momentum strategies .It is the positive autocorrelation in returns for a short period of time and by buying past winners and selling past losers they can gain the abnormal profits

2.6.3 Calendar or Seasonal

Calendar anomalies mean abnormal behavior of stock markets at and during specific period of time. Calendar anomalies are one component among a number of factors of inefficient behavior of livestock markets (Akhter et al., 2015). Calendar and time anomalies contradict the weak form efficiency because weak form efficiency postulates that markets are efficient in past prices and cannot predict future on theses bases.

2.6.3.1 January Effect

The January effect is an abnormal return on a given set of stocks achieved in January compared to other months of the year (Schulmerich et al., 2014). According to this, the January effect is attributed to the rebound of stocks after the year-end tax selling period. Actually, stocks depressed near year-end are more likely to be sold for tax purposes. On an accounting basis, any stock which lost value during the former year yields a tax credit and the investor has less to pay to the state for the past or future period, according to accounting standards(Schulmerich et al., 2014). Investors (including institutions) tend to engage in tax selling toward the end of the year to establish losses on stocks that have declined. After the new year, the tendency is to reacquire these stocks or to buy similar stocks that look attractive. This scenario would produce downward pressure on stock prices in late November and December and positive pressure in early January. Such a seasonal pattern is inconsistent with the EMH since it should be eliminated by arbitrageurs who would buy in December and sell in early January (Reilly & Brown, 2012).

2.6.3.2 Weekend or Holiday Effect

It refers to the observation that the average stock return is higher on the trading day immediately preceding holidays than on other trading days (Abu-Rub & Sharba, 2011).

2.6.3.3 Turn-of-the-Month Effects

The turn-of-the-month effect is a typical seasonal stock market anomaly. Studies have shown that stocks offer higher returns on the last and first days of every month relative to the other days. This effect is called ***turn-of-the-month effect*** and was well documented over time and across countries. Depending on researchers, the turn of the month is defined as the three to five trading days at the end of the month and at the beginning of the next month. The holiday effect is similar in that returns are on average higher on the day before a holiday, compared to other trading days (Schulmerich et al., 2014).

2.6.3.4 Islamic Calender Effect

Islamic calendar is followed by Muslims in more than fifty countries of the world and Muslims celebrate religious months such as Zul-Hijjah, Ramadan and days such as Eid-El-Fiter and Eid-El-Adha. The Islamic calendar is based on Hijri tied to lunar. It consists of 12 months according to 12 phases of the lunar. These calendars may affect the stock markets of Muslim countries because of the fact that trading activities decreasing in these months and days (Akhter et al., 2015).

2.7 Behavioral Explainations for the Anomalies

Many researchers believe that a substantial amount of the market anomalies, effects, bubbles/crashes, economic booms/busts and at the individual level, irrational financial decisions can be explained by behavioural finance. Accordingly, the ability for security asset prices to reflect all currently available information is a key aspect incorporated into many of the most prominent modern finance theories. Concurrently a variety of information sources at differing levels of frequency, availability, and quality exist. An assortment of corporate news events, earnings reports, dividend announcements, production reports and other incidents, distributed via all types of media, impact upon future company share price performance and investor portfolio return. The speed to which the market reacts to such relevant information is thought to be important in terms of market "informational efficiency" and usually the faster a correct readjustment in prices occurs, the more efficient the market is deemed to be (McGuckian, 2013).

A feature of many financial anomalies is that they tend to disappear soon after evidence of their existence enters the public domain. It is highly unlikely that anyone could consistently profit from exploiting anomalies. The first problem lies in the need for history to repeat itself. Second, even if the anomalies recurred like clockwork, once trading costs and taxes are taken into account, profits could dwindle or disappear. Finally, any returns will have to be risk-adjusted to determine whether trading on the anomaly allowed an investor to beat the market.

Chincarini (2006), indicated that anomalies and behavioural biases give fairly strong evidence that markets may not be much more than weak form or only sporadically semistrong form efficient, in other word these are the top 10 reasons why markets are not perfectly efficient:

- Obtaining information is costly. Not every one is able or willing to pay for information.
- Information, even public information, travels somewhat slowly through the market.

- Not every investor has the ability to process a large amount of information, especially quantitative information.
- By filtering public information, some people may creat what amounts to private information.
- Some investors, baise their investment decisions on sentiment rather than on the logical interpretation of information.
- Some attempts to exploit others' presumed irrationality actually create more inefficiency.
- Economic conditions, especially the state of technology, change all the time, and it takes time for people to adapt to these changes.
- Transactions costs create gaps between economic models and reality.
- Taxes cause distortions in the markets.
- Government regulation of financial markets creates gaps between economic models and reality.

2.8 Market Microstructure and Liquidity

Meyers (2010) mentioned that Market microstructure is a field of study in economics that examines the way in which assets are traded and priced under different trading mechanisms, e. g., single price call auction, dealer markets, limit-order book markets, hybrid markets, etc., and under different trading environments, e. g., perfect information environments (complete markets) compared to asymmetric information environments (incomplete markets).In the same context, As transaction-by-transaction or high frequency data from a variety of sources has become available, empirical market microstructure has grown extensively. Most papers use high frequency data to predict transaction costs, estimate limit-order book models for intraday trading strategies, and estimate the liquidity of the market. There are a few papers, though, that do not estimate market microstructure models per se, but use high frequency data to answer questions relevant to the asset pricing field, corporate finance field, and economics in general.

Easley and O'hara (2004), identified liquid market as "buyers and sellers can trade into and out of positions quickly and without having large price effects". In addition, she indicated to the microstructure definition of an asset liquidity which is the availability of large number of ready buyers and sellers. In the same context Harris (2002) indicated that the market is liquid when traders can trade without significant adverse effect on price. In other words, the liquid market is a continuous market and efficient one. The continuous market is liquid when almost any amount of stock can be bought or sold immediately. An efficient market is liquid when small amounts of stock can always be bought or sold very near the current market price, and large amounts can be bought or sold over long periods of time at prices that, on an average, are very near the current market price. It means that the ability to handle large amounts of stock in short periods of time without changing the price of the stock is not a characteristic of liquid market (Black, 1971).

Another prospective is introduced by Liu (2006) indicated that **Liquidity** is generally described as the ability to trade large quantities quickly at low cost with little price impact. This description highlights four dimensions to liquidity, namely, trading quantity, trading speed, trading cost, and price impact.

Black (1971), announced that, an asset to be consider as a liquid one, if it can be sold in a short time and at a price not too much below the selling price, if he/she took plenty of time to sell it. Furthermore, he points out that the market for a stock is liquid if the following conditions are available:

- An investor who wants to buy or sell small amounts can find bid and ask prices for the stock immediately .
- The spread, difference between the bid and ask price, is always small.
- An investor who is buying or selling a large amount of stock, in the absence of special information, can expect to do so over a long period of time at a price not very different, on average, from the current market price.
- An investor can buy or sell a large block of stock immediately, but at a premium or discount that depends on the size of the block.

Easley and O'hara (2004), said that Market liquidity enhancement is one of the most important characteristics of stable markets. The microstructure literature provides some simple prescriptions like disclosure rules, greater transparency, insider trading laws, and lower transactions costs which contribute to make markets more attractive to investors. Otherwise, investors become uncertain and want to exit the market. Thus, uncertainty can beget illiquidity, and with it market instability.

2.8.1 Liquidity and Stock Markets

Easley and O'hara (2004), demonstrated that private information increases the risk to uninformed traders and induces a form of systematic risk. As a result, uninformed traders require higher return for two reasons. The first is compensating them for bearing the risk which is generated from holding stocks with great private information. The second one is that informed investors are better able to shift their portfolio weights to incorporate new information. Studies like (Amihud (2002); Amihud & Mendelson, 1986; Amihud, Mendelson, & Pedersen, 2005, 2006) argue that investors need higher returns to hold illiquid assets, suggesting that illiquidity is a risk that requires higher compensation. On the contrary, liquidity is considered as risk-reducing, and investors will be more willing to hold assets that have greater liquidity.

Pastor and Stambaugh (2003), announced that liquidity risk describes sensitivity of stock return at unexpected changes of liquidity. Return of each stock should have different sensitivity toward changes at market liquidity; therefore, liquidity risk describes level of loss that is applied to investors for changes at market liquidity.

2.8.2 Well-Known Liquidity Measures

There are many measures of liquidity used by researchers to test the role of liquidity as a risk factor in asset pricing models, such as Bid-ask spread, Number of trades, Trades volume, Trades value and Stock Turnover. Lybek and Sarr (2002), classified liquidity measures into four categories. **Firstly**, transaction cost measures that capture costs of trading financial assets and trading frictions in the secondary markets. **Secondly**, volume-based measures distinguish liquid markets by the volume of transactions compared to the price variability, primarily to measure breadth and depth. **Thirdly**, equilibrium price-based measures try to capture orderly movements towards equilibrium prices to mainly measure resiliency. **Fourthly**, market-impact measures that attempt to differentiate between price movements due the degree of liquidity from other factors, such as general market conditions or arrival of new information to measure both elements of resiliency and speed of price discovery.

Amihud et al. (2005), classified liquidity measures into high-frequency and Low-frequency measures. High-frequency measures are those relying on long term data such as annual return and annual trading volume data. In contrast, low-frequency data applies short term data such as daily return and daily trading volume data. In another classification, (Aldaya, 2013) categorised liquidity measures into one-dimension and multi-dimensions. One-dimensional liquidity measures take only one variable into account, whereas the multi-dimensional liquidity measures encapsulate many variables within one measure. These measures are classified into three groups, volume-related liquidity measures; time-related liquidity measures; and bid-ask spread-related liquidity measures.

Recently Eid (2015) investigated the role of information asymmetry on the cost of equity capital by using many liquidity measurs such as, the number of trades, trading volume, and trading value. The results showed that the number of trades, trading volume, and trading value do not have impact on the COEC due to high multicollinearity among them. Also the results showed that there is significant relationship between bid-ask spread and COEC in "PEX" but it cannot be considered due to the weakness of R^2. So this study investigated the role of Stock Turnover defined as the number of shares traded divided by the number of shares outstanding as a liquidity proxy that was not investigated so far in "PEX".

2.8.3 The Role of Liquidity in Asset Pricing

Amihud and Mendelson (1986) were the first that shed the light on the role of liquidity in asset pricing.They analyzed the relationship between stock returns and bid-ask spreads and found empirical evidence related to the existence of a liquidity premium.Since that study, (Acharya & Pedersen, 2005; Amihud, 2002; Amihud et al., 2006; Baradarannia & Peat, 2012; Bradrania & Peat, 2014; Brennan & Subrahmanyam, 1996; Chan & Faff, 2003, 2005; Chang, Faff, & Hwang, 2010; Chordia, Huh, & Subrahmanyam, 2009; Datar et al., 1998; Eid, 2015; Hearn, Piesse, & Strange, 2010; Jun et al., 2003; Kim & Lee, 2014; Lischewski & Voronkova, 2012; Marcelo & Quirós, 2006; Marshall, 2006; Miralles Marcelo, Miralles Quirós, & Oliveira, 2011; Narayan & Zheng, 2011; Nguyen & Lo, 2013; Shaker & Elgiziry, 2014; Uddin, 2009; Vu, Chai, & Do, 2014; Wang & Kong, 2010) all of them and many others , elaborate the role of liquidity as a determinant of expected rate of return. Marcelo and Quirós (2006), mentioned that traditional Capital Asset Pricing Model (CAPM) argues that market beta is the only risk factor to explain the cross-sectional variation of expected stock returns, and it was successfully proved in empirical work because every investment strategy which seemed to provide a high average turned out to also have a high beta. However, recent research has brought into question the usefulness of the CAPM in describing the cross-section of expected returns because the expected returns from some investment strategies based on firm characteristics cannot be explained by the CAPM beta. This issue is important since a vast literature exists in the area of market microstructure of financial markets. During 1980's many economists attention to factors that put market effectiveness or properties of CAPM under question. Non ordinary factors are including accounting information and market information. Investors confirm that if assets have higher risk it leads to higher return and thus one effective factor is asset risk and liquidity ability. If liquidity is less, the share of attraction is less too. Liquidity risk is a type of risk related to stock return and is not eliminated through diversity and originates from effect of price of orders and in one model it is based on not complete competition to risk market (Shams, Abshari, Kordlouie, Naghshineh, & Gholipour, 2014).

Rahim and Nor (2006), announced that the CAPM is rigid in claiming that market risk alone is sufficient to explain asset prices, the APT and ICAPM leave an open question regarding what and how many factors should be priced in what kind of assets. The additional risk factors in E. F. Fama and French (1996) model are firm-specific factors and was proven to be very effective. These paradoxes open up the feasibility for other effective empirical models to be developed which emphasize on the role of liquidity factor in asset pricing as a potential improvement on the conventional Fama-French model.

Illiquidity premium was widely documented in the financial literature. Using a variety of liquidity measures, studies analyze whether less liquid stocks have higher average returns than expected. Datar et al. (1998), stated that liquidity risk premium IML essentially reflects the inverse relationship, the premium that investors would require for holding less liquid stocks because they anticipate the payment of higher trading costs when reselling the stocks in the future.

The series of Fama & French claim that the CAPM has no explanatory power to extrapolate the variation in stocks returns, and there is a potential factors may refine the results of CAPM (E. F. Fama & French, 1992, 1993, 1996, 2004, 2015) .

2.8.4 Liquidity-Augmented FF3 Model or FF3 Liquidity-Based Models

As mentioned by Rahim and Nor (2006) and Agarwalla et al. (2014), to differentiate the proposed 3-factor models from the standard Fama-French model, the researcher re-write conventional Fama-French 1993 model **(C.FF3)** following E. F. Fama and French (2012) and use Value (*V*), and Growth (*G*) to denote the groups that E. F. Fama and French (1993) originally denoted as High (*H*), and Low (*L*). Apart from being more descriptive labels, this notation also allows the letter *L* to denote the Liquid group in the Liquidity analysis used later. in time-series regression form:

$$\left(r_{p,t} - rf_t\right) = \alpha_p + \beta_p\left(r_{m,t} - rf_t\right) + s_i(SMB_t) + h_i(VMG_t) + \varepsilon_{p,t} \qquad \textbf{(2.10)}$$

Like most extended variants of CAPM, Merton (1973) ICAPM, Lucas Jr (1978) CCAPM and E. F. Fama and French (1993) model, the proposed liquidity-based models maintain market risk as the main risk factor, by dropping **(VMG_t)**. The first variant of the model referred as **(S.LIQ)** combines market risk premium **($R_{m,t} – R_{f,t}$)** with size **(SMB_t)** and **(IML_t)** Illiquidity premiums:

$$\left(r_{p,t} - rf_t\right) = \alpha_p + \beta_p\left(r_{m,t} - rf_t\right) + s_i(SMB_t) + l_i(IML_t) + \varepsilon_{p,t} \qquad \textbf{(2.11)}$$

Where:

- $r_{p,t}$ = the realized return on portfolio at month t
- $r_{f,t}$ = the risk free rate at month t.
- ***(rpt - rft)=*** portfolio excess returns
- α_p = the intercept.
- $r_{m,t}$ = the realized return on the market at month t.
- **($r_{m,t} – rft$) =** market excess return = ***MRP_t*** market premium
- ***SMB_t*** = ***SRP_t*** size premium, stands for (small cap minus big) and represents the premium for investing in the portfolios of small capitalization stocks compared to large cap portfolios during time period t = SPt size risk premium.
- ***VMGt*** = ***VRP_t*** value premium, stands for (value stocks minus growth stocks) and indicates the premium for taking a long position on portfolios of low market-to-book stocks **(value stocks)** and short position on the portfolios of high M/B stocks **(growth stocks)** during time period t = **VP_t** value risk premium.
- ***IML_t*** = ***IRPt*** illiquidity premium, stands for (illiquid stocks minus liquid) and represents the premium for investing in the portfolios with low stock-turnover ratio compared to high stock-turnover ratio portfolios during time period t .
- ***b_p, s_i, h_i*, and *l_i***: the slope coefficients or factor loadings in the time series regressions are respectively for ***($R_{m,t} – R_{f,t}$), SMB_t, VMG_t*, and *IML_t*** factors.
- ***$\varepsilon_{p,t}$***: is the error in estimation.

The second model referred as **(V.LIQ)** drops size premium **(SMB_t)** to form a combination of market risk premium **($r_{m,t}$ – rft)** Value **(VMG_t)** and Illiquidity **(IML_t)** premiums:

$$\left(r_{p,t} - rf_t\right) = \alpha_p + \beta_p\left(r_{m,t} - rf_t\right) + s_i(VMG_t) + l_i(IML_t) + \varepsilon_{p,t} \qquad \textbf{(2.12)}$$

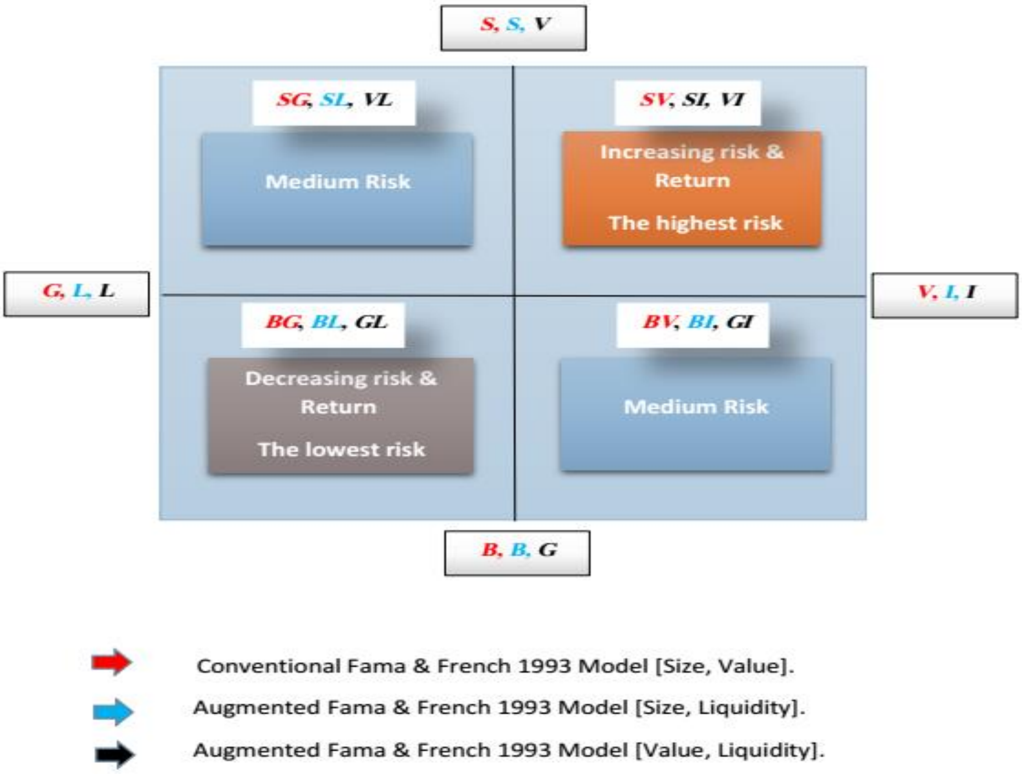

Figure (2.18): Portfolio risk degree according to three versions of FF3 used in the study, source: author, 2016

2.9 Proposed Risk Free Rate

Damodaran (1999), announced that most risk and return models in finance start off with an asset that is defined as risk free, and use the expected return on that asset as the risk free rate. The expected returns on risky investments are then measured relative to the risk free rate, with the risk creating an expected risk premium that is added on to the risk free rate. To understand what makes an asset risk free, let us go back to how risk is measured in finance. Investors who buys assets have a return that they expect to make over the time horizon that they will hold the asset. The actual returns that they make over this holding period may by very different from the expected returns, and this is where the risk comes in. Risk in finance is viewed in terms of the variance in actual returns around the expected return. For an investment to be risk free in this environment, then, the actual returns should always be equal to the expected return. There are two basic conditions that have to be met if we assume that actual returns on an investment must be equal to the expected returns.

The first is that there can be no default risk. Essentially, this rules out any security issued by a private firm, since even the largest and safest firms have some measure of default risk. The only securities that have a chance of being risk free are government securities, not because governments are better run than corporations, but because they control the printing of currency. At least in nominal terms, they should be able to fulfil their promises. ***The second condition that there can be no reinvestment risk.*** To illustrate this point, assume that you are trying to estimate the expected return over a five-year period, and that you want a risk free rate. A six-month Treasury bill rate, while default free, will not be risk free, because there is the reinvestment risk of not knowing what the Treasury bill rate will be in six months.

Under conditions of high and unstable inflation, valuation is often done in real terms. To be consistent, the discount rates used in these cases have to be real discount rates. To get a real expected rate of return, we need to start with a real risk free rate. While government bills and bonds offer returns that are risk free in nominal terms, they are not risk free in real terms, since expected inflation can be volatile. The standard approach of subtracting an expected inflation rate from the nominal interest rate to arrive at a real risk free rate provides at best an estimate of the real risk free rate.

In the same context (Brigham and Ehrhardt (2011); Brigham & Ehrhardt, 2013) mentioned that interest is the same as rent on borrowed money, or the price of money. Thus, r_{ft} is the price of money to a riskless borrower, and a stock’s required return begins with the risk-free rate. To induce an investor to take on a risky investment, the investor will need a return that is at least as big as the risk-free rate. The yield on long-term Treasury bonds is often used to measure the risk-free rate. The nominal, or quoted, risk-free rate, r_{ft}, is the real risk-free rate (r with asterisk) plus a premium for expected inflation IP = Inflation premium, which is equal to the average expected inflation rate over the life of the security:

$$rf_t = r^* + IP \qquad \textbf{(2.13)}$$

The real risk-free rate of interest, r*, is defined as the interest rate that would exist on a riskless security if no inflation were expected, and it may be thought of as the rate of interest on short-term U.S. Treasury securities in an inflation-free world. The real risk-free rate is not static, it changes over time depending on economic conditions, especially (1) the rate of return corporations and other borrowers expect to earn on productive assets, and (2) people's time preferences for current versus future consumption. To be strictly correct, the risk-free rate should mean the interest rate on a totally risk free security one that has no risk of default, no maturity risk, no liquidity risk, no risk of loss if inflation increases, and no risk of any other type. There is no such security, so there is no observable truly risk-free rate. When the term "risk-free rate" is used without either the modifier "real" or the modifier "nominal," people generally mean the quoted (nominal) rate, therefore, when we use the term "risk-free rate, r_{ft}," we mean the nominal risk-free rate, which includes an inflation premium equal to the average expected inflation rate over the life of the security. In general, we use the Treasury bill rate to approximate the short-term risk-free rate and use the T-bond rate to approximate the long-term risk-free rate.In practice, the real risk free rate is referring to the yield on treasury inflation protected securities –TIPS. Brigham and Ehrhardt (2013), indicated that the difference in yield between a T-bond and a TIPS of the same maturity reflects both the expected inflation and any risk premium for bearing inflation risk. So the difference in yields is really an upper limit on the expected inflation.

Accordingly Damodaran (2008) mentioned that the difference between the nominal and the real treasury rate can be viewed as a market expectation of inflation.

$$\textbf{Expected inflation rate} = \frac{(1 + Nominal\ Treasury\ Rate)}{(1 + TIP_S\ Rate)} - 1 \qquad \textbf{(2.14)}$$

There are two basic types of marketable U.S federal government inflation-indexed debt. ***The first*** is notes, which are issued annually on January 15 and July 15 and mature after ten years. ***The second*** is the inflation-indexed bond, which is a 30-year security issued every October 15. Inflation-indexed notes and bonds pay a modest rate of interest plus make an adjustment for changes in the Consumer Price Index (i.e., the rate of inflation). The interest rate is the “real yield” earned by the investor. The adjustment occurs by altering the amount of principal owed by the federal government; no adjustment is made in the semiannual interest rate. The amount of the change in the principal depends on the current CPI relative to the CPI when the securities were issued. Inflation-indexed bonds appeal to individuals who are primarily concerned that the rate of inflation will increase so that an investment in a traditional, fixed-rate bond will result in a loss of purchasing power. If, for example, the rate of inflation is 2 percent and an investor purchases a 5 percent, ten-year bond and the rate of inflation rises to 6 percent, the interest is insufficient to cover the higher rate of inflation. The purchasing power of the investor’s principal is also eroded. If that investor had acquired an inflation-indexed security, the principal owed and the interest earned would rise sufficiently to cover the increased inflation and provide a modest return (Mayo, 2013).In the same context Berk and DeMarzo (2014) ststed that these bonds are standard coupon bonds with one difference: The outstanding principal is adjusted for inflation. Thus, although the coupon rate is fixed, the dollar coupon varies because the semiannual coupon payments are a fixed rate of the inflation-adjusted principal.Suppose that the coupon payment is fixed in real terms, say 3%.If after 6 months coulative inflation is 2%, the principal value of the bond increases from 100$ to 100*(1+2%) = 102$.The first semi-annual coupon payment is then (3% / 2)* 102$=1.53$. .In addition, the final repayment of principal at maturity (but not the interest payments) is protected against deflation. That is, if the final inflation-adjusted principal amount is less than the original principal amount, the original principal amount is repaid.

Similary,according to Ang (2014) A real bond is a bond whose principal or coupon is indexed to inflation. In this way the investor is protected against inflation because the payouts grow as inflation increases. Bond payments, therefore, remain constant in real terms. Real bonds are called linkers. The U.S. version of linkers is Treasury Inflation-Protected Securities (TIPS), whose payoff is linked to changes in the US Consumer Price Index CPI.

Cartea, Saúl, and Toro (2012), mentioned the primary features of TIPS is that their principal is indexed to the U.S. non-seasonally adjusted consumer price index for all urban consumers. Then, if an investor holds TIPS until maturity, he will receive a known return in real terms for his investment. On the other hand, before maturity, TIPS' returns are uncertain both in real and nominal terms. TIPS were issued with maturities of 5, 10, 20, and 30 years. The 5-year TIPS were first issued toward the end of 1997, but TIPS with this maturity were discontinued until the end of 2004 when the Treasury started yearly issues. The 10-year class of TIPS is the only one which was continuously issued. Initially, the 10-year TIPS were issued once a year, but from July 2003 they were issued twice a year every year. Between 1998 and 2001 the Treasury issued three lots of 30-year TIPS (one lot every year) and were then discontinued until 2010 when they started issuing them again. Between 2005 and 2009 there were five yearly 20-year emissions. In general, it is argued that inflation protected government bonds provide benefits to the Treasury, policymakers, and investors. From the Treasury's point of view, the main benefit of issuing this type of bond is that they may reduce borrowing costs by not having to pay the inflation risk premium. From the policymakers' perspective, it is argued that by introducing inflation linked bonds, they can improve market information mechanisms and enhance the credibility of the monetary policy because their issuance incentivizes the government to take an active role in controlling inflation. Finally, from the investors' point of view, inflation-indexed bonds can protect lenders against the erosion of their purchasing power, so in practice, the nominal 10 year treasury bond yield is equal to 10 year TIPS yield plus inflation premium-IP.

As illustrated in Figure (2.19), the nominal risk-free rate could change as a result of changes in anticipated inflation or changes in the real interest rate. Consider a recession, such as the one that began in 2007. If consumers and businesses decide to cut back on spending, this will reduce the demand for funds, and that will, other things held constant, lower the risk-free rate and thus the required return on other investments. A key point to note is that a change in r_{ft} will not necessarily cause a change in the market risk premium. Thus, as r_{ft} changes, so will the required return on the market, and this will, other things held constant, keep the market risk premium stable (Brigham & Ehrhardt, 2011).

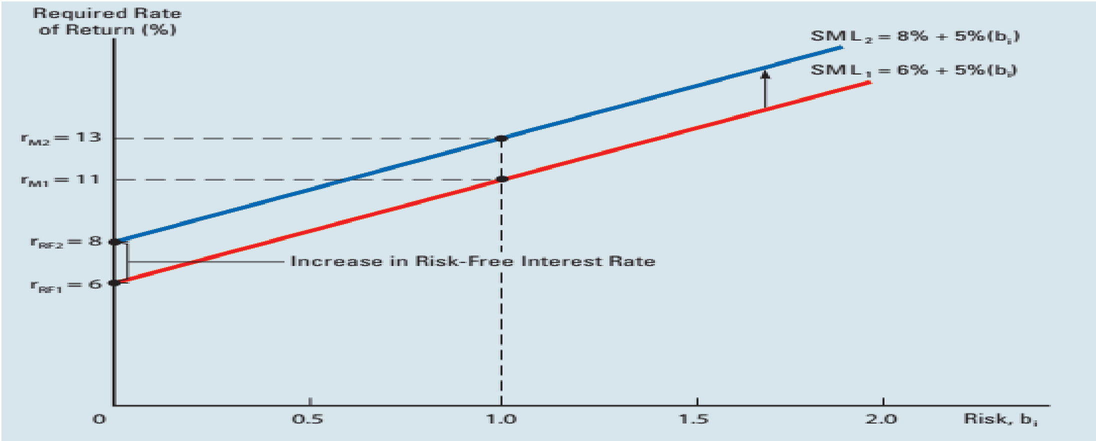

Figure (2.19): Shift in the SML Caused by an Increase in the Risk-Free Rate(Brigham & Ehrhardt, 2013, p. 261)

Choi (2003), stated that the assumption that you can use a government bond rate as the risk-free rate is predicated on the assumption that governments do not default, at least on local borrowing. There are many emerging market economies in which this assumption might not be viewed as reasonable. Governments in these markets are perceived as capable of defaulting even on local borrowing. When this is coupled with the fact that many governments do not borrow long term locally, there are scenarios in which obtaining a local risk-free rate, especially for the long term, becomes difficult.

Reinhart and Rogoff (2008), found that serial default is a nearly universal phenomenon as countries struggle to transform themselves from emerging markets to advanced economies. They introduced a comprehensive new historical database for studying international debt and banking crises, inflation, currency crashes and debasements.
As illustrated in Table (2.2) and Table (2.3), the data covers sixty-six countries in Africa, Asia, Europe, Latin America, North America, and Oceania. The range of variables encompasses, among many other dimensions, external and domestic debt, trade, GNP, inflation, exchange rates, interest rates, and commodity prices. The coverage spans eight centuries, generally going back to the date of independence for most countries, and well into the colonial period for some and these were some of their results.

Table (2.2): Default and Rescheduling: Africa and Asia, Twentieth Century–2006

Country/date of independence [1]	*Dates*			
	1900–1824	*1925–1949*	*1950–1974*	*1975–2006*
Africa				
Algeria, *1962*				1991
Angola, *1975*				1985
Central African Republic, *1960*				1981, 1983
Cote D'Ivoire, *1960*				1983, 2000
Egypt				1984
Kenya, *1963*				1994, 2000
Morocco, *1956*	1903			1983, 1986
Nigeria, *1960*				1982, 1986, 1992, 2001, 2004
South Africa, *1910*				1985, 1989, 1993
Zambia, *1964*				1983
Zimbabwe, *1965*			1965	2000
Asia				
China	1921	1939		
Japan		1942		
India, *1947*			1958, 1969, 1972	
Indonesia, *1949*			1966	1998, 2000, 2002
Myanmar, *1948*				2002
Philippines, *1947*				1983
Sri Lanka, *1948*				1980, 1982

Source: (Reinhart & Rogoff, 2008, p. 26)

Table (2.3): Default and Rescheduling: Europe, and Latin America, Twentieth Century–2006

Country/date of independence [1]	*Dates*			
	1900–1824	*1925–1949*	*1950–1974*	*1975–2006*
Europe				
Austria		1938, 1940		
Germany		1932, 1939		
Greece		1932		
Hungary, *1918*		1932, 1941		
Poland, *1918*		1936, 1940		1981
Romania		1933		1981, 1986
Russia	1918			1991, 1998
Turkey	1915	1931, 1940		1978, 1982
Latin America				
Argentina			1951, 1956	1982, 1989, 2001
Bolivia		1931		1980, 1986, 1989
Brazil	1902, 1914	1931, 1937	1961, 1964	1983
Chile		1931	1961, 1963, 1966, 1972, 1974	1983
Colombia	1900	1932, 1935		
Costa Rica	1901	1932	1962	1981, 1983, 1984
Dominican Republic		1931		1982, 2005
Ecuador	1906, 1909, 1914	1929		1982, 1999
El Salvador	1921	1932, 1938		
Guatemala		1933		1986, 1989
Honduras				1981
Mexico	1914	1928		1982
Nicaragua	1911, 1915	1932		1979
Panama, *1903*		1932		1983, 1987
Paraguay	1920	1932		1986, 2003
Peru		1931	1969	1976, 1978, 1980, 1984
Uruguay	1915	1933		1983, 1987, 1990, 2003
Venezuela				1983, 1990, 1995, 2004

Source: (Reinhart & Rogoff, 2008, p. 27)

2.9.1 Risk Free Rate in Palestine

Brooks and Yan (1999), stated that the risk-free interest rate is an extremely important measure in finance. Academicians usually use the Treasury rate as a risk-free rate, while practitioners usually use the London Inter-Bank Offer Rate. Theoretically, the riskfree rate is defined as the rate of return on an investment that is free of default risk and liquidity risk. The risk-free rate should reflect three components: (1) a rental rate, a real return for lending out funds over the investment period, thus forgoing consumption for which the funds otherwise could be used; (2) inflation; and (3) term risk or the risk that the principal’s market value will rise or fall during the term to maturity, as a function of changes in the general level of interest rates. Analysts who use the Treasury rate as the proxy for the risk-free rate argue that Treasury bills or Treasury bonds are not subject to default risk since they are backed by the full faith and credit of the U.S. government. Also, the T-bill and T-bond markets are highly liquid. It is almost unanimously agreed in academia that the Treasury rate is the best proxy for the risk-free rate. In the financial industry, however, LIBOR is more widely used as the proxy for the risk-free rate. LIBOR is the rate of interest earned on Eurodollars (dollars deposited outside the United States deposited by one bank with another bank. LIBOR is a good proxy for the dealer’s marginal cost of funds. LIBOR currencies are, U.S dollar, British pound, Euro, Swiss Franc and Yen .Practitioners use LIBOR because most banks benchmark their funding costs on a spread to LIBOR. What’s more, the LIBOR-based Eurodollar futures contracts are the most liquid contracts in the world on interest rate-sensitive securities.

Duffie and Stein (2015), defined LIBOR (London Interbank Offered Rate) as a measure of the rate at which large banks can borrow from one another on an unsecured basis. In its current form, LIBOR is determined each day (or fixed), not based on actual transactions between banks but rather on a poll of a group of panel banks, each of which is asked to make a judgmental estimate of the rate at which it could borrow.Furthermore, benchmarks such as LIBOR play a central role in modern financial markets, accordingly, Financial market participants rely on benchmarks for a range of purposes that are primarily related to reducing asymmetric information regarding the value of the underlying traded financial instrument. Inaddition reliable benchmarks also reduce search costs in over-the-counter markets, where they can improve matching efficiency and increase participation by less informed agents. For example, with the publication of a benchmark such as LIBOR, bank customers are better able to judge whether a loan rate is competitive. Without a benchmark, intermediaries can take greater advantage of market opaqueness and of the cost to customers of searching for alternative quotes. A further transparency benefit of benchmarks applies when investors delegate their trading decisions to agents, who may not make best efforts to obtain good trade execution on behalf of their clients. Suppose an investor selling Euros for dollars is told by her broker, “We obtained an excellent price of $1.3500 for your Euros.” Absent a benchmark, the investor could not easily validate the broker’s claim, and may be suspicious of the potential for dishonest service, such as front running. If, however, there is a nearly simultaneous published benchmark fixing for Euros of $1.3501, then the broker’s claim of good execution is easily verified. Less informed investors who delegate their trade execution to agents are thus more willing to participate in markets when incentives for good execution are supported by the existence of reliable benchmarks. Banks sensibly price funds loaned at the cost of the funds plus an increment or a margin that reflects the risk of failure to repay from borrower. For example, in some markets, a relatively creditworthy borrower might be able to borrow at an interest rate of 0.50% over LIBOR; while a riskier borrower might only be able to borrow at an interest rate of 1.00% over LIBOR. The increment over LIBOR is often referred to as the spread or margin in bases point (***bp).***

In our Palestinian financial industry, there is no such a proxy for the risk-free rate as a result of the absence of sovereign or treasury (governmental) financial instruments in state of Palestine. Many researchers have tried to estimate the risk free rate as an important component in asset pricing models that they were applied in their studies in palistine exchange.A number of recent studies in PEX, النواجحة (2014), لولو (2015), used the average of yearly weighted average intrest rates on USD $ deposits of banks that working in Palestine , sourced from (PMA, 2015).According to their justification, they used this rate as the most relevant approach due to the absence of governmental bonds, and this is the only potentioal alternative that available in Palestine.In another context,

(2014 ,المهتدي)used the yield on the treasury bills as a proxy for risk free rate in her study.

In this study, the justification of the method that was used to compose synthetic risk free rate depends on some logical facts from the researcher pointview, that is,

- Recall that, $r_{ft} = r^* + IP$
- The absence of governmental bonds
- The most relevant approach due to the absence of governmental bonds, and the only potential alternative that available in Palestine by using the weighted average intrest rates on USD $ deposits of banks that working in Palestine.
- The fact that , even if state of Palestine have a governmental bonds, there were historical evidence, that default is a nearly universal phenomenon, countries will struggle to transform themselves from emerging markets to advanced economies as Reinhart and Rogoff (2008) mentioned.

Practically, the study proposed to link the risk free rate to an international benchmark with a modification to reflect the Palestinian situation in risk free rate composition method.Recall that, rft = r* + IP, so, the researcher modified the portion of IP, to reflect the Palestinian inflation and as a margin or risk exposure bases point, furthermore, the real risk free rate (r*), linked to an international benchmark, that is LIBOR.There were two resons of using LIBOR. ***Firstly***, the treasury inflation protected secureties TIPS, have faced a negative yield according to fact that U.S inflation in some circumstances, were grater than nominal treasury bonds yield,and causing a negative yield on 10 years TIPS because they were only reflecting the setuation of the U.S economy as illustrated in Table (2.4). ***Secondly***, because that the weighted average intrest rates on USD $ deposits of banks that working in Palestine is the most relevant and only potential alternative , the study used the base of all banks that used LIBOR rate as an international benchmark to calculate their interest rates , accordingly , the proposed synthetic risk free rate is,

$$r_{ft} = r^* + IP$$

where:

r_{ft} = proposed risk free rate

r^* = real risk free rate regarding to monthly USD $ LIBOR sourced from (LIBOR, 2015).

IP = inflation premium regarding to monthly Palestinian inflation sourced from (PCBS, 2015)

Table (2.4): The negative Yield on 10 Years TIPS

Year	Month	10 Years T.BONDS% Nominal Rate	10 Years TIPS% Real Rate	INF%
2011	DECEMBER	1.89%	-0.07%	1.96%
2012	JANUARY	1.83%	-0.28%	2.11%
2012	FEBRUARY	1.98%	-0.28%	2.26%
2012	MARCH	2.23%	-0.09%	2.32%
2012	APRIL	1.95%	-0.30%	2.25%
2012	MAY	1.59%	-0.50%	2.09%
2012	JUNE	1.67%	-0.46%	2.13%
2012	JULY	1.51%	-0.69%	2.20%
2012	AUGUST	1.57%	-0.68%	2.25%
2012	SEPTEMBER	1.65%	-0.77%	2.42%
2012	OCTOBER	1.72%	-0.78%	2.50%
2012	NOVEMBER	1.62%	-0.79%	2.41%
2012	DECEMBER	1.78%	-0.67%	2.45%
2013	JANUARY	2.02%	-0.57%	2.59%
2013	FEBRUARY	1.89%	-0.64%	2.53%
2013	MARCH	1.87%	-0.64%	2.51%
2013	APRIL	1.70%	-0.64%	2.34%
2013	MAY	2.16%	-0.05%	2.21%

Source: (U.S.DOT, 2015)

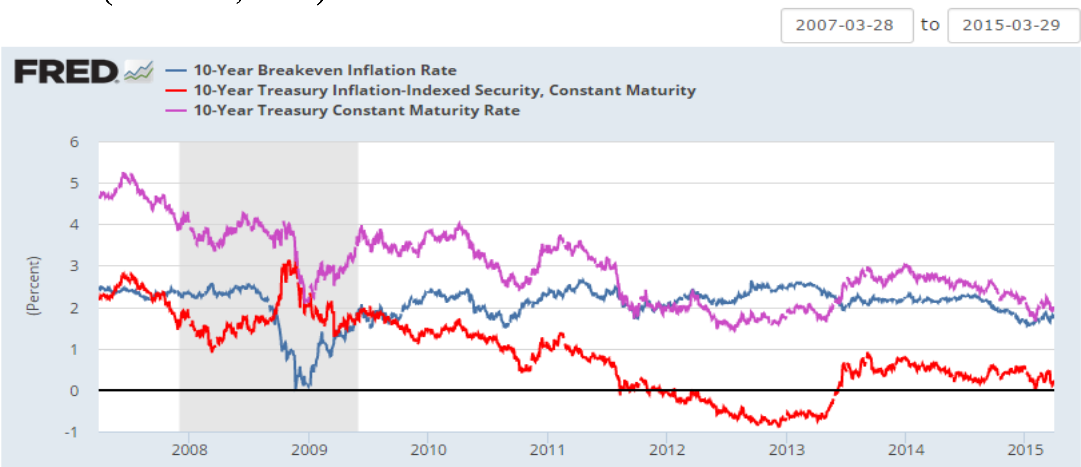

Figure (2.20): Daily data for 10 years, inflation,T.Bonds,TIPS, (FRED, 2015)

Note: the gray section reflects a recession period

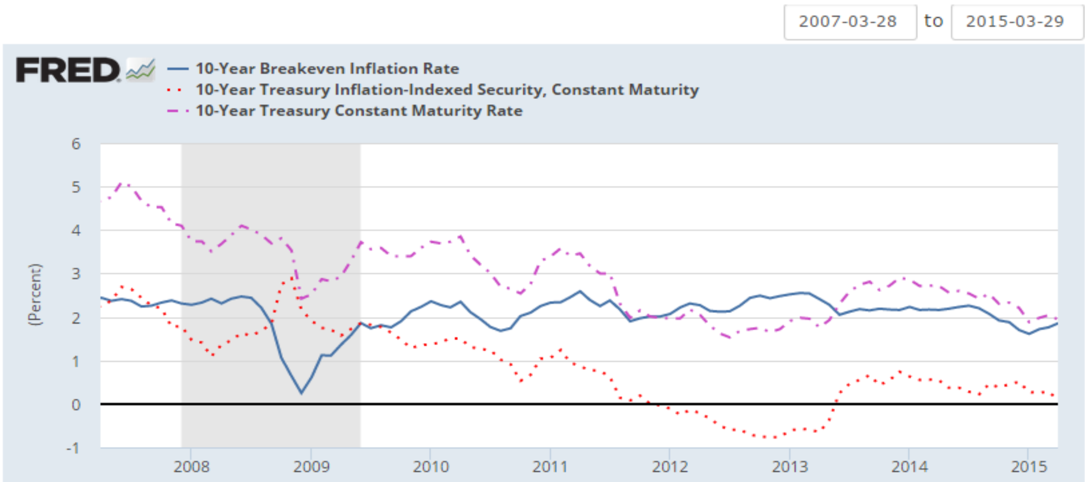

Figure (2.21): Monthly data for 10 years, inflation,T.Bonds,TIPS, (FRED, 2015)
Note: the gray section reflects a recession period

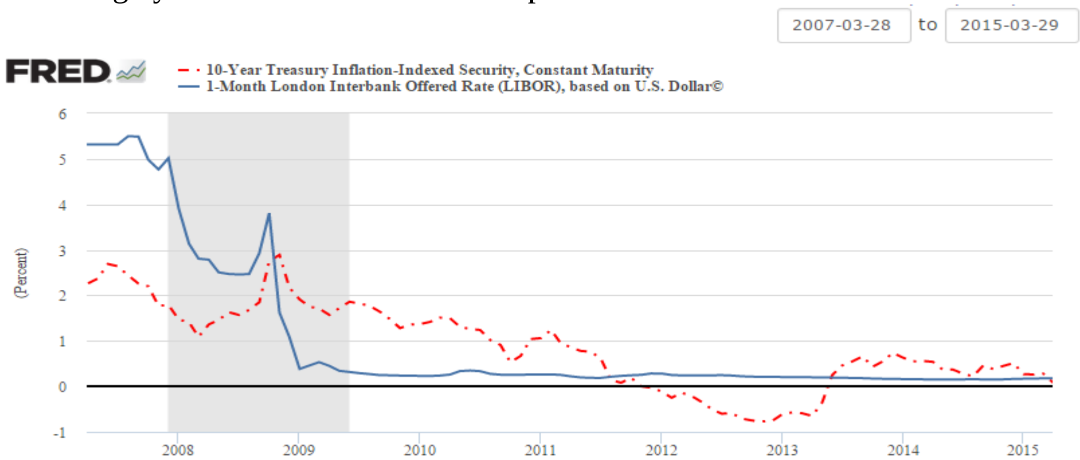

Figure (2.22): Monthly data for 10 years TIPS,and USD LIBOR, (FRED, 2015)
Note: the gray section reflects a recession period

2.10 Palestine Exchange (PEX)

The Palestine Exchange "PEX" was established in 1995 to promote investment in Palestine as a private shareholding company and transformed into a public shareholding company in February 2010 responding to principles of transparency and good governance. The "PEX" was fully automated upon establishment- the first fully automated stock exchange in the Arab world and the only Arab exchange that is publicly traded and fully owned by the private sector. The "PEX" operates under the supervision of the Palestinian Capital Market Authority. The "PEX" strives to provide an enabling environment for trading that be characterized by equity, transparency and competence, serving and maintaining the interest of investors. The "PEX" is very appealing in terms of market capitalization; it is financially sound, and well capitalized to maintain a steady business in a volatile world, as it passed with the minimum level of impact of the global financial crisis compared to other MENA Exchanges. There are 50 listed companies on "PEX" as of 29/02/2016 with market capitalization of about $3,339 billion across five main economic sectors; banking and financial services, insurance, investments, industry, and services. Most of the listed companies are profitable and trade in Jordanian Dinar, while others trade in US Dollars (PEX, 2015).

Figure (2.23): Number of listed companies & Market Capitalization from 1997-2015, source: author, 2016

2.10.1 Trading

The first trading session was held at the "PEX" on 18/02/1997. Since its launching, the "PEX" depends on electronic trading and clearing, depository, and settlement systems. In this sense, the "PEX" is considered the pioneer securities market in the region that adopted the automation of all its processes related to trading, and clearing, depository and settlement. At present, the "PEX" is adopting the horizon system supplied by OMX company as a trading system. In addition, it is adopting surveillance system called "Smarts" system (PEX, 2015).

2.10.1.1Characteristics of Electronic Trading System

Orders are being executed according to the following criteria (PEX, 2015):

- Price
- Time

- Remote trading is being conducted through brokerage firms and their branches.

- Trading is being conducted in more than one currency. Currently, trading is executed by the Jordanian dinar (JD) and United Stated Dollar (USD).
- The system saves data electronically, which enables to retrieving and looking into all movements that were carried out on that date.
- Trading is directly linked, tightly coupled, with the Clearing, Depository and Settlement Center (CDS) System. All trades are reflected directly on the investors' accounts, verify that their shares balances are available before any sell order is entered and to make sure that ownership ratio is not exceeded.

2.10.1.2 Trading Days and Times

- Trading is carried out daily from Sunday until Thursday every week.
- Trading is not carried out on: weekends (Friday and Saturday), official holidays.
- Scheduled trading session is to be cancelled if the ratio of member firms technically unable to connect and to trade is (35%) or more of the total number of member firms.
- Trading session starts at 09:45 and finishes at 13:30 (PEX, 2015).

2.10.1.3 Trading Rules

Price limits, up and down, are (7.5%) for shares listed in the first market, and (5%) for shares listed in the second market and bonds (PEX, 2015).

2.10.1.4 Trading Unit:

The minimum limit of the number of shares and bonds allowed for trading (buy/sell) at "PEX" is one (1) share for all traded shares and bonds (PEX, 2015).

2.10.1.5 Trading Surveillance

Trading Surveillance is based on regulations related to securities, which are applicable in Palestine; these are Securities Law No. (12) of the year 2004, Companies Law No. (12) of the year 1964, Securities Trading Regulation, rules, instructions issued in their accordance, and instructions issued by the Capital Market Authority. The SMARTS System is adopted to carry out the functions of trading surveillance. The Trading Surveillance System monitors the trading session instantly to detect any unusual behaviors of prices or trading volumes by making comparisons between the electronic information of the trading session and the standards adopted by the system so that an alert triggered when any standard is violated. Any violation is subject to the adopted charter of penalties and fines (PEX, 2015).

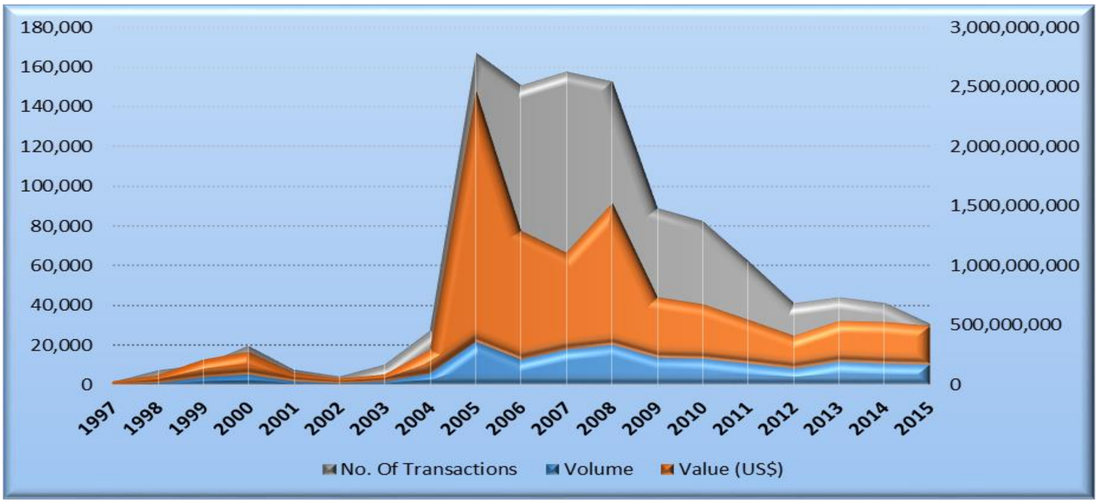

Figure (2.24): Number of transactions, traded volume and traded value from 1997-2015, source: author, 2016

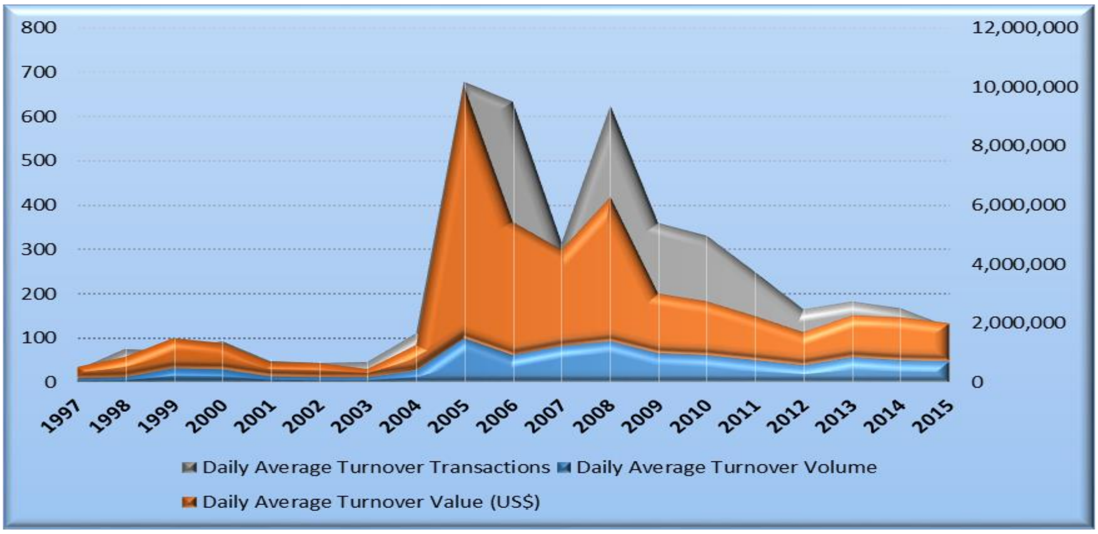

Figure (2.25): Daily average turnover transaction, daily average turnover volume and daily average turnover value from 1997-2015, source: author, 2016

2.10.2 Al Quds Index

In July 1997, "PEX" adopted a record for measuring stock prices levels and determining the general direction of these prices known as "Al Quds Index". The closing prices of 7/7/1997 were adopted to be the basis to set the value of the base for

Al Quds Index of 100 points. The adjusted list of companies to be included in its Al-Quds index for the year 2015. "PEX" raised the number of companies included from 12 to 15 to reflect the increase in the number of listed companies. Al-Quds sample for the year 2015 is as follows (PEX, 2015):

- Palestine Development & Investment - PADICO (Investment)
- Palestine Industrial Investment - PIIC (Investment)
- Palestine Real Estate Investment - PRICO (Investment)
- Arab Islamic Bank - AIB (Banking & Financial Services)
- Bank of Palestine – BOP (Banking & Financial Services)
- Palestine Islamic Bank - ISBK (Banking & Financial Services)
- The National Bank – TNB (Banking & Financial Services)
- Al-Quds Bank – QUDS (Banking & Financial Services)
- National Insurance – NIC (Insurance)
- Palestine Telecommunications - PALTEL (Services)
- Palestine Electric - PEC (Services)
- Wataniya Palestine Mobile Telecommunications - WATANIYA (Services)
- Birzeit Pharmaceuticals - BPC (Industry)
- Jerusalem Cigarettes - JCC (Industry)
- Jerusalem Pharmaceuticals - JPH (Industry)

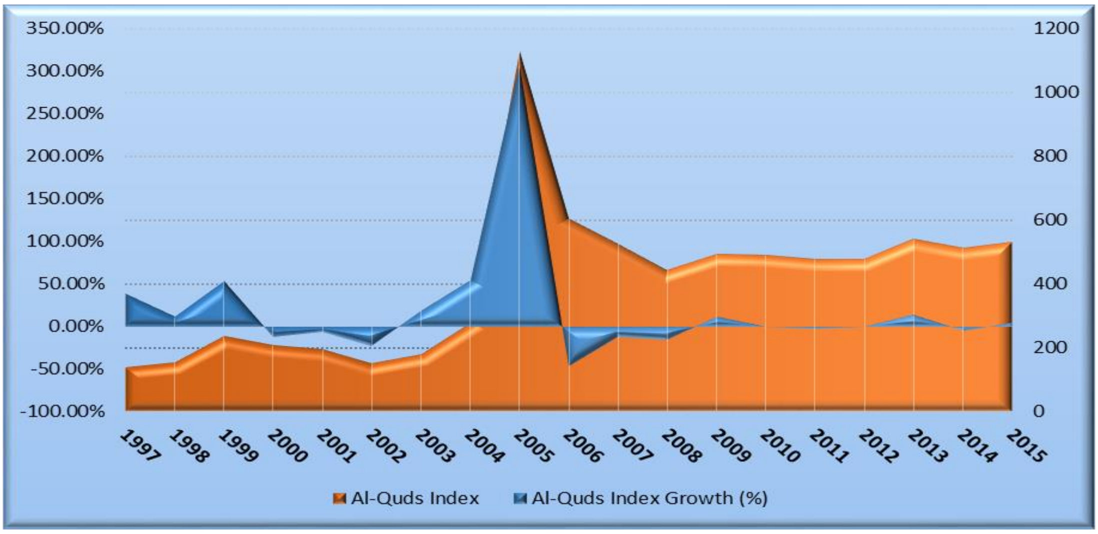

Figure (2.26): Al-Quds index growth % from 1997-2015, source: author, 2016

At the end of every year, the companies that are included in Al Quds Index are assessed since the sample is modified in accordance with the trading statistics of that year. The following criteria are adopted (PEX, 2015):

- Trading volume.
- Trading Value.
- Number of trades.

- Number of trading days.
- Market Value.
- Average of share Turnover.

2.10.3 PEX at a Glance (PEX, 2015)

Table (2.5): Palestine Exchange milestones

YEAR	EVENT
2014	• Adding Palestine to FTSE indices "Watch List". • Listing the first corporate bond since inception.
2013	• December: S&P created a stand-alone index for Palestine. • September: The highest trading value in one session of 48.5m USD. • June: MSCI created a stand-alone index for Palestine.
2012	Listed Company.
2011	Listed a record seven new companies in one year.
2010	Public Shareholding Company... New Corporate Identity.
2008	Ranked 33rd amongst International Stock Exchanges and second in the region in terms of investor protection.
2007	Launch of E-Trade Service.
2006	Launch of the Investor Education Program.
2005	Al-Quds Index increased by 306% compared to 2004, recording the highest amongst the world stock exchanges.
1997	First trading session (18 February).
1995	Established as a private shareholding company.

Source: Assembled for the purpose of this study by the author, 2016,(PEX, 2015)

2.10.4 Development of Palestine Exchange Activity

The "PEX" has developed from 1997 to 2015. Table (2.6) shows the total yearly activity figures of 19 years period from 1997 to 2015 in "PEX". The first trading session was held at the "PEX" on 18/02/1997 with 19 listed companies while the number of listed companies in 2015 is 50. The number of trading sessions increased from 66 in 1997 to 246 in 2015. In addition, the trading volume increased from 10,000,526 shares in 1997 to 175,229,463 shares in 2015 while the highest figure was in 2005 with 369,567,295 shares. The Trading value rose from 25,181,030 in 1997 to 320,388,213$ in 2015 while it peaked the greatest number in 2005 with 2,096,178,223$. The numbers of transactions were 1,957 and 31,014 in 1997 and 2015 respectively, during that time the highest record was in 2005 with 166,807. The daily average turnover volume was 151,523 and 705,304 in 1997 and 2015 respectively while it peaked 1,502,306 in 2005. The daily average turnover transactions was 30 in 1997 and 126 in 2015, once again, and the 2005 was highest with 678. The market capitalization increased from 510,036,142$ (in 1997) to 3,339,196,379 $ (in 2015). Al-Quds Index was 139.13 in 1997 and 532.73 in 2015 while it was 1128.6 in 2005.

The Growth of Al-Quds index was 39.13%, 306.61%, and 4.10% in 1997, 2005, and 2015 respectively (PEX, 2015).

Table (2.6): Total yearly activity from 1997 to 2015

Year	No of Listed Companies In 31 Dec.	No. of Trading sessions	Volume	Value (US$)	No. of Transactions	Daily Average Turnover Volume	Daily Average Turnover Value (US$)	Daily Average Turnover Transactions	Market Capitalization (US$)	Al-Quds Index	Al-Quds Index Growth (%)
1997	19	66	10,000,526	25,181,030	1,957	151,523	381,531	30	510,036,142	139.13	39.13%
1998	20	100	16,746,845	68,531,587	7,639	167,468	685,316	76	600,496,739	154.98	11.39%
1999	22	146	68,788,626	150,092,262	10,625	471,155	1,028,029	73	735,936,934	236.76	52.77%
2000	25	211	93,190,283	188,964,084	20,143	441,660	895,564	95	768,190,283	207.62	-12.31%
2001	25	161	33,424,798	74,496,050	8,205	207,607	462,708	51	727,270,525	195	-6.08%
2002	28	100	18,663,494	45,081,693	4,579	186,634	450,817	46	581,826,876	151.16	-22.48%
2003	27	223	40,304,432	58,280,758	10,552	180,737	261,349	47	655,463,931	179.81	18.95%
2004	27	244	103,642,845	200,556,709	27,296	424,766	821,954	112	1,096,525,380	277.56	54.36%
2005	28	246	369,567,295	2,096,178,223	166,807	1,502,306	8,521,050	678	4,457,227,305	1128.6	306.61%
2006	33	237	222,689,351	1,067,367,951	150,592	935,670	4,484,739	633	2,728,811,088	605	-46.39%
2007	35	247	299,422,814	813,469,090	157,300	1,207,350	3,280,117	316	2,474,679,018	527.26	-12.85%
2008	37	242	339,168,807	1,185,204,211	152,319	1,390,036	4,857,394	624	2,123,057,098	441.66	-16.23%
2009	39	246	238,877,373	500,393,398	88,838	971,046	2,034,120	361	2,375,366,531	493	11.62%
2010	40	249	230,516,370	451,208,529	82,625	925,768	1,812,082	331	2,449,901,545	489.6	-0.69%
2011	46	248	184,544,375	365,648,216	61,928	744,131	1,474,388	250	2,782,469,900	476.93	-2.59%
2012	48	249	147,304,208	273,440,441	41,442	591,583	1,098,154	166	2,859,140,375	477.59	0.14%
2013	49	241	202,965,939	340,774,269	44,425	842,182	1,414,001	184	3,247,478,385	541.45	13.37%
2014	49	245	181,545,154	353,917,125	41,257	741,000	1,444,560	168	3,187,259,624	511.77	-5.48%
2015	50	246	175,229,463	320,388,213	31,014	705,304	1,302,391	126	3,339,196,379	532.73	4.10%

Source: Assembled for the purpose of this study by the author, 2016,(PEX, 2015)

Chapter Three
Literature Review

Chapter 3
Literature Review

This chapter briefly presents some of the previous studies that are similar to this study.

3.1 Introduction

The literature on the relationship between expected rate of return and anomalies are too large to be covered here, so the researcher focus on studies that are directly relevant to the subject matter of the thesis, by summarizing the main findings of studies that have discussed anomalies phenomenon which affects expected rate of returns; and studied the empirical benefits that conventional and augmented Fama and French asset pricing model provide to extrapolate this phenomenon.In addition the researcher focus on studies that have explored the association between liquidity (as a proxy of risk), and expected rate of return in pricing capital assets.

The literatures review regarding to the subject of this thesis are presented in this chapter in four sections. The **first** one shows studies that investigate the relation between anomalies and expected rate of return in Palestine exchange market "PEX", and other related studies. The **second** section presents studies that explore the relationship between expected rate of return and anomalies, by impleminting conventional and augmented Fama and French asset pricing model in Arab Stock Exchanges.The **third** section presents studies that explore the relationship between expected rate of return and anomalies, by impleminting conventional and augmented Fama and French asset pricing model in international Stock Exchanges.The **fourth** section presents studies that explore association between liquidity (as a proxy of risk) and expected rate of return, in pricing capital assets.

3.2 Anomalies and Expected Rate of Return in Palestine exchange "PEX"

Factors Explaining the Stocks Returns at Palestine Securities Exchange: An Econometric Study

اللطيف (2006), apply a multi-factor model to explain the variation in expected returns for a sample of 19 firms listed in the Palestine Securities Exchange for the period from 2001 to 2003. The model use factors that include beta, E/P, size, leverage and book equity to market equity to explain the cross-sectional differences in stock returns. First, the relationship between each factor and average returns is tested. Second, all factors are used in the same model to explain average returns. At the later model, the statistical significance is used to judge which factor on average can best describe the behavior of average returns. As in E. F. Fama and French (1992) the results of this research show the existence of a size effect in the Palestine Securities Exchange. Furthermore, the results reveal an E/P effect and a week beta effect. UnlikeE. F. Fama and French (1992), cross-sectional analysis do not find a BE/ME or leverage effects.

Testing the Relationship between Risk and Return in the Palestine Securities Exchange

Darwish, Al-Doori, and Ala'a (2010), test the relationship between risk and return in the Palestine Securities Exchange, and determin the ability of the market risk premium to compensate investors, by using daily return for AlQuds index over the whole period from 17/10/2000 to 16/8/2009. The researcher apply GARCH model, the empirical results show no significant positive relationship between Risk and Return which mean that there is no risk – premium in Palestine stock Exchange.

The Effect of Cash Flows on Regular Stocks Returns of Listed Corporations at the Palestine Securities Exchange Market

الظاهر and العطعوط (2010), examin the effect of cash flows on regular stocks returns of listed corporations at the Palestine securities exchange market, regarding that stock returns are affected by several factors out of which the corporations generated cash flows. The study population include all 25 listed corporations, and used a sample of 10 corporations that used to calculate Al-Quds index, for stock trading on Palestine security exchange market for the period from 1/4/2004 to 31/3/2005. The study conclude that there is no empirical evidence of the relation between operating cash flows and returns for the mentioned companies nor there is a relation between returns and financial or investment cash flows. Their results show that other factors contribute to the determination of shares market prices.

Testing for Correlation and Causality Relationships between Stock Prices and Macroeconomic Variables the Case of Palestine Securities Exchange

Abu-Libdeh and Harasheh (2011), investigate the correlation and causality relationships between stock prices in Palestine and some macroeconomic variables for the period from the first quarter of 2000 (March 2000) to the second quarter of 2010 (June 2010).They use Al-Quds Index (12 companies included in Al-Quds Index) return as a stock returns. Two methodologies were used in order to determine the relationships, (1) they used a regression analysis for ten years' worth of quarterly data (40 observations in total) for the studied variables, five macroeconomic variables were used as independent variables (GDP, inflation, exchange rate, Libor rate and balance of trade), and the quarterly stock market index returns were used as the dependent variable. (2) A unit root test was conducted on the studied variables in order to perform a Granger causality test to assess the causality relationship. The results of the regression analysis as a whole indicate a significant relationship between the macroeconomic variables used and stock prices. Nevertheless, some macroeconomic variables' coefficients (although having a significant relationship with stock prices) were not consistent with the results of other researches. Moreover, the causality analysis negated any kind of causal relationships between each particular macroeconomic variable and stock prices.

Calendar Effects in the Palestine Securities Exchange (PSE): Analysis & Investigation

Abu-Rub and Sharba (2011), verify the impact of national, religious and weekend holidays effect on the trading price of stocks of companies listed on the Palestine Securities Exchange. The study comprise all the 32 shareholding companies listed in the PSE and classified into four economic sectors: industry, service, banking and investment sectors. The financial statements for the period 1/1/2006 until 1/1/2010 were used. In order to test hypotheses of the study the researcher used unilateral analysis of variance-ANOVA and Sheve for a posteriori comparisons (Post Hoc ANOVA) which has shown a positive effect for the day prior holiday at the price of shares of companies, but without statistical significance.The study found to have a statistically significant difference in the returns stocks companies due to the variable of the economic sector, to which these companies belong. The study also found that prices were trading higher on days prior to religious holidays than in the national and weekend

Factors Affecting Stocks' Rates of Return – the Case of the Palestine Securities Exchange.

الصعيدي (2011), the objective of this study is to determine factors affecting the market rates of returns for companies listed on the Palestine Securities Exchange (PSE) during the years 2006-2009, the study sample was 27 companies.The study use annual market returns and other information extracted from companies financial statements as well as a set of statistical (correlation, regression) and investment portfolio techniques to test four main hypotheses. The statistical analysis and investment portfolio techniques indicate there is a significant positive relationship between the rate of success and the stocks rates of returns, there is a significant positive relationship between the stocks dividend yields and the stocks rates of returns, and there is a significant positive relationship between the quality of earnings and the stocks rates of returns. The results of the analyses of investment portfolios that were constructed based on the study's variables are consistent with the above stated results, and contrary to CAPM specification, the results of this study indicate that there are several factors affecting the stocks rates of returns, which is more consistent with the Arbitrage Pricing Theory(APT).

Testing the Weak Form Efficiency for Palestine Stock Market

درويش (2011), aim to test the weak form efficiency for Palestine Stock Market, using daily returns (observed and corrected for infrequent (thin) trading) for Al-Quds Index over the period 1997 - 2008, and five represented sectors indexes over the period 2006 - 2008. By applying four tests, namely: Auto correlation, Runs, Unit Root, and Variance Ratio tests, the empirical results, in general, rejected the null hypothesis of weak form market efficiency for the market, due to its inherent characteristics, such as low liquidity and infrequent or thin trading.

The Intrinsic & Market Value of the Common Stocks: Evidence from Palestine Exchange

Awad, Murrar, and Ayyad (2012), indicate that the market price of the company stock's is closely related to its performance, the more optimistic, the more the investors will be and hence willing to pay a higher price for the company's share and vice versa. This study undertake two methods to examine its two main hypotheses. First, a method of Discounted Cash Flow Model DCF was used to calculate the companies' intrinsic value to investigate the direct relationship between MV and IV. Second, econometric models were used to examine the causal relations relationship between MV and IV to the companies listed in the PEX. The selected sample of this study is daily data (i.e. five days a week) of common stocks in the PEX, with taking into consideration all traded companies in the PEX were chosen from January 1st, 2010 – March 31st, 2011, They find that there is a positive correlation between the intrinsic and market value of a particular common stock , empirical results of the co-integration test of this study reveal that the market value is what causes the changes in intrinsic value, meaning that stock prices in Palestine Exchange does not significantly depend on fundamentals, but rather on supply and demand forces, other things being equal.

Testing the Weak Form Efficiency of Palestine Exchange

Abushammala (2014) , in this research, the researcher test the efficiency by using the daily prices at the period from January 1st, 2007 to December 31st, 2010. The study sample include all companies listed on the (PEX), the sample comprises of the (45) companies .The research aim to test the efficiency of "PEX" to make sure that all investors have the same chances in profit taking, and to research the stationary and random walk of PEX Indices. It cover the daily prices of general index in addition to Al-Quds index, also to increase the accuracy of the results, the Researcher test the efficiency of the main sectors Indices of "PEX. The researcher through statistical measures; Agument Dickey fuller (ADF), the Phillips Perron-PP, and the Kwiatkoowski-Phillips-Schmidt-Shin (KPSS) prove the inefficiency of the "PEX" in the weak level, which means the possibility of taking advantage of technical analysis to be able to predict future prices by extrapolating the past prices.

Market Efficiency: The Case of Palestine Exchange (PEX)

Alkhatib and Harasheh (2014) , this study aim to empirically examine the weak-form market efficiency of Palestine Exchange "PEX" as a developing financial market in the Middle East region. Data used in this study are daily closing values of market indices from the time period each index was established till 31/10/2012. The random walk theory is thoroughly investigated to test whether past indices returns can predict future returns. The study employ the serial correlation and the Augmented Dickey-Fuller test (ADF) as parametric tests. The runs test is also used as a non-parametric test. Results of the parametric tests are consistent with the alternative hypothesis that the stock market is inefficient at the weak-form level as the indices exhibited autocorrelation and stationary behavior. Meanwhile, results of the runs test also support the inefficiency of the market as the major index found to be following a pattern rather than a random walk. Finally, result of the regression analysis of stock indices do not support the random walk model.

Using the Traditional Financial Performance Evaluation Measures and the Economic Value to Measure the Change in the Stocks' Market Value - A Case Study- Bank of Palestine

المهتدي (2014), analyze the traditional financial performance measures (EPS, ROI, OCF, ROE) and stand on their technical implications as well as standing on the technical implications of the economic value added and market value added as performance evaluation measures and using them to measure the change in the market value of the Bank Of Palestine stocks prices. Many of the statistical methods were used to test the impact of these measures on the average stock price of the Bank of Palestine that listed in Palestine exchange market, in the Period from 2004 to 2012. One of the most important findings of the study was that the market value of the stocks of Bank of Palestine has a strong correlation with the traditional financial performance evaluation measures combined together better than if they were used individually in the measurement of the change in the market value of stock, also the economic value added and market value added have a high explanatory ability to measure this change, moreover the economic value added (EVA) measure was the best measure in its ability to measure the change in the market value of the Bank Of Palestine stocks prices.

The Ability of Capital Assets Pricing Models in Determining Stocks Prices of Companies Listed On Palestine Exchange – A Comparative Analysis Study

النواجحة (2014), recognize the role of capital assets pricing models in determining the stock prices of companies listed on Palestine Exchange from 2011 to 2013 and to explore these models and their role in pricing the capital assets and more particularly the accounting model for evaluation, discounted cash flow model, and discounted cash dividends model through a sample consisting of 24 companies to achieve the study goals, annual stock prices data, and financial statements of such companies by examining the relevant statistical data. The study conclude with several results, and the most significant results include that the accounting model for evaluation was better than both the discounted cash flow model and discounted cash dividends model in terms of the explanatory ability of such models, further the study conclude that there were no statistically significant differences at a level of significance (between the average prices of market stocks and actual prices of companies listed on Palestinian Exchange according to the accounting model for evaluation, however there were statistically significant differences at a level of significance (between the average prices of market stocks and actual prices of companies listed on Palestine Exchange according to the discounted cash flow and discounted cash dividends models.

The Impact of Information Asymmetry on the Cost of Equity Capital in the Palestine Exchange

Eid (2015), examine the impact of information asymmetry on the cost of equity capital (COEC). The study population and sample are the listed companies in Palestine Exchange "PEX" from 2006 to 2013, which are 50 companies. Hypotheses were tested by using multiple linear regression analysis method, through Stata software, based on extracted high frequency (long term) trading data from the Palestine Exchange "PEX". In this study, information asymmetry is measured by the bid–ask spread of companies, while the cost of equity capital is measured by required rate of return which is computed based on closing price. The main argument is that there is positive relationship between information asymmetry (bid-ask spread) and the cost of equity capital. The results show significant and very weak relationship between information asymmetry, bid-ask spread, and cost of equity capital. Furthermore, the numbers of trades, trading volume and trades volume have almost the same impact on the COEC due to high multicollinearity among them; they do not have relationship on COEC. Also, there is no relationship between volatility and COEC. Finally, the results indicate that PEX is an inefficient market.

The Ability of Economic Value Added Indicator versus Traditional Performance Measuring Tools to Explain the Change in the Market Value of Stocks "An Empirical Study of Companies Listed in Palestine Exchange"

لولو (2015), analyze the relationship between economic value added (EVA) as a modern performance indicator and the traditional indicators {Return on Assets (ROA), Return On Equity (ROE), and Earnings per Share (EPS)} on one hand and the market value of shares in Palestine stock Exchange. In addition to test which of both is more able to explain the change in the market value of shares' prices. To achieve the objectives of the study, panel data analysis was used to investigate the impact of the indicators on the stock market average prices of shares of (21) companies listed in Palestine Stock Exchange and (that conform with the study conditions) between 2010 and 2014. The most important findings of this study that the economic value added indicator has a greater ability to explain the change in the value market of the share prices .The findings also show that Earnings per Share (EPS) indicator has the highest explanatory ability among performance indicator followed by Return on Assets then economic value added. Moreover, the combined traditional performance indicators form the best model for explaining the change in the market value of shares' prices.

3.3 Anomalies and Expected Rate of Return in Arab Stock Exchanges

Seasonality in the Kuwait Stock Exchange

Al-Saad (2004), examine seasonality phenomenon in the Kuwaiti stock market. The purpose of this study is to determine if a monthly pattern in the return of stock market index exists in Kuwait, and whether such a pattern is similar to the one found in developed stock markets. Two alternative linear models were used to test for seasonality. Indices rather than individuals stocks were used to detect market return seasonality rather than a particular stock's return seasonality which might differ from one stock to another.Daily data for the three indices for the period from January 1985 to December 2002 were converted to monthly observations by taking the arithmetic mean. The study try to examine two questions. First, in the absence of taxation, does the January effect exist in the Kuwaiti stock market? Second, if there is a seasonal pattern other than January, what explain such pattern? The empirical results show significant July seasonality, which can be explained by the summer holiday.

Determining the Factors that Effect on Stock Return in Amman Stock Market

Dana (2008), identify the critical factors that effect on stock return,then clarify which factor more impact on stock return (Internal or External factors). The study population has consist of all companies in Amman Stock Market. The study sample consists of (60) companies. The study find some of conclusions: (1) there is significant statistical relationship between inflation rate and stock return. (2) There is no significant statistical relationship between payment balance sheet and stock return. (3)There is significant statistical relationship between interest rate and stock return. (4) There is no significant statistical relationship between the budget deficit and stock return. (5) There is no significant statistical relationship between the gross domestic product and stock return. (6) There is significant statistical relationship between the number of employees and stock return.

(7) There is significant statistical relationship between the size of the company capital and stock return

An Examination of the Fama and French Three Factor Model in Amman Stock Exchange

درويش (2008), focus on test whether the Fama and French three Factor Model or the CAPM can capture the cross-sectional variation in average returns in Amman Stock Exchange. For comparison reasons, a test of the Capital Assets Pricing Model (CAPM) is conducted as well. The observations period is from 31/3/1984 to 1/4/2004 and the sample was in average 128 stoks listed on Amman Stock Exchange for the whole period (that conform to the study criteria). A time series regression and portfolios sorted by size and book to market and also GRS test are used for the analysis. The empirical results show that CAPM and Fama and French Model could not capture the cross-sectional variation in average returns in Amman Stock Exchange.

Market Liquidity and Stock Size Premia in Emerging Financial Markets: The Implications for Foreign Investment

Hearn et al. (2010), estimate the cost of equity in four major African markets: South Africa, Kenya, Egypt and Morocco. These collectively represent the largest and most developed equity markets in Africa and also act as hub markets in their respective regions. London is also included as a link between the emerging and developed financial market. The Fama and French (1993) three-factor model Capital Asset Pricing Model is augmented to take account of company excess returns attributed to size (SMB), and the excess returns attributed to the illiquidity factor (ILLIQ), that feature in African financial markets. The values of the daily total returns are from Datastream for each stock held within the constituent list of the overall market indices for South Africa, Kenya, Egypt and Morocco and for the FTSE100 index in London for the whole period from 1996 to 2007. These were supplemented with daily stock price levels and trading volumes to generate liquidity factors. These measures are used to sort stocks into portfolios, following Amihud (2002). Results show that the premia associated with size are more prevalent than with liquidity although both are highly significant in both valuation and cost of equity estimates. The evidence suggests that the lowest cost of equity is achieved between the large international market of London and the smaller but well regulated Moroccan market, while Egypt has a higher cost of equity. The small developing market of Kenya has the second highest cost of equity, although the costs associated with the main market are less than ten percent of that faced by companies in the fledgling alternative investment market. South Africa has the highest cost of equity although this reflects a proliferation of smaller firms in this market.

Fama & French Three Factor Model: Evidence from Emerging Market

Al-Mwalla and Karasneh (2011), the main objective of this study is to test the ability of the Fama - French three-factor model to explain the variation in stocks rate of return. The study also investigate the existence of size and value effect in ASE, over the period from June 1999 to June 2010. The number of listed firms in this market at the end of 2010 was 274 firms. In order to obtain a suitable data analysis for the empirical estimation of the model, a set of sample selection criteria is used to select stocks included in the analysis, these criteria are: (I) each stock should have trading record at Jun of year t-1 and on Jun of year y, and should have positive book value on December of year t-1. (II) To exclude the extremely thinly traded stocks, the stock should have at least three consecutive months trading record. Based on the result that are found, this study observe a strong size and value effects in Amman stock exchange, didn't find any evidence to support the ability of the single factors model (CAPM) to provide suitable explanation to the variation in portfolios rates of return, also the CAPM incapable to predict the variation in rates of return between different portfolios. Higher-beta risk assets should carry higher expected rate of return, which in contrary in the result that found for the most portfolios, the market risk premium coefficient indicated that the big portfolios are more risky and should have higher rate of return than the small portfolios because the coefficients for big portfolios are higher than the coefficients for small portfolios. The result show that the Fama &French three factor model have the ability to provide better explanation to the variation in the stocks rate of return over CAPM, also the three factors model have superior power to predict the portfolios rates of return over the single factor model (CAPM), for more specification the both factors (SMB and HML) added to the explanatory power to the single factor model, but the (HML) factor have more constant relation with the portfolios rate of return in the all methodology that used to test the three factors model.

Can Book-to-Market, Size and Momentum be Extra Risk Factors that Explain the Stocks Rate of Return? : Evidence from Emerging Market

Al-Mwalla (2012), test the ability of different asset pricing models Fama & French three factor model and the augmented Fama & French Four Factor model, to explain the variation in stocks rate of return over the period from June 1999 to June 2010. The number of listed firm in this market at the end of 2010 was 274 firms. In order to obtain a suitable data analysis for the empirical estimation of the model, a set of sample selection criteria is used to select stocks included in the analysis, these criteria are: (I) each stock should have trading record at Jun of year t-1 and on Jun of year y, and should have positive book value on December of year t-1. (II) To exclude the extremely thinly traded stocks, the stock should have at least three consecutive months trading record. The study also investigate the existence of the size and value Momentum effects in ASE. The study find a strong size and strong positive value effects in ASE. The study results indicate that the Fama & French three factor model provide better explanation to the variation in stocks rates of return for some portfolios and is better than the augmented Fama & French Four Factor model.

Additional Risk Factors that Can be Used to Explain More Anomalies: Evidence from Emerging Market

Al-Mwalla, Al-Qudah, and Karasneh (2012), this study aim to identify additional risk factors that can provide a better explanation to the variation in stocks' rate of return. By using monthly data for the period from July 2002 to Jun 2010 for a sample of companies listed in Amman stock exchange and that satisfy the following criteria: I. Each stock should have trading record at Jun of year t-1 and on Jun of year y, and should have positive book value on December of year t-1. II. To exclude the extremely thin traded stocks, the stock should have at least three consecutive months trading record. The study sample included 121 firms in 2002, and became 205 in 2010. This study introduce risk factor, such as Momentum, distress and leverage to investigate their effect on the explanatory power of the original model that was introduced by Fama & French three Factor Model, and which was tested by Al-Mwalla and Karasneh (2011), using data from Amman Stock Exchange. The study observe the existence of the size, value, Momentum, distress and leverage effects in the Jordanian Market. Adding the Momentum, distress and leverage risk factors did not improve the explanatory power for the three factor model.

Constructing and Testing Alternative Versions of the Fama-French and Carhart Models in Tunisia

Hasnaoui and Ibrahim (2013), the aim of this study is to construct and test alternative versions of the Fama-French and Carhart models for the Tunis Stock Exchange (TSE) for the period from 2004 to 2011, and the sample in average was 50 companies in the whole period. The researcher conduct a comprehensive analysis of such models, forming risk factors using approaches including value weighted factor components. Despite these various approaches, such factor models fail to reliably describe the cross-section of returns in the TSE.

Forecasting the Ability of Dynamic Versus Static CAPM: Evidence from Amman Stock Exchange

Moh'd M, Alrabadi, and Alnader (2013), test whether the dynamic (conditional) Capital Asset Pricing Model (CAPM) outperforms the static one in forecasting the returns of the industrial companies listed in Amman Stock Exchange (ASE). The data set consist of the monthly excess returns of the industrial companies listed in ASE over the period 1 January 2000 to 31 December 2011. The sample include 65 companies with available data. Moreover, monthly excess returns of the free float market index are obtained from the ASE's website. This index is calculated using the market value of the free float shares of the companies and not the total number of listed shares of each company. They investigate the in sample forecasting ability of CAPM estimated via OLS, GJR-GARCH (1, 1), and Kalman Filter. The results indicate that the dynamic CAPM estimated through GJR-GARCH (1, 1) provide the most accurate in-sample forecasts of stock returns. Moreover, this model show the lowest values of Akaike Information Criterion and explain the cross section of returns of most sample stocks.

Stock Liquidity Determination Evidence from Amman Stock Exchange

Alnaif (2014), this study aim to investigate and examine the factors affecting stocks liquidity by using data of 100 share holding companies that represent Amman Stock Exchange (ASE) index in the recent period from 2011 to 2013. The result of fixed effects regression model indicate that firm’s size and earnings per share (EPS) have a significant positive impact on stock liquidity proxies. While firm's profitability have a significant negative impact. On the other hand, the results indicate a non significant statistical effect of stock dividends and firm’s leverage ratio.

Portfolio Formation: Empirical Evidence from Khartoum Stock Exchange'

Arabi (2014), investigate the validity of the capital asset pricing model CAPM, the arbitrage pricing theory APT, and the three factor model of Fama and French at Khartoum Stock Exchange KSE that is. Cross sectional data of seven banks and Telecommunication Company (compose 97 percent of the KSE) for the period 2005-2011 was used. Empirical results show that volatility computed via TARCH indicate the impact of the bad news on the conditional is twice as good news; in addition to the preference of generalized least squares over covariate (fixed effects) model as an estimation technique. Results are against the CAPM because the CAPM's prediction that the intercept should equal zero was not attained, and its main assumption .The APT show no reaction to news from macroeconomic variables. Nevertheless APT out-performed Fama-French model and CAPM.

The CAPM, Determinants of Portfolio Flows to Emerging Markets Economics: The Case of Jordanian Financial Crisis

Masoud and Suleiman AbuSabha (2014), the main aim of this study to investigate the impact of the determinant of portfolio return performance during and post finical market crisis based on the most active firms listed on Amman Stock Exchange (ASE) for the period from 2008 to 2012 was studied. In this study, using the framework of the Capital Assets Pricing Model (CAPM) as considered to be a centrepiece in optimal portfolio determinants. The test data set is the monthly prices based on 59 samples of the most active companies. This empirical study propose that this is not a normal cyclical crisis of capitalism but a global crisis, which require a change in the management policy to be tackled with new regulatory frameworks for financial institutions in order to stimulate economic activities.

Comparisons of Asset Pricing Models in the Egyptian Stock Market

Shaker and Elgiziry (2014), employ GRS test to empirically compare the applicability of five alternatives of asset pricing models for 55 shares listed on the EGX100 for the Egyptian stock market: (1) the CAPM, (2) the Fama-French three-factor model, (3) the Carhart four factor model, (4) liquidity-augmented four factor model, (5) and the five factor model (liquidity and momentum-augmented Fama-French three factor model. The time series regressions of Black, Jensen and Scholes (1972) are used for estimating the models.The sample was split into six portfolios sorted on size and book-to market ratio and 45 shares are excluded due to data unavailability, by using monthly data ranging from January 2003 to December 2007. Their results show evidence that Fama-French model is the best and reject the other models.

Implement Fama and French and Capital Asset Pricing Models in Saudi Arabia Stock Market

Aldaarmi et al. (2015), apply two of the famous asset pricing models in finance (Capital Assent Pricing model and Fama and French 1993 three factor model) in an emerging market with an Islamic Culture: Saudi Arabia Market (Tadwal). All the companies of Saudi Arabia Stock Exchange are considered in this study for the period from January 2007 to December 2011, by using monthly stock prices for corporations listed in Saudi Arabia Stock Exchange (SASE). The number of observations is 60 in the first part of the study to check the applicability of those models. In the second part of the study, is to divide the data into two parts. The first one contains the first 48 observations, which represent the training period from 2007 to 2010, while the last 12 observations (twelve months in 2011) represent the test period .Generalized Methods of Moments and t Test statistical techniques were used to find the coefficients and to compare between real and expected returns.The results show that Fama and French 1993 model has more explanatory power and do a better job in explaining the changes in stock returns than the CAPM, and those developed market models can be applicable in emerging markets like Saudi Arabia. CAPM model has a clear evidence for its applicability while Fama and French Model has a clear evidence for the market return but not a clear evidence for the size and book to market return. Finally the results show that prediction of the stock prices by using any of those two models is applicable which means that the Saudi Arabia Market is inefficient pricing Market.

Test of Capital Asset Pricing Model in Amman Stock Exchange

Alrgaibat (2015), test whether the capital asset pricing model met the scientific application of shares for the companies that listed in Amman Stock Exchange in order to achieve this goal, monthly closing prices were obtained on closing prices of all the companies listed in Amman Stock Exchange, with a series of monthly prices of shares for 136 companies that listed in Amman Stock Exchange during the period 1/1/2008 and up to 31 / 12/2013.The yield on the Treasury Bills for six months was obtained from the periodic reports of the Central Bank of Jordan database. The researcher calculate beta for stocks sample companies , both separately then test the capital asset pricing model through a simple linear regression by using statistical analysis program (SPSS) . The study find a number of results that were the most important: beta coefficient, which is a statistical measure of systemic risk could not interpret without 8.2% of the stock dividend for public shareholding companies that listed in Amman Stock Exchange in other words, stock returns have not been fully interpreted by a beta factor, and it also can say that there are other influential factors on stock returns , that the model could not be interpreted, the final result reached by the researcher that this model is not fit to predict accurately returns traded in Amman Stock Exchange for shares.

The Islamic Risk Factor in Expected Stock Returns: An Empirical Study in Saudi Arabia

Merdad, Hassan, and Hippler (2015), investigate the Islamic-effect in a cross-sectional stock return framework, and test for the existence of an Islamic-effect by looking at differences in stock returns between Islamic and conventional firms in Saudi Arabia from January 2003 to April 2011 for the entire 146 listed firms. Results indicate that there is a negative relationship between Saudi Islamic firms and average stock returns. The study refer to this negative relationship as the "negative Islamic-effect." They extend their results by using a time-series regression approach to show that the negative Islamic effect is, in fact, a common, systematic, and undiversifiable risk factor that affects the cross-sectional expected returns of Saudi common stocks. The results indicate that the Islamic risk factor (CMI) capture strong common variation in Saudi stock returns, regardless of other risk factors that are included in the model.

3.4Anomalies and Expected Rate of Return in International Stock Exchanges

Common Risk Factors in the Returns on Stocks and Bonds

E. F. Fama and French (1993) , identify five common risk factors in the returns on stocks and bonds. There are three stock-market factors: an overall market factor and factors related to firm size and book-to-market equity. There are two bond-market factors. Related to maturity and default risks. This paper use the time-series regression approach of Black, Jensen, and Scholes (1972). Monthly returns on stocks and bonds are regressed on the returns to a market portfolio of stocks and mimicking portfolios for size, book-to-market equity (BE/ME), and term-structure risk factors in returns. The time-series regression slopes are factor loadings that, unlike size or BE/ME, have a clear interpretation as risk-factor sensitivities for bonds as well as for stocks. The time-series regressions are also convenient for studying two important asset-pricing issues. (1) One of their central themes is that if assets are priced rationally, variables that are related to average returns, such as size and book-to-market equity, must proxy for sensitivity to common (shared and thus undiversiliable) risk factors in returns. The time-series regressions give direct evidence on this issue. In particular, the slopes and R’ values show whether mimicking portfolios for risk factors related to size and BE/ME capture shared variation in stock and bond returns not explained by other factors. (2) The time-series regressions use excess returns (monthly stock or bond returns minus the one-month Treasury bill rate) as dependent variables and either excess returns or returns on zero-investment portfolios as explanatory variables. In such regressions, a well-specified asset-pricing model produces intercepts that are indistinguishable from 0. The estimated intercepts provide a simple return metric and a formal test of how well different combinations of the common factors capture the cross-section of average returns. Moreover, judging asset-pricing models on the basis of the intercepts in excess-return regressions imposes a stringent standard. Competing models are asked to explain the one-month bill rate as well as the returns on longer-term bonds and stocks. In June of each year t from 1963 to 1991, all NYSE stocks on CRSP, Amex, and (after 1972) NASDAQ are used. Their results show that for stocks, portfolios constructed to mimic risk factors related to size and BE/ME capture strong common variation in returns, no matter what else is in the time-series regressions. This is evidence that size and book-to-market equity indeed proxy for sensitivity to common risk factors in stock returns. Moreover, for the stock portfolios they examine, the intercepts from three-factor regressions that include the excess market return and the mimicking returns for size and BE/ME factors are close to 0. Thus a market factor and their proxies for the risk factors related to size and book-to-market equity seem to do a good job explaining the cross-section of average stock returns. Stock returns have shared variation due to the stock-market factors, and they are linked to bond returns through shared variation in the bond-market factors. Except for low-grade corporates, the bond-market factors capture the common variation in bond returns. Most important, the five factors seem to explain average returns on stocks and bonds.

The Conditional Relation between Beta and Returns

G. N. Pettengill, Sundaram, and Mathur (1995), the purpose of this paper is twofold. The first is to test for a systematic, conditional relationship between betas and realized returns. The second is to test for a positive long-run tradeoff between beta risk and return**.** The sample period for this study extends from January 1926 through December 1990. Monthly returns for the securities included in the sample and the CRSP equally-weighted index (as a proxy for the market index) were obtained from the CRSP monthly databases. The three month Treasury bill rates (a proxy for the risk-free rate) for the period 1936 through 1990 were collected from the Federal Reserve Bulletin.This study find a consistent and highly significant relationship between beta and cross-sectional portfolio returns. They recognize that the positive relationship between returns and beta predicted by the Sharpe (1964), Black (1972), Lintner (1965) model based on expected rather than realized returns. In periods where excess market returns are negative, an inverse relationship between beta and portfolio returns should exist. When they adjust for the expectations concerning negative market excess returns, they find a consistent and significant relationship between beta and returns for the entire sample, for subsample periods, and for data divided by months in a year. Separately, they find support for a positive payment for beta risk.

Alternative Factor Specifications, Security Characteristics, and the Cross-Section of Expected Stock Returns

Brennan et al. (1998), examine the relation between stock returns, measures of risk, and several non-risk security characteristics, including the book-to-market ratio, firm size, the stock price, the dividend yield, and lagged returns. The basic data consist of monthly returns and other characteristics for a sample of the common stock of companies for the period January 1966 to December 1995. They exclude financial firms from the sample. This screening process yielded an average of 2457 stocks per month. The primary objective is to determine whether non-risk characteristics have marginal explanatory power relative to the arbitrage pricing theory benchmark, with factors determined using, in turn, the Connor and Korajczyk (1988) and the E. F. Fama and French (1993) approaches. E. F. Fama and MacBeth (1973) Type regressions using risk-adjusted returns provide evidence of return momentum, size, and book-to-market effects, together with a significant and negative relation between returns and trading volume, even after accounting for the CK factors. When the analysis is repeated using the FF factors, they find that the size and book-to-market effects are attenuated, while the momentum and trading volume effects persist. In addition, NASDAQ stocks showed significant underperformance after adjusting for risk using either method.

A Test of the Fama-French Three Factor Model in the Australian Equity Market

Drew and Veeraraghavan (2002), investigate the explanatory power of factors related to firm size (market equity) and style (book equity to market equity) that help to explain the cross-section of average stock returns on common stock in Australia. There were 268 firms in the sample. All firms available in the Datastream return files were used for the analysis. 1985 had the lowest number of firm's (9) in a portfolio. All other years had at least 20 firms in any portfolio. The study cover the period from June 1985 through June 2000. The fiscal year end for the majority of Australian firms is June. Some firms have a December year-end but were excluded for portfolio construction purposes. They also investigate and reject the claim that the size and style effect is the result of seasonal phenomena and find general support for the three-factor model of E. F. Fama and French (1996).

Evidence to Support the Four-Factor Pricing Model from the Canadian Stock Market

L'Her, Masmoudi, and Suret (2004), this study test the Fama-French three-factor pricing model augmented by a momentum factor on the Canadian stock market. Using Fama-French's methodology to construct the risk factors, over the July 1960–April 2001 period. The study sample include 12,526 observations (firm/year). The average annual number of firms is 298. However, the average number is 122 for the 1960s, 233 for 1970s, 272 for the 1980s and 520 for the 1990s. The results relative to the three zero-investment portfolios are in line with those obtained by Liew and Vassalou (2000) for the 1976–1996 period, even though the authors use sequential sorts to construct the risk factors. The main evidence of regularities in factors' behavior are as follows: the size factor returns are substantially greater in January than in other months, whereas the momentum factor returns are always significant, except in January. Book-to-market factor returns are positive (negative) and highly (barely) significant in down-markets (up-markets). Lastly, regarding conditioning on the monetary policy environment, they find that the SMB and HML premiums are only significant in an expansive environment.

The Size and Book-to-Market Effects and the Fama-French Three-Factor Model in Small Markets: Preliminary Findings from New Zealand

Djajadikerta and Nartea (2005), this study uses New Zealand stock market data from 1994-2002 to investigate size and book-to-market as determinants of returns in New Zealand share market, and the ability of the Fama-French three-factor model to explain the variation in stock returns. The results suggest a statistically significant size effect but a weak book-to-market effect. Additionally, the study also finds some improvement in explanatory power provided by the three-factor model relative to the conventional Capital Asset Pricing Model although not in the same magnitude as those reported in studies using relatively larger markets.

On the Conditional Pricing Effects of Beta, Size, and Book-to-Market Equity in the Hong Kong Market

Ho, Strange, and Piesse (2006), use Hong Kong equity stock data to examine the pricing effects of beta, firm size, and book-to-market equity, but conditional on market situations, i.e. whether the market is up or down. In estimating both conditional and unconditional pricing equations, the sample stocks are 117, the total test period is divided into two sub-periods of equal lengths to examine the stability of results: the first sub-period being from July 1983 to March 1991 and the second sub-period being from April 1991 to December 1998. Evidence support the hypothesis that, if the risk variable is priced by the market, then there exist a systematic but conditional relation between the risk variable and average return, and this relation take on opposite directions during up and down markets. However, the significance of the relations is often affected by the changing values of the risk variables as a result of changes in market conditions. Specifically, they find that all three-risk variables, namely beta, size, and book-to-market equity, exhibit conditional pricing effects.

An Augmented Fama and French Three-Factor Model: New Evidence from an Emerging Stock Market

Bundoo (2008), investigate the existence of the size and book-to-market equity effects and attempt an augmentation of the Fama and French (1993) three-factor model, by taking into account the time variation in betas on the Stock Exchange of Mauritius.The study sample is 40 in average for the period from 1997 to 2003. This study provide some empirical evidence in an emerging market, the Stock Exchange of Mauritius, and offer additional out of sample evidence that the size and the book-to-equity effects are international in character. It also innovate by augmenting the Fama and French three-factor model. One may expect that a Fama and French three factor that take into account the time-variation in risk, the significance of the size and book-to-market equity effects may be reduced or even disappear. The empirical results confirm that the Fama and French (1993) three factor model holds for the Stock Exchange of Mauritius. Moreover, the empirical results for the augmented model show that the Fama and French three factor model is robust after taking into account time-varying betas.

Stock Returns, Size, and Book-to-Market Equity

Simlai (2009), reinvestigate the performance of common stock returns with respect to two popularly known firm level characteristics: size and book-to-market ratio by using data from New York Stock Exchange, American Stock Exchange, and National Association of Securities Dealers Automated Quotations stocks between July 1926 and June 2007, then divided into various size and book-to-market equity groups. He implement the various versions of the simple Fama-French model and find that two risk factors based on the mimicking return for the size and book-to-market ratio play a significant role in capturing strong variation in stock returns; and volatility persistence can significantly improve the common risk factors' impact in explaining the time series variation in size and book-to-market sorted portfolios.

Predictability of the Swiss Stock Market with Respect to Style

Scheurle (2010), the study investigate to what extent the returns of combined style portfolios are serially correlated and if this serial correlation can be exploited in profitable investment strategies based on monthly data for the Swiss Stock Market,. The data gathering procedure allowed the construction of time series with a length of 180 monthly observations, i.e., the data covers 15 years of returns history, ranging from July 1993 to June 2008. In order to check for time-varying characteristics, the full sample period was split into three subsample periods of 60-months' length each. The first subperiod ranges from July 1993 to June 1998, the second subperiod covers data from July 1998 to June 2003, and the third subsample period contains data of the time period July 2003 to June 2008 The results show significant positive first-order serial correlation in the returns of large value stocks, large neutral stocks, small neutral stocks, and small growth stocks. Serial correlation seems to have become less significant in the more recent past. Moreover, serial correlation changes over time. The positive autocorrelation in the returns of large value stocks and the average small cap seem to be the most consistent. In the course of testing for profitable investment strategies, two pairs of style rotation strategies are introduced. The most pronounced outperformance in terms of a multifactor Alpha amounts to 9.4% on an annualised basis.

Revisiting Fama French Three-Factor Model in Indian Stock Market

Taneja (2010), examine the Capital Asset Pricing Model and Fama French Model have by taking a sample of 187 companies for a study period of five years, ranging from June 2004 to June 2009. In order to validate the results, the sample selection was made based on continuous presence in S&P CNX 500 index for at least ten years without fail. The study show that efficiency of Fama French Model, for being a good predictor, cannot be ignored in India but either of the two factors (size and value) might improve the model. It is so because a high degree of correlation is found between the size and value factor returns.

Estimation of Expected Return: The Fama and French Three-Factor Model Vs. The Chen, Novy-Marx and Zhang Three-Factor Model

Kilsgård and Wittorf (2011), the study examine the adequacy of the measurement of the cross-section of expected stock returns on the London Stock Exchange of the recent three-factor model introduced by Chen, Novy-Marx and Zhang against that of the Fama and French three-factor model. The former model use factors in addition to the market factor based on profitability and investment while the latter model use factors based on size and book-to-market equity. The study is conducted on the FTSE All Share Index. The FTSE All Share index includes as of March 2011 a total of 626 companies. Excluding financial companies reduces the number of companies with 257 and gives a sample of 369 companies. Applying this sample to the time period of 105 months gives a total of 38745 company months. Further exclusion of companies with negative book equity excludes 1722 company months. The final sample thereby consists of 37023 observed company months. The time period in which the models are tested is July 2002 – March 2011, this gives a total of 105 months. The models are tested together with the CAPM on a number of anomalies based trading strategies. It is found that the three-factor models consistently outperforms the CAPM and that the model by Chen, Novy-Marx and Zhang in general is not able to outperform the Fama and French three-factor model during the time period tested on the London Stock Exchange.

Risk-Return Predictions with the Fama-French Three-Factor Model Betas

G. Pettengill, Chang, and Hueng (2012), test the ability of the three-factor model to predict return and return variation. The study was conducted in the US exchange market for the period from 1927 to 2009.They find that portfolios can be formed based on the three-factor that vary with expectations in terms of risk and return. They find, however, that the CAPM performs with greater efficiency. In particular, expected returns for extreme portfolios are poor predictors of actual returns. Raising questions about the use of the three-factor model to risk adjust. They dissect the three-factor model's predictive ability and find that inclusion of the systematic risk variable dealing with the book-to-market ratio distorts predictions and that a model including the market beta and the factor loading dealing with firm size seems to predict more efficiently than either the three-factor model or the CAPM.

Evidence to Support Multifactor Asset Pricing Models: The Case of the Istanbul Stock Exchange

Unlu (2013), this study aim to test, instead of the single factor CAPM, the power of three factor, four factor and five factor models to explain stock returns for the Istanbul Stock Exchange ISE. The test results of all models in the ISE indicate that the models are applicable. During the period covering July 1992-June 2011, it is consequently established that, in addition to the market risk, size, book to market ratio, momentum and liquidity factors also constitute significant risk factors that affect the expected stock returns in the ISE and that the risk premiums belonging to these five factors are priced by the market.

Constructing and Testing Alternative Versions of the Fama–French and Carhart Models in the UK

Gregory et al. (2013), construct and test alternative versions of the Fama–French and Carhart models for the UK market with the purpose of providing guidance for researchers interested in asset pricing and event studies. Data come from various sources and cover the period from October 1980 to December 2010. The number of UK listed companies in study sample with valid BTM and market capitalisations is 896 in 1980 with the number peaking to 1,323 companies in 1997. This number then falls away progressively to 1,100 in 2000, ending up with 513 valid companies by the time financials were excluded in 2010, plus 36 companies with negative BTM ratios. They conduct a comprehensive analysis of such models, forming risk factors using approaches advanced in the recent literature including value-weighted factor components and various decompositions of the risk factors. They also test whether such factor models can at least explain the returns of large firms; they find that versions of the four-factor model using decomposed and value-weighted factor components are able to explain the cross-section of returns in large firms or in portfolios without extreme momentum exposures.

Conditional Multifactor Asset Pricing Model and Market Anomalies

Dash and Mahakud (2013), investigate the firm specific anomaly effect and to identify market anomalies that account for the cross-sectional regularity in the Indian stock market. They also examine the cross-sectional return predictability of market anomalies after making the firm-specific raw return risk adjusted with respect to the systematic risk factors in the unconditional and conditional multifactor specifications. The basic data consists of monthly returns and other firm-specific characteristics of National Stock Exchange –NSE of India listed non-financial companies for the period September 1995 to March 2011 (187 months). Controlling for various stock selection criteria as discussed in Fama and French (1992) and omitting the firms with negative book-to-market equity value, they have considered 582 continuously traded individual stocks for the whole sample period. In order to avoid data snooping bias and survivorship bias, for their analysis they consider only those stocks which were continuously traded in NSE since December 1994. However, for the selection of their sample period they exclude an initial one-year period in 1994, as the initial stage of NSE operation may have a high volatile return pattern for the listed stocks. They employ first step time series regression approach to drive the risk-adjusted return of individual firms.They use the panel data estimation technique to examine the predictability of firm characteristics on the risk-adjusted return. The results show a weak anomaly effect in the Indian stock market; the choice of a five-factor model (FFM) in its unconditional and conditional specifications is able to capture the book-to-market equity, liquidity and medium-term momentum effect. The size, market leverage and short-run momentum effect were found to be persistent in the Indian stock market even with the alternative conditional specifications of the FFM.

Fama and French Three-Factor Model: Evidence from Istanbul Stock Exchange

Eraslan (2013), this study test the validity of the Fama and French three-factor asset-pricing model on the Istanbul Stock Exchange ISE. Monthly excess stock returns over the period from 2003 to 2010 are used in the analysis. In total, there are 365 stocks trading on ISE. The current study has a monthly based test period from January 2003 to December 2010. Throughout this 96-month analysis period, firms included in this study should have been listed for at least 36 months prior to the portfolio formation date. This requirement aims to ensure that all companies have more than two years' accounting data available. This time restriction contributes to the reliability of the data. Thus, 274 stocks listed in ISE-all index are analyzed in this study. Realized returns show that portfolios containing large firms have higher average excess returns than portfolios containing smaller sized firms. Generally, portfolios containing low book-to-market ratio firms perform better than those containing high book-to-market ratio firms. Nine portfolios are constructed according to size and book-to-market ratio of firms in order to explain the variations on excess portfolio returns by using market risk factor, size risk factor and book-to- market ratio risk factors. Size factor has no effect on portfolios having big-size firms but can explain the excess return variations on portfolios having small and medium-sized firms. Book-to-market ratio factor has an effect on portfolios with high book-to-market ratio firms. Fama and French three-factor model has power on explaining variations on excess portfolio returns but this power is not strong throughout the test period on the ISE.

Size and Value Risk in Financial Firms

Baek and Bilson (2014) , assess the validity of size and value risk as common risk factors to measure of the cross-section of expected stock returns in financial companies. This research generally follow the same approach as the original method suggested by Fama and French (1992, 1993) to create size and value factors with one exception. For empirical testing, the research selects available returns data from the Center for Research in Security Prices (CRSP) NYSE, AMEX, NASDAQ monthly data and event files from July 1963 to December 2012 and chooses ordinary common shares. One difference is that, unlike the conventional method which excludes financial firms listed on the NYSE when deciding size and book-to-market rankings, this study contains all firms stocks listed on the NYSE. Empirical asset pricing tests suggest two findings. First, size and value risk premium commonly exists in both nonfinancial and financial firms, even if two factors are less explicable in financial firms. Second, an interest rate risk premium, which defined as a financial firm specific risk factor only appears in financial companies.

A Study to Check the Applicability of Fama and French, Three-Factor Model on KSE 100-Index from 2004-2014

Abbas, Khan, Aziz, and Sumrani (2014), this study aim to test the explanatory power of Fama and French three factor model (1993) in explaining cross-sectional average return for Pakistan's equity market for the time frame of 10 years from 2004-2014. The sample include firms that traded on KSE-100 index from 2004-

2014. Six portfolios were formed by the intersection of two size portfolios and three value portfolios. Excess monthly returns of the six portfolios i.e. the dependent variable were individually regressed against market premium, size premium and value premium (MRP, SMB and HML) i.e. the independent variables to test the validity of Fama and French three factor model. Along the line of original Fama & French, this study aim to provide valuable insights into components of excess returns and lay ground work towards further studies in this domain. An important insight it is bound to show is whether BE/ME & size factors hold as proxies for time-varying systematic risk as is proclaimed by past researches.

Islamic Calendar Effect on Market Risk and Return Evidence from Islamic Countries

Akhter et al. (2015), this study probe the presence of calendar anomalies in stock markets of six Islamic countries. The objective of the study was to investigate the impact of Zul-Hijjah on stock market return and volatility of the Islamic countries. For this purpose six countries (Pakistan, Turkey, Indonesia, Malaysia, Egypt and Morocco) are selected. In most of the previous studies Muharram and Ramadan effect was examined while Zul-Hijjah is also most important from religious point of view. For the purpose to examine the impact of Zul-Hijjah on return and volatility of Islamic countries' stock markets daily closing values of selected Islamic countries' stock markets indices were taken. The study time period was for Pakistan, Malaysia and Indonesia from 1/7/1997 to 3/5/2013, time period for Turkey, Morocco, and Egypt was from 4/12/2006 to 30/4/2013. A software Calendar Convertor is used for the conversion of Georgian dates to respective Hijjari Calendar dates which may arise to one day error because the beginning of every Hijjari month depending on moon sighting which may be different for different countries by the difference of one day. To study the impact of the Zul-Hijjah on return and volatility of stock markets of Islamic countries Autoregressive Conditionally Heteroscedastic Model was chosen due to the reason that that assumption of the linear regression model that the variance of the errors is constant over time is violated in this study. If the variance of the errors over time is not constant, an implication would be that standard error estimates can be wrong. It is empirically conclude that negative Zul-Hijjah effect presents in Malaysian stock market return and has no effect for other sample countries' stock markets. Zul-Hijjah has negative effect on the volatility of Turkish, Morocco and Egyptian stock markets and has no effect on the volatility of other sample countries' stock markets.

Testing Fama and French Three Factor Models in Indonesia Stock Exchange

Chandra (2015), this study aim to examine the effect of Fama and French three factor model and the CAPM to stock return in Indonesia, The sample used in this study is a company registered in LQ-45 index for the period from August 2013 to January 2014. The number of samples used, there are 43 companies. Besides, it also deepened by examining the major sector groups, groups of the manufacturing sector and the service sector groups. Period used is January 2010 to December 2013. The research model is linear regression. The results obtained from this study indicate all good sample LQ-45, the main sector groups, group manufacturing sector and the service sector groups could receive CAPM Model in predicting stock return. As for Fama and French three factor models, only the services sector that could accept to explain the changes that occur in the stock return. While, the LQ-45 and the main sector groups, book to market equity factors showed no significant results. While the group's manufacturing sector, firm size factor showed no significant results while the book to market equity factors indicate the direction of a significant negative effect.

Firm-Specific Variables and Expected Stock Returns-A study on the German Market

Remmits and Knittel (2015), the purpose of this study is to investigate which firm-specific variables can explain the cross-section of expected stock returns in the German market. The tested explanatory variables are market beta, firm size, the book-to-market ratio, the earnings-to-price ratio, leverage, the dividend yield, the cash flow-to-price ratio and sales growth. Furthermore, the study also examine the conditional version of the beta. They use the cross-sectional regression approach by Fama and MacBeth (1973) along with the portfolio approach of Fama and French (1992). This study use 300 non-financial firms listed in Prime and General Standard of the Frankfurt Stock Exchange. The data from 2004 - 2014 was gathered through Datastream. The testing period is the post-crisis period, reaching from July 2009 to June 2014. They conclude that value investing pays out in the German market. More specifically, investors should pay attention to the book-to-market, the earnings-to-price as well as the cash-flow-to price ratio. A model containing beta, the book-tomarket ratio and the cash flow-to-price ratio prove to be the best one to explain expected returns. Also beta should be looked at when making one’s investment decision since the conditional beta coefficient prove to be positive and significant in up markets and negative and significant in down markets. Size, leverage, the dividend yield and sales growth are not significant and therefore are not considered to be proxies for risk in the German market.

3.5 Importance of Liquidity in Asset Pricing Models

Market Microstructure and Asset Pricing: On the Compensation for Illiquidity in Stock Returns

Brennan and Subrahmanyam (1996), the researchers investigate the empirical relation between monthly stock returns and measures of illiquidity obtained from intraday data. They used all NYSE-listed securities on the CRSP from 1984 to 1987 and find a significant relation between required rates of return and these measures after adjusting for the Fama and French risk factors, and after accounting for the effects of the stock price level.

Liquidity and Stock Returns: An Alternative Test

Datar et al. (1998), provide an alternative test of Amihud and Mendelson (1986) model using the turnover rate (number of shares traded as a fraction of the number of shares outstanding) as a proxy for liquidity.They used the generalized least-squares (GLS) methodology to examine whether the observed cross sectional variation in stock returns can be explained by the differences in the turnover rates by using dataset consists of all non-financial firms on the NYSE from July 31,1962 through December 31, 1991. The evidence suggest that liquidity play a significant role in explaining the cross-sectional variation in stock returns. This effect persists after controlling for the well-known determinants of stock returns like the firm size, book-to-market ratio and the firm beta. They find that the liquidity effect is not restricted to the month of January alone and is prevalent throughout the year.

Trading Activity and Expected Stock Returns

Chordia, Subrahmanyam, and Anshuman (2001), analyze the relation between expected equity returns and the level as well as the volatility of trading activity, a proxy for liquidity. They used the Fama and French (1993) factors in their risk-adjustment procedure by using basic data consist of monthly returns and other characteristics for a sample of the common stock of NYSE-AMEX listed companies for the period January 1966 to December 1995.They documented a result contrary to their initial hypothesis, namely, a negative and surprisingly strong cross-sectional relationship between stock returns and the variability of dollar trading volume and share turnover, after controlling for size, book-to-market ratio, momentum, and the level of dollar volume or share turnover. Their analysis demonstrate the importance of trading activity-related variables in the cross-section of expected stock returns.

Illiquidity and Stock returns: Cross-Section and Time-Series Effects

Amihud (2002), show that over time, expected market illiquidity positively affects ex ante stock excess return, suggesting that expected stock excess return partly represent an illiquidity premium for the period from 1964–1996 . This complement the cross-sectional positive return–illiquidity relationship. Stock returns are negatively related over time to contemporaneous unexpected illiquidity. The illiquidity measure that he examined is the average across stocks of the daily ratio of absolute stock return to dollar volume, which is easily obtained from daily stock data for long time series in most stock markets. He find that illiquidity affect more strongly small firm stocks, thus explaining time series variations in their premiums over time.

Liquidity and Stock Returns in Emerging Equity Markets

Jun et al. (2003), use data for 27 emerging equity markets for the period January 1992 through December 1999; they document the behavior of liquidity in emerging markets. They find that stock returns in emerging countries are positively correlated with aggregate market liquidity as measured by turnover ratio, trading value and the turnover–volatility multiple. The results hold in both cross-sectional and time-series analyses, and are quite robust even after they control for world market beta, market capitalization and price-to-book ratio. The positive correlation between stock returns and market liquidity in a time-series analysis is consistent with the findings in developed markets. However, the positive correlation in a cross-sectional analysis appeared to be at odds with market microstructure theory that was empirically supported by studies on developed markets.

An investigation into the Role of Liquidity in Asset Pricing: Australian Evidence

Chan and Faff (2003), employ a cross-sectional regression framework, explore whether liquidity (as proxied by share turnover) is priced in an Australian setting, using monthly data over the period 1990 to 1999. They find that turnover is negatively related to stock returns and its importance persists even after controlling for book-to-market, size, stock beta and momentum. This finding is robust to seasonality effects and to potential nonlinearities.

Asset Pricing and the Illiquidity Premium

Chan and Faff (2005), examine the asset-pricing role of liquidity (as proxied by share turnover) in the context of the Fama and French three-factor model. Their analysis employ monthly Australian data, covering the sample period 1990 to 1998. The key finding of their research is that the GMM test is unable to reject the test of over-identifying restrictions – thus supporting the overall favorability of the liquidity augmented Fama-French model.

A Comparison between Fama and French Model and Liquidity-Based Three-Factor Models in Predicting the Portfolio Returns

Rahim and Nor (2006), evaluate the forecasting accuracy of two liquidity based three-factor models, SI LIQ and DI LIQ, which were developed on the Fama-French model. Using common stocks of 230 to 480 listed firms, they construct 27 test portfolios double-sorted on: (1) size and book to market ratio (B/M), (2) size and share turnover and (3) B/M and TURN. The study set the periods of January 1987 to December 2000 for estimation and January 2001 to December 2004 as forecast sample. The forecast errors are measured using mean absolute percentage errors and Theil's Inequality Coefficient. The preliminary results clearly document that three-factor models outperform CAPM. While the hypotheses of no significant differences cannot be rejected, the marginal difference in the errors of the competing three-factor models indicate that predicting returns on stocks traded on Bursa Malaysia can be slightly improved by incorporating illiquidity risk in a three-factor model in the form of DI LIQ.

The Role of an Illiquidity Risk Factor in Asset Pricing: Empirical Evidence from the Spanish Stock Market

Marcelo and Quirós (2006), this study aim to construct an illiquidity risk factor for the Spanish stock market over the 1994–2002 period. Because of the absence of consensus in empirical research about the most appropriate liquidity measure, they applied the Amihud (2002) illiquidity ratio that show the price response associated with one euro of trading volume. Moreover, they generated an illiquidity factor using the E. F. Fama and French (1993) orthogonal approach and analyzed whether it enter the stochastic discount factor as an additional state variable. They conclude that systematic illiquidity should be a key ingredient of asset pricing.

A liquidity-Augmented Capital Asset Pricing Model

Liu (2006), test a new measure of liquidity, document a significant liquidity premium robust to the CAPM and the Fama–French three-factor model. The sample comprises all NYSE/AMEX/NASDAQ ordinary common stocks over the period January 1960 to December 2003.Because trading volumes for NASDAQ stocks are inflated relative to NYSE/AMEX stocks due to interdealer trades, he examine the liquidity effect separately for NYSE/AMEX stocks and NASDAQ stocks, with a comprehensive examination of liquidity based on NYSE/AMEX stocks. The study show that liquidity is an important source of priced risk. A two-factor (market and liquidity) model explained the cross-section of stock returns, described the liquidity premium, subsumed documented anomalies associated with size, long-term contrarian investment, and fundamental (cash flow, earnings, and dividend) to price ratios. The study show that two-factor model account for the book-to-market effect, which the Fama–French three-factor model fails to explain.

Reexamination of Stock Liquidity Risk with a Relative Measure

Uddin (2009), reexamine the relationship between the return of a stock and its liquidity by using a relative measure that links the individual stock liquidity with market-wide liquidity. He used Multivariate regressions and employed to examine the effect of relative market liquidity on the stock return while controlling the effects of other factors. The results show that there is a Negative relationship between the stock return and liquidity, but the relationship is not linear. He finds also that fluctuation in relative stock liquidity does not positively affect the return.

Illiquidity and Asset Pricing in the Chinese Stock Market

Wang and Kong (2010), evaluate the suitability of proxies of illiquidity prevalent in the asset pricing literature and their explanatory power in asset pricing tests. The researchers used the available high-frequency intra-day data and they construct some proxies of illiquidity as benchmarks and then evaluate proxies of illiquidity based on inter-day data from 2005-2007. The empirical results that they find provide a convincing evidence that turnover is the most suitable proxy of illiquidity in the Chinese stock market. It is not only highly related to intra-day databased proxies of illiquidity but also completely superior to other measures of illiquidity in asset pricing tests.

Liquidity and Stock Returns in Japan: New Evidence

Chang et al. (2010), study the liquidity/stock returns linkage-using data from the First Section, the Second Section, and the Mothers Section of the Tokyo Stock Exchange (TSE). They find a significantly negative (positive) relationship between liquidity (illiquidity) proxies and returns, and while the expansionary phases largely confirm the overall finding, contractionary phases do not. When they controlled for liquidity variability in the cross-sectional regressions, the role of the liquidity level showed strong significance across business cycles, different sub periods and all Sections of the TSE. With regard to liquidity variability, they observed a strongly significant and negative association with stock returns.

Liquidity and Asset Pricing: Evidence from the Hong Kong Stock Market

Lam and Tam (2011), investigate the role of liquidity in pricing stock returns in the Hong Kong stock market The data set contains 769 companies listed on the Hong Kong Stock Exchange from July 1981 to June 2004.They find that liquidity an important factor for pricing returns in Hong Kong after taking well-documented asset pricing factors into consideration and they are robust to adding portfolio residuals and higher moment factor in the factor models. In addition they find that the results are also robust to seasonality,and conditional-market tests. Also they compared alternative factor models and find that the liquidity four-factor model (market excess return, size, book-to-market ratio, and liquidity) is the best model to explain stock returns in the Hong Kong stock market, while the momentum factor is not found to be priced.

The Relationship between Liquidity and Returns on the Chinese Stock Market

Narayan and Zheng (2011), examine the impact of liquidity on returns on the Shanghai stock exchange (SHSE) and the Shenzhen stock exchange (SZSE). They measured liquidity with the trading volume (TV), the turnover rate (TR), and the trading probability (TP). Using daily data for the period January 1997 and December 2003. They find that liquidity have a greater negative effect on returns in the SHSE than in the SZSE.

Size, Value and Liquidity. Do They Really Matter on An Emerging Stock Market?

Lischewski and Voronkova (2012), this study extend the evidence on factors determining stock prices on emerging markets by focusing on the most advanced stock market in Central and Eastern Europe, the Polish market. Besides market, size, and value factors, they investigate whether liquidity is a priced risk factor, addressing the hypothesis of its particular relevance in emerging markets. The dataset consists of all domestic stocks traded on the WSE from January 1996 to March 2009. The results support existing evidence for developed markets regarding market, size, and value factors. Contrary to the expectation that liquidity is a priced factor on emerging markets, they did not find evidence supporting this hypothesis.

Characteristic Liquidity, Systematic Liquidity and Expected Returns

Baradarannia and Peat (2012), investigate whether the effect of liquidity on equity returns can be attributed to the liquidity level, as a stock characteristic, or a market wide systematic liquidity risk. They develop a CAPM liquidity-augmented risk model and test the characteristic hypothesis against the systematic risk hypothesis for the liquidity effect. They find that the two-factor systematic risk model explains the liquidity premium and the null hypothesis that the liquidity characteristic is compensated irrespective of liquidity risk loadings are rejected. The result was robust over 1931–2008 data and sub-samples of pre-1963 and post-1963 data both in the time-series and the cross-sectional analysis, the findings provide clear guidance on the impact of liquidity on expected returns and can have practical implications in portfolio construction and investment strategies.

The Cross-Section of Stock Returns in an Early Stock Market

Ye and Turner (2014), use a new dataset which contain monthly data on 1015 stocks traded on the London Stock Exchange between 1825 and 1870, they investigate the cross section of stock returns in this early capital market. The features of this market allow them to evaluate the veracity of several popular explanations of asset pricing behavior. Using portfolio analysis and E. F. Fama and MacBeth (1973) regressions, they find that stock characteristics such as beta, illiquidity, dividend yield, and past-year return performance are all positively correlated with stock returns. However, market capitalization and past-three-year return performance have no significant correlation with stock returns.

Pricing of Liquidity Risks: Evidence from Multiple Liquidity Measures

Kim and Lee (2014), investigate the pricing implication of liquidity risks in the liquidity-adjusted capital asset pricing model of Acharya and Pedersen (2005), using multiple liquidity measures and their principal component. They collect the daily return, price, and trading volume data of common shares for non-financial firms listed in the New York Stock Exchange and the American Stock Exchange from CRSP daily stock files for July 1, 1962, to December 31, 2011. Monthly returns and prices are collected from CRSP monthly stock files for the corresponding period. They find that the empirical results are sensitive to the liquidity measure used in the test, and strong evidence of pricing of liquidity risks when they estimate liquidity risks based on the first principal component across eight measures of liquidity, both in the cross-sectional and factor-model regressions. Result implies that the systematic component measured by each liquidity proxy is correlated across measures and the shocks to the systematic and common component of liquidity are an un-diversifiable source of risk.

Studying the Relationship between Liquidity Risk and Market Risk with Non-Ordinary Return at Fama-French Three Factor Model at Tehran Stock Exchange

Shams et al. (2014), in this research, the effect of information quality is studied by regarding liquidity risk, effect of information quality by regarding risk of market on non-ordinary return at Fama-French three model factor. Analyzing correlation is applied through regression analysis for studying pattern and the relationship between statistical variables. Whereas data of this research is studied at time series simultaneously, the data is mixed (panel). Data panel model measures variables during section and during time. Statistical universe of this research is all firms listed at Tehran stock exchange from 2001 until 2011 .In this research the stock return influenced by Small minus Big (SMB) and High minus Low (HML) that are available at Fama-French three model factor was eliminated. In addition corporate properties and market are considered as market risk variables and liquidity risk. Results show that model is acceptable.

3.6 Comments on Literature Review and Research Gap

As illustrated in the literatures review, the study's object is related to the previous studies that examined the relation between Expected Rate of Return and anomalies phenomenon regarding to size, value, and liquidity effects,(Amihud, 2002),(Liu, 2006), (Chan & Faff, 2005), (E. F. Fama & French, 1993),(Drew & Veeraraghavan, 2002),(Djajadikerta & Nartea, 2005),(Remmits & Knittel, 2015),(Scheurle, 2010),(Gregory et al., 2013) (Rahim & Nor, 2006), (Abbas et al., 2014)and (Kilsgård & Wittorf, 2011). These studies are conducted on international markets, in the same context,(درويش, 2008), (Aldaarmi et al., 2015), (Al-Mwalla, 2012),(Al-Mwalla et al., 2012),(Al-Mwalla & Karasneh, 2011),(Hasnaoui & Ibrahim, 2013),(Hearn et al., 2010),(Shaker & Elgiziry, 2014). These studies are conducted in Arab Stock Exchanges, but none of them are conducted on PEX. Multivariate regression analysis method was used to findout if there is positive relation between size risk premium, value risk premium, illiquidity risk premium and expected rate of return to extrapolate the existence of anomalies phenomenon.

Furthermore, the relevant studies on PEX did not investigate the anomalies phenomenon and its impact on the expected rate of return by this methodology before. اللطيف (2006) used a multiple regression analysis to explain the factors that affect the expected rate of return in PEX.Abu-Rub and Sharba (2011), it's the only study that talked about anomalies concept in PEX regarding to calendar effects, used unilateral analysis of variance - ANOVA and Sheve for a posteriori comparisons (Post Hoc ANOVA) to verify the impact of national, religious and weekend holidays effect on the trading price of stocks of companies listed on the Palestine Securities Exchange. النواجحة (2014), recognize the role of capital assets pricing models in determining the stock prices of companies listed on Palestine Exchange and explore those models and their role in pricing the capital assets and more particularly the accounting model for evaluation, discounted cash flow model, and discounted cash dividends model.Eid (2015), examine the impact of information asymmetry on the cost of equity capital by using multiple linear regression analysis method, based on extracted high frequency (long term data) trading data from the Palestine Exchange "PEX", information asymmetry is measured by the bid–ask spread.الظاهر and

العطعوط (2010), Alkhatib and Harasheh (2014), Abushammala (2014)and درويش (2011), test the weak form of the market efficiency for the Palestine Exchange (PEX). It is found in these studies that PEX is inefficient at the weak-form level. As a result, this is likely to be evidence that the prudent investor who deals with PEX will achieve abnormal returns using historical data of stock prices.

Moreover, Darwish et al. (2010), test the relationship between risk and return in the Palestine Securities Exchange, and determin the ability of the market risk premium to compensate investors, the empirical results show no significant positive relationship between Risk and Return which mean that there is no risk – premium in Palestine stock Exchange.

In addition, (المهتدي, 2014), analyze the traditional financial performance measures (EPS, ROI, OCF, ROE) and stand on their technical implications as well as standing on the technical implications of the economic value added and market value added as performance evaluation measures and using them to measure the change in the market value of the Bank Of Palestine stocks prices, find that the market value of the stocks of Bank of Palestine has a strong correlation with the traditional financial performance evaluation measures combined together better than if they were used individually in the measurement of the change in the market value of stock, also the economic value added and market value added have a high explanatory ability to measure this change.In the same context, لولو (2015), analyze the relationship between economic value added (EVA) as a modern performance indicator and the traditional indicators {Return on Assets (ROA), Return On Equity (ROE), and Earnings per Share (EPS)} on one hand and the market value of shares in Palestine stock Exchange, and find that the economic value added indicator has a greater ability to explain the change in the value market of the share prices, earnings per share (EPS) indicator has the highest explanatory ability among performance indicator followed by Return on Assets then economic value added.

While Awad et al. (2012), explore the correlation between the intrinsic value (IV) and market value (MV) of common stocks. It is found that there is a positive correlation between the intrinsic and market value of a particular common stock although the positive correlation does not always imply that the intrinsic value causes the changes in market value. The empirical results of the co-integration test of this paper reveals that the market value is what causes the changes in intrinsic value, meaning that stock prices in PEX does not significantly depend on fundamentals, but rather on supply and demand forces.

According to previous PEX studies' results, the researcher believe that the research gape not examined yet on PEX as an investigation of the anomalies status and its impact on the expected rate of return by multidimentional Fama and French methodology. Therefore, it is used three models to test the impact of the study's variables (anomalies) on expected rate of return, regarding to size, value, and illiquidity risk premium. As mentioned before, multidimentional Fama and French, augmented Fama and French three factor models used as the study methodology in multivariate regression analysis.

Chapter Four
Study Methodology and Results

Chapter 4

Study Methodology and Results

4.1 Introduction

This chapter explains the selection process of determining which companies are to be included in the study, the time period of our study and how the data for the study was gathered and it presents the number of companies included in the sample as well as how the variables needed for the multivariate regression analysis were created. In addition, in this chapter the results of the study are analysed and discussed, as well as the validity of the results.

The conventional FF3 and liquidity augmented FF3 models were applied in Palestine Exchange Market "PEX" by using the same E. F. Fama and French (1993) methodology and check the applicability of those models in this small and emerging market. Finally, the study compared between models reffering to risk free rate or without due to the absence of sovereign or treasury (governmental) financial instruments in state of Palestine.

4.2 Data Structure and Statistical Techniques

This chapter outlined and discussed the main results by using cross-sectional low frequency (yearly and monthly) – data. Hypotheses were tested by using multivariate regression analysis method, through ***SPSS*** (Statistical Package for the Social Science) software, and in the same context ,Gibbons, Ross, and Shanken (1989) GRS test was conducted through ***STATA*** software

4.2.1 Study Population and Sample Size

A systematic procedures were applied in the data collection for the listed companies in Palestine Exchange PEX (2015), which were **50** companies for a time period of 8 years from April 2007 to March 2015, and the sample size was **39** companies for the whole study period.

To be included in the firms' sample must have the following criteria:

- At least 12 months available data.
- Still traded through study period from April 2007 to March 2015.
- Firms must have positive M/B ratio.
- Firms that have stopped trading due to mergers were excluded from the sample the year of merging and year after (one case, TNB).

Table (4.1): Sample Size of the Study that conform with the study from April 2007 to March 2015

Year	Number of listed firms	Number of still traded firms	Number of included firms
2007-2008	35	30	21
2008-2009	37	32	24
2009-2010	39	34	27
2010-2011	40	37	28
2011-2012	46	43	23
2012-2013	48	45	23
2013-2014	49	46	27
2014-2015	49	47	22

Source: author, 2016.

***Note*:** Beit Jala Pharmaceutical **BJP** was listed in PEX in 03/05/2015, to became **50** firms in 31/12/2015

4.3 Portfolio Monthly Return

The monthly return is the function of the closing price of the stock in the current month and the closing price of the stock in the previous month and calculated from April of the year t to March of the year t+1, because the fiscal yearends for all Palestinian firms is in December, assuming a 3-months gap for publication of accounting data, so portfolio monthly return can be represented in the following equation:

$$r_{it} = ln\left(\frac{p_{it}}{p_{it-1}}\right) \quad (4.1)$$

Eq. (4.1), r_{it} denotes the monthly stock return on stock i, P_{it} is the stock price of stock i at the end of current month, P_{it-1} is the closing price of previous month of stock i and ln is the natural log. The market portfolio returns are calculated as:

$$rm_t = ln\left(\frac{MP_t}{MP_{t-1}}\right) \quad (4.2)$$

Eq. (4.2), r_{mt} denotes the monthly returns on the market portfolio MP_t, i.e. AL-QUDS index, MP_t is the end of current month value of AL-QUDS index, MP_{t-1} is the ending of previous month value of AL-QUDS index and ***ln*** is the natural log.

4.4 Data Description

The study used a multidimintional **(bivariate sorts**), **(2x2)** portfolio intersection.

The following points prsentst the procedures of froming fundamental factors, hence construction of prposed models:

- Rank all stocks that included in the sample firms at time 1 in terms of the factor (double sorting due to bivariate sorts).
- Create high-exposure and low-exposure portfolios by equally weighting the stocks in the top 50% of the list and in the bottom 50% of the list.
- Create the intersected portfolios according to the nature of anomalies, in our case 2x2 = 4 intersected portfolios for each model. (The researcher used the coding system in SPSS to create and calculate required intersected portfolios returns).
- Calculate the zero-investment portfolio return as the difference between the returns on the high exposure and low exposure intersected portfolios. The return on the zero investment portfolio is the factor premium for time 1. (Called zero investment portfolio because, theoretically, no capital needs to be used to create the portfolio).
- Repeat these steps for time 2. Repeat the procedure for factors interested in, at each time interval. In other words, the total number of iterations of the procedure will equal the number of factors multiplied by the number of time intervals.

  The study follow the construction approach of E. F. Fama and French (1993). However, there are some differences.

✓ The first is the treatment of financials. E. F. Fama and French (1993), exclude all financials; however, this might be inappropriate for the Palestine exchange market. Financials have a large share of the entire market capitalisation and are one of the main drivers of the Palestinian economy. The study by E. F. Fama and French (1992) excludes financial firms, as they were interested in studying the explanatory power of leverage on security returns. However, they observed that the leverage effect was not pervasive and the size and distressed firm effect subsumed the explanatory power of all other variables. Barber and Lyon (1997) tested the size and style returns of financial firms, excluded from the original sample used by E. F. Fama and French (1992) and found the results from the multifactor model are similar to non-financial firms and suggest that data snooping and selection biases cannot explain the results of E. F. Fama and French (1992). Moreover, Barber and Lyon (1997) supported the view that the size effect and distressed firms effect do not have different meanings for financial and non-financial firms.

- ✓ Another difference is the utilization of the M/B ratio instead of the B/M ratio. This was decided because of the smoothing procedure of constructing porfolios by ranking from the smallest or lowest to biggest or highest.
- ✓ The third difference is related to the number of intersection portfolios (**2x2**), instead of (**2x3**), due to the limited number of companies were included in study sample.The study used **50%** as a value breakpoints instead (**30%, 40%, 30%)** , by ignoring the nutral or medium portfolio.

4.4.1 Forming the Dependent & Independent Factors Portfolios

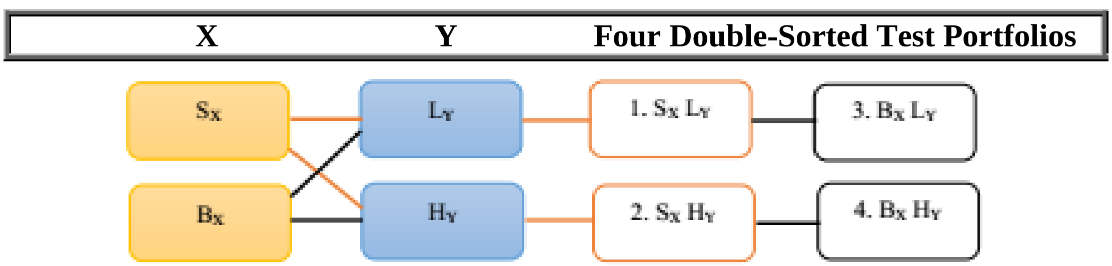

Figure (4.1): Procedure for constructing the double-sorted test portfolios, source: author, 2016

Note: The portfolios are double-sorted on X and Y which represent two of the firm-specific factors, i.e., ME, M/B, and TURN. For instance, when X = ME and Y = M/B, portfolio SH consists of stocks that are Small in ME category and also High in M/B category. Whereas, portfolio SL is composed of stocks that are also Small in ME category but Low in M/B category.

4.4.1.1 Size Breakpoints (S & B portfolios)

The study defined big firms (B) as the biggest 50% by market capitalization and classified the remaining 50% of the sample's firms as small firms (S).

4.4.1.2 Value Breakpoints (V & G portfolios)

The study defined value firms (V) as the lowest 50% by M/B ratio and classified the remaining 50% of the sample's firms as growth firms (G).

4.4.1.3 Liquidity Breakpoints (I & L portfolios)

The study defined illiquid firms (I) as the lowest 50% by stock turnover ratio and classified the remaining 50% of the sample's firms as liquid firms (L).

4.4.1.4 Portfolios Formation Date

E. F. Fama and French (1993), formed their portfolios in June of each year after considering a 6-month gap from the fiscal yearends (December) to account for the time taken for the publication of accounting data. As the fiscal yearends for all Palestinian firms is December, assuming a 3-months gap for publication of accounting data according to Disclosure Law No. (3b) of the year 2006, the gap between the financial statements data and the stock returns helps to ensure that the financial statements data are made publicly available prior to the stock returns they are used to explain. The researcher formed the portfolios in March-End of each year. To summarize the methodology relating to portfolio formation date,

- At the end of March of the year **t+1**, the stocks were classified as Big (B) and Small (S), based on their market capitalisation at the end of March of the year **t+1.**
- At the same time, the stocks were independently classified as Value (V), and Growth (G) based on their M/B ratio. The M/B ratio was computed in March using the data as at the fisical year ending in December of the year **t.**
- Turnover Ratio was used the liquidity criterion as similar to Chan and Faff (2005) mentioned, the turnover ratio is found by using the monthly traded volume and the number of outstanding shares present in the market. That is to say, the turnover ratio of a stock was calculated by dividing the monthly traded volume into the number of outstanding shares present in the market, then take the average of twelve monthly turnover ratios as the measure of the company's liquidity throughout the year. That was to avoid relying on a single monthly figure and the possible effect of seasonality. The classification of stocks as liquid (L), illiquid (I) was done based on their average of twelve monthly turnover ratios from April of the year **t**, to March of the year **t+1.**

- The portfolios created were calculated in a manner to cover the period between each t year's April until each t+1 year's March and they were reconstructed in March of each year.

4.4.2 Estimation of C.FF3, Size and Value portfolios

4.4.2.1 Forming the Independent Factors

1. ***SMB.$_V$*** **=** size premium(small minus big after controlling value) ***is calculated as;***

   SMB.$_V$ = Average return of (***SV, SG***) portfolios minus average return of (***BV, BG***) portfolios

$$= \left(\frac{[SV + SG] - [BV + BG]}{2}\right) \quad \textbf{(4.3)}$$

OR

$$= \left(\frac{[SV - BV] + [SG - BG]}{2}\right) \quad \textbf{(4.4)}$$

2. ***Similarly, VMG.S*** **=** value premium (value minus growth after controlling size) ***is calculated as;***

   VMG.$_S$ **=** Average return of (***SV, BV***) portfolios minus average return of (***SG, BG***) portfolios.

$$= \left(\frac{[SV + BV] - [SG + BG]}{2}\right) \quad \textbf{(4.5)}$$

OR

$$= \left(\frac{[SV - SG] + [BV - BG]}{2}\right) \quad \textbf{(4.6)}$$

4.4.2.2 Forming the Dependent Variables Portfolios

The returns of four equally-weighted intersected portfolios were constructed to be tested as dependent variables in a multivariate regression analysis.

Table (4.2): C.FF3 Model, Dependent Variables Portfolios

	(Value = M/B)	
(Size = M.CAP)	**Value (below 50%)**	**Growth (above 50%)**
Small (below 50%)	***SV***	***SG***
Big (above 50%)	***BV***	***BG***

Source: author, 2016

4.4.3 Estimation of S.LIQ, Size and Liquidity portfolios

4.4.3.1 Forming the Independent Factors

1. ***SMB.**$_L$*= size premium (small minus big after controlling liquidity) ***is calculated as;***

   SMB.**$_L$* = Average return of (SI, SL***) portfolios minus average return of (***BI, BL*** portfolios

$$= \left(\frac{[SI + SL] - [BI + BL]}{2}\right) \quad \textbf{(4.7)}$$

OR

$$= \left(\frac{[SI - BI] + [SL - BL]}{2}\right) \quad \textbf{(4.8)}$$

2. ***Similarly, IML.**$_S$* = illiquidity premium (illiquid minus liquid after controlling size) ***is calculated as;***

   IML.**$_S$* = Average return of (SI, BI***) portfolios minus average return of (***SL, BL***) portfolios.

$$= \left(\frac{[SI + BI] - [SL + BL]}{2}\right) \quad \textbf{(4.9)}$$

OR

$$= \left(\frac{[SI - SL] + [BI - BL]}{2}\right) \quad \textbf{(4.10)}$$

4.4.3.2 Forming the Dependent Variables Portfolios

The returns of four equally-weighted intersected portfolios were constructed to be tested as dependent variables in a multivariate regression analysis.

Table (4.3): S.LIQ Model, Dependent Variables Portfolios

	(LIQ = Stock.Turnover)	
(Size = M.CAP)	**ILLIQ (below 50%)**	**LIQ (above 50%)**
Small (below 50%)	***SI***	***SL***
Big (above 50%)	***BI***	***BL***

Source: author, 2016

4.4.4 Estimation of V.LIQ, Value and Liquidity portfolios

4.4.4.1 Forming the Independent Factors

1. ***VMG.$_L$*=** value premium (value minus growth after controlling liquidity) ***is calculated as;***

   VMG.$_L$* =** Average return of (VI, VL***) portfolios minus average return of (***GI, GL***) portfolios

$$= \left(\frac{[VI + VL - [GI + GL]]}{2}\right) \quad \textbf{(4.11)}$$

OR

$$= \left(\frac{[VI - GI] + [VL - GL]}{2}\right) \quad \textbf{(4.12)}$$

2. ***Similarly, IML.$_V$*** = illiquidity premium (illiquid minus liquid after controlling value) ***is calculated as;***

   IML.$_V$ = Average return of (***VI, GI***) portfolios minus average return of (***VL, GL***) portfolios.

$$= \left(\frac{[VI + GI] - [VL + GL]}{2}\right) \quad \textbf{(4.13)}$$

OR

$$= \left(\frac{[VI - VL][GI - GL]}{2}\right) \quad \textbf{(4.14)}$$

4.4.4.2 Forming the Dependent Variables Portfolios

The returns of four equally-weighted intersected portfolios were constructed to be tested as dependent variables in a multivariate regression analysis.

Table (4.4): V.LIQ Model, Dependent Variables Portfolios

	(LIQ = Stock.Turnover)	
(Value = M/B)	**ILLIQ (below 50%)**	**LIQ (above 50%)**
Value (below 50%)	***VI***	***VL***
Growth (above 50%)	***GI***	***GL***

Source: author, 2016

4.4.5 Estimation of Market Portfolio

The market portfolio is estimated as the equally-weighted portfolio of all the stocks involved in the estimation of SMB_t, HML_t, and IML_t portfolios. The risk-free rate Rf_t , computed using the synthetic risk free rate method by combigning monthly LIBOR and monthly inflation rate, risk free rate was deducted from the return of the market portfolio to obtain the market risk premium MRP_t or $(Rm_t - Rf_t)$. The monthly LIBOR rates was sourced from LIBOR (2015), and monthly inflation rates was sourced from (PCBS, 2015).

4.5 Estimation of Palestine Risk Free Rate

R_{ft} = LIBOR + Inflation Premium

The study mentioned the methodology of composing the synthetic risk free rate in chapter 2, section 9.

4.6 Descriptive Analysis

The descriptive analysis clarifies general view of study variables' characteristics among listed companies in Palestine exchange market. The general view of collected data of 8 years' period (April 2007- March 2015) is presented in this section. It focuses on describing the study factors. It shows row (return) and their mean, standard deviation, median, max and minimum values. The return for constructed portfolios, for independent variables, market return factor-MKT, size risk premium- SMB, value risk premium-VMG, and illiquidity risk premium- IML. For dependent variables, twelve equally-weighted average rate of returns- EWAR were constructed,small size and low M/B-SVt, small size and high M/B-SGt, BV, BG, small size and illiquid-SI, small size and liquid-SL and so forth,BI,BL,VI,VL,GI,GL, with statistical & correlation metrics.

Table (4.5): Descriptive statistics for stocks monthly-row- returns, risk free rates, market returns, and market excess returns for the whole period 2007-2015

Variables	Period 2007-2015, 195 observations, 39 Companies				
	Mean	**SD**	**Median**	**Max**	**Min**
Apr R1	**-0.027**	**0.103**	**-0.017**	**0.539**	**-0.553**
May R2	**-0.020**	**0.085**	**-0.015**	**0.518**	**-0.275**
Jun R3	**-0.004**	**0.065**	**-0.004**	**0.427**	**-0.148**
Jul R4	**-0.009**	**0.076**	**-0.004**	**0.208**	**-0.575**
Aug R5	**-0.016**	**0.081**	**-0.009**	**0.307**	**-0.499**
Sep R6	**0.016**	**0.076**	**0.000**	**0.327**	**-0.185**
Oct R7	**-0.012**	**0.074**	**-0.009**	**0.364**	**-0.255**
Nov R8	**-0.013**	**0.088**	**-0.008**	**0.263**	**-0.511**
Dec R9	**0.021**	**0.069**	**0.013**	**0.360**	**-0.151**
Jan R10	**0.000**	**0.071**	**0.000**	**0.288**	**-0.193**
Feb R11	**-0.007**	**0.066**	**0.000**	**0.258**	**-0.279**
Mar R12	**0.005**	**0.078**	**0.000**	**0.375**	**-0.280**
Rm_t	**-0.003**	**0.055**	**-0.002**	**0.148**	**-0.241**
Rf_t	**0.013**	**0.018**	**0.005**	**0.079**	**0.001**
$Rm_t - Rf_t$	**-0.016**	**0.058**	**-0.011**	**0.143**	**-0.246**

Table (4.5) reports the average monthly row returns for companies sample included in the whole period of study from April 2007 to March 2015

The month of December has the greatest return's mean among other months with **0.021** and the month of September was the second one with **0.016**. March was the third one with **0.005**. On the other side, the month of April was the biggest loss with **-0.027** .In the same time, the remaining months show losses by **-0.020, -0.004, -0.009, -0.016, -0.012, -0.013** and **-0.007** for **May**, **Jun , Jul , Aug, Oct , Nov and Feb** months respectively.The month of January show a zero mean in the whole period from 2007 to 2015.

In addition, the return on Al-Quds index was reported as the return on the market portfolio **rmt**, and show a negative mean **-0.003** for the period from 2007-2015.Similary, the proposed synthetic risk free rate demonstrated as an average for the whole period and was **0.013**.

Table (4.6): Descriptive statistics and correlation matrix for the three models variables, without referring to risk free rate, for period 2007-2015

Descriptive statistics				Correlation						
PANEL A. Conventional FF3 Model : ***Rpt= α + bi (Rmt) + si (SMBt) + hi (VMGt) + εpt***										
	Mean	**t-statistics**	**SD**	**SVt**	**SGt**	**BVt**	**BGt**	**SMBt**	**VMGt**	**Rmt**
SVt	-0.0085	-1.919	0.0436	1						
SGt	-0.0050	-1.261	0.0391	**0.351****	1					
BVt	-0.0057	-1.175	0.0475	**0.469****	**0.289****	1				
BGt	-0.0042	-0.991	0.0411	**0.346****	**0.526****	**0.618****	1			
SMBt	-0.0019	-0.513	0.0355	**0.293****	**0.269****	**-0.580****	**-0.491****	1		
VMGt	-0.0025	-0.692	0.0356	**0.531****	**-0.445****	**0.437****	**-0.242***	**-0.071**	1	
Rmt	-0.0028	-0.507	0.0546	**0.360****	**0.414****	**0.770****	**0.716****	**-0.480****	**0.092**	1
PANEL B. Augmented FF3 Model S.LIQ: ***Rpt= α + bi (Rmt) + si (SMBt) + li (IMLt) + εpt***										
	Mean	**t-statistics**	**SD**	**SIt**	**SLt**	**BIt**	**BLt**	**SMBt**	**IMLt**	**Rmt**
SIt	-0.0057	-1.428	0.0391	1						
SLt	-0.0112	-2.179*	0.0503	**0.378****	1					
BIt	-0.0067	-1.759	0.0371	**0.248***	**0.434****	1				
BLt	-0.0020	-0.400	0.0496	**0.287****	**0.478****	**0.616****	1			
SMBt	-0.0041	-1.052	0.0381	**0.454****	**0.331****	**-0.474****	**-0.488****	1		
IMLt	**0.0004**	0.122	0.3356	**0.225***	**-0.641****	**-0.083**	**-0.588****	**0.115**	1	
Rmt	-0.0028	-0.507	0.0546	**0.202***	**0.481****	**0.611****	**0.777****	**-0.383****	**-0.478****	1
PANEL C. Augmented FF3 Model V.LIQ: ***Rpt= α + bi (Rmt) + hi (VMGt) + li (IMLt) + εpt***										
	Mean	**t-statistics**	**SD**	**VIt**	**VLt**	**GIt**	**GLt**	**VMGt**	**IMLt**	**Rmt**
VIt	-0.0069	-1.784	0.0382	1						
VLt	-0.0085	-1.703	0.0491	**0.445****	1					
GIt	-0.0062	-1.596	0.0382	**0.299****	**0.441****	1				
GLt	-0.0053	-1.121	0.0467	**0.450****	**0.437****	**0.512****	1			
VMGt	-00019	-0.552	0.0349	**0.396****	**0.414****	**-0.416****	**-0.395****	1		
IMLt	**0.0004**	0.114	0.0301	**0.122**	**-0.592****	**0.067**	**-0.521****	**-0.044**	1	
Rmt	-0.0028	-0.507	0.0546	**0.317****	**0.596****	**0.531****	**0.678****	**-0.151**	-0.473**	1

Notes: * and ** denote significance at 1% and 5% levels, respectively.

SVt denotes to equally weighted average rate of return on the intersection portfolio for small size and value (low M/B)

Table (4.7): Descriptive statistics and correlation matrix for the three models variables, referring to risk free rate, for period 2007-2015

Descriptive statistics				Correlation						
PANEL A. Conventional FF3 Model : ***Rpt-Rft = α + bi (Rmt – Rft) + si (SMBt) + hi (VMGt) + εpt***										
	Mean	**t-statistics**	**SD**	**SVt-RFt**	**SGt-RFt**	**BVt-RFt**	**BGt-RFt**	**SMBt**	**VMGt**	**Rmt – Rft**
SVt-RFt	-0.0218	-4.382**	0.0487	1						
SGt-RFt	-0.0183	-3.970**	0.0452	**0.496****	1					
BVt-RFt	-0.0189	-3.478**	0.0534	**0.579****	**0.452****	1				
BGt-RFt	-0.0174	-3.556**	0.0480	**0.498****	**0.649****	**0.707****	1			
SMBt	-0.0019	-0.513	0.0355	**0.230***	**0.198**	**-0.545****	**-0.453****	1		
VMGt	-0.0025	-0.692	0.0356	**0.468****	**-0.393****	**0.383****	**-0.214***	**-0.071**	1	
Rmt – Rft	-0.0161	-2.741*	0.0575	**0.449****	**0.501****	**0.800****	**0.753****	**-0.483****	**0.082**	1
PANEL B. Augmented FF3 Model S.LIQ: ***Rpt-Rft = α + bi (Rmt – Rft) + si (SMBt) + li (IMLt) + εpt***										
	Mean	**t-statistics**	**SD**	**SIt-RFt**	**SLt-RFt**	**BIt-RFt**	**BLt-RFt**	**SMBt**	**IMLt**	**Rmt – Rft**
SIt-RFt	-0.0189	-4.148**	0.0448	1						
SLt-RFt	-0.0244	-4.358**	0.0549	**0.499****	1					
BIt-RFt	-0.0199	-4.493**	0.0435	**0.439****	**0.549****	1				
BLt-RFt	-0.0153	-2.663**	0.0562	**0.456****	**0.579****	**0.713****	1			
SMBt	-0.0041	-1.052	0.0381	**0.361****	**0.274****	**-0.442****	**-0.459****	1		
IMLt	**0.0004**	0.122	0.3356	**0.161**	**-0.615****	**-0.107**	**0.546****	**0.115**	1	
Rmt – Rft	-0.0161	-2.741*	0.0575	**0.324****	**0.547****	**0.663****	**0.810****	**-0.391****	-0.481**	1
PANEL C. Augmented FF3 Model V.LIQ: ***Rpt-Rft = α + bi (Rmt – Rft) + hi (VMGt) + li (IMLt) + εpt***										
	Mean	**t-statistics**	**SD**	**VIt-RFt**	**VLt-RFt**	**GIt-RFt**	**GLt-RFt**	**VMGt**	**IMLt**	**Rmt – Rft**
VIt-RFt	-0.0202	-4.511**	0.0439	1						
VLt-RFt	-0.0218	-3.872**	0.0552	**0.572****	1					
GIt-RFt	-0.0195	-4.258**	0.0448	**0.481****	**0.574****	1				
GLt-RFt	-0.0186	-3.452**	0.0528	**0.579****	**0.557****	**0.631****	1			
VMGt	-00019	-0.552	0.0349	**0.334****	**0.360****	**-0.364****	**-0.357****	1		
IMLt	**0.0004**	0.114	0.0301	**0.055**	**-0.561****	**0.016**	**-0.495****	**-0.044**	1	
Rmt – Rft	-0.0161	-2.741*	0.0575	**0.420****	**0.655****	**0.600****	**0.723****	**-0.151**	**-0.481****	1

Notes: * and ** denote significance at 1% and 5% levels, respectively.

SVt denotes to equally weighted average rate of return on the intersection portfolio for small size and value (low M/B)

Table (4.6) and Table (4.7) demonestrate the correlation matrix for study variables without referring to risk free rate or with respect to risk free respectively.

By comparing between the two tables, there was enhancement tendency of correlation power between dependent variables and the return of the market **rmt** (as one of the independent variables) when consider the synthetic risk free rate in calculations, but this tendency is reversed with SMB, VMG, and IML.The study observe a monotonic increase or decrease in correlation power regarding to risk free rate between dependent & independent variables.

The study observe that in **Conventional FF3 Model** C.FF, the most correlation positive power was between VMG (as one of the independent variables) and the value portfolios, also between the market return factor and all dependent variables .In **Augmented FF3 Model S.LIQ**, the most correlation positive power was between SMB (as one of the independent variables) and the small portfolios,also between the market return factor and all dependent variables .In **Augmented FF3 Model V.LIQ,** the most correlation positive power was between VMG (as one of the independent variables) and the value portfolios, also between the market return factor and all dependent variables.

4.7 Validity and Reliability

4.7.1 Multicollinearity Test & (VIF) Variance-Inflating Factor

Table (4. 8): Descriptive statistics and correlation coefficient for independent variables in the three models referring to risk free rate for the whole period 2007-2015

Descriptive statistics				Correlation		
Rpt-Rft = α + bi (Rmt – Rft) + si (SMBt) + hi (VMGt) + εpt						
PANEL A. Explanatory Factors in Conventional FF3 Model						
	Mean	**t-statistics**	**SD**	**Rmt – Rft**	**SMB**	**VMG**
Rmt – Rft	-0.0161	-2.741*	0.0575	1		
SMB	-0.0019	-0.513	0.0355	**-0.483****	1	
VMG	-0.0025	-0.692	0.0356	**0.082**	**-0.071**	1
Rpt-Rft = α + bi (Rmt – Rft) + si (SMBt) + li (IMLt) + εpt						
PANEL B. Explanatory Factors in Augmented FF3 Model S.LIQ						
	Mean	**t-statistics**	**SD**	**Rmt – Rft**	**SMB**	**IML**
Rmt – Rft	-0.0161	-2.741	0.0575	1		
SMB	-0.0041	-1.052	0.0381	**-0.391****	1	
IML	**0.0004**	0.122	0.3356	**0.-481****	**0.115**	1
Rpt-Rft = α + bi (Rmt – Rft) + hi (VMGt) + li (IMLt) + εpt						
PANEL C. Explanatory Factors in Augmented FF3 Model V.LIQ						
	Mean	**t-statistics**	**SD**	**Rmt – Rft**	**VMG**	**IML**
Rmt – Rft	-0.0161	-2.741*	0.0575	1		
VMG	-00019	-0.552	0.0349	**-0.151**	1	
IML	**0.0004**	0.114	0.0301	**-0.481****	**-0.044**	1

Notes: * and ** denote significance at 1% and 5% levels, respectively.

Table (4.9): Descriptive statistics and correlation coefficient for independent variables in the three models without referring to risk free rate for the whole period 2007-2015

Descriptive statistics				Correlation		
Rpt= α + bi (Rmt) + si (SMBt) + hi (VMGt) + εpt						
PANEL A. Explanatory Factors in Conventional FF3 Model						
	Mean	**t-statistics**	**SD**	**Rmt**	**SMB**	**VMG**
Rmt	-0.0028	-0.507	0.0546	1		
SMB	-0.0019	-0.513	0.0355	**-0.480****	1	
VMG	-0.0025	-0.692	0.0356	**0.092**	**-0.071**	1
Rpt = α + bi (Rmt) + si (SMBt) + li (IMLt) + εpt						
PANEL B. Explanatory Factors in Augmented FF3 Model S.LIQ						
	Mean	**t-statistics**	**SD**	**Rmt**	**SMB**	**IML**
Rmt	-0.0028	-0.507	0.0546	1		
SMB	-0.0041	-1.052	0.0381	**-0.383****	1	
IML	**0.0004**	0.122	0.3356	**-0.478****	**0.115**	1
Rpt= α + bi (Rmt) + hi (VMGt) + li (IMLt) + εpt						
PANEL C. Explanatory Factors in Augmented FF3 Model V.LIQ						
	Mean	**t-statistics**	**SD**	**Rmt**	**VMG**	**IML**
Rmt	-0.0028	-0.507	0.0546	1		
VMG	-00019	-0.552	0.0349	**-0.151**	1	
IML	**0.0004**	0.114	0.0301	**-0.473****	**-0.044**	1

Notes: * and ** denote significance at 1% and 5% levels, respectively.

A factor that might affect the results is multicollinearity, because if the variables are highly correlated, small changes in the data might lead to erratic changes in the coefficient estimates. The results of the test for multicollinearity are included inTable (4. 8) and Table (4.9). But since none of the correlations exceed neither **0.5** nor **-0.5** the study conclude that multicollinearity should not cause a problem in our study.

There is an absence of multicollinearity according to VIF results that illustrated in, Table (4.11),Table (4.12) and Table (4.13),ranged from (1.01 to 1.53) for all models. Gujarati (2004), mentioned that VIF shows how the variance of an estimator is inflated by the presence of multicollinearity, the larger the value of VIF_j, the more troublesome or collinear the variable X_j. As a rule of thumb, if the VIF of a variable exceeds 10, which will happen if R^2_j exceeds 0.90, that variable is said to be highly collinear.

4.7.2 Investment Environment & Database Reliability

According to World Bank dataset for WestBank & Gaza (W.B, 2015) , the extent of disclosure index for the listed companies in PEX was **6** for the period 2007-2015. This indicator measures the extent of investor protection through disclosure of ownership and financial information. IC.BUS.DISC.XQ is the code for disclosure index in dataset catalog and it is a scale from 0-10, high score refers to high level of disclosure. Furthermore, Strength of minority investor protection index (0-10) in 2016 was **4.2**, and Extent of corporate transparency index (0-10) in 2016 was **2**. For more detailes see (W.B.D.B, 2016)

Table (4.10): extent of disclosure index for the listed companies in PEX, for the period 2007-2015

Year	Extent of Disclosure index 0-10
2007	6
2008	6
2009	6
2010	6
2011	6
2012	6
2013	6
2014	6
2015	6

Source: The World Bank (W.B, 2015)

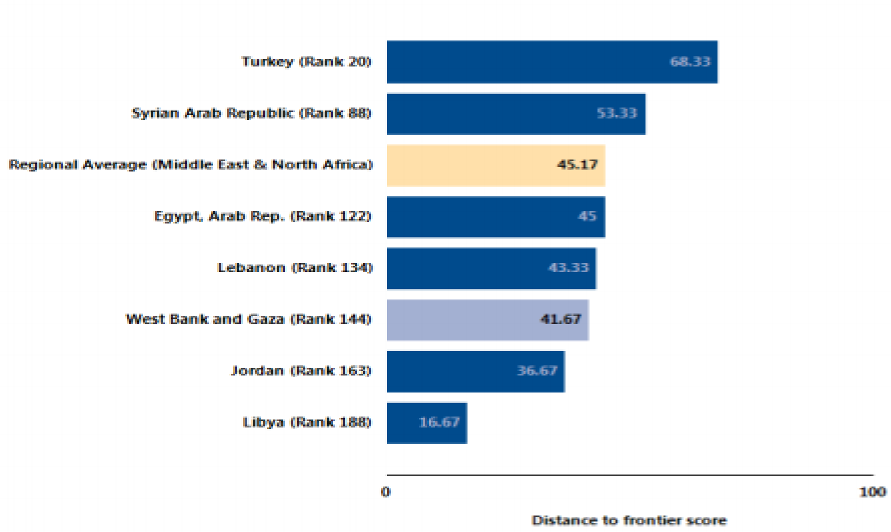

Figure (4.2): How West Bank and Gaza and comparator economies perform on the strength of minority investor protection index **Source:** (W.B.D.B, 2016)

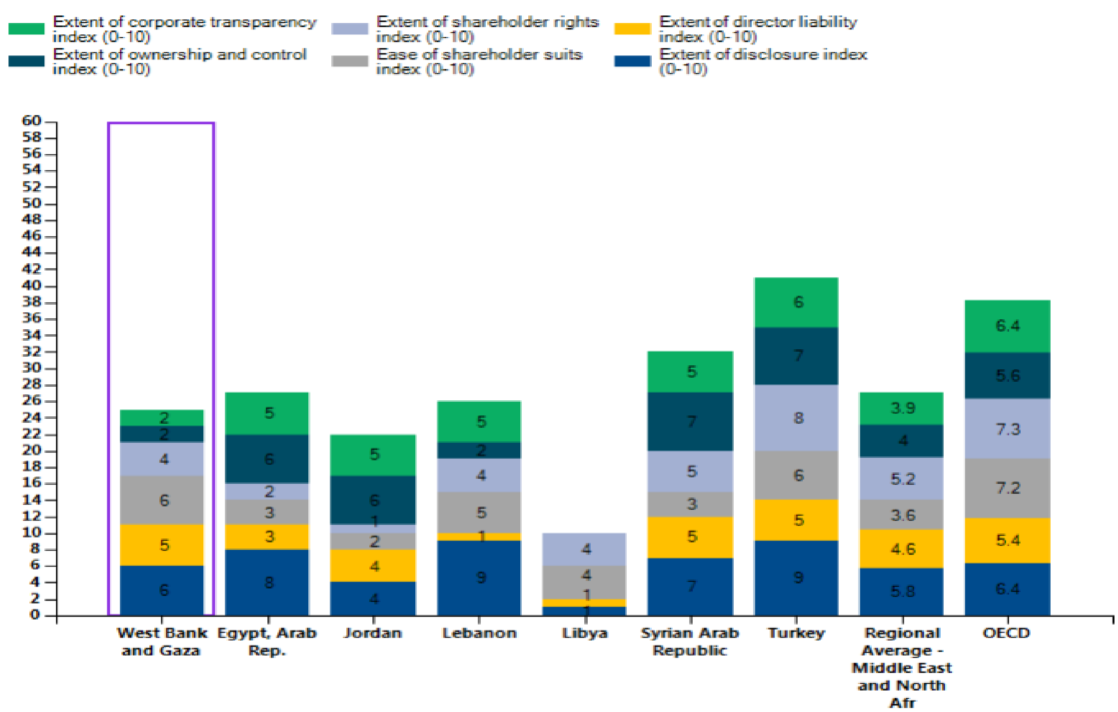

Figure (4.3): Summary of the various minority investor protection indices for West Bank and Gaza and comparator economies. Source: (W.B.D.B, 2016)

4.8 Results

4.8.1 Testing Hypotheses

Multivariate regression method was applied to test the validity of the models, expressed below, and the model will hold true if the jointly intercept ***αi*** is **not** significant i.e. statistically = **0** and the four slope coefficients (***bi, si, hi, and li***) are significant i.e. statistically ≠ **0**.

- ***Model 1.1 C.FF3: Rpt= α + bi (Rmt) + si (SMBt) + hi (VMGt) + εpt***
- ***Model 1.2 C.FF3: Rpt-Rft = α + bi (Rmt – Rft) + si (SMBt) + hi (VMGt) + εpt***
- ***Model 2.1 S.LIQ: Rpt= α + bi (Rmt) + si (SMBt) + li (IMLt) + εpt***
- ***Model 2.2 S.LIQ: Rpt-Rft = α + bi (Rmt – Rft) + si (SMBt) + li (IMLt) + εpt***
- ***Model 3.1 V.LIQ: Rpt= α + bi (Rmt) + hi (VMGt) + li (IMLt) + εpt***
- ***Model 3.2 V.LIQ: Rpt-Rft = α + bi (Rmt – Rft) + hi (VMGt) + li (IMLt) + εpt***

The following hypothesis will be tested,

- **H_1**: The tested model jointly **$\alpha_i \neq 0$**, not all α_i coefficients obtained from multiple factor models are equivalent to zero ($\alpha_i \neq 0$).
- **H_2**: There is a significant effect of the market return factor **MKT** on each of the four tested portfolios, ***the Coefficient of the MKT, bi ≠ 0***
- **H_3**: There is a significant effect of the size factor **SMB** on each of the four tested portfolios,***the Coefficient of the SMB, si ≠ 0***
- **H_4**: There is a significant effect of the value factor **VMG** on each of the four tested portfolios, ***the Coefficient of the VMG, hi ≠ 0***
- **H_5**: There is a significant effect of the liquidity factor **IML** on each of the four tested portfolios, ***the Coefficient of the IML, li ≠ 0***
- **H_6**: The conventional Fama & French model based on **MKT**, **SMB** and **VMG** is the best model to explain most of the time-series variations in stock returns over the period from April 2007 to March 2015 in "PEX" referring to **Rft** or without.
- **H_7**: The liquidity-augmented Fama & French model based on **MKT**, **SMB** and **IML is** the best model to explain most of the time-series variations in stock returns over the period from April 2007 to March 2015 in "PEX" referring to **Rft** or without **Rft.**
- **H_8 :** The liquidity-augmented Fama & French model based on **MKT**, **VMG** and **IML is** the best model to explain most of the time-series variations in stock returns over the period from April 2007 to March 2015 in "PEX" referring to **Rft** or without **Rft**

4.8.2 Models Predictions & Factor Loadings

Table (4.11): Factor Loadings and the First Model C.FF3 Predictions, referring to risk free rate and without

Conventional FF3 Model										
**Rpt= α + bi (Rmt) + si (SMBt) + hi (VMGt) + εpt*						*****Rpt-Rft = α + bi (Rmt – Rft) + si (SMBt) + hi (VMGt) + εpt***				
Rpt = SVt, SGt, BVt and BGt						***(Rpt-Rft)= (SVt- Rft), (SGt- Rft),(BVt- Rft) and (BGt- Rft)***				
(Value)						*(Value)*				
(Size)	**α Intercept***		**Sig.**		**VIF**	**α Intercept****		**Sig.**		**VIF**
	Value	**Growth**	**Value**	**Growth**		**Value**	**Growth**	**Value**	**Growth**	
Small	-0.004	-0.004	**0.113**	**0.123**	-	-0.009	-0.008	**0.004**	**0.005**	-
Big	-0.004	-0.004	**0.123**	**0.113**		-0.008	-0.009	**0.005**	**0.004**	
	Slope (*bi*) *Rmt**		**Sig.**		**VIF**	**Slope (*bi*) *(Rmt – Rft)*****		**Sig.**		**VIF**
	Value	**Growth**	**Value**	**Growth**		**Value**	**Growth**	**Value**	**Growth**	
Small	0.488	0.532	0.000	0.000	**1.31**	0.596	0.632	0.000	0.000	**1.31**
Big	0.532	0.488	0.000	0.000		0.632	0.596	0.000	0.000	
	Slope (*si*) *SMBt**		**Sig.**		**VIF**	**Slope (*si*) *SMBt*****		**Sig.**		**VIF**
	Value	**Growth**	**Value**	**Growth**		**Value**	**Growth**	**Value**	**Growth**	
Small	0.766	0.652	0.000	0.000	**1.30**	0.826	0.709	0.000	0.000	**1.01**
Big	-0.348	-0.234	0.000	0.006		-0.291	-0.174	0.001	0.069	
	Slope (*hi*) *VMGt**		**Sig.**		**VIF**	**Slope (*hi*) *VMGt*****		**Sig.**		**VIF**
	Value	**Growth**	**Value**	**Growth**		Value	**Growth**	**Value**	**Growth**	
Small	0.635	-0.518	0.000	0.000	**1.01**	0.620	-0.531	0.000	0.000	**1.31**
Big	0.482	-0.365	0.000	0.000		0.469	-0.380	0.000	0.000	
	R-Square*		**Adj R-Square**			**R-Square****		**Adj R-Square**		
	Value	**Growth**	**Value**	**Growth**		**Value**	**Growth**	**Value**	**Growth**	
Small	**0.679**	**0.676**	**0.668**	**0.665**		**0.666**	**0.679**	**0.655**	**0.668**	
Big	**0.780**	**0.640**	**0.773**	**0.628**		**0.770**	**0.656**	**0.763**	**0.644**	
	F-statistics*		**Sig.**			**F-statistics****		**Sig.**		
Small	**64.83**	**63.98**	**0.000**	**0.000**		**61.15**	**64.80**	**0.000**	**0.000**	
Big	**108.60**	**54.44**	**0.000**	**0.000**		**102.8**	**58.37**	**0.000**	**0.000**	

Source: Calculated by the researcher,* denotes the absence of risk free and **denotes the synthetic risk free consediration

4.8.2.1 Conventional FF3 Model Predictions & Factor Loadings

The results in Table (4.11), reported the estimation results of the conventional Fama & French Three-Factor model referring to risk free rate (with two signs of asterisk) or without referring to risk free rate (with one sign of asterisk).

- The intercept coefficients for C.FF3* model were constant and equal to **-0.004**, they were generally not statistically significant for all portfolios.The intercepts for C.FF3** model were ranged from **(-0.009 to -0.008)**, they were generally statistically significant for all portfolios.
- The betas, on the other hand, are all statistically significant ranging in value for C.FF3* and C.FF3** model from **(0.488 to 0.532)** and **(0.596 to 0.632)** respectively. The tendency of beta to increase with size observed for the **value** (low M/B) portfolios but this tendency is reversed for the **growth** (high M/B) portfolios. The magnitude of the beta that estimated compared with its counterpart ***si*** and ***hi*** estimates, suggest that it was the lowest explanatory variable in C.FF3 model.
- There is evidence that SMB possesses explanatory power with all four portfolios, the coefficients estimated were statistically significant for all portfolios. The study observe a monotonic increase in the risk factor loading on SMB from big to small portfolios. The sign of the SMB coefficient that estimated for the big size portfolios were negative, all portfolios are statistically significant. The magnitude of the SMB that estimated compared with its counterpart ***bi*** and ***hi*** estimates, suggest that it was the dominant explanatory variable in C.FF3 model. The coefficients were positive for all the portfolios except the big size and value BV and big size and growth BG portfolios, their coefficient sign was negative.
- There is also an evidence of VMG having explanatory power, that all portfolios having a statistically significant estimate of the VMG, coefficients. There is also evidence of an increase in the VMG factor loading from growth to value portfolios. The study also find a negative VMG coefficient for the growth portfolios and the coefficient of all portfolio is statistically significant.

- By comparing between C.FF3*and C.FF3** models, there was enhancement tendency of adjusted R^2 to slightly increase with growth porfolios from C.FF3* to C.FF3** model, but this tendency is reversed with **value** portfolios from C.FF3* to C.FF3** model.

$$*Rpt = \alpha + bi\ (Rmt) + si\ (SMBt) + hi\ (VMGt) + \varepsilon pt$$

$$*SV = -0.004 + 0.488\ (Rmt) + 0.766\ (SMBt) + 0.635\ (VMGt) + \varepsilon pt$$

$$*BV = -0.004 + 0.532\ (Rmt) + -0.348\ (SMBt) + 0.482\ (VMGt) + \varepsilon pt$$

$$*SG = -0.004 + 0.532\ (Rmt) + 0.652\ (SMBt) + -0.518\ (VMGt) + \varepsilon pt$$

$$*BG = -0.004 + 0.488\ (Rmt) + -0.234\ (SMBt) + -0.365\ (VMGt) + \varepsilon pt$$

$$**Rpt = \alpha + bi\ (Rmt) + si\ (SMBt) + hi\ (VMGt) + \varepsilon pt$$

$$**(SV - rft) = -0.009 + 0.596\ (Rmt - rft) + 0.826\ (SMBt) + 0.620\ (VMGt) + \varepsilon pt$$

$$**(BV - rft) = -0.008 + 0.632\ (Rmt - rft) + -0.291\ (SMBt) + 0.469\ (VMGt) + \varepsilon pt$$

$$**(SG - rft) = -0.008 + 0.632\ (Rmt - rft) + 0.709\ (SMBt) + -0.531\ (VMGt) + \varepsilon pt$$

$$**(BG - rft) = -0.009 + 0.596\ (Rmt - rft) + -0.174\ (SMBt) + -0.380\ (VMGt) + \varepsilon pt$$

- **H_1**: The tested model jointly $\boldsymbol{\alpha_i \neq 0}$, *not all α_i coefficients obtained from multiple factor models are equivalent to zero ($\alpha_i \neq 0$).*

This hypothesis can be rejected for C.FF3* model because the four portfolios are insignificantly different from 0, and accept the null hypothesis that imply $\boldsymbol{\alpha_i = 0}$, furthermore, the C.FF3** model, couldn't reject this hypothesis because the four portfolios are significantly different from 0.

- **H_2**: There is a significant effect of the market return factor **MKT** on each of the four tested portfolios, ***the Coefficient of the MKT, bi $\neq$ 0***

This hypothesis was accepted for both C.FF3***,** C.FF3** models**,** because the Coefficients of the ***MKT*=** the market return factor (***Rmt*** or ***Rmt – rft***) in the four portfolios for both models were significantly different from 0, and positive as the sig-value was less than 1% (1-confidence level (99%).This imply that there is a significant positive effect for the market return factor on the portfolio return on each of the four tested portfolios, for both models.

- **H3**: There is a significant effect of the size factor **SMB** on each of the four tested portfolios,***the Coefficient of the SMB, si $\neq$ 0***

The null hypothesis can be rejected for both C.FF3*, C.FF3** models, because the Coefficients of the **SMB** = the size premium factor in the four portfolios for both models were significantly different from 0. In C.FF3** model, the SMB size factor, the coefficients for (big size, value = low M/B) BV, (small size, value) SVand (small size, growth = high M/B) SG portfolios were significantly different than zero at 1 percent significant level but the coefficient for (big size, growth) BG portfolio was significantly different from zero at 10 percent significant. In the same context, for the C.FF3* model, the **SMB** factor in the four portfolios was significantly different than zero at 1 percent significant level. Finally the coefficients were positive for all the portfolios except the (big size, value) BV and (big size, growth) BG portfolios for both models, their coefficient signs were negative. So the null hypothesis can be rejected which imply that there is no significant effect of the SMB size factor on the tested portfolio returns as the sig-value is less than 1% (1-confidence level (99%). This imply that the alternative hypothesis can be accepted which indicate that there is negative significant effect for the SMB size factor on the BV and BG portfolios return and positive significant effect for the SMB size factor on the SV and SG portfolios return.

- **H4**: There is a significant effect of the value factor **VMG** on each of the four tested portfolios, ***the Coefficient of the VMG, hi $\neq$ 0***

The null hypothesis can be rejected for both C.FF3*, C.FF3** models, because the Coefficients of the VMG = the value premium factor in the four portfolios for both models were significantly different from 0 at 1 percent significant level. Finally the coefficients were positive for all the portfolios except the (big size, growth = high M/B) BG and (small size, growth) SG portfolio for both models, their coefficient sign were negative. So the null hypothesis can be rejected which imply that there is no significant effect of the VMG value factor on the tested portfolio returns as the sig-value is less than 1% (1-confidence level (99%). This imply that the alternative hypothesis can be accepted which indicate that there is negative significant effect for the VMG value factor on the BG and SG portfolios return and positive significant effect for the VMG value factor on the SV and BV portfolios return.

Table (4.12): Factor Loadings and the Second Model S.LIQ Predictions, referring to risk free rate and without

Augmented FF3 Model S.LIQ										
Rpt= α + bi (Rmt) + si (SMBt) + li (IMLt) + εpt						*Rpt-Rft = α + bi (Rmt – Rft) + si (SMBt) + li (IMLt) + εpt*				
Rpt =SIt, SLt, BIt and BLt						*(Rpt-Rft)= (SIt- Rft), (SLt- Rft), (BIt- Rft) and (BLt- Rft)*				
(Liquidity)						*(Liquidity)*				
(Size)	*α* Intercept*		Sig.		VIF	*α* Intercept**		Sig.		VIF
	ILLIQ	LIQ	ILLIQ I	LIQ		ILLIQ	LIQ	ILLIQ	LIQ	
Small	-0.002	-0.007	**0.522**	**0.020**	-	-0.006	-0.012	**0.061**	**0.000**	-
Big	-0.007	-0.002	**0.020**	**0.552**		-0.012	-0.006	**0.000**	**0.061**	
	Slope (*bi*) *Rmt**		Sig.		VIF	Slope (*bi*) *(Rmt – Rft)***		Sig.		VIF
	ILLIQ	LIQ	ILLIQ	LIQ		ILLIQ	LIQ	ILLIQ	LIQ	
Small	0.489	0.429	0.000	0.000	**1.51**	0.616	0.538	0.000	0.000	**1.53**
Big	0.429	0.489	0.000	0.000		0.538	0.616	0.000	0.000	
	Slope (*si*) *SMBt**		Sig.		VIF	Slope (*si*) *SMBt***		Sig.		VIF
	ILLIQ	LIQ	ILLIQ	LIQ		ILLIQ	LIQ	ILLIQ	LIQ	
Small	0.678	0.745	0.000	0.000	**1.18**	0.724	0.779	0.000	0.000	**1.19**
Big	-0.255	-0.322	0.002	0.000		-0.221	-0.276	0.015	0.003	
	Slope (*li*) *IMLt**		Sig.		VIF	Slope (*li*) *IMLt***		Sig.		VIF
	ILLIQ	LIQ	ILLIQ	LIQ		ILLIQ	LIQ	ILLIQ	LIQ	
Small	0.553	-0.725	0.000	0.000	**1.31**	0.629	-0.666	0.000	0.000	**1.31**
Big	0.275	-0.447	0.004	0.000		0.334	-0.371	0.002	0.001	
	R-Square*		Adj R-Square			R-Square**		Adj R-Square		
	ILLIQ	LIQ	ILLIQ	LIQ		ILLIQ	LIQ	ILLIQ	LIQ	
Small	**0.545**	**0.721**	**0.530**	**0.712**		**0.554**	**0.706**	**0.540**	**0.696**	
Big	**0.489**	**0.717**	**0.472**	**0.708**		**0.530**	**0.717**	**0.515**	**0.708**	
	F-statistics		Sig.			F-statistics		Sig.		
Small	**36.70**	**79.24**	**0.000**	**0.000**		**38.15**	**73.64**	**0.000**	**0.000**	
Big	**29.30**	**77.64**	**0.000**	**0.000**		**34.60**	**77.85**	**0.000**	**0.000**	

Source: Calculated by the researcher,* denotes the absence of risk free and **denotes the synthetic risk free consediration

4.8.2.2 Augmented FF3 Model S.LIQ Predictions & Factor Loadings

The results in Table (4.12), reported the estimation results of the augmented Fama & French Three-Factor model S.LIQ, referring to risk free rate (with two signs of asterisk) or without referring to risk free rate (with one sign of asterisk).

- The intercept coefficients for S.LIQ * model were ranged from **(-0.007 to -0.002)**, they were generally not statistically significant for all portfolios.The intercepts for S.LIQ ** model were ranged from **(-0.012 to -0.006)**, they were generally statistically significant for all portfolios.
- The betas, on the other hand, are all statistically significant ranging in value for S.LIQ* and S.LIQ ** model from **(0.429 to 0.489)** and **(0.538 to 0.616)** respectively. The tendency of beta to increase with size observed for the **liquid** portfolios but this tendency is reversed for the **illiquid** portfolios.
- There is evidence that SMB possesses explanatory power with all four portfolios, the coefficients estimated were statistically significant for all portfolios. The study observe a monotonic increase in the risk factor loading on SMB from big to small portfolios. The sign of the SMB coefficient that estimated for the big size portfolios were negative, all portfolios are statistically significant. The magnitude of the SMB that estimated compared with its counterpart ***bi*** and ***li*** estimates, suggest that it was the dominant explanatory variable in S.LIQ model. The coefficients were positive for all the portfolios except the big size and liquid BL and big size and illiquid BI portfolios, their coefficient sign was negative.
- There is also an evidence of IML having explanatory power, that all portfolios having a statistically significant estimate of the IML, coefficients. There is also evidence of an increase in the IML factor loading from liquid to illiquid portfolios. The study also find a negative IML coefficient for the liquid portfolios and the coefficient of all portfolio is statistically significant.
- By comparing between S.LIQ* and S.LIQ** models, there was enhancement tendency of adjusted R^2 to slightly increase with illiquid porfolios from S.LIQ *

to S.LIQ ** model, but this tendency is reversed with liquid portfolios from S.LIQ * to S.LIQ ** model.

$$*R_{pt} = \alpha + b_i (R_{mt}) + s_i (SMB_t) + l_i (IML_t) + \varepsilon_{pt}$$

$$*SI = -0.002 + 0.489\ (R_{mt}) + 0.678\ (SMB_t) + 0.553\ (IML_t) + \varepsilon_{pt}$$

$$*BI = -0.007 + 0.429\ (R_{mt}) + -0.255\ (SMB_t) + 0.275\ (IML_t) + \varepsilon_{pt}$$

$$*SL = -0.007 + 0.429\ (R_{mt}) + 0.745\ (SMB_t) + -0.725\ (IML_t) + \varepsilon_{pt}$$

$$*BL = -0.002 + 0.489\ (R_{mt}) + -0.322\ (SMB_t) + -0.447\ (IML_t) + \varepsilon_{pt}$$

$$**R_{pt} = \alpha + b_i (R_{mt}) + s_i (SMB_t) + l_i (IML_t) + \varepsilon_{pt}$$

$$**(SI - r_{ft}) = -0.006 + 0.616\ (R_{mt} - r_{ft}) + 0.724\ (SMB_t) + 0.629\ (IML_t) + \varepsilon_{pt}$$

$$**(BI - r_{ft}) = -0.012 + 0.538\ (R_{mt} - r_{ft}) + -0.221\ (SMB_t) + 0.334\ (IML_t) + \varepsilon_{pt}$$

$$**(SL - r_{ft}) = -0.012 + 0.538\ (R_{mt} - r_{ft}) + 0.779\ (SMB_t) + -0.666\ (IML_t) + \varepsilon_{pt}$$

$$**(BL - r_{ft}) = -0.006 + 0.616\ (R_{mt} - r_{ft}) + -0.276\ (SMB_t) + -0.371\ (IML_t) + \varepsilon_{pt}$$

- **H_1:** The tested model jointly $\boldsymbol{\alpha_i \neq 0}$, *not all α_i coefficients obtained from multiple factor models are equivalent to zero ($\alpha_i \neq 0$).*

This hypothesis can be rejected for S.LIQ * model because the four portfolios are insignificantly different from 0, and accept the null hypothesis that imply $\boldsymbol{\alpha_i = 0}$, furthermore, the S.LIQ ** model, couldn't reject this hypothesis because the four portfolios are significantly different from 0.

- **H_2:** There is a significant effect of the market return factor **MKT** on each of the four tested portfolios, ***the Coefficient of the MKT, bi*** $\boldsymbol{\neq 0}$

This hypothesis was accepted for both S.LIQ ***,** S.LIQ ** models**,** because the Coefficients of the ***MKT*=** the market return factor (***Rmt*** or ***Rmt – rft***) in the four portfolios for both models were significantly different from 0, and positive as the sig-value was less than 1% (1-confidence level (99%).This imply that there is a significant positive effect for the market return factor on the portfolio return on each of the four tested portfolios, for both models.

- **H_3**: There is a significant effect of the size factor **SMB** on each of the four tested portfolios,***the Coefficient of the SMB, si ≠ 0***

The null hypothesis can be rejected for both S.LIQ *, S.LIQ ** models, because the Coefficients of the **SMB** = the size premium factor in the four portfolios for both models were significantly different from 0. Finally the coefficients were positive for all the portfolios except the (big size, illiquid) BI and (big size, liquid) BL portfolios for both models, their coefficient signs were negative. So the null hypothesis can be rejected which imply that there is no significant effect of the SMB size factor on the tested portfolio returns as the sig-value is less than 1% (1-confidence level (99%). This imply that the alternative hypothesis can be accepted which indicate that there is negative significant effect for the SMB size on the BI and BL portfolios return and positive significant effect for the SMB size factor on the SI and SL portfolios return.

- **H_4**: There is a significant effect of the value factor **IML** on each of the four tested portfolios, ***the Coefficient of the IML, li ≠ 0***

The null hypothesis can be rejected for both S.LIQ *, S.LIQ ** models, because the Coefficients of the IML = the illiquidity premium factor in the four portfolios for both models were significantly different from 0 at 1 percent significant level. Finally the coefficients were positive for all the portfolios except the (small size, liquid) SL and (big size, liquid) BL portfolio for both models, their coefficient sign were negative. So the null hypothesis can be rejected which imply that there is no significant effect of the IML illiquidity factor on the tested portfolio returns as the sig-value is less than 1% (1-confidence level (99%). This imply that the alternative hypothesis can be accepted which indicate that there is negative significant effect for the IML illiquidity factor on the SL and BL portfolios return and positive significant effect for the IML illiquidity factor on the SI and BI portfolios return.

Table (4.13): Factor Loadings and the Third Model V.LIQ Predictions, referring to risk free rate and without

Augmented FF3 Model V.LIQ										
Rpt= α + bi (Rmt) + hi (VMGt) + li (IMLt) + εpt						*Rpt-Rft = α + bi (Rmt – Rft) + hi (VMGt) + li (IMLt) + εpt*				
Rpt =VIt, VLt, GIt and GLt						*(Rpt-Rft)= (VIt- Rft), (VLt- Rft), (GIt- Rft) and (GLt- Rft)*				
(Liquidity)						*(Liquidity)*				
(Value)	*α* Intercept*		Sig.		VIF	*α* Intercept**		Sig.		VIF
	ILLIQ	LIQ	ILLIQ	LIQ		ILLIQ	LIQ	ILLIQ	LIQ	
Value	-0.005	-0.006	**0.106**	**0.045**	--	-0.011	-0.011	**0.003**	**0.001**	--
Growth	-0.006	-0.005	**0.045**	**0.106**		-0.011	-0.011	**0.0001**	**0.003**	
	Slope (*bi*) *Rmt**		Sig.		VIF	Slope (*bi*) (*Rmt – Rft*)**		Sig.		VIF
	ILLIQ	LIQ	ILLIQ	LIQ		ILLIQ	LIQ	ILLIQ	LIQ	
Value	0.412	0.461	0.000	0.000	1.34	0.521	0.575	0.000	0.000	1.35
Growth	0.461	0.412	0.000	0.000		0.575	0.521	0.000	0.000	
	Slope (*hi*) *VMGt**		Sig.		VIF	Slope (*hi*) *VMGt***		Sig.		VIF
	ILLIQ	LIQ	ILLIQ	LIQ		ILLIQ	LIQ	ILLIQ	LIQ	
Value	0.551	0.671	0.000	0.000	1.04	0.573	0.695	0.000	0.000	1.04
Growth	-0.329	-0.449	0.000	0.000		-0.305	-0.427	0.002	0.000	
	Slope (*li*) *IMLt**		Sig.		VIF	Slope (*li*) *IMLt***		Sig.		VIF
	ILLIQ	LIQ	ILLIQ	LIQ		ILLIQ	LIQ	ILLIQ	LIQ	
Value	0.523	-0.536	0.000	0.000	1.31	0.589	-0.463	0.000	0.000	1.33
Growth	0.464	-0.477	0.000	0.000		0.537	-0.411	0.000	0.002	
	R-Square*		Adj R-Square			R-Square**		Adj R-Square		
	ILLIQ	LIQ	ILLIQ	LIQ		ILLIQ	LIQ	ILLIQ	LIQ	
Value	**0.432**	**0.697**	**0.413**	**0.687**		**0.461**	**0.693**	**0.444**	**0.683**	
Growth	**0.500**	**0.619**	**0.483**	**0.607**		**0.535**	**0.627**	**0.520**	**0.615**	
	F-statistics		Sig.			F-statistics		Sig.		
Value	**23.32**	**70.66**	**0.000**	**0.000**		**26.25**	**69.16**	**0.000**	**0.000**	
Growth	**30.63**	**49.91**	**0.000**	**0.000**		**35.28**	**51.65**	**0.000**	**0.000**	

Source: Calculated by the researcher,* denotes the absence of risk free and **denotes the synthetic risk free consediration

4.8.2.3 Augmented FF3 Model V.LIQ Predictions & Factor Loadings

The results in Table (4.13), reported the estimation results of the augmented Fama & French Three-Factor model V.LIQ, referring to risk free rate (with two signs of asterisk) or without referring to risk free rate (with one sign of asterisk).

- The intercept coefficients for V.LIQ * model were ranged from **(-0.006 to -0.005)**, they were generally not statistically significant for all portfolios.The intercept coefficients for V.LIQ ** model were constant and equal to **-0.011**, they were generally statistically significant for all portfolios.
- The betas, on the other hand, are all statistically significant ranging in value for V.LIQ* and V.LIQ ** model from **(0.412 to 0.461)** and **(0.521 to 0.575)** respectively. The tendency of beta to increase with value (low M/B) observed for the **illiquid** portfolios but this tendency is reversed for the **liquid** portfolios.
- There is evidence that VMG possesses explanatory power with all four portfolios, the coefficients estimated were statistically significant for all portfolios. The study observe a monotonic increase in the risk factor loading on VMG from growth to value portfolios. The sign of the VMG coefficient that estimated for the growth portfolios were negative, all portfolios are statistically significant.
- There is also an evidence of IML having explanatory power, that all portfolios having a statistically significant estimate of the IML, coefficients. There is also evidence of an increase in the IML factor loading from liquid to illiquid portfolios. The study also find a negative IML coefficient for the liquid portfolios and the coefficient of all portfolio is statistically significant.
- By comparing between V.LIQ *and V.LIQ ** models, there was enhancement tendency of adjusted R^2 to slightly increase with liquid and illiquid porfolios from V.LIQ * to V.LIQ ** model.

$$*R_{pt} = \alpha + b_i (R_{mt}) + h_i (VMG_t) + l_i (IML_t) + \varepsilon_{pt}$$

$$*VI = -0.005 + 0.412\ (R_{mt}) + 0.551\ (VMG_t) + 0.523\ (IML_t) + \varepsilon_{pt}$$

$$*GI = -0.006 + 0.461\ (R_{mt}) + -0.329\ (VMG_t) + 0.464\ (IML_t) + \varepsilon_{pt}$$

$$*VL = -0.006 + 0.461\ (R_{mt}) + 0.671\ (VMG_t) + -0.536\ (IML_t) + \varepsilon_{pt}$$

$$*GL = -0.005 + 0.412\ (R_{mt}) + -0.449\ (VMG_t) + -0.477\ (IML_t) + \varepsilon_{pt}$$

$$**R_{pt} = \alpha + b_i (R_{mt}) + h_i (VMG_t) + l_i (IML_t) + \varepsilon_{pt}$$

$$**(VI - rf_t) = -0.011 + 0.521\ (R_{mt} - rf_t) + 0.573\ (VMG_t) + 0.589\ (IML_t) + \varepsilon_{pt}$$

$$**(GI - rf_t) = -0.011 + 0.575\ (R_{mt} - rf_t) + -0.305\ (VMG_t) + 0.537\ (IML_t) + \varepsilon_{pt}$$

$$**(VL - rf_t) = -0.011 + 0.575\ (R_{mt} - rf_t) + 0.695\ (VMG_t) + -0.463\ (IML_t) + \varepsilon_{pt}$$

$$**(GL - rf_t) = -0.011 + 0.521\ (R_{mt} - rf_t) + -0.427\ (VMG_t) + -0.411\ (IML_t) + \varepsilon_{pt}$$

- **H_1:** The tested model jointly $\boldsymbol{\alpha_i \neq 0}$, *not all α_i coefficients obtained from multiple factor models are equivalent to zero ($\alpha_i \neq 0$).*

This hypothesis can be rejected for V.LIQ * model because the four portfolios are insignificantly different from 0, and accept the null hypothesis that imply $\boldsymbol{\alpha_i = 0}$, furthermore, the V.LIQ ** model, couldn't reject this hypothesis because the four portfolios are significantly different from 0.

- **H_2:** There is a significant effect of the market return factor **MKT** on each of the four tested portfolios, ***the Coefficient of the MKT, bi*** $\boldsymbol{\neq 0}$

This hypothesis was accepted for both V.LIQ*, V.LIQ** models, because the Coefficients of the ***MKT*****=** the market return factor (***Rmt*** or ***Rmt – rft***) in the four portfolios for both models were significantly different from 0, and positive as the sig-value was less than 1% (1-confidence level (99%).This imply that there is a significant positive effect for the market return factor on the portfolio return on each of the four tested portfolios, for both models.

- **H3**: There is a significant effect of the value factor **VMG** on each of the four tested portfolios,***the Coefficient of the VMG, hi*** $\neq$ ***0***

The null hypothesis can be rejected for both V.LIQ*, V.LIQ** models, because the Coefficients of the **VMG** = the value premium factor in the four portfolios for both models were significantly different from 0. Finally the coefficients were positive for all the portfolios except the (growth= high M/B, illiquid) GI and (growth, liquid) GL portfolios for both models, their coefficient signs were negative. So the null hypothesis can be rejected which imply that there is no significant effect of the VMG value factor on the tested portfolio returns as the sig-value is less than 1% (1-confidence level (99%). This imply that the alternative hypothesis can be accepted which indicate that there is negative significant effect for the VMG value factor on the GI and GL portfolios return and positive significant effect for the VMG value factor on the VI and VL portfolios return.

- **H4**: There is a significant effect of the value factor **IML** on each of the four tested portfolios, ***the Coefficient of the IML, li*** $\neq$ ***0***

The null hypothesis can be rejected for both V.LIQ*, V.LIQ** models, because the Coefficients of the IML = the illiquidity premium factor in the four portfolios for both models were significantly different from 0 at 1 percent significant level. Finally the coefficients were positive for all the portfolios except the (value= low M/B, liquid) VL and (growth, liquid) GL portfolio for both models, their coefficient sign were negative. So the null hypothesis can be rejected which imply that there is no significant effect of the IML illiquidity factor on the tested portfolio returns as the sig-value is less than 1% (1-confidence level (99%). This imply that the alternative hypothesis can be accepted which indicate that there is negative significant effect for the IML illiquidity factor on the VL and GL portfolios return and positive significant effect for the IML illiquidity factor on the VI and GI portfolios return.

4.9 GRS Test

The Gibbons, Ross and Shanken (1989, GRS F-statistic) test is a multivariate, finite sample counterpart to this statistic, when the errors are also normally distributed, and offer one of the most famous tests for asset pricing models, and used to examine the empirical fit of models and to test the hypothesis that $\alpha_i = 0 \ \forall_i$ The GRS test statistic is;

$$\text{GRS} = \left(\frac{T}{N}\right)\left(\frac{T-N-L}{T-L-1}\right)\left[\frac{\hat{\alpha}\hat{\sum}^{-1}\hat{\alpha}}{1+\bar{\mu}\hat{\Omega}^{-1}\bar{\mu}}\right] \sim F(N, T-N-L) \qquad \textbf{(4.15)}$$

$\hat{\alpha}$ = N x 1 vector of estimated intercept.

$\hat{\sum}$ = an unbiased estimate of the residual covariance matrix.

$\bar{\mu}$ = L x 1 vector of the factor portfolios' sample means.

$\hat{\Omega}$ = an unbiased estimate of the factor portfolios' covariance matrix.

T = number of observations.

N = number of regressions.

L = number of explanatory factors in the regression.

- **H_0** = *All* $\boldsymbol{\alpha_i}$ *coefficients obtained from multiple factor models are equivalent to zero* *(*$\boldsymbol{\alpha_i}$ *= 0).*
- ***H_1*** = *Not all* $\boldsymbol{\alpha_i}$ *coefficients obtained from multiple factor models are equivalent to zero (*$\boldsymbol{\alpha_i} \neq 0$*).*

The acceptance of the **H_0** hypothesis will also show that the multi-factor asset pricing models, which constitute the basic purpose of the study, can be used for the PEX to explain the stock prices. Because of the significance of intercepts in multivariate regressions, it is required to use GRS test as a tool to test the precision of each model. Merton (1973), indicated that well-specified asset pricing models produce intercepts that are indistinguishable from zero. In essence, the intercept is a test of how well combinations of common factors capture the variation in average stock returns. Intercepts close to zero say that the regressions that use market return with (SMB and VMG), (SMB and IML) or (VMG and IML) separately to absorb common time series variation in returns, do a good job in explaining the cross section of average stock returns.

Table (4.14), reviews the performance of the three alternative models referring to risk free rate or without. The table exhibits the GRS test, which is F-statistic. It tests the hypothesis that all α_i equal 0. P-value is the probability values of all models.The GRS statistic, tests whether all intercepts in a set of **4** (**2x2**) regressions are zero.

Summary statistics and intercepts for C.FF3, S.LIQ, and V.LIQ regressions to explain variation in monthly excess returns portfolios for Palestine Exchange market, from April 2007 to March 2015; **R^2** is the average adjusted **R^2**; **SE (α) is** the average standard error of the intercepts; and **SR (α)** is the Sharpe ratio for the intercepts. With **4** portfolios and **96** monthly returns, critical values of the GRS statistic for all three models are: **90%: 1.97; 95%: 2.41; 97.5%: 2.84; and 99%: 3.40**

Cotrary to separated significancy of **α,** that reveal significant intercepts for those models referring to synthetic risk free rate as discussed inTable (4.11),Table (4.12) and Table (4.13). The results show that the three models are accepted referring to or without risk free, as the as p-value is more than 1% (1-confidence level (99%), furthermore, C.FF3 conventional Fama-French three factor model outperforms the other models and the GRS test for C.FF3 model is smallest figure with a value of **2.5139**, and have P-value = **(0.5306,0.0471)**, the highest **R^2 (0.6836,0.6826)**, Hence the three models referring to risk free as mentiomed in section 8, cannot be rejected as an asset pricing model due to their ability to describe the variation in cross-section of average returns as well as its P-value is bigger than 1%.

Table (4.14): GRS Test

GRS Test: Statistical significance at the 1% level							
Model	**Mean | α |**	**Mean α**	**GRS**	**P-value**	**R^2**	**SE (α)**	**SR (α)**
C.FF3*	0.0039	- 0.0039	0.7965	**0.5306**	0.6836	0.0025	0.1906
C.FF3**	0.0086	- 0.0086	2.5139	**0.0471**	0.6826	0.0029	0.3569
S.LIQ*	0.0042	- 0.0042	1.3707	**0.2505**	0.6053	0.0028	0.0042
S.LIQ**	0.0093	- 0.0093	3.2796	**0.0148**	0.6148	0.0033	0.4135
V.LIQ*	0.0053	- 0.0053	1.2544	**0.2939**	0.5478	0.0029	0.2383
V.LIQ**	0.0109	- 0.0109	3.3567	**0.0132**	0.5654	0.0034	0.4096

- ***Model 1.1 C.FF3*: Rpt= α + bi (Rmt) + si (SMBt) + hi (VMGt) + εpt***
- ***Model 1.2 C.FF3**: Rpt-Rft = α + bi (Rmt – Rft) + si (SMBt) + hi (VMGt) + εpt***
- ***Model 2.1 S.LIQ*: Rpt= α + bi (Rmt) + si (SMBt) + li (IMLt) + εpt***
- ***Model 2.2 S.LIQ**: Rpt-Rft = α + bi (Rmt – Rft) + si (SMBt) + li (IMLt) + εpt***
- ***Model 3.1 V.LIQ*: Rpt= α + bi (Rmt) + hi (VMGt) + li (IMLt) + εpt***
- ***Model 3.2 V.LIQ**: Rpt-Rft = α + bi (Rmt – Rft) + hi (VMGt) + li (IMLt) + εpt***

Table (4.14), also shows the average Sharpe ratio of the intercepts SR (α), the core of the GRS statistic:

$$SR(a) = (a'S^{-1}a)^{1/2} \qquad \textbf{(4.15)}$$

E. F. Fama and French (2012) indicated that **α** is the column vector of the 4 regression intercepts produced by a model when applied to 4 portfolios, and SE is the covariance matrix of regression residuals.Gibbons et al. (1989) show that **SR (α)** ^{2} is the difference between (1) the square of the maximum Sharpe ratio for the portfolios that can be constructed from the **LHS** (left hand side) and **RHS** (right hand side) assets in a set of time-series regression tests of an asset pricing model and (2) the square of the maximum Sharpe ratio for the portfolios that can be constructed from the **RHS** assets alone. More directly, SR (**α**) is the maximum Sharpe ratio for excess returns on portfolios of the **LHS** assets constructed to have zero slopes on the **RHS** returns. We often refer to SR (**α**), somewhat loosely, as the Sharpe ratio for the intercepts (unexplained average returns) of a model. The advantage of SR (**α**) as a summary statistic is that it combines the regression intercepts with the covariance matrix of the regression residuals, which is an important determinant of the precision of the alphas. This advantage, however, is also a disadvantage: because SR (**α**) combines information about both the magnitude of the intercepts and their precision, it is useful to have the information about the two pieces provided by the average absolute intercept, the average R^2, and the average standard error of the intercepts.

Chapter Five
Conclusions and Recommendations

Chapter 5

Conclusions and Recommendations

In this chapter the conclusions of the study are presented as well as suggestions of future research topics

5.1Conclusions

The study findings are similar to that of, E. F. Fama and French (1993), E. F. Fama and French (1996) ,Rahim and Nor (2006), Drew and Veeraraghavan (2002),Shaker and Elgiziry (2014) ,Chan and Faff (2005), in that the study find the overall market factor to be slightly close to one and highly significant at the 1 – percent level for all four portfolios. In addition, the study also find that the small size , low M/B (value) equity and illiquid firms load positively on SMB , VMG and IML respectively , and size , value, and illiquidity risk premiums are priced in PEX and there were anomalies in Palestine exchange in addition to market risk premium (MKT),and reflect the ability to benefit from the weak form inefficiency in Palestine exchange as mentioned by , درويش (2011), Alkhatib and Harasheh (2014),Abushammala (2014), in other context,contrary to Darwish et al. (2010), that show no significant positive relationship between risk and return which mean that there is no risk – premium in Palestine Exchange.

The main argument is that the incorporation of MKT, SMB and VMG factors in the Fama-French three factor model framework show the model superiority to capture the cross-section of average returns, clarifying the time-series variations in stock returns with adjusted $\mathbf{R^2}$ in average 68% over the two variants of the augmented Fama-French three-factor models.Furthermore, the two variants of the augmented Fama-French three-factor models obtains lower adjusted R^2 values, ranging from 54% to 60%.

In general, the findings confirm that the use of conventional Fama-French three factor model based on size and value factors, is the best to capture the cross-section of average returns than the other models do during the period April 2007-March 2015. The incorporation of SMB and VMG factors in the Fama-French three factor model show the model superiority over the two variants of the augmented Fama-French three-factor model, contrary to Rahim and Nor (2006) and Chan and Faff (2005), that find the liquidity-based three-factor asset pricing model show superiority over the conventional Fama-French three factor model based on size and value factors.

Once again, our findings are similar to that of who observe that small size, low market-to-book equity firms and illiquid firms tend to have positive loadings on SMB, VMG and IML respectively. Hence, the study answer the question of whether small , value and illiquid stocks outperform big , growth and liquid stocks in the affirmative, finding a size , value and illiquidity premiums in Palestine exchange.

5.2 Recommendations

This study recommend that the invetors of Palestine exchang, may consider the study results and use the conventional Fama and French asset pricing model when they asses the stocks that they invested in, or potential to invest in.In addition, the study recommend that they may consider the C.FF3 referring to the proposed synthetic risk free as a base in the essence of safe investment.

This study recommend that more models applicable in developed markets must be applied in Palestine exchange but by adding new variables at the micro and macro level. In addition the market efficiency of the Palestine exchange must be tested deeply by applying the Efficient Market Hypothesis tests at the three forms to improve the confidence of the risk adjusted return reward investing background in front of speculating methodology. Finally it is recommended to overcome the low number of the companies of the Palestine exchange by developing a new technique to construct the portfolios.

The Reference List

First: English Reference

Abbas, N., Khan, J., Aziz, R., & Sumrani, Z. (2014). A Study to Check the Applicability of Fama and French, Three-Factor Model on KSE 100-Index from 2004-2014. International Journal of Financial Research, 6(1), 90-100.

Abu-Libdeh, H., & Harasheh, M. (2011). Testing for correlation and causality relationships between stock prices and macroeconomic variables The case of Palestine Securities Exchange. International Review of Business Research Papers, 7(5), 141-154.

Abu-Rub, N., & Sharba, T. (2011). Calendar Effects in the Palestine Securities Exchange (PSE): Analysis & Investigation. World Review of Business Research, 1(5), 52-66.

Abushammala, S. N. (2014). Testing the Weak Form Efficiency of Palestine Exchange. International Journal of Economics and Finance, 3(6), 244-253.

Acharya, V. V., & Pedersen, L. H. (2005). Asset pricing with liquidity risk. Journal of financial economics, 77(2), 375-410.

Agarwalla, S. K., Jacob, J., & Varma, J. R. (2014). Four factor model in Indian equities market. Indian Institute of Management, Ahmedabad Working Paper(9), 5, 1-21.

Akhter, A., Sandhu, A., & Butt, S. (2015). Islamic Calendar Effect on Market Risk and Return Evidence from Islamic Countries. Journal of Business & Financial Affairs, 1-5.

Al-Mwalla, M. (2012). Can book-to-market, size and momentum be extra risk factors that explain the stocks rate of return?: Evidence from emerging market. Journal of Finance, Accounting and Management, 3(2), 42-57.

Al-Mwalla, M., Al-Qudah, K. A., & Karasneh, M. (2012). Additional Risk Factors that can be used to Explain more Anomalies: Evidence from Emerging Market. International Research Journal of Finance and Economics(99), 64-75.

Al-Mwalla, M., & Karasneh, M. (2011). Fama & French Three Factor Model: Evidence from Emerging Market. European Journal of Economics, Finance and Administrative Sciences, 41, 132-140.

Al-Saad, K. (2004). Seasonality in the Kuwait stock exchange. Savings and Development, 359-374.

Aldaarmi, A., Abbodb, M., & Salameh, H. (2015). Implement Fama and French and capital asset pricing models in Saudi Arabia stock market. Journal of Applied Business Research, 31(3), 953-968.

Aldaya, W. H. (2013). Index revisions, market quality and the cost of equity capital. University of Bradford.

Alkhatib, A., & Harasheh, M. (2014). Market Efficiency: The Case of Palestine Exchange (PEX). World Journal of Social Sciences, 4(1), 196-206.

Alnaif, K. L. (2014). Stock Liquidity Determination Evidence from Amman Stock Exchange. Asian Economic and Financial Review, 4(12), 1894-1905.

Alrgaibat, G. A. M. (2015). Test of capital asset pricing model in Amman Stock Exchange. Journal of Emerging Trends in Economics and Management Sciences (JETEMS), 6(2), 137-143.

Amihud, Y. (2002). Illiquidity and stock returns: cross-section and time-series effects. Journal of Financial Markets, 5(1), 31-56.

Amihud, Y., & Mendelson, H. (1986). Asset pricing and the bid-ask spread. Journal of financial economics, 17(2), 223-249.

Amihud, Y., Mendelson, H., & Lauterbach, B. (1997). Market microstructure and securities values: Evidence from the Tel Aviv Stock Exchange. Journal of financial economics, 45(3), 365-390.

Amihud, Y., Mendelson, H., & Pedersen, L. H. (2005). Liquidity and Asset Prices. Foundations and Trends in Finance, 1(4), 269-364.

Amihud, Y., Mendelson, H., & Pedersen, L. H. (2006). Liquidity and asset prices: Now Publishers Inc.

Ang, A. (2014). Asset Management: A Systematic Approach to Factor Investing: Oxford University Press (UK).

Arabi, K. (2014). Portfolio formation: Empirical evidence from Khartoum Stock Exchange'. International Journal of Current Business and Social Sciences, 1(2), 38-57.

Awad, I. M., Murrar, A., & Ayyad, H. (2012). The Intrinsic & Market Value of the Common Stocks: Evidence from Palestine Exchange. Interdisciplinary Journal of Research in Business 2(6), 1-9.

Baek, S., & Bilson, J. F. (2014). Size and value risk in financial firms. Journal of Banking & Finance, 55, 295-326.

Bailey, R. E. (2005). The economics of financial markets: Cambridge University Press.

Baker, H. K., & Nofsinger, J. R. (2010). Behavioral finance: investors, corporations, and markets , John Wiley & Sons.

Banz, R. W. (1981). The relationship between return and market value of common stocks. Journal of financial economics, 9(1), 3-18.

Baradarannia, M. R., & Peat, M. (2012). Characteristic liquidity, systematic liquidity and expected returns, Journal of International Financial Markets, Institutions and Money, 33, 78-98..

Barber, B. M., & Lyon, J. D. (1997). Firm Size, Book ‐ to ‐ Market Ratio, and Security Returns: A Holdout Sample of Financial Firms. The Journal of Finance, 52(2), 875-883.

Basu, S. (1977). Investment performance of common stocks in relation to their price ‐ earnings ratios: A test of the efficient market hypothesis. The Journal of Finance, 32(3), 663-682.

Berk, J. B., & DeMarzo, P. M. (2014). Corporate finance.

Black, F. (1971). Toward a fully automated stock exchange, part I. Financial Analysts Journal, 27(4), 28-35.

Black, F. (1972). Capital market equilibrium with restricted borrowing. Journal of business, 45(3), 444-455.

Bodie, Z. (2013). Investments: McGraw-Hill.

Bradrania, M. R., & Peat, M. (2014). Characteristic liquidity, systematic liquidity and expected returns. Journal of International Financial Markets, Institutions and Money, 33, 78-98.

Brennan, M. J., Chordia, T., & Subrahmanyam, A. (1998). Alternative factor specifications, security characteristics, and the cross-section of expected stock returns. Journal of financial economics, 49(3), 345-373.

Brennan, M. J., & Subrahmanyam, A. (1996). Market microstructure and asset pricing: On the compensation for illiquidity in stock returns. Journal of financial economics, 41(3), 441-464.

Brigham, E., & Ehrhardt, M. (2011). Financial management : theory and practice. Mason: South-Western Cengage Learning.

Brigham, E., & Ehrhardt, M. (2013). Financial management: Theory & practice: Cengage Learning.

Brooks, R., & Yan, D. Y. (1999). London inter-bank offer rate (LIBOR) versus treasury rate: Evidence from the parsimonious term structure model. The Journal of Fixed Income, 9(1), 71-83.

Bundoo, S. K. (2008). An augmented Fama and French three-factor model: new evidence from an emerging stock market. Applied Economics Letters, 15(15), 1213-1218.

Cakici, N., & Topyan, K. (2014). Risk and Return in Asian Emerging Markets: A Practitioner's Guide: Palgrave Macmillan.

Campbell, J. Y., Lo, A. W.-C., & MacKinlay, A. C. (1997). The econometrics of financial markets , princeton University press Princeton, NJ.

Cartea, Á., Saúl, J., & Toro, J. (2012). Optimal portfolio choice in real terms: Measuring the benefits of TIPS. Journal of Empirical Finance, 19(5), 721-740.

Chan, H. W., & Faff, R. W. (2003). An investigation into the role of liquidity in asset pricing: Australian evidence. Pacific-Basin Finance Journal, 11(5), 555-572.

Chan, H. W., & Faff, R. W. (2005). Asset pricing and the illiquidity premium. Financial Review, 40(4), 429-458.

Chandra, T. (2015). Testing Fama and French Three Factor Models in Indonesia Stock Exchange. International Business Management, 9(6), 1025-1034.

Chang, Y. Y., Faff, R., & Hwang, C.-Y. (2010). Liquidity and stock returns in Japan: New evidence. Pacific-Basin Finance Journal, 18(1), 90-115.

Chincarini, L. B. (2006). Quantitative equity portfolio management: an active approach to portfolio construction and management: McGraw-Hill.

Choi, F. D. (2003). International finance and accounting handbook: John Wiley & Sons.

Chordia, T., Huh, S.-W., & Subrahmanyam, A. (2009). Theory-based illiquidity and asset pricing. Review of Financial Studies, 22(9), 3629-3668.

Chordia, T., Subrahmanyam, A., & Anshuman, V. R. (2001). Trading activity and expected stock returns. Journal of financial economics, 59(1), 3629-3668.

Cochrane, J. H. (2000). Asset Pricing.

Connor, G., & Korajczyk, R. A. (1988). Risk and return in an equilibrium APT: Application of a new test methodology. Journal of financial economics, 21(2), 255-289.

Damodaran, A. (1999). Estimating risk free rates. WP, Stern School of Business, New York.

Damodaran, A. (2002). Equity Risk Premiums Ratings, Rating Agencies and the Global Financial System: Springer.

Damodaran, A. (2008). What is the riskfree rate? A Search for the Basic Building Block. A Search for the Basic Building Block.

Dana, B. (2008). Determining the factors that effect on stock return in Amman stock market,(master thesis).

Danthine, J.-P., & Donaldson, J. B. (2014). Intermediate financial theory: academic press.

Darwish, M. J., Al-Doori, M. A., & Ala'a, M. (2010). Testing the relationship between risk and return in the Palestine securities Exchange. Interdisciplinary Journal of Contemporary Research in Business, 2(4), 265-281.

Dash, S. R., & Mahakud, J. (2013). Conditional multifactor asset pricing model and market anomalies. Journal of Indian Business Research, 5(4), 271-294.

Datar, V. T., Y Naik, N., & Radcliffe, R. (1998). Liquidity and stock returns: An alternative test. Journal of Financial Markets, 1(2), 203-219.

Djajadikerta, H., & Nartea, G. (2005). The Size and Book-to-Market Effects and the Fama-French Three-Factor Model in Small Markets: Preliminary Findings from New Zealand, (10),1-17.

Drew, M. E., & Veeraraghavan, M. (2002). A test of the Fama-French three factor model in the Australian equity market. Accounting, Accountability & Performance, 8(1), 77-92.

Duffie, D., & Stein, J. C. (2015). Reforming LIBOR and other financial market benchmarks. The Journal of Economic Perspectives, 29(2), 191-212.

Easley, D., & O'hara, M. (2004). Information and the cost of capital. The Journal of Finance, 59(4), 1553-1583.

Eid, M. Y. (2015). The Impact of Information Asymmetry on The Cost of Equity Capital in The Palestine Exchange. Retrieved from http://www.iugaza.edu.ps/

Eraslan, V. (2013). Fama and French Three-Factor Model: Evidence from Istanbul Stock Exchange. Business and Economics Research Journal, 4(2), 11-22.

Fama, E. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. Journal of Finance, 25(2), 383-417.

Fama, E. F., & French, K. R. (1992). The cross‐section of expected stock returns. The Journal of Finance, 47(2), 427-465.

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. Journal of financial economics, 33(1), 3-56.

Fama, E. F., & French, K. R. (1996). Multifactor explanations of asset pricing anomalies. The Journal of Finance, 51(1), 55-84.

Fama, E. F., & French, K. R. (2004). The capital asset pricing model: theory and evidence. Journal of Economic Perspectives, 18, 25-46.

Fama, E. F., & French, K. R. (2012). Size, value, and momentum in international stock returns. Journal of financial economics, 105(3), 457-472.

Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model. Journal of financial economics, 116(1), 1-22.

Fama, E. F., & MacBeth, J. D. (1973). Risk, return, and equilibrium: Empirical tests. The Journal of Political Economy, 607-636.

FRED. (2015). Economic Research,Federal Reserve Bank of St. Louis, Website [Online]. from https://research.stlouisfed.org/fred2/series/T10YIE#

Gibbons, M. R., Ross, S. A., & Shanken, J. (1989). A test of the efficiency of a given portfolio. Econometrica: Journal of the Econometric Society, 1121-1152.

Gray, V. T. V. S. J. (2003). Beyond the Random Walk: A Guide to Stock Market Anomalies and Low-Risk Investing: A Guide to Stock Market Anomalies and Low-Risk Investing: Oxford University Press, USA.

Gregory, A., Tharyan, R., & Christidis, A. (2013). Constructing and testing alternative versions of the Fama–French and Carhart models in the UK. Journal of Business Finance & Accounting, 40(1-2), 172-214.

Gujarati, D. N. (2004). Economics Basic Econometrics: Mcgraw Hill.

Harris, L. (2002). Trading and exchanges: Market microstructure for practitioners: Oxford University Press.

Hasnaoui, H., & Ibrahim, F. (2013). Constructing and testing alternative versions of the Fama-French and carhart models in Tunisia, 20-34.

Hawawini, G., Michel, P., & Corhay, A. (1989). A look at the validity of the CAPM in light of equity market anomalies: the case of Belgian common stocks: Springer, 143-164.

Hearn, B., Piesse, J., & Strange, R. (2010). Market liquidity and stock size premia in emerging financial markets: The implications for foreign investment. International Business Review, 19(5), 489-501.

Ho, R. Y.-w., Strange, R., & Piesse, J. (2006). On the conditional pricing effects of beta, size, and book-to-market equity in the Hong Kong market. Journal of International Financial Markets, Institutions and Money, 16(3), 199-214.

Jegadeesh, N., & Titman, S. (1993). Returns to buying winners and selling losers: Implications for stock market efficiency. The Journal of Finance, 48(1), 65-91.

Jun, S.-G., Marathe, A., & Shawky, H. A. (2003). Liquidity and stock returns in emerging equity markets. Emerging Markets Review, 4(1), 1-24.

Kilsgård, D., & Wittorf, F. (2011). Estimation of Expected Return: The Fama and French Three-Factor Model Vs. The Chen, Novy-Marx and Zhang Three-Factor Model.

Kim, S.-H., & Lee, K.-H. (2014). Pricing of liquidity risks: Evidence from multiple liquidity measures. Journal of Empirical Finance, 25, 112-133.

L'Her, J.-F., Masmoudi, T., & Suret, J.-M. (2004). Evidence to support the four-factor pricing model from the Canadian stock market. Journal of International Financial Markets, Institutions and Money, 14(4), 313-328.

Lam, K. S., & Tam, L. H. (2011). Liquidity and asset pricing: Evidence from the Hong Kong stock market. Journal of Banking & Finance, 35(9), 2217-2230.

LIBOR. (2015). USD LIBOR interest rate ,global-rates .com Website [Online]. from http://www.global-rates.com/interest-rates/libor/american-dollar/american-dollar.aspx

Liew, J., & Vassalou, M. (2000). Can book-to-market, size and momentum be risk factors that predict economic growth? Journal of financial economics, 57(2), 221-245.

Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. The review of economics and statistics, 13-37.

Lischewski, J., & Voronkova, S. (2012). Size, value and liquidity. Do they really matter on an emerging stock market? Emerging Markets Review, 13(1), 8-25.

Liu, W. (2006). A liquidity-augmented capital asset pricing model. Journal of financial economics, 82(3), 631-671.

Lucas Jr, R. E. (1978). Asset prices in an exchange economy. Econometrica: Journal of the Econometric Society, 1429-1445.

Lybek, M. T., & Sarr, M. A. (2002). Measuring liquidity in financial markets: International Monetary Fund, 2-232.

Marcelo, J. L. M., & Quirós, M. d. M. M. (2006). The role of an illiquidity risk factor in asset pricing: Empirical evidence from the spanish stock market. The Quarterly Review of Economics and Finance, 46(2), 254-267.

Markowitz, H. (1952). Portfolio selection. The Journal of Finance, 7(1), 77-91.

Markowitz, H. (1959). Portfolio selection: efficient diversification of investments. Cowies Foundation Monograph, (16).

Marshall, B. R. (2006). Liquidity and stock returns: Evidence from a pure order-driven market using a new liquidity proxy. International Review of Financial Analysis, 15(1), 21-38.

Masoud, N., & Suleiman AbuSabha, D. (2014). The CAPM, Determinants of Portfolio Flows to Emerging Markets Economics: The Case of Jordanian Financial Crisis. Global Journal of Management And Business Research, 14(3), 12-22.

Mayo, H. (2013). Investments: an introduction: Cengage Learning.

McGuckian, F. (2013). Behavioural finance and financial markets: micro, macro and corporate.

Merdad, H. J., Hassan, M. K., & Hippler, W. J. (2015). The Islamic risk factor in expected stock returns: an empirical study in Saudi Arabia. Pacific-Basin Finance Journal, 34, 293-314.

Merton, R. C. (1973). An intertemporal capital asset pricing model. Econometrica: Journal of the Econometric Society, 867-887.

Meyers, R. A. (2010). Complex systems in finance and econometrics: Springer Science & Business Media.

Miralles Marcelo, J. L., Miralles Quirós, M. d. M., & Oliveira, C. (2011). The role of an illiquidity factor in the Portuguese stock market, 1-26.

Moh'd M, A., Alrabadi, D. W., & Alnader, T. K. (2013). Forecasting the Ability of Dynamic versus static CAPM: Evidence from Amman Stock Exchange. Jordan Journal of Business Administration, 9(2), 431-443.

Mossin, J. (1966). Equilibrium in a capital asset market. Econometrica: Journal of the Econometric Society, 768-783.

Moy, R. (Producer). (2013). Security Market Line. [educational vedio screenshot] Retrieved from https://www.youtube.com/watch?v=R3oAOCR2S5I

Muscarella, C. J., & Piwowar, M. S. (2001). Market microstructure and securities values:: Evidence from the Paris Bourse. Journal of Financial Markets, 4(3), 209-229.

Muthama, N., & Mutothya, N. (2013). AN EMPIRICAL INVESTIGATION OF THE RANDOM WALK HYPOTHESIS OF STOCK PRICES ON THE NAIROBI STOCK EXCHANGE. European Journal of Accounting Auditing and Finance Research, 1(4), 33-59.

Narayan, P. K., & Zheng, X. (2011). The relationship between liquidity and returns on the Chinese stock market. Journal of Asian Economics, 22(3), 259-266.

Nguyen, N. H., & Lo, K. H. (2013). Asset returns and liquidity effects: Evidence from a developed but small market. Pacific-Basin Finance Journal, 21(1), 1175-1190.

Pastor, L., & Stambaugh, R. R. (2003). Liquidity Risk and Expected Stock Returns, Journal of Political Economy, 111(3).

PCBS. (2015). Palestinian Central Bureau of Statistics Website [On Line]. from http://www.pcbs.gov.ps/DesktopDefault.aspx?lang=en

Pettengill, G., Chang, G., & Hueng, J. (2012). Risk-return Predictions with the Fama-french Three-factor Model Betas. International Journal of Economics and Finance, 5(1).

Pettengill, G. N., Sundaram, S., & Mathur, I. (1995). The conditional relation between beta and returns. Journal of Financial and Quantitative Analysis, 30(01), 34-47.
PEX. (2015). Palestine Exchange Market Website [Online]. from http://www.pex.ps/PSEWEBSITE/English/default.aspx
Phong, N. A., & Hoang, T. V. (2012). Applying Fama and French Three Factors Model and Capital Asset Pricing Model in the Stock Exchange of Vietnam. International Research Journal of Finance and Economics(95), 115-120.
PMA. (2015). The Palestine Monetary Authority Website [Online]. from http://www.pma.ps/en-us/home.aspx
Pratt, S. P., & Grabowski, R. J. (2008). Cost of capital: John Wiley & Sons.
Rahim, R. A., & Nor, A. H. S. M. (2006). A Comparison Between Fama and French Model and Liquidity-Based Three Factor Models in Predicting Portfolio Returns. Asian Academy of Management Journal of Accounting and Finance, 2(2), 43-60.
Reilly, F. K., & Brown, K. C. (2012). Investment Analysis and Portfolio Management, 10e.
Reinhart, C. M., & Rogoff, K. S. (2008). This time is different: A panoramic view of eight centuries of financial crises: National Bureau of Economic Research.
Remmits, D., & Knittel, V. (2015). Firm-Specific Variables and Expected Stock Returns-A study on the German Market.
Ross, S. A. (1976). The arbitrage theory of capital asset pricing. Journal of economic theory, 13(3), 341-360.
Scheurle, P. (2010). Predictability of the Swiss Stock Market with Respect to Style. University of St. Gallen.
Schulmerich, M., Leporcher, Y.-M., & Eu, C.-H. (2014). Applied Asset and Risk Management: A Guide to Modern Portfolio Management and Behavior-Driven Markets: Springer.
Sehgal, S., Subramaniam, S., & Deisting, F. (2014). Tests of equity market anomalies for select emerging markets. The International Journal of Business and Finance Research, 8(3), 27-46.
Shaker, M. A., & Elgiziry, K. (2014). Comparisons of Asset Pricing Models in the Egyptian Stock Market. Accounting and Finance Research, 3(4), 24-30.
Shams, M. F., Abshari, L., Kordlouie, H., Naghshineh, N., & Gholipour, M. (2014). Studying the Relationship between Liquidity Risk and Market Risk with Non-Ordinary Return at Fama-French Three Factor Model at Tehran Stock Exchange. International Business Research, 7(2), 53-63.
Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk*. The Journal of Finance, 19(3), 425-442.
Silvestri, A., & Veltri, S. (2011). On the robustness of Fama and French Model: evidence from Italy. Journal of Applied Finance & Banking, 1(4), 201-221.
Simlai, P. (2009). Stock returns, size, and book‐to‐market equity. Studies in Economics and Finance, 26(3), 198-212.
Srimarksuk, M. M. (2007). TEST OF THE FAMA FRENCH THREE FACTOR MODEL IN STOCK EXCHANGE OF THAILAND IN ENERGY SECTOR. (Doctoral dissertation, University of the Thai Chamber of Commerce).
Stattman, D. (1980). Book values and stock returns. The Chicago MBA: A journal of selected papers, 4(1), 25-45.

Suh, D. (2009). Stock returns, risk factor loadings, and model predictions: A test of the CAPM and the Fama-French 3-factor model: WEST VIRGINIA UNIVERSITY.
Taneja, Y. P. (2010). Revisiting Fama French Three-Factor Model in Indian Stock Market. Vision: The Journal of Business Perspective, 14(4), 267-274.
U.S.DOT. (2015). United States Department of the Treasury Website [Online]. from https://www.treasury.gov/Pages/default.aspx
Uddin, M. H. (2009). Reexamination of stock liquidity risk with a relative measure. Studies in Economics and Finance, 26(1), 24-35.
Unlu, U. (2013). Evidence to Support Multifactor Asset Pricing Models: The Case of The Istanbul Stock Exchange. Asian Journal of Finance & Accounting, 5(1), 197-208.
Victor, S. (2006). Stock Market Anomalies: The Latin American Evidence. Deutscher Universities-Verlag, Germany.
Vu, V. H., Chai, D., & Do, V. M. (2014). Empirical Test on the Liquidity-Adjusted Capital Asset Pricing Model. Pacific-Basin Finance Journal, 35, 73-89.
W.B. (2015). The World Bank. from http://data.worldbank.org/country/west-bank-gaza
W.B.D.B. (2016). World Bank Doing Business. from http://www.doingbusiness.org/data/exploreeconomies/west-bank-and-gaza#protecting-minority-investors
Wang, M., & Kong, D. (2010). Illiquidity and asset pricing in the Chinese stock market. China Finance Review International, 1(1), 57-77.
Womack, K. L., & Zhang, Y. (2003). Understanding risk and return, the CAPM, and the Fama-French three-factor model. Tuck Case (3), 1-14.
Ye, Q., & Turner, J. D. (2014). The cross-section of stock returns in an early stock market. International Review of Financial Analysis, 34, 114-123.
Zacks, L. (2011). The handbook of equity market anomalies: translating market inefficiencies into effective investment strategies , John Wiley & Sons.
Zhong, A., Limkriangkrai, M., & Gray, P. (2014). Anomalies, risk adjustment and seasonality: Australian evidence. International Review of Financial Analysis, 35, 207-218.

Second: Arabic Reference

1. الصعيدي ، إسماعيل ، بعنوان العوامل المؤثرة على معدل عائد السهم السوقي -دراسة تطبيقية على الشركات المدرجة في سوق فلسطين للأوراق المالية ، رسالة ماجستير غير منشورة، جامعة الأزهر بغزة، 2011.
2. الظاهر، مفيد و العطعوط ، سامح ، بعنوان أثر مقاييس التدفقات النقدية في تفسير العوائد السوقية العادية للأسهم دراسة ميدانية على الشركات المساهمة العامة الفلسطينية .مجلة القدس المفتوحة للابحاث والدراسات، العدد الحادي والعشرين، 2010.
3. اللطيف ، أنس ، بعنوان العوامل المفسرة لعوائد الأسهم المدرجة في سوق فلسطين للأوراق المالية:(دراسة قياسية)، رسالة ماجستير غير منشورة، جامعة ال البيت بالاردن،2006.
4. المهتدي ، غدير، بعنوان استخدام مؤشرات تقييم الأداء المالية التقليدية والقيمة الاقتصادية لقياس التغير في القيمة السوقية للأسهم -دراسة حالة بنك فلسطين، رسالة ماجستير غير منشورة، الجامعة الإسلامية بغزة ،2014.
5. النواجحة ، فؤاد ، بعنوان قدرة نماذج تسعير الأصول الرأسمالية في تحديد أسعار أسهم الشركات المدرجة في بورصة فلسطين -دراسة تحليلية مقارنة، رسالة ماجستير غير منشورة، الجامعة الإسلامية بغزة ، 2014.
6. درويش، جمعة ، بعنوان إختبار نموذج فاما وفرنش ثلاثي العوامل في بورصة عمان، مجلة إربد للبحوث والدراسات -الأردن، المجلد الثاني عشر، العدد الأول، 2008.
7. درويش، جمعة، بعنوان اختبار كفاءة سوق فلسطين للأوراق المالية على المستوى الضعيف ، مجلة جامعة القدس المفتوحة للأبحاث والدراسات، المجلد الثالث والعشرين ، العدد الثاني، 2011.
8. لولو، شعبان، بعنوان قدرة مؤشر القيمة الاقتصادية المضافة مقابل مؤشرات الأداء التقليدية على تفسير التغير في القيمة السوقية للأسهم "دراسة تطبيقية على الشركات المدرجة في بورصة فلسطين"، رسالة ماجستير غير منشورة، الجامعة الإسلامية بغزة ،2015 .

Appendices

Appendix (1.1): Listed Companies in 31/12/2015

#	company	symbol	Sector
1	Al Quds Bank	QUDS	Banking &Financial Services Sector
2	Arab Islamic Bank	AIB	
3	Bank Of Palestine	BOP	
4	Palestine Commercial Bank	PCB**	
5	Palestine Investment Bank	PIBC	
6	Palestine Islamic Bank	ISBK	
7	Palestine Securities Exchange	PSE	
8	The National Bank	TNB**	
9	Al-Aqariya Trading Investment	AQARIYA	Investment Sector
10	Arab Investors	ARAB	
11	Arab Palestinian Investment	APIC	
12	Jerusalem Real Estate Investment	JREI	
13	Palestine Development & Investment	PID	
14	Palestine Industrial Investment	PIIC	
15	Palestine Investment & Development	PADICO	
16	palestine Real Estate Investment	PRICO	
17	Union Construction And Investment	UCI	
18	Al-Wataniah Towers	ABRAJ	Service Sector
19	Arab Palestinian Shopping Centers	PLAZA**	
20	Arab Real Estate Establishment	ARE	
21	Globalcom Telecommunications	GCOM	
22	Nablus Surgical Center	NSC	
23	Palaqar For Real Estate Dev.& Management	PALAQAR	
24	Palestine Electric	PEC	
25	Palestine Telecommunications	PALTEL	
26	Palestinian Dist. & Logistics Services	WASSEL**	
27	The Arab Hotels	AHC	
28	The Ramallah Summer Resorts	RSR	
29	Wataniya Palestine Mobile Telecomm.	WATANIYA	
30	Grand Park Hotel and Resorts	HOTEL	
31	Al Shark Electrode	ELECTRODE	Industry Sector
32	Arab Company For Paints Products	APC	
33	Birzeit Pharmaceuticals	BPC**	
34	Dar Al-Shifa Pharmaceuticals	PHARMACARE**	
35	Golden Wheat Mills	GMC	
36	Jerusalem Cigarette	JCC	
37	Jerusalem Pharmaceuticals	JPH**	
38	National Aluminium And Profile	NAPCO	
39	Palestine Plastic Industries	LADAEN	
40	Palestine Poultry	AZIZA	
41	The National Carton Industry	NCI**	
42	The Vegetable Oil Industries	VOIC	
43	Beit Jala Pharmaceutical	BJP	
44	Ahliea Insurance Group	AIG	Insurance Sector
45	Al-Takaful Palestinian Insurance	TIC	
46	Global United Insurance	GUI	
47	National Insurance	NIC**	
48	Palestine Insurance	PICO	
49	Trust International Insurance	TRUST	
50	Al Mashriq Insurance	MIC	

- BJP, was listed in PEX in 03/05/2015
- MIC, HOTEL, trading was suspended 2011 and 2003 respectively
- PCB, change the trading symbol from CBP to PCB, 2/1/2009
- TNB, change the trading symbol from AMB to TNB, due to mergers, 13/5/2012
- PLAZA, change the trading symbol from PLAZA to BRAVO 31/8/2015
- WASSEL, change trading currency from JD to US$, 27/10/2014
- BPC, change trading currency from JD to US$, 8/1/2013
- PHARMACARE, change trading currency from JD to US$, 6/12/2013
- JPH, change trading currency from JD to US$, 8/1/2013
- NCI, change trading currency from JD to US$, 31/3/2011
- NIC, change trading currency from JD to US$, 27/3/2008

Appendix (1.2): Samples' firms and their complete closing prices from April 2007 to March 2015

#	**Company**	7/8	8/9	9/10	10/11	11/12	12/13	13/14	14/15
1	ABRAJ							✓	✓
2	AHC	✓	✓	✓	✓			✓	
3	AIB	✓	✓	✓	✓	✓	✓	✓	✓
4	AIG	✓	✓	✓	✓	✓	✓	✓	✓
5	APIC								✓
6	ARAB			✓					
7	ARE	✓	✓	✓	✓	✓			
8	AZIZA			✓	✓	✓			
9	BOP	✓	✓	✓	✓	✓	✓	✓	✓
10	BPC	✓	✓	✓	✓	✓	✓	✓	✓
11	GCOM				✓	✓		✓	✓
12	GMC	✓	✓	✓	✓	✓	✓		✓
13	GUI						✓	✓	✓
14	ISBK				✓	✓	✓	✓	✓
15	JCC	✓	✓	✓	✓	✓	✓	✓	✓
16	JPH	✓	✓	✓	✓	✓	✓	✓	✓
17	LADAEN	✓		✓		✓			
18	NAPCO								✓
19	NCI	✓	✓	✓	✓		✓	✓	
20	NIC		✓	✓	✓	✓	✓	✓	
21	NSC			✓	✓				
22	PADICO	✓	✓	✓	✓	✓	✓	✓	✓
23	PALTEL	✓		✓	✓	✓	✓	✓	✓
24	PCB	✓	✓	✓	✓				
25	PEC	✓	✓	✓	✓	✓	✓	✓	
26	PHARMACARE								✓
27	PIBC	✓	✓	✓	✓		✓	✓	
28	PID	✓	✓		✓		✓	✓	
29	PIIC	✓	✓	✓	✓	✓	✓	✓	✓
30	PLAZA		✓						
31	PRICO	✓	✓	✓	✓	✓	✓	✓	✓
32	QUDS	✓	✓	✓	✓	✓	✓	✓	✓
33	RSR					✓	✓	✓	
34	TIC						✓		
35	TNB		✓	✓	✓	✓	✓	✓	✓
36	UCI	✓	✓	✓	✓	✓		✓	✓
37	VOIC		✓	✓	✓			✓	
38	WASSEL		✓	✓	✓	✓	✓	✓	
39	WATANIYA					✓	✓	✓	✓
	#. firms	**21**	**24**	**27**	**28**	**24**	**24**	**27**	**22**

Appendix (1.3): Monthly Stocks Turnover Ratio & Yearly Average, for the firms' sample, from April 2007 to March 2008

Company	7.Apr	7.May	7.Jun	7.Jul	7.Aug	7.Sep	7.Oct	7.Nov	7.Dec	8.Jan	8.Feb	8.Mar	LIQ AVRG
AHC	0.32%	0.73%	0.46%	0.86%	4.50%	0.15%	0.17%	0.06%	8.05%	0.19%	2.38%	0.02%	**1.49%**
AIB	16.83%	9.54%	16.32%	2.42%	112.30	11.53%	4.50%	0.99%	136.30%	3.08%	2.00%	0.58%	**26.37%**
AIG	0.47%	1.22%	8.91%	1.20%	21.80%	0.31%	0.22%	0.13%	26.53%	0.21%	0.09%	0.20%	**5.11%**
ARE	1.35%	1.65%	0.72%	1.26%	14.86%	1.86%	0.91%	0.83%	20.59%	0.54%	0.09%	0.39%	**3.75%**
BOP	4.63%	13.83%	10.44%	10.53%	50.49%	4.54%	13.87%	6.12%	83.97%	8.43%	12.91%	16.28%	**19.67%**
BPC	0.52%	0.36%	0.39%	0.17%	4.97%	0.23%	0.63%	1.27%	8.30%	0.61%	0.31%	0.56%	**1.53%**
GMC	1.83%	1.30%	1.81%	0.57%	13.16%	1.12%	2.39%	0.85%	19.56%	0.91%	0.81%	1.46%	**3.81%**
JCC	1.08%	0.52%	1.36%	0.82%	4.91%	1.32%	0.45%	0.25%	11.32%	1.58%	0.24%	1.08%	**2.08%**
JPH	0.56%	0.31%	0.58%	0.16%	2.49%	2.65%	0.20%	0.24%	6.23%	4.71%	2.72%	2.97%	**1.99%**
LADAEN	0.86%	0.19%	0.25%	0.07%	2.37%	0.14%	0.21%	0.85%	3.88%	0.22%	0.38%	0.04%	**0.79%**
NCI	1.50%	1.03%	0.72%	0.35%	11.47%	1.25%	1.89%	1.01%	19.88%	4.75%	1.52%	1.49%	**3.91%**
PADICO	2.29%	2.03%	2.45%	0.97%	13.65%	3.56%	4.29%	3.12%	29.63%	7.72%	3.48%	3.50%	**6.39%**
PALTEL	0.56%	0.67%	1.02%	0.33%	7.07%	6.68%	3.07%	0.95%	22.25%	5.85%	1.97%	3.28%	**4.48%**
PCB	0.09%	0.86%	0.43%	0.10%	6.10%	0.04%	0.94%	0.00%	7.41%	1.07%	2.04%	0.23%	**1.61%**
PEC	0.88%	0.52%	1.12%	0.35%	4.97%	0.29%	0.32%	0.35%	6.94%	0.43%	0.28%	0.44%	**1.41%**
PIBC	0.03%	0.01%	0.02%	0.27%	1.56%	0.07%	0.04%	0.14%	2.17%	0.07%	0.13%	0.22%	**0.39%**
PID	0.56%	3.00%	1.43%	0.70%	17.32%	0.10%	1.07%	1.48%	22.73%	0.30%	0.26%	0.60%	**4.13%**
PIIC	1.83%	2.38%	1.73%	0.63%	16.95%	1.23%	1.50%	2.94%	24.75%	4.56%	1.50%	0.90%	**5.08%**
PRICO	0.44%	0.43%	2.92%	0.30%	7.30%	2.30%	1.19%	0.28%	12.46%	1.79%	0.43%	0.41%	**2.52%**
QUDS	4.79%	7.20%	10.79%	0.08%	45.53%	1.51%	0.41%	3.73%	51.52%	0.10%	0.19%	40.73%	**13.88%**
UCI	5.13%	4.24%	15.85%	7.50%	44.07%	4.26%	2.13%	0.92%	63.79%	0.93%	2.11%	1.36%	**12.69%**

Appendix (1.4): Monthly Stocks Turnover Ratio & Yearly Average, for the firms' sample, from April 2008 to March 2009

Company	8.Apr	8.May	8.Jun	8.Jul	8.Aug	8.Sep	8.Oct	8.Nov	8.Dec	9.Jan	9.Feb	9.Mar	LIQ AVRG
AHC	0.42%	0.75%	1.03%	0.65%	0.88%	0.17%	0.03%	6.12%	6.60%	0.31%	0.44%	0.05%	**1.45%**
AIB	1.47%	0.74%	2.77%	1.43%	1.53%	0.59%	3.95%	30.33%	31.55%	1.33%	38.10%	7.67%	**10.12%**
AIG	0.49%	0.19%	0.31%	0.26%	1.34%	1.18%	0.15%	6.78%	7.11%	0.66%	0.41%	1.01%	**1.66%**
ARE	1.56%	1.01%	0.36%	1.36%	0.63%	0.30%	1.41%	9.15%	10.28%	0.87%	1.09%	4.18%	**2.68%**
BOP	13.63%	13.08%	7.49%	1.46%	4.01%	2.37%	4.01%	73.72%	74.48%	0.75%	2.29%	5.43%	**16.89%**
BPC	1.85%	2.73%	0.43%	7.74%	5.33%	1.01%	2.67%	21.16%	26.05%	1.12%	0.44%	1.18%	**5.98%**
GMC	1.87%	1.39%	3.40%	2.31%	0.96%	0.47%	1.79%	17.43%	17.91%	0.29%	1.35%	17.87%	**5.59%**
JCC	2.18%	1.19%	1.73%	0.98%	3.48%	1.43%	0.37%	14.11%	15.79%	2.11%	1.77%	0.88%	**3.84%**
JPH	11.70%	3.64%	1.98%	2.05%	5.14%	0.36%	1.01%	32.15%	32.39%	0.39%	0.30%	0.67%	**7.65%**
NCI	2.66%	3.84%	2.87%	1.19%	0.40%	1.11%	3.69%	26.47%	27.10%	0.57%	1.53%	1.06%	**6.04%**
NIC	0.29%	1.06%	0.25%	0.18%	3.80%	0.38%	0.18%	4.05%	4.49%	0.48%	0.76%	0.09%	**1.33%**
PADICO	11.48%	7.53%	6.47%	2.20%	2.35%	2.02%	3.08%	51.54%	53.09%	1.87%	5.01%	4.62%	**12.61%**
PCB	1.56%	1.28%	3.29%	0.08%	0.90%	0.34%	0.16%	7.27%	7.48%	0.17%	0.02%	0.20%	**1.90%**
PEC	1.05%	0.38%	1.13%	0.79%	0.96%	0.34%	0.53%	6.17%	6.31%	0.45%	1.31%	0.62%	**1.67%**
PIBC	0.65%	0.16%	0.13%	0.10%	1.63%	0.00%	0.02%	12.37%	12.47%	0.00%	0.01%	0.02%	**2.30%**
PID	0.60%	0.66%	2.62%	0.35%	1.00%	0.52%	0.85%	8.01%	8.25%	0.31%	0.07%	0.78%	**2.00%**
PIIC	4.47%	1.03%	1.36%	0.48%	0.63%	1.44%	1.75%	20.74%	21.82%	1.08%	1.28%	1.70%	**4.82%**
PLAZA	0.63%	2.55%	0.70%	0.12%	0.58%	0.42%	0.96%	7.98%	13.28%	0.46%	0.50%	0.10%	**2.36%**
PRICO	1.01%	0.48%	2.14%	0.33%	0.85%	0.97%	0.64%	9.27%	9.63%	0.18%	34.08%	0.35%	**4.99%**
QUDS	1.20%	1.33%	8.51%	0.64%	0.99%	0.21%	0.30%	53.82%	57.55%	0.19%	3.70%	0.12%	**10.71%**
TNB	4.97%	1.75%	2.10%	4.39%	0.88%	1.74%	0.85%	21.50%	21.87%	0.27%	1.47%	0.61%	**5.20%**
UCI	2.41%	2.32%	1.31%	1.58%	0.77%	1.42%	1.75%	20.47%	20.95%	0.33%	0.63%	1.18%	**4.59%**
VOIC	8.68%	0.46%	0.19%	0.13%	2.19%	0.09%	0.07%	8.30%	9.20%	0.08%	0.06%	0.14%	**2.47%**
WASSEL	8.05%	13.27%	2.70%	0.99%	0.86%	0.79%	2.40%	36.42%	37.65%	0.68%	1.53%	0.97%	**8.86%**

Appendix (1.5): Monthly Stocks Turnover Ratio & Yearly Average, for the firms' sample, from April 2009 to March 2010

Company	9.Apr	9.May	9.Jun	9.Jul	9.Aug	9.Sep	9.Oct	9.Nov	9.Dec	10.Jan	10.	10.Mar	LIQ AVRG
AHC	0.07%	3.52%	0.02%	0.85%	0.01%	0.09%	0.45%	0.59%	10.71%	3.47%	0.18	0.12%	**1.67%**
AIB	1.09%	0.75%	2.27%	0.24%	0.55%	0.47%	0.52%	0.37%	0.34%	0.32%	0.32	0.26%	**0.63%**
AIG	0.32%	0.39%	1.26%	0.07%	0.30%	5.35%	0.74%	0.16%	1.33%	0.89%	3.05	6.55%	**1.70%**
ARAB	0.58%	1.89%	0.41%	0.20%	0.51%	0.52%	0.75%	0.28%	0.43%	0.16%	0.11	0.09%	**0.49%**
ARE	3.25%	0.90%	1.12%	0.33%	1.19%	0.84%	1.35%	1.14%	0.17%	1.74%	2.59	2.71%	**1.44%**
AZIZA	0.17%	0.13%	0.49%	0.27%	0.23%	0.65%	0.43%	0.13%	0.02%	0.28%	0.43	0.33%	**0.30%**
BOP	2.24%	1.43%	10.43%	1.49%	3.57%	1.00%	3.75%	1.41%	2.29%	0.80%	0.86	0.79%	**2.51%**
BPC	4.03%	2.69%	1.44%	0.37%	1.02%	0.49%	0.84%	2.53%	1.55%	0.54%	0.63	1.95%	**1.51%**
GMC	0.53%	0.64%	0.93%	0.20%	0.77%	0.59%	0.55%	3.05%	20.59%	0.57%	0.28	0.24%	**2.41%**
JCC	0.35%	1.03%	2.14%	0.25%	0.76%	0.21%	0.86%	0.58%	1.28%	3.18%	0.61	1.33%	**1.05%**
JPH	0.41%	0.30%	0.89%	0.20%	0.23%	0.10%	0.24%	0.33%	0.19%	0.12%	0.20	0.59%	**0.32%**
LADAEN	0.04%	0.01%	0.22%	1.11%	0.26%	0.65%	0.27%	0.02%	0.23%	0.08%	0.03	0.40%	**0.28%**
NCI	3.69%	1.77%	3.48%	0.47%	2.27%	3.05%	4.81%	1.12%	22.78%	1.15%	1.61	2.32%	**4.04%**
NIC	1.43%	0.15%	0.15%	0.51%	0.34%	0.03%	0.53%	0.59%	0.22%	0.26%	0.50	0.34%	**0.42%**
NSC	3.36%	0.59%	0.10%	0.58%	0.22%	0.49%	0.18%	0.18%	0.54%	4.71%	1.30	6.90%	**1.60%**
PADICO	2.08%	1.55%	3.40%	1.13%	0.93%	0.91%	1.56%	0.44%	1.54%	1.18%	2.93	1.57%	**1.60%**
PALTEL	2.01%	1.22%	1.48%	0.51%	0.70%	0.66%	0.38%	0.82%	1.02%	0.84%	3.14	2.36%	**1.26%**
PCB	0.41%	1.77%	0.44%	1.05%	0.92%	0.09%	0.20%	0.17%	0.96%	1.50%	0.44	0.13%	**0.67%**
PEC	0.85%	0.34%	1.18%	0.35%	0.50%	0.45%	0.43%	0.30%	0.41%	0.35%	0.37	0.30%	**0.49%**
PIBC	0.01%	0.03%	0.27%	0.03%	0.08%	0.01%	0.06%	0.00%	0.01%	0.00%	35.0	0.36%	**2.99%**
PIIC	0.88%	0.84%	1.41%	0.74%	4.16%	6.25%	4.60%	4.30%	1.66%	1.40%	2.33	4.89%	**2.79%**
PRICO	0.23%	0.28%	0.85%	0.22%	0.52%	0.53%	0.39%	0.11%	0.21%	0.61%	0.19	0.11%	**0.35%**
QUDS	1.76%	0.18%	0.51%	6.19%	3.29%	18.55%	2.35%	1.32%	0.56%	0.45%	0.29	0.44%	**2.99%**
TNB	2.37%	1.86%	0.95%	0.35%	0.41%	18.60%	6.96%	1.87%	2.23%	2.24%	1.89	12.71%	**4.37%**
UCI	3.36%	0.69%	0.58%	0.76%	0.56%	1.24%	0.54%	0.48%	1.70%	0.86%	0.71	2.12%	**1.13%**
VOIC	0.10%	3.88%	2.54%	0.28%	0.01%	0.02%	0.22%	0.04%	1.50%	0.14%	6.94	2.75%	**1.54%**
WASSEL	9.12%	1.54%	0.90%	0.59%	1.16%	2.23%	1.50%	2.17%	3.16%	1.18%	1.65	0.82%	**2.17%**

Appendix (1.6): Monthly Stocks Turnover Ratio & Yearly Average, for the firms' sample, from April 2010 to March 2011

Company	10.Apr	10.May	10.Jun	10.Jul	10.Aug	10.Sep	10.Oct	10.Nov	10.Dec	11.Jan	11.Feb	11.Mar	LIQ AVRG
AHC	0.71%	5.38%	3.15%	0.07%	0.11%	2.80%	0.93%	0.04%	12.42%	0.14%	0.01%	1.32%	**2.26%**
AIB	0.39%	0.61%	0.75%	0.22%	0.19%	0.36%	0.36%	0.22%	0.51%	0.44%	0.26%	0.25%	**0.38%**
AIG	6.77%	4.34%	0.80%	0.37%	0.35%	0.20%	1.56%	0.39%	1.02%	2.41%	1.12%	1.31%	**1.72%**
ARE	1.00%	7.14%	5.56%	2.29%	1.20%	0.18%	0.48%	1.37%	14.43%	5.41%	0.31%	0.90%	**3.36%**
AZIZA	0.36%	0.67%	4.19%	0.24%	0.40%	1.02%	0.82%	0.07%	0.23%	0.17%	0.22%	2.10%	**0.87%**
BOP	1.60%	0.87%	1.02%	0.43%	0.44%	0.83%	0.43%	0.15%	0.30%	0.29%	1.38%	0.62%	**0.70%**
BPC	0.65%	0.45%	1.08%	2.16%	0.29%	0.13%	0.23%	0.15%	0.41%	0.06%	0.59%	0.50%	**0.56%**
GCOM	0.73%	0.31%	4.36%	1.70%	4.97%	14.30%	20.39%	12.86%	15.19%	11.42%	9.89%	9.28%	**8.78%**
GMC	0.15%	1.83%	0.85%	0.30%	0.39%	0.20%	0.20%	0.37%	0.30%	0.47%	0.22%	0.83%	**0.51%**
ISBK	3.12%	1.91%	7.51%	0.81%	4.16%	0.78%	13.52%	0.42%	0.58%	1.36%	1.11%	0.85%	**3.01%**
JCC	0.93%	1.84%	0.46%	1.04%	0.34%	0.43%	0.70%	0.57%	2.88%	0.56%	0.76%	0.95%	**0.95%**
JPH	0.38%	1.13%	0.58%	0.29%	0.11%	0.46%	0.67%	0.13%	0.36%	0.14%	0.14%	0.74%	**0.43%**
NCI	17.90%	23.87%	9.58%	9.34%	6.50%	6.82%	8.28%	7.12%	12.18%	3.59%	1.69%	24.80%	**10.97%**
NIC	0.58%	0.95%	0.82%	0.48%	0.29%	0.41%	0.26%	0.11%	0.51%	0.37%	0.03%	0.98%	**0.48%**
NSC	1.66%	1.37%	1.73%	1.00%	0.33%	0.09%	0.16%	0.29%	0.05%	0.12%	1.61%	1.12%	**0.79%**
PADICO	2.02%	1.73%	5.56%	2.81%	1.16%	1.09%	0.76%	0.87%	1.36%	0.89%	0.55%	1.25%	**1.67%**
PALTEL	0.73%	0.49%	2.46%	0.49%	0.34%	1.27%	0.34%	2.80%	2.61%	0.85%	0.93%	1.00%	**1.19%**
PCB	0.58%	0.20%	0.70%	0.47%	0.34%	1.39%	0.85%	0.14%	0.34%	2.03%	1.39%	0.98%	**0.78%**
PEC	0.50%	0.43%	0.23%	0.23%	0.21%	0.54%	0.50%	0.24%	0.18%	0.55%	0.27%	0.31%	**0.35%**
PIBC	0.43%	0.37%	0.16%	0.03%	0.09%	2.21%	0.14%	0.06%	0.06%	0.56%	0.03%	0.04%	**0.35%**
PID	0.54%	0.27%	1.08%	0.31%	0.22%	0.25%	1.78%	0.80%	0.11%	0.70%	1.66%	0.07%	**0.65%**
PIIC	7.28%	32.89%	27.12%	5.02%	8.52%	5.12%	3.33%	0.98%	2.55%	1.53%	3.72%	9.84%	**8.99%**
PRICO	0.27%	6.99%	13.08%	3.06%	1.55%	0.88%	0.60%	0.57%	0.86%	0.65%	1.15%	4.32%	**2.83%**
QUDS	0.31%	6.29%	0.40%	0.37%	0.11%	0.14%	0.50%	0.16%	3.28%	5.50%	5.10%	0.77%	**1.91%**
TNB	7.09%	3.27%	4.81%	2.39%	0.90%	0.74%	10.66%	0.70%	1.46%	0.93%	0.82%	1.98%	**2.98%**
UCI	6.00%	1.98%	0.83%	0.17%	0.62%	0.23%	0.76%	0.15%	0.29%	0.37%	0.66%	0.92%	**1.08%**
VOIC	0.12%	2.20%	0.25%	0.05%	0.31%	0.76%	0.64%	0.54%	0.01%	0.11%	0.04%	0.10%	**0.43%**
WASSEL	0.81%	6.77%	3.87%	0.79%	0.75%	0.61%	0.63%	7.33%	31.77%	3.57%	1.33%	17.91%	**6.34%**

Appendix (1.7): Monthly Stocks Turnover Ratio & Yearly Average, for the firms' sample, from April 2011 to March 2012

Company	11.Apr	11.Ma	11.Jun	11.Jul	11.Aug	11.Sep	11.Oct	11.Nov	11.Dec	12.Jan	12.Feb	12.Mar	LIQ AVRG
AIB	1.66%	0.20%	0.38%	0.29%	0.22%	0.36%	0.25%	0.07%	1.03%	0.89%	5.87%	0.43%	**0.97%**
AIG	0.66%	0.42%	2.43%	0.27%	0.25%	0.45%	0.54%	0.26%	1.04%	0.28%	0.66%	0.98%	**0.69%**
ARE	6.01%	1.43%	1.58%	0.74%	0.20%	0.12%	0.14%	0.02%	0.74%	0.08%	0.01%	0.03%	**0.93%**
AZIZA	0.54%	2.28%	0.11%	0.16%	0.02%	0.01%	0.00%	0.00%	0.00%	0.01%	1.50%	0.00%	**0.39%**
BOP	1.82%	1.02%	0.88%	0.58%	0.53%	0.74%	0.45%	0.74%	2.91%	2.28%	0.94%	0.47%	**1.11%**
BPC	1.36%	0.49%	0.33%	1.82%	0.23%	3.29%	0.09%	0.43%	0.97%	0.04%	0.23%	0.17%	**0.79%**
GCOM	3.85%	4.37%	3.38%	2.43%	1.07%	1.43%	14.15%	3.91%	5.54%	7.06%	9.18%	6.47%	**5.24%**
GMC	5.06%	17.62%	2.28%	2.76%	3.21%	1.02%	0.65%	0.24%	0.38%	0.43%	3.21%	0.36%	**3.10%**
ISBK	3.50%	1.98%	2.69%	1.47%	1.69%	0.48%	0.34%	0.16%	1.68%	2.90%	0.26%	0.94%	**1.51%**
JCC	0.63%	2.57%	0.67%	0.93%	0.15%	0.05%	0.13%	0.35%	0.36%	0.61%	1.08%	0.22%	**0.65%**
JPH	0.15%	0.24%	0.10%	0.20%	0.63%	0.24%	6.53%	0.09%	0.45%	0.02%	2.24%	0.33%	**0.94%**
LADAEN	0.18%	1.24%	0.26%	0.92%	0.70%	0.02%	0.24%	0.10%	0.03%	0.88%	0.24%	0.21%	**0.42%**
NIC	0.11%	0.25%	0.30%	0.16%	0.08%	0.28%	0.11%	0.04%	1.91%	0.32%	0.24%	0.35%	**0.35%**
PADICO	2.88%	7.36%	1.15%	1.64%	0.40%	0.69%	1.39%	0.82%	0.97%	2.13%	0.97%	1.12%	**1.79%**
PALTEL	1.09%	1.36%	1.60%	0.86%	0.32%	0.53%	1.93%	0.58%	2.75%	0.83%	0.95%	2.49%	**1.27%**
PEC	0.65%	0.24%	0.27%	0.30%	0.20%	0.30%	0.32%	0.15%	0.18%	0.34%	0.16%	0.13%	**0.27%**
PIIC	12.76%	7.14%	8.63%	0.88%	0.34%	0.50%	0.73%	0.26%	1.08%	1.45%	1.21%	0.41%	**2.95%**
PRICO	1.95%	3.24%	0.56%	0.80%	0.27%	0.17%	2.56%	0.30%	0.48%	1.01%	3.49%	0.57%	**1.28%**
QUDS	0.20%	0.16%	0.18%	0.04%	0.04%	0.16%	0.01%	0.12%	0.23%	0.16%	0.09%	0.08%	**0.12%**
RSR	0.26%	0.05%	0.60%	0.98%	0.11%	0.49%	0.11%	0.24%	2.05%	0.23%	0.16%	0.03%	**0.44%**
UCI	1.30%	0.28%	0.48%	1.11%	0.91%	1.57%	0.64%	0.09%	0.45%	1.42%	1.05%	1.51%	**0.90%**
WASSEL	0.83%	0.90%	0.26%	0.39%	0.36%	15.01%	0.12%	0.44%	0.98%	0.56%	0.39%	0.24%	**1.71%**
WATANIY	0.38%	0.48%	0.20%	0.28%	0.30%	0.16%	0.12%	0.05%	0.62%	1.20%	0.15%	0.08%	**0.34%**

Appendix (1.8): Monthly Stocks Turnover Ratio & Yearly Average, for the firms' sample, from April 2012 to March 2013

Company	12.Apr	12.Ma	12.Jun	12.Jul	12.Aug	12.Sep	12.Oct	12.Nov	12.Dec	13.Jan	13.Feb	13.Mar	LIQ AVRG
AIB	0.18%	0.01%	0.47%	0.22%	0.19%	0.42%	1.70%	0.26%	0.49%	0.19%	0.37%	0.30%	**0.40%**
AIG	0.29%	0.08%	0.80%	0.43%	0.26%	2.90%	0.95%	3.26%	0.09%	0.37%	3.39%	1.04%	**1.16%**
BOP	1.15%	0.66%	1.15%	0.54%	0.64%	0.89%	1.97%	0.37%	0.23%	0.64%	0.66%	0.71%	**0.80%**
BPC	0.44%	0.01%	0.25%	0.21%	0.23%	0.76%	0.55%	0.34%	0.10%	0.48%	0.63%	0.46%	**0.37%**
GMC	0.42%	0.80%	0.09%	0.40%	0.18%	0.72%	0.03%	0.30%	0.02%	1.26%	0.97%	1.46%	**0.55%**
GUI	0.53%	0.00%	0.16%	0.02%	0.28%	0.94%	0.18%	0.02%	0.04%	0.28%	0.29%	0.32%	**0.26%**
ISBK	0.50%	0.21%	11.30%	0.57%	0.45%	0.72%	4.32%	5.39%	1.51%	3.18%	2.34%	0.98%	**2.62%**
JCC	0.16%	1.86%	0.31%	1.04%	0.33%	0.36%	2.14%	0.65%	0.49%	2.96%	1.78%	0.98%	**1.09%**
JPH	2.12%	0.03%	0.24%	0.42%	0.17%	0.21%	0.24%	1.07%	0.01%	0.12%	0.02%	0.05%	**0.39%**
NCI	0.32%	0.14%	2.17%	7.74%	9.72%	0.06%	0.38%	0.07%	0.30%	0.66%	0.05%	3.69%	**2.11%**
NIC	0.22%	0.22%	1.17%	0.59%	0.56%	0.16%	0.83%	0.61%	0.18%	0.29%	0.09%	0.05%	**0.41%**
PADICO	1.53%	0.29%	0.83%	0.65%	0.43%	0.64%	0.41%	0.49%	0.83%	0.60%	1.49%	1.15%	**0.78%**
PALTEL	1.61%	0.13%	0.34%	0.22%	0.36%	0.85%	0.25%	0.36%	0.06%	0.74%	0.49%	0.90%	**0.53%**
PEC	0.16%	0.03%	0.35%	0.22%	0.11%	0.19%	0.19%	0.17%	0.11%	0.37%	0.17%	0.13%	**0.18%**
PIBC	0.91%	0.00%	0.03%	0.01%	0.02%	0.01%	0.04%	0.02%	0.01%	0.53%	0.00%	0.05%	**0.14%**
PID	0.18%	1.43%	0.20%	0.82%	2.68%	0.29%	0.16%	0.11%	0.15%	0.73%	0.08%	0.08%	**0.58%**
PIIC	0.24%	0.02%	0.94%	0.28%	0.34%	0.37%	0.47%	2.29%	0.10%	0.29%	1.91%	1.00%	**0.69%**
PRICO	0.78%	0.03%	0.53%	0.30%	0.12%	0.27%	0.32%	0.33%	0.05%	0.26%	0.21%	0.25%	**0.29%**
QUDS	0.53%	0.00%	0.01%	0.05%	0.01%	0.11%	0.04%	0.27%	0.07%	0.21%	0.01%	0.26%	**0.13%**
RSR	0.02%	3.70%	0.22%	0.24%	0.14%	0.13%	1.03%	0.51%	0.00%	0.41%	0.06%	0.61%	**0.59%**
TIC	0.06%	0.01%	1.44%	0.90%	0.98%	0.83%	0.16%	0.49%	0.00%	0.08%	1.38%	16.25%	**1.88%**
WASSEL	0.32%	0.05%	0.22%	0.17%	0.24%	0.75%	0.13%	0.07%	0.08%	0.28%	0.14%	0.78%	**0.27%**
WATANIY	0.07%	0.02%	0.06%	0.10%	0.07%	0.06%	0.14%	0.06%	0.03%	0.08%	0.06%	0.04%	**0.07%**

Appendix (1.9): Monthly Stocks Turnover Ratio & Yearly Average, for the firms' sample, from April 2013 to March 2014

Company	13.Apr	13.May	13.Jun	13.Jul	13.Aug	13.Sep	13.Oct	13.Nov	13.Dec	14.Jan	14.Feb	14.Mar	LIQ AVRG
ABRAJ	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.02%	0.01%	0.16%	0.00%	0.00%	**0.02%**
AHC	0.01%	0.05%	0.02%	4.90%	0.02%	0.00%	0.02%	0.03%	0.09%	0.00%	0.02%	0.32%	**0.46%**
AIB	2.15%	0.36%	0.58%	0.25%	0.21%	1.79%	0.09%	3.17%	0.30%	0.19%	0.07%	0.15%	**0.78%**
AIG	1.74%	7.10%	0.78%	0.38%	1.79%	1.25%	0.88%	1.56%	0.14%	1.23%	0.96%	0.21%	**1.50%**
BOP	2.97%	0.76%	0.68%	0.90%	1.09%	0.54%	0.35%	0.87%	1.22%	0.70%	0.64%	0.82%	**0.96%**
BPC	3.28%	0.20%	0.26%	3.79%	0.41%	0.76%	0.05%	0.30%	0.25%	0.34%	0.32%	0.39%	**0.86%**
GCOM	5.82%	5.42%	4.96%	4.16%	8.32%	6.29%	2.92%	7.68%	4.43%	15.16%	9.01%	4.09%	**6.52%**
GUI	0.20%	0.25%	0.47%	0.17%	0.36%	0.10%	0.29%	0.10%	0.01%	0.07%	0.59%	0.25%	**0.24%**
ISBK	2.85%	5.12%	1.42%	1.81%	5.79%	1.87%	2.98%	2.80%	3.22%	1.29%	5.07%	1.38%	**2.97%**
JCC	2.53%	3.01%	1.62%	1.84%	1.19%	0.67%	0.17%	1.32%	0.86%	2.33%	1.28%	1.23%	**1.50%**
JPH	0.39%	0.14%	0.46%	1.96%	0.34%	0.14%	0.38%	0.61%	0.18%	0.57%	2.08%	0.34%	**0.63%**
NCI	0.70%	3.44%	5.60%	2.33%	0.52%	0.68%	2.13%	3.54%	1.61%	3.36%	1.29%	1.02%	**2.19%**
NIC	3.00%	0.18%	0.26%	0.20%	0.13%	0.69%	0.18%	0.33%	0.11%	0.68%	0.25%	0.03%	**0.50%**
PADICO	1.18%	1.73%	0.52%	2.06%	3.42%	0.84%	0.40%	20.51%	1.21%	6.17%	5.22%	2.37%	**3.80%**
PALTEL	2.24%	0.42%	0.35%	0.43%	0.70%	0.29%	0.30%	2.63%	0.97%	1.77%	1.21%	2.11%	**1.12%**
PEC	0.29%	0.12%	0.15%	0.17%	0.14%	0.16%	0.18%	0.20%	0.06%	0.18%	0.23%	0.31%	**0.18%**
PIBC	1.10%	1.01%	0.09%	0.04%	1.31%	0.04%	0.00%	3.07%	0.02%	0.06%	0.00%	0.60%	**0.61%**
PID	0.06%	10.51%	0.19%	0.03%	1.05%	0.96%	0.03%	0.04%	1.19%	1.07%	0.22%	0.26%	**1.30%**
PIIC	0.72%	0.45%	0.65%	3.69%	0.49%	0.73%	2.13%	2.21%	2.01%	0.66%	0.10%	0.17%	**1.17%**
PRICO	0.19%	0.09%	0.29%	0.88%	0.31%	0.30%	0.17%	0.63%	0.70%	3.36%	1.28%	0.53%	**0.73%**
QUDS	0.39%	0.06%	0.08%	0.14%	0.15%	3.55%	0.42%	0.77%	0.27%	5.33%	0.46%	2.33%	**1.16%**
RSR	0.04%	0.02%	4.55%	4.44%	0.61%	1.01%	0.33%	1.04%	0.13%	0.13%	6.89%	0.07%	**1.61%**
TNB	0.11%	4.31%	0.12%	0.15%	5.01%	0.18%	0.33%	3.43%	1.14%	1.98%	2.40%	0.56%	**1.64%**
UCI	0.47%	4.04%	0.73%	0.41%	1.61%	1.21%	0.26%	2.11%	0.35%	0.74%	1.19%	0.13%	**1.10%**
VOIC	0.96%	0.05%	0.07%	0.28%	0.00%	0.03%	0.02%	0.48%	0.05%	0.00%	0.02%	0.18%	**0.18%**
WASSEL	0.31%	0.89%	0.19%	0.24%	0.12%	0.11%	0.11%	0.16%	1.51%	0.17%	0.11%	0.17%	**0.34%**
WATANIY	0.12%	0.06%	0.10%	0.14%	0.30%	0.16%	0.27%	0.13%	0.27%	0.30%	0.50%	0.85%	**0.27%**

Appendix (1.10): Monthly Stocks Turnover Ratio & Yearly Average, for the firms' sample, from April 2014 to March 2015

Company	14.Apr	14.May	14.Jun	14.Jul	14.Aug	14.Sep	14.Oct	14.Nov	14.Dec	15.Jan	15.Feb	15.Mar	LIQ AVRG
ABRAJ	0.00%	0.01%	0.05%	0.02%	0.17%	0.12%	0.23%	0.34%	0.13%	0.00%	0.03%	0.02%	**0.09%**
AIB	0.10%	0.86%	3.31%	1.16%	0.04%	0.39%	0.09%	0.03%	0.06%	0.03%	0.16%	0.25%	**0.54%**
AIG	0.61%	0.41%	0.40%	0.16%	1.08%	0.10%	0.62%	3.21%	0.66%	1.49%	1.97%	0.24%	**0.91%**
APIC	0.92%	2.03%	0.97%	0.30%	2.51%	0.72%	0.46%	3.57%	0.45%	0.24%	5.10%	0.50%	**1.48%**
BOP	0.96%	0.59%	0.50%	0.20%	0.36%	0.36%	3.57%	3.14%	1.87%	1.13%	0.40%	8.31%	**1.78%**
BPC	0.43%	0.41%	0.12%	0.75%	0.39%	0.20%	0.73%	0.57%	0.34%	0.17%	0.23%	0.58%	**0.41%**
GCOM	4.54%	5.89%	2.23%	0.32%	1.70%	1.99%	2.68%	5.20%	1.13%	0.02%	0.67%	0.15%	**2.21%**
GMC	0.50%	0.14%	0.08%	0.10%	0.12%	0.12%	0.02%	0.00%	0.12%	0.01%	0.01%	0.21%	**0.12%**
GUI	0.78%	0.10%	0.07%	0.02%	0.45%	0.37%	0.34%	0.43%	0.07%	0.06%	0.01%	0.06%	**0.23%**
ISBK	0.22%	0.87%	0.24%	0.13%	0.24%	1.91%	0.57%	0.22%	0.45%	0.06%	0.08%	0.17%	**0.43%**
JCC	0.49%	0.64%	0.70%	0.47%	0.16%	0.33%	0.23%	0.24%	0.70%	0.09%	0.29%	0.62%	**0.41%**
JPH	0.29%	0.05%	0.12%	0.72%	0.14%	0.78%	0.20%	0.52%	1.07%	0.99%	0.34%	0.20%	**0.45%**
NAPCO	0.25%	0.96%	0.56%	0.16%	0.09%	0.08%	0.02%	0.02%	0.01%	0.12%	0.04%	0.06%	**0.20%**
PADICO	1.26%	0.73%	1.89%	0.30%	1.20%	1.16%	0.27%	0.51%	0.55%	0.41%	1.55%	0.70%	**0.88%**
PALTEL	0.29%	0.49%	0.64%	0.29%	0.48%	0.59%	0.25%	0.57%	0.34%	0.17%	1.08%	0.54%	**0.48%**
PHARMAC	0.13%	0.11%	0.24%	0.01%	0.25%	0.77%	0.30%	0.04%	0.16%	0.07%	0.24%	2.61%	**0.41%**
PIIC	0.54%	0.13%	0.01%	0.00%	0.16%	0.67%	0.00%	0.00%	0.05%	0.09%	0.26%	0.08%	**0.17%**
PRICO	0.50%	0.40%	0.20%	0.13%	0.20%	0.34%	0.29%	0.14%	0.54%	0.57%	1.19%	0.21%	**0.39%**
QUDS	0.07%	0.05%	0.30%	0.05%	1.79%	0.07%	0.47%	0.10%	0.25%	0.07%	1.28%	2.10%	**0.55%**
TNB	0.17%	0.27%	0.30%	0.09%	0.62%	10.94%	5.49%	3.35%	2.52%	0.04%	0.12%	15.03%	**3.25%**
UCI	0.20%	0.10%	0.21%	0.10%	0.23%	0.04%	0.15%	0.07%	0.19%	0.17%	0.43%	0.32%	**0.18%**
WATANIY	0.27%	0.09%	0.07%	0.06%	0.06%	0.06%	0.30%	0.07%	0.79%	0.05%	0.08%	0.25%	**0.18%**

Appendix (1.11): Monthly stocks returns, for the firms' sample, from April 2007 to March 2008

Company	7.Apr	7.May	7.Jun	7.Jul	7.Aug	7.Sep	7.Oct	7.Nov	7.Dec	8.Jan	8.Feb	8.Mar	R. AVRG
AHC	-5.13%	-11.12%	-1.18%	8.00%	-1.10%	4.35%	-1.07%	1.07%	6.19%	-13.93%	6.67%	-6.67%	-1.16%
AIB	-2.71%	8.43%	0.00%	-1.02%	1.02%	0.00%	0.00%	1.01%	-0.50%	-6.22%	0.53%	1.06%	0.13%
AIG	-4.50%	-5.41%	-6.45%	-57.45%	-1.32%	3.28%	-1.95%	-2.67%	0.00%	-6.27%	0.72%	0.00%	-6.84%
ARE	11.64%	-23.42%	-4.26%	2.86%	4.14%	-9.94%	0.00%	0.00%	-4.58%	-8.13%	-10.72%	3.70%	-3.23%
BOP	-55.34%	22.02%	-5.01%	5.01%	-9.51%	-6.61%	-24.32%	14.26%	-6.55%	2.86%	15.64%	11.15%	-3.03%
BPC	-17.51%	1.66%	3.47%	-2.30%	-3.79%	16.85%	1.22%	-0.61%	9.11%	-4.93%	3.07%	-2.10%	0.34%
GMC	4.45%	-18.06%	1.04%	-10.88%	-10.92%	7.41%	10.18%	-4.40%	0.00%	-3.43%	-2.35%	5.78%	-1.77%
JCC	-7.02%	-11.04%	-6.83%	-8.21%	-12.22%	8.62%	3.90%	0.00%	3.47%	2.25%	-2.82%	2.54%	-2.28%
JPH	-6.90%	0.71%	-1.79%	-2.56%	-23.48%	15.78%	0.00%	-2.02%	2.22%	3.72%	3.40%	-4.95%	-1.32%
LADAEN	10.54%	-9.16%	-13.16%	-11.58%	-11.12%	9.35%	5.22%	12.72%	-4.58%	1.55%	-6.35%	0.00%	-1.38%
NCI	-19.89%	-8.34%	-2.20%	10.54%	-12.78%	-2.30%	-9.76%	-5.26%	10.27%	4.76%	-2.35%	-7.41%	-3.73%
PADICO	-21.88%	-11.83%	1.91%	-3.87%	-13.14%	18.89%	5.43%	1.75%	-3.52%	13.41%	-2.38%	0.40%	-1.24%
PALTEL	-17.01%	-3.83%	2.41%	-6.64%	-5.22%	22.69%	-1.07%	1.29%	4.99%	19.64%	-0.50%	15.06%	2.65%
PCB	-1.27%	-2.60%	-8.22%	-1.44%	2.86%	-11.95%	0.00%	10.54%	0.00%	-1.44%	9.66%	-5.41%	-0.77%
PEC	-11.69%	-6.84%	-3.60%	-2.79%	-0.95%	0.00%	-0.96%	-1.94%	-0.99%	0.00%	0.00%	4.83%	-2.08%
PIBC	-7.62%	-24.95%	-5.50%	-21.33%	-5.76%	16.99%	-6.45%	10.14%	2.38%	-12.52%	-1.34%	2.01%	-4.50%
PID	-6.60%	6.60%	0.00%	-5.47%	-21.20%	8.00%	2.53%	19.27%	0.00%	-9.74%	2.25%	2.20%	-0.18%
PIIC	-12.26%	-11.51%	4.76%	-5.99%	-7.70%	3.92%	3.77%	7.15%	-3.51%	4.65%	-8.29%	-2.50%	-2.29%
PRICO	-6.84%	-3.60%	12.08%	-16.78%	0.96%	18.23%	-8.27%	-0.87%	-0.87%	5.13%	-8.70%	-7.55%	-1.42%
QUDS	-3.82%	-3.97%	5.90%	-15.84%	-9.38%	15.18%	-15.18%	6.35%	-0.77%	-9.76%	5.81%	3.17%	-1.86%
UCI	3.72%	-15.78%	-12.74%	-16.88%	3.39%	3.28%	-7.83%	1.16%	4.50%	-12.88%	1.24%	7.15%	-3.47%
R. AVRG	-8.46%	-6.29%	-1.87%	-7.84%	-6.54%	6.76%	-2.12%	3.28%	0.82%	-1.49%	0.15%	1.07%	

Appendix (1.12): Monthly stocks returns, for the firms' sample**,** from April 2008 to March 2009

Company	8.Apr	8.May	8.Jun	8.Jul	8.Aug	8.Sep	8.Oct	8.Nov	8.Dec	9.Jan	9.Feb	9.Mar	R. AVRG
AHC	0.00%	-5.92%	-1.23%	5.99%	2.30%	-9.53%	4.88%	-6.14%	-2.56%	-1.31%	-1.32%	-6.90%	-1.81%
AIB	-17.81%	3.10%	1.81%	-3.66%	-5.10%	-3.32%	-17.69%	-5.81%	-6.17%	12.78%	-0.80%	14.95%	-2.31%
AIG	0.00%	-2.17%	1.45%	0.00%	-3.66%	-3.03%	-19.47%	-3.81%	-12.39%	-1.10%	-6.90%	4.65%	-3.87%
ARE	-7.55%	0.00%	11.12%	10.01%	0.00%	-3.23%	-15.96%	-31.37%	-5.41%	10.54%	-13.35%	5.56%	-3.30%
BOP	-17.52%	10.31%	0.51%	2.53%	0.25%	-5.38%	-12.31%	-14.72%	-3.51%	11.78%	-3.23%	19.32%	-1.00%
BPC	-13.16%	0.00%	-2.45%	19.57%	-1.30%	-4.41%	-7.11%	-18.19%	-4.12%	15.79%	-8.19%	-2.72%	-2.19%
GMC	2.22%	-3.35%	8.70%	-4.26%	4.26%	0.00%	-7.57%	-9.42%	3.64%	9.10%	-5.59%	-2.33%	-0.38%
JCC	2.48%	-2.20%	2.74%	6.54%	-12.67%	1.43%	-3.75%	-0.29%	4.61%	1.95%	-5.10%	-3.25%	-0.63%
JPH	10.38%	-3.22%	-4.84%	0.38%	-2.31%	-2.76%	-5.76%	-11.67%	0.95%	3.25%	-0.69%	2.27%	-1.17%
NCI	16.51%	-2.20%	-2.25%	-4.65%	-4.88%	-7.80%	-17.69%	0.00%	-6.67%	6.67%	-6.67%	-3.51%	-2.76%
NIC	-15.76%	-1.32%	-7.12%	0.00%	-10.01%	14.89%	-2.53%	-7.23%	0.00%	5.12%	-2.16%	-2.96%	-2.42%
PADICO	12.04%	-8.12%	2.28%	0.00%	-12.39%	-7.51%	-25.46%	-26.24%	-7.17%	15.30%	6.19%	-12.03%	-5.26%
PCB	10.54%	11.78%	8.52%	-8.52%	0.00%	0.00%	-8.10%	-8.81%	2.60%	-12.26%	1.44%	-1.44%	-0.35%
PEC	-3.85%	-0.99%	0.99%	-1.98%	-4.08%	-6.45%	-3.39%	-16.18%	-8.46%	23.48%	4.55%	6.45%	-0.83%
PIBC	11.85%	-9.88%	6.29%	-2.47%	1.86%	-4.39%	-7.31%	17.66%	11.46%	-13.21%	-7.32%	-12.10%	-0.63%
PID	-1.09%	5.35%	2.06%	2.02%	0.00%	0.00%	-4.08%	-8.70%	2.25%	5.41%	0.00%	5.13%	0.69%
PIIC	1.26%	-6.45%	0.00%	0.00%	-17.44%	-6.56%	-12.63%	-28.77%	2.53%	16.13%	-8.89%	-4.76%	-5.47%
PLAZA	1.44%	2.82%	-10.23%	-6.35%	-5.04%	-10.92%	5.61%	-5.61%	1.90%	-1.90%	-3.92%	3.92%	-2.36%
PRICO	-1.98%	-3.05%	0.00%	-2.08%	-11.12%	-6.06%	-14.79%	-13.98%	13.98%	4.26%	-4.26%	-5.97%	-3.75%
QUDS	-14.25%	-2.74%	2.74%	-6.51%	-4.93%	0.00%	-16.43%	-19.67%	26.57%	-4.55%	-2.35%	-4.88%	-3.92%
TNB	2.15%	-4.35%	2.20%	2.15%	-6.60%	-2.30%	-7.23%	-19.24%	1.50%	2.94%	-9.10%	-4.88%	-3.56%
UCI	-9.65%	-3.87%	0.00%	3.87%	-2.56%	-5.33%	-13.16%	-4.80%	9.38%	2.94%	-4.45%	-6.25%	-2.82%
VOIC	-7.68%	-7.86%	3.57%	4.71%	-8.74%	-18.51%	-6.82%	0.00%	5.72%	-5.72%	0.00%	0.00%	-3.44%
WASSEL	0.00%	13.63%	-1.98%	-5.13%	-9.95%	1.16%	-7.15%	-11.78%	-8.70%	14.11%	-8.22%	-13.76%	-3.15%
R. AVRG	-1.64%	-0.86%	1.04%	0.51%	-4.75%	-3.75%	-9.41%	-10.62%	0.91%	5.06%	-3.76%	-1.06%	

Appendix (1.13): Monthly stocks returns, for the firms' sample, from April 2009 to March 2010

Company	9.Apr	9.May	9.Jun	9.Jul	9.Aug	9.Sep	9.Oct	9.Nov	9.Dec	10.Jan	10.Feb	10.Mar	R. AVRG
AHC	0.00%	0.00%	-4.38%	-6.16%	-4.88%	18.23%	2.74%	6.54%	10.79%	9.74%	-12.04%	8.89%	2.46%
AIB	-13.35%	3.13%	3.77%	-9.31%	0.81%	2.39%	-1.59%	-1.61%	-6.73%	-0.87%	1.74%	-2.62%	-2.02%
AIG	3.35%	-9.20%	0.00%	-1.21%	5.92%	2.27%	-6.98%	-1.21%	1.21%	-1.21%	-10.27%	-5.56%	-1.91%
ARAB	-13.13%	-1.77%	-3.64%	20.07%	-9.53%	1.65%	-3.33%	0.00%	1.68%	6.45%	-16.99%	10.54%	-0.67%
ARE	17.33%	20.48%	-9.72%	-4.17%	-2.15%	0.00%	14.17%	0.00%	1.87%	0.00%	5.41%	16.16%	4.95%
AZIZA	2.74%	7.80%	15.06%	-22.85%	30.11%	12.22%	5.17%	8.07%	4.55%	-3.77%	8.83%	18.58%	7.21%
BOP	-20.97%	-5.13%	14.96%	1.80%	8.80%	-0.82%	1.36%	-0.81%	2.16%	-2.43%	1.09%	-0.54%	-0.05%
BPC	-3.31%	2.30%	-0.51%	-2.06%	-2.63%	-1.34%	0.00%	0.00%	2.40%	1.57%	9.88%	-4.82%	0.12%
GMC	-6.06%	3.68%	-2.44%	-1.24%	3.68%	0.00%	-3.68%	-2.53%	0.00%	-5.26%	-4.14%	1.40%	-1.38%
JCC	0.00%	-2.43%	-8.67%	-3.76%	3.09%	0.34%	-1.36%	0.68%	0.00%	-1.71%	0.00%	0.34%	-1.12%
JPH	-6.98%	1.20%	-4.88%	-3.30%	3.30%	-3.82%	3.32%	-2.29%	6.47%	-1.46%	9.55%	-7.62%	-0.54%
LADAEN	-3.51%	13.35%	-9.84%	3.39%	-3.39%	21.62%	-5.72%	-2.99%	-9.53%	0.00%	0.00%	-6.90%	-0.29%
NCI	16.43%	-16.43%	6.90%	-3.39%	0.00%	9.84%	-6.45%	3.28%	-6.67%	-3.51%	0.00%	0.00%	0.00%
NIC	0.00%	0.00%	0.00%	-1.26%	0.51%	2.00%	-1.24%	-3.05%	12.80%	-0.91%	10.01%	-28.01%	-0.76%
NSC	2.20%	4.26%	0.00%	-6.45%	18.23%	3.64%	-5.51%	-7.85%	9.72%	7.15%	25.70%	28.77%	6.65%
PADICO	1.49%	-7.70%	3.92%	-4.73%	0.80%	2.37%	0.00%	-0.78%	-6.51%	-0.84%	9.68%	0.77%	-0.13%
PALTEL	1.53%	1.51%	-0.33%	-12.24%	0.00%	-2.48%	0.96%	1.52%	-3.07%	4.93%	4.53%	-8.69%	-0.99%
PCB	4.26%	17.77%	-9.76%	8.59%	-9.88%	3.82%	0.00%	0.00%	0.00%	-5.13%	3.87%	-2.56%	0.91%
PEC	-9.84%	0.00%	1.14%	3.35%	0.00%	7.41%	-1.03%	2.04%	4.93%	1.90%	3.70%	-0.91%	1.06%
PIBC	1.42%	-12.75%	0.80%	-4.05%	-0.83%	4.88%	-3.23%	-1.65%	0.00%	4.08%	-2.43%	0.00%	-1.15%
PIIC	-2.47%	-2.53%	0.00%	-2.60%	23.36%	25.59%	6.25%	8.70%	-2.82%	-1.44%	4.26%	9.28%	5.47%
PRICO	7.41%	-1.44%	-4.45%	1.50%	2.94%	17.26%	-1.23%	-2.50%	2.50%	-1.24%	-7.80%	1.34%	1.19%
QUDS	-2.53%	-10.82%	5.56%	-2.74%	4.08%	32.69%	14.31%	0.83%	0.00%	-3.36%	0.00%	-1.72%	3.02%
TNB	0.00%	4.88%	1.57%	-9.84%	11.39%	25.64%	-8.70%	0.00%	-5.33%	1.36%	-1.36%	15.22%	2.90%
UCI	1.60%	0.00%	-3.23%	-1.65%	0.00%	6.45%	-8.13%	0.00%	12.72%	-3.03%	3.03%	7.20%	1.25%
VOIC	-6.06%	1.86%	9.36%	0.56%	-0.56%	10.09%	3.96%	0.48%	10.97%	2.14%	7.74%	0.00%	3.38%
WASSEL	-5.04%	1.71%	-3.45%	-3.57%	0.00%	15.15%	-1.57%	0.00%	-11.78%	0.00%	0.00%	1.77%	-0.57%
R. AVRG	-1.24%	0.51%	-0.08%	-2.49%	3.08%	8.04%	-0.28%	0.18%	1.20%	0.12%	2.00%	1.86%	

Appendix (1.14): Monthly stocks returns, for the firms' sample**,** from April 2010 to March 2011

Company	10.Apr	10.May	10.Jun	10.Jul	10.Aug	10.Sep	10.Oct	10.Nov	10.Dec	11.Jan	11.Feb	11.Mar	R. AVRG
AHC	-5.47%	-1.13%	5.53%	-7.83%	2.30%	7.65%	-5.41%	1.10%	-1.10%	-11.78%	-5.13%	12.36%	-0.74%
AIB	-5.46%	-3.81%	0.97%	-3.92%	-10.54%	4.35%	-1.07%	-5.53%	2.25%	-2.25%	-9.53%	0.00%	-2.88%
AIG	-17.10%	-5.22%	3.51%	-1.74%	-1.77%	1.77%	-5.41%	-7.70%	-15.08%	-4.76%	-10.27%	-5.56%	-5.78%
ARE	0.00%	-11.03%	42.74%	-13.98%	-14.79%	-4.45%	4.45%	-12.32%	-10.35%	16.71%	-3.13%	-8.27%	-1.20%
AZIZA	7.87%	13.62%	33.04%	0.00%	-5.22%	3.16%	-3.88%	4.23%	-5.31%	-3.70%	9.02%	7.31%	5.01%
BOP	0.54%	-5.56%	-1.44%	-5.36%	-1.23%	12.22%	-7.69%	-0.30%	0.89%	1.46%	-2.64%	2.06%	-0.59%
BPC	-9.04%	0.00%	-0.27%	-2.47%	1.38%	-1.38%	-4.55%	-1.17%	6.82%	-6.82%	1.17%	7.02%	-0.78%
GCOM	-2.20%	-3.39%	2.27%	-5.78%	-49.90%	14.57%	15.66%	4.26%	13.01%	-10.27%	-20.97%	0.00%	-3.56%
GMC	2.74%	7.80%	0.00%	-6.45%	0.00%	1.32%	-1.32%	-1.34%	0.00%	-8.46%	1.46%	7.00%	0.23%
ISBK	-1.17%	0.00%	1.17%	1.16%	-7.15%	4.82%	2.33%	-4.71%	-3.68%	3.68%	2.38%	-1.18%	-0.20%
JCC	-0.34%	-2.80%	0.35%	-1.07%	-2.53%	-1.10%	1.10%	-1.10%	-5.72%	-6.06%	0.00%	-4.26%	-1.96%
JPH	7.62%	-2.70%	0.46%	-1.37%	-0.93%	0.46%	1.83%	0.00%	11.78%	1.01%	-4.08%	5.87%	1.66%
NCI	53.90%	8.00%	1.90%	1.87%	-7.70%	-4.08%	9.91%	-14.17%	4.26%	-2.11%	-6.60%	37.47%	6.89%
NIC	-1.38%	0.00%	-6.01%	-5.46%	2.16%	6.49%	5.29%	-8.19%	12.43%	-8.11%	-4.32%	10.33%	0.27%
NSC	-18.63%	9.20%	-5.65%	13.06%	6.90%	-1.92%	1.92%	0.00%	0.00%	0.00%	0.00%	-3.88%	0.08%
PADICO	3.75%	-8.43%	10.62%	2.14%	-2.86%	-1.46%	-4.51%	-5.54%	-2.47%	-1.68%	-6.12%	3.54%	-1.09%
PALTEL	0.19%	-0.58%	5.83%	-4.11%	-1.92%	0.39%	0.00%	-1.76%	3.86%	0.19%	-0.76%	2.82%	0.35%
PCB	2.56%	-3.87%	-8.22%	-5.88%	-6.25%	12.14%	0.00%	0.00%	0.00%	0.00%	0.00%	13.35%	0.32%
PEC	-12.70%	-1.05%	2.08%	3.05%	2.96%	7.48%	2.67%	-1.77%	1.77%	2.60%	2.53%	-0.84%	0.73%
PIBC	0.00%	-19.89%	1.00%	-3.02%	2.02%	-6.19%	-1.07%	2.13%	5.13%	-3.05%	-2.08%	9.05%	-1.33%
PID	1.96%	-0.98%	-1.98%	0.00%	0.00%	1.98%	-1.98%	1.00%	-1.00%	0.00%	0.00%	-2.02%	-0.25%
PIIC	6.14%	51.79%	12.64%	-3.82%	-5.33%	-4.91%	-0.72%	-2.20%	-6.90%	-4.88%	12.52%	17.49%	5.98%
PRICO	0.00%	8.92%	8.19%	6.52%	-5.41%	0.00%	-6.90%	1.18%	-9.88%	5.06%	2.44%	14.55%	2.06%
QUDS	0.00%	3.42%	-3.42%	-6.28%	-1.87%	-1.90%	8.30%	0.88%	4.29%	-5.17%	-0.89%	-7.41%	-0.84%
TNB	2.33%	-3.51%	-2.41%	-2.47%	0.00%	0.00%	-9.16%	-1.38%	-1.40%	-1.42%	-8.96%	14.52%	-1.15%
UCI	-16.58%	3.23%	1.57%	1.55%	-3.13%	4.65%	-3.08%	-3.17%	-3.28%	-1.68%	1.68%	0.00%	-1.52%
VOIC	2.71%	-4.29%	7.30%	10.54%	-4.78%	10.61%	-2.87%	-1.30%	4.80%	-4.80%	-1.99%	-4.80%	0.93%
WASSEL	-1.77%	11.78%	-1.60%	1.60%	-6.56%	1.68%	0.00%	22.31%	13.69%	6.74%	1.08%	-1.08%	3.99%
R. AVRG	0.02%	1.41%	3.93%	-1.41%	-4.36%	2.44%	-0.22%	-1.31%	0.67%	-1.77%	-1.90%	4.48%	

Appendix (1.15): Monthly stocks returns, for the firms' sample, from April 2011 to March 2012

Company	11.Apr	11.May	11.Jun	11.Jul	11.Aug	11.Sep	11.Oct	11.Nov	11.Dec	12.Jan	12.Feb	12.Mar	R. AVRG
AIB	10.66%	-6.98%	-2.44%	0.00%	-1.24%	-5.13%	-5.41%	-2.82%	15.82%	0.00%	-2.47%	-9.16%	-0.76%
AIG	5.56%	-2.74%	-5.72%	-6.06%	-9.84%	3.39%	-6.90%	-3.64%	3.64%	6.90%	20.97%	-11.44%	-0.49%
ARE	0.00%	-5.31%	-3.70%	-5.83%	11.33%	-11.33%	1.98%	0.00%	-8.17%	8.17%	-4.00%	-10.76%	-2.30%
AZIZA	2.53%	-14.07%	-6.69%	-8.00%	8.00%	4.88%	-5.26%	-7.62%	2.06%	0.00%	-2.06%	-2.96%	-2.43%
BOP	7.31%	-19.05%	-0.99%	0.33%	-1.00%	0.00%	-0.67%	-4.81%	2.09%	-0.69%	4.08%	2.31%	-0.92%
BPC	0.27%	-10.84%	-0.60%	-3.08%	-0.63%	-3.85%	-3.66%	-1.71%	9.53%	-6.14%	-0.67%	-1.01%	-1.87%
GCOM	1.65%	-14.06%	-1.90%	-10.11%	-4.35%	-9.31%	36.40%	-7.02%	3.57%	-19.29%	6.19%	-10.54%	-2.40%
GMC	33.07%	12.74%	-8.00%	7.15%	0.00%	-1.74%	-3.57%	-5.61%	-2.93%	3.88%	-4.88%	0.00%	2.51%
ISBK	4.65%	-1.14%	2.27%	1.12%	-1.12%	-5.78%	-2.41%	-3.73%	6.14%	-1.20%	-3.68%	0.00%	-0.41%
JCC	3.00%	-27.51%	-14.31%	5.00%	-8.92%	0.00%	-6.90%	-10.54%	1.57%	-2.37%	-2.43%	-8.55%	-6.00%
JPH	-4.01%	0.20%	1.62%	-1.62%	-6.32%	8.34%	-6.19%	4.57%	-0.61%	-8.31%	6.45%	4.08%	-0.15%
LADAEN	-4.08%	-2.11%	-4.35%	-11.78%	16.13%	-8.89%	-9.76%	-8.00%	2.74%	0.00%	-5.56%	10.82%	-2.07%
NIC	-7.43%	0.00%	-2.90%	0.00%	7.10%	-7.10%	3.18%	-9.25%	18.23%	1.55%	6.21%	5.39%	1.25%
PADICO	13.79%	-8.70%	-4.22%	-0.87%	-2.64%	-1.80%	-5.61%	-3.92%	0.00%	4.88%	0.00%	1.89%	-0.60%
PALTEL	-7.90%	5.08%	-0.38%	1.33%	0.00%	0.00%	-2.48%	2.48%	-0.19%	1.69%	1.48%	1.27%	0.20%
PEC	-4.29%	-1.77%	-0.90%	0.90%	2.64%	-0.87%	-0.88%	1.75%	3.42%	1.67%	1.64%	1.61%	0.41%
PIIC	6.57%	-5.95%	9.36%	-5.16%	0.59%	2.31%	-7.10%	-11.70%	6.67%	-7.36%	-2.82%	-2.90%	-1.46%
PRICO	-8.70%	0.00%	-5.85%	-1.21%	-2.47%	-2.53%	-2.60%	0.00%	-8.22%	0.00%	10.82%	-2.60%	-1.95%
QUDS	0.96%	0.95%	-1.90%	-0.97%	0.00%	-2.96%	3.92%	-1.94%	0.00%	-1.98%	0.00%	-2.02%	-0.50%
RSR	4.62%	-4.62%	1.80%	2.47%	-2.47%	-2.90%	1.10%	-1.83%	3.64%	0.00%	0.00%	0.00%	0.15%
UCI	3.28%	-3.28%	-5.13%	11.58%	-1.57%	18.76%	-11.12%	-1.48%	4.38%	0.00%	13.35%	-1.26%	2.29%
WASSEL	-2.20%	-5.72%	-4.82%	0.00%	-5.06%	9.88%	-6.06%	0.00%	6.06%	-2.38%	0.00%	3.55%	-0.56%
WATANIYA	1.59%	-4.84%	-3.36%	4.18%	2.43%	-2.43%	-5.04%	-3.51%	14.13%	-8.07%	-2.55%	0.86%	-0.55%
R. AVRG	2.65%	-5.20%	-2.74%	-0.90%	0.03%	-0.83%	-1.96%	-3.49%	3.63%	-1.26%	1.74%	-1.37%	

Appendix (1.16): Monthly stocks returns**,** for the firms' sample, from April 2012 to March 2013

Company	12.Apr	12.May	12.Jun	12.Jul	12.Aug	12.Sep	12.Oct	12.Nov	12.Dec	13.Jan	13.Feb	13.Mar	R. AVRG
AIB	-2.78%	-1.42%	2.82%	4.08%	2.63%	6.29%	-1.23%	5.99%	6.74%	-3.32%	1.12%	3.28%	2.02%
AIG	-6.25%	-21.51%	-4.08%	-4.26%	-4.45%	-4.65%	13.35%	-13.35%	-4.88%	9.53%	-9.53%	0.00%	-4.17%
BOP	-7.44%	-6.52%	1.12%	-3.39%	-1.16%	0.77%	8.12%	-0.71%	6.57%	0.33%	4.56%	1.27%	0.29%
BPC	-1.37%	-6.02%	-6.41%	1.16%	0.00%	-1.94%	19.53%	1.60%	1.26%	-2.86%	-3.28%	1.00%	0.22%
GMC	-5.13%	-21.01%	0.00%	1.29%	-5.26%	9.04%	-3.77%	-10.82%	-1.44%	7.00%	-4.14%	6.81%	-2.29%
GUI	-16.55%	2.96%	1.92%	-4.88%	4.88%	15.82%	-5.00%	2.53%	0.00%	8.00%	7.41%	-5.88%	0.93%
ISBK	1.24%	1.23%	8.19%	-9.42%	2.44%	-1.21%	3.59%	12.17%	6.06%	0.98%	0.97%	1.90%	2.35%
JCC	-0.90%	-2.74%	1.83%	-0.91%	1.82%	-1.82%	-3.74%	-1.92%	0.97%	10.05%	2.58%	1.68%	0.57%
JPH	-11.20%	-5.05%	-4.82%	-0.50%	-0.75%	-0.75%	-0.51%	0.51%	0.50%	-0.25%	-3.06%	0.26%	-2.13%
NCI	-6.90%	-5.51%	7.28%	1.74%	3.39%	-5.13%	-13.10%	7.70%	1.83%	13.58%	-6.56%	9.68%	0.67%
NIC	-22.43%	-4.38%	-3.03%	1.53%	-3.08%	-2.21%	5.29%	7.30%	8.63%	-2.09%	-7.67%	-8.31%	-2.54%
PADICO	-0.94%	-12.01%	-3.24%	0.00%	-1.10%	0.00%	4.35%	-7.74%	3.39%	-2.25%	0.00%	-1.14%	-1.72%
PALTEL	-9.88%	-0.80%	-1.83%	-0.41%	-5.50%	8.14%	-1.82%	0.00%	4.98%	0.97%	-0.77%	1.54%	-0.45%
PEC	-8.34%	0.00%	1.72%	6.61%	6.20%	-5.41%	4.65%	-0.76%	5.21%	-2.20%	0.74%	1.46%	0.82%
PIBC	-4.26%	-1.09%	-3.35%	-2.30%	2.30%	-4.65%	3.51%	0.00%	4.50%	2.17%	-4.40%	-3.43%	-0.92%
PID	2.93%	-3.92%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.98%	-0.99%	0.00%
PIIC	-2.23%	-1.52%	4.48%	-6.80%	-3.98%	0.00%	0.81%	-4.12%	0.00%	-4.29%	-3.57%	5.31%	-1.33%
PRICO	2.60%	-13.72%	2.90%	0.00%	-2.90%	1.46%	1.44%	0.00%	0.00%	-4.38%	-1.50%	-9.53%	-1.97%
QUDS	-5.24%	1.07%	-1.07%	-2.17%	0.00%	-1.10%	-1.12%	-1.13%	2.25%	-8.10%	-3.68%	-1.26%	-1.80%
RSR	0.00%	0.00%	0.00%	-1.80%	3.57%	0.35%	1.39%	3.39%	0.00%	0.00%	1.65%	-1.32%	0.60%
TIC	-4.88%	0.00%	1.00%	-1.00%	1.00%	0.99%	-0.99%	-1.00%	2.96%	-0.98%	0.00%	5.72%	0.23%
WASSEL	-1.17%	0.00%	0.00%	0.00%	0.00%	-6.06%	0.00%	0.00%	6.06%	-2.38%	0.00%	-3.68%	-0.60%
WATANIYA	0.00%	-3.48%	-4.53%	4.53%	0.88%	-2.67%	8.63%	0.82%	4.02%	-8.20%	-2.60%	-2.67%	-0.44%
R. AVRG	-4.83%	-4.58%	0.04%	-0.73%	0.04%	0.23%	1.89%	0.02%	2.59%	0.49%	-1.29%	0.07%	

Appendix (1.17): Monthly stocks returns, for the firms' sample, from April 2013 to March 2014

Company	13.Apr	13.May	13.Jun	13.Jul	13.Aug	13.Sep	13.Oct	13.Nov	13.Dec	14.Jan	14.Feb	14.Mar	R. AVRG
ABRAJ	-4.21%	-3.28%	-4.55%	5.65%	0.00%	0.00%	0.00%	7.41%	4.98%	0.97%	-3.92%	-1.01%	0.17%
AHC	-14.20%	-1.71%	-10.92%	20.76%	30.70%	-9.65%	-13.53%	-13.98%	36.00%	-15.03%	-27.87%	-11.33%	-2.56%
AIB	7.26%	1.00%	-1.00%	0.00%	0.00%	0.00%	4.88%	14.18%	-5.09%	1.72%	-1.72%	-2.64%	1.55%
AIG	-5.13%	5.13%	-5.13%	-5.41%	-11.78%	6.06%	5.72%	-11.78%	0.00%	-13.35%	0.00%	0.00%	-2.97%
BOP	-9.91%	-2.82%	-0.36%	0.00%	1.42%	1.75%	1.38%	4.68%	4.47%	-0.63%	2.18%	-2.81%	-0.05%
BPC	-9.70%	-3.70%	-1.14%	3.01%	0.00%	5.41%	2.77%	3.36%	0.00%	1.96%	1.61%	1.89%	0.45%
GCOM	-6.67%	-18.92%	-13.35%	0.00%	4.65%	0.00%	-9.53%	-10.54%	0.00%	10.54%	-5.13%	-11.12%	-5.01%
GUI	-0.76%	1.52%	-0.75%	2.25%	0.00%	0.00%	3.64%	0.71%	3.48%	0.00%	25.81%	8.61%	3.71%
ISBK	-2.87%	3.81%	5.46%	-3.60%	4.49%	-2.67%	5.26%	17.95%	9.53%	-4.65%	0.00%	-5.60%	2.26%
JCC	5.67%	3.10%	-14.78%	0.88%	-5.41%	-0.93%	3.67%	-1.82%	0.91%	-2.77%	-10.85%	-8.70%	-2.58%
JPH	-49.46%	-1.71%	-5.31%	-4.65%	0.00%	-3.39%	-0.49%	0.99%	2.90%	-3.39%	-0.99%	-0.50%	-5.50%
NCI	-6.35%	3.23%	1.57%	10.38%	-1.42%	-4.38%	11.28%	15.98%	3.35%	7.41%	1.02%	-4.12%	3.16%
NIC	0.92%	-0.31%	-1.55%	1.86%	2.72%	-3.65%	0.62%	1.53%	8.70%	0.00%	-5.42%	1.17%	0.55%
PADICO	3.39%	-2.25%	-1.14%	18.81%	-0.96%	-1.94%	0.98%	26.31%	0.74%	28.77%	1.10%	-5.07%	5.73%
PALTEL	-9.19%	1.45%	-1.04%	4.88%	-1.00%	0.40%	2.56%	9.11%	2.97%	14.13%	-2.73%	-14.19%	0.61%
PEC	-5.97%	0.00%	0.77%	3.01%	0.00%	2.20%	0.00%	0.72%	2.14%	2.09%	-2.09%	7.46%	0.86%
PIBC	-4.76%	3.59%	4.60%	1.12%	-2.25%	1.13%	-3.43%	3.43%	-1.13%	-3.47%	6.82%	0.00%	0.47%
PID	0.99%	-1.98%	0.00%	1.98%	1.94%	0.96%	0.00%	-1.92%	-1.96%	-1.00%	0.00%	4.88%	0.32%
PIIC	2.55%	0.00%	5.72%	16.77%	-4.11%	8.06%	11.56%	14.42%	2.46%	2.87%	1.41%	-4.76%	4.75%
PRICO	-1.68%	9.68%	3.03%	2.94%	-13.98%	-3.39%	3.39%	11.03%	-1.50%	10.08%	-10.08%	-11.21%	-0.14%
QUDS	-2.56%	-1.31%	-1.32%	1.32%	11.19%	0.00%	2.33%	13.93%	-1.01%	0.00%	1.01%	0.00%	1.96%
RSR	2.95%	3.17%	0.00%	-3.17%	-3.28%	3.60%	1.28%	3.13%	0.00%	-1.55%	0.00%	0.00%	0.51%
TNB	-3.51%	2.35%	-2.35%	2.35%	-1.17%	0.00%	5.72%	18.23%	8.00%	16.51%	-8.31%	-7.35%	2.54%
UCI	-1.71%	-3.51%	0.00%	-5.51%	-16.36%	2.20%	-2.20%	2.20%	-4.45%	0.00%	-2.30%	0.00%	-2.64%
VOIC	4.79%	0.00%	0.00%	0.00%	4.75%	-1.98%	6.68%	1.18%	9.61%	6.64%	6.90%	2.63%	3.43%
WASSEL	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.06%	-4.82%	2.44%	0.00%	0.31%
WATANIYA	-1.82%	-0.92%	-4.74%	0.97%	-1.94%	-0.99%	-1.00%	5.83%	-3.85%	0.00%	-1.98%	-3.05%	-1.12%
R. AVRG	-4.15%	-0.16%	-1.79%	2.84%	-0.07%	-0.04%	1.61%	5.05%	3.23%	1.96%	-1.23%	-2.47%	

Appendix (1.18): Monthly stocks returns, for the firms' sample, from April 2014 to March 2015

Company	14.Apr	14.May	14.Jun	14.Jul	14.Aug	14.Sep	14.Oct	14.Nov	14.Dec	15.Jan	15.Feb	15.Mar	R. AVRG
ABRAJ	0.00%	0.00%	-14.08%	-3.55%	-10.14%	-5.48%	13.18%	10.54%	12.52%	3.85%	-5.83%	0.00%	0.08%
AIB	-5.51%	0.94%	2.77%	0.00%	-1.83%	3.64%	-0.90%	-0.90%	0.90%	-3.67%	4.57%	6.90%	0.57%
AIG	13.35%	-13.35%	-7.41%	7.41%	0.00%	0.00%	13.35%	-6.45%	-6.90%	-7.41%	7.41%	0.00%	0.00%
APIC	-15.29%	1.72%	-8.00%	0.92%	0.91%	-0.91%	-0.92%	0.92%	-1.85%	1.85%	1.82%	-0.90%	-1.64%
BOP	-8.59%	0.00%	-3.51%	-0.36%	0.36%	1.07%	-1.07%	-0.72%	0.72%	0.00%	-0.72%	-0.72%	-1.13%
BPC	-6.45%	1.65%	-1.65%	1.65%	1.95%	1.28%	0.32%	-5.20%	9.53%	-4.65%	1.57%	0.00%	0.00%
GCOM	-12.52%	-14.31%	-8.00%	8.00%	-26.24%	-10.54%	10.54%	-51.08%	28.77%	0.00%	-13.35%	13.35%	-6.28%
GMC	-2.56%	-9.53%	0.00%	18.23%	-11.33%	7.70%	-5.06%	-3.97%	-1.36%	-7.10%	0.00%	9.80%	-0.43%
GUI	-19.21%	2.90%	-2.90%	2.90%	5.56%	1.61%	1.06%	-1.06%	0.00%	0.00%	1.06%	-12.31%	-1.70%
ISBK	-14.70%	0.00%	0.00%	-2.53%	4.18%	4.02%	0.00%	-3.20%	-1.64%	-3.36%	5.81%	-1.63%	-1.09%
JCC	5.53%	-8.99%	4.60%	1.12%	-5.72%	-1.18%	2.35%	-3.55%	8.10%	-4.55%	-13.69%	-8.34%	-2.03%
JPH	-0.50%	-0.50%	-2.04%	-1.04%	-1.05%	-0.53%	-4.88%	-5.72%	0.00%	-2.38%	1.20%	6.90%	-0.88%
NAPCO	-8.92%	0.00%	0.00%	0.00%	-6.90%	6.90%	0.00%	2.63%	-2.63%	3.92%	2.53%	22.31%	1.65%
PADICO	-15.61%	1.34%	-3.39%	2.72%	8.98%	-3.75%	-9.34%	-15.88%	10.86%	-4.51%	-2.33%	0.00%	-2.58%
PALTEL	-3.06%	3.94%	-5.23%	0.19%	2.91%	-2.91%	0.74%	-0.92%	5.41%	1.74%	1.03%	-12.92%	-0.76%
PHARMACARE	0.00%	-3.87%	0.00%	-1.32%	1.06%	-0.53%	-0.27%	-0.53%	0.00%	0.00%	-1.35%	-0.82%	-0.64%
PIIC	1.93%	-9.53%	-0.53%	-4.88%	13.01%	-10.27%	4.75%	2.54%	-3.58%	-2.64%	3.67%	-4.75%	-0.86%
PRICO	0.00%	0.00%	-1.71%	3.39%	1.65%	-1.65%	-6.90%	-5.51%	0.00%	-12.01%	-4.35%	-2.25%	-2.44%
QUDS	-3.05%	-5.29%	-9.10%	0.00%	6.90%	-2.25%	3.35%	3.24%	3.14%	1.03%	0.00%	5.94%	0.33%
TNB	3.33%	-4.18%	0.85%	-5.22%	1.77%	1.74%	-0.87%	-2.64%	14.13%	-8.91%	-1.71%	11.39%	0.81%
UCI	-2.35%	0.00%	-2.41%	4.76%	-2.35%	-2.41%	2.41%	-2.41%	-2.47%	-5.13%	-2.67%	2.67%	-1.03%
WATANIYA	-10.88%	-3.51%	-4.88%	3.68%	1.20%	-4.88%	-9.16%	-4.20%	19.42%	-18.00%	-7.30%	-4.65%	-3.60%
R. AVRG	-4.77%	-2.75%	-3.03%	1.64%	-0.69%	-0.88%	0.58%	-4.28%	4.23%	-3.27%	-1.03%	1.36%	

Appendix (1.19): Book value of equity, for the firms' sample, as in 31/12 from 2007 to 2014

#	Company	Market to Book Value as in 31/12 Each Year t = M/B Ratio							
		2007	2008	2009	2010	2011	2012	2013	2014
1	ABRAJ	NA	NA	NA	NA	NA	NA	0.92	0.90
2	AHC	1.05	0.80	0.93	0.98	NA	NA	0.90	NA
3	AIB	1.75	0.88	0.94	0.76	0.69	0.77	0.90	0.82
4	AIG	3.70	2.45	2.13	1.23	0.70	0.63	0.40	0.36
5	APIC	NA	NA	NA	NA	NA	NA	NA	0.83
6	ARAB	NA	NA	0.79	NA	NA	NA	NA	NA
7	ARE	0.67	0.37	0.50	0.69	0.44	NA	NA	NA
8	AZIZA	NA	NA	0.86	1.59	1.80	NA	NA	NA
9	BOP	2.06	1.86	2.50	2.08	1.80	1.82	1.91	1.60
10	BPC	2.42	1.73	1.60	1.43	1.31	1.23	1.08	1.15
11	GCOM	NA	NA	NA	1.06	0.89	NA	0.28	0.15
12	GMC	0.97	0.80	0.78	0.67	0.89	0.63	NA	0.68
13	GUI	NA	NA	NA	NA	NA	0.76	0.91	1.33
14	ISBK	NA	NA	NA	0.77	0.74	0.83	1.21	0.90
15	JCC	2.30	2.25	1.63	1.24	0.75	0.55	0.61	0.60
16	JPH	1.53	1.03	1.04	1.05	1.04	1.03	0.99	0.85
17	LADAEN	0.84	NA	0.50	NA	0.76	NA	NA	NA
18	NAPCO	NA	NA	NA	NA	NA	NA	NA	0.50
19	NCI	0.51	0.39	0.40	0.64	NA	0.50	0.79	NA
20	NIC	NA	2.39	2.20	1.96	1.88	1.97	1.66	NA
21	NSC	NA	NA	0.48	0.87	NA	NA	NA	NA
22	PADICO	1.68	0.87	0.82	0.75	0.62	0.56	0.81	0.78
23	PALTEL	2.34	NA	1.93	1.78	1.62	1.48	1.52	1.44
24	PCB	0.97	0.95	0.92	0.75	NA	NA	NA	NA
25	PEC	0.85	0.55	0.83	0.90	0.91	1.03	1.08	NA
26	PHARMACARE	NA	NA	NA	NA	NA	NA	NA	1.46
27	PIBC	1.11	1.26	0.79	0.81	NA	0.73	0.69	NA
28	PID	1.61	1.57	NA	1.84	NA	1.73	1.65	NA
29	PIIC	0.72	0.37	0.58	0.86	1.15	0.86	1.26	1.23
30	PLAZA	NA	0.50	NA	NA	NA	NA	NA	NA
31	PRICO	0.88	0.56	0.66	0.60	0.53	0.57	0.55	0.45
32	QUDS	1.33	1.02	1.29	1.18	0.93	0.78	0.76	0.69
33	RSR	NA	NA	NA	NA	1.00	1.08	1.10	NA
34	TIC	NA	NA	NA	NA	NA	0.96	NA	NA
35	TNB	NA	0.76	0.76	0.74	NA	NA	1.06	1.14
36	UCI	0.92	0.57	0.54	0.50	0.57	NA	0.36	0.32
37	VOIC	NA	0.95	1.04	1.21	NA	NA	1.51	NA
38	WASSEL	NA	0.73	0.56	0.86	1.21	1.51	1.48	NA
39	WATANIYA	NA	NA	NA	NA	2.44	2.91	2.88	2.93

Appendix (1.20): Market value of equity, for the firms' sample, as in 31/3 from 2008 to 2015

#	Company	Market Capitalization$ as in 31/3 Each Year t+1 = MVE							
		2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
1	ABRAJ	NA	NA	NA	NA	NA	NA	10,890,000	11,000,000
2	AHC	24,558,927*	22,452,349*	33,145,269*	30,324,395*	NA	NA	13,876,696*	NA
3	AIB	67,543,837	55,286,408	45,987,541	38,137,987	34,800,913	44,335,410	56,000,000	60,000,000
4	AIG	45,095,277	29,479,426	23,449,544	11,724,772	11,054,785	8,000,000	5,600,000	5,600,000
5	APIC	NA	NA	NA	NA	NA	NA	NA	66,000,000
6	ARAB	NA	NA	7,999,148*	NA	NA	NA	NA	NA
7	ARE	736,612*	495,189*	896,694*	776,243*	588,874*	NA	NA	NA
8	AZIZA	NA	NA	24,118,473*	52,806,761*	44,168,117*	NA	NA	NA
9	BOP	249,239,803	301,195,307	368,000,000	343,000,000	368,400,000	426,120,000	474,000,000	441,600,000
10	BPC	80,578,687*	68,094,499*	69,118,465*	62,974,602*	54,365,474*	55,946,205*	59,168,563**	59,209,040
11	GCOM	NA	NA	NA	5,857,213	4,392,909	NA	951,249	447,647
12	GMC	18,842,625*	17,983,075*	15,232,720*	15,655,851*	21,156,555*	16,078,982*	NA	15,867,416*
13	GUI	NA	NA	NA	NA	NA	8,167,500	12,746,250	13,440,000
14	ISBK	NA	NA	NA	38,658,199	36,817,332	50,002,539	69,500,000	61,000,000
15	JCC	35,469,301*	32,877,292*	28,730,602*	22,708,036*	15,796,894*	16,925,244*	12,411,846*	9,732,015*
16	JPH	36,132,675*	31,382,229*	29,407,611*	35,895,622*	35,260,925*	32,750,347*	34,120,000**	30,708,000
17	LADAEN	6,026,817*	NA	2,764,457*	NA	3,850,493*	NA	NA	NA
18	NAPCO	NA	NA	NA	NA	NA	NA	NA	9,732,015*
19	NCI	2,752,294*	1,974,612*	1,974,612*	4,513,398*	NA	3,250,000**	4,750,000	NA
20	NIC	NA	32,000,000	36,500,000	37,700,000	43,800,000	38,760,000	41,400,000	NA

#	Company	Market Capitalization$ as in 31/3 Each Year t+1 = MVE							
		2008	2009	2010	2011	2012	2013	2014	2015
21	NSC	NA	NA	4,482,105*	4,526,926*	NA	NA	NA	NA
22	PADICO	625,000,000	332,500,000	327,500,000	287,500,000	267,500,000	217,500,000	432,500,000	317,500,000
23	PALTEL	1,289,311,927*	NA	961,660,629*	1,002,503,358*	1,026,637,699*	972,799,544*	1,047,059,070*	956,091,169*
24	PCB	14,400,000	20,717,979	23,120,063	24,020,845	NA	NA	NA	NA
25	PEC	63,600,000	57,600,000	65,400,000	71,400,000	75,000,000	82,800,000	91,800,000	NA
26	PHARMACARE	NA	NA	NA	NA	NA	NA	NA	30,973,200
27	PIBC	60,400,000	56,000,000	48,800,000	52,000,000	NA	45,580,000	48,230,000	NA
28	PID	6,285,371*	6,827,107*	NA	6,690,564*	NA	6,895,377*	7,168,461*	NA
29	PIIC	20,906,845*	10,842,736*	20,892,098*	42,842,024*	35,966,144*	30,677,004*	54,213,673*	48,924,534*
30	PLAZA	NA	3,828,491*	NA	NA	NA	NA	NA	NA
31	PRICO	70,183,486*	44,693,230*	51,569,103*	65,772,817*	52,070,147*	53,959,781*	53,060,452*	39,570,507*
32	QUDS	64,000,000	40,000,000	57,500,000	52,000,000	49,000,000	39,500,000	50,000,000	52,000,000
33	RSR	NA	NA	NA	NA	11,847,671*	12,736,246*	16,298,094*	NA
34	TIC	NA	NA	NA	NA	NA	9,180,000	NA	NA
35	TNB	NA	18,000,000	25,500,000	22,200,000	NA	NA	59,000,000	97,500,000
36	UCI	34,800,000	24,800,000	28,800,000	24,000,000	31,600,000	NA	13,760,000	12,160,000
37	VOIC	NA	9,590,973*	14,386,457*	16,078,982*	NA	NA	43,441,460*	NA
38	WASSEL	NA	5,592,384*	5,225,669*	8,434,413*	7,884,343*	7,334,272*	7,609,308*	NA
39	WATANIYA	NA	NA	NA	NA	301,860,000	286,380,000	250,260,000	162,540,000

Note: * Means that this company traded in Jordanian Dinars (JD), and ** means that this company converted its trading currency from JD to US$.In addition, NA means that not applicable due to non listing, or excluded due to uncompleted required data. NA means that not included due to mergers.

Appendix (1.21): Al-Quds index monthly returns from April 2007 to March 2015

M / Y	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-17.49%	-3.67%	1.11%	-6.12%	-7.19%	14.76%	-1.42%	2.38%	0.97%	12.27%	0.60%	8.86%
8-9	8.59%	-2.45%	-1.17%	1.98%	-6.14%	-2.40%	-17.96%	-24.08%	4.19%	14.43%	0.03%	0.83%
9-10	0.60%	-1.10%	2.47%	-7.12%	1.96%	0.09%	0.25%	0.39%	-1.83%	1.89%	4.43%	-4.28%
10-11	-0.29%	-2.04%	4.82%	-2.82%	-1.95%	2.39%	-2.46%	-2.18%	1.80%	-0.02%	-1.51%	3.17%
11-12	-0.29%	0.51%	-1.23%	0.42%	-0.76%	-0.58%	-2.80%	-0.62%	1.09%	-0.16%	1.26%	0.93%
12-13	-4.05%	-3.85%	-1.28%	-0.39%	-2.25%	3.04%	2.89%	-0.55%	4.55%	-1.14%	-0.14%	0.31%
13-14	-3.48%	0.03%	-0.98%	4.46%	-0.93%	0.29%	1.89%	10.05%	2.18%	10.03%	-1.31%	-7.45%
14-15	-5.54%	0.82%	-3.95%	0.46%	3.18%	-2.00%	-2.09%	-3.69%	5.90%	-2.04%	-0.48%	-4.95%

Appendix (1.22): Monthly returns on small and value portfolio - SV, C.FF3 model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.0103	-0.1250	-0.0450	-0.0317	-0.0416	0.0052	0.0006	0.0287	0.0103	-0.0361	-0.0156	-0.0067
8-9	0.0071	-0.0108	0.0070	0.0018	-0.0444	-0.0495	-0.0788	-0.1301	-0.0049	0.0658	-0.0684	-0.0366
9-10	0.0064	0.0307	-0.0229	-0.0087	0.0462	0.1146	-0.0162	-0.0015	-0.0254	0.0053	0.0143	0.0847
10-11	0.0307	0.0270	0.0354	-0.0134	-0.0394	0.0117	0.0034	-0.0126	0.0036	0.0122	-0.0181	0.0739
11-12	0.0664	-0.0615	-0.0569	-0.0126	0.0019	-0.0178	-0.0066	-0.0489	0.0258	-0.0034	0.0265	-0.0511
12-13	-0.0715	-0.0956	0.0139	-0.0140	0.0008	0.0265	-0.0245	-0.0317	-0.0070	0.0963	-0.0205	0.0246
13-14	-0.0417	-0.0181	-0.0599	0.0363	0.0005	-0.0084	-0.0012	-0.0148	0.0554	-0.0153	-0.0291	-0.0346
14-15	-0.0107	-0.0660	-0.0213	0.0613	-0.0727	-0.0017	0.0238	-0.1005	0.0336	-0.0461	-0.0344	0.0536

Appendix (1.23): Monthly returns on small and growth portfolio - SG, C.FF3 model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.0681	-0.0222	-0.0341	-0.0684	-0.1671	0.0831	0.0322	0.0963	0.0173	-0.0375	-0.0028	0.0237
8-9	0.0059	0.0309	0.0472	-0.0059	-0.0291	-0.0617	-0.0633	-0.0584	0.0352	-0.0419	0.0048	0.0123
9-10	0.0107	0.0456	0.0366	-0.0373	0.0640	0.0710	0.0054	0.0184	0.0418	-0.0199	0.0254	0.0262
10-11	-0.0341	-0.0297	0.0283	-0.0098	-0.0945	0.0591	0.0018	-0.0062	-0.0085	-0.0628	-0.0639	-0.0071
11-12	-0.0053	-0.0338	-0.0047	0.0028	-0.0462	0.0511	-0.0372	0.0091	0.0303	-0.0356	0.0215	0.0254
12-13	-0.0276	-0.0175	0.0011	-0.0168	-0.0003	-0.0091	0.0012	-0.0020	0.0159	-0.0132	-0.0050	0.0088
13-14	-0.0892	-0.0016	-0.0137	-0.0080	0.0028	-0.0050	0.0028	0.0074	0.0314	-0.0215	-0.0079	0.0111
14-15	-0.0493	-0.0037	-0.0475	-0.0075	-0.0114	-0.0123	0.0227	0.0081	0.0313	0.0037	-0.0123	-0.0156

Appendix (1.24): Monthly returns on big and value portfolio - BV, C.FF3 model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.0926	-0.0522	0.0424	-0.0979	0.0000	0.0912	-0.0461	-0.0140	-0.0093	0.0256	-0.0435	-0.0136
8-9	0.0207	-0.0405	0.0109	-0.0135	-0.0920	-0.0668	-0.1455	-0.1880	-0.0055	0.1435	0.0216	-0.0385
9-10	0.0298	-0.0547	-0.0074	-0.0223	0.0073	0.0774	-0.0315	-0.0123	0.0218	-0.0026	0.0062	0.0233
10-11	0.0054	0.0476	0.0576	-0.0016	-0.0488	-0.0057	-0.0199	-0.0244	-0.0259	-0.0052	-0.0007	0.0724
11-12	0.0325	-0.0328	-0.0260	-0.0032	-0.0208	-0.0337	-0.0354	-0.0255	-0.0070	0.0123	0.0238	-0.0024
12-13	-0.0156	-0.0432	0.0104	-0.0163	0.0056	0.0013	0.0176	0.0155	0.0382	-0.0248	-0.0125	-0.0170
13-14	0.0033	0.0214	0.0083	0.0484	-0.0120	-0.0084	0.0163	0.1378	-0.0160	0.0742	-0.0057	-0.0379
14-15	-0.0986	-0.0032	-0.0443	0.0091	0.0374	-0.0082	-0.0195	-0.0316	0.0326	-0.0133	0.0101	0.0298

Appendix (1.25): Monthly returns on big and growth portfolio - BG, C.FF3 model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.1526	-0.0191	-0.0056	-0.1178	-0.0784	0.1145	-0.0470	0.0328	0.0082	-0.0001	0.0277	0.0287
8-9	-0.0598	-0.0090	0.0013	0.0182	-0.0421	-0.0078	-0.1026	-0.0708	0.0193	0.0353	-0.0408	0.0170
9-10	-0.0555	-0.0102	0.0067	-0.0357	0.0131	0.0546	0.0175	0.0039	0.0298	0.0074	0.0285	-0.0457
10-11	-0.0086	0.0089	0.0378	-0.0275	-0.0058	0.0337	0.0025	-0.0101	0.0457	-0.0232	0.0000	0.0339
11-12	-0.0004	-0.0561	-0.0093	-0.0116	0.0213	-0.0111	-0.0200	-0.0403	0.0622	-0.0215	0.0059	0.0028
12-13	-0.0824	-0.0353	-0.0216	0.0167	-0.0044	-0.0055	0.0740	0.0138	0.0511	-0.0234	-0.0150	-0.0095
13-14	-0.0396	0.0002	0.0026	0.0304	0.0027	0.0135	0.0388	0.0839	0.0393	0.0432	-0.0034	-0.0286
14-15	-0.0549	-0.0166	-0.0214	-0.0107	0.0363	-0.0142	-0.0075	-0.0205	0.0628	-0.0512	0.0034	-0.0190

Appendix (1.26): Monthly excess returns on small and value portfolio - SV- rft, C.FF3 model, from April 2007 to March 2015

M / Y	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.0652	-0.1781	-0.1086	-0.0853	-0.1213	-0.0520	-0.0606	-0.0243	-0.0380	-0.0877	-0.0554	-0.0540
8-9	-0.0339	-0.0343	-0.0212	-0.0275	-0.0702	-0.0927	-0.1001	-0.1354	-0.0077	0.0642	-0.0713	-0.0502
9-10	0.0038	0.0243	-0.0290	-0.0171	0.0328	0.1071	-0.0181	-0.0096	-0.0330	0.0029	0.0126	0.0827
10-11	0.0278	0.0233	0.0301	-0.0207	-0.0447	-0.0045	-0.0041	-0.0159	0.0012	-0.0096	-0.0247	0.0718
11-12	0.0649	-0.0629	-0.0596	-0.0176	-0.0013	-0.0264	-0.0099	-0.0554	0.0201	-0.0098	0.0239	-0.0551
12-13	-0.0729	-0.0971	0.0123	-0.0198	-0.0159	0.0108	-0.0261	-0.0333	-0.0087	0.0835	-0.0220	0.0230
13-14	-0.0432	-0.0205	-0.0649	0.0326	-0.0044	-0.0140	-0.0104	-0.0158	0.0416	-0.0190	-0.0299	-0.0355
14-15	-0.0116	-0.0669	-0.0258	0.0450	-0.0790	-0.0043	0.0229	-0.1022	0.0260	-0.0473	-0.0356	0.0464

Appendix (1.27): Monthly excess returns on small and growth portfolio - SG- rft, C.FF3 model, from April 2007 to March 2015

M / Y	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.1231	-0.0754	-0.0978	-0.1220	-0.2469	0.0260	-0.0291	0.0433	-0.0310	-0.0891	-0.0426	-0.0236
8-9	-0.0351	0.0074	0.0189	-0.0353	-0.0550	-0.1049	-0.0846	-0.0637	0.0324	-0.0435	0.0018	-0.0014
9-10	0.0081	0.0392	0.0305	-0.0457	0.0505	0.0635	0.0035	0.0103	0.0342	-0.0223	0.0237	0.0241
10-11	-0.0370	-0.0334	0.0230	-0.0172	-0.0998	0.0429	-0.0056	-0.0096	-0.0109	-0.0847	-0.0706	-0.0092
11-12	-0.0068	-0.0351	-0.0073	-0.0022	-0.0494	0.0425	-0.0405	0.0026	0.0246	-0.0420	0.0189	0.0215
12-13	-0.0291	-0.0190	-0.0005	-0.0226	-0.0169	-0.0248	-0.0003	-0.0036	0.0142	-0.0260	-0.0066	0.0073
13-14	-0.0907	-0.0041	-0.0187	-0.0117	-0.0021	-0.0106	-0.0064	0.0064	0.0176	-0.0253	-0.0088	0.0102
14-15	-0.0502	-0.0046	-0.0520	-0.0238	-0.0177	-0.0149	0.0218	0.0064	0.0237	0.0025	-0.0135	-0.0228

Appendix (1.28): Monthly excess returns on big and value portfolio - BV- rft, C.FF3 model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.1476	-0.1053	-0.0213	-0.1515	-0.0797	0.0340	-0.1074	-0.0671	-0.0576	-0.0260	-0.0833	-0.0609
8-9	-0.0203	-0.0640	-0.0174	-0.0429	-0.1178	-0.1100	-0.1668	-0.1933	-0.0083	0.1418	0.0186	-0.0522
9-10	0.0272	-0.0611	-0.0135	-0.0308	-0.0062	0.0699	-0.0334	-0.0204	0.0141	-0.0050	0.0045	0.0212
10-11	0.0025	0.0440	0.0523	-0.0089	-0.0541	-0.0218	-0.0274	-0.0278	-0.0283	-0.0271	-0.0073	0.0703
11-12	0.0310	-0.0341	-0.0287	-0.0082	-0.0240	-0.0423	-0.0387	-0.0320	-0.0126	0.0059	0.0212	-0.0063
12-13	-0.0171	-0.0448	0.0088	-0.0221	-0.0111	-0.0144	0.0160	0.0139	0.0366	-0.0377	-0.0140	-0.0185
13-14	0.0017	0.0190	0.0034	0.0447	-0.0169	-0.0141	0.0070	0.1367	-0.0297	0.0705	-0.0066	-0.0387
14-15	-0.0995	-0.0041	-0.0488	-0.0072	0.0311	-0.0108	-0.0204	-0.0333	0.0251	-0.0145	0.0089	0.0226

Appendix (1.29): Monthly excess returns on big and growth portfolio - BG- rft, C.FF3 model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.2075	-0.0722	-0.0693	-0.1714	-0.1582	0.0574	-0.1083	-0.0203	-0.0401	-0.0518	-0.0120	-0.0187
8-9	-0.1008	-0.0325	-0.0270	-0.0111	-0.0679	-0.0510	-0.1239	-0.0761	0.0165	0.0337	-0.0438	0.0033
9-10	-0.0581	-0.0166	0.0005	-0.0441	-0.0004	0.0470	0.0156	-0.0042	0.0221	0.0050	0.0267	-0.0477
10-11	-0.0115	0.0052	0.0325	-0.0349	-0.0112	0.0175	-0.0050	-0.0134	0.0433	-0.0451	-0.0066	0.0319
11-12	-0.0019	-0.0574	-0.0120	-0.0166	0.0181	-0.0197	-0.0233	-0.0468	0.0565	-0.0279	0.0033	-0.0011
12-13	-0.0839	-0.0369	-0.0232	0.0109	-0.0211	-0.0212	0.0725	0.0122	0.0495	-0.0363	-0.0166	-0.0111
13-14	-0.0411	-0.0022	-0.0024	0.0267	-0.0022	0.0079	0.0296	0.0828	0.0255	0.0395	-0.0042	-0.0295
14-15	-0.0558	-0.0175	-0.0258	-0.0269	0.0300	-0.0168	-0.0085	-0.0222	0.0553	-0.0524	0.0022	-0.0262

Appendix (1.30): Monthly size premium, SMB.v, C.FF3 model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	0.0834	-0.0380	-0.0579	0.0578	-0.0651	-0.0587	0.0630	0.0532	0.0144	-0.0495	-0.0013	0.0010
8-9	0.0260	0.0348	0.0210	-0.0044	0.0303	-0.0183	0.0530	0.0352	0.0083	-0.0775	-0.0222	-0.0014
9-10	0.0214	0.0706	0.0072	0.0060	0.0449	0.0268	0.0016	0.0127	-0.0176	-0.0097	0.0025	0.0666
10-11	-0.0001	-0.0296	-0.0159	0.0029	-0.0396	0.0214	0.0113	0.0078	-0.0123	-0.0111	-0.0407	-0.0198
11-12	0.0146	-0.0032	-0.0132	0.0026	-0.0224	0.0391	0.0058	0.0130	0.0004	-0.0149	0.0091	-0.0131
12-13	-0.0005	-0.0173	0.0131	-0.0156	-0.0004	0.0108	-0.0575	-0.0315	-0.0402	0.0657	0.0010	0.0300
13-14	-0.0473	-0.0207	-0.0423	-0.0253	0.0063	-0.0092	-0.0268	-0.1145	0.0317	-0.0771	-0.0139	0.0215
14-15	0.0468	-0.0249	-0.0016	0.0277	-0.0789	0.0042	0.0368	-0.0202	-0.0153	0.0110	-0.0301	0.0136

Appendix (1.31): Monthly value premium, VMG.s, C.FF3 model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	0.0589	-0.0679	0.0186	0.0283	0.1020	-0.0506	-0.0153	-0.0572	-0.0122	0.0136	-0.0420	-0.0363
8-9	0.0409	-0.0366	-0.0152	-0.0120	-0.0326	-0.0234	-0.0291	-0.0945	-0.0325	0.1079	-0.0054	-0.0522
9-10	0.0405	-0.0297	-0.0368	0.0210	-0.0118	0.0332	-0.0353	-0.0180	-0.0376	0.0076	-0.0167	0.0638
10-11	0.0394	0.0477	0.0135	0.0112	0.0061	-0.0434	-0.0104	-0.0103	-0.0297	0.0465	0.0226	0.0597
11-12	0.0523	-0.0022	-0.0345	-0.0035	0.0030	-0.0457	0.0076	-0.0216	-0.0368	0.0330	0.0114	-0.0409
12-13	0.0115	-0.0430	0.0224	-0.0151	0.0055	0.0212	-0.0411	-0.0140	-0.0179	0.0540	-0.0065	0.0042
13-14	0.0452	0.0024	-0.0202	0.0311	-0.0085	-0.0127	-0.0133	0.0159	-0.0156	0.0186	-0.0117	-0.0275
14-15	-0.0026	-0.0244	0.0016	0.0443	-0.0301	0.0083	-0.0054	-0.0598	-0.0139	-0.0059	-0.0077	0.0590

Appendix (1.32): Monthly returns on small and illiquid portfolio - SI, S.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	0.0175	-0.1147	-0.0673	-0.0207	-0.0349	0.0009	0.0161	0.0486	0.0010	-0.0394	-0.0071	-0.0117
8-9	-0.0200	0.0033	0.0197	0.0168	-0.0201	-0.0679	-0.0538	-0.0935	0.0198	-0.0033	-0.0309	0.0000
9-10	0.0154	0.1153	-0.0358	0.0101	0.0103	0.0786	0.0206	0.0102	-0.0029	-0.0049	0.0022	0.0716
10-11	-0.0150	0.0084	-0.0137	0.0170	-0.0111	0.0384	-0.0052	-0.0046	-0.0032	-0.0322	-0.0009	0.0090
11-12	0.0247	-0.0805	-0.0554	0.0024	-0.0134	0.0207	-0.0672	-0.0510	0.0319	0.0091	0.0527	-0.0209
12-13	-0.0964	-0.0070	-0.0097	-0.0179	0.0138	0.0300	-0.0184	0.0101	0.0219	0.0179	0.0145	-0.0310
13-14	-0.1128	-0.0091	-0.0385	0.0431	0.0557	-0.0278	-0.0163	-0.0056	0.1035	-0.0371	-0.0166	-0.0051
14-15	-0.0344	-0.0244	-0.0206	0.0319	-0.0352	0.0062	0.0085	-0.0048	0.0177	-0.0263	-0.0304	0.0138

Appendix (1.33): Monthly returns on small and liquid portfolio - SL, S.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.0612	-0.0942	-0.0183	-0.0574	-0.0984	0.0406	-0.0022	0.0358	0.0225	-0.0333	-0.0190	0.0104
8-9	0.0443	-0.0054	0.0133	-0.0238	-0.0692	-0.0310	-0.1045	-0.1384	-0.0154	0.0979	-0.0769	-0.0585
9-10	0.0029	-0.0147	0.0149	-0.0347	0.0775	0.1153	-0.0284	0.0011	-0.0059	-0.0010	0.0274	0.0636
10-11	0.0164	-0.0016	0.0669	-0.0335	-0.1019	0.0273	0.0087	-0.0138	-0.0003	-0.0107	-0.0654	0.0618
11-12	0.0653	-0.0319	-0.0321	-0.0174	-0.0094	-0.0155	0.0286	-0.0181	0.0229	-0.0299	0.0022	-0.0380
12-13	-0.0292	-0.0703	0.0131	-0.0147	-0.0049	-0.0015	-0.0076	-0.0252	-0.0007	0.0436	-0.0220	0.0336
13-14	-0.0147	-0.0140	-0.0453	-0.0012	-0.0452	0.0107	0.0146	-0.0068	-0.0031	-0.0010	-0.0247	-0.0272
14-15	0.0011	-0.0939	-0.0582	0.0479	-0.0909	-0.0369	0.0634	-0.2108	0.0729	-0.0326	-0.0158	0.0675

Appendix (1.34): Monthly returns on big and illiquid portfolio - BI, S.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.1011	-0.0660	0.0093	-0.0915	-0.0660	0.1357	-0.0289	0.0094	0.0237	-0.0172	-0.0072	-0.0155
8-9	-0.0106	-0.0331	0.0087	0.0042	-0.0571	0.0049	-0.0729	-0.0197	-0.0095	0.0325	-0.0339	-0.0144
9-10	-0.0245	0.0025	-0.0208	-0.0333	0.0133	0.0369	-0.0129	-0.0065	0.0370	-0.0030	0.0310	-0.0487
10-11	-0.0157	-0.0242	0.0373	-0.0232	-0.0117	0.0333	-0.0106	-0.0132	0.0447	-0.0236	-0.0124	0.0510
11-12	-0.0106	-0.0509	-0.0273	-0.0116	0.0326	-0.0205	-0.0129	-0.0371	0.0790	-0.0216	0.0043	0.0031
12-13	-0.0523	-0.0363	-0.0137	0.0168	0.0075	-0.0128	0.0509	0.0173	0.0408	-0.0362	-0.0266	-0.0243
13-14	-0.0170	0.0138	0.0022	0.0158	-0.0192	0.0034	0.0190	0.0568	0.0003	0.0272	-0.0008	-0.0070
14-15	-0.0513	-0.0380	-0.0235	0.0015	0.0538	-0.0462	-0.0136	-0.0228	0.0846	-0.0843	-0.0068	-0.0313

Appendix (1.35): Monthly returns on big and liquid portfolio - BL, S.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.1754	0.0090	-0.0021	-0.1330	-0.0626	0.0890	-0.0618	0.0366	-0.0106	0.0228	0.0330	0.0514
8-9	-0.0604	-0.0053	0.0001	0.0146	-0.0527	-0.0421	-0.1422	-0.1575	0.0293	0.0837	-0.0190	0.0156
9-10	-0.0398	-0.0568	0.0339	-0.0299	0.0089	0.0934	0.0253	0.0069	0.0147	0.0146	0.0103	0.0043
10-11	0.0148	0.0919	0.0584	-0.0073	-0.0409	-0.0051	-0.0025	-0.0202	-0.0246	-0.0047	0.0160	0.0497
11-12	0.0262	-0.0496	0.0003	-0.0074	-0.0111	-0.0130	-0.0348	-0.0361	0.0108	-0.0045	0.0165	0.0000
12-13	-0.0425	-0.0453	0.0106	-0.0330	-0.0133	0.0192	0.0356	0.0093	0.0525	0.0001	0.0119	0.0089
13-14	-0.0316	0.0018	0.0071	0.0579	0.0141	0.0080	0.0426	0.1495	0.0388	0.0814	-0.0076	-0.0568
14-15	-0.0781	-0.0019	-0.0320	-0.0054	0.0302	0.0008	-0.0113	-0.0251	0.0396	-0.0198	0.0106	0.0101

Appendix (1.36): Monthly excess returns on small and illiquid portfolio - SI- rft, S.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.0375	-0.1678	-0.1310	-0.0744	-0.1147	-0.0563	-0.0452	-0.0044	-0.0473	-0.0911	-0.0469	-0.0590
8-9	-0.0610	-0.0202	-0.0085	-0.0126	-0.0459	-0.1111	-0.0751	-0.0988	0.0170	-0.0049	-0.0339	-0.0136
9-10	0.0128	0.1089	-0.0419	0.0016	-0.0031	0.0711	0.0187	0.0021	-0.0105	-0.0073	0.0005	0.0696
10-11	-0.0179	0.0047	-0.0190	0.0096	-0.0164	0.0222	-0.0127	-0.0079	-0.0056	-0.0541	-0.0076	0.0069
11-12	0.0233	-0.0818	-0.0581	-0.0026	-0.0166	0.0122	-0.0705	-0.0575	0.0263	0.0027	0.0501	-0.0248
12-13	-0.0979	-0.0085	-0.0113	-0.0237	-0.0029	0.0143	-0.0199	0.0086	0.0203	0.0051	0.0129	-0.0326
13-14	-0.1144	-0.0116	-0.0435	0.0394	0.0508	-0.0335	-0.0255	-0.0066	0.0898	-0.0409	-0.0174	-0.0060
14-15	-0.0353	-0.0253	-0.0251	0.0156	-0.0415	0.0036	0.0076	-0.0065	0.0101	-0.0275	-0.0315	0.0066

Appendix (1.37): Monthly excess returns on small and liquid portfolio - SL - rft, S.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.1161	-0.1473	-0.0820	-0.1110	-0.1782	-0.0165	-0.0635	-0.0172	-0.0258	-0.0850	-0.0588	-0.0369
8-9	0.0033	-0.0289	-0.0149	-0.0531	-0.0951	-0.0743	-0.1258	-0.1437	-0.0182	0.0963	-0.0799	-0.0721
9-10	0.0003	-0.0211	0.0088	-0.0431	0.0641	0.1077	-0.0303	-0.0070	-0.0135	-0.0033	0.0257	0.0616
10-11	0.0135	-0.0053	0.0616	-0.0408	-0.1073	0.0111	0.0012	-0.0172	-0.0027	-0.0326	-0.0720	0.0597
11-12	0.0638	-0.0332	-0.0348	-0.0224	-0.0126	-0.0240	0.0253	-0.0246	0.0173	-0.0363	-0.0005	-0.0420
12-13	-0.0307	-0.0718	0.0115	-0.0204	-0.0216	-0.0172	-0.0091	-0.0267	-0.0023	0.0308	-0.0235	0.0321
13-14	-0.0162	-0.0164	-0.0502	-0.0049	-0.0501	0.0050	0.0054	-0.0078	-0.0168	-0.0048	-0.0255	-0.0281
14-15	0.0002	-0.0948	-0.0627	0.0317	-0.0972	-0.0394	0.0625	-0.2125	0.0653	-0.0338	-0.0170	0.0603

Appendix (1.38): Monthly excess returns on big and illiquid portfolio - BI - rft, S.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.1561	-0.1192	-0.0544	-0.1451	-0.1458	0.0786	-0.0902	-0.0436	-0.0246	-0.0689	-0.0469	-0.0628
8-9	-0.0516	-0.0566	-0.0196	-0.0252	-0.0830	-0.0384	-0.0942	-0.0250	-0.0123	0.0309	-0.0369	-0.0281
9-10	-0.0272	-0.0039	-0.0269	-0.0418	-0.0001	0.0294	-0.0148	-0.0145	0.0294	-0.0053	0.0292	-0.0507
10-11	-0.0186	-0.0279	0.0319	-0.0306	-0.0171	0.0171	-0.0180	-0.0166	0.0423	-0.0455	-0.0191	0.0489
11-12	-0.0121	-0.0523	-0.0299	-0.0166	0.0294	-0.0291	-0.0162	-0.0436	0.0733	-0.0280	0.0017	-0.0008
12-13	-0.0537	-0.0378	-0.0153	0.0110	-0.0091	-0.0285	0.0493	0.0157	0.0391	-0.0491	-0.0281	-0.0259
13-14	-0.0185	0.0113	-0.0028	0.0121	-0.0241	-0.0023	0.0098	0.0557	-0.0135	0.0234	-0.0016	-0.0079
14-15	-0.0522	-0.0388	-0.0280	-0.0147	0.0476	-0.0488	-0.0145	-0.0245	0.0770	-0.0855	-0.0080	-0.0386

Appendix (1.39): Monthly excess returns on big and liquid portfolio - BL - rft, S.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.2304	-0.0441	-0.0657	-0.1866	-0.1424	0.0319	-0.1231	-0.0164	-0.0589	-0.0289	-0.0067	0.0041
8-9	-0.1014	-0.0288	-0.0282	-0.0147	-0.0786	-0.0853	-0.1635	-0.1629	0.0265	0.0821	-0.0220	0.0020
9-10	-0.0425	-0.0632	0.0278	-0.0383	-0.0045	0.0858	0.0234	-0.0012	0.0071	0.0122	0.0086	0.0023
10-11	0.0119	0.0882	0.0531	-0.0147	-0.0462	-0.0213	-0.0100	-0.0235	-0.0270	-0.0265	0.0093	0.0476
11-12	0.0247	-0.0509	-0.0023	-0.0124	-0.0143	-0.0215	-0.0381	-0.0426	0.0051	-0.0109	0.0139	-0.0040
12-13	-0.0440	-0.0468	0.0090	-0.0388	-0.0300	0.0035	0.0341	0.0077	0.0509	-0.0128	0.0103	0.0074
13-14	-0.0331	-0.0007	0.0021	0.0542	0.0092	0.0023	0.0333	0.1484	0.0251	0.0777	-0.0085	-0.0577
14-15	-0.0790	-0.0028	-0.0365	-0.0216	0.0240	-0.0018	-0.0122	-0.0268	0.0320	-0.0210	0.0094	0.0029

Appendix (1.40): Monthly size premium, SMB.L, S.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	0.1165	-0.0759	-0.0464	0.0732	-0.0023	-0.0916	0.0523	0.0192	0.0052	-0.0391	-0.0260	-0.0186
8-9	0.0476	0.0181	0.0122	-0.0129	0.0103	-0.0308	0.0284	-0.0273	-0.0077	-0.0108	-0.0274	-0.0298
9-10	0.0413	0.0774	-0.0170	0.0193	0.0328	0.0318	-0.0101	0.0055	-0.0303	-0.0087	-0.0058	0.0898
10-11	0.0011	-0.0304	-0.0212	0.0070	-0.0302	0.0187	0.0083	0.0075	-0.0118	-0.0073	-0.0349	-0.0149
11-12	0.0372	-0.0059	-0.0303	0.0021	-0.0221	0.0194	0.0045	0.0021	-0.0175	0.0026	0.0170	-0.0310
12-13	-0.0154	0.0022	0.0033	-0.0082	0.0073	0.0110	-0.0562	-0.0208	-0.0360	0.0488	0.0036	0.0090
13-14	-0.0395	-0.0193	-0.0465	-0.0159	0.0078	-0.0142	-0.0316	-0.1093	0.0307	-0.0734	-0.0164	0.0158
14-15	0.0481	-0.0392	-0.0116	0.0418	-0.1051	0.0074	0.0484	-0.0839	-0.0168	0.0226	-0.0250	0.0513

Appendix (1.41): Monthly illiquidity premium, IML.s, S.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	0.0765	-0.0478	-0.0188	0.0391	0.0300	0.0034	0.0256	-0.0072	0.0064	-0.0230	-0.0141	-0.0445
8-9	-0.0072	-0.0095	0.0075	0.0150	0.0224	0.0050	0.0600	0.0914	-0.0018	-0.0762	0.0156	0.0142
9-10	0.0139	0.0946	-0.0527	0.0207	-0.0314	-0.0465	0.0054	-0.0021	0.0127	-0.0108	-0.0023	-0.0225
10-11	-0.0310	-0.0530	-0.0508	0.0173	0.0600	0.0247	-0.0110	0.0081	0.0332	-0.0202	0.0180	-0.0257
11-12	-0.0387	-0.0250	-0.0255	0.0078	0.0198	0.0143	-0.0369	-0.0169	0.0386	0.0109	0.0192	0.0102
12-13	-0.0385	0.0361	-0.0235	0.0233	0.0198	-0.0002	0.0022	0.0216	0.0054	-0.0310	-0.0010	-0.0489
13-14	-0.0418	0.0084	0.0009	0.0011	0.0338	-0.0216	-0.0272	-0.0457	0.0340	-0.0452	0.0075	0.0360
14-15	-0.0044	0.0167	0.0230	-0.0046	0.0397	-0.0020	-0.0286	0.1042	-0.0051	-0.0291	-0.0160	-0.0475

Appendix (1.42): Monthly returns on value and illiquid portfolio - VI, V.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.0046	-0.0946	-0.0306	-0.0362	-0.0087	0.0167	-0.0085	0.0359	-0.0081	-0.0280	-0.0157	-0.0185
8-9	-0.0392	-0.0159	0.0013	0.0231	-0.0188	-0.0709	-0.0440	-0.1282	-0.0103	0.0675	-0.0370	0.0056
9-10	0.0194	0.0612	-0.0617	0.0383	-0.0243	0.0940	-0.0085	-0.0110	0.0185	0.0044	-0.0327	0.0567
10-11	-0.0376	-0.0211	-0.0238	-0.0124	-0.0157	0.0194	-0.0031	-0.0095	0.0148	-0.0275	-0.0203	0.0510
11-12	0.0194	-0.0891	-0.0738	-0.0031	-0.0105	0.0331	-0.0867	-0.0591	0.0308	0.0113	0.0658	-0.0261
12-13	-0.0524	-0.0244	0.0064	-0.0105	0.0138	0.0356	-0.0048	0.0148	0.0270	-0.0112	-0.0021	-0.0336
13-14	-0.0306	0.0180	-0.0160	0.0545	0.0241	-0.0198	-0.0084	0.0380	0.0612	-0.0095	-0.0183	-0.0293
14-15	-0.0166	-0.0371	0.0010	0.0550	-0.0493	0.0187	-0.0144	-0.0256	0.0033	-0.0497	-0.0363	0.0484

Appendix (1.43): Monthly returns on value and liquid portfolio - VL, V.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.0600	-0.1342	-0.0229	-0.0580	-0.0700	0.0308	-0.0091	-0.0034	0.0281	-0.0172	-0.0294	0.0075
8-9	0.0460	-0.0198	0.0128	-0.0200	-0.0830	-0.0415	-0.1322	-0.1563	-0.0013	0.0979	-0.0522	-0.0675
9-10	0.0100	-0.0311	0.0091	-0.0448	0.0708	0.1089	-0.0286	-0.0010	-0.0292	0.0019	0.0396	0.0715
10-11	0.0518	0.0675	0.0831	-0.0060	-0.0588	-0.0042	-0.0085	-0.0222	-0.0222	0.0227	-0.0052	0.0856
11-12	0.0787	-0.0335	-0.0341	-0.0139	-0.0007	-0.0538	0.0268	-0.0330	0.0089	-0.0051	0.0028	-0.0445
12-13	-0.0315	-0.1026	0.0166	-0.0193	-0.0053	-0.0063	0.0011	-0.0233	0.0099	0.0648	-0.0278	0.0316
13-14	-0.0191	-0.0208	-0.0488	0.0293	-0.0287	0.0014	0.0175	0.0490	-0.0006	0.0437	-0.0216	-0.0415
14-15	-0.0644	-0.0483	-0.0552	0.0318	-0.0188	-0.0230	0.0268	-0.1169	0.0582	-0.0212	-0.0032	0.0421

Appendix (1.44): Monthly returns on growth and illiquid portfolio - GI, V.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.0976	-0.0841	-0.0266	-0.0860	-0.1131	0.1456	-0.0033	0.0188	0.0429	-0.0287	0.0058	-0.0063
8-9	0.0005	-0.0090	0.0250	0.0033	-0.0475	-0.0137	-0.0744	-0.0160	0.0203	-0.0283	-0.0286	-0.0142
9-10	-0.0271	0.0362	-0.0046	-0.0510	0.0349	0.0273	0.0053	0.0067	0.0237	-0.0088	0.0528	-0.0394
10-11	-0.0031	-0.0042	0.0373	-0.0024	-0.0091	0.0444	-0.0112	-0.0096	0.0294	-0.0272	-0.0003	0.0230
11-12	-0.0025	-0.0503	-0.0208	-0.0064	0.0244	-0.0217	-0.0095	-0.0344	0.0729	-0.0185	0.0037	0.0027
12-13	-0.0742	-0.0315	-0.0284	0.0222	0.0054	-0.0317	0.0627	0.0158	0.0428	-0.0300	-0.0265	-0.0199
13-14	-0.0875	-0.0095	-0.0171	0.0060	0.0079	-0.0034	0.0123	0.0194	0.0365	0.0036	0.0007	0.0137
14-15	-0.0577	-0.0206	-0.0401	-0.0025	0.0211	-0.0304	0.0165	0.0035	0.0631	-0.0357	-0.0136	-0.0375

Appendix (1.45): Monthly returns on growth and liquid portfolio - GL, V.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.1598	0.0171	-0.0018	-0.1218	-0.0839	0.0878	-0.0494	0.0589	-0.0091	0.0056	0.0315	0.0472
8-9	-0.1047	0.0149	-0.0044	0.0246	-0.0268	-0.0317	-0.1186	-0.1401	0.0274	0.0781	-0.0305	0.0579
9-10	-0.0492	-0.0350	0.0417	-0.0164	0.0179	0.1019	0.0257	0.0097	0.0459	0.0107	-0.0060	-0.0062
10-11	-0.0491	-0.0138	0.0274	-0.0515	-0.1063	0.0450	0.0263	-0.0064	0.0099	-0.0636	-0.0760	0.0044
11-12	-0.0005	-0.0509	0.0096	-0.0102	-0.0236	0.0411	-0.0450	-0.0189	0.0280	-0.0341	0.0184	0.0166
12-13	-0.0358	-0.0213	0.0079	-0.0223	-0.0101	0.0171	0.0125	-0.0041	0.0242	-0.0066	0.0064	0.0192
13-14	-0.0271	0.0086	0.0106	0.0274	-0.0024	0.0173	0.0397	0.0937	0.0364	0.0367	-0.0107	-0.0426
14-15	-0.0470	-0.0015	-0.0199	-0.0179	0.0164	0.0068	-0.0121	-0.0264	0.0372	-0.0258	0.0112	0.0061

Appendix (1.46): Monthly excess returns on value and illiquid portfolio - VI- rft, V.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.0596	-0.1477	-0.0942	-0.0898	-0.0885	-0.0404	-0.0697	-0.0172	-0.0564	-0.0797	-0.0555	-0.0658
8-9	-0.0802	-0.0394	-0.0270	-0.0063	-0.0446	-0.1142	-0.0653	-0.1335	-0.0131	0.0659	-0.0400	-0.0081
9-10	0.0168	0.0549	-0.0679	0.0298	-0.0377	0.0864	-0.0104	-0.0190	0.0108	0.0020	-0.0344	0.0547
10-11	-0.0405	-0.0248	-0.0292	-0.0198	-0.0211	0.0032	-0.0105	-0.0128	0.0123	-0.0494	-0.0270	0.0490
11-12	0.0179	-0.0904	-0.0764	-0.0081	-0.0137	0.0246	-0.0900	-0.0656	0.0252	0.0049	0.0632	-0.0300
12-13	-0.0539	-0.0259	0.0048	-0.0163	-0.0028	0.0199	-0.0063	0.0132	0.0253	-0.0241	-0.0037	-0.0352
13-14	-0.0321	0.0156	-0.0210	0.0508	0.0192	-0.0255	-0.0177	0.0370	0.0475	-0.0133	-0.0191	-0.0302
14-15	-0.0175	-0.0379	-0.0035	0.0387	-0.0556	0.0161	-0.0153	-0.0273	-0.0043	-0.0509	-0.0375	0.0412

Appendix (1.47): Monthly excess returns on value and liquid portfolio - VL- rft, V.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.1149	-0.1873	-0.0865	-0.1117	-0.1498	-0.0264	-0.0704	-0.0564	-0.0202	-0.0689	-0.0691	-0.0398
8-9	0.0050	-0.0433	-0.0155	-0.0493	-0.1089	-0.0848	-0.1535	-0.1616	-0.0041	0.0962	-0.0552	-0.0812
9-10	0.0073	-0.0375	0.0030	-0.0533	0.0573	0.1014	-0.0305	-0.0091	-0.0369	-0.0004	0.0379	0.0695
10-11	0.0489	0.0638	0.0778	-0.0134	-0.0641	-0.0204	-0.0160	-0.0255	-0.0247	0.0008	-0.0119	0.0835
11-12	0.0773	-0.0348	-0.0367	-0.0189	-0.0039	-0.0623	0.0235	-0.0395	0.0032	-0.0115	0.0002	-0.0485
12-13	-0.0329	-0.1041	0.0150	-0.0250	-0.0219	-0.0220	-0.0004	-0.0248	0.0083	0.0520	-0.0294	0.0300
13-14	-0.0206	-0.0232	-0.0538	0.0256	-0.0336	-0.0042	0.0082	0.0480	-0.0144	0.0400	-0.0225	-0.0423
14-15	-0.0652	-0.0491	-0.0597	0.0155	-0.0251	-0.0256	0.0259	-0.1186	0.0506	-0.0224	-0.0043	0.0349

Appendix (1.48): Monthly excess returns on growth and illiquid portfolio - GI- rft, V.LIQ model, from April 2007 to March 2015

M / Y	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.1526	-0.1372	-0.0903	-0.1396	-0.1929	0.0885	-0.0646	-0.0343	-0.0054	-0.0804	-0.0340	-0.0536
8-9	-0.0405	-0.0325	-0.0033	-0.0261	-0.0733	-0.0570	-0.0957	-0.0213	0.0175	-0.0299	-0.0316	-0.0279
9-10	-0.0297	0.0298	-0.0107	-0.0594	0.0215	0.0198	0.0034	-0.0013	0.0161	-0.0111	0.0511	-0.0414
10-11	-0.0060	-0.0079	0.0319	-0.0097	-0.0144	0.0282	-0.0186	-0.0129	0.0270	-0.0490	-0.0070	0.0209
11-12	-0.0040	-0.0516	-0.0235	-0.0114	0.0212	-0.0303	-0.0128	-0.0409	0.0672	-0.0249	0.0011	-0.0013
12-13	-0.0757	-0.0331	-0.0301	0.0165	-0.0112	-0.0474	0.0611	0.0142	0.0412	-0.0428	-0.0280	-0.0215
13-14	-0.0890	-0.0119	-0.0221	0.0023	0.0030	-0.0091	0.0030	0.0184	0.0228	-0.0002	-0.0002	0.0128
14-15	-0.0586	-0.0215	-0.0445	-0.0188	0.0148	-0.0330	0.0156	0.0018	0.0556	-0.0369	-0.0148	-0.0448

Appendix (1.49): Monthly excess returns on growth and liquid portfolio - GL- rft, V.LIQ model, from April 2007 to March 2015

M / Y	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	-0.2148	-0.0360	-0.0654	-0.1755	-0.1637	0.0306	-0.1106	0.0059	-0.0574	-0.0461	-0.0082	-0.0001
8-9	-0.1457	-0.0086	-0.0327	-0.0047	-0.0526	-0.0750	-0.1399	-0.1454	0.0246	0.0765	-0.0335	0.0442
9-10	-0.0518	-0.0413	0.0355	-0.0248	0.0044	0.0943	0.0238	0.0017	0.0382	0.0084	-0.0077	-0.0083
10-11	-0.0520	-0.0175	0.0221	-0.0588	-0.1117	0.0288	0.0188	-0.0098	0.0075	-0.0855	-0.0827	0.0023
11-12	-0.0019	-0.0522	0.0069	-0.0152	-0.0268	0.0325	-0.0483	-0.0254	0.0224	-0.0405	0.0158	0.0127
12-13	-0.0373	-0.0228	0.0063	-0.0281	-0.0268	0.0014	0.0110	-0.0056	0.0225	-0.0195	0.0049	0.0177
13-14	-0.0287	0.0061	0.0056	0.0237	-0.0073	0.0116	0.0304	0.0927	0.0226	0.0329	-0.0115	-0.0435
14-15	-0.0479	-0.0024	-0.0243	-0.0342	0.0101	0.0042	-0.0131	-0.0281	0.0297	-0.0270	0.0100	-0.0012

Appendix (1.50): Monthly value premium, VMG.$_{L}$, V.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	0.0964	-0.0809	-0.0125	0.0568	0.0592	-0.0929	0.0176	-0.0226	-0.0069	-0.0111	-0.0412	-0.0259
8-9	0.0555	-0.0208	-0.0032	-0.0124	-0.0138	-0.0335	0.0084	-0.0642	-0.0297	0.0578	-0.0150	-0.0528
9-10	0.0528	0.0145	-0.0448	0.0304	-0.0031	0.0368	-0.0340	-0.0142	-0.0402	0.0022	-0.0199	0.0869
10-11	0.0332	0.0322	-0.0027	0.0177	0.0204	-0.0370	-0.0134	-0.0079	-0.0234	0.0430	0.0254	0.0546
11-12	0.0505	-0.0107	-0.0483	-0.0002	-0.0060	-0.0200	-0.0027	-0.0194	-0.0306	0.0294	0.0233	-0.0450
12-13	0.0130	-0.0371	0.0218	-0.0149	0.0066	0.0220	-0.0394	-0.0101	-0.0150	0.0451	-0.0049	-0.0007
13-14	0.0325	-0.0009	-0.0291	0.0252	-0.0050	-0.0161	-0.0214	-0.0131	-0.0062	-0.0030	-0.0150	-0.0209
14-15	0.0119	-0.0316	0.0028	0.0536	-0.0528	0.0097	0.0040	-0.0598	-0.0194	-0.0047	-0.0186	0.0610

Appendix (1.51): Monthly illiquidity premium, IML.v, V.LIQ model, from April 2007 to March 2015

Y \ M	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
7-8	0.0588	-0.0308	-0.0163	0.0288	0.0161	0.0219	0.0233	-0.0005	0.0079	-0.0225	-0.0061	-0.0397
8-9	0.0100	-0.0100	0.0090	0.0108	0.0218	-0.0057	0.0662	0.0761	-0.0080	-0.0684	0.0085	0.0005
9-10	0.0158	0.0818	-0.0586	0.0243	-0.0390	-0.0447	-0.0001	-0.0065	0.0128	-0.0085	-0.0068	-0.0240
10-11	-0.0216	-0.0395	-0.0486	0.0213	0.0701	0.0115	-0.0160	0.0048	0.0282	-0.0069	0.0303	-0.0080
11-12	-0.0307	-0.0275	-0.0350	0.0073	0.0191	0.0120	-0.0390	-0.0208	0.0334	0.0160	0.0241	0.0022
12-13	-0.0297	0.0340	-0.0233	0.0266	0.0173	-0.0034	0.0221	0.0290	0.0179	-0.0497	-0.0036	-0.0522
13-14	-0.0359	0.0104	0.0026	0.0019	0.0316	-0.0210	-0.0267	-0.0426	0.0310	-0.0432	0.0073	0.0342
14-15	0.0185	-0.0040	0.0180	0.0193	-0.0129	0.0023	-0.0063	0.0606	-0.0145	-0.0192	-0.0290	-0.0187

Appendix (1.52): Descriptive statistics for dependent variables of the first model C.FF3, referring to risk free rate and without

Variables	Statistic	Years from April to March									Variables	Years from April to March								
		7/8	8/9	9/10	10/11	11/12	12/13	13/14	14/15	7/15		7/8	8/9	9/10	10/11	11/12	12/13	13/14	14/15	7/15
SV	N	8	9	9	8	8	5	8	7	-	SV-RF	8	9	9	8	8	5	8	7	-
	Mean	-0.022	-0.029	0.019	0.010	-0.012	-0.009	-0.011	-0.015	-0.009		-0.078	-0.048	0.013	0.002	-0.016	-0.014	-0.015	-0.019	-0.022
	SD	0.039	0.051	0.044	0.030	0.039	0.049	0.032	0.052	0.044		0.042	0.051	0.043	0.031	0.039	0.046	0.029	0.049	0.049
	Min	-0.125	-0.130	-0.025	-0.039	-0.062	-0.096	-0.060	-0.101	-0.130		-0.178	-0.135	-0.033	-0.045	-0.063	-0.097	-0.065	-0.102	-0.178
	Max	0.029	0.066	0.115	0.074	0.066	0.096	0.055	0.061	0.115		-0.024	0.064	0.107	0.072	0.065	0.083	0.042	0.046	0.107
SG	N	2	3	4	6	3	6	5	4	-	SG-RF	2	3	4	6	3	6	5	4	-
	Mean	-0.012	-0.010	0.024	-0.019	-0.002	-0.005	-0.008	-0.008	-0.005		-0.068	-0.030	0.018	-0.026	-0.006	-0.011	-0.012	-0.012	-0.018
	SD	0.072	0.040	0.032	0.042	0.031	0.012	0.029	0.024	0.039		0.077	0.043	0.030	0.042	0.030	0.014	0.028	0.024	0.045
	Min	-0.167	-0.063	-0.037	-0.095	-0.046	-0.028	-0.089	-0.049	-0.167		-0.247	-0.105	-0.046	-0.100	-0.049	-0.029	-0.091	-0.052	-0.247
	Max	0.096	0.047	0.071	0.059	0.051	0.016	0.031	0.031	0.096		0.043	0.032	0.063	0.043	0.043	0.014	0.018	0.024	0.063
BV	N	2	3	4	6	3	6	5	4	-	BV-RF	2	3	4	6	3	6	5	4	-
	Mean	-0.018	-0.033	0.003	0.004	-0.010	-0.003	0.019	-0.008	-0.006		-0.073	-0.053	-0.003	-0.003	-0.014	-0.009	0.015	-0.013	-0.019
	SD	0.054	0.086	0.034	0.037	0.023	0.022	0.048	0.038	0.047		0.053	0.089	0.034	0.038	0.024	0.023	0.049	0.036	0.053
	Min	-0.098	-0.188	-0.055	-0.049	-0.035	-0.043	-0.038	-0.099	-0.188		-0.151	-0.193	-0.061	-0.054	-0.042	-0.045	-0.039	-0.100	-0.193
	Max	0.091	0.144	0.077	0.072	0.033	0.038	0.138	0.037	0.143		0.034	0.142	0.070	0.070	0.031	0.037	0.137	0.031	0.142
BG	N	9	9	10	8	9	6	9	7	-	BG-RF	9	9	10	8	9	6	9	7	-
	Mean	-0.017	-0.020	0.001	0.007	-0.007	-0.004	0.015	-0.010	-0.004		-0.073	-0.040	-0.005	0.000	-0.011	-0.009	0.011	-0.014	-0.017
	SD	0.073	0.043	0.033	0.025	0.030	0.040	0.034	0.033	0.041		0.076	0.047	0.032	0.027	0.030	0.041	0.033	0.031	0.048
	Min	-0.153	-0.103	-0.056	-0.028	-0.056	-0.082	-0.040	-0.055	-0.153		-0.208	-0.124	-0.058	-0.045	-0.057	-0.084	-0.041	-0.056	-0.208
	Max	0.115	0.035	0.055	0.046	0.062	0.074	0.084	0.063	0.115		0.057	0.034	0.047	0.043	0.057	0.072	0.083	0.055	0.083
	Σ N	21	24	27	28	23	23	27	22	-		21	24	27	28	23	23	27	22	-

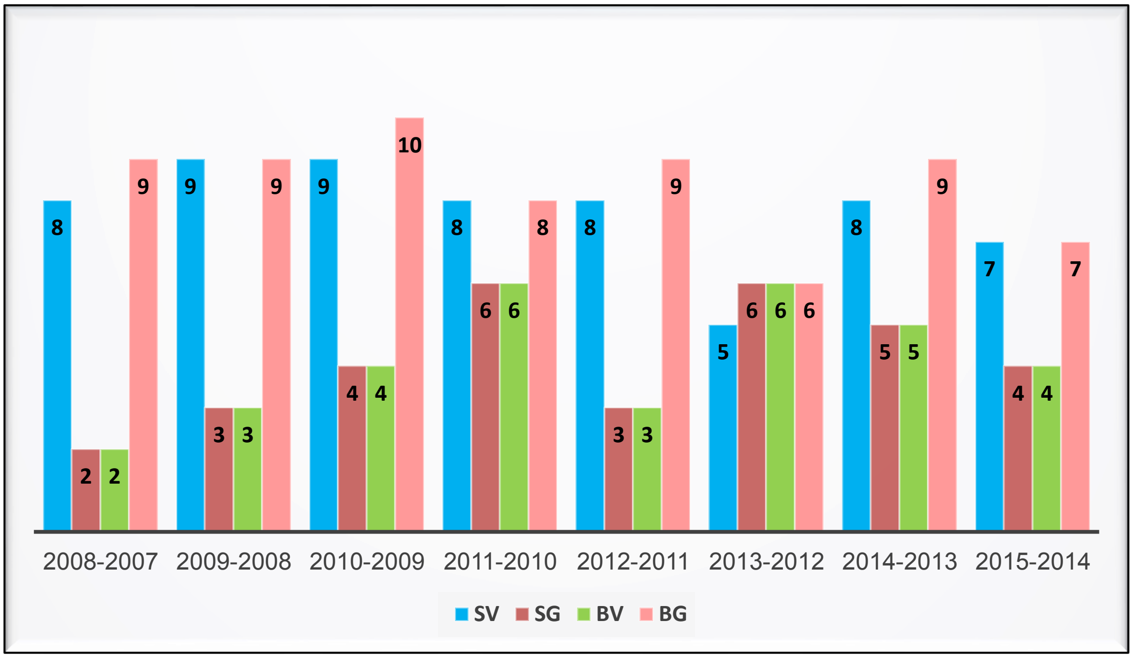

Figure (A.1): Number of firms that used to construct dependent variables portfolios in C.FF3 model without risk free rate

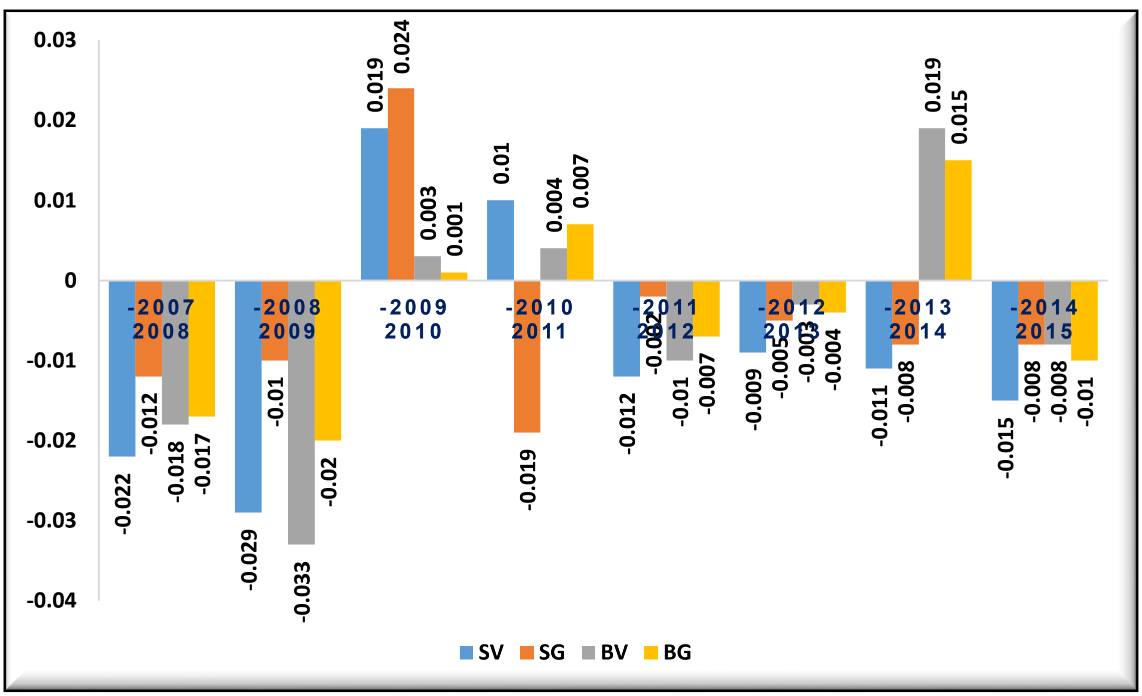

Figure (A.2): The mean of portfolio returns that used to construct dependent variables portfolios in C.FF3 model without risk free rate

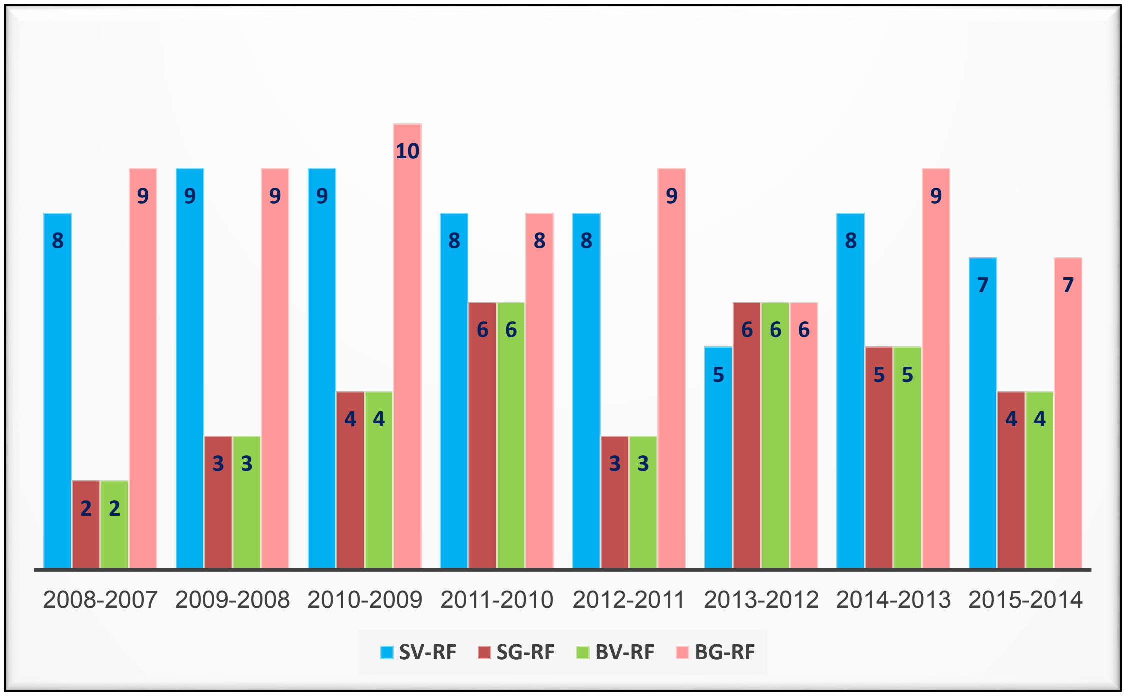

Figure (A.3): Number of firms that used to construct dependent variables portfolios in C.FF3 model with risk free rate

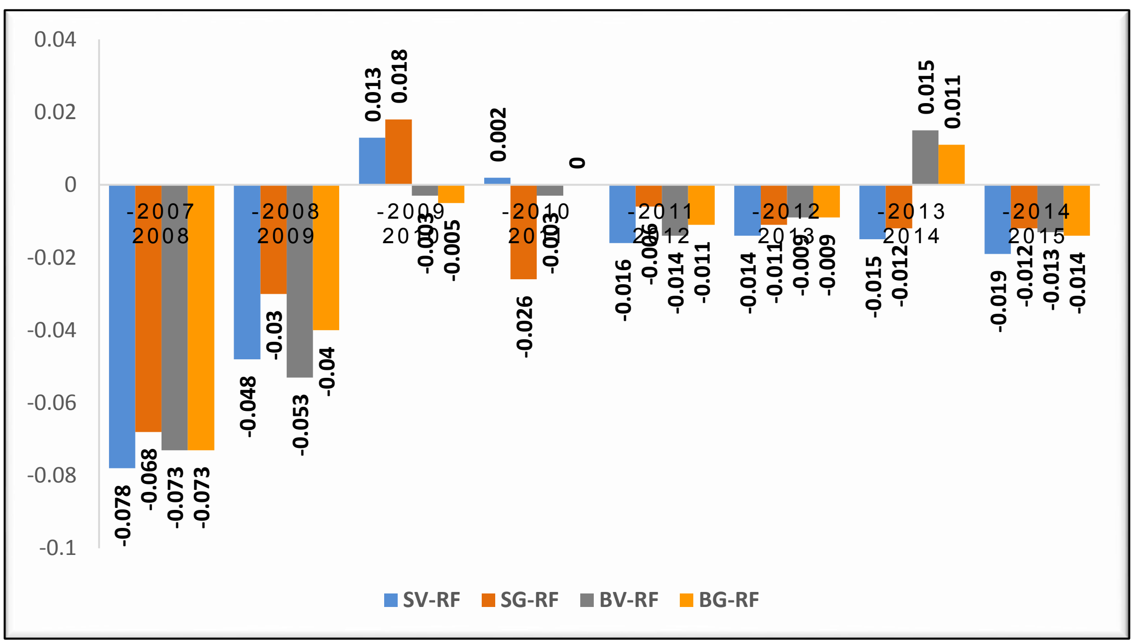

Figure (A.4): The mean of portfolio returns that used to construct dependent variables portfolios in C.FF3 model with risk free rate

Appendix (1.53): Descriptive statistics for dependent variables of the second model S.LIQ, referring to risk free rate and without

Variables	Statistic	Years from April to March									Variables	Years from April to March								
		7/8	8/9	9/10	10/11	11/12	12/13	13/14	14/15	7/15		7/8	8/9	9/10	10/11	11/12	12/13	13/14	14/15	7/15
SI	N	5	7	5	6	5	3	6	8	-	SI-RF	5	7	5	6	5	3	6	8	-
	Mean	-0.018	-0.019	0.024	-0.001	-0.012	-0.006	-0.006	-0.008	-0.006		-0.073	-0.039	0.019	-0.008	-0.016	-0.011	-0.010	-0.012	-0.019
	SD	0.043	0.037	0.043	0.018	0.043	0.034	0.054	0.023	0.039		0.046	0.040	0.043	0.019	0.043	0.032	0.052	0.021	0.045
	Min	-0.115	-0.094	-0.036	-0.032	-0.081	-0.096	-0.113	-0.035	-0.115		-0.168	-0.111	-0.042	-0.054	-0.082	-0.098	-0.114	-0.041	-0.168
	Max	0.049	0.020	0.115	0.038	0.053	0.030	0.104	0.032	0.115		-0.004	0.017	0.109	0.022	0.050	0.020	0.090	0.016	0.109
SL	N	5	5	8	8	6	8	7	3	-	SL-RF	5	5	8	8	6	8	7	3	-
	Mean	-0.023	-0.031	0.018	-0.004	-0.006	-0.007	-0.013	-0.024	-0.011		-0.078	-0.051	0.012	-0.011	-0.010	-0.012	-0.018	-0.028	-0.024
	SD	0.047	0.065	0.045	0.048	0.031	0.030	0.020	0.084	0.050		0.052	0.064	0.045	0.049	0.032	0.028	0.018	0.082	0.055
	Min	-0.098	-0.138	-0.035	-0.102	-0.038	-0.070	-0.045	-0.211	-0.211		-0.178	-0.144	-0.043	-0.107	-0.042	-0.072	-0.050	-0.213	-0.213
	Max	0.041	0.098	0.115	0.067	0.065	0.044	0.015	0.073	0.115		-0.017	0.096	0.108	0.062	0.064	0.032	0.005	0.065	0.108
BI	N	5	5	8	8	6	8	7	3	-	BI-RF	5	5	8	8	6	8	7	3	-
	Mean	-0.018	-0.017	-0.002	0.003	-0.006	-0.006	0.008	-0.015	-0.007		-0.073	-0.037	-0.008	-0.004	-0.010	-0.011	0.003	-0.019	-0.020
	SD	0.063	0.029	0.028	0.029	0.034	0.032	0.021	0.046	0.037		0.065	0.033	0.027	0.031	0.034	0.033	0.021	0.044	0.043
	Min	-0.101	-0.073	-0.049	-0.024	-0.051	-0.052	-0.019	-0.084	-0.101		-0.156	-0.094	-0.051	-0.045	-0.052	-0.054	-0.024	-0.085	-0.156
	Max	0.136	0.033	0.037	0.051	0.079	0.051	0.057	0.085	0.136		0.079	0.031	0.029	0.049	0.073	0.049	0.056	0.077	0.079
BL	N	6	7	6	6	6	4	7	8	-	BL-RF	6	7	6	6	6	4	7	8	-
	Mean	-0.017	-0.028	0.007	0.010	-0.009	0.001	0.025	-0.007	-0.002		-0.072	-0.048	0.001	0.003	-0.013	-0.004	0.021	-0.011	-0.015
	SD	0.078	0.069	0.039	0.039	0.022	0.030	0.054	0.031	0.050		0.081	0.073	0.038	0.040	0.023	0.031	0.054	0.029	0.056
	Min	-0.175	-0.158	-0.057	-0.041	-0.050	-0.045	-0.057	-0.078	-0.175		-0.230	-0.164	-0.063	-0.046	-0.051	-0.047	-0.058	-0.079	-0.230
	Max	0.089	0.084	0.093	0.092	0.026	0.053	0.150	0.040	0.149		0.032	0.082	0.086	0.088	0.025	0.051	0.148	0.032	0.148
	Σ N	21	24	27	28	23	23	27	22	-		21	24	27	28	23	23	27	22	-

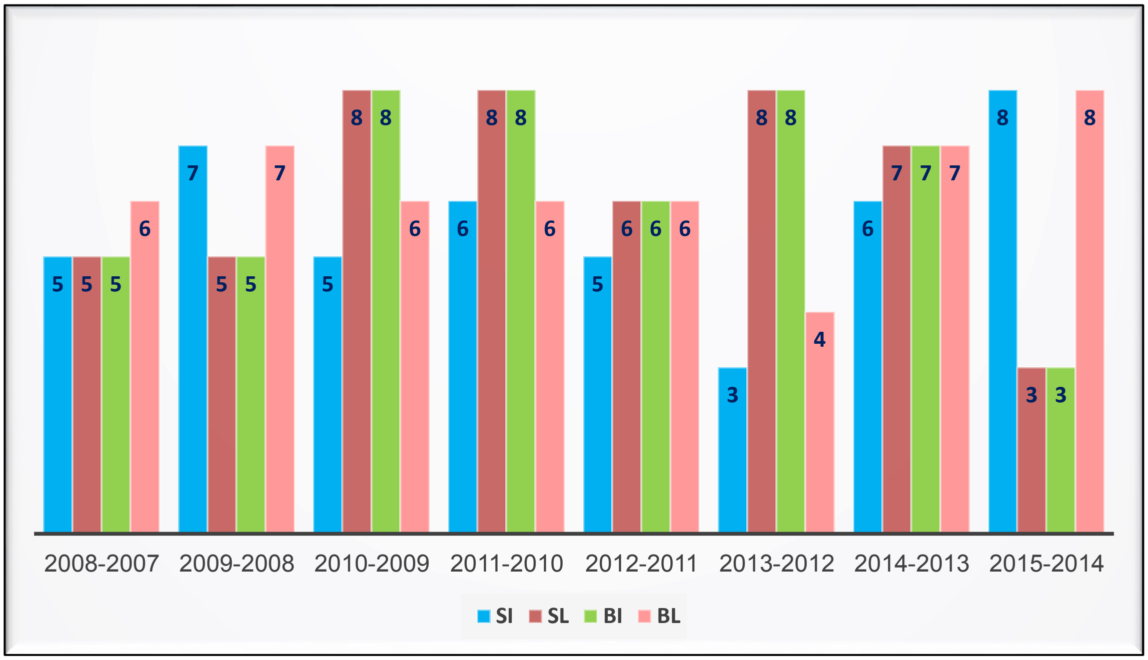

Figure (A.5): Number of firms that used to construct dependent variables portfolios in S.LIQ model without risk free rate

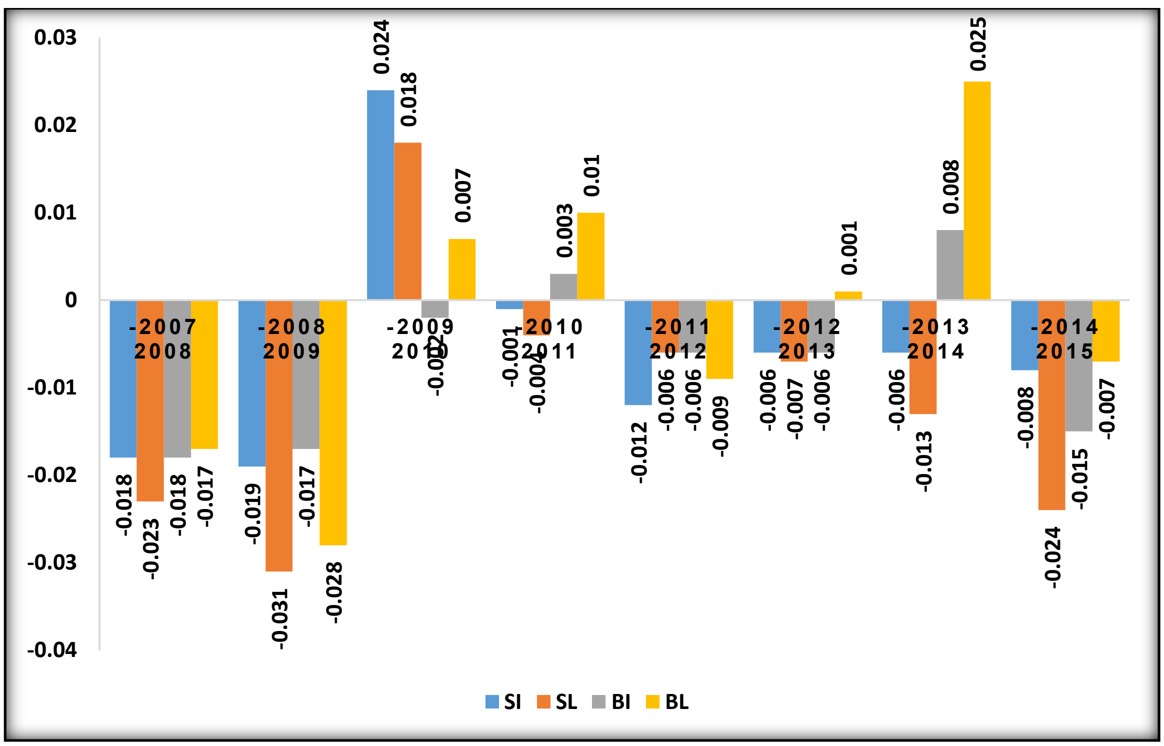

Figure (A.6): The mean of portfolio returns that used to construct dependent variables portfolios in S.LIQ model without risk free rate

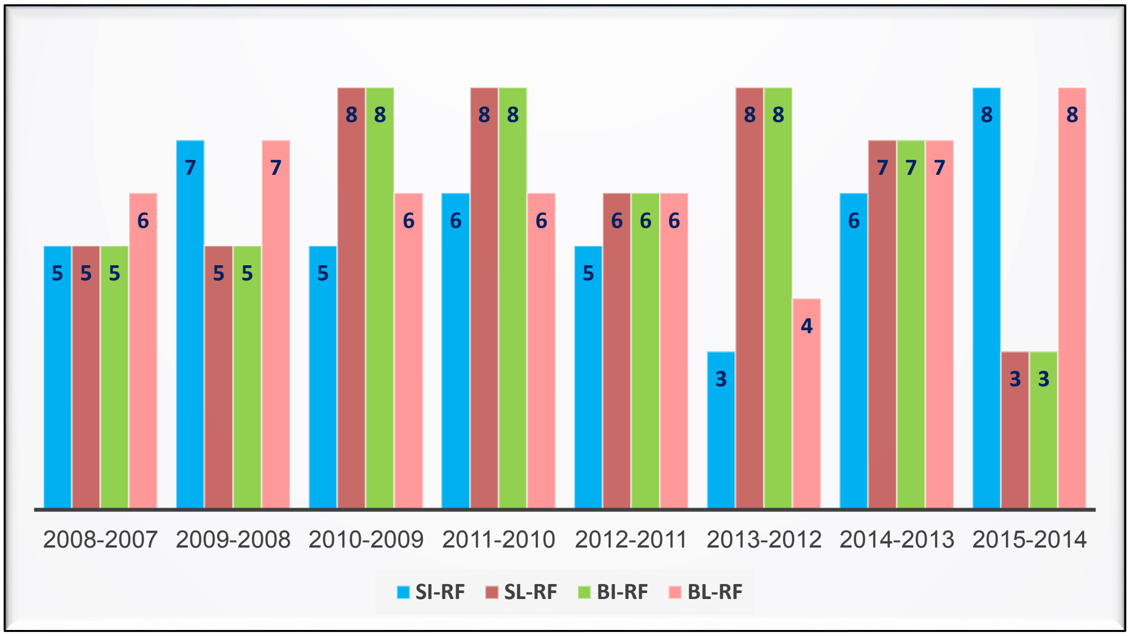

Figure (A.7): Number of firms that used to construct dependent variables portfolios in S.LIQ model with risk free rate

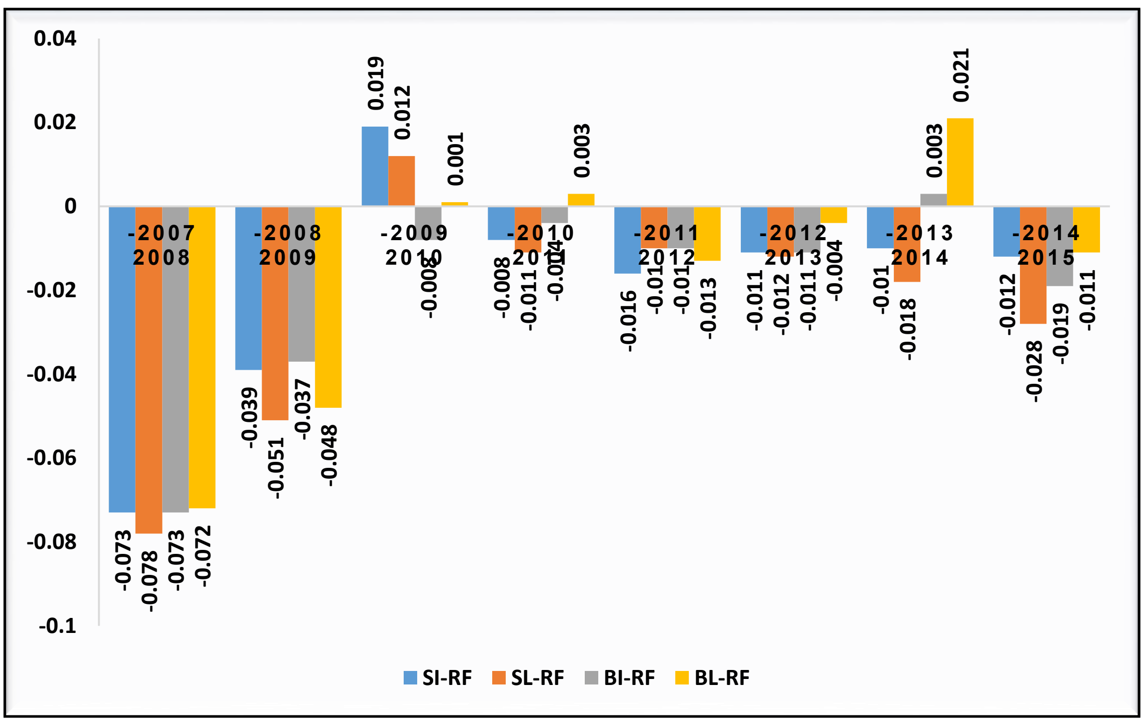

Figure (A.8): The mean of portfolio returns that used to construct dependent variables portfolios in S.LIQ model with risk free rate

Appendix (1.54): Descriptive statistics for dependent variables of the third model V.LIQ, referring to risk free rate and without

Variables	Statistic	Years from April to March									Variables	Years from April to March								
		7/8	8/9	9/10	10/11	11/12	12/13	13/14	14/15	7/15		7/8	8/9	9/10	10/11	11/12	12/13	13/14	14/15	7/15
VI	N	6	5	5	5	4	5	6	5	-	VI-RF	6	5	5	5	4	5	6	5	-
	Mean	-0.017	-0.022	0.013	-0.007	-0.016	-0.004	0.005	-0.009	**-0.007**		-0.072	-0.042	0.007	-0.014	-0.020	-0.009	0.001	-0.013	**-0.020**
	SD	0.032	0.049	0.044	0.025	0.052	0.025	0.033	0.035	**0.038**		0.032	0.053	0.045	0.026	0.051	0.023	0.031	0.032	**0.044**
	Min	-0.095	-0.128	-0.062	-0.038	-0.089	-0.052	-0.031	-0.050	**-0.128**		-0.148	-0.134	-0.068	-0.049	-0.090	-0.054	-0.032	-0.056	**-0.148**
	Max	0.036	0.068	0.094	0.051	0.066	0.036	0.061	0.055	**0.094**		-0.017	0.066	0.086	0.049	0.063	0.025	0.051	0.041	**0.086**
VL	N	4	7	8	9	7	6	7	6	-	VL-RF	4	7	8	9	7	6	7	6	-
	Mean	-0.028	-0.035	0.015	0.015	-0.008	-0.008	-0.003	-0.016	**-0.009**		-0.083	-0.055	0.009	0.008	-0.013	-0.013	-0.008	-0.020	**-0.022**
	SD	0.047	0.071	0.048	0.047	0.037	0.041	0.032	0.051	**0.049**		0.050	0.072	0.048	0.048	0.037	0.039	0.032	0.049	**0.055**
	Min	-0.134	-0.156	-0.045	-0.059	-0.054	-0.103	-0.049	-0.117	**-0.156**		-0.187	-0.162	-0.053	-0.064	-0.062	-0.104	-0.054	-0.119	**-0.187**
	Max	0.031	0.098	0.109	0.086	0.079	0.065	0.049	0.058	**0.109**		-0.020	0.096	0.101	0.084	0.077	0.052	0.048	0.051	**0.101**
GI	N	4	7	8	9	7	6	7	6	-	GI-RF	4	7	8	9	7	6	7	6	-
	Mean	-0.019	-0.015	0.005	0.006	-0.005	-0.008	-0.002	-0.011	**-0.006**		-0.075	-0.035	-0.001	-0.001	-0.009	-0.013	-0.006	-0.015	**-0.019**
	SD	0.072	0.028	0.032	0.022	0.031	0.038	0.030	0.034	**0.038**		0.076	0.030	0.032	0.024	0.031	0.039	0.029	0.032	**0.045**
	Min	-0.113	-0.074	-0.051	-0.027	-0.050	-0.074	-0.088	-0.058	**-0.113**		-0.193	-0.096	-0.059	-0.049	-0.052	-0.076	-0.089	-0.059	**-0.193**
	Max	0.146	0.025	0.053	0.044	0.073	0.063	0.037	0.063	**0.146**		0.088	0.018	0.051	0.032	0.067	0.061	0.023	0.056	**0.088**
GL	N	7	5	6	5	5	6	7	5	-	GL-RF	7	5	6	5	5	6	7	5	-
	Mean	-0.015	-0.021	0.012	-0.021	-0.006	-0.001	0.016	-0.006	**-0.005**		-0.070	-0.041	0.006	-0.028	-0.010	-0.006	0.011	-0.010	**-0.019**
	SD	0.075	0.069	0.040	0.047	0.030	0.019	0.036	0.023	**0.047**		0.079	0.074	0.039	0.048	0.029	0.020	0.035	0.023	**0.053**
	Min	-0.160	-0.140	-0.049	-0.106	-0.051	-0.036	-0.043	-0.047	**-0.160**		-0.215	-0.146	-0.052	-0.112	-0.052	-0.037	-0.044	-0.048	**-0.215**
	Max	0.088	0.078	0.102	0.045	0.041	0.024	0.094	0.037	**0.102**		0.031	0.076	0.094	0.029	0.033	0.023	0.093	0.030	**0.094**
	Σ N	21	24	27	28	23	23	27	22	-		21	24	27	28	23	23	27	22	-

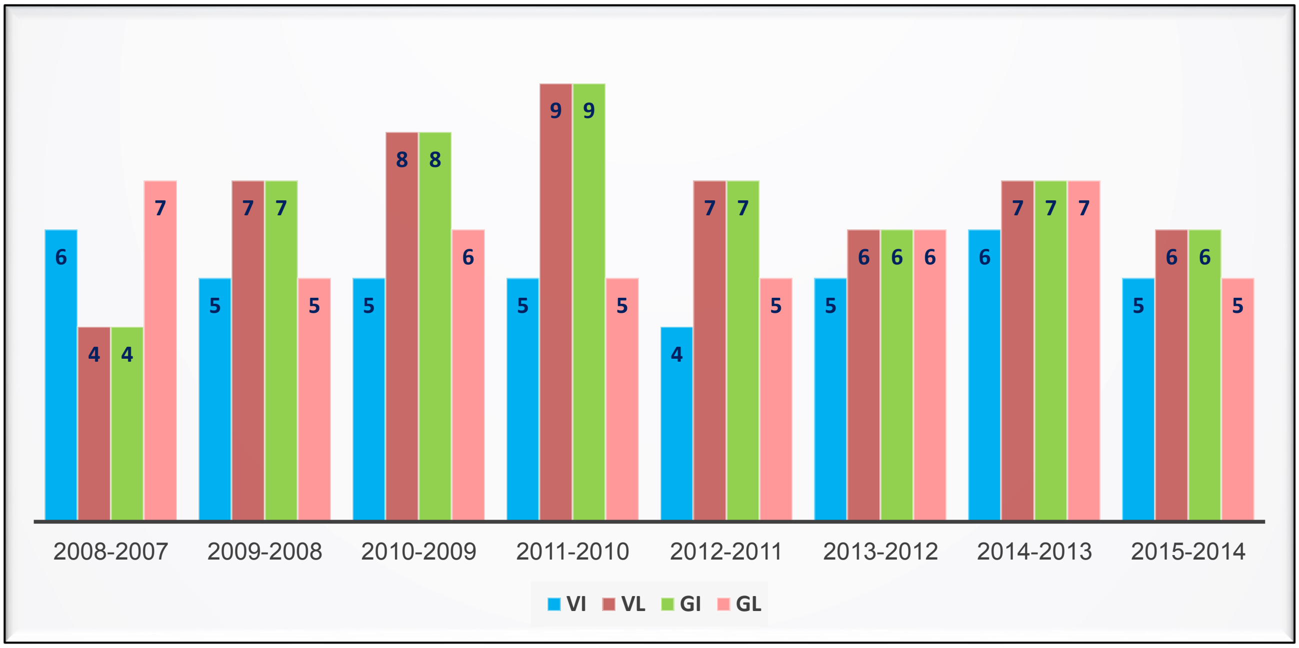

Figure (A.9): Number of firms that used to construct dependent variables portfolios in V.LIQ model without risk free rate

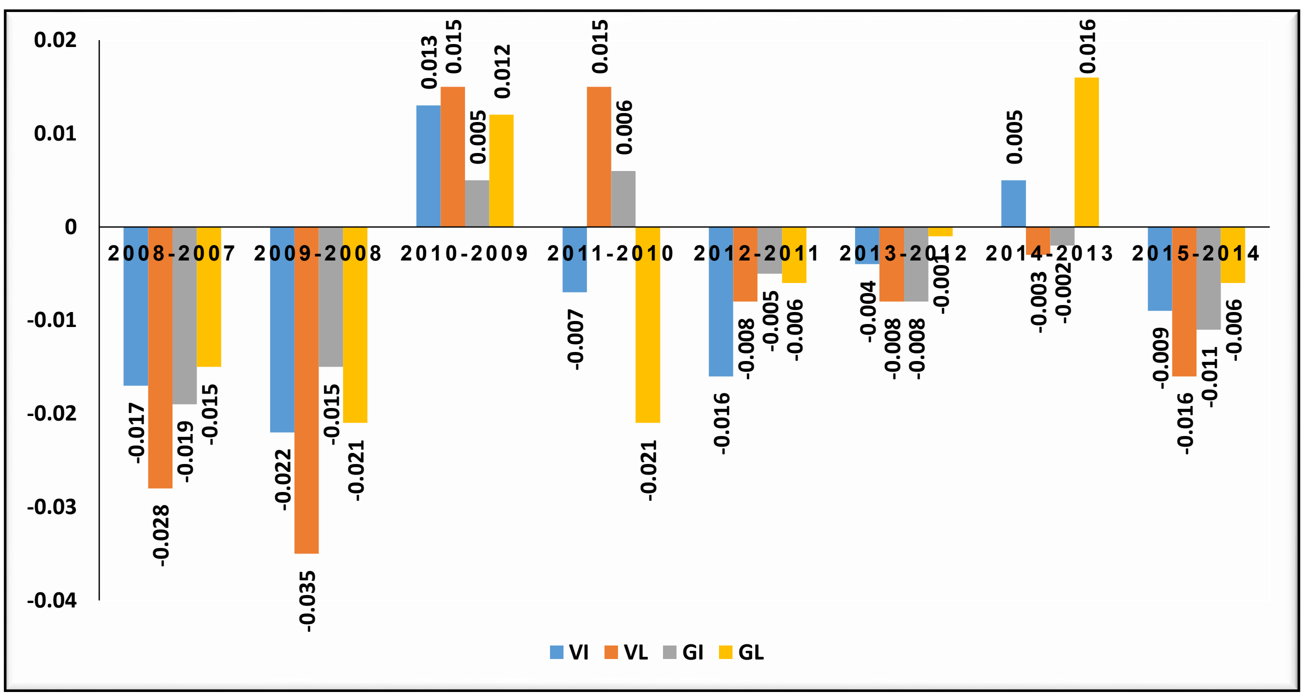

Figure (A.10): The mean of portfolio returns that used to construct dependent variables portfolios in V.LIQ model without risk free rate

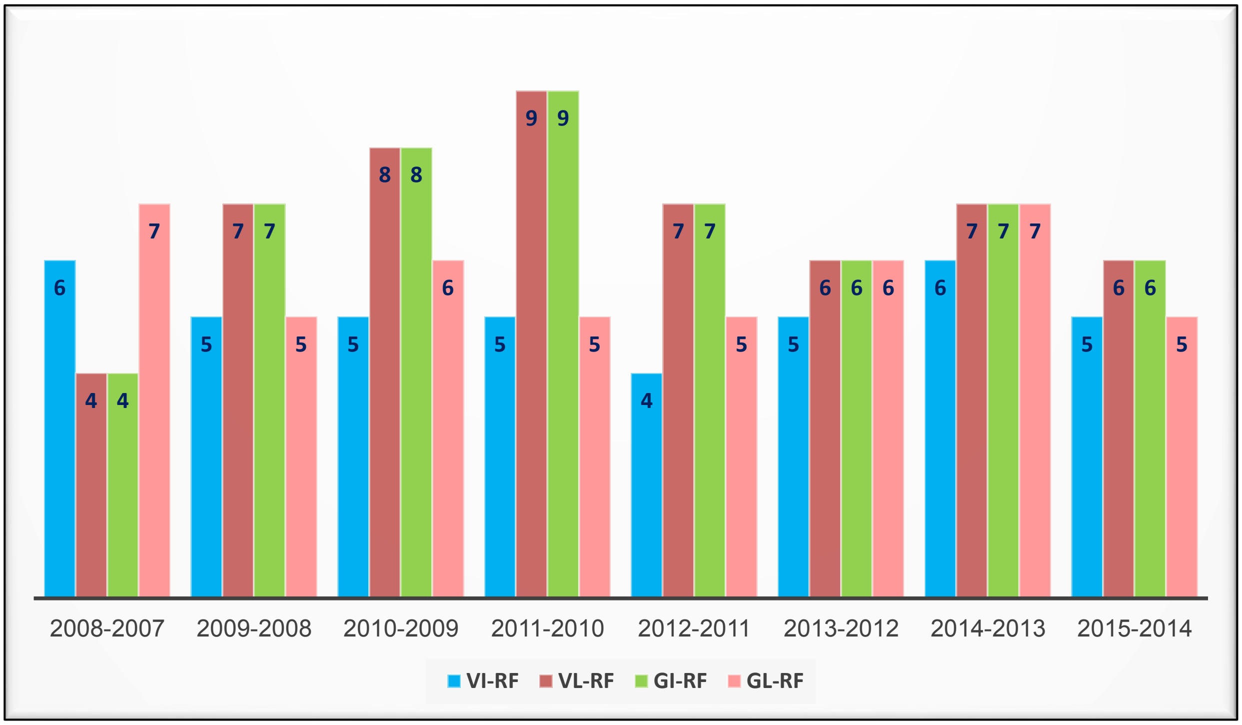

Figure (A.11): Number of firms that used to construct dependent variables portfolios in V.LIQ model with risk free rate

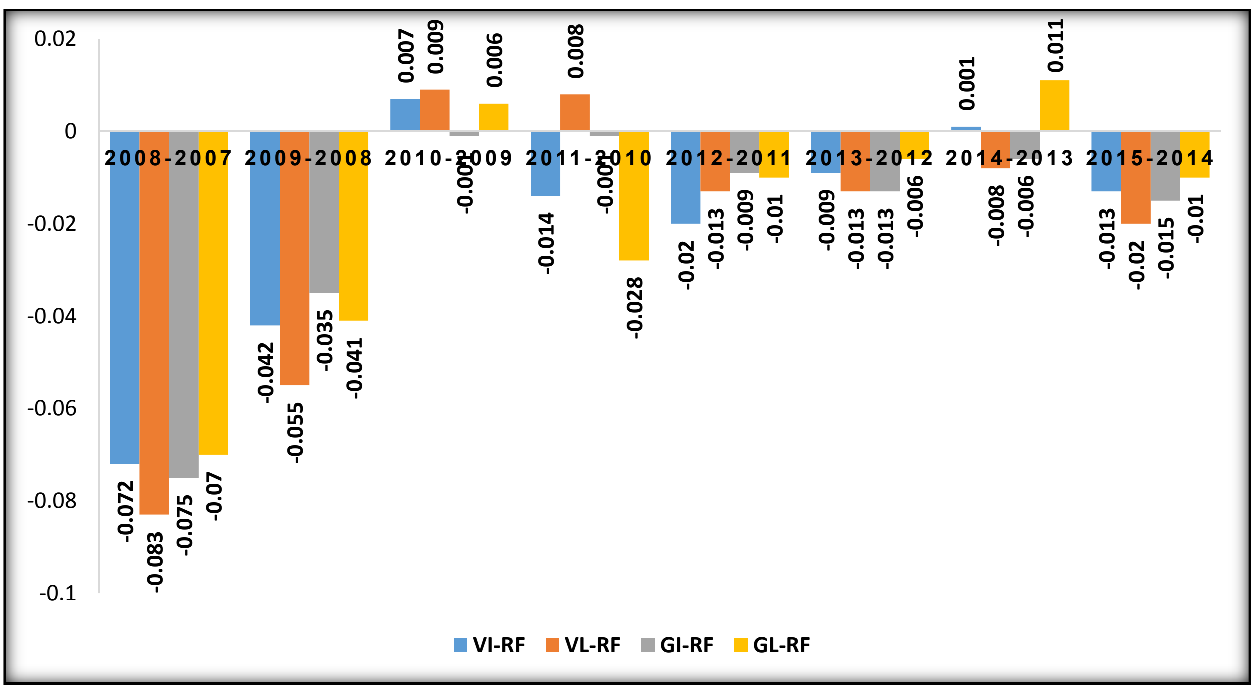

Figure (A.12): The mean of portfolio returns that used to construct dependent variables portfolios in V.LIQ model with risk free rate

Appendix (1.55): Yearly descriptive statistics for independent variables of the three models.

year	S.Parameters	C.FF3 [S,V]		S.LIQ [S, L]		V.LIQ [V, L]	
		SMB.V	VMG.S	SMB.L	IML.S	VMG.L	IML.V
2007-2008	Mean	0.0002	-0.0050	-0.0028	0.0021	-0.0053	0.0034
	Std. Deviation	0.0541	0.0512	0.0609	0.0361	0.0559	0.0283
	Median	-0.0002	-0.0138	-0.0104	-0.0019	-0.0118	0.0037
	Minimum	-0.0651	-0.0679	-0.0916	-0.0478	-0.0929	-0.0397
	Maximum	0.0834	0.1020	0.1165	0.0765	0.0964	0.0588
2008-2009	Mean	0.0071	-0.0154	-0.0025	0.0114	-0.0103	0.0092
	Std. Deviation	0.0352	0.0499	0.0257	0.0400	0.0371	0.0368
	Median	0.0146	-0.0263	-0.0092	0.0109	-0.0144	0.0088
	Minimum	-0.0775	-0.0945	-0.0308	-0.0762	-0.0642	-0.0684
	Maximum	0.0530	0.1079	0.0476	0.0914	0.0578	0.0761
2009-2010	Mean	0.0194	-0.0016	0.0188	-0.0018	0.0056	-0.0045
	Std. Deviation	0.0282	0.0342	0.0374	0.0385	0.0403	0.0371
	Median	0.0099	-0.0142	0.0124	-0.0022	-0.0005	-0.0066
	Minimum	-0.0176	-0.0376	-0.0303	-0.0527	-0.0448	-0.0586
	Maximum	0.0706	0.0638	0.0898	0.0946	0.0869	0.0818
2010-2011	Mean	-0.0105	0.0127	-0.0090	-0.0025	0.0118	0.0021
	Std. Deviation	0.0199	0.0323	0.0178	0.0350	0.0283	0.0330
	Median	-0.0117	0.0123	-0.0096	-0.0015	0.0191	-0.0010
	Minimum	-0.0407	-0.0434	-0.0349	-0.0530	-0.0370	-0.0486
	Maximum	0.0214	0.0597	0.0187	0.0600	0.0546	0.0701
2011-2012	Mean	0.0015	-0.0065	-0.0018	-0.0019	-0.0066	-0.0032
	Std. Deviation	0.0167	0.0306	0.0208	0.0254	0.0296	0.0257
	Median	0.0015	-0.0029	0.0021	0.0090	-0.0084	0.0048
	Minimum	-0.0224	-0.0457	-0.0310	-0.0387	-0.0483	-0.0390
	Maximum	0.0391	0.0523	0.0372	0.0386	0.0505	0.0334
2012-2013	Mean	-0.0035	-0.0016	-0.0043	-0.0029	-0.0011	-0.0013
	Std. Deviation	0.0328	0.0275	0.0264	0.0270	0.0247	0.0308
	Median	-0.0004	-0.0012	0.0027	0.0010	-0.0028	0.0069
	Minimum	-0.0575	-0.0430	-0.0562	-0.0489	-0.0394	-0.0522
	Maximum	0.0657	0.0540	0.0488	0.0361	0.0451	0.0340
2013-2014	Mean	-0.0265	0.0003	-0.0260	-0.0050	-0.0061	-0.0042
	Std. Deviation	0.0407	0.0225	0.0385	0.0309	0.0184	0.0289
	Median	-0.0230	-0.0101	-0.0179	0.0010	-0.0096	0.0022
	Minimum	-0.1145	-0.0275	-0.1093	-0.0457	-0.0291	-0.0432
	Maximum	0.0317	0.0452	0.0307	0.0360	0.0325	0.0342
2014-2015	Mean	-0.0026	-0.0031	-0.0052	0.0039	-0.0037	0.0012
	Std. Deviation	0.0343	0.0313	0.0522	0.0397	0.0367	0.0247
	Median	0.0013	-0.0057	-0.0021	-0.0045	-0.0009	-0.0051
	Minimum	-0.0789	-0.0598	-0.1051	-0.0475	-0.0598	-0.0290
	Maximum	0.0468	0.0590	0.0513	0.1042	0.0610	0.0606

Appendix (1.56): Synthetic risk free rates form April 2007 to March 2009

Year	Month	LIBOR	INF%	Synthetic *rft*	Year	LIBOR	INF%	Synthetic *rft*
2007	APR	5.320%	0.18%	5.50%	2008	2.610%	1.49%	4.10%
2007	MAY	5.312%	-0.34%	**5.312%**	2008	2.257%	0.09%	2.35%
2007	JUN	5.320%	1.05%	6.37%	2008	2.232%	0.59%	2.83%
2007	JUL	5.321%	0.04%	5.36%	2008	2.247%	0.69%	2.93%
2007	AUG	5.435%	2.54%	7.98%	2008	2.175%	0.41%	2.58%
2007	SEP	5.172%	0.54%	5.71%	2008	3.044%	1.28%	4.33%
2007	OCT	4.873%	1.25%	6.13%	2008	2.129%	-0.06%	**2.129%**
2007	NOV	4.679%	0.63%	5.30%	2008	0.531%	-0.84%	**0.531%**
2007	DEC	4.484%	0.35%	4.83%	2008	0.280%	-0.52%	**0.280%**
2008	JAN	4.037%	1.13%	5.17%	2009	0.161%	-0.71%	**0.161%**
2008	FEB	3.122%	0.85%	3.98%	2009	0.299%	-0.03%	**0.299%**
2008	MAR	3.088%	1.64%	4.73%	2009	0.317%	1.05%	1.37%

Note: if there was a negative inflation (deflation), the inflation premium will be 0

Appendix (1.57): Synthetic risk free rates form April 2009 to March 2011

Year	Month	LIBOR	INF%	Synthetic *rft*	Year	LIBOR	INF%	Synthetic *rft*
2009	APR	0.261%	-0.21%	**0.261%**	2010	0.242%	0.05%	0.29%
2009	MAY	0.233%	0.40%	0.64%	2010	0.296%	0.07%	0.37%
2009	JUN	0.265%	0.35%	0.61%	2010	0.298%	0.24%	0.53%
2009	JUL	0.242%	0.60%	0.84%	2010	0.266%	0.47%	0.74%
2009	AUG	0.235%	1.11%	1.35%	2010	0.231%	0.30%	0.53%
2009	SEP	0.218%	0.54%	0.75%	2010	0.227%	1.39%	1.62%
2009	OCT	0.190%	-0.04%	**0.190%**	2010	0.226%	0.52%	0.75%
2009	NOV	0.178%	0.63%	0.80%	2010	0.229%	0.10%	0.33%
2009	DEC	0.179%	0.58%	0.76%	2010	0.241%	-0.10%	**0.241%**
2010	JAN	0.172%	0.06%	0.24%	2011	0.239%	1.95%	2.19%
2010	FEB	0.173%	-0.28%	**0.173%**	2011	0.232%	0.44%	0.67%
2010	MAR	0.203%	-0.03%	**0.203%**	2011	0.208%	-0.05%	**0.208%**

Note: if there was a negative inflation (deflation), the inflation premium will be 0

Appendix (1.58): Synthetic risk free rates form April 2011 to March 2013

Year	Month	LIBOR	INF%	Synthetic *rft*	Year	LIBOR	INF%	Synthetic *rft*
2011	APR	0.148%	-0.03%	**0.148%**	2012	0.149%	-0.24%	**0.149%**
2011	MAY	0.131%	-0.26%	**0.131%**	2012	0.152%	-0.20%	**0.152%**
2011	JUN	0.127%	0.14%	0.27%	2012	0.163%	-0.86%	**0.163%**
2011	JUL	0.124%	0.38%	0.50%	2012	0.167%	0.41%	0.58%
2011	AUG	0.145%	0.17%	0.32%	2012	0.154%	1.51%	1.67%
2011	SEP	0.145%	0.71%	0.85%	2012	0.152%	1.42%	1.57%
2011	OCT	0.142%	0.19%	0.33%	2012	0.153%	-0.60%	**0.153%**
2011	NOV	0.143%	0.51%	0.65%	2012	0.155%	-0.55%	**0.155%**
2011	DEC	0.150%	0.42%	0.57%	2012	0.163%	-0.01%	**0.163%**
2012	JAN	0.146%	0.49%	0.64%	2013	0.160%	1.13%	1.29%
2012	FEB	0.141%	0.12%	0.26%	2013	0.155%	-0.47%	**0.155%**
2012	MAR	0.147%	0.25%	0.40%	2013	0.155%	-0.50%	**0.155%**

Note: if there was a negative inflation (deflation), the inflation premium will be 0

Appendix (1. 59): Synthetic risk free rates form April 2013 to March 2015

Year	Month	LIBOR	INF%	Synthetic *rft*	Year	LIBOR	INF%	Synthetic *rft*
2013	APR	0.154%	-0.09%	**0.154%**	2014	0.089%	-0.78%	**0.089%**
2013	MAY	0.144%	0.10%	0.24%	2014	0.088%	-0.80%	**0.088%**
2013	JUN	0.131%	0.37%	0.50%	2014	0.093%	0.36%	0.45%
2013	JUL	0.121%	0.25%	0.37%	2014	0.093%	1.53%	1.63%
2013	AUG	0.118%	0.37%	0.49%	2014	0.091%	0.54%	0.63%
2013	SEP	0.113%	0.45%	0.57%	2014	0.090%	0.17%	0.26%
2013	OCT	0.104%	0.82%	0.92%	2014	0.091%	-0.54%	**0.091%**
2013	NOV	0.103%	-0.99%	**0.103%**	2014	0.096%	0.07%	0.17%
2013	DEC	0.100%	1.28%	1.38%	2014	0.110%	0.65%	0.76%
2014	JAN	0.090%	0.28%	0.37%	2015	0.119%	-0.40%	**0.119%**
2014	FEB	0.086%	-0.21%	**0.086%**	2015	0.118%	-0.42%	**0.118%**
2014	MAR	0.089%	-0.06%	**0.089%**	2015	0.121%	0.60%	0.72%

Note: if there was a negative inflation (deflation), the inflation premium will be 0

Appendix (1.60): Merger agreement between ,Al-Rafah Microfinance Bank and Arab Palestinian Investment Bank to became The National Bank TNB

بنك الرفاه لتمويل المشاريع الصغيرة
Alrafah Microfinance Bank

التاريخ:20-11-2012
المرجع: RB –F/12-11/2012

السادة / هيئة سوق راس المال الفلسطينية المحترمين

الموضوع: اتفاقية اندماج عن طريق الشراء "التملك والضم"
بين بنك الرفاه لتمويل المشاريع الصغيرة والبنك العربي الفلسطيني للاستثمار

تحيه طيبة وبعد ،

بالإشارة الى الموضوع أعلاه، ولاحقاً للافصاحات السابقة بهذا الخصوص يرجى العلم بانه قد تم التوقيع على اتفاقية الاندماج بين البنكين، وفيما يلي اهم بنود الاتفاق:

1. استحواذ بنك الرفاه على البنك العربي الفلسطيني للاستثمار وفقاً للقيمة الدفترية للبنك مقابل اصدار 10 مليون سهم من اسهم بنك الرفاه لصالح مساهمي البنك العربي للاستثمار بالقيمة الاسمية للسهم، ودفع الفرق نقداً في حسابات مساهمي البنك العربي الفلسطيني للاستثمار.
2. يصبح راس مال بنك الرفاه المدفوع 50 مليون دولار يمتلك منها مساهمي البنك العربي الفلسطيني للاستثمار ما نسبة 20% من راس مال البنك.
3. يتشكل مجلس الإدارة للبنك على النحو التالي:
   - السيد طلال ناصر الدين رئيساً.
   - مساهمي البنك العربي الفلسطيني للإستثمار (مقعدين منها نائب الرئيس).
   - شركة الاتصالات الفلسطينية (مقعدان).
   - شركة مسار العالمية للإستثمار (مقعدان).
   - شركة فلسطين والتنمية والاستثمار –باديكو– (مقعد)
   - شركة ترست للتأمين (مقعد).

الإدارة العامة، الماصيون، ص.ب 700، رام الله، فلسطين – هاتف 6090 294 2 970+ فاكس 6114 294 2 970+
General Management, Al-Masyoun, P.O Box 700, Ramallah, Palestine – Tel: +970 2 294 6090 Fax: +970 2 294 6114
www.alrafahbank.ps

بنك الرفاه لتمويل المشاريع الصغيرة
Alrafah Microfinance Bank

4. تغيير اسم البنك الى البنك الوطني، حيث سيتم إطلاق الأسم الجديد اعتباراً من 2012/11/21.
5. استمرار عقود عمل جميع الموظفين الحاليين في البنك العربي الفلسطيني للإستثمار بنفس الشروط في البنك الجديد.
6. اعتماد النظام البنكي والمحاسبي والهيكل التنظيمي ونظام شؤون الموظفين المعتمد لدى بنك الرفاه لتمويل المشاريع الصغيرة.
7. رفع رأس مال البنك إلى 75 مليون دولار بعد موافقة الهيئة العامة غير العادية للبنك في العام 2013.

وتفضلو بقبول فائق الاحترام ،،،

احمد الحاج حسن
المدير العام

نسخة / السادة بورصة فلسطين

الإدارة العامة، الماصيون، ص.ب 700، رام الله، فلسطين – هاتف: 6090 294 2 970+ فاكس: 6114 294 2 970+
General Management, Al-Masyoun, P.O Box 700, Ramallah, Palestine – Tel: +970 2 294 6090 Fax: +970 2 294 6114
www.alrafahbank.ps

Appendix (1.61): Studies that Investigate the Role of Anomalies in Asset Pricing in Palestinian Exchange Market

Palestinian exchange market
قدرة نماذج تسعير الأصول الرأسمالية في تحديد أسعار أسهم الشركات المدرجة في بورصة فلسطين- دراسة تحليلية مقارنة (النواجحة, 2014)
العوامل المؤثرة على معدل عائد السهم السوقي- دراسة تطبيقية على الشركات المدرجة قي سوق فلسطين للأوراق المالية (الصعيدي, 2011)
العوامل المفسرة لعوائد الأسهم المدرجة في سوق فلسطين للأوراق المالية: دراسة قياسية (اللطيف, 2006)
The Impact of Information Asymmetry on The Cost of Equity Capital in The Palestine Exchange (Eid, 2015)
Testing for correlation and causality relationships between stock prices and macroeconomic variables The case of Palestine Securities Exchange (Abu-Libdeh & Harasheh, 2011)
Calendar Effects in the Palestine Securities Exchange (PSE): Analysis & Investigation (Abu-Rub & Sharba, 2011)

Source: Assembled for the purpose of this study by the author, 2016

Appendix (1.62): Studies that Investigate the Role of Anomalies in Asset Pricing in Arabic Exchange Markets

Arabic exchange markets
إختبار نموذج فاما وفرنش ثلاثي العوامل في بورصة عمان **(درويش, 2008)**
Implement Fama and French and capital asset pricing models in Saudi Arabia stock market **(Aldaarmi et al., 2015)**
Fama & French Three Factor Model: Evidence from Emerging Market **(Al-Mwalla & Karasneh, 2011) - Jordan**
Seasonality in the Kuwait stock exchange **(Al-Saad, 2004)**
Portfolio formation: Empirical evidence from Khartoum Stock Exchange' **(Arabi, 2014)**
Constructing and testing alternative versions of the Fama-French and carhart models in Tunisia (Hasnaoui & Ibrahim, 2013)
Comparisons of Asset Pricing Models in the Egyptian Stock Market **(Shaker & Elgiziry, 2014)**

Source: Assembled for the purpose of this study by the author, 2016

Appendix (1.63): Studies that Investigate the Role of Anomalies in Asset Pricing in International Exchange Markets

International exchange markets
A Study to Check the Applicability of Fama and French, Three-Factor Model on KSE 100-Index from 2004-2014 (Abbas et al., 2014) - Pakistan
Four factor model in Indian equities market (Agarwalla et al., 2014)
Islamic Calendar Effect on Market Risk and Return Evidence from Islamic Countries (Akhter et al., 2015) – Pakistan, Malaysia, Indonesia, Turkey, Morocco and Egypt
Market liquidity and stock size premia in emerging financial markets: The implications for foreign investment (Hearn et al., 2010) - South Africa, Kenya, Egypt and Morocco
A look at the validity of the CAPM in light of equity market anomalies: the case of Belgian common stocks (Hawawini, Michel, & Corhay, 1989)
Market microstructure and securities values: Evidence from the Tel Aviv Stock Exchange (Amihud, Mendelson, & Lauterbach, 1997)
An investigation into the role of liquidity in asset pricing: Australian evidence (Chan & Faff, 2003)
Evidence to support the four-factor pricing model from the Canadian stock market (L'Her et al., 2004)
The role of an illiquidity risk factor in asset pricing: Empirical evidence from the spanish stock market (Marcelo & Quirós, 2006)
Size, value and liquidity. Do they really matter on an emerging stock market? (Lischewski & Voronkova, 2012) - Poland
A Comparison Between Fama and French Model and Liquidity-Based Three Factor Models in Predicting Portfolio Returns (Rahim & Nor, 2006) - Malaysia
Stock Market Anomalies: The Latin American Evidence (Victor, 2006)
An augmented Fama and French three-factor model: new evidence from an emerging stock market (Bundoo, 2008) - Mauritius
Stock returns, risk factor loadings, and model predictions: A test of the CAPM and the Fama-French 3-factor model (Suh, 2009) - USA
Liquidity and stock returns in Japan: New evidence (Chang et al., 2010)
Predictability of the Swiss Stock Market with Respect to Style

International exchange markets
(Scheurle, 2010)
Estimation of Expected Return: The Fama and French Three-Factor Model Vs. The Chen, Novy-Marx and Zhang Three-Factor Model (Kilsgård & Wittorf, 2011) - UK
Liquidity and asset pricing: Evidence from the Hong Kong stock market (Lam & Tam, 2011)
The role of an illiquidity factor in the Portuguese stock market (Miralles Marcelo et al., 2011)
The relationship between liquidity and returns on the Chinese stock market (Narayan & Zheng, 2011)
Market microstructure and securities values:: Evidence from the Paris Bourse (Muscarella & Piwowar, 2001)
On the robustness of Fama and French Model: evidence from Italy (Silvestri & Veltri, 2011)
The Size and Book-to-Market Effects and the Fama-French Three-Factor Model in Small Markets: Preliminary Findings from New Zealand (Djajadikerta & Nartea, 2005)
Fama and French Three-Factor Model: Evidence from Istanbul Stock Exchange (Eraslan, 2013)
Constructing and testing alternative versions of the Fama–French and Carhart models in the UK (Gregory et al., 2013)
An empirical investigation of the random walk hypothesis of stock prices on the Nairobi stock exchange (Muthama & Mutothya, 2013)
Tests of equity market anomalies for select emerging markets (Sehgal et al., 2014) – Brazil, China, India, Indonesia, South Korea and South Africa
Studying the Relationship between Liquidity Risk and Market Risk with Non-Ordinary Return at Fama-French Three Factor Model at Tehran Stock Exchange (Shams et al., 2014)
Anomalies, risk adjustment and seasonality: Australian evidence (Zhong, Limkriangkrai, & Gray, 2014)
Testing Fama and French Three Factor Models in Indonesia Stock Exchange (Chandra, 2015)
Applying Fama and French Three Factors Model and Capital Asset Pricing Model in the Stock Exchange of Vietnam (Phong & Hoang, 2012)

International exchange markets
Test of the fama french three factor model in stock exchange of Thailand in energy sector (Srimarksuk, 2007)
Firm-Specific Variables and Expected Stock Returns-A study on the German Market (Remmits & Knittel, 2015)

Source: Assembled for the purpose of this study by the author, 2016