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# Two Essays on Corporate Spin-Offs

YingChou Lin  
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# TWO ESSAYS ON CORPORATE SPIN-OFFS

by

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December 2007

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## **ABSTRACT**

### **TWO ESSAYS ON CORPORATE SPIN-OFFS**

YingChou Lin  
Old Dominion University, 2007  
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This dissertation investigates two possible sources that contribute to the gains of corporate spin-offs. In the first essay, I investigate the relation between the value created by corporate spin-offs and the misvaluations of the parent firms and their spun-off divisions. I argue that spin-offs could create value even though the efficiency of the firm remains unchanged. Corporate spin-offs could be driven by the desire to correct the undervaluation of the parent firm or the spun-off unit. Thus, the gains of spin-offs should be highly correlated with the degree of misvaluation. By examining a 263 corporate spinoffs sample in the period of 1980 - 2006, I find that parent firms are relatively undervalued before the spin-offs, and the undervaluation problem subsides after the divestiture. Moreover, the degree of undervaluation of parents is positively correlated with the announcement abnormal returns. Surprisingly, I find that the spun-off divisions, on average, are highly overvalued before the spin-offs, and such overvaluation turned into undervaluation after those divisions become independent entities. Overall, the findings indicate that the gains of spin-offs are primarily attributed to the undervaluation correction of parent firms, rather than the value created by spun-off divisions.

In the second essay, I investigate whether managers “manage” earnings before corporate spin-offs. I argue that managers have incentives to manipulate earnings due to either managerial opportunism or managerial optimism. Either motivation could result in

a positive correlation between the level of abnormal accruals and the announcement abnormal returns. With a 240 spin-off sample from 1980-2006, I find that spin-offs firms aggressively manage earnings prior to the announcements. The results show that the level of abnormal accruals of spin-off parents increases significantly prior to the spin-off and becomes insignificant after the spin-off is completed. I also find that pre-spin-off abnormal accruals have predictive power of the announcement returns. The finding indicates that significant, positive spin-off announcement returns are correlated to the pre-spin-off earnings management. In addition, I find a positive relation between the level of earnings management and the long-term returns of spin-offs parents, which is consistent with the signaling hypothesis prediction. However, the predictive power is not statistically significant. A number of explanations regarding the findings are discussed.

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This dissertation is dedicated to my beloved parents, Song-Kee Lin and Li-Hua Cheng,  
my lovely wife, Shu-Chi, and my beautiful baby, Sarah

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## INTRODUCTION

The determination of size of the firm has been argued in both academic and industrial circles for years. In the famous essay “the nature of the firm” (1937), Coase stated that the scope of a firm is determined by the transaction costs between a firm and the market. He argued that firms “should be integrated when costs of organizing an extra transaction within firms become lower than the costs of carrying out the same transaction by means of an exchange on the open market or the costs of organizing in another firm” (p394-395). However, when firms get large, there may be decreasing returns due to the certain marketing costs and organizational costs, which diminish the efficiency. It implies that when the costs of integration are higher than the costs of market transactions, the firm should be better off by separating one or more units from this organization. In other words, when the economies of scale are unable to deliver a better performance, or when a division of a firm no longer fit into the firm’s plan, managers may restructure their organizational and ownership structure to enhance their competitive advantage. Since the size of the firm could be highly correlated with the cost-benefit of the firm, managers could change the scope of the corporation once the size of the firm does not satisfy their desire.

Takeovers and restructuring can be viewed as the efforts by managers to achieve the optimal scope of firms. In recent years, such developments have continued to accelerate dramatically. In 1980 in the U.S, the aggregate deal volume stood at 1,560 completed deals (including merger and acquisitions (M&As) and divestitures<sup>1</sup>) and the

---

<sup>1</sup> The definition of divestitures is obscure. Copeland, Weston and Shastri (2004) describe divestitures as “the sale of a segment of a company to another entity.”(p785). Rosenfeld (1984) and Brauer (2006) defined divestitures as “a firm’s adjustment of its ownership and business portfolio via spin-off, equity carve-out, split-up or sell-off”. In this paper, we use the latter definition.

aggregate value of \$34.8 billion, as shown in Table 1. The number climbed to 8,853 deals and \$1.781 trillion of value in the year 2000. In 2005, there were 7,928 deals that accounted for aggregate value \$980.8 billion, including 4,839 deals with a total \$673.1 billion in M&As, and 2,459 deals with a total of \$307.7 billion in divestiture.

[Insert Table 1 here]

Even though faith in the advantage of economies of scale retains a powerful hold on many business thinkers, U.S. corporations have started changing the scale-as-endgame strategies. In 1980, M&As accounted for almost 85% of the overall deals, or 93% of the value of transactions in the changing of the scope of firms (see Table 1 and Table 2). By 2005, however, the divestiture deals and value increased to 33.7% and 31.4%, respectively. The downsizing of corporations became a significant strategy for managers to restructure their businesses and improve the performance of their firms. During the past two decades, some of the world's most admired public companies have conducted such transactions to rebuild their edges.<sup>2</sup>

[Insert Table 2 here]

Among various techniques of corporate restructuring and reorganization, a popular approach of choice for corporations seeking to achieve an appropriate size is the spin-off.<sup>3</sup> The term "corporate spin-off" is described as the distribution of all or substantially all of the ownership interest of one firm (the parent) in another firm(s) (the subsidiary/subsidiaries) on a pro rata basis to the shareholders of the parent company (Kudla and McInish, 1984; Hite and Owers, 1983). Therefore, following the spin-off

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<sup>2</sup> For example, in 1983, Warner-Lambert sold its bakery unit, Entenmann's to General Foods. In 1988, DuPont divested its original commercial explosive business. The same year, Xerox sold its last remaining insurance unit, Crum & Forster Holdings, Inc., to Fairfax Financial Holdings Limited of Toronto for \$680 million. In 2007, Tyco spun itself into three businesses: Covidien, Tyco Electronics, and Tyco International.

<sup>3</sup> In British, a spin-off is also called breakup.



there are at least two separate publicly held companies. Shareholders exchange their claims on an existing firm for new shares in two or more distinct entities-the original parent firm and the newly-separated subsidiaries. For example, on September 20, 1995, AT&T corporation announced that it would separate into three public trading, global companies. The long-term distance business was still under the AT&T brand name; the computer equipment division became Global Info Solutions (now renamed NCR Corp); and the equipment segment became Lucent Technologies. In January, 1997, Pepsico Inc. announced that it would spin off its KFC, Pizza Hut and Taco Bell restaurant businesses as a publicly traded company, Tricon Global Restaurants (YUM). In both cases, the distribution of the new companies' shares is on a pro-rata basis to the original shareholders.

In spite of the surge of spin-offs in the U.S. business for releasing shareholder value and achieving other business purposes, such transactions have received far less attention. It is obvious that there are little incentives for institutional investors to initiate coverage of spun-off companies, since these firms cannot make any fees on the distribution of new shares to initial shareholders of parent companies. Furthermore, spin-offs activities are often treated as either "minor images of M&As activities" or "part of corporate restructuring rather than an independence, purposeful strategic option for corporate renewal" (Brauer, 2006). Last, but not least, the spun-off units are usually not included in stocks index therefore institutional holders are reluctant to hold such stocks.<sup>4</sup>

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<sup>4</sup> In the article "*Finding value in spin-offs*", Dorsey (2003) stated that spin-offs are usually neglected in Wall Street due to: (1) no hype, (2) selling pressure of index funds, (3) low analyst coverage and, (4) limited track record.

This purpose of this dissertation is to investigate two possible sources that contribute to the gains of corporate spin-offs. In the first essay, I examine the relation between the value created by corporate spin-offs and the misvaluations of the parent firms and their spun-off divisions. I argue that spin-offs could create value even though the efficiency of the firm remains unchanged. Corporate spin-offs could be driven by the desire to correct the undervaluation of the parent firm or the spun-off unit. Thus, the gains of spin-offs should be highly correlated with the degree of misvaluation. By examining a 263 corporate spinoffs sample in the period of 1980 - 2006, I find that parent firms are relatively undervalued before the spin-offs, and the undervaluation problem subsides after the divestiture. Moreover, the degree of undervaluation of parents is positively correlated with the announcement abnormal returns. Surprisingly, I find that the spun-off divisions, on average, are highly overvalued before the spin-offs, and such overvaluation turned into undervaluation after those divisions become independent entities. Overall, the findings indicate that the gains of spin-offs are primarily attributed to the undervaluation correction of parent firms, rather than the value created by spun-off divisions.

In the second essay, I investigate whether managers “manage” earnings before corporate spin-offs. I argue that managers have incentives to manipulate earnings due to either managerial opportunism or managerial optimism. Either motivation could result in a positive correlation between the level of abnormal accruals and the announcement abnormal returns. With a 240 spin-off sample from 1980-2006, I find that spin-offs firms aggressively manage earnings prior to the announcements. The results show that the level of abnormal accruals of spin-off parents increases significantly prior to the spin-off and

becomes insignificant after the spin-off is completed. I also find that pre-spin-off abnormal accruals have predictive power of the announcement returns. The finding indicates that significant, positive spin-off announcement returns are correlated to the pre-spin-off earnings management. In addition, I find a positive relation between the level of earnings management and the long-term returns of spin-offs parents, which is consistent with the signaling hypothesis prediction. However, the predictive power is not statistically significant. A number of explanations regarding the findings are discussed.

## ESSAY 1

### MISVALUATION AND CORPORATE SPIN-OFFS

#### 1.1 INTRODUCTION

Corporation spin-offs have become a popular strategy for firms to reorganize their operations and structures in the last decade. In the early 1980s, very few companies adopted such strategies to divest their assets (See Table 1.1). Such break-up techniques, however, have been widely adopted by many leading corporations over the past few years. For example, on October, 28, 2003, Palm announced that it would spin off its operation segment, Palmsource, which develops and licenses software for mobile information devices, as an independent publicly traded company. The latest case is the Altria Group Inc. In January, 2007, the company announced that it plans to spin off its stake in Kraft Food Inc., the national's largest food marketer, as an independent publicly-held firm.

[Insert Table 1.1 here]

Because of the popularity of spin-offs, many scholars have investigated such corporate restructuring phenomena. Kudla and McInish (1976) are among the first authors to examine the effects on share prices of corporate spin-offs. With only six voluntary corporate spin-off samples from 1972-1976, they find that the spin-offs had a positive impact on the stock returns of parent companies, thereby increasing shareholders' wealth. Following their findings, several studies have documented that corporate spin-offs yield a significant positive return around the time of the announcement period. Table 1.2 summarizes the results of studies of returns of corporate

spin-offs for shareholders in the last three decades. On average, the abnormal return to shareholders from spin-offs around the announcement period is approximately 2 to 3%.

[Insert Table 1.2 here]

There is no doubt of the merit of corporate spin-offs, but what contributes to such significant gains is ambiguous. In the literature, a number of hypotheses have been promoted to interpret such phenomena. Those explanations can be classified into five types<sup>5</sup>: (1) Improving efficiency<sup>6</sup> (Schipper and Smith, 1983; Cusatis, Miles, and Woolridge, 1993; Daley, Mehrotra, and Sivakumar, 1997; Desai and Jain, 1999; Burch and Nanda, 2003; Ahn and Denis, 2004; York, 2005; Cloak and Whited, 2006); (2) Expropriating wealth from bondholders (Galai and Masulis, 1976; Parrino, 1997; Maxwell and Rao 2003); (3) Restructuring of managerial incentive contracts (Aron, 1991; Pyo, 2006); (4) Reversing previous M&As loss<sup>7</sup> (Allen, McConnell, and Reed, 1995; Cusatis, Miles, and Woolridge, 1993), and (5) Improving information asymmetry (Habib, Johnson, and Naik, 1997; Best, Best, and Agapos, 1998; Nanda and Narayanan, 1999; Krishnaswami and Subramaniam, 1999).

Despite these explanations about the gains of the spin-offs, it is likely that spin-offs are driven by the misvaluation of the firms. A spin-off could be beneficial even if the efficiency and compensations of divisional managers remain unchanged (Goldman, 2005; Chen and Zhang, 2007). The spin-offs that only change the level of misvaluation of stocks relative to a firm's true intrinsic value could still be beneficial to investors. In this

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<sup>5</sup> Some studies refer to the increasing focus as the diminishing diversification discount (e.g., Burch and Nanda, 2003).

<sup>6</sup> In this study, I view the focus-increasing motivation as the same as the operating efficiency hypothesis.

<sup>7</sup> Notice that these explanations are not necessarily mutually exclusive. For example, Desai and Jain (1999) argued that the focus-increasing spin-offs improve operation efficiency as well as stock market performance. Yook (2005) argued that the changes of parent firm performance after spin-offs are positively correlated with the changes in informativeness surrounding the spin-off.

study, I argue that a spin-off can be driven simply by the valuation of the parent firms and their spun-off divisions and the gains of spin-offs could be correlated with the degree of misvaluation which is induced by different motives.

Based on a 263 spin-offs sample from 1980-2006, I found that corporate spin-off serves as a mechanism to correct the undervaluation problem. The spin-off parent firms are severely undervalued, compared to their industry average before the spin-off. As a result, managers tend to apply a spin-off strategy to correct the misvaluation problem. The empirical results show that the undervaluation has been significantly alleviated after the spin-offs have been completed, and the level of undervaluation is significantly positively correlated with the announcement abnormal returns.

I also investigate the level of misvaluation of spun-off divisions and whether those levels are associated with announcement returns. Surprisingly, I find that the spun-off divisions are highly overvalued prior to spin-offs. However, the overvaluation soon turns into the undervaluation after those divisions becomes independent entities. Moreover, I find that giving away a highly undervalued spun-off division can generate higher market reactions but the effect is weak.

I further investigate whether both undervaluation of parents and spun-offs contribute to the announcement abnormal returns. The empirical results confirm that the most undervalued parent firms earn the highest announcement abnormal returns. The effects of misvaluation of the spun-offs, however, are not significant. Overall, the findings indicate that the gains of a spin-off are primarily attributed to the undervaluation correction of parents, rather than the value-enhancement of spun-off divisions.

Recent studies have documented that misvaluation is a crucial factor that affects the corporation investment pattern. Those studies argue that managers rationally respond to less-than rational markets. It implies that when the market value of firms diverges from the fundamental values of firms, the managers may take advantage of the mispricing (for example, Shleifer and Vishny, 2003; Baker and Wurgler, 2003). A variety of literature has documented how the misvaluation of firms influences corporate decisions. For example, Loughran and Ritter (1995) argue that firms issue equity instead of debt when they are overvalued, which would explain low post-issue returns. Ikenberry, Lakonishok, and Vermaelen (1995) and Dittmar (2000) find that the stock repurchases are associated with a low valuation of firms. Graham and Harvey (2001) surveyed 392 CEOs, and their report discloses that the recent increase in stock price presents a “window of opportunity” for issuing equities. Baker and Wurgler (2002) investigate how marketing timing affects capital structure and find low leverage firms are those that raised funds when their market valuations were high (high market-to-book ratio), while high leverage firms are those that raised funds when their market valuations were low. Shleifer and Vishny (2003), Rhodes-Kropf, Robinson, and Viswanathan (2005), and Dong, Hirshleifer, Richardson, and Teoh (2006) document that the overvaluation of bidders motivates M&As, and overpriced equity rather than cash is used as the payment.

The remainder of this paper is organized as follows. Section 1.2 reviews the related literature and predictions based on the misvaluation literature. Section 1.3 details the sampling procedure and describes selected characteristics of spin-offs firms. Section 1.4 presents and discusses the empirical results. Section 1.5 offers the concluding discussion.

## 1.2 LITERATURE REVIEW

Previous studies have recognized several hypotheses that could contribute to the positive abnormal returns during the period of corporate spin-off announcements. The efficiency improvement motive has been dominant in corporate spin-off studies. In the literature, at least three types of efficiency improvement have been proposed: managerial efficiency, operational improvement, and internal asset allocation improvement.

Managerial efficiency suggests that reducing the size and variety of the assets under one management may improve either the diseconomies of size which result from increasing costs<sup>8</sup> (Schipper and Smith, 1983) or the alignment of incentives between managers and shareholders (Daley, Mehrotra, and Sivakumar, 1997). The operational efficiency rationale is the idea that the benefit of spin-offs should be derived from an improvement in the operating performance of parent firms' remaining assets due to the "diversification discounts" or "negative excess value" reduction (John and Ofek, 1995; Berger and Ofek, 1995; Burch and Nanda, 2003). It implies that the significant value creation should be available for focus-increasing spin-offs only; no significant value is created for non-focus-increasing spin-offs. Spin-offs can also create value for shareholders if removing unrelated businesses allows managers to focus more on the core business. For example, Burch and Nanda (2003) argue that there is a strong relation between aggregate value improvements and a reduction in divisional diversity, indicating that the diversification discounts can be partially reduced by corporate spin-offs.

The internal asset allocation improvement hypothesis simply suggests that firms can reduce their diversification discounts by either eliminating inefficient asset

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<sup>8</sup> According to Schipper and Smith (1983), the costs include the costs of decision management and the costs of ratification and monitoring of decisions.



allocations or changing their investment behavior through spin-offs (Ahn and Denis, 2004). John (1993) proposes that spin-offs can be value-enhancing by reducing agency costs if parent firm debt is optimally allocated between parent and spun-off units. Ahn and Denis (2004) find that parent firms before spin-offs are valued at a discount and invest less in high Q segments. Such undervaluation is significantly improved after spin-offs. Dittmar and Shivdasani (2003) show that the firms increase investment for those segments that are underinvested prior to spin-offs events. They argue that the divisional investment policy becomes more efficient after the divestiture. Gertner, Powers, and Scharfstein (2002) show that spin-offs increase the sensitivity of investment to investment opportunities: firms tend to cut investment in low Q industries and increase investment in high Q industry, and such improvement of the allocation of capital is the reason why investors react favorably to spin-off announcements.

The wealth expropriation hypothesis is promoted by Galai and Masulis (1976). In their theoretical model, they argue that debt-holders of parent firms will find their position has deteriorated because fewer assets now serve as collateral for the debt. As a result, the value of debt-holders is transferred to the limited liability shareholders. Therefore, bond holders bear a higher risk after the spin-off due to the loss of collateral and liquidation value of the firm.

This hypothesis has gained some support from several empirical studies. Parrino (1997) examines the changes in bondholder and shareholder wealth based on Marriott's spin-off event in 1993. He finds a large wealth transfer from senior security bondholders to shareholders around the time of the spin-off announcement and a decline in the total value of the firm following the event. Maxwell and Rao (2003) find that the bondholders

experience on average a significant negative abnormal return of 0.88% in the month of the spin-off announcement and the shareholders experience an average 2.9% gain during the month of spin-offs announcement. However, Schipper and Smith (1983) and Dittmar (2003) dispute those findings. Neither the mean nor the median abnormal bond return in their studies is significantly different from zero after spin-offs, indicating that firms are less likely to expropriate wealth from the debt holders in spin-offs.

The managerial incentives hypothesis suggests that the spin-off process acts as an incentive for divisional managers because an anticipated spin-off gives divisional managers the motivation to increase firm value, which will directly affect their compensation if the transaction takes place (Aron, 1991). In other words, managers are more likely to preserve shareholder interest since the performance of managers is easily observed. Pyo (2006) finds that spin-offs are more likely driven by managerial incentives rather than by refocusing/operating improvement; managers use spin-offs as a way to rewrite management compensation contracts more efficiently and to improve firm performance.

Further, the excess stock returns around corporate spin-off announcements could be the compensation of wealth losses which are incurred by prior acquisitions. Allen, Lummer, McConnell, and Reed (1995) argue that managers who undertake poor acquisitions can correct their errors by subsequently divesting the unwise M&As. Sadtler, Campbell, and Koch (1997) report that some multi-business companies such as Sears and ITT sold their non-core business that they acquired from prior M&As due to years of deteriorating performance and increasingly severe market competition.<sup>9</sup>

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<sup>9</sup> On February 6th, 2002, the *Wall Street Journal* also reported that more and more mergers of the 1990s were becoming recent spin-offs. It mentioned that some analysts agreed that many conglomerates try to get

The information effects of spin-offs have gained attention recently. Such studies argue that the information changes through corporate spin-offs are the sources of shareholder gain. Habib, Johnson, and Naik (1997) state that spin-offs improve the quality of the managers' investment decisions and reduce uninformed investors' uncertainty about the value of divisions. Both effects lead to an increase in the sum total of the market values of a firm from informed investors to managers and to uninformed investors. Best, Best, and Agapos (1998), Krishnaswami and Subramaniam (1999), and Nanda and Narayanan (1999) argue that firms that have higher levels of information asymmetry are more likely to engage in spin-offs and that the announcement returns are positively correlated with the degree of information asymmetry: the spin-off announcement period abnormal returns are significantly related to the information conveyance. As a result, the information problem decreases significantly after spin-offs.

Numerous studies have questioned the validity of information asymmetry with corporations. The main controversy is focused on whether information is more transparent after corporate divestitures. Huson and MacKinnon (2003) argue that spin-offs increase, instead of decrease, the information asymmetry between informed traders and uninformed traders since the increased transparent information regarding a firm's value makes traders' private information more valuable. Goldman (2005) suggests that spin-offs can lead either to an increase or to a decrease in aggregate information collection and, therefore, does not necessarily increase firm value. Thomas (2002) and Hodges and Lin (2004) both examine the relationship between information production and diversification and find that information asymmetry is not likely to contribute to the

---

rid of bad units from prior M&As; others believed that the splits are simply part of the "everyday churn of business."

diversification discount; the greater diversification does not exacerbate information problems, which is the opposite of the predictions of information asymmetry hypothesis.

There is another dilemma presented by asymmetric information hypothesis. Based on the rationale of information asymmetry, the uncertainty about the intrinsic value will be diminished because spin-offs produce more and more transparent information for both parents and spun-off units, implying that the gains of spin-offs are attributed to “unlocking the hidden value of firms,” which is usually cited by managers when asked about the motives behind such transactions.<sup>10</sup> If the statement is valid, investors should expect that both the divisions and the parents are more likely to be undervalued before spin-offs, and therefore, managers tend to adopt a divesting strategy to reform the valuation. However, several reports have evidenced that firms and their divisions involved in divestitures are not necessarily undervalued. Instead, they could be overvalued before spin-offs.<sup>11</sup> Sudarsanam and Qian (2006) have quoted a report from *Financial Times* that states that “spin-offs sometimes point to asset categories that are overvalued,” since a spate of companies donated overvalued offshoots to their shareholders. Such a phenomenon contradicts the predictions of information asymmetry hypothesis.

Based on those arguments, it is possible that corporate spin-offs are driven by the misvaluation of parents prior to the events, and spin-offs can be viewed as an effective

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<sup>10</sup> For example, an article of Returns on Feb, 17, 2000 reported that Dun & Bradstreet Corp. stated that the planned spin-off of its fast-growing Moody's Investor Service credit rating agency would likely boost the business information company's flagging stock price. Pennzoil Company said on May 7, 1998, that the spin-off of its auto products business would unlock hidden value by creating separate and highly focused “pure play” companies.

<sup>11</sup> For instance, the Tyco Internationals, which broke the company into three publicly-traded companies, is viewed as overvalued by several Wall Street analysts. Alberto-Culver Co., which spun off its distribution operations, was viewed as overvalued when the spin-off announcement was made.

mechanism for correcting market inefficiencies. In other words, Managers apply a corporate spin-off to signal the market that their shares are undervalued, thereby inducing positive price movement during the announcement periods.

Based on the arguments of Krishnaswami and Subramaniam (1999), Nanda and Narayaman (1998), Burch and Nanda (2003), and Chemmanur and Liu (2007), pre-spin-off parent firms are more likely to be undervalued, a situation which is caused by different reasons.<sup>12</sup> When a firm is relatively undervalued, it will jeopardize a firm's capability to obtain external financing and the job security of executives. In addition, managers' compensation packages and options are highly associated with the value of the firm. Finally, the undervalued firm could also easily become the target of the M&As. If managers believe that the firm is undervalued relative to their superior private information, they may attempt to disclose this potentially value-increasing information by adopting a spin-off to signal the market. Consequently, this action incurs significantly positive announcement abnormal returns which are identified in previous empirical studies, and such returns should be highly related with the degree of undervaluation. Therefore, I propose the first hypotheses as follows:

- H1a: On average, the spin-offs parents are relatively undervalued compared to their industry average.*
- H1b: The misvaluation (undervaluation) problem will be alleviated after the spin-offs' completion.*
- H1c: The higher degree of undervaluation of parent firms is associated with the higher abnormal return around the time of the spin-off announcement.*

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<sup>12</sup> Misvaluation could be triggered by information asymmetry, assets misallocated, market sentiment, or the overreaction /under-reaction of investors. I have no intention of identifying this distinction in this paper.

The corporate spin-offs could also be driven by the misvaluation of spun-off divisions. If managers realize that a subsidiary is highly undervalued, they may approve of a spin-off strategy to unlock the hidden value of this segment. Given the future value-enhancing of the subsidiary, the market reactions around spin-off announcements should be favorable, and the division that is given away is more likely to be an undervalued segment rather than an overvalued one.

Conversely, managers may also tend to spin-off an overvalued subsidiary to their shareholders. Two possible explanations can be found from literature. Due to the asymmetric information between inside managers and outside shareholders, investors may observe only the aggregate cash flow and earnings, not those for each division. As a result, they could systematically undervalue one division (with good performance) and overvalue the other division (with poor performance), while the firm as a whole is being undervalued (Nanda, 1991; Nanda and Narayanan, 1999). In this case, managers are forced to abandon control over an overvalued division with less information to correct the undervaluation problem, but investors may not recognize the fact during the announcement periods.

Behavioral perspective provides further evidence why firms are willing to give away the overvalued division. Managers may cater to investors demand by giving them focused-firms stocks, which are overvalued. In this case, market reactions to spin-off announcements that cater to the demand of overvalued stocks should be more positive. In the study of Sudarsanam and Qian (2006), managers of European companies divested overvalued divisions to shareholders, and such decisions maximized the short-run share

prices and temporarily relieved the pressures to improve the firm performance. Overall, both hypotheses suggest that there is a possibility that firms divest an overvalued division.

However, if spun-offs are overvalued, managers should take advantage by either issuing equity carve-out (Power, 2003) or initial public offerings (IPOs) (Lucas and McDonald, 1990), which will bring cheaper capital into the company. In addition, giving a relatively overvalued division to current shareholders will be discovered by the investors eventually, thereby causing a return reversal in the future. Several studies, such as Allen (2001) and Chemmanur and Liu (2007), find that the insiders and institutional shareholders are substantial purchasers of stock in the public subsidiaries subsequent to spin-offs, implying that the spun-off divisions are more likely to be undervalued rather than overvalued.

Based on those arguments, I propose the second set of hypotheses about the valuation of the spun-off divisions as follows:

- H2a: On average, the spun-offs divisions are relatively undervalued than their industry average.*
- H2b: The misevaluation (undervaluation) problem will be alleviated after spin-offs completion.*
- H2c: The degree of undervalued spun-off divisions is positively associated with the abnormal announcement return of parents: The higher level of an undervalued spun-off division, the higher announcement abnormal returns of parents.*

## 1.3 DATA

### *1.3.1 Data Sources and Requirements*

Using the Thomas ONE Banker database (the former Deals Securities Data Corporation (SDC) database), I identify a sample of U.S. firms that undertook spin-offs during the 1980-2006 period. The Thomas ONE Banker data include the announcement dates and effective dates, the CUSIP identifiers and the tickers for parent and spun-off firms, transaction data, and a brief description of the spin-off deals. To be included in our sample, those spin-offs must meet following criteria:

1. Deals must be voluntary tax-free spin-offs.<sup>13</sup> Any non-voluntary spin-offs such as those forced through anti-trust regulation and taxable distribution deals are excluded from the sample.
2. The spin-off is not part of liquidity, bankruptcy, or merger processing.
3. Financial firms' spin-offs (parent firms with SIC code 6000-6999) are dropped from the sample.

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<sup>13</sup> Section 355 of the Internal Revenue Code allows a corporation to make a tax-free distribution to its shareholders of stock and securities in one or more controlled subsidiaries. To be qualified for the tax-free treatment, firms must satisfy the following requirements: (a) The distributing corporation must distribute the stock of a controlled corporation (defined as owning at least 80% of the voting power and at least 80% of the shares of each class of non-voting stock), preexisting or newly created, to its shareholders. (b) The distributing corporation generally must distribute all its controlled corporation stock and securities immediately before the transaction. (c) Following the distribution, both the controlled and distributing corporations must be actively engaged in a trade or business with a five-year history. (d) Neither the distributing nor the controlled corporation can use the spin-off as a device for distributing earnings and profits. (e) A spin-off is to be motivated, in whole or substantial part, by one or more corporate business purposes. The purpose(s) must be real and substantial and germane to the distributing or controlled corporations business or to the affiliated group of which the distributing corporation is a member. (f) Following the distribution of the controlled corporations stock, the distributing corporation shareholders must maintain continuity of interest in both companies. Revenue procedure 96-30 further states this requirement generally is met if one or more persons who directly or indirectly own the distributing corporation before the distribution also own 50% or more of the stock in each of the modified companies after the separation.



4. The announcement and effective day of spin-offs must be identifiable through articles from Factiva.
5. Spin-off parent firms' data must be available on the Center for Research in Security Prices (CRSP), COMPUSTAT, and Compact Disclosure databases.

I use Factiva to identify detailed information about each spin-off deal and the Cleaning House's *Capital Changes Reporter (CCR)* to determine each deal's tax status. I collect price and return data from CRSP and accounting data from COMPUSTAT and Compact Disclosure. The financial analysts' data is from Institutional Brokers Estimate System (I/B/E/S). Initially, I obtained 765 spin-offs from Thomson ONE Banker. I excluded 127 records with unverified announcement dates through *Wall Street Journal* articles, 66 records with carve-out, 39 records with taxable spin-offs, 11 records with non-voluntary spin-offs, 42 records combined with other corporate events (such as M&As and dividend announcements), 55 non-spin-off records<sup>14</sup>, 98 records with parent firms operating in the financial industry, 21 non-voluntary (regulation) records, 8 duplicate records, and 5 foreign spin-offs records. I also deleted 30 firms for which either market value data or book value data is not available (Table 1.3). The final sample consists of 263 spin-offs divested by 254 companies from 1980-2006.

[Insert Table 1.3 here]

Table 1.4 shows the distribution of spin-offs by year. Around 45% of the spin-offs occurred during 1995-2000, with the highest 23 spin-offs in 1995, followed by 21 deals in 1998, and 20 deals in both 1996 and 1999. More than 85% of the parent firms (221 of 254) have multiple segments; only 33 firms operate on a single business. There are 169

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<sup>14</sup> Those deals include split-up, tracking stock, leverage buyout, and sell-offs.

spin-offs where the operations of the parent firm and the spun-off subsidiaries differ at the first two-digit SIC code level, and 94 occur where the parent and spun-off subsidiaries have the same first two-digit SIC codes. In addition, 181 out of 254 parent firms are traded on the New York Stock Exchange (NYSE) 65 are traded on the NASDAQ and 17 are listed on the American Stock Exchange (AMEX).

[Insert Table 1.4 here]

### ***1.3.2 Matching Industry***

For comparison purposes, I first find a matching industry which has similar characteristics with the parents and spun-off subsidiaries before and after the spin-off announcements. In this study, two types of matching industries are identified: a peer industry and a peer-specified firm industry. A *peer industry* is defined as the industry of firms having similar businesses with parent/spun-off subsidiaries. The *peer-specified industry* is the industry of one-segment firms having similar businesses with parent/spun-off subsidiaries. I start the matching process with the peer industry firms that have the same four-digit SIC codes as the parents/spun-off subsidiaries at the end of the fiscal year ( $t-1$ ) prior to the announcement year ( $t$ ), and at the end of the fiscal year one year ( $e+1$ ) after the effective year ( $e$ ). If no such industry is found or the number of firms within this industry is less than five, then the three-digit SIC codes are used followed by two-digit SIC codes and one-digit SIC codes. I repeat the same processes to form a peer-specified industry. All firms' segment data is from the COMPUSTAT Industry Segment database.

### ***1.3.3 Measure of Misvaluation***

I assume that the level of misvaluation of firms is correlated with the spin-offs announcement returns. Following Baker and Wugler (2002) and others, I apply the market-to-book (M/B) ratio as the proxy of misvaluation.

I calculate the M/B ratio of the industry average based on the matched peer industry of the parents and spun-off subsidiaries. The M/B ratio of the peer industry average (the peer specified-firm industry average) for pre-spin-offs is the value-asset-weight mean and median of the ratio of the market equity at the end of December of the fiscal year  $t-1$ , divided by the book common equity for the fiscal year ending  $t-1$ , in each matched peer industry (matched peer specified-firm industry). The M/B ratio of the peer industry average (the peer specified-firm industry average) for post-spin-offs is the value-asset-weight mean and median of ratio of market equity at the end of December of the fiscal year  $e+1$ , divided by the book common equity for the fiscal year  $e+1$ , in each matched peer industry (peer specified-firm industry).

The M/B ratio for both the parent firms and the spun-off subsidiaries are also calculated. The pre-spin-off M/B ratio of parent firms is the ratio of market equity at the end of December of the year  $t-1$  divided by the book common equity for the fiscal year ending in the year  $t-1$ , and the post-spin-off M/B ratio of the parent firms (spun-off subsidiaries) is the ratio of market equity at the end of December of the year  $e+1$ , divided by the book common equity for the fiscal year ending in year  $e+1$ . The pre-spin-off M/B ratio of the spun-off subsidiaries is the ratio of estimated market equity in the year  $t-1$ , divided by book common equity for the fiscal year ending in the year  $t-1$ . To

estimate the market equity of spun-off subsidiaries prior to the announcement, I apply the following multiplier estimation method inspired by Berger and Ofek (1995)<sup>15</sup>:

$$E(MV) = AI_i * \left( Ind \left( \frac{V}{AI} \right)_{mf} \right) - BD_i \quad (1)$$

Where

$E(MV)$  = the estimated market value of a spun-off segment as a stand-alone firm

$AI_i$  = spun-off division  $i$ 's value of the accounting item (sales or assets) used in the valuation multiple

$Ind_i \left( \frac{V}{AI} \right)_{mf}$  = multiplier of total capital to an accounting item (sales or assets) for the median single-segment firm in segment  $i$ 's industry

$V$  = a single-segment firm's total capital (market value of common equity plus book value of debt)

$BD$  = the book value of the debt of a spun-off segment

All the variables used in equation (1) are the numbers at the end of the fiscal year prior to the announcement year.

#### **1.3.4 Measure of Announcement Return**

Abnormal returns around the spin-off announcement of parent firms are calculated by using the market model (Brown and Warner, 1985) with the CRSP value-weighted index as the benchmark of the market portfolio. The estimated period is over a

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<sup>15</sup> In Berger and Ofek (1995), three accounting multipliers (sales, asset and EBIT) are applied to estimate the excess value of the firms. Due to the bias of EBIT, I apply only the sales and assets (not reported) multiplier. Using the assets multiplier basically generates a similar result as applying the sales multiplier.

255 trading-day period, ending 5 trading days prior to the announcement day. Abnormal returns with several time intervals around the announcement day for parent firms are examined. The average cumulative abnormal returns (CARs) and the median cumulative abnormal returns are reported.

### ***1.3.5 Parent Firms Characteristics***

Table 1.5 reports the descriptive statistics for the sample parent firms, peer industries, and spin-off transactions. The reported financial data is based on the end-of-fiscal-year information prior to the spin-off announcement. The average sales of sample firms are \$5.35 billion, and the average book value of total assets of the sample parent firms is \$7 billion, both of which are significantly less than their industry average. The mean and median market value of parent firms prior to the announcement year is \$23 billion and \$3.3 billion, respectively. In addition, the sample firms apply almost two times more debt than equity to structure their assets, which is significantly lower than their industry average. Moreover, the leverage data show that sample firms, on average, do not suffer from financial distress. In terms of profitability, the return on assets (ROA) and the return on equity (ROE) are 2% and 5.8%, respectively, which are lower than the industry average but not significantly different. Compared to their peer industry, parent firms own fewer segments but the degree of the diversification is much higher than their industry average before spin-offs which is measured by the Herfindahl index. Panel B discloses selected information about spin-offs transactions. The transaction value is based on the market value of spin-off subsidiaries at the end of the first trading day, and the spin-off size is the ratio of the spin-off transaction value to the market value of the parent

firm one day prior to the ex-day. The transaction value of spin-offs is around \$8.7 billion, and the spun-off subsidiary represents 28.64 % of the market value of a parent firm's capitalization. In general, parent firms take an average 209 days to complete the transaction.

[Insert Table 1.5 here]

## 1.4 EMPIRICAL RESULTS

### *1.4.1 Abnormal Returns*

The mean and median abnormal returns around the announcements of spin-offs are reported in Table 1.6. Similar to earlier studies, I confirm those positive returns around spin-offs. A three-day window (-1, 1) has a significant mean cumulative abnormal return of 3.52%. Significant positive abnormal returns of 2.05% and 2.61% are also found on the announcement day and in the window (-1, 0), respectively. Consistent with previous studies, I do not find significant drift after spin-off announcements.

[Insert Table 1.6 here]

### *1.4.2 Misvaluation Estimation*

If spin-offs are driven by the undervaluation, significantly undervaluation of parent firms as well as of their divisions should be observed. In this section, I investigate the level of misvaluation of parent firms and spun-off subsidiaries before and after spin-offs by comparing the M/B ratios of parent firms/spun-off divisions with those of their peer industry. Panel A of Table 1.7 presents the level of misvaluation between sample parents and their matched industry. On average, parent firms are more highly undervalued than their pure-play industry and peer industry before spin-offs. The undervaluation has been alleviated subsequent to spin-offs. The data show that even though the parents are still more undervalued than their pure-play peers, their M/B ratio has increased around 18% one year after the spin-offs are completed, and this result is not significant in comparison to their peer industry. The findings confirm the belief that a

spin-off could serve as a mechanism to correct the undervaluation problem of parents, which is consistent with H1a and H1b hypothesis.<sup>16</sup>

[Insert Table 1.7 here]

Panel B of Table 1.7 reports the level of misvaluation for sample spun-off subsidiaries and their peer industry. Surprisingly, sample spun-off divisions are highly overvalued before the spin-off, compared to their peer industry and pure-play peers. However, such overvaluation ultimately turns into undervaluation. After one year as an independent entity, the M/B ratio of spun-off subsidiaries has declined significantly, and the after-spin-off M/B ratio is considerably lower than that of their peer industry as well as that of their pure-play industry peers. The findings are opposite to the hypothesis H2a and H2b, which predicate that an undervalued spun-off division is more likely to be divested and such misvaluation of divisions should be corrected soon after spin-offs are completed.

The overvaluation of a spun-off division could be attributed to managerial incentive or information asymmetry. Berger and Ofek (1995) have argued that managers do have some ability to allocate sales/assets and greater discretion to allocate expenses or overstate earnings to both providers of capital and product market competitors. This proposal implies that managers have motives to overstate the value-relevant accounting numbers of the spun-off divisions before the spin-offs in order to attract investors' attention. Information asymmetry hypothesis suggests that investors have difficulties to observing each division's cash flow and earnings directly, so the valuation of a firm will be decided by the average performance of all divisions. In other words, investors could

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<sup>16</sup> I also checked the M/B two and three years after spin-offs completion. The results (which are not reported) are the same as these findings.



potentially overvalue one poor-performance division and undervalue another better-performance division. Since managers tend to maintain the profitability of a firm, they are more willing to give up the control of the poor-performance division that is overvalued. Since more transparent information about the spun-off divisions becomes available soon after the announcements, the overvaluation will be caught by investors eventually, thereby, driving the value reversal. Such after-spin-off undervaluation may also explain why many spun-off subsidiaries become future targets of M&As.

Since undervalued firms are more likely to adopt spin-offs to solve the valuation problem, the relatively undervalued firms should earn higher returns at the time of announcements. To examine this rationale, I sort the sample parent firms into quartiles (lowest to highest based on their industry-adjusted misvaluation) and examine the quartiles to see whether the abnormal returns are significantly different between the top quartile relative to the bottom quartile. As showed in Table 1.8, the average abnormal returns are significantly higher for the bottom quartile (highly undervalued parents) than the top quartile (highly overvalued parents). For example, the bottom quartile earns average two-day (-1, 0) cumulative abnormal returns (CARs) 4.54% (median 4.08%), while they are 2.04% (median 1.33%) in the top quartile. The difference of 2.5% (median 2.75%) is significant at the 10% level (median at 5% level). The findings strongly support H1c; the highly undervalued parent firms that adopt a spin-off should earn the highest abnormal announcement returns.

[Insert Table 1.8 here]

It is also possible that a spin-off is driven by the undervaluation of the spun-off division when the profitability of the division is “buried” under the parent firm. In this

case, divisional managers may request the combined firm to spin off their division in order to unlock the hidden value. Based on the motives of undervaluation hypothesis, firms that spin-off highly undervalued divisions should earn higher returns at the time of announcements. I investigate this logic by sorting the announcement returns of parent samples by the industry-adjusted misvaluation of spun-off units. The results in Panel B of Table 1.9 show that the abnormal announcement returns of parents decrease from the bottom quartile that divests the highest level of undervalued divisions to the top quartile that divests the highest level of overvalued ones. For example, the bottom quartile (with the highest undervalued spun-off divisions) earn average two-day CARs of 4.06% (median 2.92%), while they are 2.31% (median 1.69%) in the top quartile (with the highest overvalued spun-off divisions). The mean difference 1.75% (median 1.23%), however, is not statistically significant. The findings in Table 1.9 partly support hypothesis H2c, which predicates a significant positive relation between the level of undervaluation of spun-off divisions and the announcement abnormal returns.

[Insert Table 1.9 here]

### ***1.4.3 Cross-Sectional Regressions***

The undervaluation explanation predicates a positive association between the degree of the undervaluation and the market reaction to the corporate spin-offs. In this section, I conduct multiple regression methods to investigate this statement. The three-day window (-1, 1) announcement returns are regressed on the misvaluation proxy (market-to-book ratio of a parent (M/B) and that of a spun-off division (TM/B)) and a set of control variables for other known potential predictions in the regression model. Based

on the undervaluation hypothesis, both M/B and TM/B should be negatively correlated with the announcement returns.

However, the relation between the valuation of spun-off divisions and the returns could be positive. Nanda and Narayanan (1999) have argued that parent firms have incentives to spin-off overvalued divisions, which are less informative and perform poorly, because the action causes undervaluation of the combined firm. This interpretation implies that the higher gains of a spin-off could be attributed to giving away a highly overvalued division, if the gains of the holding stocks of parent firms can compensate the loss of holding the overvalued stocks of divisions. Market sentiment hypothesis also provides another example to forecast a positive relation. Sudarsanam and Qian (2006) have argued that catering plays a role in corporate spin-off decisions. Managers tend to give overvalued divisions to shareholders if investors demand glamour stocks, thereby maximizing the short-run share prices and temporarily relieving the pressures to improve the firm. In this case, giving away a highly overvalued spun-off division will be more welcome by the market than giving away a relatively undervalued one. Both explanations suggest a potential positive relation between the announcement returns and the degree of overvaluation of a divested division.

The control variables considered in our regression models include debt/equity ratio (D/E), sales-based Herfindahl index (HERFINDAHL), focus dummy (FOCUS), profitability proxy (ROA), information asymmetry proxy (SD), and the hot/cold market dummy (N\_IPOs). D/E ratio is applied to control the bondholders' wealthy expropriation effect, which is advocated by Galai and Masulis (1976), Parrino (1997), and Maxwell and Rao (2003). If a firm has too much debt, it will face the capital constraint. Spin-offs

provide a firm an opportunity to transfer debt to spun-off divisions thereby increasing its borrowing capacity.

HERFINDAHL serves as a proxy of level of diversification. It is calculated across  $n$  business segments as the sum of the squares of each segment's sales as a proportion of total sales of parent firms in the fiscal year prior to announcement year. Previous studies such as Berger and Ofek (1995), Rajan, Servaes and Zingales (2000), and Lamont and Polk (2002) have documented that the diversified firms suffer from diversification discount. Since the level of diversification will diminish after the divestiture, the market should approve of a spin-off decision. Focus dummy (FOCUS) is applied to control whether gains of spin-offs are derived from focusing increasing transactions. The FOCUS is defined as 1 when the parent and the spun-off division have different first 2-digit SIC codes and 0 otherwise. Several studies have stated that a focus-increasing spin-off can improve a firm's operating performance (Daley, Mehrotra, and Sivakumar, 1997; Desai and Jain, 1999) or diversification discount (Burch and Nanda, 2003), while non-focus-increases deals do not. Therefore, I expect focus-increasing spin-offs earn higher announcement abnormal returns.

ROA is included to control the level of profitability. It is calculated as the ratio of income before extraordinary items to the book value of assets in the year prior to the spin-off announcement year. Chemmanur and Liu (2007) have argued that firms that choose a spin-off strategy should be the ones with better profitability and high cash flow realization in the future. Therefore, I expect that higher profitable firms should earn higher announcement returns.

SD represents the level of information asymmetry. It is measured as the standard deviation of the market model residual over the period from 255 to 5 days before the spin-offs announcement day. Nanda and Narayanan (1999), Krishnaswami and Subramaniam (1999), and Chemmanur and Liu (2007) have documented that gains of spin-offs could be attributed to the improvement of asymmetric information suggesting that firms with higher levels of information asymmetry should earn higher announcement returns because such a problem is alleviated subsequently.

Finally, the number of IPOs in the industries of spun-off divisions is applied to identify whether a spin-off is influenced by the market condition. When market is optimistic about the industries of the spun-off divisions, managers tend to issue equity of the spun-off division (carve-out) rather than a spin-off. Therefore, a negative relation between the hot-market condition and the announcement abnormal returns is expected.

The results of cross-sectional regressions and their statistics are reported in Table 1.10. The univariate test in regression 1 demonstrates that there is a significant negative relation between the level of overvaluation and the announcement returns. The coefficient of M/B is -0.004 and is statistically significant at the 1% level ( $t$ -statistics=-2.713). The multivariate regressions also return similar results. A significant negative correlation between the level of overvaluation and the announcement abnormal is found in regressions 2 to 4. The influence of M/B is significant at the 1% to 5% level, which strongly supports the undervaluation prediction.

[Insert Table 1.10 here]

In terms of the effects of the valuation of the spun-off divisions, regressions 5 and 6 show that there is a negative relation between the levels of overvaluation of the spun-

off subsidiaries and the announcement returns, which indicates that giving away the relatively overvalued divisions to shareholders will be discounted by the market. However, the effect is weak and insignificant. Such phenomenon might be caused by the nature of parents firms before spin-offs: Given the high level of information asymmetry before a corporate spin-off, investors may not be able to observe each division's performance directly. Consequently, they should rely primarily on the overall performance of the combined firm to decide the valuation of each division. In other words, a division's value is determined by the combined firm's information. It may explain why the effects of the valuation of the divisions are not substantial. Furthermore, since the spun-offs only account for a small portion of the value of the combined firm, investors may focus mainly on the change of the value of parent firms rather than the spun-off division. The findings of multiple regressions are in opposition to the catering hypothesis, which asserts that investors will favor glamour divisions (stocks), thereby contributing to significantly higher announcement abnormal returns.

The results in Table 1.10 also indicate that the gains of a spin-off could be triggered by other motives. Regression 4 and regression 5 indicate that a higher level of information asymmetry before the spin-off contributes to a higher market reaction, a finding which is consistent with those of Krishnaswami and Subramaniam (1999). Moreover, it supports the bondholders' wealth extrapolation explanation, which indicates that a spin-off could potentially improve a firm's debt capability by transferring debts to its spun-off divisions.

Overall, the regression models demonstrate that the gains of a spin-off are strongly contributed by the undervaluation correction of parents, and information

hypothesis and bondholders wealth extrapolation also play a role in contributing to the gains at the time of announcements.

## 1.5 CONCLUSIONS

Despite an increase in recent years in misvaluation arguments about corporate and investment decisions, there has been relatively little analysis of the degree to which misvaluation of a firm influences gains of corporate spin-offs. The undervaluation hypothesis implies that the gains of spin-offs are attributed to the correction of undervaluation problems. Therefore, both parent firms and spun-off divisions are more likely to be undervalued rather than overvalued before spin-offs.

The purpose of this study was to investigate the relation between gains of corporate spin-offs and misvaluation. I argued that spin-offs could be beneficial even though the efficiency and compensations of divisional managers remains unchanged. The corporate spin-offs could be driven simply by misvaluation of a parent firm as well as its spun-off division, and the gains around announcements should be associated with their degree of misvaluation.

Based on a sample of 263 spin-offs from 1980 to 2006, I found that corporate spin-off serves as a mechanism to adjust an undervaluation problem. Parent firms are more severely undervalued than their peer industry before spin-offs. It is likely that managers tend to apply a spin-off strategy to boost the valuation of firms. The empirical results indicate that the undervaluation problem has been partially alleviated after a spin-off is completed and the level of undervaluation of a parent firm is significantly positively correlated with the announcements abnormal returns.

I also investigated whether the level of valuation of spun-off divisions are associated with announcement returns. Surprisingly, the spun-off divisions are highly



overvalued prior to spin-offs. However, the overvaluation soon turns into undervaluation after a division becomes an independent entity.

Further I investigated whether the undervaluation of parents and spun-offs contribute to the announcement abnormal returns. My empirical results confirm that the most undervalued parent firms earn the highest announcement abnormal returns. I also find that giving away a highly undervalued spun-off division can generate higher market reactions. However, the effect is insignificant, thus only partially supporting the undervaluation hypothesis. Overall, the findings indicate that the gains of spin-offs are primarily attributed to the undervaluation correction of parent firms, rather than the value created by spun-off divisions.

## ESSAY 2

### EARNINGS MANAGEMENT IN CORPORATE SPIN-OFFS

#### 2.1 INTRODUCTION

In this study, I investigate whether managers “manage” their earnings before corporate spin-offs. Corporate spin-offs have been recognized as favorable corporate events since significant positive abnormal returns around spin-off announcements have been documented by extant literature (Hite and Owers, 1983; Daley, Mehrotra, and Sivakumar, 1997; Desai and Jain, 1999; Krishnaswami and Subramaniam, 1999; and others.). Several authors have argued that the sources of the gains can be explained by (1) Improving efficiency (Schipper and Smith, 1983; Cusatis, Miles, and Woolridge, 1993; Daley, Mehrotra, and Sivakumar, 1997; Desai and Jain, 1999; Burch and Nanda, 2003; Ahn and Denis, 2004; York, 2005; Cloak and Whited, 2006); (2) Expropriating wealth from bondholders (Galai and Masulis, 1976; Parrino, 1997; Maxwell and Rao, 2003); (3) Restructuring of managerial incentive contracts (Aron, 1991; Pyo, 2006); (4) Reversing previous M&As loss (Allen, McConnell, and Reed, 1995; Cusatis, Miles, and Woolridge, 1993).

Recently, several studies have recognized that the value increase of spin-offs is a result of information asymmetry.<sup>17</sup> Nanda and Narayanan (1999) suggest that the positive gains of shareholders are attributed to the change in the level of information of the stock

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<sup>17</sup> Two types of information asymmetry have been advocated in literature. The first is the asymmetric information between insiders (managers) and investors (Habib, Johnson, and Naik, 1997; Nanda and Narayanan, 1999; Krishnaswami and Subramaniam, 1999; Allen, 2001). The second one is the asymmetric information between investors (Huson and MacKinnon; 2003). In this study, *information asymmetry* refers to the former definition.

price relative to the firm's true economic value. Krishnaswami and Subramaniam (1999) indicate that firms that have a higher level of information asymmetry are more likely to engage in spin-offs. This information asymmetry problem is mitigated significantly after the spin-off, thereby enhancing the value of the firms.

Given the high level of information asymmetry of the firm before spin-offs, it is reasonable to assume that managers should possess private information about the firm and its current and prospective earnings that shareholders do not have. Such a discrepancy in information gives managers incentives to manipulate earnings reports, thus influencing investors' perceptions about the firm's value because a firm's value is based on the present value of expected future earnings. Additionally, managers' compensation packages, as well as options, are based upon the valuation of the firm. In this study, I refer to such motivation of earnings management as the *opportunistic hypothesis*. Krishnaswami and Subramaniam (1999, p.79) have argued that an ordinary disclosure of the information by a combined firm may not be reliable because a firm can manipulate shared costs across divisions to maximize proceeds from new security issues. The financial executives survey of Graham, Harvey, and Rajgopal (2006) shows that more than 80% of senior managers agree that maintaining or increasing their firms' stock price is their priority. In addition, most of the chief financial officers have strong intentions to "sacrifice economic value of values" in order to smooth earnings. Trueman and Titman (1988), Dye (1988), and Richardson (2000) have argued that information asymmetry is a necessary condition for earnings management and the level of information asymmetry should be positively correlated with the level of earnings manipulation.

Nevertheless, managers who engage in earnings management activities may not intend to mislead investors. When managers have favorable private information that investors do not have, they can use earnings management in conjunction with a corporate event to signal the market about the value of the firm. Consequently, managers of a spin-off firm may tend to correct the undervaluation problem by inflating earnings to reflect the true economic value of the firm. I refer to this motivation as the *private signaling hypothesis*. Subramanyam (1996) suggests that managers can use discretionary accruals to increase the ability of earnings, thereby conveying the information of firm value. Louis and Robinson (2005) have found that managers use accruals to express their optimism about their firms' future, and investors perceive the signal and price the accruals efficiently.

By using a 240 spin-off sample from 1980-2006, I discover that firms aggressively manage earnings prior to the announcements. The results show that the level of abnormal accruals of spin-off parents increases significantly prior to the spin-off announcements and becomes insignificant after spin-offs are completed. I also identify that pre-spin-off abnormal accruals have predictive power for the spin-off announcement returns. The findings indicate that significant, positive spin-off announcement returns are partly attributed to the pre-spin-off earnings management. Additionally, I find a positive relation between the levels of earnings management and the long-term returns after the spin-offs, a finding which is consistent with the signaling hypothesis prediction. However, the predictive effect is not statistically significant on the one-year return after the announcements. A number of explanations regarding the findings are discussed.

The remainder of this study is organized as follows. Section 2.2 reviews the relevant literature and develops the hypotheses. Section 2.3 describes the estimation of the abnormal accruals and returns measurement. Section 2.4 describes the sample selection, the sample characteristics and the abnormal returns findings. Section 2.5 reports the relation between abnormal accruals and abnormal returns. Section 2.6 describes the results of the regression model regarding the predictability of abnormal accruals. The conclusions are presented in Section 2.7.

## 2.2 LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Earnings management could occur when managers manage financial reporting either to mislead outside investors about the underlying economic performance of the firm or to influence valuations depending on reported accounting numbers. The importance of earnings creates a strong incentive for managers to control accounting earnings number to serve their own interests before or during corporate events. Numerous studies have documented that corporate managers have objectives for manipulating earnings during corporate events, such as initial public offers (IPOs) (Teoh, Wong, and Rao, 1998a; Teoh, Welch, and Wong, 1998b; DuCharme, Malatesta, and Sefcik, 2004; Zheng and Stangeland, 2007), reverse leveraged buyouts (Chou, Gombola, and Liu, 2006), seasoned equity offerings (SEOs) (Teoh, Welch, and Wong, 1998c; Rangan, 1998; Shivakumar, 2000; Lim, Thong, and Ding, 2007), stock splits (Louis and Robinson, 2005), mergers and acquisitions (M&As) (Erickson and Wang, 1999; Louis, 2004), cross-listing (Lang, Raedy, and Wilson, 2006), and management buyouts (DeAngelo, 1988; Perry and Williams, 1994).

Even though it is a well known fact that managers attempt to influence stock prices, their motives for earnings management are still in debate. The prevailing assumption to explain earnings management is managerial opportunism. This hypothesis assumes that managers tend to manipulate earnings when there are gaps between firm performance and investors' expectations. For example, firms are more likely to report a

high level of accruals (income-increasing) prior to IPOs and SEOs<sup>18</sup> (Teoh, Wong, and Rao, 1998a; Teoh, Welch, and Wong, 1998b; DuCharme, Malatesta, and Sefcik, 2004; Zheng and Stangeland, 2007; Teoh, Welch, and Wong, 1998c; Rangan, 1998; Shivakumar, 2000; Lim, Thong, and Ding, 2007). There is also evidence that acquiring firms inflate with earnings of prior to stock mergers (Erickson and Wang, 1999; Louis, 2004) in order to reduce buying costs.

Based on these findings, there are several possibilities that managers may have incentives to manage earnings before corporate spin-offs. First, those parent firms are decreasing profit before spin-offs<sup>19</sup> (Desai and Jain, 1999). Given that managers are expected to report/maintain positive earnings and meet analysts' expectations (DeGeorge, Patel, and Zeckhauser, 1999), they have a motive to boost the market value by overstating earnings. Second, the spin-off firms are more likely to be undervalued compared to industry peers due to the disadvantages of the combined firms.<sup>20</sup> Since managers' compensation packages and options are highly correlated with the value of the stocks, managers are willing to change the earnings to correct the undervalue problem. Third, parent firms may have information asymmetry dilemmas before spin-offs. Krishnaswami and Subramaniam (1999) find that firms that engage in spin-offs have a high level of information asymmetry before the announcements. If uninformed investors

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<sup>18</sup> Shivakumar (2000), however, argues that earnings management of SEOs may not necessarily be designed to mislead investors. It may only reflect the issuers' rational response to anticipated market behavior at offering announcements.

<sup>19</sup> For example, on August 27, 2002, HealthSouth announced that it was considering spinning off its surgery-center division and focusing on its more profitable inpatient rehab hospitals after the earnings dropped.

<sup>20</sup> Such disadvantages can be driven by either the poor performance of spun-off divisions (Woo, Willard, and Daellenbach, 1992; Desai and Jain, 1999), the inappropriate asset allocations/inefficient investment (Gertner, Powers, and Scharfstein, 2002; Dittmar and Shivdasani, 2003; Rajan, Servaes and Zingales, 2000), information asymmetry (Krishnaswami and Subramaniam, 1999), or diversification discount (Berger and Ofek, 1995, 1999).

cannot observe each division's cash flow and earnings directly, managers may take advantage of transferring shared costs in order to increase earnings number. Several articles also indicate that information asymmetry and earnings management are highly correlated (Chaney and Lewis, 1995; Richardson, 2000; Lim, Thong, and Ding, 2007). Therefore, it is logical to assume that managers tend to manage their earnings before corporate spin-offs.

Nonetheless, the information asymmetry may not necessarily indicate the opportunistic behaviors of managers. Since the information problem interferes with the communication between managers and outside investors, the market is more likely to discount a firm's value due to uncertainty. When the undervaluation creates capital constraints for the firms as well as crisis for the job security of executives, those managers may apply accruals to signal favorable information to the market, thereby correcting the stock value. Beaver, Eger, Ryan, and Wolfson (1989) and Beaver and Engel (1996) find that managers use loan loss provisions to signal firms' future operation performance. Louis and Robinson (2005) also state that the managers combine the earnings management and the stock split to communicate private information to shareholders.

Considering those arguments, I assume that managers have strong incentives to manage earnings before corporate spin-offs. Therefore,

*H1: Firms that adopt spin-offs report significant abnormal accruals prior to the spin-off announcements*



Although managers could use discretionary accruals as an attempt to improve the valuation of the firm, investors may not be able to fully price such earnings increases because the uncertainty of parent firms or divisions' cash flow and earnings are affected by the high level of information asymmetry. According to the opportunistic hypothesis, managers may use corporate events with an intention to hide an earnings maneuver so they can mislead investors' beliefs about their firms' future. Due to the complex restructuring of firms before the break up, it is likely that investors may not be able to identify managers' motives.<sup>21</sup> Sloan (1996) states that investors fail to price correctly the accruals component of earnings instantaneously. Defond and Park (2001) and Xie (2001) both argue that the market usually fails to price abnormal accruals accurately because investors are either unable to anticipate the future reversal of those abnormal accruals or overestimate the persistence of those accruals. This situation will become more severe once managers apply favorable corporate events to magnify the mispricing. Allen (2001) argues that the reason that managers would like to give up control over assets is managerial opportunism. For example, if insiders hold favorable information regarding the parent firm or division that is not fully observed by outside investors, they may change their portfolios by exaggerating the firm's or division's prospect. Based on the evidence, it is rational to assume that investors will value abnormal (unexpected) accruals before spin-off announcements and the announcement returns should be positively correlated with the level of abnormal accruals.

Signaling motive rationalization about earnings management provides more evidence for evaluating the relationship between the announcement returns and the

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<sup>21</sup> Based on my review of all spin-offs news from FACTICA, the most cited reason by firms' managers who adopt spin-offs is "value creation." Only a few firms claim that the purpose of the spin-offs is to reduce "the losses of current operations."

abnormal accruals. Managers can use corporate spin-offs to alleviate information problems<sup>22</sup>, thereby verifying their earnings reports. In other words, managers could use spin-off announcements to increase the validity of the accruals before the announcements, whereas accruals could strengthen their spin-off decision. Chemmanur and Liu (2007) state that, when insiders of parents have favorable private information, they are more likely to adopt the spin-off strategy in order to convey this information to outsider shareholders in order to stimulate a positive price movement. Louis and Robinson (2005) find that pre-split abnormal accrual is associated with stock split announcement returns, while the pre-split abnormal accruals are viewed as a signal of managerial optimism rather than managerial opportunism.

Based on the above discussion, I formulate the second hypothesis as follows:

H2: *The spin-offs announcement returns are positively correlated with the pre-spin-offs abnormal accruals.*

However, Guay, Kothari, and Watts (1996) and Healy and Wahlen (1999) have showed that a positive relation between returns and discretionary accruals could be both the opportunistic behavior and the signaling effect. One way to distinguish these two motives is to evaluate the relation between the long-term returns of parent firms and the level of pre-event abnormal accruals.

Even though managers can maneuver accruals to boost stock price in the short run, they cannot manage the earnings frequently because it is costly. In general, earnings management can incur both direct and indirect costs ( Xue, 2004). When a firm manages

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<sup>22</sup> For example, on April, 27, 2007, Layne and Alexis from Bloomberg reported that Wall Street analysts urged GE to separate its NBC Universal, GE Money, and real-estate division due to the difficulties of understanding the true value of the firm.

earnings by manipulating operating cash flows, the lower future profitability imposes a direct cost on the firm. It also could increase indirect costs such as reduced reliability of earnings, loss of reputation, and higher tax payment in the future. If the abnormal accruals of spin-off firms are driven by opportunism, these abnormal accruals could not persist for a long time. In other words, firms that manipulate accruals by attempting to borrow earnings from the future will not be able to maintain the same level of accruals in the future. The high level of abnormal accruals is expected to disappear when information about the firms' condition is revealed. Once the firms' cash flow and earnings are more easily observed, managers' attempts to control the accruals will be recognized by investors. Consequently, a return reversal is expected in the subsequent periods. Teoh, Welch, and Wong (1998c) have argued that the long term underperformance of IPOs can be attributed to "aggregative" earnings management. Teoh, Welch, and Wong (1998c) also find that the investors naively extrapolate pre-issue earnings without adjusting for the manipulation of reported earnings, thereby causing long-term underperformance of SEOs. Louis (2004) finds a post-merger price reversal is partly caused by pre-merger earnings management for stock swap acquisitions.

On the other hand, managers may use earnings management to signal their future prospects. The purpose of reporting high earnings is based on the rationale that managers are optimistic about their firms' future. Consequently, when a firm reports superior earnings, investors will place a higher value on that firm because they expect the firm can maintain the same level of earnings in the future. Since managing accruals is costly, only firms with high earnings growth have the ability to do so. Those arguments imply that the impact of abnormal accruals can be continued in the future. Xue (2004) also finds that the

capital markets recognize the information content of earnings management and rationally price the signals in both the short term and the long term. From this point of view, there is no return reversal of parent firms in the long-run.

Previous studies have identified that spin-offs are favorable corporation events. Cusatis, Miles, and Woolridge (1993) find positive post-event long-term abnormal returns for divesting firms and the firms they divest. Ahn and Denis (2004) found that a significant increase in measures of investment efficiency and the diversification discount is eliminated after spin-offs. Habib, Johnsen, and Naik (1997), Best, Best, and Agapos (1998), Nanda and Narayanan (1999), and Krishnaswami and Subramaniam (1999) argue that spin-offs alleviate information problems because markets are able to observe individual division cash flow more accurately. Chemmanur and Liu (2007) suggest that, in equilibrium, insiders with the most favorable private information are more likely to choose spin-offs when firms face high information production costs. Given the findings of performance improvement and information asymmetry reduction from prior studies, corporate spin-offs are more likely to be driven by the signaling motivation rather than managerial opportunism. Therefore,

*H3a: Firms that adopt spin-offs have less incentive to manage abnormal accruals after spin-offs completion.*

*H3b: The long term return of spin-off parent firms are positively correlated with the level of the pre-spin-offs abnormal accruals.*

## 2.3 EARNINGS MANAGEMENT MEASUREMENT AND RETURNS ESTIMATION

### *2.3.1 Earnings Management Estimation*

Based on previous studies, I calculate abnormal accruals as the proxy for earnings management by using the following methodology.

The Jones Model is one of the most applied methods in literature to estimate the earnings management. Following Jones (1991) and Erickson and Wang (1999), I define abnormal accruals of parent firms are the residuals (Residual\_J) from the estimation of the following model of

$$TA_{it} = \beta_1(1/A_{it-1}) + \beta_2\Delta REV_{it} + \beta_3PPE_{it} + \varepsilon_{it} \quad (1)$$

where  $TA_{it}$  is the total accruals of parent firm  $i$  at the ending of fiscal year  $t$ ;  $A_{it-1}$  is the total assets of parent firm  $i$  at the beginning of fiscal year  $t$  (COMPUSTAT item 6);  $\Delta REV_{it}$  is the change in revenues of parent firm  $i$  from year  $t-1$  to year  $t$  (COMPUSTAT item 12);  $PPE_{it}$  is the gross property plant of firm  $i$  at the ending of fiscal year  $t$ . In the equation (1),  $TA_{it}$ ,  $\Delta REV_{it}$  and  $PPE_{it}$  are scaled by the  $A_{it-1}$ .

For firms which announced spin-offs in 1988<sup>23</sup> or earlier, I calculated total accruals as following<sup>24</sup>:

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<sup>23</sup> Since operating cash flow of firm (COMPUSTAT item 308) is not available prior to 1988 (SFAS NO.95), I apply different methods to calculate the total accruals.

<sup>24</sup> The estimation of total accruals is suggested by Zheng and Stangeland (2007).

$$TA_{it} = \Delta CA_{it} - \Delta CASH_{it} - \Delta CL_{it} + \Delta CLD_{it} + \Delta TAXP_{it} - DEP_{it}$$

Where  $\Delta CA_{it}$  = the change in current assets of parent firm  $i$  during year  $t$  (COMPUSTAT item 4);  $\Delta CASH_{it}$  = the change in current cash of parent firm  $i$  during year  $t$  (COMPUSTAT item 1);  $\Delta CL_{it}$  = the change in current liabilities of parent firm  $i$  during year  $t$  (COMPUSTAT item 5);  $\Delta CLD_{it}$  = the change in debt included in current liabilities of parent firm  $i$  during year  $t$  (COMPUSTAT item 34);  $\Delta CLD_{it}$  = the change in taxes payable of parent firm  $i$  during year  $t$  (COMPUSTAT item 71) and  $DEP_{it}$  = the depreciation and amortization of parent firm  $i$  in year  $t$ .

For firms that announced spin-offs after 1988, the total accruals are calculated as follows:

$$TA_{it} = Earnings_{it} - OCF_{it}$$

Where  $Earnings_{it}$  = income before extraordinary item of parent firm  $i$  in year  $t$  (COMPUSTAT item 237);  $OCF_{it}$  = operating cash flow of parent firm  $i$  in year  $t$  (COMPUSTAT item 308) minus extraordinary items and discounted operations of parent firm  $i$  in year  $t$  (COMPUSTAT item 124).

Despite of the popularity of the Jones Model, Dechow, Sloan and Sweeney (1995) have argued that Jones Model suffers from correlated omitted variables issues. Therefore, the abnormal accruals could be misspecified.<sup>25</sup> They suggest that using a modified model of Jones could provide most power tests earnings management. Thus, I apply a modified

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<sup>25</sup> Dechow, Sloan and Sweeney (1995) argued that since revenues can be managed by firms through inflated credit sales, the parameter  $\beta_2$  should be corrected with the change in account receivables. See Dechow, Sloan and Sweeney (1995) p. 199 for detail discussion.

version of the Jones Model applied by Dechow, Sloan and Sweeney (1995) and Abarbanell and Lehavy (2003) as the main measurement to estimate the abnormal accruals. The abnormal accruals of parent firms are the residuals (Residual\_MJ) from the estimation of the following model of

$$TA_{it} = \gamma_1(1/A_{it-1}) + \gamma_2[\Delta REV_{it} - \Delta REC_{it}] + \gamma_3 PPE_{it} + \eta_{it} \quad (2)$$

Where the  $\Delta REC_{it}$  = the change in accounts receivable of parent firm  $i$  during year  $t$  (COMPUSTAT item 2), scaled by the  $A_{it-1}$ . Prior studies (Subramanyam, 1996; Barua, Legoria, and Moffitt, 2006) have documented that cross-sectional version of the Jones Model and modified-Jones Model is better than their time-series counterparts. In this study, I use pooled data to estimate abnormal accruals in both models.

The third measure I apply to represent the earning management is the industry-adjusted accruals (TACC\_D) which is inspired by Zheng and Stangeland (2007). The TACC\_D is defined as the total accruals of parent firms less the median total accruals of relevant industry (which has the same first two-digit SIC-code as parent firms) during the same periods. Therefore,

$$TACC\_D = TA_{it} - TA_{Mt} \quad (3)$$

Where  $TA_{Mt}$  = medians of total accruals (deflated by total assets at beginning year  $t$ ) for relevant industry  $M$  of parents at the ending of fiscal year  $t$ .

Healy and Wahlen (1999) suggest that the earnings management studies should report whether the observed effects of earnings management are attributable to a few firms or are pervasive. It implies that separating a sample firm by the sign of abnormal accruals may provide more meaningful results. Lim, Thong, and Ding (2007) have argued that the sign of the abnormal accruals matters. The decision of applying positive/negative or absolute values to the abnormal accruals depends on the design of the study concerning the management incentives. For example, Jones (1991) predicates that the unexpected accruals should be negative because she expected that firms would downplay earnings during import relief investigation. Lim, Thong, and Ding (2007) only focus on positive discretionaries since they believed that firms that issue SEOs are more likely to overstate earnings before the issuance. Bergstresser and Philippon (2006) applies an absolute value of total accruals as the proxy of the earnings management since the objective of their study is to examine the relation between the degree of earnings manipulation and the CEO's compensation. Based on the rationale of earnings management before spin-offs, I only focus on positive abnormal accruals spin-offs sample in this study.<sup>26</sup>

### ***2.3.2 Announcement and Long-Term Abnormal Returns Estimation***

Abnormal returns around the spin-off announcement of parent firms are calculated by using the market model (Brown and Warner, 1985) with the CRSP value-weighted

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<sup>26</sup> There is another way to deal with the sign of the abnormal accruals. Teoh, Welch, and Wong (1998b) divided their IPOs sample by discretionary current accruals into "conservative" IPOs (most negative discretionary current accruals) to "aggressive" (most positive discretionary current accruals) IPOs (p.1947-1948). Their result shows that almost half of IPOs sample carrying negative discretionary current accruals in the issuance year. Although the findings are consistent with their predication across all sample firms, the rationale is lacked.



index as the benchmark of the market portfolio. The estimated period is over a 255 trading day period ending 5 trading days prior to the announcement day. Abnormal returns with several time intervals around announcement day for parent firms are examined. The average cumulative abnormal returns (CARs) and the median cumulative abnormal returns are reported.

I also calculate the long term abnormal returns after spin-offs announcement. Monthly windows up to one, two and three year after spin-offs announcements are employed to estimate long-run abnormal stock returns. The estimated period is over a 60 month period ending 13 months prior to the announcement day. Since long-run abnormal stock returns can be very sensitive to the performance benchmark and the procedure that is used (Barber and Lyon, 1997; Mitchell and Stafford, 2000), I apply a control firm method suggested by Barber and Lyon (1997) to estimate buy-and-hold (BHARs) long-term abnormal returns. The long-run abnormal return is the difference between the raw return of a sample spin-offs firm and the raw return of a matched firm. The matched firm is the firm that has the same four-digit SIC codes as the parents sample and the market value is between 80% and 120% of the market value of the sample firm at the end of year prior to announcement year. If no such firm is found, then the three-digit SIC code is used followed by two-digit SIC and one-digit SIC code.

## 2.4 SAMPLE SELECTION, SAMPLE CHARACTERISTICS AND ABNORMAL RETURNS

### *2.4.1 Data sources and requirements*

Using the Thomas One Banker database (the former Deals Securities Data Corporation (SDC) database), I identify a sample of U.S. firms that undertook spin-offs during 1980-2006 period. The Thomas ONE Banker data includes the announcement dates and effective dates, the CUSIP identifiers and the tickers for parent and spun-off firms, transaction data and a brief description of the spin-off deals. To be included in our sample, those spin-offs must meet following criteria:

1. Deals must be voluntary tax-free spin-offs.<sup>27</sup> Any non-voluntary spin-offs such as those forced through anti-trust regulation and taxable distribution deals are excluded from the sample.
2. The spin-off is not part of liquidity, bankruptcy, or merger processing.
3. Financial firms' spin-offs (parent firms with SIC code 6000-6999) are dropped from the sample.

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<sup>27</sup> Section 355 of the Internal Revenue Code allows a corporation to make a tax-free distribution to its shareholders of stock and securities in one or more controlled subsidiaries. To be qualified for the tax-free treatment, firms must satisfy the following requirements: (a) The distributing corporation must distribute the stock of a controlled corporation (defined as owning at least 80% of the voting power and at least 80% of the shares of each class of non-voting stock), preexisting or newly created, to its shareholders. (b) The distributing corporation generally must distribute all its controlled corporation stock and securities immediately before the transaction. (c) Following the distribution, both the controlled and distributing corporations must be actively engaged in a trade or business with a five-year history. (d) Neither the distributing nor the controlled corporation can use the spin-off as a device for distributing earnings and profits. (e) A spin-off is to be motivated, in whole or substantial part, by one or more corporate business purposes. The purpose(s) must be real and substantial and germane to the distributing or controlled corporations business or to the affiliated group of which the distributing corporation is a member. (f) Following the distribution of the controlled corporations stock, the distributing corporation shareholders must maintain continuity of interest in both companies. Revenue procedure 96-30 further states this requirement generally is met if one or more persons who directly or indirectly own the distributing corporation before the distribution also own 50% or more of the stock in each of the modified companies after the separation.

4. The announcement and effective day of spin-offs must be identifiable through articles from Factiva.
5. Spin-off parent firms' data must be available on the Center for Research in Security Prices (CRSP), COMPUSTAT, and Compact Disclosure databases.

I use FACTIVA to identify detailed information about each spin-off deal and the Cleaning House's *Capital Changes Reporter* (CCR) to determine each deal's tax status. I collect price and return data from CRSP and financial analysts' data from Institutional Brokers Estimate System (I/B/E/S). Annual accounting data includes segment information and executive compensation data from COMPUSTAT. Initially, I obtained 766 spin-offs from Thomson ONE Banker. I excluded 127 records with unverified announcement dates through *Wall Street Journal* articles, 66 records with carve-out, 39 records with taxable spin-offs, 11 records with non-voluntary spin-offs, 42 records combined with other corporate events (such as M&As and dividend announcements), 55 non-spin-off records<sup>28</sup>, 98 records with parent firms operating in the financial industry, 21 non-voluntary (regulation) records, 8 duplicate records, 5 foreign spin-offs records and 54 records without accrual data. The final sample consists of 240 spin-offs divested by 230 different companies from 1980-2006.<sup>29</sup>

#### **2.4.2 Parent Firms Characteristics**

Table 2.1 shows the distribution of spin-offs by year. More than 60% of the spin-offs occurred between 1991 and 2000, with the highest 25 spin-offs in 2000, followed by

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<sup>28</sup> Those deals include split-up, tracking stock, leverage buyout, and sell-offs.

<sup>29</sup> Eight firms have made two spin-offs and one firm has made three spin-offs.

19 deals in 1995 and 1996. There are a total of 151 spin-offs where the operations of the parent firm and the spun-off subsidiaries differ at the two-digit SIC code level, and 79 occur where the parent and spun-off subsidiaries have the same two-digit SIC codes. Panel B reports the distribution of spin-offs by industry. Most of the spin-offs occur in manufacturing (43), followed by service (23) and business service (23).

[Insert Table 2.1 here]

Table 2.2 reports the descriptive statistics for the sample parent firms and transactions. The reported financial data in Panel A is based on end-of-fiscal-year information prior to the spin-off announcements. The average sales of sample firms are \$5.536 billion, and the average book value of total assets of the sample parent firms is \$7.266 billion. The mean and median market value of parent firms prior to the announcement year is \$24.22 billion and \$3.5 billion, respectively. In addition, the sample firms apply average 1.78 times more debt than equity to support their projects. In terms of profitability, the return on assets (ROA) and return on equity (ROE) are 2.34% and 7.49%, respectively, which indicate that on average parent firms are profitable prior to spin-offs. In terms of the level of diversification, spin-offs sample owns an average of three segments and the sales-based Herfindahl index is 0.6114. The mean and median market-to-book ratio (M/B) is 2.9534 and 2.0548, respectively.

[Insert Table 2.2 here]

Panel B of Table 2.2 shows information about the spin-off transaction. The transaction value is based on the market value of spin-off subsidiaries at the end of the first trading day and the spin-off size is the ratio of the spin-off transaction value to the market value of the parent firm one day prior to the effective day. The transaction value

of spin-offs is around \$1.094 billion dollars and the spun-off subsidiary represents 29.88 % of the market value of parent firm's capitalization. In general, the parents take an average of 203 days to complete the transaction.

Table 2.3 reports the descriptive statistics for the sample parent firms based on positive and negative accruals which is estimated by a modified Jones Model prior to the spin-offs announcement. The assets and sales levels of positive abnormal accruals parent firms are smaller than those of negative abnormal accruals parent firms, but the difference is not significant. Additionally, firms with pre-spin-offs positive abnormal accruals are significantly more profitable than those with pre-spin-offs negative abnormal accruals. It is noticed that there is no significant difference in the level of diversification and the M/B ratios between those two groups.

[Insert Table 2.3 here]

#### ***2.4.3 Abnormal returns around and after spin-offs announcements***

Panel A of table 2.4 reports the mean and median abnormal returns around the announcements of spin-offs. Similar to previous studies, I identify positive abnormal returns during spin-offs announcement period. A three-day window (-1, 1) has a significant mean cumulative abnormal return of 3.27%. Significant positive abnormal returns of 1.90% and 2.53% are also found on the announcement day and during the two-day window (-1, 0). There is no significant drift after the spin-off announcement.

[Insert Table 2.4 here]

The long-term buy-and-hold returns are reported in Table 2.4. Panel B of table 2.4 shows that the parents earn significant positive raw returns of 0.85%, 1.63% and 2.74% over the holding period of one, two and three years, respectively. The abnormal returns of spin-offs after one, two, and three years are 0.24%, 0.49% and -0.69%, but not significantly different than 0. The findings confirm that the parent firms perform better after the spin-offs, but holding parent firms does not carry superior returns to investors, which are consistent to previous literature. Cusatis, Miles, and Woolridge (1993) find both parents and spun-off units have positive abnormal returns in the three years after the event. However, the abnormal returns are limited to event firms (parents and spin-offs) that are acquired in mergers.

## 2.5 ABNORMAL ACCRUALS AND ABNORMAL RETURNS

### *2.5.1 Abnormal Accrual Estimation Before and After Spin-Offs Announcements*

Basing my approach, on the literature, I apply the abnormal accrual as the proxy of earnings management. Abnormal accruals of parent firms three years prior to a spin-off's announcement year (t) and three years after a spin-off's completion year (e) are reported in Table 2.5. Abnormal accruals are proxies by Residual\_J, Residual\_MJ, and TACC\_D. Residual\_J is calculated as the residuals of the Jones Model; Residual\_MJ is calculated as the residuals of the Modified Jones Model; and TACC\_D is the industrial-adjusted total accruals. The results in Panel A of Table 2.5 indicate that no significant abnormal accruals are engaged before the spin-offs. However, the abnormal accruals are significant in some years after the spin-off completions. This result is surprising but is consistent with the findings from previous studies about insider and institutional holders' transactions after spin-offs. Allen (2001) indicates that, if insiders have favorable information regarding a public subsidiary/parent and the information is not fully disclosed at the time of spin-offs, they are likely to hold the stocks with favorable information and sell other stocks, suggesting that managers may try to buy parents firms with low costs by lowering the earnings intentionally. Because the purpose of this study is to identify whether managers use income increasing to signal favorable information to markets or to overstate the earnings in order to fulfill their portfolios, it is reasonable to divide the whole sample into positive and negative abnormal accruals sub-samples. The mean and median of positive and negative abnormal accruals, Residual\_MJ, of parents before and after spin-offs are reported in Panel B of Table 2.5. The abnormal accruals are

significant at the year prior to the announcement year  $t$  for both positive and negative accrual samples. The same conclusion is also reached by using the other two abnormal accrual measurements, Residual\_J and TACC\_D, which are reported in Panel C and Panel D. These findings in Table 2.5 support the first hypothesis, which suggests that spin-off parents have tended to manage earnings before the announcement. The results also show those intentions of managing earnings have been significantly reduced after spin-offs, which is consistent with the hypothesis 3a.

[Insert Table 2.5 here]

### ***2.5.2 Abnormal Accrual and Abnormal Returns Around Spin-Offs Announcements***

Table 2.6 presents the abnormal returns around spin-off announcements based on the sample of positive accruals. The firms in the positive accrual sample indicate significant returns during the announcement period, no matter what proxy is applied. The abnormal returns during a three-day window (-1, 1) are between 2.4% to 2.68%. However, the returns decline during day 6 to day 30. The returns are significantly negative, 3.56% to 4.31%, during this period, depending on which proxy abnormal accrual is applied. Such negative returns could be attributed by the selling pressure from investors who want to sell stocks before the spin-off completions.

[Insert Table 2.6 here]

According to the opportunistic hypothesis and signaling hypothesis, the higher levels of earnings management should result in higher abnormal returns. I examine this possibility by separating the sample by the level of abnormal accruals. The results are shown in Table 2.7. This table indicates that the firms with the most positive abnormal



accruals (Q4) earn a higher abnormal return around announcements compared to other abnormal accruals groups, although the difference is not significant. The only significant difference in return occurs during days 6 to 30. The returns of the group with the highest abnormal accruals exceed those of the group with the lowest positive abnormal accruals with a mean of 7.85% and a median 5.55%.

[Insert Table 2.7 here]

## 2.6 ASSOCIATION BETWEEN SPIN-OFFS' STOCK PERFORMANCE AND ABNORMAL ACCRUALS

### *2.6.1 Event-Time Cross-Sectional Regressions*

To examine the incremental influence of the abnormal accrual variables on spin-off announcement returns, I conduct a cross-sectional regression to investigate this issue. The three-day window (-1, 1) returns around spin-off announcements are regressed on the three abnormal accruals (Residual\_MJ1, Residual\_J1 and TACC\_D) and a set of control variables for other known potential predictions in one cross-sectional regression. The earnings management proxy applied in the regressions is the abnormal accruals calculated at the end of the fiscal year prior to the announcement year. The control variables considered in the regression models are market-to-book ratio (M/B), target estimated market-to-book ratio (TM/B), debt/equity ratio (D/E), return on assets (ROA), sales-based Herfindahl index (HERFINDAHL), leverage level (LEVERAGE), and financial analysts' forecast error (ERROR).

Prior studies (Nanda and Narayanan, 1999; Krishnaswami and Subramaniam, 1999; Chemmanur and Liu, 2007) have documented that the firms that are more likely to engage in corporate spin-offs are those firms undervalued relative to their peer industry, implying that the lower M/B parents are more likely to earn higher returns during the announcements due to "unlocking the hidden value." On the other hand, M/B ratio can be viewed as the proxy of the future growth perspective based on the Q theory. In this case, the higher growth perspective firms that adopt spin-offs should be good news to the market. Consequently, the sign is unknown. ROA is applied to control the level of

earnings of parent firms before spin-off, as suggested by Dechow, Sloan and Sweeney (1995) and Kasznik (1999).

I also apply TM/B as the valuation of the spun-off units. If the parent firm tends to give investors the divisions' stocks that are highly overvalued, then investors should discount the managers' spin-offs decisions. D/E ratio is applied to control the bondholders' wealthy expropriation effect, an approach which is advocated by Galai and Masulis (1976), Parrino (1997), and Maxwell and Rao (2003). This approach implies that firms that have a higher level of D/E ratio could increase their borrowing capacity by adopting spin-offs to transfer debts to spun-off divisions, thereby improving firms' capital constraint. LEVERAGE is applied to control whether firms suffer financial distress before spin-offs. Chemmanur and Liu (2007) suggest that spin-off parents are more likely to be firms with profitability and high cash flow realization in the future. Therefore, I predict that the abnormal returns are positively correlated with profitability but are negatively related to the level of financial leverage. HERFINDAHL is applied to identify the level of diversification. Since focus-increasing spin-offs can improve firms' operating performance (Daley, Mehrotra, and Sivakumar, 1997; Desai and Jain, 1999) or reduce diversification discount (Burch and Nanda, 2003), I expect the more diversified firms earn higher returns during the announcement period. I also include the ERROR in the regression because studies (Nanda and Narayanan, 1999; Krishnaswami and Subramaniam, 1999) have documented the positive relation between the level of information asymmetry and the spin-offs' abnormal returns.

The results of cross-sectional regressions and their statistics are reported in Table 2.8. All the variables in the regressions 1 through 3 indicate that the M/B ratios show the

expected signs. The coefficient of the abnormal accruals, which is expressed by Residual\_MJ, is 0.20 and significant at the 5% or 10 % level. The findings support hypothesis 2, which states that the spin-off announcement returns are positively correlated with the pre-spin-off abnormal accruals. These findings are consistent with the findings of previous earnings management studies. Subramanyam (1996) finds abnormal accruals are positively associated with future profitability. Louis and Robinson (2005) also identify a significant positive correlation between the level of discretionary accrual and stock returns by using stock-split as the sample.

[Insert Table 2.8 here]

Consistent with the focus-increasing hypothesis, the coefficient of HERFINDAHL is significant at 5% or 10% in regressions 1- 3 and is negatively correlated with abnormal returns, implying that the gains of spin-offs could be contributed by the level of diversification reduction. I also find that the market valuation of spun-off divisions has a strong negative influence on the announcement returns. The coefficient is -0.02 and is significant at the 1% level. The coefficient of LEVERAGE is negatively correlated with the abnormal returns, which is consistent with the prediction of Chemmanur and Liu (2007), who argue that the firms that do not have better growth perspective or suffer financial distress are constrained to adopt spin-offs. Instead, they could maintain the same structure or try to sell out part of their assets. The regression models also indicate that higher levels of D/E ratio will result in higher announcement returns, but the effect is not significant, implying that managers could be restricted to transfer their debt to the spun-off units in order to increase future borrowing capability. For example, Parrino (1997) found that, even though the gains of stockholders are

transferred from bondholders in the Marriott's spin-off case, the managers faced lawsuits from bondholders who wanted to block this transaction due to their wealth lost.

Conversely, in regression 1, the influence of the M/B of parents is positive but insignificant on the announcement returns. Moreover, ROA is positively related with the abnormal returns but is insignificant. These results could be caused by the upward earnings management. McNicholes (2000) has argued that the firms with greater expected earnings growth are likely to have greater accruals than those with less expected earnings growth. It could be the reason that the ROA does not provide extra explanatory power in our model.

Overall, the regression statistics for regressions 1 - 3 show that the model is adequately specified. The  $F$ -statistics for regression fit is significant at the 5% level. I repeat the same analysis in regressions 4 through 9 by using the other two abnormal accrual variables. Consistent with our predication, all the abnormal accrual variables are significantly positively correlated with the abnormal returns. Those regression results provide strong support that managers who engage in spin-offs are more likely to overstate their earnings before the event, and such positive abnormal accruals are positively correlated with the abnormal returns around announcements.

### ***2.6.2 Long-term Cross-Sectional Regressions***

Although a positive relation between the level of abnormal accruals and the abnormal returns around announcements is found, it cannot distinguish whether the earnings inflation is triggered by managerial opportunism or managerial optimism because such a positive relation is consistent with the prediction of both hypotheses

(Guay, Kothari, and Watts, 1996). Therefore, I examine the relation between long-term returns and the level of accruals to see whether there is a return reversal in after-corporate spin-offs.

Several cross-sectional regressions are examined to investigate this issue. The one-year, monthly (+1, +12), buy-and-hold returns after spin-off announcements are regressed on the abnormal accrual variables calculated at the end of the fiscal year prior to the announcement year. I include several control variables in the regression models: M/B, D/E, HERFINDAHL, and ERROR, which are addressed in Section 6.1. Another set of control variables are also included in the long-term return regressions suggested by the literature: percent of institutional holders prior to the spin-offs (INST), number of financial analysts who report forecasts for parents (NUMBER) and the median estimate of long-term earnings growth (MEDIAN).

Furthermore, the role of institutional holders in corporate events has been documented by several studies. Shleifer and Vishny (1997) argue that institutional investors can help to alleviate agency problems in firms and pressure managers to improve performance. Cheng, DeFond, and Park (2002) argue that the pressure of institutional holders can reduce the level of earnings management. Therefore, I predict the level of institutional ownership that serves as an instrument to monitor managerial opportunism should be positively correlated with the long-term returns of parent firms. In addition, I apply MEDIAN as a proxy of the future growth perspective and NUMBER to express the forecast coverage.

The results of cross-sectional regressions and their statistics are reported in Table 2.9. Regressions 1 through 3 show that the abnormal accruals are positively correlated

with the Buy-and-Hold abnormal returns but are not significant (significant only at 10% when applying Residual\_J as the abnormal accrual proxy). This finding partially supports hypothesis H3b, which states that the abnormal accruals before corporate spin-offs are positively correlated with the long-term returns. There are several reasons why significant results cannot be obtained. First, the persistence of abnormal accruals could be discounted after spin-offs since spin-off parents are required to report additional information such as the proxy statement to the Security Exchange Committee (SEC) in order to obtain tax-free spin-off approval. The transparent disclosure could alleviate the information problem, thereby reducing the power of the earnings management as the signaling. Furthermore, the holding period returns after the spin-off announcements could be strongly influence by the selling pressure from insiders or institutional holders due to the nature of the spin-off design. Even though parent firms have better growth perspective, institutional investors are forced to trade these holding stocks before the effective day if they do not intent to hold spun-off divisions. Those behaviors could increase the volatility of the returns, thereby reducing signaling power. Both reasons could cause the insignificant results in our long-term regression model.

[Insert Table 2.9 here]

## 2.7 CONCLUSIONS

Prior studies have indicated that managers tend to manipulate earnings before corporate events. Nonetheless, earnings management can be used to convey a manager's private information to outside shareholders. Both effects could result in a positive correlation between the level of abnormal accruals and the abnormal returns around corporate events. On the other hand, the relation between the abnormal accruals and the long-term returns should be different, indicating a positive correction between earnings management and long-term returns by managerial optimism and a negative relation between those by managerial opportunism.

In this study, I investigate whether managers increase their earnings before corporate spin-offs. By using a sample of 240 spin-offs during 1980 to 2006, I find that firms adopting corporate spin-offs tend to "manage" their earnings before the spin-off announcements. The intentions of managing earnings are significantly reduced after the spin-offs. I also find a significant positive relation between the spin-offs announcement and the abnormal accruals, which indicates that the announcement returns of spin-offs are partially caused by the pre-spin-offs earnings management.

In terms of motives behind the pre-spin-off earnings management, the results marginally support the signaling hypothesis, which predicates a positive relation between the level of earnings management and long-term returns. Such results could be attributed to significant information production after spin-offs and the nature of the design of the corporate spin-offs.



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**Table 1: Completed Mergers & Acquisitions versus Divestitures 1980-2005**

Year	No. of Deals (Total)	Total Value (\$bil)	Completed M&A 1980-2005				Completed Divestitures 1980-2005			
			No. of Deals	% of All Deals	Value (\$bil)	% of Total Value	No. of Deals	% of All Deals	Value (\$bil)	% of Total Value
1980	1,560	32.9	1,456	93.3%	27.8	84.5%	104	6.7%	5.1	15.5%
1981	2,329	70.1	1,853	79.6%	59.9	85.4%	476	20.4%	10.2	14.6%
1982	2,298	60.7	1,736	75.5%	52.3	86.2%	562	24.5%	8.4	13.8%
1983	2,391	52.7	1,730	72.4%	39.8	75.5%	661	27.6%	12.9	24.5%
1984	3,164	126.1	2,373	75.0%	95.6	75.8%	791	25.0%	30.5	24.2%
1985	3,437	145.5	2,409	70.1%	102.1	70.2%	1,028	29.9%	43.4	29.8%
1986	4,381	204.9	2,986	68.2%	132.5	64.7%	1,395	31.8%	72.4	35.3%
1987	3,920	177.2	2,728	69.6%	119.7	67.6%	1,192	30.4%	57.5	32.4%
1988	3,041	302.2	1,708	56.2%	183.6	60.8%	1,333	43.8%	118.6	39.2%
1989	3,850	330.9	2,168	56.3%	234.9	71.0%	1,682	43.7%	96.0	29.0%
1990	4,344	212.1	2,370	54.6%	121.9	57.5%	1,974	45.4%	90.2	42.5%
1991	3,619	148.4	1,790	49.5%	89.6	60.4%	1,829	50.5%	58.8	39.6%
1992	3,778	130.9	2,043	54.1%	71.6	54.7%	1,735	45.9%	59.3	45.3%
1993	4,200	193.3	2,242	53.4%	100.4	51.9%	1,958	46.6%	92.9	48.1%
1994	5,013	299.3	2,944	58.7%	174.0	58.1%	2,069	41.3%	125.3	41.9%
1995	6,301	437.7	3,857	61.2%	245.8	56.2%	2,444	38.8%	191.9	43.8%
1996	7,347	563.0	4,651	63.3%	373.3	66.3%	2,696	36.7%	189.7	33.7%
1997	8,479	771.5	5,707	67.3%	558.5	72.4%	2,772	32.7%	213.0	27.6%
1998	10,193	1,373.8	7,262	71.2%	1,071.7	78.0%	2,931	28.8%	302.1	22.0%
1999	9,173	1,422.9	7,442	81.1%	1,133.8	79.7%	1,731	18.9%	289.1	20.3%
2000	8,853	1,781.6	6,308	71.3%	1,410.3	79.2%	2,545	28.7%	371.3	20.8%
2001	6,296	1,155.8	3,940	62.6%	904.4	78.2%	2,356	37.4%	251.4	21.8%
2002	5,497	625.0	3,346	60.9%	324.5	51.9%	2,151	39.1%	300.5	48.1%
2003	5,959	521.5	3,579	60.1%	311.8	59.8%	2,380	39.9%	209.7	40.2%
2004	7,031	857.1	4,631	65.9%	579.3	67.6%	2,400	34.1%	277.8	32.4%
2005	7,298	980.8	4,839	66.3%	673.1	68.6%	2,459	33.7%	307.7	31.4%

Source: Mergers & Acquisitions, May/June 1989; March/April 1998; March/April 2005

**Table 2: Percentage Change of Deals and Value - M&As versus Divestitures 1980-2005**

Year	No. of M&A Deals	Percentage Change (%)	No. of Divestitures Deals	Percentage Change (%)	M&A Value	Percentage Change (%)	Divestitures Value (\$bil)	Percentage Change (%)
1980	1,456		104		27.8		5.1	
1981	1,853	27%	476	358%	59.9	115%	10.2	100%
1982	1,736	-6%	562	18%	52.3	-13%	8.4	-18%
1983	1,730	0%	661	18%	39.8	-24%	12.9	54%
1984	2,373	37%	791	20%	95.6	140%	30.5	136%
1985	2,409	2%	1,028	30%	102.1	7%	43.4	42%
1986	2,986	24%	1,395	36%	132.5	30%	72.4	67%
1987	2,728	-9%	1,192	-15%	119.7	-10%	57.5	-21%
1988	1,708	-37%	1,333	12%	183.6	53%	118.6	106%
1989	2,168	27%	1,682	26%	234.9	28%	96.0	-19%
1990	2,370	9%	1,974	17%	121.9	-48%	90.2	-6%
1991	1,790	-24%	1,829	-7%	89.6	-26%	58.8	-35%
1992	2,043	14%	1,735	-5%	71.6	-20%	59.3	1%
1993	2,242	10%	1,958	13%	100.4	40%	92.9	57%
1994	2,944	31%	2,069	6%	174.0	73%	125.3	35%
1995	3,857	31%	2,444	18%	245.8	41%	191.9	53%
1996	4,651	21%	2,696	10%	373.3	52%	189.7	-1%
1997	5,707	23%	2,772	3%	558.5	50%	213.0	12%
1998	7,262	27%	2,931	6%	1,071.7	92%	302.1	42%
1999	7,442	2%	1,731	-41%	1,133.8	6%	289.1	-4%
2000	6,308	-15%	2,545	47%	1,410.3	24%	371.3	28%
2001	3,940	-38%	2,356	-7%	904.4	-36%	251.4	-32%
2002	3,346	-15%	2,151	-9%	324.5	-64%	300.5	20%
2003	3,579	7%	2,380	11%	311.8	-4%	209.7	-30%
2004	4,631	29%	2,400	1%	579.3	86%	277.8	32%
2005	4,839	4%	2,459	2%	673.1	16%	307.7	11%

Source: Mergers & Acquisitions, May/June 1989; March/April 1998; March/April 2005

**Table 1.1: Number Transaction and Value of Corporation Spin-offs in U.S. From 1980-2006**

<b>Announcement Year</b>	<b>Number of Deals</b>	<b>Deal Value (\$ Mil)</b>	<b>% of Number of Total Spin-offs Deals</b>	<b>% of Value of Total Spin-offs Deals</b>
1980	2	289.50	0.26%	0.04%
1981	1	722.00	0.13%	0.10%
1982	4	343.50	0.52%	0.05%
1983	18	3,833.10	2.35%	0.51%
1984	15	229.30	1.96%	0.03%
1985	22	1,861.00	2.88%	0.25%
1986	32	4,468.50	4.18%	0.60%
1987	24	4,516.10	3.14%	0.61%
1988	33	9,562.00	4.31%	1.28%
1989	26	8,932.00	3.40%	1.20%
1990	35	5,742.90	4.58%	0.77%
1991	14	4,270.50	1.83%	0.57%
1992	34	17,697.50	4.44%	2.38%
1993	33	16,088.20	4.31%	2.16%
1994	32	27,763.80	4.18%	3.73%
1995	50	98,723.80	6.54%	13.26%
1996	46	20,803.20	6.01%	2.80%
1997	49	79,720.20	6.41%	10.71%
1998	57	42,838.40	7.45%	5.76%
1999	48	81,468.60	6.27%	10.95%
2000	58	111,595.40	7.58%	14.99%
2001	21	38,344.90	2.75%	5.15%
2002	21	4,008.60	2.75%	0.54%
2003	33	27,266.70	4.31%	3.66%
2004	22	25,238.10	2.88%	3.39%
2005	25	65,691.30	3.27%	8.83%
2006	10	42,276.30	1.31%	5.68%
<b>Total</b>	<b>765</b>	<b>744,295.40</b>	<b>100.00%</b>	<b>100.00%</b>

Source: Thomson ONE Banker



**Table 1.2: Summary of Event Studies of Returns to Shareholders from Corporate Spin-Offs**

Author(s):	Period Covered	Sample Size	Determination of Abnormal Returns	CAR	Event-Window
Kudla and McInish (1976)	1972-1976	6 voluntary spin-offs	market-model	-	Week (-46,46)
Hite and Owers (1983)	1963-1981	123 voluntary spin-offs	market-model	1.00%***	day 0
Schipper and Smith (1983)	1963-1981	93 voluntary spin-offs	market-model	3.3%***	days (-1,0)
Miles and Rosenfeld (1983)	1963-1980	55 spin-offs	mean-adjusted	2.84%***	days (-1,0)
Rosenfeld (1984)	1963-1981	35 large spin-offs	mean-adjusted	3.34%***	days (0,1)
Copeland, Lemgruber and Mayers (1987)	1962-1981	188 spin-offs	market-model and mean-adjusted	5.56%***	days (-1,0)
Kudla and McInish (1988)	1972- 1981	39 spin-offs	market-model	3.01%***	days (-1,0)
Seifert and Rubin (1989)	1968-1983	51 spin-offs	market-model	3.29%*	week 0
Johnson, Brown and Johnson (1994)	1980-1991	113 voluntary spin-offs	market-model	3.26%***	days (-1,0)
Vijh (1994)	1964-1990	113 spin-offs	market-model	3.42%***	day 0
Michaely and Shawc (1995)	1981-1988	9 spin-offs	market-model	2.90%***	days (-1,0)
Slovin, Sushka, and Ferraro (1995)	1980-1991	37 spin-offs	market-model	2.43%***	days (-1,0)
Seward and Walsh (1996)	1972 -1987	78 voluntary spin-offs	market-model	1.32%**	days (-1,0)
Daley, Mehrotra, and Sivakumar (1997)	1975-1991	85 voluntary spin-offs	market-model	2.60%***	days (-1,0)
Best, Best and Agapos (1998)	1979-1993	72 spin-offs	market-model	3.40%***	days (-1,0)
Desai and Jain (1999)	1975-1991	144 spinoffs	market-model	3.41%***	days (-1,1)
Krishnaswami and Subramaniam (1999)	1979-1993	118 spinoffs	market-model	3.84%***	days (-1,1)
Wruck and Wruck (2001)	1985-1995	172 spin-offs	market-model	3.15%***	days (-1,0)
Houge and Wellman (2001)	1990-1996	70 spin-offs	market-model	3.58% NS	days (-1,0)
Maxwell and Rao(2003)	1976-1997	79 spin-offs	market-model	2.20%***	day 0
Abarbanell, Bushee, and Raedy (2003)	1980-1996	169 spin-offs	market-model	2.89%***	days (-1,0)
Wheatley and Brown and Johnson (2005)	1978-1993	160 voluntary spin-offs	market-model	2.83%***	day 0
				3.70%***	day 0

Notes:

1. CAR = Cumulative abnormal returns using the market model approach
2. Day 0 signify the press announcement day
3. Days (-1,0) signify a two-day return window from day -1 through day 0.
4. \*\*\* Significant at the 1% level; \*\*Significant at the 5% level; \*Significant at the 1% level; N/S significant data not stated

**Table 1.3: Sample Selection Process**

<b>Initial Sample (1980~2006)</b>		<b>765</b>
<b>Announcement data cannot be identified</b>	<b>127</b>	
<b>IPO (Carve out)</b>	<b>66</b>	
<b>Taxable spin-off</b>	<b>39</b>	
<b>Bankrupt, liquidity and lawsuit</b>	<b>11</b>	
<b>Takeover, merger of target and merger of parent</b>	<b>42</b>	
<b>Not a spin-off deal</b>	<b>55</b>	
<b>Financial industry spin-off</b>	<b>98</b>	
<b>Regulated spin-off</b>	<b>21</b>	
<b>Foreign parent firms</b>	<b>5</b>	
<b>Repeated deal</b>	<b>8</b>	
<b>Data unavailable</b>	<b>30</b>	<b>502</b>
<b>Final Sample</b>		<b>263</b>

**Table 1.4: Time Profile of Sample Spin-offs**

Distribution of a sample of 254 parent firms that completed 263 spin-off deals during the period 1980-2006, by announcement year, multi/single segments, and exchange listing. The number of spin-off is the number of spin-off deals distributed by announcement year as identified by articles from Factiva. Number of parent firms is the number of announcement spin-off parent firms during this period. Single/Multi-segment parent firm is defined as whether a parent firm operates one or more than one segments in announcement year. The segment data is identified by Compustat Segment Database Cross-industry/ Own-industry Spin-offs is defined as whether parent firm has the same first 2-digit SIC codes as the spin-off units. The SIC codes data is obtained from the COMPUSTAT. NYSE/AMEX/NASDAQ is the stock exchange in which the parent firms are listed in the announcement year.

Year	Number of Spin-offs	Number of Parent Firms	Single-segment Parent Firms	Multi-segment Parent Firms	Cross-industry Spin-offs	Own-industry Spin-offs	NYSE	AMEX	NASDAQ
1981	1	1	0	1	1	0	1	0	0
1982	1	1	0	1	1	0	0	1	0
1983	2	2	0	2	2	0	2	0	0
1984	6	5	0	5	3	3	3	1	2
1985	8	8	0	8	8	0	8	0	0
1986	9	9	1	8	8	1	7	2	0
1987	4	4	0	4	3	1	2	1	1
1988	12	12	1	11	11	1	9	0	3
1989	6	6	2	4	1	5	5	0	1
1990	10	10	0	10	10	0	7	0	3
1991	6	6	0	6	5	1	3	2	1
1992	13	13	2	11	8	5	5	3	5
1993	15	15	1	14	11	4	11	1	3
1994	10	9	1	8	6	4	5	1	4
1995	23	23	5	18	15	8	19	1	3
1996	20	17	3	14	12	8	12	1	7
1997	14	13	5	8	7	7	11	1	2
1998	21	20	7	13	9	12	11	0	10
1999	19	18	1	17	14	5	17	1	1
2000	20	19	1	18	10	10	13	0	7
2001	9	9	0	9	6	3	5	1	3
2002	9	9	2	7	4	5	6	0	3
2003	10	10	1	9	6	4	5	0	5
2004	5	5	0	5	1	4	4	0	1
2005	8	8	0	8	6	2	8	0	0
2006	2	2	0	2	1	1	2	0	0
<b>Grand Total</b>	<b>263</b>	<b>254</b>	<b>33</b>	<b>221</b>	<b>169</b>	<b>94</b>	<b>181</b>	<b>17</b>	<b>65</b>

**Table 1.5: Descriptive Statistics for Sample Companies**

This table provides selected descriptive statistics for parent firms and their matching industries. Panel A is calculated from the COMPUSTAT and Compact Disclosure databases. All variables and ratios are for the parent firms and their matching industries in the fiscal year ending prior to the announcement year. The matching industry is defined as the industry with the same 4-digit SIC with parents in the fiscal year end prior to the announcement year. If such industry is not found, or the number of firms in an industry is less than five, then subsequent matching will be done at the three digit, two digit or one digit. Those variables and ratios for the industry is calculated as a weighted average using a firm's reported total assets as the weight. The market capitalization of parents is the market value of equity of the parent firm as the fiscal year end prior to the announcement year. Debt/Equity is the ratio of the book value of total debt to the book value of common equity. The current ratio is the ratio of current assets to current liabilities. Leverage is measured as the ratio of long-term and short-term debt to book value of assets. Operating income/ Total assets is defined as sales minus the cost of good sold, sales and general administration, and working capital change, divided by the book value of assets. ROA is the ratio of income before extraordinary items to the book value of assets. ROE is the ratio of income before extraordinary items to the book value of common equity. The number of segments is obtained from the COMPUSTAT segment database and is the number of business segment of parent firms in the fiscal year prior to announcement year. The sales-based Herfindahl index calculated across n business segments as the sum of the squares of each segment's sales as a proportion of total sales of parent firms in the fiscal year prior to announcement year. The results of the t-statistics for the difference in the mean between the parents and the industry average, and the results of the Wilcoxon Signed Rank test for the difference in the median between the parents and industry average, as specified in the panel. In Panel B, the transaction value and days to completion are from the SDC database. The transaction value is the market value of spun-off subsidiaries at the end of the first trading day. Days to completion is the number of days between announcement and effective date. Spin-off size is the ratio of transaction value to the market value of parent firm one day prior to effective day.

**Panel A: Selected characteristics of parent firms and their matching industries prior to spin-offs**

	<u>Parent Firm</u>			<u>Matching Industry</u>			<u>Difference (Parent-Industry)</u>	
	<u>Mean</u>	<u>Median</u>	<u>Std. Dev</u>	<u>Mean</u>	<u>Median</u>	<u>Std. Dev</u>	<u>Mean Difference</u>	<u>Median Difference</u>
Sales (\$MM)	5348.37	1425.82	13478.37	61952.57	16621.05	161874.22	-56604.2 ***	-15195.23 ***
Total Assets (\$MM)	7005.71	1432.00	22345.82	76605.57	16981.58	195984.49	-69599.86 ***	-15549.58 ***
Net Income (\$MM)	248.82	37.12	1337.50	3494.11	650.80	12898.24	-3245.29 ***	-613.68 ***
Market Capitalization (\$MM)	23089.16	3379.74	72004.58	12740.50	4520.92	21215.03	10348.66 ***	-1141.18
Debt /Equity	1.96	1.37	2.13	2.64	1.81	4.80	-0.68 **	-0.44 ***
Current Ratio (%)	212.00	116.43	216.45	192.71	173.62	94.18	19.29	-57.19
Leverage (%)	26.38	25.70	16.75	26.44	26.40	11.40	-0.06	-0.7
Operation Income/ Total Assets (%)	12.17	13.61	12.38	14.23	13.62	6.22	-2.06 ***	-0.01 *
ROA (%)	2.00	3.35	10.76	3.13	3.37	4.61	-1.13 *	-0.02
ROE (%)	5.79	10.61	40.90	9.19	8.77	19.00	-3.4	1.84
Number of Segments	3.05	3.00	1.59	3.81	2.43	3.06	-0.76 ***	0.57 ***
Sales-based Herfindahl	0.62	0.54	0.27	0.77	0.75	0.81	-0.15 **	-0.21 **

**Panel B: Deal characteristics**

	<u>Mean</u>	<u>Median</u>	<u>Std. Dev</u>
Transaction Value (\$MM)	870.02	181.12	1939.15
Spin-off Size (%)	28.641	15.03	47.73
Days to Completion	209.44	191.00	178.97

\*\*\* Significant at 1% \*\* Significant at 5% \*Significant at 10%

**Table 1.6: Abnormal Returns around Spin-offs Announcements for Sample Parent Firms**

Cumulative abnormal returns over selected intervals for a sample of 263 firms that completed spin-offs during the period 1980-2006. Abnormal returns are calculated using the market model parameters estimated over a 255-day period ending 5 days before the announcement date. The CRSP value-weighted index is used in the market model to compute betas. The abnormal returns are cumulated in the intervals. The percentage positive is the ratio of the number of firms with positive abnormal returns to the total number of firms. The generalized sign test is used to test the significance of the percentage of firms with positive abnormal returns.

Interval	Cumulative Abnormal Returns for Sample Parents			
	Mean %	t-statistic	Median %	Percentage Positive
-30 to -6	-0.37%	-0.339	-0.66%	48.28%
-5 to -1	1.06%	2.167**	-0.03%	49.80%
-1 to 0	2.61%	8.413***	1.95%	69.50%***
0	2.05%	9.330***	1.46%	67.30%***
-1 to +1	3.52%	9.249***	2.63%	68.82%***
+1 to +5	0.88%	1.800*	-0.03%	49.80%
+6 to +30	-1.70%	-1.549	-1.25%	42.58%

\*\*\* Significant at 1% \*\* Significant at 5% \*Significant at 10%

**Table 1.7: Mean and Median of Misvaluation of Parents and Spun-off Subsidiaries**

These are the summary statistics of the M/B ratio for a sample of firms that completed a spin-off in the period 1980 - 2006 and its industry and specified-industries. The pre-spin-off M/B ratio of parent firms is the ratio of market equity at the end of December of announcement year  $t - 1$  divided by the book common equity for the fiscal year  $t-1$ . The pre-spin-off M/B ratio of spun-off subsidiaries is the ratio of the estimated market equity in announcement year  $t - 1$ , divided by the book common equity for the fiscal year ending in announcement year  $t - 1$ . The estimated market equity of spun-off subsidiaries is equal to the spun-off subsidiary's accounting sale multiplied by its matching specified-firm industry median ratio of capital to accounting sale minus its book value of debt. The numbers given are all for the announcement year  $t - 1$ . The M/B ratio of the industry (specified-firm industry average) for pre-spin-offs is the median of ratio of market equity at the end of December of announcement year  $t - 1$ , divided by book common equity for the fiscal year ending in announcement year  $t - 1$  in each matching industry (specified-firm industry). The M/B ratio of industry (specified-firm industry) for post-spin-offs is the median of the ratio of market equity at the end of December of effective year  $e + 1$ , divided by the book common equity for the fiscal year ending in effective year  $e + 1$  in each matched industry (specified-firm industry). The results of the nonparametric Wilcoxon Signed Rank test for the difference in the means, and Median scores test for the difference in the medians between sample parents/ spun-off subsidiaries and industry average are reported. Respectively, \*, \*\* and \*\*\* denote statistical significance at the 10%, 5% and 1% level.

**Panel A: Level of Before-and -After Event Misvaluation for Sample Parents and Matching Industry Average**

Variables	Sample Parent Firms (1)		Specified-firm Industry (2)		Industry (3)		Difference(1) - (3)		Difference (1) - (2)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
M/B Ratio-Pre-Spinoffs	3.2450	2.2044	4.7444	2.9057	3.5490	2.6612	-0.3040	-0.4568**	-1.4994***	-0.7013***
M/B Ratio-Post-Spinoffs	3.8333	2.4242	4.6548	2.9652	4.1952	2.6272	-0.3619	-0.2030	-0.8215**	-0.5410***
Difference: Post M/B-Pre M/B	0.5883	0.2198*	-	-	-	-	-	-	-	-

**Panel B: Level of Before-and-After-Event Misvaluation for Sample Spun-off Subsidiaries and Matching Industry Average**

Variables	Sample Spun-off Subsidiaries (1)		Specified-firm Industry (2)		Industry (3)		Difference (1) - (3)		Difference (1) - (2)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
M/B Ratio-Pre-Spinoffs	7.3424	2.7016	4.6860	2.9765	3.6922	2.7973	3.6502***	-0.0957	2.6564***	-0.2749
M/B Ratio-Post-Spinoffs	3.0030	2.0080	4.5809	3.0283	3.8932	2.7954	-0.8902***	-0.7874***	-1.5779***	-1.0203***
Difference: Post M/B-Pre M/B	-4.3394***	-0.6936***	-	-	-	-	-	-	-	-

**Table 1.8: Degree of Misvaluation of Sample Parent Firms and Announced Abnormal Returns of Parents**

This table reports the abnormal returns for a sample of 254 firms that completed a spin-off in the period 1980-2006, sorted based on the level of industry-adjusted misvaluation. Abnormal returns are calculated using the market model parameters estimated over a 255-day period ending 5 days before the announcement date. The CRSP value-weighted index is used in the market model to compute betas. The abnormal returns are the cumulative abnormal returns measured over the interval (-1, 0), (0,0) and (-1,1). N represents the number of observations in each category. The results of the t-statistics for the difference in the mean abnormal returns between the relevant groups, and the results of the Wilcoxon Signed Rank test for the difference in the median abnormal returns between the relevant groups are specified in the panel.

Variable		Quartile 1 Undervaluation	Quartile 2	Quartile 3	Quartile 4 Overvaluation	Difference Q1 - Q4
<b>M/B Ratio-Parents vs. Industry</b>						
(-1,0)	Mean	4.54%	3.81%	2.63%	2.04%	2.5%*
	Median	4.08%	3.01%	2.41%	1.33%	2.75%**
	N	64	63	63	64	
(0,0)	Mean	3.89%	3.06%	1.20%	1.74%	2.15%*
	Median	3.24%	2.78%	1.09%	0.96%	2.28%*
	N	64	63	63	64	
(-1,1)	Mean	4.52%	4.31%	3.82%	3.65%	0.87%
	Median	4.90%	3.47%	3.36%	2.25%	2.65%**
	N	64	63	63	64	

\*\*\* Significant at 1% \*\* Significant at 5% \*Significant at 10%

**Table 1.9: Degree of Misvaluation of Sample Spun-off Divisions and Announced Abnormal Returns of Parents**

This table reports the abnormal returns for a sample of 254 firms that completed 263 spin-offs in the period 1980-2006, sorted based on the level of industry-adjusted misvaluation. Abnormal returns are calculated using the market model parameters estimated over a 255-day period ending 5 days before the announcement date. The CRSP value-weighted index is used in the market model to compute the betas. The abnormal returns are the cumulative abnormal returns measured over the interval (-1, 0), (0, 0) and (-1, 1). N represents the number of observations in each category. The results of the t-statistics for difference in the mean abnormal returns between the relevant groups, and the results of the Wilcoxon Signed Rank test for the difference in the median abnormal returns between the relevant groups are specified in the panel.

Variable		Quartile 1 Undervaluation	Quartile 2	Quartile 3	Quartile 4 Overvaluation	Difference Q1 - Q4
<b>M/B Ratio-Spunoff Subsidiaries vs. Industry</b>						
(-1,0)	Mean	4.06%	3.17%	3.42%	2.31%	1.75%
	Median	2.92%	2.51%	2.70%	1.69%	1.23%
	N	49	50	50	48	
(0,0)	Mean	3.10%	2.88%	1.94%	1.83%	1.27%
	Median	2.48%	1.82%	1.37%	1.21%	1.27%
	N	49	50	50	48	
(-1,1)	Mean	5.39%	3.86%	4.47%	2.18%	3.21%*
	Median	4.62%	3.26%	3.39%	3.06%	1.56%
	N	49	50	50	48	

\*\*\* Significant at 1% \*\* Significant at 5% \*Significant at 10%



**Table 1.10: Cross-Sectional Regressions of Abnormal Announcement Returns on Misvaluation Measurement**

This table reports the abnormal announcement returns on pre-spin-offs misvaluation of firms that completed a spin-off in the period 1980-2006. The dependent variable is the mean three-day cumulative abnormal return generated over the interval (-1, +1). The cumulative abnormal return around the spin-off announcement of parent firms are calculated by using the market model (Brown and Warner, 1985) with the CRSP value-weighted index as the benchmark of the market portfolio. The estimated period is over a 255 trading day period ending 5 trading days prior to the announcement day. All the explanatory variables except for SD and N\_IPOs are calculated from the annual data at the end of fiscal year prior to the spin-offs announcement year. The pre-spin-off M/B ratio of parent firms is the ratio of market equity in the last month of the year divided by the book common equity. The pre-spin-off M/B ratio of spun-off subsidiaries is the ratio of the estimated market divided by the book common equity. The estimated market equity of spun-off subsidiaries is equal to the spun-off subsidiary's accounting sale multiplied by its matching specified-firm industry median ratio of capital to accounting sale minus its book value of debt. D/E is the ratio of the book value of total debt to the book value of common equity. FOCUS dummy is defined as 1 when the parent and the spun-off division have different first 2-digit SIC codes and 0 otherwise. HERFINDAHL is the sales-based Herfindahl index which is calculated across n business segments as the sum of the squares of each segment's sales as a proportion of total sales of parent firms. ROA is the ratio of income before extraordinary items to the book value of assets. N\_IPOs is the number of IPOs in the industries of spun-off divisions. Heteroskedasticity-adjusted t-statistics are in parentheses. Respectively, \*, \*\* and \*\*\* denote statistical significance at the 10%, 5% and 1% level.

	Predicted sign	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5	Regression 6
Intercept		0.047 (7.083)	0.036 (2.21)	0.038 (2.27)	0.023 (1.550)	0.036 (1.98)	0.042 (2.36)
M/B	-	-0.004 (-2.713) ***	-0.004 (-2.89) ***	-0.004 (-2.38) ***	-0.004 (-2.557) ***	-0.001 (-0.20)	-0.003 (-1.61) **
TM/B	+/-					-0.00003 (-0.35)	-0.00004 (-0.48)
DE	+		0.004 (1.70) **	0.006 (2.32) ***		0.003 (0.87)	0.003 (1.14)
FOCUS	+		0.009 (0.86)	0.010 (0.92)	0.004 (0.386)	0.010 (0.88)	0.005 (0.42)
HERFINDAHL	-		-0.003 (-0.16)	-0.014 (-0.75)		-0.020 (-0.94)	-0.003 (-0.16)
ROA	+				0.001 (1.715) **		
SD	+			-0.012 (-0.72)	0.373 (1.266) *	0.145 (2.87) ***	
N_IPOs	-				-0.000837 (-0.455)		
F Statistics		7.358 ***	2.800 ***	2.250 **	2.436 ***	1.92 **	0.710
Adjusted R <sup>2</sup>		0.024	0.027	0.026	0.037	0.029	-0.007

**Table 2.1: Time Profile of Sample Spin-offs**

Panel A reports the distribution of a sample of 230 parent firms that completed 240 spin-off deals during the period 1980-2006, by announcement year and multi/single segments. The number of spin-off is the number of spin-off deals distributed by announcement year that as identified by articles from Factiva. Number of parent firms is the number of announcement spin-off parent firms during this period. Cross-industry/ Own-industry Spin-offs is defined as whether parent firm has the same first 2-digital SIC code as the spin-off units. The SIC code data is obtained from the COMPUSTAT database Panel B reports the distribution the spin-offs sample by industry. The first two-digital SIC codes are applied to identify the belonged industry categories.

**Panel A: The Distribution of Spin-off Sample by Years**

Year	Number of Spin-offs	Number of Parent Firms	Cross-industry Spin-offs	Own-industry Spin-offs
1980	0	0	0	0
1981	1	1	1	0
1982	0	0	0	0
1983	2	2	2	0
1984	5	5	2	3
1985	8	7	7	0
1986	7	7	6	1
1987	3	3	2	1
1988	12	12	11	1
1989	6	6	2	4
1990	9	9	9	0
1991	7	7	6	1
1992	12	12	7	5
1993	14	14	10	4
1994	10	10	6	4
1995	19	18	13	5
1996	19	17	10	7
1997	12	10	5	5
1998	17	15	9	6
1999	18	17	11	6
2000	21	20	11	9
2001	6	6	5	1
2002	9	9	4	5
2003	10	10	6	4
2004	5	5	1	4
2005	7	7	5	2
2006	1	1	0	1
<b>Grand Total</b>	<b>240</b>	<b>230</b>	<b>151</b>	<b>79</b>

**Panel B: The Distribution of Spin-off Sample by Industry**

<b>Industry</b>	<b>SIC Codes</b>	<b>Frequency</b>
Agricultural Production	01	1
Mining	10, 12	3
Oil and Gas Extraction	13	10
Construction	15, 16	4
Food and Kindred Products	20	17
Manufacturing	21-26, 29, 31-34, 37	43
Chemicals and Allied Products	28	17
Industrial and Commercial Machinery and Computer Equipment	35	19
Electronic and Other Electronic Equipment	36	19
Measuring, Analyzing, and Controlling Instruments	38	19
Transportation, Communications, Electric, Gas, and Sanitary Services	40, 42, 45, 47	6
Communications	48	12
Wholesale Trade	50, 51	8
Retail Trade	53, 55-59	14
Services	70, 72, 75, 78-80, 82, 87	23
Business Services	73	23
Non-classifiable Establishments	99	2
<b>Total</b>		<b>240</b>

**Table 2.2: Descriptive Statistics for Sample Firms**

Table 2.2 provides selected descriptive statistics for sample of 240 completed spin-off deals in the period 1980-2006. Panel A is calculated from COMPUSTAT and Compact Disclosure databases. All variables and ratios are calculated in the fiscal year end prior to the announcement year. The market capitalization of parents is the market value of equity of the parent firm as the fiscal year end prior to the announcement year. Debt/Equity is the ratio of the book value of total debt to the book value of common equity. The current ratio is the ratio of current assets to current liabilities. Leverage is measured as the ratio of long-term and short-term debt to book value of assets. Operating income/ Total assets is defined as sales minus the cost of good sold, sales and general administration, and working capital change, divided by the book value of assets. ROA is the ratio of income before extraordinary items to the book value of assets. ROE is the ratio of income before extraordinary items to the book value of common equity. The number of segments is obtained from the COMPUSTAT segment database and is the number of business segment of parent firms in the fiscal year prior to announcement year. The sales-based Herfindahl index calculated across n business segments as the sum of the squares of each segment's sales as a proportion of total sales of parent firms in the fiscal year prior to announcement year. The M/B ratio of parent firms is the ratio of market equity at the end of December divided by the book common equity.

In Panel B, the transaction value and days to completion are from the SDC database. The transaction value is the market value of spun-off subsidiaries at the end of the first trading day. Days to completion is the number of days between announcement and effective date. Spin-off size is the ratio of transaction value to the market value of parent firm one day prior to effective day.

**Panel A: Selected characteristics of parent firms prior to spin-offs**

	Parent Firms		
	<u>Mean</u>	<u>Median</u>	<u>Std. Dev</u>
Sales(\$MM)	5536.85	1500.65	13995.57
Total Assets (\$MM)	7266.52	1800.15	23305.93
Net Income(\$MM)	271.4595	42.7500	1396.97
Market Capitalization(\$MM)	24215.33	3497.69	75955.46
Debt /Equity	1.7753	1.3513	2.4132
Current Ratio (%)	207.311	161.1634	214.0722
Leverage (%)	26.0867	25.7025	17.0723
ROA (%)	2.3453	3.6084	10.2314
ROE (%)	7.4877	11.4431	31.8087
Number of Segments	3.0793	3.0000	1.6010
Sales-based Herfindahl	0.6114	0.5359	0.2776
Market to Book Ratio (M/B)	2.9543	2.0575	3.4733

**Panel B: Deal characteristics**

	Mean	Median	Std. Dev
Transaction Value (\$MM)	1094.30	231.30	2822.67
Spin-off Size (%)	29.8825	15.2772	49.9900
Days to Completion	203.0417	195.50000	135.2128

**Table 2.3: Descriptive Statistics for Sample Firms Based on Positive/Negative Abnormal Accruals**

Table 2.3 provides selected descriptive statistics for sample of 240 completed spin-off deals in the period 1980-2006, based on positive/negative abnormal accruals (Residual\_MJ) which is estimated by Modified-Jones Model. Panel A is calculated from COMPUSTAT and Compact Disclosure databases. All variables and ratios are calculated in the fiscal year end prior to the announcement year. The market capitalization of parents is the market value of equity of the parent firm as the fiscal year end prior to the announcement year. Debt/Equity is the ratio of the book value of total debt to the book value of common equity. The current ratio is the ratio of current assets to current liabilities. Leverage is measured as the ratio of long-term and short-term debt to book value of assets. Operating income/ Total assets is defined as sales minus the cost of good sold, sales and general administration, and working capital change, divided by the book value of assets. ROA is the ratio of income before extraordinary items to the book value of assets. ROE is the ratio of income before extraordinary items to the book value of common equity. The number of segments is obtained from the COMPUSTAT segment database and is the number of business segment of parent firms in the fiscal year prior to announcement year. The sales-based Herfindahl index calculated across n business segments as the sum of the squares of each segment's sales as a proportion of total sales of parent firms in the fiscal year prior to announcement year. The M/B ratio of parent firms is the ratio of market equity at the end of December divided by the book common equity. The nonparametric Wilcoxon Signed Rank test for means difference is conducted and the two tail *p*-values are reported in parentheses.

	Positive			Negative			Difference (Positive-Negative)		Wilcoxon P-Value
	Mean	Median	N	Mean	Median	N	Mean Difference	Median Difference	
Sales(\$MM)	4684.55	1921.60	115	6320.96	1008.27	125	-1636.41	913.33	0.134
Total Assets (\$MM)	4908.54	1944	115	9435.86	1579.5	125	-4527	364.61	0.577
Net Income(\$MM)	294.787	111.10	115	236.04	17.73	125	58.749	94.17	<0.0001
Market Capitalization(\$MM)	18771.2	3056.10	115	29132.5	3937.67	125	-10361.3	-881.57	0.603
Debt /Equity	1.7339554	1.307	115	1.81371	1.3815	125	-0.08	-0.0742	0.822
Current Ratio (%)	202.97185	178.4	115	211.362	155.99	125	-84.0012	22.423	0.189
Leverage (%)	26.1467557	24.84	115	26.0311	26.348	125	0.1156	-1.5083	0.889
Operation Income/ Total Assets (%)	14.2894604	15.62	115	11.9465	12.178	125	2.343	3.43911	0.004
ROA (%)	4.1403874	4.81	115	0.69395	2.3203	125	3.4464	2.49001	<0.0001
ROE (%)	14.1617364	14.52	115	1.34767	7.2973	125	12.814	7.22258	<0.0001
Number of Segments	2.8684211	3	115	2.97581	3	125	-0.107	0	0.996
Sales-based Herfindahl	0.6079914	0.53	115	0.61459	0.5696	125	-0.007	-0.0397	0.926
Market to Book Ratio (M/B)	2.962185	2.114589	115	2.94726	2.007762	125	0.0149	0.1058	0.505

**Table 2.4: Abnormal Returns around Spin-offs Announcements and Long Term Returns for Sample Parent Firms**

Panel A reports cumulative abnormal returns over selected intervals for a sample of 240 firms that completed spin-offs during the period 1980-2006. Abnormal returns are calculated using the market model parameters estimated over a 255-day period ending 5 days (Day -5) before the announcement date (Day 0). The CRSP value-weighted index is used in the market model to compute betas. The abnormal returns are cumulated in the intervals. The percentage positive is the ratio of the number of firms with positive abnormal returns to the total number of firms.

Panel B reports buy-and-hold raw returns and abnormal long-term returns after spin-offs announcements. Monthly windows up to twelve, twenty-four and thirty-six months after spin-offs announcements are employed to estimate long-run abnormal stock returns. The estimated period is over a 60 month period ending 13 months prior to the announcement day. The control firm method suggested by Barber and Lyon (1997) to estimate buy-and-hold (BHARs) long-term abnormal returns is applied. The long-run abnormal return is the difference between the raw return of a sample spin-offs firm and the raw return of a matched firm. The matched firm is the firm that has the same four-digit SIC codes as the parent sample and the market value is between 80% and 120% of the market value of the sample firm at the end of announcement year  $t - 1$ . The generalized sign test is used to test the significance of the percentage of firms with positive abnormal returns.

**Panel A: Abnormal Returns around Spin-offs Announcements**

Interval (Days)	Cumulative Abnormal Returns			
	Mean	t-statistic	Median	Percentage Positive
-30 to -6	-0.35%	-0.322	-0.78%	48.33%
-5 to -1	1.17%	2.403**	-0.01%	50.00%
-1 to 0	2.53%	7.714***	1.95%	70.42%***
0	1.90%	8.676***	1.34%	65.42%***
0 to +1	3.27%	8.647***	2.68%	70.00%***
+1 to +5	0.56%	1.146	-0.06%	49.57%
+6 to +30	-1.29%	-1.182	-1.25%	41.67%*

**Panel B: Long-term Returns After Spin-offs Announcements**

Interval (Months)	Buy-and-Hold Long-term Returns				
	Raw Return (Mean)	Raw Return (Median)	Percentage Positive	Abnormal Long- Term Return (Mean)	Abnormal Long-Term Return (Median)
+1 to +12	0.85%*	0.86%	52.5%***	0.24%	-0.62%
+1 to +24	1.63%**	1.61%	57.5%***	0.40%	0.57%
+1 to +36	2.74%***	1.74%	53.75%***	-0.69%	-0.18%
0 to +36	4.84%***	3.84%	57.5%***	1.10%	1.08%

\*\*\* Significant at 1% \*\* Significant at 5% \* Significant at 10%

**Table 2.5: Parent Firms' Abnormal Accruals Before and After Spin-offs**

Table 2.5 reports the means and the medians of abnormal accruals of spin-offs parents firms during 1980-2006. Abnormal accruals of parent firms three years prior to spin-offs announcement year (t) and three years after spin-offs completion year (e) are reported. Abnormal accruals are proxies by Residual\_J, Residual\_MJ, and TACC\_D. Residuals\_J is calculated as the residuals of the Jones Model; Residual\_MJ is the residuals of the Modified Jones Model; and TACC\_D is the industrial-adjusted total accruals. It is measured as the total scaled accruals of parent firms subtract the median of total scaled accruals of relevant industry. The median of total scaled accruals of relevant industry are calculated as the median of total scaled accruals for all firms (exclude sample firms) in the same industry (the same first 2-digital SIC codes) during the same period. The positive/ negative abnormal accruals are defined as the positive/negative number in Residual\_J, Residuals\_MJ and TACC\_D. Panel A reports the means and medians of abnormal accruals of all parents before and after spin-offs. Panel B reports the means and medians of abnormal accruals of parents firms based on positive/ negative Residual\_J; Panel C reports the means and medians of abnormal accruals of parents firms based on positive/ negative Residual\_MJ, and Panel D reports the means and medians of abnormal accruals of parents based on positive/ negative TACC\_D. The p-values are the two-tailed, Student's t-test about the null hypothesis that the means are not significantly different from zero.

**Panel A: Abnormal Accruals of Parent Firms Before and After Spin-offs**

Year	Abnormal Accruals (Residual_J)				Abnormal Accruals (Residual_MJ)				Abnormal Accruals (TACC_D)			
	Mean	Median	p-value	N of Obs	Mean	Median	p-value	N of Obs	Mean	Median	p-value	N of Obs
t-3	0.00812	0.0010	0.4049	237	0.0073	-0.0010	0.4464	237	-0.0123	-0.01239	0.6144	238
t-2	-0.00672	-0.0067	0.3411	238	-0.00672	-0.0084	0.3427	237	-0.0128	-0.01282	0.1030	240
t-1	-0.00370	-0.0042	0.6744	240	-0.00367	-0.0030	0.6797	240	-0.0147	-0.01472	0.1043	240
e+1	-0.01050	0.0119	0.5227	231	-0.0099	0.0080	0.5290	231	-0.0516	-0.01278	0.0124	197
e+2	-0.00803	-0.0098	0.1096	205	-0.0082	-0.0097	0.1077	205	0.0092	-0.0030	0.1644	182
e+3	-0.01039	-0.0118	0.0788	192	-0.0106	-0.0112	0.0698	192	-0.0008	-0.0061	0.9097	170

**Panel B: Positive/ Negative Abnormal Accruals of Parent Firms Before and After Spin-offs Based on the Modified Jones Model**

Year	Abnormal Positive Accruals (Residual_MJ)				Abnormal Negative Accruals (Residual_MJ)			
	Mean	Median	p-value	N of Obs	Mean	Median	p-value	N of Obs
t-3	0.0096637	0.0042918	0.5112	113	0.005832	-0.008477	0.6573	123
t-2	0.0103261	0.0036396	0.3177	113	-0.022883	-0.018117	0.0208	123
t-1	0.0667467	0.0368545	<0.0001	113	-0.069122	-0.032161	<0.0001	123
e+1	-0.021053	0.0197842	0.4915	109	0.0018142	-0.000028	0.8802	117
e+2	-0.008758	-0.005164	0.1777	99	-0.006128	-0.012144	0.4434	102

**Table 2.5: Parent Firms' Abnormal Accruals Before and After Spin-offs –cont'**

Table 2.5 reports the means and the medians of abnormal accruals of spin-offs parents firms during 1980-2006. Abnormal accruals of parent firms three years prior to spin-offs announcement year (t) and three years after spin-offs completion year (e) are reported. Abnormal accruals are proxies by Residual\_J, Residual\_MJ, and TACC\_D. Residuals\_J is calculated as the residuals of the Jones Model; Residual\_MJ is the residuals of the Modified Jones Model; and TACC\_D is the industrial-adjusted total accruals. It is measured as the total scaled accruals of parent firms subtract the median of total scaled accruals of relevant industry. The median of total scaled accruals of relevant industry are calculated as the median of total scaled accruals for all firms (exclude sample firms) in the same industry (the same first 2-digital SIC codes) during the same period. The positive/ negative abnormal accruals are defined as the positive/negative number in Residual\_J, Residuals\_MJ and TACC\_D. Panel A reports the means and medians of abnormal accruals of all parents before and after spin-offs. Panel B reports the means and medians of abnormal accruals of parents firms based on positive/ negative Residual\_J; Panel C reports the means and medians of abnormal accruals of parents firms based on positive/ negative Residual\_MJ, and Panel D reports the means and medians of abnormal accruals of parents based on positive/ negative TACC\_D. The p-values are the two-tailed, Student's t-test about the null hypothesis that the means are not significantly different from zero.

**Panel C: Positive/ Negative Abnormal Accruals of Parent Firms Before and After Spin-offs Based on the Jones Model**

Year	Abnormal Positive Accruals (Residual_J)				Abnormal Negative Accruals (Residual_J)			
	Mean	Median	p-value	N of Obs	Mean	Median	p-value	N of Obs
t-3	0.0083	-0.0055	0.3142	110	0.0085	-0.0062	0.3142	126
t-2	0.0104	0.0021	0.6044	110	-0.0667	-0.0349	0.0253	126
t-1	0.0697	0.0389	<0.0001	110	-0.0218	-0.0156	<0.0001	126
e+1	-0.0272	0.0237	0.4136	105	0.0056	0.6244	0.6244	127
e+2	-0.0070	-0.0041	0.2878	94	-0.0078	0.3057	0.3057	107
e+3	-0.0015	-0.0080	0.8196	88	-0.0194	0.0426	0.0426	101

**Panel D: Positive/ Negative Abnormal Accruals of Parent Firms Before and After Spin-offs Based on the Industrial-adjusted Total Accruals**

Year	Abnormal Positive Accruals (TACC_D)				Abnormal Negative Accruals (TACC_D)			
	Mean	Median	p-value	N of Obs	Mean	Median	p-value	N of Obs
t-3	-0.004696	0.0043174	0.8327	91	-0.007625	-0.02146	0.5177	145
t-2	0.0154565	0.0041329	0.2236	91	-0.029499	-0.033251	0.0005	147
t-1	0.0649626	0.0402843	<0.0001	91	-0.064251	-0.039891	<0.0001	151
e+1	-0.105961	-0.008876	0.0715	67	-0.024131	-0.015649	0.0025	129
e+2	0.0108797	0.0038968	0.2596	62	0.009257	-0.009314	0.2977	119
e+3	0.0097014	0.0053038	0.3093	58	-0.006472	-0.013861	0.5023	111



**Table 2.6: Abnormal Returns around Spin-offs Announcements for Sample Parent Firms Based on Positive/ Negative Abnormal Accruals**

Table 2.6 reports cumulative abnormal returns over selected intervals for sample firms that completed spin-offs during the period 1980-2006, based on positive/negative abnormal accruals. The abnormal accruals (Residual\_MJ1) in panel A is estimated by the residuals of Jones Model. The abnormal accruals (Residual\_J) in Panel B are estimated by the residuals of Modified-Jones Model. The industry-adjusted total accruals in Panel C are calculated as the total accruals of sample parent firms minus the medians of total accruals of relevant industry of parent firms. All the abnormal returns in table 2.6 are calculated using the market model parameters estimated over a 255-day period ending 5 days before the announcement date. The CRSP value-weighted index is used in the market model to compute betas. The abnormal returns are cumulated in the intervals. The percentage positive is the ratio of the number of firms with positive abnormal returns to the total number of firms. The generalized sign test is used to test the significance of the percentage of firms with positive abnormal returns. The nonparametric Wilcoxon Signed Rank test for means difference is reported. The two tail *p*-values are reported in parentheses. Respectively, \*, \*\* and \*\*\* denote statistical significance at the 10%, 5% and 1% level.

**Panel A: Cumulative Abnormal Returns for Sample Parents with Positive / Abnormal Accruals Based on Modified-Jones Models**

Interval	Cumulative Abnormal Returns for Sample Parents with Positive Abnormal Accruals (Residual_MJ>0) N=115				Cumulative Abnormal Returns for Sample Parents with Negative Abnormal Accruals(Residual_MJ<0) N=125				Mean Diff (%) (1)-(2)
	Mean % (1)	t-statistic	Median %	Percentage Positive	Mean % (2)	t-statistic	Median %	Percentage Positive	
-30 to -6	-0.96	-0.682	-0.29	49.6%	0.21	0.118	-1.14	47.2%	-1.17 (0.880)
-5 to -1	1.13	1.801*	-0.04	45.1%	1.21	1.56	0.03	51.2%	-0.08 (0.766)
-1 to 0	2.31	5.805***	1.94	69.6%***	2.73	5.550***	2.03	71.2%***	-0.42 (0.305)
0	1.71	6.085***	1.71	62.6%***	2.07	5.946***	1.69	68%***	-0.36 (0.192)
-1 to +1	2.68	5.513***	2.25	62.6%***	3.82	6.336***	3.74	70.4%***	-1.14 (0.201)
+1 to +5	-0.58	-0.924	-0.38	45.2%	1.61	2.070**	0.73	53.6%	-2.19 (0.14)
+6 to +30	-3.56	-2.535**	-1.28	35.7%**	0.80	5.550	-0.48	47.2%	-4.36 (0.050)

**Panel B: Cumulative Abnormal Returns for Sample Parents with Positive / Abnormal Accruals Based on Jones Models**

Interval	Cumulative Abnormal Returns for Sample Parents with Positive Abnormal Accruals (Residual_J) <i>N=110</i>				Cumulative Abnormal Returns for Sample Parents with Negative Abnormal Accruals(Residual_J) <i>N=130</i>				Mean Diff (%) (1)-(2)
	Mean % (1)	t-statistic	Median %	Percentage Positive	Mean % (2)	t-statistic	Median %	Percentage Positive	
-30 to -6	-0.83	-0.584	-0.36	49.1%	0.05	0.029	-1.06	47.7%	-0.88 (0.980)
-5 to -1	1.09	1.721*	-0.03	49.1%	1.25	1.668	0.02	50.8%	-0.16 (0.659)
-1 to 0	2.26	5.642***	1.85	68.2%***	2.76	6.639***	2.14	67.7%***	-0.5 (0.210)
0	1.80	6.368***	1.11	61.8%***	1.98	5.912***	1.73	68.5%***	-0.18 (0.261)
-1 to +1	2.51	5.127***	1.90	69.1%***	3.92	6.765***	3.77	70.7%***	-1.41 (0.108)
+1 to +5	-0.61	-2.595	-0.38	47.2%	1.55	2.075**	0.52	51.5%	-2.16 (0.1502)
+6 to +30	-3.67	-2.595***	-1.36	35.5%**	0.72	0.430	-0.52	47.9%	-4.39 (0.047)

**Panel C: Cumulative Abnormal Returns for Sample Parents with Positive / Abnormal Accruals Based on the Industry-Adjusted Total Accruals**

Interval	Cumulative Abnormal Returns for Sample Parents with Positive Abnormal Accruals (TACC_D>0) <i>N=90</i>				Cumulative Abnormal Returns for Sample Parents with Negative Abnormal Accruals(TACC_D<0) <i>N=150</i>				Mean Diff (%) (1)-(2)
	Mean % (1)	t-statistic	Median %	Percentage Positive	Mean % (2)	t-statistic	Median %	Percentage Positive	
-30 to -6	-0.91	-0.553	0.44	50.5%	-0.17	-0.115	-0.93	47%	-0.74 (0.6105)
-5 to -1	1.58	2.148**	0.31	51.6%	1.08	1.634	-0.04	49%	0.5 (0.7938)
-1 to 0	2.24	4.796***	2.12	64.8%***	2.70	6.497***	1.81	73.5%***	-0.46 (0.6305)
0	1.31	3.978***	0.38	58.2%***	2.28	7.722***	1.66	70.2%***	-0.97 (0.1283)
-1 to +1	2.40	4.199***	2.12	68.1%***	3.78	7.403***	3.36	70.9%***	-1.38 (0.6306)
+1 to +5	-0.61	-2.595	-0.38	47.20%	1.01	2.523	0.03	50.3%	-1.62 (0.4944)
+6 to +30	-4.31	-2.616***	-1.36	28.6%***	0.30	0.204	-0.29	49%	-4.61 (0.0183)

**Table 2.7: The Degree of Abnormal Accruals of Sample Parent Firms and Announced Abnormal Returns**

This table reports the abnormal returns for a sample firms with positive abnormal accruals that completed a spin-off in the period 1980-2006, sorted based on the level of abnormal accruals (Residual\_MJ) at the end of fiscal year prior to the announcement year. Abnormal returns are calculated using the market model parameters estimated over a 255-day period ending 5 days before the announcement date. The CRSP value-weighted index is used in the market model to compute betas. The abnormal returns are the cumulative abnormal returns measured over the interval (-1, 0), (0, 0), (-1, 1), and (+6, +30). N represents the number of observations in each category. The results of the t-statistics for the difference in the mean abnormal returns between the relevant groups, and the results of the Wilcoxon Signed Rank test for the difference in the median abnormal returns between the relevant groups are specified in the panel.

Variable		Quartile 1 Lowest Abnormal Accruals	Quartile 2	Quartile 3	Quartile 4 Highest Abnormal Accruals	Difference Q4 – Q1
<b>Residual_MJ</b>						
(-1,0)	Mean	2.95%	1.45%	1.64%	3.20%	0.25%
	Median	2.98%	0.64%	1.13%	3.01%	0.3%
	N	28	29	29	29	
(0,0)	Mean	1.94%	1.26%	1.45%	2.19%	0.25%
	Median	1.18%	0.66%	2.17%	1.33%	0.15%
	N	28	29	29	29	
(-1,1)	Mean	3.00%	1.28%	2.24%	4.22%	1.22%*
	Median	2.45%	0.58%	2.97%	2.63%	0.18%
	N	28	29	29	29	
(+6, +30)	Mean	-8.95%	-2.99%	-1.40%	-1.10%	7.85%**
	Median	-5.23%	-1.49%	-1.06%	0.32%	5.55%**
	N	28	29	29	29	

\*\*\* Significant at 1%; \*\* Significant at 5%; \*Significant at 10%.

**Table 2.8: Cross-Sectional Regressions of Abnormal Announcement Returns on Positive Pre-spin-offs Abnormal Accruals**

This table reports the abnormal announcement returns on abnormal accruals for a pre-spin-offs positive abnormal accruals sample that completed a spin-off in the period 1980-2006. The dependent variable is the mean three-day cumulative abnormal return generated over the interval (-1, +1). The cumulative abnormal return around the spin-off announcement of parent firms are calculated by using the market model (Brown and Warner, 1985) with the CRSP value-weighted index as the benchmark of the market portfolio. The estimated period is over a 255 trading day period ending 5 trading days prior to the announcement day. All the independent variables applied in those regressions are calculated from the annual data at the end of fiscal year prior to the spin-offs announcement year. The Residual\_MJ is the residuals from the estimation of the Modified-Jones Model, Residual\_J is the residuals from the estimation of the Jones Model, and the TACC\_D is defined as the total accruals of parent firms subtract the median total accruals of relevant industry (which has the same first two-digit SIC-code as parent firms) during the same periods. D/E is the ratio of the book value of total debt to the book value of common equity. HERFINDAHL is the sales-based Herfindahl index which is calculated across n business segments as the sum of the squares of each segment's sales as a proportion of total sales of parent firms in the fiscal year prior to announcement year. TMB is the pre-spin-off M/B ratio of spun-off subsidiaries which is defined as the ratio of the estimated market equity in announcement year t - 1, divided by the book common equity for the fiscal year ending in announcement year t - 1. The estimated market equity of spun-off subsidiaries is equal to the spun-off subsidiary's accounting sale multiplied by its matching specified-firm industry median ratio of capital to accounting sale minus its book value of debt. ERROR is the forecast errors which measure in the last month of the fiscal year before the announcement of the spin-off. They are defined as the ratio of the absolute value of the difference between the actual earnings and the forecast earnings to the price per share at the beginning of the month. Leverage is measured as the ratio of long-term and short-term debt to book value of assets. ROA is the ratio of income before extraordinary items to the book value of assets. M/B is the pre-spin-off market-to-book ratio of parent firms which is calculated by market equity at the end of December of announcement year t-1 divided by the book common equity for the fiscal year t-1. Heteroskedasticity-adjusted t-statistics are in parentheses. Respectively, \*, \*\* and \*\*\* denote statistical significance at the 10%, 5% and 1% level.

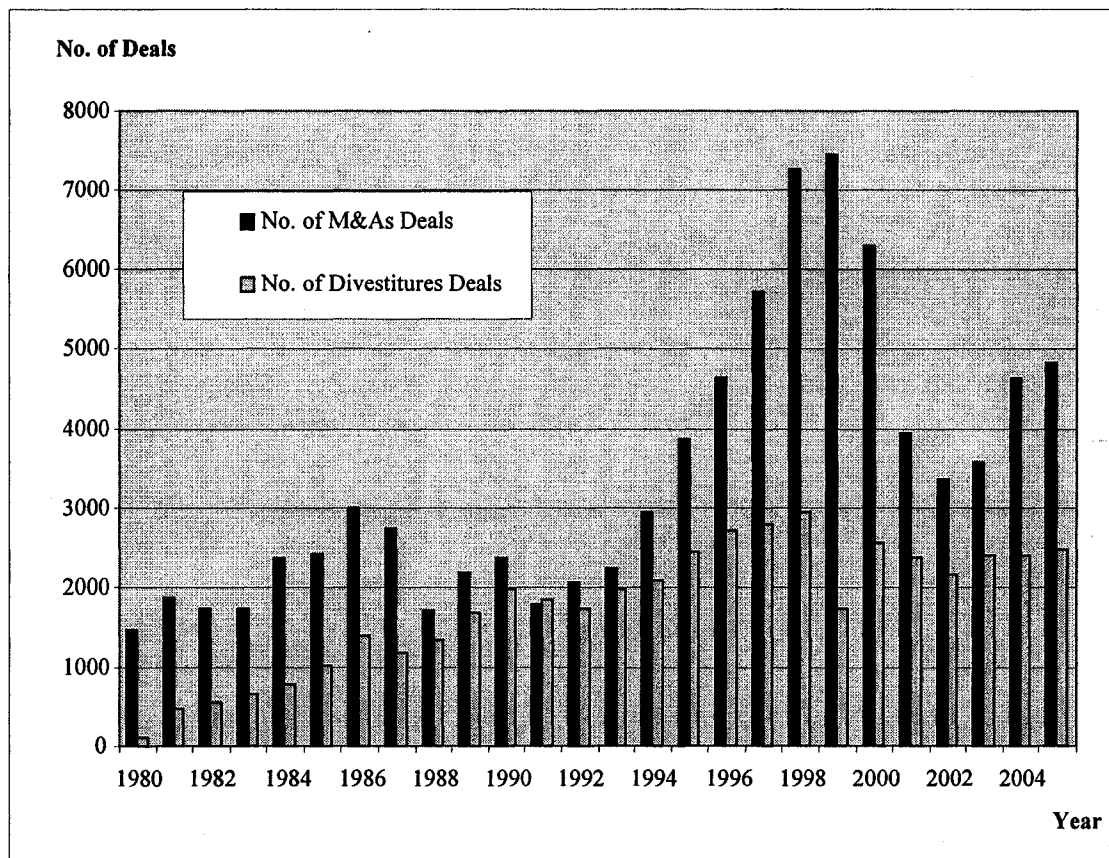
	Predicted sign	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5	Regression 6	Regression 7	Regression 8	Regression 9
Intercept		0.62 (2.567)	0.064 (2.681)	0.071 (3.235)	0.055 (2.121)	0.057 (2.234)	0.066 (2.751)	0.049 (1.365)	0.058 (1.624)	0.063 (1.914)
Residual_MJ	+	0.166 (1.543) *	0.161 (1.510) *	0.201 (2.065) **						
Residual_J	+				0.149 (1.487) **	0.148 (1.483) **	0.184 (1.968) **			
TACC_D	+							0.349 (2.112) **	0.314 (1.890) **	0.344 (2.349) ***
DE	+	0.003 (0.587)	0.003 (0.798)	0.004 (0.874)	0.003 (0.696)	0.004 (0.886)	0.004 (0.917)	0.003 (0.448)	0.005 (0.849)	0.005 (0.870)
HERFINDAHL	-	-0.044 (-1.545) *	-0.045 (-1.622) *	-0.044 (-1.582) **	-0.036 (-1.225)	-0.038 (-1.302) *	-0.034 (-1.165)	-0.055 (-1.304) *	-0.066 (-1.559) *	-0.064 (-1.543) *
TMB	-	-0.002 (-2.382) ***	-0.002 (-2.344) ***	-0.002 (-2.776) ***	-0.002 (-2.396) ***	-0.002 (-2.369) ***	-0.002 (-2.843) ***	-0.004 (-3.109) ***	-0.003 (-2.677) ***	-0.003 (-3.076) ***
ERROR	+	0.005 (0.397)	0.006 (0.436)	0.005 (0.414)	0.007 (0.044)	-0.006 (-0.039)	-0.039 (-0.268)	0.045 (0.172)	0.023 (0.088)	-0.003 (-0.011)
LEVERAGE	-	-0.001 (-1.278) *	-0.001 (-1.299) *	-0.001 (-1.451) *	-0.001 (-1.118)	-0.001 (-1.169)	-0.001 (-1.270) *	0.000 (-0.314)	0.000 (-0.367)	0.000 (-0.413)
ROA	+	0.001 (0.514)	0.001 (0.890)		0.001 (0.736)	0.002 (1.070)		-0.001 (-0.385)	0.001 (0.387)	
MB	?	0.002 (0.639)			0.002 (0.619)			0.006 (1.532) *		
F Statistics		2.599 **	2.333 **	2.072 **	1.88 **	2.116 **	2.273 *	2.441 **	2.383 **	2.807 **
Adjusted R <sup>2</sup>		0.127	0.124	0.115	0.099	0.109	0.107	0.181	0.157	0.173

**Table 2.9: Cross-Sectional Regressions of Long-term Returns on Positive Pre-spin-offs Abnormal Accruals**

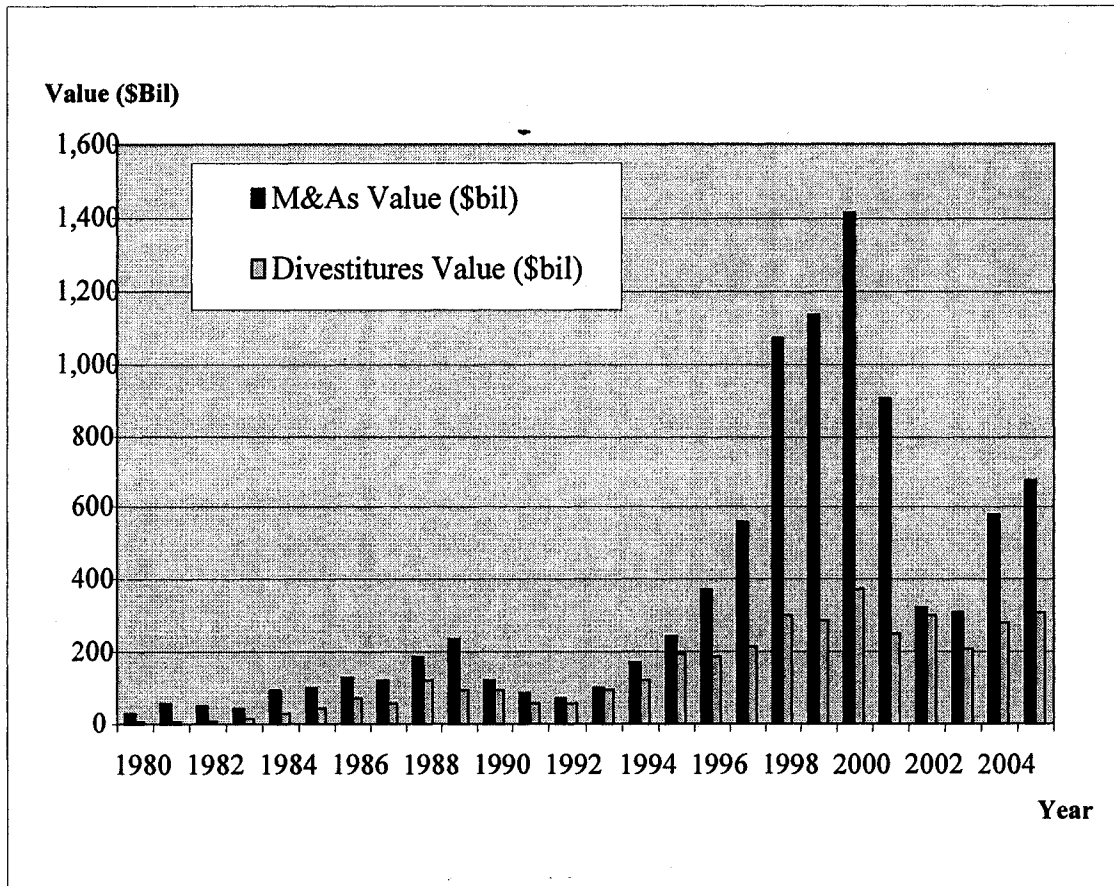
This table reports the long-term returns after spin-offs announcements on abnormal accruals for a pre-spin-offs positive abnormal accruals sample that completed a spin-off in the period 1980-2006. The dependent variable is the mean one-year (+1, +12) buy-and-hold raw returns after the announcement month. All the independent variables applied in those regressions are calculated from the annual data at the end of fiscal year prior to the spin-offs announcement year. The Residual\_MJ is the residuals from the estimation of the Modified-Jones Model, Residual\_J is the residuals from the estimation of the Jones Model, and the TACC\_D is defined as the total accruals of parent firms subtract the median total accruals of relevant industry (which has the same first two-digit SIC-code as parent firms) during the same periods. HERFINDAHL is the sales-based Herfindahl index which is calculated across n business segments as the sum of the squares of each segment's sales as a proportion of total sales of parent firms in the fiscal year prior to announcement year. GROWTH is the median long term earnings growth rate which is predicated by financial analysts in the last month of the fiscal year before the announcement of the spin-off. INST is the institutional ownership which is calculated by the shares held by institutional shareholders divided by the total outstanding common stock shares in the last month of the fiscal year before the announcement of the spin-off. D/E is the ratio of the book value of total debt to the book value of common equity. M/B is the pre-spin-off market-to-book ratio of parent firms which is calculated by market equity at the end of December of announcement year t-1 divided by the book common equity for the fiscal year t-1. ERROR is the forecast errors which measure in the last month of the fiscal year before the announcement of the spin-off. They are defined as the ratio of the absolute value of the difference between the actual earnings and the forecast earnings to the price per share at the beginning of the month. NUMBERS is the number of the financial analysts issuing long-term earnings forecast for the firm in the last month of the fiscal year prior to spin-offs. Heteroskedasticity-adjusted t-statistics are in parentheses. Respectively, \*, \*\* and \*\*\* denote statistical significance at the 10%, 5% and 1% level.

	Predicted sign	Regression 1	Regression 2	Regression 3
Intercept		-0.049 (-1.076)	-0.050 (-1.041)	-0.008 (-0.150)
Residual_MJ	+	0.130 (0.988)		
Residual_J	+		0.187 (1.342) *	
TACC_D	+			0.167 (0.952)
HERFINDAHL	-	-0.067 (-1.752) **	-0.074 (-1.774) **	-0.065 (-1.324) *
GROWTH	+	0.002 (1.601) *	0.002 (1.124)	0.000 (0.228)
INST	+	0.110 (2.338) ***	0.103 (2.498) ***	0.099 (1.655) **
DE	+	-0.003 (-0.643)	-0.003 (-0.447)	-0.005 (-0.741)
MB	-	-0.006 (-1.578) *	-0.007 (-1.560) *	-0.003 (-0.554)
NUMBERS	+	0.002 (1.164)	0.002 (1.358) *	0.001 (0.497)
ERROR	+	0.204 (0.999)		-0.289 (-0.814)
F Statistics		2.184 **	2.152 **	0.931
Adjusted R <sup>2</sup>		0.107	0.108	0.001

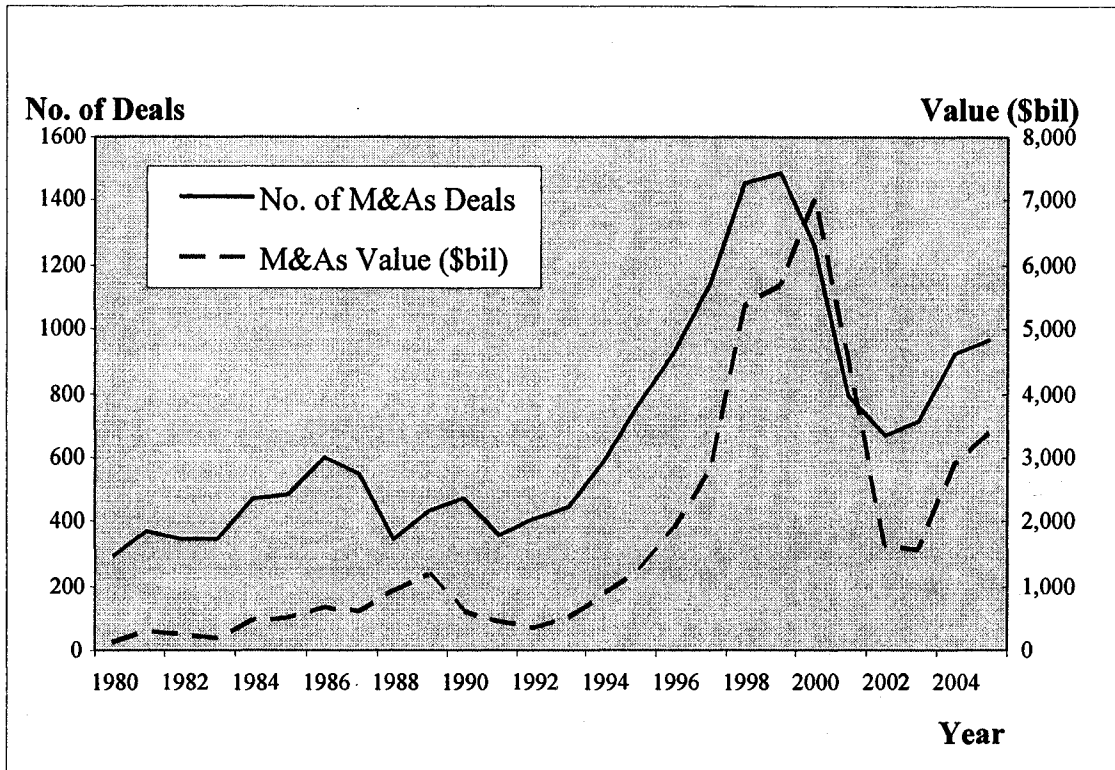
\*\*\* Significant at 1% \*\* Significant at 5% \*Significant at 10%

**Figure 1 (A): No. of M&As versus Divestitures Deals 1980-2005**

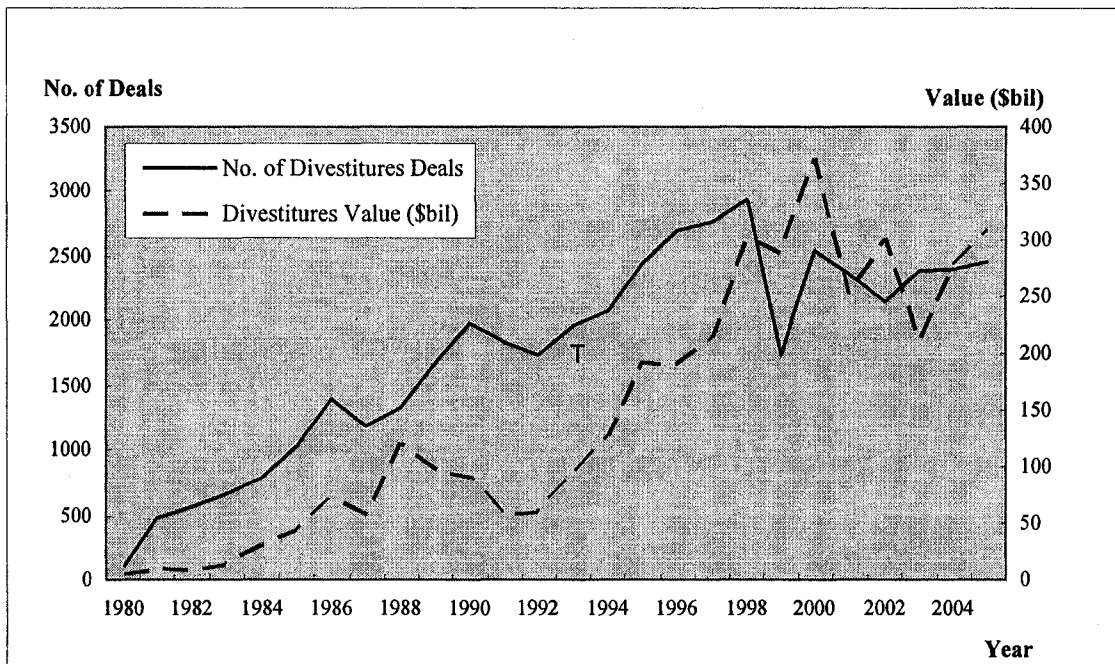
**Figure 1 (B): Value of M&As versus Divestitures 1980-2005**



**Figure 2 (A): Completed M&As 1980-2005**



**Figure 2 (B): Completed Divestitures 1980-2005**





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#### PUBLICATIONS

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- “Does mispricing motivate companies to list shares abroad?” With Deqing Diane Li and William Hummer, *forthcoming, Journal of the International Society of Business Disciplines*

#### TEACHING AND ACADEMIC EXPERIENCE

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- Visiting Professor, Department of Business Administration, University of Missouri-Rolla, 2007-2008
- Instructor, College of Business and Public Administration, Old Dominion University, 2006-2007
- Research Assistant, College of Business and Public Administration, Old Dominion University, 2005-2006
- Teaching Assistant, College of Business and Public Administration, Old Dominion University, 2004-2005

#### INDUSTRIAL EXPERIENCE

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- Operations Assistant, Communication Center, University of Dallas, Irving, Texas, January 2001 - June 2003
- Assistant Manager/Financial Controller, Extension Education Center, National Taipei University, Taipei, Taiwan, August 1997 – August 1999
- Treasurer and Squad Leader, Chinese Army Corps, Taipei, Taiwan, October 1995 – July 1997