

# THE MOTIVES OF CORPORATE SPINOFFS: EVIDENCE FROM EX-ANTE MISVALUATION

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## ABSTRACT

*This study examines whether ex-ante misvaluation can explain motive differences between focus-increasing and non-focus-increasing spinoffs. In this study, a spinoff is defined as focus-increasing if the parent firm and the spun-off subsidiary operate in different industries. Otherwise, a spinoff is classified as a non-focus-increasing spinoff. The empirical results show that firms are more likely to conduct non-focus-increasing (focus-increasing) spinoffs if their valuation errors are larger (smaller). Also, short-term firm-specific overvaluation and overvalued long-run growth opportunities increase the probability of conducting a non-focus-increasing spinoff. The probability of conducting a focus-increasing spinoff increases when long-run growth opportunities are undervalued. The results suggest that motives underlying non-focus-increasing spinoffs are likely related to the exploitation of investors, whereas the motives underlying focus-increasing spinoffs are more likely beneficial to investors. An examination of investor reactions to spinoff announcements suggests that investors can see through the motives underlying corporate spinoffs.*

**JEL:** G14, G32, G34

**KEYWORDS:** Corporate Spinoff, Divestiture, Focus, Misvaluation

## INTRODUCTION

Prior studies suggest that deciphering spinoff motivation is a difficult task (Kurtaran, 2009). Despite this, many have hypothesized that the motivation for corporate spinoffs is to improve firm focus, significant conflicting results have been reported in the literature (Slovin et al. 1995). The issue is further complicated by the fact that a considerable number of spinoffs are non-focus-increasing (Harris and Madura, 2011; Lin and Yung, 2014). Other suggested motivations for spinoffs include reduction of information asymmetry (Krishnaswami and Subramaniam 1999; Bergh et al. 2008), removal of regulatory constraints (Schipper and Smith, 1983), and reduction of agency costs (Allen, 1998). Nevertheless, their empirical supports have also been inconclusive. The issue of spinoff motivation is also made complex by the insignificant or negative abnormal returns associated with many spinoff announcements (Veld and Veld-Merkoulova 2008; Lin and Yung 2014). Existing empirical evidence is unable to clearly distinguish among the hypothesized motivations for spinoffs, probably due to the simultaneous existence of multiple motives in any sample of spinoffs. Researchers have emphasized the value creation effect of corporate spinoffs. Surprisingly, none has directly examined the impact of firm misvaluation on spinoff decisions even though undervaluation is considered by many as related to the motives underlying spinoffs (Siddiqi and Warganegara 2003; Ahn and Denis 2004; Ahn and Walker 2007).

In this study, the ex-ante misvaluation of the parent firm is proposed to identify spinoff motivation. The idea that pre-announcement share prices influence corporate restructuring activity has gained much attention in recent years. Many have focused on the assumption that the deviation of share price from fundamental value can explain major firm investment decisions (Baker et al. 2003, Campello and Graham 2013). Specifically, a sizeable stream of research has argued that mergers are driven by market values that are excessively high as compared with fundamental values (Shleifer and Vishny 2003; Rhodes-Kropf and

Viswanathan 2004; Dong et al. 2006). This line of research is extended in this study to examine motivations for corporate spinoffs. The approach adopted in this paper is based on the Rhodes-Kropf, Robinson, and Viswanathan (2005, henceforth RKR) methodology to decompose a firm's misvaluation into three components: short-term firm-specific valuation error, industry-wide valuation error, and long-term growth opportunities valuation error. This approach offers a unique advantage over methodologies adopted in prior spinoff studies because different motives of spinoffs are assessed simultaneously in the same model; it removes the issue of comparability as different methods are not used to examine different types of spinoff motivations. In addition, this approach's focus on firm misvaluation explores directly the commonly offered explanation by firms announcing spinoffs that the objective is to correct valuation problems in the market. To my knowledge, no published research on corporate spinoffs has analyzed the relation between firm misvaluation and spinoff motivations. The RKR approach also has an advantage over conventional event study methodologies in understanding motivations for spinoffs as event study methodologies, in general, require the assumption that the underlying asset-return generating process is correctly specified.

Several interesting observations are found from the empirical results. First, firms contemplating non-focus-increasing spinoffs have significantly larger misvaluation errors than firms contemplating focus-increasing spinoffs. Second, overvaluation increases (decreases) the probability of conducting a non-focus-increasing (focus-increasing) spinoff. The result implies that the motives underlying non-focus-increasing spinoffs are likely related to exploiting investors because non-focus-increasing spinoffs aggravate the problem of information asymmetry. On the other hand, the motives underlying focus-increasing spinoffs are more likely beneficial to investors because improving firm focus when the firm value is less mispriced suggests that the firm wants to be informed or knowledgeable investors to know more about the future of the company. Third, higher levels of short-term firm-specific misvaluation and long-run growth misvaluation increase the probability of conducting a non-focus-increasing spinoff. Fourth, overvalued long-run growth opportunities increases (decreases) the likelihood of conducting a non-focus-increasing (focus-increasing) spinoff. Fifth, investors react more positively to spinoff announcements when valuation errors are smaller. Sixth, investor reactions to non-focus-increasing spinoff announcements are non-positive or insignificant when valuation errors are significant. Seventh, investors react positively to focus-increasing spinoff announcements, and the size of misvaluation has no impact on the reaction of investors. Eighth, overvaluation has a significant negative effect on investor reactions to non-focus-increasing spinoff announcements. Ninth, undervaluation has a significant positive impact on investor reactions to focus-increasing spinoff announcements. In sum, my findings suggest that the motives underlying non-focus-increasing spinoffs are unlikely related to improving firm efficiency, valuation accuracy, and information asymmetry. Vice versa, the motivations underlying focus-increasing spinoffs are likely related to improving valuation accuracy, information asymmetry, and firm efficiency.

This paper contributes to the literature on corporate spinoffs in several ways. It is the first study to examine the effect of firm misvaluation on corporate spinoff decisions. It is also the first paper to evaluate motives for corporate spinoffs by examining the ex-ante misvaluation of the parent firm. This approach has garnered much attention in recent years as researchers find that the deviation of share price from fundamental value can explain critical corporate decisions (Baker et al. 2003, Campello and Graham 2013). This paper also contributes to the literature by explicitly showing that the motives underlying non-focus-increasing are different from those underlying focus-increasing spinoffs. There is no existing study on the motivations underlying non-focus-increasing spinoffs. Another vital contribution in this paper to the literature is that my results are consistent with the implication that there could be multiple motives underlying a spinoff decision. For example, the motives underlying focus-increasing spinoffs seem more likely related to improving firm efficiency, information asymmetry, and valuation accuracy. This observation of the possible existence of multiple motives is particularly important because prior studies on spinoff motivation have frequently encountered conflicting results. Previous studies are unable to clearly distinguish among the hypothesized motivations for spinoffs, probably due to the simultaneous existence of multiple motivations in any sample of spinoffs. The rest of the paper is organized as follows. Section 2 summarizes related

literature and testing hypotheses. Section 3 describes the sample collection process and provides descriptive statistics of the sample. Section 4 reports and discusses the results of this study. Section 5 concludes the paper.

## **LITERATURE REVIEW AND HYPOTHESES**

### Literature Review

A firm is split into separately traded entities when a spinoff takes place. Shareholders of the parent firm are given shares of the spun-off subsidiary on a pro-rata basis. Spinoffs differ from other forms of divestitures in that they do not involve any cash. Thus, spinoffs are unlikely motivated by a desire to generate cash to pay off debt, as is often the case with other forms of divestitures. Corporate spinoffs could be either focus-increasing or non-focus-increasing. In a focus-increasing spinoff, assets unrelated to the core business of the parent company are spun off to form a subsidiary. In a non-focus-increasing spinoff, the assets spun off are related to the core business of the parent firm.

A frequently mentioned spinoff motivation is corporate focus improvement. John and Ofek (1995) use the term 'removal of negative synergies' to describe the improvement of corporate focus through spinoffs as managers are freed from operations unrelated to the core business. Chen and Guo (2005) find that highly diversified firms are more likely to divest units when suffering from low operating efficiency. Comment and Jarrell (1995) suggest that firm performance is positively related to corporate focus because managerial efficiency improves when they are not distracted by non-core issues. Related to these arguments is the extensive evidence that the equity of diversified firms is traded at a discount compared with single-business firms. Thus, underlying the motivation to increase corporate focus and firm efficiency is the incentive to improve firm valuation. Although empirical findings are supporting the corporate focus explanation, Slovin et al. (1995) find contradictory results by examining how the share prices of competitors respond to spinoff announcements. Specifically, they find the positive share price reactions of competing firms opposite to the predictions of the corporate focus explanation of corporate spinoffs. They argue that if improved firm focus and better managerial incentives do indeed enhance firm performance, share prices of competitors are expected to react negatively to a spinoff announcement. Based on the finding of Solvin et al. (1995), Habib et al. (1997) posit that the corporate focus explanation may be viewed as having some limitations.

Another frequently mentioned motivation for the corporate spinoff is the reduction of agency costs. The agency costs explanation views spinoffs as a way to enhance firm performance as the alignment of incentives between managers and shareholders is improved (Allen, 1998). Specifically, the creation of a subsidiary with publicly traded securities enables shareholders to motivate and monitor the subsidiary managers in ways that may not have been feasible when the subsidiary was not publicly traded. Seward and Walsh (1996) and Daley et al. (1997) do not find evidence supporting the incentive alignment explanation. The third motivation for corporate spinoff discussed in the literature is the removal of tax or regulatory constraints. It is suggested that through a spinoff, either the parent or the subsidiary can escape constraints imposed by external regulatory bodies. For example, contracts with labor unions or rate regulators that presume the existence of one firm are altered upon a spinoff. Schipper and Smith (1983) study 93 voluntary spinoffs between 1963 and 1981, but they do not find evidence supporting the regulatory constraints argument. Lastly, the reduction of information asymmetry is another commonly mentioned motivation for the corporate spinoff. The explanation argues that spinoffs enable investors to value the parent firm more correctly and thus avoid the firm's value discount typically suffered by diversified firms. Habib et al. (1997) argue that spinoffs increase the number of securities that are traded on the market, and this makes the price system more informative. Krishnaswami and Subramaniam (1999) postulate that spinoffs improve the accuracy of information about the parent firm and its spun-off assets and thus enhance the total firm value. Chen and Zhang (2007) suggest that firms divest to improve information availability and enhance valuation accuracy. Tracking the Motives for Corporate Spinoffs and Hypothesis Development The methodology

developed by RKRK is applied to identify spinoff motivation from ex-ante market valuation data. According to RKRK, the market-to-book (M/B) ratio of a firm can be decomposed into three misvaluation components: short-term firm-specific misvaluation, time-series sector misvaluation, and long-run growth opportunities misvaluation. The decomposition equation is stated as:

$$m - b = (m - v_1) + (v_1 - v_2) + (v_2 - b) \quad (1)$$

where  $m$  and  $b$  are the market and book values of shares in logarithmic forms, respectively. The first component,  $(m - v_1)$ , is the difference between market value and the fundamental value implied by industry averages at time  $t$ . This component measures firm-specific pricing deviations from short-run industry pricing, and it exists when the firm is experiencing short-run irrational mispricing in the market. The second component,  $(v_1 - v_2)$ , is the difference between the firm's fundamental value implied by industry averages at time  $t$  and the firm's fundamental value implied by long-run industry averages. This component arises when contemporaneous multiples differ from long-run multiples. The component reflects that firms in the same industry could encounter common misvaluation factors temporarily. The third component,  $(v_2 - b)$ , is the difference between the firm's fundamental value implied by long-run industry averages and the book value of the firm. According to RKRK, the third component captures the misvaluation of the long-run growth opportunities of the firm. Positive errors imply overvaluation, whereas negative errors imply undervaluation. For straightforward interpretation of the multivariate regression results, negative errors are multiplied by -1. Following RKRK (2005, Eq. 15), a firm's fundamental value is estimated as follow:

$$m_{it} = \alpha_{0jt} + \alpha_{1jt}b_{it} + \alpha_{2jt} \ln(NI)_{it}^+ + \alpha_{3jt}I_{(<0)} \ln(NI)_{it}^+ + \alpha_{4jt}LEV_{it} + \varepsilon_{it} \quad (2)$$

where  $m_{it}$  is the natural logarithm of the market value of equity of firm  $i$  in year  $t$ ,  $b_{it}$  is the natural logarithm of the firm's book value of equity in year  $t$ .  $NI$  is net income, and  $LEV$  is book leverage ratio.  $(NI)^+$  is the absolute value of its net income in year  $t$ .  $I_{(<0)}$  is an indicator when its net income in year  $t$  is negative. To calculate the short-run contemporaneous industry average multiples,  $\alpha_{jt}$ , each year, all the firms in the same industry are grouped to run annual cross-sectional regressions to generate estimated industry multiples. The industry multiples,  $\alpha_{jt}$ , are then used to compute the short-run fundamental value ( $v_1$ ) of each firm in year  $t$ . To calculate the long-run industry multiples,  $\alpha_j$ , the short-run yearly estimates ( $\alpha_{jt}$ ) is averaged. The long-run industry multiples are used to compute the long-run fundamental value ( $v_2$ ) of each firm.

RKRK compare the three M/B ratio components between acquirers and target firms to evaluate merger motivation. For example, RKRK conclude that for many acquirers, the motivation is to use overvalued equities to acquire assets because acquirers have significantly higher short-term valuation errors than target firms. RKRK also suggest that the motivation of many acquirers is to buy growth because acquirers have long-term growth opportunities valuation errors that are significantly lower than those of target companies. Based on the result of RKRK, an acquisition could be driven by multiple motives if the acquirer exhibits different types of valuation errors simultaneously. In this study, the RKRK methodology is extended to relate the three misvaluation components to spinoff decisions to decipher the motives underlying corporate spinoffs. The first component of the decomposed M/B ratio, short-term firm-specific valuation error, likely occurs when investors are affected by the problem of information asymmetry. When investors lack sufficient information, they miscalculate firm value, and they tend to overreact or underreact to market news. It implies that if a non-focus-increasing spinoff decision is related to positive short-term firm-specific misvaluation (that is, overvaluation), then the motivation of the spinoff is likely associated with the exploitation of investors by compounding the problem of information asymmetry. Consistent with this view, some researchers find that assets divested through spinoffs are less than desirable. Michaely and Shaw (1995) find no evidence supporting the hypothesis that parent firms attempt to leave undervalued assets in the hands of current shareholders. Desai and Jain (1999) conclude that parent firms that undertake non-focus-increasing spinoffs are merely divesting the poorly performing subsidiaries and that efficiency is not the motive in these spinoffs. On the other hand, if a focus-increasing spinoff decision is related to negative

short-term firm-specific misvaluation (that is, undervaluation), then the motivation is likely related to improving valuation accuracy by reducing information asymmetry in the market. Thus, the hypotheses are:

*H1a: The motives underlying non-focus-increasing spinoffs are likely related to exploiting investors if the spinoffs are related to positive short-term misvaluation.*

*H1b: The motives underlying focus-increasing spinoffs are likely beneficial to investors if the spinoffs are related to negative short-term misvaluation.*

The second component of the decomposed M/B ratio, time-series sector-wide valuation error, exists when firm value deviates from the long-run industry average. This error likely occurs when there are temporal regulatory changes or industry-wide structural problems. It implies that spinoff firms experiencing this misvaluation are facing some temporary industry-wide valuation adjustments. Thus, it is argued that a significant relationship between a spinoff decision and the second component of the M/B ratio can be used to infer motives that represent responses to industry-wide fundamental shocks. Thus, the hypothesis is:

*H2: The motives underlying corporate spinoffs are likely related to reducing regulatory constraints in the industry if the spinoffs are related to sector-wide valuation errors.*

The last component of the decomposed M/B ratio measures the misvaluation of long-run growth opportunities. It is argued that this component is suitable for tracking spinoff motivations that are related to concerns of agency problems or firm efficiency. Specifically, if long-run growth opportunities are undervalued, the motives underlying focus-increasing spinoffs are likely related to the improvement of valuation accuracy and firm efficiency. Moreover, if long-run growth opportunities are overvalued, the motives of focus-increasing spinoffs are likely related to the reduction of agency problems. Prior studies suggest that overvalued firms are more likely to have significant agency problems as managers use overvalued equities to pursue personal objectives (Jensen, 2005; Kothari et al. 2006). Divesting non-core assets when the firm is overvalued may discourage managers from abusing its resources for personal interests. On the other hand, one can argue that if long-run growth opportunities are misvalued (overvalued or undervalued), the motives underlying non-focus-increasing spinoffs are likely unrelated to the improvement of firm efficiency or valuation accuracy. It is because non-focus increasing spinoffs keep the firms diversified and make the valuation of growth opportunities difficult by complicating the issue of information asymmetry. Non-focus-increasing spinoffs also allow managers to extract benefits from the firm more easily. Thus, my hypotheses are:

*H3a: The motives underlying focus-increasing spinoffs for firms that experienced negative long-run valuation errors are likely related to the improvement of firm efficiency and/or valuation accuracy.*

*H3b: The motives underlying focus-increasing spinoffs for firms that experienced positive long-run valuation errors are likely related to the reduction of agency problems.*

*H3c: The motives underlying non-focus-increasing spinoffs for firms that experienced (positive or negative) long-run valuation errors are likely unrelated to the improvement of firm value or efficiency.*

## **DATA AND METHODOLOGY**

### Sample Selection

A sample of U.S. publicly traded firms that completed a spinoff transaction between 1980 and 2008 are collected from the Thomas ONE Banker's Mergers and Acquisitions database. The data does not extend beyond 2008 is to avoid the significant negative market reactions on corporate events caused by the

financial crisis. Following RKR (2005) and Hertz and Li (2010), the fiscal year-end accounting data from Compustat is collected and matched with the Center for Research in Security Prices (CRSP) market value data three months after the fiscal year-end to calculate and decompose M/B ratio. If a spinoff is announced between the fiscal year-end and one month after the CRSP market value measured, the spinoff is matched with data from fiscal year  $t-1$ . To be included in the final sample, a spinoff must be a voluntary tax-free deal. It means spinoffs engaged in anti-trust regulations, taxable distribution, liquidation, bankruptcy, carve-out, and merger process are excluded. Firms in financial and regulated industries (SIC codes 4900-4949 and 6000-6999) are also excluded. A sample is dropped if the spinoff announcement date and the effective date (completion of a spinoff) of a firm cannot be verified in news releases or articles from Factiva. Finally, to remain in the sample, a spinoff parent firm must have enough Compustat and CRSP data to calculate the three components of the M/B ratio. The financial analysts' forecast data is from the Institutional Brokers Estimate System (IBES) through Thomas ONE Banker and segment data from Compustat and Compact Disclosure. My final sample consists of 307 completed spinoff transactions over the period 1980-2008. Consistent with the existing literature, a spinoff is classified as focus-increasing if the parent firm and the spun-off subsidiary have different 2-digit SIC codes. Otherwise, a spinoff is labeled as a non-focus-increasing spinoff.

### Descriptive Statistics

Table 1 presents the distribution of the sample by year. There are at least five spinoffs in each year of the sample period except between 1980 and 1983. More than half of the spinoffs occurred during the decade between 1990 and 2000. Of the 307 spinoffs examined, 205 are focus-increasing, and 102 are non-focus-increasing. The 307 spinoffs involved 286 parent firms. Among the 286 parent firms, one divested four subsidiaries, one divested three subsidiaries, and sixteen divested two subsidiaries in the same year. The distribution of the parent firms of spinoffs by industry is analyzed (non-tabulated). The industry that has the largest number of spinoffs is manufacturing (52), followed by electronics (28) and services (27)

Table 1: Sample Distribution of Spinoffs

Year	Number of Spinoffs	Focus-Increasing Spinoffs	Non-Focus-Increasing Spinoffs	Year	Number of Spinoffs	Focus-Increasing Spinoffs	Non-Focus-Increasing Spinoffs
1980	0	0	0	1995	13	9	4
1981	1	1	0	1996	28	16	12
1982	0	0	0	1997	22	17	5
1983	1	1	0	1998	14	9	5
1984	6	5	1	1999	23	9	14
1985	9	8	1	2000	17	11	6
1986	12	12	0	2001	10	7	3
1987	7	4	3	2002	11	5	6
1988	13	10	3	2003	10	5	5
1989	7	4	3	2004	8	5	3
1990	10	5	5	2005	7	4	3
1991	8	8	0	2006	5	4	1
1992	11	6	5	2007	9	5	4
1993	17	13	4	2008	14	11	3
1994	14	11	3				

Notes: The number of spinoffs is the number of completed spinoffs per year. A spinoff is classified as focus-increasing if the parent firm and the spun-off subsidiary have the same 2-digit SIC code; otherwise, it is classified as non-focus-increasing.

Table 2 presents basic descriptive statistics of the parent firms and information regarding the spinoff transactions. All ratios are calculated in the fiscal year-end preceding the announcement year. The financial characteristics of the parent firms are reported in Panel A. The mean (median) sales revenue of the entire sample is \$4,657 million (\$1,279 million), and the mean (median) book assets are \$6,198 million (\$1,394 million). The sales and total assets of my sample of parent firms are higher than those in previous studies (Desai and Jain 1999; Krishnaswami and Subramaniam 1999), implying that spinoffs have become more commonly used by larger firms to restructure their organizations in recent years. The mean (median) market value of all the parent firms prior to the announcement is \$6,358 million (\$1,233) million. The mean (median) market-to-book ratio (M/B) of the entire sample is 3.36 (2.15), and non-focus-increasing firms have significantly higher M/B ratios compared to focus-increasing firms. The numbers suggest that non-focus-increasing firms have a higher degree of misvaluation before the spinoff. The mean (median) leverage of the entire sample is 0.55 (0.57), and this ratio is comparable between non-focus increasing and focus-increasing firms. Regarding operating performances, the mean (median) return on assets (ROA), return on equity (ROE), and cash-adjusted return on assets (ROA\_cash\_adj) are 12.60% (13.68%), 34.04% (32.81%) and 12.69% (15.05%), respectively.

Relative to focus-increasing firms, non-focus-increasing firms have poorer performance ratios across all the measures, which is consistent with the findings of Krishnaswami and Subramaniam (1999) and Michaely and Shaw (1995) that firms involved in non-focus spinoffs have lower levels of operating performance. Prior to the split, spinoff firms, on average, have 3 subsidiaries. The mean (median) Herfindahl index (HERF) of the entire sample is 0.59 (0.54); it is comparable to the finding of Harris and Madura (2011). Panel B of Table 2 presents spinoff transaction characteristics. Transaction value is measured by the market value of the spun-off subsidiary at the end of the first trading day, and spinoff size is the ratio of the transaction value to the market value of the parent firm one day prior to the ex-date. The mean (median) transaction value for the entire sample is \$867.84 million (\$176.3 million), and the mean (median) transaction value for focus-increasing and non-focus-increasing spinoffs is \$895.61 million (\$176.3 million) and \$815 million (\$178.30 million), respectively. The mean (median) spinoff size for all spinoffs is equal to 34.76 % (17.07%) of the value of the parent firm’s capitalization. These numbers are comparable to 29% in Vijh (1994) and 30.7% in Krishnaswami and Subramaniam (1999). On average, parent firms in my sample took approximately seven months to complete their spinoffs, and non-focus-increasing deals are completed slightly quicker than focus-increasing deals.

Table 2: Descriptive Statistics for Spinoff Firms

<b>Panel A: Characteristics of Spinoff Firms</b>			
<b>Measure</b>	<b>All Spinoffs</b>	<b>Focus-increasing</b>	<b>Non-focus-increasing</b>
Sales(\$MM)	4,657.05 [1,279.13]	4,595.93 [1,512.95]	4,770.73 [790.33]
Total Assets (\$MM)	6,198.48 [1,394.89]	5,435.85 [1,424.15]	7,616.96[1,357.15]
Market Value(\$MM)	6,358.68 [1,233.02]	6,804.65 [1,174.45]	5,529.18 [1,490.30]
M/B	3.36 [2.15]	2.68 [1.92]	4.63 [2.70]
LEVERAGE	0.55 [0.57]	0.55 [0.57]	0.54 [0.56]
ROA (%)	12.60 [13.68]	13.20 [13.80]	11.49 [13.25]
ROE (%)	34.04 [32.81]	35.73 [33.11]	30.87 [31.36]
ROA_cash_adj (%)	12.69 [15.05]	13.43 [16.06]	11.31 [15.02]
Current Ratio (%)	225.81 [169.67]	218.38 [171.96]	239.53 [163.71]
N_SEG	2.92 [3.00]	3.09[3.00]	2.58[3.00]
HERF	0.59 [0.54]	0.55 [0.52]	0.67 [0.61]

Panel B: Deal Characteristics		
Transaction Value (\$MM)	867.84 [176.30]	895.61 [176.30]
Spinoff Size (%)	34.76 [17.07]	35.41 [17.91]
Duration (Days)	208.51 [190.00]	216.03 [194.50]

Notes: Panel A represents the characteristics of spinoff parent firms. All ratios are calculated in the fiscal year-end preceding the announcement year. The first value of each variable represents the mean, and the second value represents the median. Sales are sales revenue. Total assets are the total book value of assets. Market capitalization is market value of equity of a firm. M/B is measured as the market value of equity divided by the book value of equity. Leverage is measured as the ratio of long-term and short-term debt to book assets. ROA is the ratio of operating income before depreciation to total book assets. ROE is the ratio of operating income before depreciation to total book equity. ROA\_cash\_adj is the ratio of operating income before depreciation scaled by book value of total assets minus cash and marketable securities. The current ratio is the ratio of current assets to current liabilities. N\_SEG is the number of segments of the spinoff firm. HERF is the sales-based Herfindahl index. Panel B reports deal characteristics of the spinoffs. The transaction value is the market value of a spun-off subsidiary at the end of the first trading day. Spinoff size is the ratio of the transaction value to the market value of a parent firm one day prior to the ex-date. Duration is calculated as the number of days between spinoff announcement and ex-date.

## RESULTS AND DISCUSSIONS

### Univariate Analysis

The valuation errors of firms in the year prior to their corporate spinoff announcements are examined using the equation (2) developed by RKR and reported in Table 3. The result shows that firms contemplating spinoffs have significant valuation errors. For example, firms contemplating focus-increasing spinoffs have a mean total misvaluation (TOTALMISV) of 0.718 and a median total misvaluation of 0.651. Firms contemplating non-focus-increasing spinoffs have a mean total misvaluation of 0.989 and a median total misvaluation of 0.994. Of the three misvaluation components, both focus-increasing and non-focus-increasing firms have experienced only short-term firm-specific (FSE) and long-run growth opportunities (LRVTB) valuation errors. Interestingly, industry-wide valuation (TSSE) errors are not found among firms contemplating spinoffs. An important result shown in Table 3 is that non-focus-increasing firms have valuation errors that are significantly higher than those of focus-increasing firms. As shown in the last column of Table 3, the mean (median) difference in total misvaluation is significant at the 1 percent and 5 percent levels, respectively; the mean (median) difference in long-run growth opportunities misvaluation is significant at the 5 percent level. The association between higher valuation errors and non-focus-increasing spinoffs implies that the motives underlying non-focus-increasing spinoffs are likely unrelated to improving valuation accuracy because such spinoffs typically aggravate the problem of asymmetric information (Krishnaswami and Subramaniam, 1999). On the other hand, the association between focus-increasing spinoffs and lower valuation errors suggest that the motives underlying focus-increasing spinoffs are likely related to improving firm efficiency and/or valuation accuracy as the parent firms want knowledgeable investors to know more about the future of the company.

Table 3: Ex-ante Firm Misvaluation before the Spinoff

Component	Focus-Increasing (n=186)		Non-Focus-Increasing (n=100)		Difference	
	Mean	Median	Mean	Median	t(diff)	z(diff)
TOTALMISV	0.718***	0.651***	0.989***	0.994***	-2.68***	-2.23**
FSE	0.336***	0.350***	0.402***	0.438***	-0.82	-0.74
TSSE	0.019	0.014	0.037	0.036	-0.52	-0.74
LRVTB	0.357***	0.394***	0.552***	0.639***	-2.24**	-2.48**

Notes: This table reports information on the ex-ante misvaluation of focus-increasing and non-focus-increasing spinoff firms over the period 1980-2008. Three valuation errors are computed using the Rhodes-Kropf, Robinson, and Viswanathan (2005) methodology as follow:  $m_{it} = \alpha_{0,jt} + \alpha_{1,jt}b_{it} + \alpha_{2,jt} \ln(NI)_{it} + \alpha_{3,jt}I_{(<0)} \ln(NI)_{it} + \alpha_{4,jt}LEV_{it} + \varepsilon_{it}$ . FSE is short-term firm-specific misvaluation, TSSE is time-series sector-wide misvaluation, and LRVTB is long-run growth opportunities misvaluation. TOTALMISV is the sum of the three valuation errors. \*\*\*, \*\* and \* denote significance at the 1%, 5%, and 10% levels, respectively.



Probit Analysis on Motives of Underlying Spinoffs

Probit regression is adopted to examine the effect of market misvaluation on spinoff decisions in a multivariate framework. The first testing model is expressed as follow:

$$Prob(Non\_Focus\_Increasing\ Spinoff_{it}) = \alpha + \beta_1 MISVALUATION_{it-1} + \gamma Control_{it-1} + \varphi Year\ dummies + \theta Industry\ Dummies + \varepsilon_{it-1} \quad (3)$$

where the dependent variable is a dummy variable with a value of 1 if the spinoff is non-focus-increasing, and 0 otherwise. A group of control variables, including leverage, firm size, profitability, level of diversification, and proxies of information asymmetry from previous literature, is included in the model to control the potential motivations of spinoffs. The year and industry dummies are also included in the model to capture the influence of time-series trends and industry effects. In Panel A of Table 4, the misvaluation is defined as total misvaluation (TOTALMISV). In Panel B of Table 4, the misvaluation is separated into positive total misvaluation (POS\_TOTALMISV) and negative total misvaluation (NEG\_TOTALMISV).

Panel A of Table 4 shows that the coefficient on TOTALMISV is positive and significant in all the models. The results suggest that firms with higher levels of misvaluation are more likely to conduct non-focus-increasing spinoffs. When TOTALMISV is separated into POS\_TOTALMISV and NEG\_TOTALMISV, the significant positive coefficient on POS\_TOTALMISV reported in Panel B of Table 4 implies that overvaluation is more likely to result in non-focus-increasing spinoffs. Vice versa, firms are more likely to conduct focus-increasing spinoffs when they are less overvalued. Those findings above provide several interesting implications. On the one hand, the higher levels of market misvaluation among non-focus-increasing firms imply that the problem of asymmetric information facing investors is likely significant for these firms. Thus, if firms with high levels of misvaluation decide to pursue non-focus-increasing spinoffs, the problem of asymmetric information is further aggravated; the motive is, therefore, likely to take advantage of investors' asymmetric information problems rather than improving firm efficiency or valuation accuracy. On the other hand, the lower levels of market misvaluation among focus-increasing firms imply that the problem of asymmetric information is less significant for these firms. Thus, if firms with lower levels of misvaluation conduct focus-increasing spinoffs, it suggests that the firms appreciate the presence of informed investors and want to send credible signals about the firm's true potential to the investors. Thus, the likely motive of focus-increasing spinoffs when misvaluation is low is to improve firm efficiency or valuation accuracy. The findings support hypotheses 1a and 1b.

Table 4: Estimates of the Probability of Spinoffs and the Effect of Total Misevaluation

Panel A: Estimates of the Probability of Non-Focus-Increasing Spinoffs and the Effect of Total Misevaluation					
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-0.642*** (-2.82)	-0.468 (-0.12)	-0.371 (-0.81)	-1.820** (-2.39)	-1.806*** (-2.70)
TOTALMISV	0.223** (2.18)	0.254** (2.31)	0.139# (1.61)	0.245** (2.15)	0.263* (1.88)
LEVERAGE		-0.374 (-0.75)	-0.102 (-0.18)	-0.413 (-0.78)	-0.387 (-0.57)
SIZE		0.017 (0.38)	0.055 (0.95)	0.073# (1.36)	0.117* (1.76)
ROA		-0.007 (-0.97)	-0.003 (-0.34)	-0.006 (-0.81)	-0.013 (-1.03)
N_SEG			-0.156** (-2.33)	0.031 (0.32)	
HERF				1.336** (2.35)	1.111*** (2.67)
SPIN_SIZE			-0.001 (-0.03)		
SPREAD			-0.991 (-0.39)	-0.689 (-0.26)	
ANA_ERROR					-0.031 (-0.33)
Pseudo R <sup>2</sup>	0.087	0.091	0.101	0.131	0.101
Wald X <sup>2</sup> Statistic	24.754***	25.807**	25.434*	35.280***	21.011*
N	286	286	257	276	215
Panel B: Estimates of the Probability of Non-Focus-Increasing Spinoffs and the Effects of Positive and Negative Total Misvaluation					
	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-0.711*** (-5.32)	-0.424 (-1.38)	-0.274 (-0.77)	-1.440** (-2.18)	-1.630*** (-2.77)
POS_TOTALMISV	0.349*** (3.09)	0.398*** (3.32)	0.298** (2.23)	0.360*** (2.90)	0.356** (2.51)
NEG_TOTALMISV	-0.382 (-0.78)	-0.377 (-0.08)	-0.444 (-0.82)	-0.277 (-0.52)	-0.993 (-1.23)
LEVERAGE		-0.727# (-1.57)	-0.517 (-0.99)	-0.639# (-1.32)	-0.507 (-0.84)
SIZE		0.023 (0.53)	0.061 (1.09)	0.070# (1.35)	0.096 (1.50)
ROA		-0.007 (-0.99)	-0.004 (-0.42)	-0.005 (-0.69)	-0.008 (-0.69)
N_SEG			-0.173*** (-2.68)	-0.015 (-0.16)	
HERF				1.120** (2.09)	0.962** (2.46)
SPIN_SIZE			-0.001 (-0.36)		
SPREAD			-1.097 (-0.43)	-1.179 (-0.39)	
ANA_ERROR					-0.061 (-0.58)
Pseudo R <sup>2</sup>	0.034	0.046	0.052	0.086	0.069
Wald X <sup>2</sup> Statistic	9.621***	12.471**	13.063*	23.261***	14.069**
N	286	286	257	276	215

Notes: This table reports the results of probit regressions on the likelihood of conducting a non-focus-increasing spinoff:  $Prob(\text{Non\_Focus\_Increasing Spinoff}_{it}) = \alpha + \beta_1 \text{MISVALUATION}_{it-1} + \gamma \text{Control}_{it-1} + \phi \text{Year dummies} + \theta \text{Industry Dummies} + \varepsilon_{it-1}$ . The dependent variable is a dummy variable with a value of 1 if the spinoff is non-focus-increasing, and 0 otherwise. TOTALMISV is the total misvaluation of the firm. POS\_TOTALMISV (NEG\_TOTALMISV) represents positive (negative) total misvaluation. LEVERAGE is measured as the ratio of book leverage to book assets. SIZE is the natural log of the book assets. ROA is the ratio of operating income before depreciation to total book assets. N\_SEG is the number of segments of the spinoff firm. HERF is the sales-based Herfindahl index. SPIN\_SIZE is the log of the transaction value. SPREAD is bid-ask spread calculated as the average 100 days bid-ask spread scaled by the average of the bid-ask prices before the spinoff announcement. ANA\_ERROR is financial analysts' forecast error and is measured as the ratio of the absolute value of the difference between actual earnings and forecast earnings to the price per share in the last month of the fiscal year before the spinoff announcement. Robust z-statistics are reported in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively (two-tailed t-test).

To further understand the impact of misvaluation on spinoff decisions, TOTALMISV is separated into short-term firm-specific error (FSE), industry-wide error (TSSE), and long-run growth misvaluation (LRVTB) in the probit models. The probit model, therefore, is expressed as follow:

$$Prob(Non\_Focus\_Increasing\ Spinoff_{it}) = \alpha + \beta_1 FSE_{it-1} + \beta_2 TSSE_{it-1} + \beta_3 LRVTB_{it-1} + \gamma Control_{it-1} + \varphi Year\ dummies + \theta Industry\ Dummies + \varepsilon_{it-1} \quad (4)$$

Table 5 reports the probability of non-focus-increasing spinoffs and the effects of those three misvaluation components using the equation above. The coefficients of FSE in Table 5 is positive and significant in columns (1) through (4), implying that short-term firm-specific misvaluation increases the probability of conducting a non-focus-increasing spinoff. The result is consistent with the implication that the motive for conducting non-focus-increasing spinoffs is to exploit the short-term misunderstanding of investors rather than improving information asymmetry or firm efficiency. If the intention is to reduce information asymmetry or improve firm efficiency, focus-increasing spinoffs should have been conducted instead. The coefficient on TSSE is insignificant in all the columns. The coefficient on LRVTB, however, is positive and significant in four of the five columns, implying that firms are more likely to conduct non-focus-increasing spinoffs when investors do not fully understand the value of the long-run growth opportunities. The motive, again, is likely to exploit the misunderstanding of investors rather than correcting the misvaluation.

Table 5: Estimates of the Probability of Non-Focus-Increasing Spinoffs and the Effects of the Misvaluation Components

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-0.675*** (-2.92)	-0.206 (-0.38)	-0.309 (-0.50)	-1.552* (-1.77)	-2.386*** (-2.74)
FSE	0.253** (1.99)	0.425** (1.96)	0.249* (1.51)	0.402* (1.80)	0.157 (0.62)
TSSE	-0.066 (-0.18)	0.005 (0.01)	-0.389 (-0.89)	-0.115 (-0.29)	-0.525 (-1.15)
LRVTB	0.258* (1.93)	0.233* (1.82)	0.166 (1.02)	0.245* (1.73)	0.519** (2.32)
LEVERAGE		-0.822 (-1.11)	-0.327 (-0.38)	-0.795 (-1.02)	0.172 (0.17)
SIZE		0.003 (0.06)	0.053 (0.87)	0.063 (1.09)	0.150** (2.07)
ROA		-0.007 (-0.88)	-0.002 (-0.25)	-0.006 (-1.09)	-0.019 (-1.45)
N_SEG			-0.158** (-2.35)	0.022 (0.22)	
HERF				1.278** (2.23)	1.193*** (2.81)
SPIN_SIZE			-0.001 (-0.54)		
SPREAD			-1.257 (-0.49)	-0.882 (-0.33)	
ANA_ERROR					-0.045 (-0.44)
Pseudo R <sup>2</sup>	0.089	0.096	0.109	0.136	0.115
Wald X <sup>2</sup> Statistic	25.350**	27.047**	27.225*	36.498***	23.627*
N	286	286	257	276	215

Notes: This table reports the results of probit regression on the likelihood of non-focus-increasing spinoffs and the effect of the three RKR misvaluation components. The testing model is expressed as follow:  $Prob(Non\_Focus\_Increasing\ Spinoff_{it}) = \alpha + \beta_1 FSE_{it-1} + \beta_2 TSSE_{it-1} + \beta_3 LRVTB_{it-1} + \gamma Control_{it-1} + \varphi Year\ dummies + \theta Industry\ Dummies + \varepsilon_{it-1}$ . The three components are: firm-specific error (FSE), time-series sector error (TSSE), and the long-run value-to-book (LRVTB). The dependent variable is a dummy variable with a value of 1 if the firm is a non-focus-increasing spinoff and 0 otherwise. All other variables definitions can be found in the notes of Table 4. Robust z-statistics are reported in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively (two-tailed t-test).

Three misvaluation errors in are also separated into their respective positive and negative components to examine the impacts of individual misvaluation components in detail. The probit model is expressed as follow:

$$\begin{aligned} \text{Prob}(\text{Non\_Focus\_Increasing Spinoff}_{it}) = & \alpha + \beta_1 \text{POS\_FSE}_{it-1} + \beta_2 \text{NEG\_FSE}_{it-1} + \\ & \beta_3 \text{POS\_TSSE}_{it-1} + \beta_4 \text{NEG\_TSSE}_{it-1} + \beta_5 \text{POS\_LRVTR}_{it-1} + \beta_6 \text{NEG\_LRVTR}_{it-1} + \gamma \text{Control}_{it-1} + \\ & \varphi \text{Year dummies} + \theta \text{Industry Dummies} + \varepsilon_{it-1} \end{aligned} \quad (5)$$

The results of the probit model above are reported in Table 6. It is found that only the coefficient on POS\_LRVTB is significant. The positive coefficient on POS\_LRVTB implies that firms are more likely to conduct non-focus-increasing spinoffs when their long-run growth opportunities are overvalued in the market. Thus, the result further confirms that the motive is likely not to improve valuation accuracy because the problem of information asymmetry is made more complicated by non-focus-increasing spinoffs. Similarly, the significant positive coefficient on POS\_LRVTB also implies that the motive for conducting non-focus-increasing spinoffs in the presence of overvalued long-run growth opportunities is unlikely related to improving firm efficiency. Vice versa, the result in Table 6 also implies firms are more likely to conduct focus-increasing spinoffs if their long-run growth opportunities are less overvalued. That is, when investors are more capable of understanding a firm's long-run growth opportunities, firms are more inclined to pursue focus-increasing spinoffs as if trying to signal the firm's future to investors. The finding is consistent with the view that the motive of conducting focus-increasing spinoffs is to improve valuation accuracy and/or efficiency. The findings support hypothesis 3a and 3c.

**Do Investors See Through the Motives Underlying Spinoffs?** The results in Tables 3 to 6 suggest that the motives for conducting non-focus-increasing spinoffs are likely related to exploiting investors, whereas the motives for conducting focus-increasing spinoffs are possibly related to helping investors. It would be interesting to know if investors were capable of understanding the motivations underlying spinoffs. Therefore, I calculate abnormal returns around spinoff announcements measured by the market model as the proxy of market reaction. Then, the spinoff sample is divided into quantities based on the degree of pre-spinoff misvaluation to examine investors' reactions. Quintile 1 are spinoffs that have the lowest misvaluation, and Quintile 5 are spinoffs that have the highest misvaluation.

Table 7 reports the relationship between the degree of pre-spinoff misvaluation and investor reactions around spinoff announcements for all spinoffs. The findings in Table 7 indicate that investors react positively to spinoff announcements when valuation errors are small. For example, the announcement period return has a mean of 4.49% and a median of 2.46% for firms that are in the lowest quintile of TOTALMISV; the announcement period return has a mean of 1.00% and a median of 1.26% for firms that are in the highest quintile of TOTALMISV. The difference in the mean is significant at the one percent level, and the difference in the median is significant at the 10 percent level. Similarly, firms in the lowest quintile of FSE also have a more positive announcement period return (the mean is 3.96%, and the median is 2.48%) than firms in the highest quintile of FSE (the mean is 2.46% and the median is 1.87%). A similar observation can also be made for firms in the lowest and highest quintiles of LRVTB. Specifically, the announcement period return has a mean of 4.22% and a median of 2.12% for firms that are in the lowest quintile of LRVTB; the announcement period return has a mean of 1.84% and a median of 2.03% for firms that are in the highest quintile of LRVTB. The difference in the mean is significant at the 10 percent level. In sum, investors react more positively to spinoff announcements when valuation errors are smaller.

Table 6: Estimates of the Probability of Non-Focus-Increasing Spinoffs and the Effects of Positive and Negative Misvaluation Components

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-0.906*** (-5.01)	-0.719 (-1.36)	-0.710 (-1.21)	-1.793** (-2.19)	-2.180*** (-2.80)
POS_FSE	0.193 (1.05)	0.276 (1.18)	0.276# (1.38)	0.220 (0.90)	0.118 (0.43)
NEG_FSE	-0.217 (-0.58)	-0.312 (-1.73)	0.169 (0.35)	-0.313 (-0.71)	0.029 (0.06)
POS_TSSE	0.188 (0.33)	0.099 (0.17)	0.087 (0.13)	0.169 (0.28)	0.083 (0.13)
NEG_TSSE	0.525 (0.72)	0.334 (0.44)	0.685 (0.83)	0.527 (0.65)	0.816 (0.90)
POS_LRVTB	0.652*** (3.47)	0.634*** (3.04)	0.455** (1.97)	0.561*** (2.65)	0.582** (2.06)
NEG_LRVTB	0.389 (1.15)	0.367 (1.07)	0.129 (0.50)	0.216 (0.60)	-0.144 (-0.28)
LEVERAGE		-0.543 (-0.79)	-0.176 (-0.22)	-0.388 (-0.54)	0.217 (0.25)
SIZE		0.029 (0.79)	0.066 (1.12)	0.072# (1.30)	0.121* (1.74)
ROA		-0.007 (-0.85)	-0.004 (-0.49)	-0.004 (-0.56)	-0.017# (-1.29)
N_SEG			-0.164** (-2.53)	0.002 (0.02)	
HERF				1.162** (2.14)	1.000** (2.48)
SPIN_SIZE			-0.001 (-0.12)		
SPREAD				-1.261 (-0.46)	
ANA_ERROR					-0.054 (-0.54)
Pseudo R <sup>2</sup>	0.053	0.059	0.062	0.095	0.071
Wald X <sup>2</sup> Statistic	14.633**	15.627*	15.623	25.385**	14.559
N	286	286	257	276	215

Notes: This table reports the results of probit regression on the likelihood of non-focus-increasing spinoffs and the effect of the three positive and negative RKR misvaluation components. The testing model is expressed as follows:

$Prob(Non - Focus - Increasing Spinoff_{it}) = \alpha + \beta_1 POS\_FSE_{it-1} + \beta_2 NEG\_FSE_{it-1} + \beta_3 POS\_TSSE_{it-1} + \beta_4 NEG\_TSSE_{it-1} + \beta_5 POS\_LRVTB_{it-1} + \beta_6 NEG\_LRVTB_{it-1} + \gamma Control_{it-1} + \phi Year\ dummies + \theta Industry\ Dummies + \varepsilon_{it-1}$  The dependent variable is a dummy variable with a value of 1 if the firm is a non-focus-increasing spinoff and 0 otherwise. POS\_FSE (NEG\_FSE) is the positive (negative) firm-specific error. POS\_TSSE (NEG\_TSSE) is the positive (negative) time-series sector error. POS\_LRVTB (NEG\_LRVTB) is the positive (negative) long-run value-to-book. All other variables definitions can be found in the notes of Table 4. Robust z-statistics are reported in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively (two-tailed t-test).

Table 7: Degree of Pre-Spinoff Misvaluation and Investor Reactions to Spinoff Announcements

Component		Quintile 1 Lowest	Quintile 2	Quintile 3	Quintile 4	Quintile 5 Highest	Difference Q1 – Q5
TOTALMISV	Mean	4.49%***	2.44%***	2.61%***	3.06%***	1.00%	3.39%***
	Median	2.46%***	1.81%***	1.91%***	2.64%***	1.26%	1.20%*
	N	57	57	58	57	57	
FSE	Mean	3.96%***	3.58%***	1.56%**	2.37%***	2.46%***	1.50%
	Median	2.48%***	1.59%***	1.42%***	1.94%***	1.81%***	0.67%
	N	57	57	58	57	57	
TSSE	Mean	2.15%***	3.15%***	3.28%***	3.14%***	2.12%**	0.03%
	Median	0.84%***	3.14%***	3.02%***	2.20%***	2.05%**	-1.21%
	N	57	57	58	57	57	
LRVTB	Mean	4.22%***	2.61%***	2.38%***	2.88%***	1.84%**	2.38%*
	Median	2.12%***	2.40%***	1.76%***	2.20%***	2.03%**	0.09%
	N	57	57	58	57	57	

Notes: This table reports the mean and median of 2-day (-1, 0) cumulative abnormal returns estimated by market model for a sample of spinoff firms around the spinoff announcement period, sorted based on the degree of misvaluation. The abnormal returns are calculated using the market model parameters estimated over 255 days ending five days (Day -5) before the announcement date (Day 0). The CRSP value-weighted index is used in the market model to compute betas. N represents the number of observations in each quintile. The difference is the mean and median differences between Quintile 1 and Quintile 5. The t-test is used for the mean difference, and the Wilcoxon signed-rank test is applied for the median difference. \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A of Table 8 reports the results on the effect of misvaluation on investor reactions to spinoff announcements among non-focus-increasing spinoffs only. The result shows that investors react positively to non-focus-increasing spinoff announcements when valuation errors are small; the result also indicates that investor reactions to non-focus-increasing spinoff announcements are non-positive and insignificant when valuation errors are large. For example, the announcement period return has a mean of 4.28% and a median of 1.95% for firms that are in the lowest quintile of TOTALMISV; the announcement period return has a mean of -0.210% and a median of -0.50% for firms that are in the highest quintile of TOTALMISV. The difference in the mean is significant at the 10 percent level, and the difference in the median is significant at the one percent level. A similar pattern is found between firms in the lowest and highest quintiles of LRVTB. Thus, the result in Panel A suggests that investors are concerned about the motives underlying non-focus-increasing spinoffs when misvaluation is large. Investors are less worrisome about the motives underlying non-focus-increasing spinoffs when misvaluation is small. Such finding is consistent with the results of the probit models in Tables 3-5 that the motives of non-focus-increasing spinoffs are likely related to exploiting investors.

Panel B of Table 8 reports results on the effect of misvaluation on investor reactions to spinoff announcements among focus-increasing spinoffs only. The result shows investors react positively to focus-increasing spinoff announcements, and the size of misvaluation has no impact on the reaction of investors. For example, the announcement period return has a mean of 4.86% and a median of 3.77% for firms that are in the lowest quintile of TOTALMISV; the announcement period return has a mean of 3.02% and a median of 3.07% for firms that are in the highest quintile of TOTALMISV. The difference in mean and the difference in the median are insignificant. A similar pattern can be observed between firms in the lowest and highest quintiles of FSE, TSSE, and LRVTB, respectively. Thus, the result in Panel B suggests that investors are not concerned about the magnitude of misvaluation when focus-increasing spinoffs are carried out. The result implies that investors consider the motives underlying focus-increasing spinoffs likely advantageous. This is consistent with the finding of the probit models in Tables 3-6 that the motives of focus-increasing spinoffs are likely related to improving valuation and efficiency. Overall, both Tables 7 and 8 show the univariate results on the effect of misvaluation on investor reactions to spinoff announcements.

The results of multivariate regressions on the impact of misvaluation on investor reactions to non-focus-increasing and focus-increasing spinoff announcements are reported in Table 9 and Table 10. The testing model adopted in those two tables is expressed as follow:

$$CAR = \beta_0 + \beta_1 POS\_FSE + \beta_2 NEG\_FSE + \beta_3 POS\_TSSE + \beta_4 NEG\_TSSE + \beta_5 POS\_LRVTB + \beta_6 NEG\_LRVTB + \gamma Control_{it-1} + \varphi Year\ dummies + \theta Industry\ Dummies + \varepsilon \quad (6)$$

where CAR is the mean 2-day cumulative abnormal returns generated over the interval (-1, 0) by using the market model with the CRSP value-weighted index as the benchmark of the market portfolio; POS\_FSE (NEG\_FSE) is the positive (negative) firm-specific error; POS\_TSSE (NEG\_TSSE) is the positive (negative) time-series sector error; POS\_LRVTB (NEG\_LRVTB) is the positive (negative) long-run value-to-book. Table 9 reports the relationship between the market reaction and the degree of misvaluation components of non-focus-increasing spinoffs. A major observation in the table is that overvaluation has a significant negative effect on investor reactions to non-focus-increasing spinoff announcements. For example, the coefficient on POS\_FSE is negative and significant in columns (1) to (4); the coefficient on POS\_TSSE is negative and significant in columns (1), (2), and (5); the coefficient on POS\_LRVTB is negative and significant in columns (1), (3), and (4). Thus, investors are concerned about the motives underlying non-focus-increasing spinoffs when firms are overvalued. On the other hand, undervaluation does not affect investor reactions to non-focus-increasing spinoff announcements.

Table 8: Degree of Pre-Spinoff Misvaluation And Investor Reactions to Spinoff Announcements by Non-Focus-Increasing and Focus-Increasing Spinoffs

Panel A: Degree of Pre-Spinoff Misvaluation and Investor Reactions to Spinoff Announcements of Non-Focus-Increasing Spinoffs							
Component		Quintile 1 Lowest	Quintile 2	Quintile 3	Quintile 4	Quintile 5 Highest	Difference Q1 – Q5
TOTALMISV	Mean	4.28% <sup>**</sup>	2.40% <sup>**</sup>	1.72%	1.90% <sup>*</sup>	-0.21%	4.49% <sup>***</sup>
	Median	1.95% <sup>**</sup>	1.72% <sup>**</sup>	2.20%	1.87%	-0.50%	2.45% <sup>*</sup>
	N	20	20	20	20	20	
FSE	Mean	3.21% <sup>**</sup>	2.62% <sup>*</sup>	1.17%	1.11%	0.61%	2.60%
	Median	2.71% <sup>**</sup>	1.46%	2.70%	1.10%	0.56%	2.15%
	N	20	20	20	20	20	
TSSE	Mean	1.53%	1.77%	1.63%	3.07% <sup>**</sup>	0.05%	1.48%
	Median	0.43%	1.53%	2.14% <sup>*</sup>	2.21% <sup>**</sup>	-0.01%	0.44%
	N	20	20	20	20	20	
LRVTB	Mean	5.36% <sup>***</sup>	0.55%	1.81% <sup>**</sup>	2.43% <sup>*</sup>	-1.12%	6.48% <sup>***</sup>
	Median	2.79% <sup>***</sup>	-0.29%	1.17% <sup>*</sup>	1.79% <sup>*</sup>	-1.12%	3.91% <sup>*</sup>
	N	20	20	20	20	20	

  

Panel B: Degree of Pre-Spinoff Misvaluation and Investor Reactions to Announcements of Focus-Increasing Spinoffs							
TOTALMISV	Mean	4.86% <sup>***</sup>	3.22% <sup>***</sup>	1.52% <sup>*</sup>	4.43% <sup>***</sup>	3.02% <sup>***</sup>	1.84%
	Median	3.77% <sup>***</sup>	1.83% <sup>***</sup>	0.86% <sup>**</sup>	2.92% <sup>***</sup>	3.07% <sup>***</sup>	0.70%
	N	37	37	38	37	37	
FSE	Mean	4.23% <sup>***</sup>	4.18% <sup>***</sup>	2.65% <sup>***</sup>	2.13% <sup>**</sup>	3.84% <sup>***</sup>	0.39%
	Median	2.48% <sup>***</sup>	1.86% <sup>***</sup>	2.14% <sup>***</sup>	1.95% <sup>***</sup>	3.07% <sup>***</sup>	-0.59%
	N	37	37	38	37	37	
TSSE	Mean	2.61% <sup>***</sup>	2.94% <sup>***</sup>	4.36% <sup>***</sup>	3.24% <sup>***</sup>	3.68% <sup>***</sup>	-1.07%
	Media	0.98% <sup>***</sup>	3.01% <sup>***</sup>	4.63% <sup>***</sup>	2.20% <sup>***</sup>	2.48% <sup>***</sup>	-1.50%
	N	37	37	38	37	37	
LRVTB	Mean	4.05% <sup>***</sup>	2.48% <sup>***</sup>	3.26% <sup>***</sup>	3.54% <sup>***</sup>	3.33% <sup>***</sup>	0.72%
	Median	1.83% <sup>***</sup>	2.40% <sup>***</sup>	2.96% <sup>***</sup>	2.60% <sup>***</sup>	2.48% <sup>***</sup>	-0.65%
	N	37	37	38	37	37	

Notes: This table reports the mean and median of 2-day (-1, 0) cumulative abnormal returns estimated by market model for a sample of non-focus-increasing (focus-increasing) firms around the spinoff announcement period, sorted based on the degree of misvaluation components. The abnormal returns are calculated using the market model parameters estimated over 255 days 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. N represents the number of observations in each quintile. The difference is the mean and median differences between Quintile 1 and Quintile 5. The t-test is used for the mean difference, and the Wilcoxon signed-rank test is applied for the median difference. \*\*\*, \*\*, \* denote significance at the 1%, 5%, and 10% levels, respectively.

Table 9: Relation between Investor Reactions and Misvaluation Components of Non-Focus-Increasing Spinoffs

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	0.012 (0.40)	-0.019 (-0.40)	-0.006 (-0.12)	-0.030 (-0.45)	-0.022 (-0.18)
POS_FSE	-0.027* (-1.84)	-0.036** (-2.09)	-0.046** (-2.48)	-0.046** (-2.45)	-0.029 (-1.17)
NEG_FSE	0.029 (0.85)	0.042 (1.17)	0.013 (0.33)	0.009 (0.22)	-0.040 (-0.72)
POS_TSSE	-0.082# (-1.60)	-0.082# (-1.55)	-0.065 (-1.03)	-0.071 (-1.08)	-0.134# (-1.59)
NEG_TSSE	0.059 (0.91)	0.065 (1.00)	0.074 (1.02)	0.070 (0.94)	-0.086 (-0.78)
POS_LRVTB	-0.019* (-1.75)	-0.017 (-1.26)	-0.024* (-1.73)	-0.022# (-1.41)	-0.018 (-0.70)
NEG_LRVTB	0.003 (1.22)	0.028 (1.13)	0.026 (0.90)	0.026 (0.90)	0.053 (0.67)
LEVERAGE		0.054 (1.24)	0.056 (1.20)	0.056 (1.19)	0.033 (0.39)
SIZE		-0.001 (-0.01)	-0.002 (-0.46)	0.001 (0.07)	-0.001 (-0.02)
N_SEG			0.001 (0.21)		
HERF				0.017 (0.59)	0.057# (1.39)
SPREAD				0.443 (0.33)	
ANA_ERROR					0.066** (2.29)
N	100	100	93	93	73
Adj. R <sup>2</sup>	0.238	0.232	0.166	0.155	0.194

The abnormal returns on the misvaluation component of non-focus-increasing spinoffs. The testing model is expressed as follow:  $CAR = \beta_0 + \beta_1 POS\_FSE + \beta_2 NEG\_FSE + \beta_3 POS\_TSSE + \beta_4 NEG\_TSSE + \beta_5 POS\_LRVTB + \beta_6 NEG\_LRVTB + \gamma Control_{it-1} + \phi Year\ dummies + \theta Industry\ Dummies + \varepsilon$ . The dependent variable CAR is the mean 2-day cumulative abnormal returns generated over the interval (-1, 0) by using the market model with the CRSP value-weighted index as the benchmark of the market portfolio. POS\_FSE (NEG\_FSE) is the positive (negative) firm-specific error. POS\_TSSE (NEG\_TSSE) is the positive (negative) time-series sector error. POS\_LRVTB (NEG\_LRVTB) is the positive (negative) long-run value-to-book. All other variables definitions can be found in the notes of Table 4. Two-tail heteroskedasticity-adjusted t-statistics are reported in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively (two-tailed t-test). # indicates statistical significance at the 10% levels (one-tailed t-test).

Table 10 reports the results of multivariate regressions on the effect of misvaluation on investor reactions to focus-increasing spinoff announcements. The results in this table are opposite to those in Table 9. The major observation in Table 10 is that undervaluation has a significant positive effect on investor reactions to focus-increasing spinoff announcements. For example, the coefficient on NEG\_FSE is positive and significant in columns (1) to (5); the coefficient on NEG\_TSSE is positive and significant in column (5); the coefficient on NEG\_LRVTB is positive and significant in columns (1) and (5). Thus, the results imply that investors consider the motives underlying focus-increasing spinoffs likely related to improve valuation and efficiency when the firm is undervalued. Interestingly, the coefficients on POS\_FSE, POS\_TSSE, and POS\_LRVTB are all insignificant. It appears that investors are less concerned about firm overvaluation when they consider the motives underlying focus-increasing spinoffs are likely beneficial. In sum, the reaction of investors to focus-increasing and non-focus-increasing spinoffs confirm the results of the probit regression models that the motives underlying non-focus-increasing spinoffs are likely related to exploiting investors whereas the motives underlying focus-increasing spinoffs are likely advantageous to investors.



Table 10: Relation Between Investor Reactions and Misvaluation Components of Focus-Increasing Spinoffs

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	0.060 (0.88)	0.015 (0.18)	0.001 (0.01)	0.004 (0.05)	0.038 (0.48)
POS_FSE	0.010 (0.81)	-0.004 (-0.21)	-0.005 (-0.27)	-0.004 (-0.23)	0.002 (0.09)
NEG_FSE	0.046** (1.98)	0.062** (2.19)	0.067** (2.30)	0.066** (2.25)	0.055* (1.90)
POS_TSSE	0.019 (0.36)	0.024 (0.47)	0.024 (0.47)	0.025 (0.48)	0.036 (0.70)
NEG_TSSE	0.032 (0.52)	0.063 (0.95)	0.074 (1.09)	0.067 (0.91)	0.103# (1.31)
POS_LRVTB	-0.001 (-0.06)	0.001 (0.06)	0.001 (0.06)	0.001 (0.05)	0.017 (1.08)
NEG_LRVTB	0.003# (1.37)	0.027 (1.08)	0.028 (1.13)	0.029 (1.14)	0.006** (2.09)
LEVERAGE		0.086* (1.72)	0.099* (1.80)	0.094* (1.75)	0.070 (1.12)
SIZE		-0.003 (-0.93)	-0.003 (-0.85)	-0.003 (-0.77)	-0.006# (-1.38)
N_SEG			-0.001 (-0.14)		
HERF				-0.003 (-0.11)	-0.036# (-1.32)
SPREAD				0.030 (0.28)	
ANA_ERROR					-0.001# (-1.58)
N	186	186	183	183	142
Adj. R <sup>2</sup>	0.035	0.049	0.042	0.035	0.164

This table reports the abnormal returns on the misvaluation component of focus-increasing spinoffs. The testing model is expressed as follow:  $CAR = \beta_0 + \beta_1 POS\_FSE + \beta_2 NEG\_FSE + \beta_3 POS\_TSSE + \beta_4 NEG\_TSSE + \beta_5 POS\_LRVTB + \beta_6 NEG\_LRVTB + \gamma Control_{it-1} + \varphi Year\ dummies + \theta Industry\ Dummies + \varepsilon$ . The dependent variable is the mean 2-day cumulative abnormal returns generated over the interval (-1, 0) by using the market model with the CRSP value-weighted index as the benchmark of the market portfolio. POS\_FSE (NEG\_FSE) is the positive (negative) firm-specific error. POS\_TSSE (NEG\_TSSE) is the positive (negative) time-series sector error. POS\_LRVTB (NEG\_LRVTB) is the positive (negative) long-run value-to-book. All other variables definitions can be found in the notes of Table 4. Two-tail heteroskedasticity-adjusted t-statistics are reported in parentheses. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively (two-tailed t-test). # indicates statistical significance at the 10% levels (one-tailed t-test).

## CONCLUDING COMMENTS

Understanding the motives underlying corporate spinoffs is besieged by conflicting empirical results in the existing literature. The issue is further complicated by the firm’s choice between non-focus-increasing and focus-increasing spinoffs. This study is the first one to use ex-ante misvaluation of the parent firm to identify spinoff motivation. Based on the results of studies on merger motivation, this study argues that the deviation of share price from fundamental value can explain corporate spinoff decisions. By adopting the methodology of Rhodes-Kropf et al. (2005) to decompose a firm’s misvaluation into three components that include short-term firm-specific valuation error, industry-wide valuation error, and long-term growth valuation error, I find that firms contemplating non-focus-increasing spinoffs have significantly larger valuation errors than firms contemplating focus-increasing spinoffs. My results show that short-term firm-specific overvaluation and long-run growth opportunities overvaluation increases the likelihood of conducting non-focus-increasing spinoffs. The finding suggests that the motives underlying non-focus-increasing spinoffs are likely related to the exploitation of investors because non-focus-increasing spinoffs aggravate the problem of asymmetric information.

My results also show that firms are more likely to conduct focus-increasing spinoffs when they have smaller valuation errors, and when long-run growth opportunities are less overvalued. The finding suggests that

when investors are more informed or knowledgeable, firms use focus-increasing spinoffs to signal the future of the firm to investors. In other words, the motives underlying focus-increasing spinoffs are likely related to improving valuation and/or firm efficiency. My investigation of investor reactions to spinoff announcements suggests that investors can see through the motives underlying the spinoff decisions. The results show that investor reactions to non-focus-increasing spinoff announcements are non-positive and insignificant when valuation errors are large. In addition, overvaluation has a significant negative effect on investor reactions to non-focus-increasing spinoff announcements. On the other hand, univariate results show that investors react positively to focus-increasing spinoff announcements, and the size of misvaluation has no impact on the reaction of investors. Multivariate regressions show that investors respond favorably to focus-increasing spinoffs if long-run growth opportunities are undervalued. The findings in this study shed light on the investment strategies to practitioners who consider investing in spinoff companies. According to recent research by Willis Towers Watson (2019), over half of the companies engaging in divestments since 2010 have lost shareholder value. Such evidence supports the hypotheses addressed in this study that not all spin-offs create value for shareholders. Investors, therefore, must study the motive of a spinoff carefully to avoid being exploited by managers due to information asymmetry problems prior to spinoffs. Due to the significant adverse market reactions during the recent global financial market crash, this study only examines the pre-crash sample. Future studies might want to include recent spin-off cases to determine whether the relationship between misvaluation of spinoffs and the market reactions holds due to the significant market microstructure and regulations change after the crisis.

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