

Insider Trading and Corporate Spinoffs

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Abstract

This paper studies insider trading to examine undervaluation as a motive behind corporate spinoffs. We show an unmistakable increase (decrease) in the number of insider purchases (sales) and net purchases (sales) in the four quarters prior to a spinoff announcement. In addition, relative to a benchmark period, insider selling is significantly lower, and their net purchases significantly higher, in the three quarters prior to a spinoff announcement compared to other periods. We find that announcement period excess returns for abnormal net insider purchases are significantly higher than excess returns for abnormal net insider sales. Moreover, only firms with abnormal net insider purchases exhibit significant improvement in their long-run market and operating performance after a spinoff. The results suggest that undervaluation is an important motive behind corporate spinoffs and that it is possible to identify the quality of a spinoff firm on the basis of insider trading behavior prior to its announcement.

Key words: insider trading; undervaluation; corporate spinoffs.

JEL Classification: G14; G34

Insider Trading and Corporate Spinoffs

1. Introduction

The information-based model of Nanda and Narayanan (1999) implies that undervaluation is an important motive for spinoffs. If a firm is undervalued due to information asymmetry between its management and the market, it may choose to do a spinoff to get *correctly* valued before approaching the external capital market for funds. Empirical research is consistent with this argument. For example, Ahn and Denis (2004) and Burch and Nanda (2003) report a significant improvement in aggregate firm value following spinoffs. Furthermore, Krishnaswami and Subramaniam (1999) find lower levels of information asymmetry and larger amounts of capital raised after spinoffs.

This study provides complementary evidence on the link between undervaluation and corporate spinoffs. We analyze personal trades made by corporate insiders in their firm's stock prior to the announcement of a spinoff. Since insiders have intimate knowledge of their firm's operations, transactions that they make on their own behalf should reflect their belief regarding the future prospects of the firm. If their firm is undervalued and a spinoff is undertaken to enhance market valuation, then we expect insiders to increase their share purchases, or decrease their sales, prior to the spinoff announcement. Either action results in a higher net share purchase measure for the corporate insider. In addition, we expect to see a strong relation between insider trading prior to a spinoff announcement and improvements in the long-run performance of spinoff firms. If only firms with prior increases in net insider purchases exhibit a significant improvement in their long-run performance after a spinoff but other firms do not, then insiders may tend to intentionally trade on superior information regarding the true value of their firm. Otherwise, prior insider trading patterns may simply reflect a tendency for insiders to mechanically follow price increases or decreases. Finally, if investors regard prior insider trading activity of a firm as a useful backdrop for evaluating its spinoff decisions, then the spinoff announcement period's excess returns should be expected to be significantly higher among firms with prior increases in net insider purchases.

The purpose of this paper is to examine insider trading around corporate spinoffs to test our hypotheses. We begin by examining insiders' personal trading of their firm's stock before the announcement of a spinoff. We define insider trading as open-market and private transactions by a firm's top management. The sample consists of 187 separate spinoff events by 172 parent firms from 1987 through 2006. The results show a clear and near-monotonic increase (decrease) in the number of insider purchases (sales) and net purchases (sales) in the four quarters prior to the announcement. Moreover, relative to a benchmark period, insider selling is significantly lower, and net purchases significantly higher, in the three quarters prior to a spinoff announcement compared to other periods.

We investigate whether insider trading can predict spinoff announcements. We stratify the sample based on insider trading activity one quarter prior to the announcement day. Spinoffs with positive abnormal insider net purchases are classified as the "abnormal net purchases sample," while those with zero or negative abnormal insider net purchases are classified as the "abnormal net sale sample." Consistent with our hypotheses, we find that announcement period excess returns for the abnormal net purchases group are significantly higher than those for the abnormal net sales group, suggesting that the market views spinoff decisions by firms with prior abnormal net purchases as more compatible with shareholder interests. We also investigate the ties between insider trading activity and changes in firm performance around spinoffs. The results show that firms with abnormal net purchases exhibit significant improvement in their long-run market and operating performance following spinoffs. The results imply that managers know when their firms are undervalued and time their own trades accordingly.

The rest of the paper is organized as follows. Section 2 reviews the related research and develops the hypotheses to be tested. Section 3 describes the sample selection procedure and research method. Section 4 presents evidence on insider trading before the spinoff announcement. The results of the stock market performance and the operating performance around spinoffs are reported in section 5 and 6, respectively. Section 7 concludes the paper.

2. Literature review and hypotheses development

Numerous studies, such as Hite and Owers (1983), Miles and Rosenfeld (1983), and Schipper and Smith (1983), among others, document a significant positive stock price reaction to the announcement of corporate spinoffs. There is considerable empirical evidence that spinoffs, on average, enhance long-run shareholder value (e.g., Burch and Nanda, 2003; Ahn and Denis, 2004). A variety of reasons has been presented in the literature to explain the value gains from spinoffs. Among the most popular are improvements in corporate focus (Daley *et al.*, 1997; Desai and Jain, 1999), improvements in management incentives (Schipper and Smith, 1983), increase in investment efficiency (Ahn and Denis, 2004), relaxation of regulatory or tax constraints (Schipper and Smith, 1983), facilitation of a merger or takeover (Cusatis *et al.*, 1993), and elimination of cross subsidies (Daley *et al.*, 1997), etc.

However, as pointed out by Krishnaswami and Subramaniam (1999), if these motives are the only ones behind the separation of a parent from its subsidiary, then any other type of divestiture should work just as well as a spinoff. Spinoffs differ from other forms of divestitures such as asset sells and equity carve-outs in that no capital is raised in spinoffs. Therefore, a spinoff is an especially appropriate mode of separation when a firm is undervalued because undervaluation does not affect the cash inflows to the firm since the “subsidiary is not being sold” (Krishnaswami and Subramaniam, 1999). Nanda and Narayanan (1999) develop an information-based model to explain the undervaluation of multi-divisional firms. They argue that diversified firms may be undervalued due to information asymmetry between a firm’s management and the market. Splitting the firm’s divisions into multiple business components will facilitate the market valuation of each component more accurately. Then the market value of the sum of the separated parts may be greater than the market value of the combined firm. One way to determine the undervaluation of firms that engage in spinoffs is to compare the excess value of firms prior to and following spinoffs. For example, Ahn and Denis (2004) and Burch and Nanda (2003) report that pre-spinoff firms are valued at a discount. Post-spinoff, they report a significant improvement in aggregate value and the diversification discount is eliminated. However, there is much debate about the accuracy of the Compustat segment data used to measure excess value in most studies. This study provides complementary evidence to prior studies by measuring undervaluation using an approach that does not

rely on the estimation of excess value. We analyze personal trades made by corporate insiders in their firm's stock prior to the announcement of a spinoff. Since insiders have intimate knowledge of their firm's operations, transactions that insiders make on their own behalf are assumed to reflect their belief regarding the future prospects of the firm. If a firm is undervalued and a spinoff is undertaken to enhance market valuation, then we expect insiders to increase their share purchases or decrease their sales prior to a spinoff announcement. Either action results in an increase in their net share purchases.

Hypothesis 1. Insider net share purchases increase prior to the announcement of a spinoff.

Studies dating back to the late 1960s and early 1970s, such as Lorie and Niederhoffer (1968), Pratt and Devere (1970), Jaffe (1974), and Finnerty (1976), etc., document that corporate insiders earn significant abnormal profits by trading in stocks of their own firms. More recently, researchers have examined insider trading around corporate announcements of asset sales (Hirschey and Zaima, 1989), capital expenditures (John and Mishra, 1990), corporate bankruptcy (Seyhun and Bradley, 1997), dividends (John and Lang, 1991), earnings (Penman, 1982; Elliot *et al.*, 1984), equity issues (Clarke *et al.*, 2001; Kahle, 2000; Lee, 1997), mergers and acquisitions (Akbulut, 2005; Boehmer and Metter, 1997; Seyhun, 1990b; Song, 2005), and stock repurchases (Lee *et al.*, 1992). Most studies report significant changes in insider trading patterns before the public announcement. For example, Lee *et al.* (1992) find evidence of increased buying by insiders prior to fixed price repurchase offers, and of their decreased selling prior to fixed price repurchases and repurchases that follow takeover-related events. Kahle (2000) show that insider sales increase and purchases decrease prior to issues of equity and convertible debt by industrial firms.

Clarke *et al.* (2001) provide evidence that insider selling increases prior to both completed and canceled seasoned equity offerings. However, as Lee (1997) points out, the abnormal insider trading patterns around corporate announcements could simply reflect a tendency for insiders to sell (buy) and to mechanically follow price increases (decreases) rather than a tendency for them to take advantage of specific information unavailable to the public. One way to investigate this issue is to examine the relation

between insider trading and the long-term performance of the firm. For example, Lee (1997) shows that primary issuers significantly underperform their benchmarks in the long run, regardless of insiders' prior trading pattern. For secondary issuers, only those with insiders selling their shares before the issuance significantly underperform their benchmarks in the long run, while the others do not. This indicates that primary and secondary issuers with insiders selling their shares before the issuance seem to be knowingly selling overvalued equity, while primary issuers with insiders purchasing shares before the issuance do not seem to be knowingly selling overvalued equity.

In the current study, we examine whether the insider trading pattern before a spinoff announcement is related to improvements in long run stock market performance and operating performance of the firm around a spinoff. Our assumptions are that insiders are aware of the *correct* valuation of their firm at the time of the spinoff decision and that not all spinoffs are motivated by undervaluation. Whereas insiders of undervalued firms have an incentive to increase the net purchase of their firm's stock, the motive disappears in the absence of undervaluation. As such, we separate firms where undervaluation is a motive for the spinoff from other firms by examining their insider trades. Significant improvements in the long run stock market performance and operating performance following spinoffs are expected in firms with prior increases in insider net purchases.

Hypothesis 2. Following a spinoff, firms with prior increases in net insider purchases exhibit improvements in their long run stock market and operating performance.

Studies also suggest that insiders' personal trading of their firm's stock prior to a corporate announcement is related to the market reaction to the announcement. For example, Hirschey and Zaima (1989) find that most positive market reactions to corporate sell-off announcements occur in closely held firms with insider net-buy activity six months before the sell-off announcement. John and Lang (1991) present evidence that announcement day excess returns are negative and significantly lower for firms with insider selling prior to a dividend initiation announcement than for the remaining firms with no insider trading or with only insider buying. In the current study, we examine whether investors similarly regard

the recent pattern of insider trading activity of the firm as a useful backdrop for evaluating their spinoff decisions. If the market views spinoff decisions by firms with recent increases in insider net purchases are compatible with shareholder interests, then we can expect spinoff announcement period excess returns to be significantly higher among these firms than in others.

Hypothesis 3. Spinoff announcement period excess returns are higher among firms with recent increases in insider net purchases.

3. Sample data and research method

3.1. Spinoff sample

The sample is obtained from the SDC Mergers and Acquisitions Database which identifies spinoffs from news articles. We first search the database for all spinoffs announced by firms listed on the NYSE, AMEX or NASDAQ between 1987 and 2006. The reason for starting in 1987 is because the Thomson Financial Insider Filing Data Files, where our insider trading data are accessed, begin in 1986 and the nature of the study necessitates that at least one year's insider trading data prior to the announcement date of a spinoff be available. Spinoffs involving a Real Estate Investment Trust are excluded. An initial sample of 524 spinoffs is identified. The following data selection criteria are then applied to the initial sample:

- 1) We verify that each transaction in the data is indeed a spinoff by checking news articles from Factiva and Lexis-Nexis. Transactions involving tracking stock, equity carve-outs or distributions of common stock in other publicly traded firms that are not subsidiaries of the parent firm do not fall within our definition of spinoffs and are excluded, resulting in a loss of 28 transactions;
- 2) A precise announcement date and ex date for the spinoff must be available from Factiva, Lexis-Nexis or the CRSP database. 58 transactions are lost due to the lack of an identifiable announcement date or ex-spinoff date or both;
- 3) 30 spinoffs that are taxable are eliminated;

- 4) 8 spinoffs involving ADRs (American Depository Receipts) and 9 involving firms with operations in a regulated industry (SIC 4910-4949) are dropped;
- 5) 28 spinoffs are excluded because they were undertaken to facilitate the parent's or the subsidiary's merger with some other firm;
- 6) 11 spinoffs are removed because their announcement occurred simultaneously with other corporate information disclosures (e.g., the appointment of a new CEO, etc.);
- 7) 35 spinoffs are eliminated because the subsidiary's stock was trading prior to the spinoff announcement date;
- 8) 33 two-step spinoffs are dropped;
- 9) Another 7 spinoffs are removed because they represent cases in which one firm engaged in multiple spinoffs and the interval between the announcement date of a spinoff and the ex-date of the immediate prior spinoff is less than 1 year; and
- 10) Finally, 35 spinoffs are lost because of an absence of insider trade in the five years before the spinoff announcement date.

The final sample consists of 187 separate spinoff events by 172 parent firms. Fifteen parent firms have two spinoffs separated by at least one year. Panel A of Table 1 summarizes our sampling procedure. Panel B reports the frequency of spinoffs by the year of announcement.

3.2. Insider trading data

Insider trading data are obtained from the Thomson Financial Insider Filing Data Files, which include all insider activity reported on SEC forms 3, 4, 5, and 144.¹ These data are available from 1986. The SEC defines a corporate insider as a company's officer, director or any beneficial owner of 10% or more of any equity class of securities. Previous research, however, indicates that trades by large

¹ The SEC has recently modified the Electronic Data Gathering, Analysis, and Retrieval ("EDGAR") system to allow persons to file electronically securities ownership and transaction reports pursuant to Section 16(a) of the Securities Exchange Act of 1934 (Forms 3, 4 and 5). Persons required to file notifications of proposed sale of securities pursuant to Rule 144 under the Securities Act of 1933 (Form 144) also may now file electronically, where the issuer of the securities is a public company.

shareholders who are not officers or directors do not convey much information (Seyhun, 1986). Consequently, this study analyzes only top executives' transactions, where top executives are defined as chairpersons of the board of directors, executive directors, controlling persons, presidents, and anyone holding the position of vice president and above (Lee, 1997). Both open market and private insider transactions are combined together in our study because the Thomson Financial Insider Filing Data Files do not report these two types of transactions separately. Following Seyhun (1986), we exclude all duplicate, amended, inconsistent transactions, and any transaction involving less than 100 shares.

In our analysis, we focus on several measures of abnormal insider trades. Following Clarke *et al.* (2001), we define abnormal insider trading as actual trading less expected trading. Trading refers to sales, purchases, or net purchases (purchases minus sales) by insiders. Expected trading is the mean insider trading of the firm in the 36-month period beginning 48 months prior to the spinoff announcement and ending 13 months prior to the announcement.² Trading can be defined in terms of the number of trades (e.g., Clarke, *et al.*, 2001), the number of shares traded (e.g., Kaestner and Liu, 1996), or the dollar value of trades (e.g., Pettit and Venkatesh, 1995) by insiders. While we examine all three measures, we only report the measure of abnormal insider trading using the number of trades. Results using other insider trading measures are qualitatively similar.

3.3. Matching firms

To compute long run abnormal returns, we follow the procedure by Desai and Jain (1999) and select four matching firms for each parent and each subsidiary in our sample. Only CRSP-listed non-spinoff firms are used as a pool of possible matching firms. From this list of possible matches, we select the firm with the same two-digit SIC code as that of the sample firm and that is closest to the sample firm in market capitalization in the month of the ex-spinoff date. The closest matching firm is designated the first matching firm; the second closest, the second matching firm, and so on, until the fourth closest

² For spinoffs announced before Jan 1, 1990, the benchmark period begins on Jan 1, 1986 and is less than 36 months since the insider trading data from Thomson Financial Insider Filing Data Files start in 1986. Our results are robust to excluding these spinoffs.

matching firm. The stock market return of the sample firm is then compared with the return of the first matching firm. If the first matching firm should disappear for some reason, the return of the second matching firm is used from that point on. Similarly, the third and fourth matching firms are used until they are exhausted, after which the return of the CRSP value-weighted index is used as a matching proxy.

Following Desai and Jain (1999), we create a pro-forma combined firm following the spinoff by weighting the return of the parent and that of its subsidiary using their market values of equity at the end of the month of the ex-spinoff date. The combined matching firm's return is created by weighting the return of the parent's matching firm and the subsidiary's matching firm in both the pre- and post-spinoff periods using similar weights.

As a robustness check, we employ two additional benchmarks for computing abnormal returns. In the first benchmark, we use the CRSP value-weighted index return; in the second, the value-weighted industry return is used, where industry is defined as all non-spinoff firms that have the same 2-digit SIC code as the sample firm. However, we do not report the results from the sensitivity analysis as they are qualitatively similar to those reported in the paper.

4. Insider trading before spinoff announcement

Table 2 presents the analysis of insider trading in the four quarters prior to the spinoff announcement. The first three columns report the average quarterly insider sales, purchases, and net purchases, which are measured as insider purchases minus insider sales. The last three columns report insiders' abnormal sales, purchases, and net purchases, defined as actual sales, purchases, and net purchases minus expected sales, purchases, and net purchases, respectively. Expected insider sales, purchases, and net purchases are the mean sales, purchases, and net purchases in the 36-month period beginning 48 months and ending 13 months prior to the announcement. If undervaluation is an important motive for spinoffs, then insiders have an incentive to increase buying or decrease selling before spinoff announcements. Consequently, we should observe significant abnormal insider net purchasing prior to spinoff announcements.

The first three columns of Table 2 indicate a clear, almost monotonic, increase in purchasing and net purchasing and a steady decline in selling in the four quarters prior to the spinoff announcement. The last three columns show that sales are abnormally low relative to historical levels in the three quarters prior to the announcement. In contrast, there is no evidence of abnormally high purchases. This may be due to the impact of insider trading regulations which deter insiders from increasing purchases when they have favorable private information about the firm. However, insiders do not act illegally if, instead of increasing purchases, they simply decrease sales. Finally, significant abnormal net purchases are evident for the three quarters before the announcement, primarily due to less insider selling. Overall, the findings are consistent with the conjecture that undervaluation is an important motive for spinoffs.

5. Firms' market performance around spinoffs

In this section, we examine spinoff announcement excess returns as well as the firms' long run stock market performance around spinoffs. We stratify the sample based on abnormal insider net purchases during the quarter prior to the spinoff announcement day. Spinoffs with positive abnormal insider net purchases are classified as "abnormal net purchases sample," while those with zero or negative abnormal insider net purchases are classified as "abnormal net sales sample." We then compare announcement period excess returns as well as long term abnormal returns between the two sub-samples.

5.1. Announcement period abnormal returns

Panel A of Table 3 reports the abnormal returns over different time intervals around the announcement of spinoffs. Abnormal returns are estimated using the value-weighted NYSE/AMEX/Nasdaq index return and the market model with parameters estimated over days -250 through -50 relative to the announcement date. For the entire sample, the average (median) two-day cumulative abnormal return is 3.24% (2.38%) in the window [-1, 0]. Both the mean and the median are significant at the 1% level. Significant mean (median) returns of 2.70% (1.89%) and 4.36% (3.94%) are also found on day 0 and in the window [-1, +1], respectively. What is remarkable about the

announcement period excess returns is the difference between the abnormal net purchases and abnormal net sales sub-samples. The average two-day cumulative abnormal return in the abnormal net purchases sample is 4.12%, which is more than twice that of the abnormal net sales sample at 2.01%. A t-test of the difference in the means between the two sub-samples and a Wilcoxon's signed rank test for the difference in the medians indicate that the announcement period excess returns of the two sub-samples are significantly different from each other at the 1% level and the 5% level, respectively. These results also persist through the other two time intervals investigated, namely, day 0 and the time period [-1, +1].

Panel B of Table 3 examines the previous results using univariate and multivariate regression analyses. Models 1 through 3 use cumulative abnormal returns over three different time intervals, day -1 to 0, day 0, and day -1 to 1, respectively, as dependent variables. The independent variable, ANP, is an indicator variable that is set to one for firms in the abnormal net purchase sub-sample, and zero otherwise. All three regressions show a significant and positive relationship between ANP and abnormal returns, suggesting that firms in the abnormal net purchase sub-sample experience significantly higher announcement period abnormal returns. In models 4 to 6, we include ARPR, FOCUS, and SPINSIZE as control variables. ARPR is the parent firm's prior annual return minus the industry-and-size matched control firm's prior annual return. FOCUS is a dummy variable that is equal to one if the two-digit SIC code of the subsidiary is different from the two-digit SIC code of the parent, and zero otherwise. SPINSIZE is the spun-off firm's market value of equity at the end of the month of the ex-spinoff date divided by the sum of the parent's and the spun-off firm's market value of equity. The results of multivariate regressions are consistent with those in the univariate analysis. In all three models, ANP is significantly and positively related to the abnormal returns. Furthermore, the results show that firms with a larger SPINSIZE experience higher announcement abnormal returns. Altogether, the results are consistent with the expectation that insider trading activity provides a useful indicator for the market to evaluate corporate spinoff decisions. Moreover, spinoff decisions by firms with recent increases in insider net purchases are viewed by the market as being more compatible with shareholder interests.

5.2. Performance of pro forma combined firms before spinoff

Table 4 reports the results for the pro-forma combined firms. The results in Panel A show that in the three years pre-spinoff period (prior to the month of announcement), firms in the entire sample significantly underperform their benchmarks. The average (median) abnormal return one year before the announcement (month -12 to -1) is -15.19% (-8.26%). The average (median) abnormal returns two and three years prior to the announcement are -21.51% (-8.97%) and -21.41% (-16.07%), respectively. These returns are all large in magnitude and are statistically significant at the 1% level. More interestingly, as we shall show in Panel B and C, the performance of the abnormal net purchases sub-sample is substantially different from that of the abnormal net sales sub-sample during the pre-spinoff period.

Panel B of Table 4 presents the results for the abnormal net purchases sub-sample. The average (median) abnormal returns for one to three years prior to the announcement are -20.72% (-12.31%), -29.28% (-12.11%), -25.98% (-16.36%), respectively. All these returns are statistically significant at the 1% level. Panel C of Table 4 reports the results for the abnormal net sales sub-sample. In contrast with the results for abnormal net purchases, none of the abnormal returns in the abnormal net sales sub-sample during the pre-spinoff period is significant. Hence, the significant negative abnormal returns in the full sample appear to be driven solely by the results in the abnormal net purchases sub-sample. A comparison of the performance of the abnormal net purchases sub-sample to that of the abnormal net sales sub-sample indicates that, on average, the abnormal net purchases sub-sample underperforms the abnormal net sales sub-sample by 14.27% (p-value=0.08), 20.12% (p-value=0.08), and 11.85% (p-value=0.34) for holding periods of one, two, and three years prior to the spinoff announcement, respectively.

5.3. Performance of the pro-forma combined firms after spinoff

After the completion of a spinoff (following the month of the ex-spinoff date), the pro-forma combined firms in the full sample significantly outperform their matching firms for a holding period of up to one year (see Table 4, Panel A). The average (median) abnormal return in the first year following the spinoff (month +1 to +12) is 9.31% (2.72%), which is significant at the 5% (10%) level. For holding

periods of two years (month +1 to +24) and three years (month +1 to +36), the average (median) abnormal returns are 7.78% (1.64%) and 12.43% (6.14%), respectively, and they are not statistically significant.

In the abnormal net purchases sub-sample, the post-spinoff average (median) abnormal returns are 7.35% (4.18%), 5.95% (1.55%), and 8.43% (3.45%), respectively, for holding periods of one to three years (see Table 4, Panel B). In the abnormal net sales sub-sample, the corresponding values are 12.08% (1.92%), 10.56% (2.89%), and 18.58% (10.59%), respectively (see Table 4, Panel C). However, none of these returns is statistically significant. Further, a comparison of the performance of the two sub-samples indicates no significant difference between them. Finally, when we compare the performance of the pro-forma combined firms before and after the spinoff, we find that the abnormal net purchases sub-sample exhibits a significant improvement in market performance around the spinoff, whereas the abnormal net sales sub-sample does not. In sum, the results that have been presented are consistent with the prediction that insider trades reflect superior information on the future prospects of the firm.

5.4. Performance of parents after spinoff

We examine the post-spinoff performance of parent firms and their subsidiaries separately to test whether there is any difference between abnormal net purchases and abnormal net sales. Table 5 reports the results for parent firms following a spinoff. Panel A of the table presents results for all parents. The results show that parent firms earn significant positive average (median) abnormal returns of 10.57% (3.35%), and 16.36% (8.96%) over a holding period of one and three years, respectively, and insignificant average (median) abnormal returns of 7.70% (-2.18%) over a holding period of two years. Panel B and C report our findings for parents in the abnormal net purchases and sales sub-samples, respectively. Parent firms with abnormal net purchases earn average (median) abnormal returns of 9.34% (4.54%), 6.25% (-2.18%), and 12.31% (5.19%) for holding periods of one, two, and three years, respectively. Those with abnormal net sales earn abnormal returns of 12.31% (2.54%), 9.90% (-0.89%), and 22.56% (19.04%) over the same holding periods. However, none of these returns is statistically significant.

5.5. Performance of subsidiaries after spinoff

Table 6 reports the results for subsidiary firms. Panel A of the table shows that the sample of all subsidiaries exhibits a strong positive performance following a spinoff. The average (median) abnormal returns for the entire sample of subsidiaries for holding periods of one, two, and three years are 22.34% (12.24%), 19.56% (17.63%), and 19.69% (13.64%), respectively. All of these returns are significant at the 10% level or better. Panel B shows that subsidiaries in the abnormal net purchases sub-sample earn significant average (median) abnormal returns of 25.93% (12.21%), 22.88% (27.53%), and 22.50% (16.44%) over holding periods of one, two, and three years, respectively. The corresponding abnormal returns for subsidiaries in the abnormal net sales sub-sample are 17.26% (12.24%), 14.52% (-0.11%), and 15.39% (6.57%), respectively. However, only abnormal returns for a one year holding period are significant. Relative to parent firms, the market performance of subsidiaries is much stronger. Overall, the results indicate that there is an improvement in the market performance of pro-forma combined firms following a spinoff and these are due primarily to the superior performance of their subsidiaries.

6. Operating performance changes around spinoffs

In this section, we examine changes in operating performance around spinoffs. Following Daley *et al.* (1997), we use the ratio of operating cash flow (Compustat annual data item #13) to total assets (Compustat data item #6) as a measure of operating performance and call it return on assets (ROA). Table 7 reports changes in ROA from year -1 (the year before the ex-spinoff year) to year +1 (the year after the ex-spinoff year) for pro-forma combined firms.³ Similar to our analysis of the firms' stock market performance, we focus on the adjusted ROA of matching-firms. For each parent and subsidiary in the sample, we select a matching firm with available data on the Compustat annual database. The matching firm selected is the one closest to the sample firm in terms of market capitalization and the same two-digit

³ We concentrate on the ROA change from year -1 to year +1 since there will be a large loss of observations due to missing Compustat data if we examine two or more years around the year of spinoff.

SIC code in the month of the ex-spinoff date. We create a pro-forma ROA measure for each combined firm in the post-spinoff period by weighting the ROA of the parent and of its subsidiary with their respective market value of equity at the end of the month of the ex-spinoff date. Similarly, the matching firm's combined ROA is created by weighting the ROA of the parent's and subsidiary's matching firm in the pre- and post-spinoff periods using the same weights. A firm is included in the sample as long as it has at least one year's operating performance data before and after the spinoff.

We stratify the sample into abnormal net purchases and sales, and report the mean and median change in operating performance (ROA) for the pro-forma combined firms from year -1 (the year before the ex-spinoff year) to year +1 (the year after the ex-spinoff year). The abnormal net purchases sample comprises firms with positive abnormal net insider purchases in the quarter prior the announcement day. The remaining firms are classified as the abnormal net sales sample. The findings are reported in Table 7. In the abnormal net purchases sub-sample, the mean (median) change in matching-firm-adjusted ROA is 2.63% (2.20%) around the spinoff year. Both the mean and the median changes are significant at least at the 5% level. In the abnormal net sales sub-sample, the corresponding mean and median changes are -4.31% and -0.95%, which are not significant at the 10% level. The Wilcoxon two-sample median test rejects the equality of median ROA changes across both the abnormal net purchases and the abnormal net sales sub-samples at the 10% significance level. Overall, the results in Table 7 suggest that only the abnormal net purchases sub-sample exhibit a significant improvement in operating performance following a spinoff. These findings support our hypothesis that firms with prior increases in insider net purchases have an improved post-spinoff long run operating performance.

7. Conclusion

We use insider trading to examine undervaluation as a motive behind corporate spinoffs. Our sample consists of 187 separate spinoff events by 172 parent firms during 1987-2006. If undervaluation is a motive for spinoffs, as predicted by the model of Nanda and Narayanan (1999), self-interested managers have an incentive to increase their share purchases or to decrease their sales prior to a spinoff

announcement. Either action leads to an increase in net insider share purchases. Consistent with our hypothesis, we find a clear and almost monotonic increase (decrease) in the number of insider purchases (sales) and net purchases (sales) in the four quarters prior to a spinoff announcement. In addition, relative to the benchmark period, insider sales (net purchases) are significantly lower (higher) in the three quarters prior to a spinoff announcement.

We further stratify our sample based on insider trading activity one quarter prior to the announcement day and classify it into two groups: abnormal net purchases and abnormal net sales. We find that the announcement period excess returns for abnormal net purchases are significantly higher than those for abnormal net sales, suggesting that the market views spinoff decisions by firms with prior abnormal net purchases as more compatible with shareholder interests. Moreover, only firms in the abnormal net purchases group exhibit significant improvement in their long-run stock market and operating performance following a spinoff, suggesting that managers seem to be aware that their firms are undervalued and hence time their own trades accordingly. Overall, the results imply that undervaluation is an important motive behind corporate spinoffs and that it is possible to identify the quality of a spinoff firm on the basis of insider trading behavior prior to its announcement.

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Table 1 Description of sample

Panel A reports the sample selection procedure. Spinoffs are identified from the SDC Mergers and Acquisitions Database. The initial sample starts with 524 spinoffs announced by non-REIT firms listed on the NYSE/AMEX/Nasdaq between 1987 and 2006. The sample excludes the following cases: 1) the transaction was not a spinoff; 2) a precise announcement date or ex-spinoff date for the spinoff was unavailable; 3) the spinoff was taxable; 4) the spinoff involved ADRs or firms with segments operating in the utilities industry (SIC4910-4949); 5) the spinoff was undertaken to facilitate the parent's or the subsidiary's merger with some other firm; 6) the spinoff announcement occurred simultaneously to other corporate information disclosures; 7) the subsidiary was trading prior to the spinoff announcement date; 8) one firm engaged in multiple spinoffs and the interval between the announcement date of the current spinoff and the ex-spinoff date of the previous spinoff was less than 1 year; 9) there is no insider trade in the 5 years before the spinoff announcement date. Panel B reports the distribution by year of announcement of the final sample of 187 spinoffs.

<i>Panel A: Sample Selection Procedure</i>			
Initial sample			524
Reason for elimination			
Not a spinoff transaction			28
Unable to identify a precise announcement date or ex-spinoff date			58
Taxable spinoff			30
ADRs			8
Utilities			9
Spinoff undertaken to facilitate merger with some other firm			55
Return data unavailable on the CRSP database for the parent on the announcement date			28
Contaminated simultaneous announcements			11
Subsidiary publicly listed before the announcement date			35
Two-step spinoffs			33
Multiple spinoffs by the same parent			7
No reported insider trade in the 5 years before the announcement date			35
Final sample			187
<i>Panel B: Distribution of Spinoffs by Year of Announcement</i>			
Year	Number	Year	Number
1987	5	1997	14
1988	9	1998	11
1989	7	1999	12
1990	9	2000	15
1991	5	2001	6
1992	9	2002	5
1993	10	2003	8
1994	14	2004	6
1995	19	2005	4
1996	18	2006	1
		Total	187

Table 2 Quarterly insider trading before the announcement of spinoffs

The table reports the average number of insider purchases, sales, and net purchases per firm per quarter in the four quarters before the announcement of spinoffs for a sample of 187 spinoffs. Net purchases are measured as purchases minus sales. Abnormal sales/purchases/net purchases are defined as actual sales/purchases/net purchases minus expected sales/purchases/net purchases in the given quarter. Expected sales/purchases/net purchases are the mean quarterly sales/purchases/net purchases of that firm in the 36-month period beginning 48 months prior to the announcement of spinoffs and ending 13 months prior to the announcement. All variables are winsorized at the 5th and the 95th percentiles. *, ** and *** indicate significance of the test statistics at the 0.1, 0.05 and 0.01 levels, respectively.

	Average			Abnormal		
	Purchases	Sales	Net Purchases	Purchases	Sales	Net Purchases
Q-4	0.08	1.60	-1.51	-0.13***	0.02	-0.08
Q-3	0.26	1.09	-0.83	0.07	-0.34**	0.61***
Q-2	0.17	1.07	-0.95	-0.07**	-0.40***	0.38**
Q-1	0.18	0.76	-0.63	-0.03	-0.61***	0.64***

Table 3 Announcement period abnormal returns

Panel A shows mean and median announcement period abnormal returns for 187 spinoff announcements during the period 1987-2006. Abnormal returns are estimated using the value-weighted NYSE/AMEX/Nasdaq index return and the market model with parameters estimated over days -250 to -50 relative to the announcement date. The abnormal net purchases sample comprises firms with positive abnormal net insider purchases in the quarter prior the announcement day. The remaining sample is classified as the abnormal net sales sample. The t-test and the Wilcoxon signed ranks test are used to test the significance of the mean and median, respectively. *, ** and *** indicate significance of the test statistics at the 0.1, 0.05 and 0.01 levels, respectively. Panel B shows regressions of announcement period abnormal returns on ANP and other control variables. ANP is an indicator variable that is set to one for firms in the abnormal net purchases sub-sample and zero otherwise. ARPR is the parent firm's prior annual return minus the industry-and-size matched control firm's prior annual return. FOCUS is a dummy variable that is equal to one if the two-digit SIC code of the subsidiary is different from the two-digit SIC code of the parent and zero otherwise. SPINSIZE is the spun-off firm's market value of equity at the end of the month of the ex-spinoff date divided by the sum of the parent and the spinoff market value of equity. Heteroskedasticity-consistent estimates of t-values are reported in parentheses. Sample sizes vary due to missing data. *, ** and *** indicate significance of the test statistics at the 0.1, 0.05 and 0.01 levels, respectively.

<i>Panel A: Announcement Period Abnormal Returns</i>						
Variables		All firms	Abnormal Net Purchases	Abnormal Net Sales	T/Z statistics for tests of differences	
		(1)	(2)	(3)	(2)-(3)	
CAR (day -1 to day 0)	Mean	3.24%***	4.12%***	2.01%***	2.60***	
	Median	2.38%***	2.91%***	1.82%***	2.22**	
	No. of obs.	187	109	78		
AR (day 0)	Mean	2.70%***	3.72%***	1.28%***	3.68***	
	Median	1.89%***	3.00%***	1.37%***	2.65***	
	No. of obs.	187	109	78		
CAR (day -1 to day 1)	Mean	4.36%***	5.28%***	3.07%***	2.15**	
	Median	3.94%***	5.12%***	3.18%***	2.37**	
	No. of obs.	187	109	78		
<i>Panel B: Regressions of Announcement Period Abnormal Returns</i>						
Coefficient Estimates	Dependent Variables					
	CAR(-1, 0)	AR(0)	CAR(-1, 1)	CAR(-1, 0)	AR(0)	CAR(-1, 1)
Constant	0.02 (3.30)***	0.01 (2.83)***	0.03 (3.86)***	0.00 (0.44)	0.00 (0.36)	0.01 (0.60)
ANP	0.02 (2.61)***	0.02 (3.66)***	0.02 (2.14)**	0.03 (3.33)***	0.03 (3.60)***	0.03 (2.22)**
ARPR				0.00 (0.58)	0.00 (0.57)	-0.01 (-0.60)
FOCUS				0.00 (0.05)	0.01 (1.10)	0.01 (0.87)
SPINSIZE				0.04 (1.62)	0.04 (2.02)**	0.05 (1.70)*
Adjusted R ²	0.03	0.06	0.02	0.07	0.10	0.04
Sample Size	187	187	187	169	169	169

Table 4 Stock market performance of the pro-forma combined firm

The table shows raw buy-and-hold returns of the sample firms (RAWS), raw buy-and-hold returns of the matching firms (RAWM), and abnormal returns (AR) over several periods for the full sample of pro-forma combined firms as well as for the abnormal net purchases and the abnormal net sales sub-samples. The abnormal net purchases sample comprises firms with positive abnormal net insider purchases in the quarter prior to the announcement day. The remaining sample is classified as the abnormal net sales sample. A pro-forma combined firm following the spinoff is created by weighting the return of the parent and that of its subsidiary using their market values of equity at the end of the month of the ex-spinoff date. The matching firm's return is created by weighting the return of the parent's matching firm and the subsidiary's matching firm in the pre-spinoff period as well as the post-spinoff period using the above weights. For each parent and each subsidiary in our sample, we select four matching firms. The matching firms selected are the ones with the same two-digit SIC code as that of the sample firm and are closest to the sample firm in market capitalization in the month of the ex-spinoff date. The closest matching firm is designated as the first matching firm; the second closest matching firm is designated as the second matching firm and so on to the fourth matching firm. The stock market return on the sample firm is then compared with the return on the first matching firm. If the first matching firm should disappear for some reason, the return on the second matching firm is used from that point on and then the third and so on until all the four matching firms are exhausted, after that return of CRSP value-weighted index is used. AM is the month of the announcement date. EX is the month of the ex-spinoff date. Sample sizes vary due to missing return data. Median values are shown in brackets. *, ** and *** indicate significance of the test statistics at the 0.1, 0.05 and 0.01 levels, respectively.

Time Period	N		RAWS	RAWM	AR
Panel A: All Firms					
AM -36 to AM -1	158	Mean	45.43%	66.84%	-21.41%***
		Median	[43.47%]	[55.51%]	[-16.07%***]
AM -24 to AM -1	163	Mean	24.75%	46.26%	-21.51%***
		Median	[24.62%]	[40.46%]	[-8.97%***]
AM -12 to AM -1	165	Mean	8.05%	23.24%	-15.19%***
		Median	[9.01%]	[16.12%]	[-8.26%***]
AM	169	Mean	5.67%	1.23%	4.43%***
		Median	[4.81%]	0.49%	[3.54%***]
EX	169	Mean	1.94%	1.43%	0.51%
		Median	[0.44%]	0.93%	[0.81%]
EX +1 to EX +12	157	Mean	18.60%	9.29%	9.31%**
		Median	[16.77%]	[11.29%]	[2.72%*]
EX +1 to EX +24	131	Mean	29.68%	21.90%	7.78%
		Median	[24.40%]	[27.06%]	[1.64%]
EX +1 to EX +36	109	Mean	51.61%	39.18%	12.43%
		Median	[43.55%]	[40.25%]	[6.14%]
Panel B: Abnormal Net Purchases Sample					
AM -36 to AM -1	97	Mean	41.61%	67.59%	-25.98%***
		Median	[38.96%]	[57.47%]	[-16.36%***]
AM -24 to AM -1	100	Mean	20.22%	49.51%	-29.28%***
		Median	[23.75%]	[41.17%]	[-12.11%***]
AM -12 to AM -1	101	Mean	3.34%	24.06%	-20.72%***
		Median	[5.71%]	[13.94%]	[-12.31%***]
AM	104	Mean	7.12%	1.78%	5.34%***
		Median	[6.25%]	0.27%	[4.48%***]
EX	104	Mean	1.95%	2.19%	-0.24%
		Median	[0.75%]	0.93%	[0.82%]
EX +1 to EX +12	92	Mean	13.69%	6.34%	7.35%
		Median	[11.67%]	[8.96%]	[4.18%]
EX +1 to EX +24	79	Mean	24.78%	18.83%	5.95%
		Median	[21.49%]	[24.07%]	[1.55%]
EX +1 to EX +36	66	Mean	42.48%	34.06%	8.43%
		Median	[41.00%]	[38.51%]	[3.45%]
Panel C: Abnormal Net Sales Sample					
AM -36 to AM -1	61	Mean	51.50%	65.64%	-14.13%
		Median	[46.16%]	[50.00%]	[-15.78%]
AM -24 to AM -1	63	Mean	31.95%	41.11%	-9.17%
		Median	[27.88%]	[40.32%]	[-2.01%]
AM -12 to AM -1	64	Mean	15.49%	21.95%	-6.46%
		Median	[17.01%]	[17.70%]	[0.15%]
AM	65	Mean	3.33%	0.36%	2.97%**
		Median	[1.58%]	[0.66%]	[1.79%*]
EX	65	Mean	1.91%	0.21%	1.71%
		Median	[-0.41%]	[0.54%]	[0.57%]
EX +1 to EX +12	65	Mean	25.54%	13.45%	12.08%
		Median	[21.67%]	[15.41%]	[1.92%]
EX +1 to EX +24	52	Mean	37.13%	26.56%	10.56%
		Median	[36.41%]	[30.77%]	[2.89%]
EX +1 to EX +36	43	Mean	65.61%	47.04%	18.58%
		Median	[48.58%]	[42.27%]	[10.59%]

Table 5 Stock market performance of the parents following spinoffs

The table shows raw buy-and-hold returns of the sample firms (RAWS), raw buy-and-hold returns of the matching firms (RAWM), and abnormal returns (AR) over several periods for the full sample of parent firms as well as for the abnormal net purchase and the abnormal net sales sub-samples. The abnormal net purchases sample comprises parent firms with positive abnormal net insider purchases in the quarter prior to the announcement day. The remaining sample is classified as the abnormal net sales sample. For each parent in our sample, we select four matching firms. The matching firms selected are the ones with the same two-digit SIC code as that of the sample firm and are closest to the sample firm in market capitalization in the month of the ex-spinoff date. The closest matching firm is designated as the first matching firm; the second closest matching firm is designated as the second matching firm and so on to the fourth matching firm. The stock market return on the sample firm is then compared with the return on the first matching firm. If the first matching firm should disappear for some reason, the return on the second matching firm is used from that point on and then the third and so on until all the four matching firms are exhausted, after that return of CRSP value-weighted index is used. AM is the month of the announcement date. EX is the month of the ex-spinoff date. Sample sizes vary due to missing return data. Median values are shown in brackets. *, ** and *** indicate significance of the test statistics at the 0.1, 0.05 and 0.01 levels, respectively.

Time Period	N		RAWS	RAWM	AR
<i>Panel A: All Parents</i>					
EX +1 to EX +12	157	Mean	18.38%	7.81%	10.57%**
		Median	[17.21%]	[11.59%]	[3.35%*]
EX +1 to EX +24	131	Mean	26.90%	19.20%	7.70%
		Median	[22.65%]	[22.71%]	[-2.18%]
EX +1 to EX +36	109	Mean	51.42%	35.06%	16.36%*
		Median	[42.30%]	[41.33%]	[8.96%*]
<i>Panel B: Abnormal Net Purchases Sample</i>					
EX +1 to EX +12	92	Mean	11.51%	2.17%	9.34%
		Median	[14.24%]	[9.06%]	[4.54%]
EX +1 to EX +24	79	Mean	21.48%	15.23%	6.25%
		Median	[19.42%]	[22.08%]	[-2.18%]
EX +1 to EX +36	66	Mean	41.79%	29.48%	12.31%
		Median	[41.17%]	[41.16%]	[5.19%]
<i>Panel C: Abnormal Net Sales Sample</i>					
EX +1 to EX +12	65	Mean	28.11%	15.79%	12.31%
		Median	[23.23%]	[20.91%]	[2.54%]
EX +1 to EX +24	52	Mean	35.13%	25.23%	9.90%
		Median	[37.03%]	[31.44%]	[-0.89%]
EX +1 to EX +36	43	Mean	66.20%	43.64%	22.56%
		Median	[48.97%]	[41.33%]	[19.04%]

Table 6 Stock market performance of the subsidiaries following spinoffs

The table shows raw buy-and-hold returns of the sample firms (RAWS), raw buy-and-hold returns of the matching firms (RAWM), and abnormal returns (AR) over several periods for the full sample of subsidiaries as well as for the abnormal net purchase and the abnormal net sale sub-samples. The abnormal net purchase sample comprises firms with positive abnormal net insider purchases in the quarter prior to the announcement day. The remaining sample is classified as the abnormal net sale sample. For each subsidiary in our sample, we select four matching firms. The matching firms selected are the ones with the same two-digit SIC code as that of the sample firm and are closest to the sample firm in market capitalization in the month of the ex-spinoff date. The closest matching firm is designated as the first matching firm; the second closest matching firm is designated as the second matching firm and so on to the fourth matching firm. The stock market return on the sample firm is then compared with the return on the first matching firm. If the first matching firm should disappear for some reason, the return on the second matching firm is used from that point on and then the third and so on until all the four matching firms are exhausted, after that return of CRSP value-weighted index is used. AM is the month of the announcement date. EX is the month of the ex-spinoff date. Sample sizes vary due to missing return data. Median values are shown in brackets. *, ** and *** indicate significance of the test statistics at the 0.1, 0.05 and 0.01 levels, respectively.

Time Period	N		RAWS	RAWM	AR
<i>Panel A: All Subsidiaries</i>					
EX +1 to EX +12	157	Mean	26.88%	4.55%	22.34%***
		Median	[21.82%]	[7.58%]	[12.24%***]
EX +1 to EX +24	131	Mean	46.81%	27.24%	19.56%**
		Median	[44.36%]	[22.58%]	[17.63%**]
EX +1 to EX +36	109	Mean	69.75%	50.06%	19.69%*
		Median	[70.71%]	[49.43%]	[13.64%**]
<i>Panel B: Abnormal Net Purchases Sample</i>					
EX +1 to EX +12	92	Mean	30.07%	4.14%	25.93%***
		Median	[23.09%]	[4.65%]	[12.21%***]
EX +1 to EX +24	79	Mean	46.92%	24.04%	22.88%**
		Median	[47.02%]	[21.68%]	[27.53%**]
EX +1 to EX +36	66	Mean	65.05%	42.55%	22.50%*
		Median	[68.34%]	[46.40%]	[16.44%**]
<i>Panel C: Abnormal Net Sales Sample</i>					
EX +1 to EX +12	65	Mean	22.37%	5.11%	17.26%**
		Median	[20.18%]	[9.17%]	[12.24%*]
EX +1 to EX +24	52	Mean	46.62%	32.11%	14.52%
		Median	[41.56%]	[25.54%]	[-0.11%]
EX +1 to EX +36	43	Mean	76.98%	61.58%	15.39%
		Median	[70.71%]	[53.52%]	[6.57%]

Table 7 Change in operating performance around spinoffs for the pro-forma combined firms

The table reports mean and median change in operating performance for the pro-forma combined firms from year -1 (the year before the ex-spinoff year) to year +1 (the year after the ex-spinoff year). The abnormal net purchase sample comprises firms with positive abnormal net insider purchases in the quarter prior the announcement day. The remaining sample is classified as the abnormal net sale sample. Operating performance is measured as the ratio of operating cash flow (Compustat annual data item #13) to total assets (Compustat data item #6) as the measure of operating performance. For each parent and each subsidiary in our sample, we select one matching firm with data available on the Compustat annual database. The matching firm selected is the one closest to the sample firm in market capitalization and has the same two-digit SIC as that of the sample firm in the month of the ex-spinoff date. The pro-forma combined firm's ROA measure in the post-spinoff period is computed by weighting ROA of the parent and that of its subsidiary using their market values of equity at the end of the month of the ex-spinoff date. The matching firm's ROA is created by weighting ROA of the parent's matching firm and the subsidiary's matching firm in the pre-spinoff period as well as the post-spinoff period using the above weights. A firm is included in the sample as long as it has at least one year's operating performance data before and after the spinoff. Median values are shown in brackets. *, ** and *** indicate significance of the test statistics at the 0.1, 0.05 and 0.01 levels, respectively.

Year Relative to Spinoff	N		Unadjusted	Match-firm-adjusted
<i>Panel A: Abnormal Net Purchases Sample</i>				
-1	73	Mean	13.10%	-1.66%
		Median	[12.90%]	[-0.42%]
1	73	Mean	13.36%	0.97%
		Median	[15.03%]	[1.20%]
ΔROA	73	Mean	0.26%	2.63%**
		Median	[0.50%]	[2.20%***]
<i>Panel B: Abnormal Net Sales Sample</i>				
-1	41	Mean	14.88%	7.57%
		Median	[14.48%]	[0.58%]
1	41	Mean	12.88%	3.26%
		Median	[10.97%]	[1.66%]
ΔROA	41	Mean	-2.00%	-4.31%
		Median	[0.80%]	[-0.95%]