Divestitures and Divisional Investment Policies

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Abstract

We study a sample of diversified firms that alter their organizational structure by divesting an entire business segment, primarily through asset sales. These firms experience a substantial reduction in the diversification discount after the divestiture. Investment in the firm's ongoing segments is more sensitive to their imputed market to book ratio. We show that the efficiency of segment investment increases substantially following the divestiture and that improvement in the efficiency of investment is associated with a decrease in the diversification discount. Our results support the corporate focus and financing hypotheses for corporate divestitures. We conclude that inefficient investment is partly responsible for the diversification discount and show that asset sales lead to an improvement in the efficiency of investment for remaining divisions.

Divestitures and Divisional Investment Policies

It is well known that diversified firms trade at a discount relative to stand-alone firms[1]. However, there is debate over the cause of the discount. A commonly held view is that inefficient investment policies of diversified firms are to blame for the diversification discount. For instance, Lamont (1997) suggests the inefficient investment hypothesis by showing that diversified oil companies cut back on investment in non-oil divisions when oil prices declined during the 1980s. Shin and Stulz (1998) find that divisional resources do not appear to be directed to segments with the most favorable investment opportunities. Scharfstein (1998) shows that misallocation of resources between divisions is most pronounced when management has a small ownership stake and suggests that agency costs underlie distortions in divisional allocation. Most of the existing literature uses cross-sectional comparisons of diversified firms to investigate the discount and the investment policy. This approach has been the source of much of the debate about the diversification discount.

Our approach, in contrast, is to examine changes in the degree of diversification for firms and test whether changes in diversification are associated with simultaneous changes in the diversification discount and investment policy. We then explore several hypotheses to explain the changes in the discount and investment policy. The primary advantage of this approach is that it does not rely on cross-sectional comparisons of the discount across firms and thus avoids the omitted variables problem that typically confounds inferences from this research.

A number of recent papers describe the potential problems with cross-sectional comparisons of the discount. For example, Maksimovic and Phillips (2001) argue that the choice to diversify is endogenous and that the discount reflects underlying firm characteristics that explain which firms diversify. Similarly, Burch, Nanda, and Narayanan (2000) contend that the choice to diversify is an

[1] Berger and Ofek (1995, 1996), Lang and Stulz (1994), Servaes (1996), Denis and Thothadri (1999), Lamont and Polk (2002a), among others, document the discount of diversified firms relative to stand-alone firms. There has also been a systematic pattern of firms undoing diversification in recent years, as shown by Comment and

endogenous, value enhancing response to industry conditions. Graham, Lemmon, and Wolf (2002) suggest that measurement error partially explains the diversification discount. They observe that the stand-alone firms that are used as the benchmark to compute the diversification discount differ systematically from divisions of conglomerate firms. Lamont and Polk (2002b) further note that diversified firms have higher expected returns, and that this higher return accounts for part of the diversification discount. Due to these criticisms, a consensus view on the interpretation of the discount and the importance of investment policy in explaining the discount does not exist. By investigating changes in the discount, we are able to avoid the problems that arise because of many of the differences between diversified and single segment firms. We are therefore able to focus on examining the characteristics that change when a firm becomes more focused and how these changes explain the change in the diversification discount. Thus, our testing environment allows us to more clearly link the diversification discount and inefficient investment.

Our sample consists of diversified firms that divest an entire business segment, primarily through asset sales. We show that such divestitures are associated with a significant reduction in the diversification discount. Consistent with the literature on asset sales, we find that divestitures have significantly positive announcement returns. The announcement returns are significantly correlated with the change in the diversification discount. The decline in the discount around the divestitures is accompanied by significant changes in the investment of the firms' remaining segments. Specifically, segments that underinvest relative to single segment firms display increased investment levels after the divestiture, while segments that overinvest experience declines in investment. Using a measure of the efficiency of segment investment similar to that used by Rajan, Servaes, and Zingales (2000), we also find the efficiency of segment investment increases following the divestiture and that this improvement in efficiency significantly explains the change in the discount. These results are noteworthy because they indicate a relation between the change in the discount and the investment

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Jarrell (1995). Scharfstein (1998) finds that the majority of diversified firms in the late 1970s became undiversified by the mid 1990s.

policy, independent of the obfuscating factors suggested in other papers, and they allow us to further investigate why investment improves around a divestiture.

We evaluate several hypotheses to understand why efficiency of segment investment improves. According to the corporate focus hypothesis, diversified firms trade at a discount because managers use discretionary resources to undertake value-decreasing investments, cross-subsidize poor segments by draining resources away from segments with valuable opportunities, and because of misalignment of incentives between central and division managers [Berger and Ofek (1995) and Comment and Jarrell (1995)]. The corporate focus hypothesis therefore predicts that divestitures that increase focus lead to large improvements in investment policy. Scharfstein and Stein (2000) and Rajan, Servaes, and Zingales (2000) identify specific mechanisms by which corporate focus affects investment policy. Scharfstein and Stein (2000) argue that when firms are comprised of several divisions, divisions with poor prospects will engage in rent-seeking behavior. This rent-seeking argument predicts that divestitures of divisions most likely to engage in rent-seeking, such as those with low growth opportunities, should be associated with the greatest improvements in investment policy. Rajan, Servaes, and Zingales (2000) argue that divisions that contribute to diversity in investment opportunities are likely candidates for rent-seeking. Their diversity argument predicts that divestitures that reduce the diversity of investment opportunities should be associated with the improvements in investment efficiency.

The second hypothesis is based on Lang, Poulson, and Stulz (1994), who argue that asset sales are often an expedient means to raise financing when market frictions limit firms' access to external capital. According to the financing hypothesis, asset sales help relax external financial constraints and allow firms to undertake valuable investments that would otherwise be foregone.[2] This hypothesis predicts that divestitures should be associated with increased investment levels for those divisions that are unable to finance all their positive NPV projects. This hypothesis also

predicts that divesting an overinvesting segment relaxes financial constraints for the firms' remaining segments, thereby improving the overall efficiency of investment policy.

A potential drawback of our approach is that major divestitures often do not occur in isolation. For many firms, the divestiture is part of a broader restructuring that is often tied to changes in the firm's internal and external control environment. Therefore, we examine a third hypothesis, which we label the kick-in-the-pants hypothesis. Under this hypothesis, both the changes in the diversification discount and changes investment policy are driven by broader changes in firms' corporate governance and external corporate control environment. Thus, this hypothesis predicts that the change in the discount and in investment policy is concentrated in firms that experience other changes such as external takeover pressure or management replacement.

Our paper is linked to other studies examining the source of gains from divestitures. John and Ofek (1995) argue that improvements in investment policy are an important source of gains from asset sales. Hite and Owers (1983) and Rosenfeld (1984) argue that redeployment of assets to higher valued users is an important source of gains from asset sales. However, neither study documents changes in investment policy and the effects on the diversification discount.

The general conclusions presented in our paper are consistent with the results from studies of other corporate reorganizations. Our work complements Gertner, Powers, and Scharfstein (2002) who show improved investment of spun-off subsidiaries helps explain the gains from spin-offs. In contrast to their work, we examine how the divestiture of a division affects investment in the parent firm's remaining divisions. Related to Gertner, Powers and Scharfstein, Burch and Nanda (2002) show that an increase in focus partially explains the change in the combined value of the parent and subsidiary in a spin-off. Our study extends this analysis by examining the impact of the focus and financing hypotheses on the gains from asset sales. Burch and Nanda's approach is similar to ours in that both papers examine changes rather than levels in a relative value metric to control for many of

[2] Nanda and Narayanan (1998) reason that firms divest to raise capital only when they are undervalued and thus the value increase is partly due to revaluing the firm.

the potential measurement problems in estimating the diversification discount. However, due to the different samples, the questions of interest and some of the results differ. Moreover, our sample only includes firms that divest an entire segment (a spin-off often does not result in a complete removal of a segment), this allows for more explicit tests of the corporate focus hypotheses and may account for some of the differences in results. Our sampling technique also allows us to separate out the divestitures that result in the firm remaining a diversified firm and those that become a single segment. This distinction further strengthens our ability to test certain hypotheses. Our paper is also related to Lamont and Polk (2002a), who examine changes in the degree of diversity among investment opportunities for divisions over time. They find that industry shocks that change the degree of diversity of opportunities among segments leads to changes in firm value.

The paper is organized as follows. Section I describes the sample. Section II reports changes in the diversification discount. In Section III, we examine changes in investment. Section IV explores the link between changes in the diversification discount and changes in investment. Section V concludes.

I. Sample

We obtain data from the Compustat segment tapes. Since 1977, firms have been required to report data on business segments that account for more than 10% of consolidated profits, sales, or assets. We start by identifying all firms where the number of segments decreased between 1983 and 1994. The sample ends in 1994 because some of our tests follow investment for three years after the divestiture. [3] The initial sample consists of 4,111 firm-years where the number of segments reported by a firm declines. However, several declines are due to changes in the reporting of segment data. To identify actual organizational changes, we examine divestiture and spinoff activity by these firms

[3] In June 1997, FASB 131 changed the way businesses define their segments. Firms continue to report operating segments but the substantial changes in the definition of segments makes it difficult to compare segments from pre and post 1998.

using the Securities Data Corp. (SDC) database. We require that Compustat reports at least one less segment and that the firm simultaneously engages in a divestiture or spin-off. This results in a sample of 1,268 divestitures by 624 firms in 769 firm-years. In several instances, the divested assets belong to divisions other than those for which reporting ceases in Compustat. To ensure a sample where we can reliably identify a divestiture with a change in segment reporting, we examine the 3-digit SIC codes of the dropped segment and of the divested assets. In addition, we search Lexis-Nexis in the year surrounding the announcement date to verify that the divestiture corresponds to the business segment that ceases reporting. We find 431 firm-years of organizational changes representing 388 different firms that reduce the number of segments and where we can verify that assets belonging to the dropped segment(s) were divested. [4]

We remove 54 firm-years where the divestiture includes a major restructuring, defined as an event where the firm divests or changes the 3-digit SIC code of more than 50% of its retained segments.[5] We remove 45 additional firm-years where firms are incorporated outside the US and 22 firm-years where the primary SIC code represents the financial services industry (primary 3 digit SIC code between 600 and 699). Finally, we drop 32 firm-years where a firm divests segments in multiple years over a 3-year period because some tests examine investment policy for 3 years before and after the divestiture.[6] The final sample consists of 278 organizational changes by 235 firms.

Although most of the events are divestitures, there are 15 spin-offs in the sample. Since spin-offs do not provide a cash inflow to the parent, the financing hypothesis is not applicable to spin-offs. In untabulated tests, we have conducted all the analysis restricting the sample to include only divestitures and obtain results similar to those estimated with the full sample. Throughout the paper,

[4] It is worth noting that although Compustat reports fewer segments following the divestiture, this does not imply that all the assets of that segment have been divested. Since firms are only required to report data on segments that comprise at least 10% of the firm's profits, sales, or assets, a partial divestiture might result in a smaller segment that accounts for less than 10% of the firm's operations. Such instances of unobserved segments lower the likelihood of detecting significant shifts in divisional investment policies. In this regard, the power of our tests is reduced, and the changes that we document could be viewed as conservative estimates of changes that might occur in instances of complete divestitures.

[5] An example of this restructuring is NL Industries. In 1986, NL reported 3 segments at the 3 digit level with SIC codes 735, 353, and 289. In 1987, the firm reported 2 segments with the SIC codes 289 and 281. Thus, only the segment with SIC code 289 remained after the divestitures. The firm divested the other 2 segments and added one segment with a new SIC code.

[6] The results are qualitatively unchanged if we do not remove these firms.

we report results using the full sample that includes spin-offs, and for convenience, refer to all events as divestitures.

In 134 cases, the divestiture results in the firm becoming a single segment entity. Therefore, tests of how capital is allocated across divisions can only be conducted on the remaining 144 parent firms that continue as diversified. We refer to the 144 parents with multiple segments after the divestiture as diversified parents and the remaining firms with only one ongoing segment as the single segment parents.

Panel A of Table 1 shows that divestitures are spread evenly during the sample period, but are slightly less frequent in 1983 and 1992. Panel B shows that segment data for the sample of 278 firms is available in 275 cases for three years prior to the divestiture. In the three-year period after the divestiture, the sample size drops to 225 because of acquisitions and delistings. As expected, there is a substantial decline in the number of segments around year 0. The sample consists of 913 segments in year t-1, which declines to 563 segments in year 0. The decline in segments exceeds 278, the number of firms in the sample, because several firms divest more than one segment. As shown in Panel C, 224 firms divest one segment, 41 divest two segments, 8 divest three segments, and 5 firms divest four segments.

We examine announcements of the divestitures using the Wall Street Journal and wire reports in Lexis-Nexis. Panel D of Table 1 shows that 186 firms announce a single divestiture and 92 firms announce multiple divestitures. The average number of individual divestitures per decline in a segment is 1.64. Thus, many firms implement multiple divestitures to exit a single business line.

We are able to obtain data on transaction values for divestitures made by 191 firms using the Wall Street Journal, Lexis-Nexis, and SDC. Panel E reports that the divestitures in the sample are relatively large. The average transaction value for the 191 divestitures is $123.5 million.[7] This size is comparable to the average transaction value of the sample of "significant divestitures" over 1984 to 1989 in Lang, Poulsen, and Stulz (1994) of $120.7 million. Because firms in our sample often undertake multiple divestitures when exiting an industry, we also calculate the sum of all the

[7] Since the divestitures in our sample are associated with a decline in the number of reported segments, they tend to be relatively large. Using data on transaction values from SDC, the mean (median) size of divestitures not in our sample is $77.5 (24) million.

available transaction values for divestitures in that industry by a firm. We are able to collect transaction values of all announced divestitures for 144 firms. The proceeds average $141.23 million, which represents 31% of the sum of the market value of equity and book value of debt in the year prior to the divestiture. The total proceeds from all divestitures averages 7.3 times the firm's investment in the prior year, indicating that the proceeds are large enough to have a substantial impact on the firm's investment policy.

Panel F shows that divested assets display a pattern of moving from firms with relatively unrelated assets to those with relatively related assets. At the 3-digit level, 52 (12%) of the divested assets share a primary SIC code with the divesting firm. However, 126 (29.4%) of the acquirers share a primary SIC code with the divested assets. At the 4-digit level, 101 (23.6%) acquirers have the same primary SIC code as the divested asset, compared to 33 (7.7%) of the divesting firms. A Z-test indicates that the proportion of acquirers related to the segments is significantly greater than the proportion of parents related to the segments at the 1% level.

Denis, Denis, and Sarin (1997) show that external control changes are typical prior to corporate restructuring events. Weisbach (1995) finds that divestiture activity is often preceded by top management turnover. Panel G shows a similar pattern in our sample, with 56 (20%) of the firms experiencing a top management change prior to divestitures. Merger and/or takeover attempts occur in 26 (9.4%) firms, and a large accumulation of shares in another 10 (3.6%) firms. Shareholder activists target 4 (1.4%) firms in the sample, and another 9 (3.2%) experience about of financial distress. Overall, 91 (32.7%) firms experience an external control event prior to the divestiture.

As seen in Panel E, the typical divestiture provides a large cash inflow. If firms use the cash to repay debt, then the divestiture should be associated with a decline in leverage. Panel H of Table 1 shows that the ratio of total debt to the market value of equity declines from 66% in year t-1 to 60% in year t+1. This decline in leverage is statistically significant at the 1% level. However, divestitures do not appear to be associated with a permanent shift in capital structure. There is no significant change in leverage from year t-3 to year t+3, implying that the reduction in leverage associated with divestiture is temporary.

According to the financing hypothesis, investment policy changes around the divestiture because the proceeds from the divestiture can be used to finance investment activities. Thus, we may expect to see changes in external financing after the divestiture. Figure 1 shows a dramatic shift in the external financing in the year of and immediately following the divestiture. In years t-3 to t-1, the firm raises more external capital than it distributes to investors in the firm of debt repayments and share repurchases. However, in year t, the firm is a net distributor of capital, repurchasing on average, 6% of the outstanding market value of its equity. This repurchase amount is substantially less than the divestiture proceeds that average 31% of equity value, indicating that the bulk of the proceeds are typically retained. Firms tend to return to being net issuers of external capital by t+3 at close to pre-divestiture levels suggesting that divestitures do not have a long-term impact on external financing activities.

We compare the characteristics of divested and retained segments in Table 2. The median size of divested segments in year t–1 is $62 million, while that of retained segments is $189 million. Sixty-eight percent of the sample firms divest their smallest segment, consistent with Schlingemann, Stulz, and Walkling (2002). However, unlike their sample, 30% of firms in our sample also divest their largest segment.

We measure segments' investment opportunities using the imputed market-to-book ratio (MB), calculated as the median MB of stand-alone firms in the same 3-digit SIC code as the segment of the diversified firm[8]. The median MB for divested segments in the year prior to the divestiture is 1.27, and that of retained divisions is also 1.27. About half of the firms (49.6%) divest a division with an imputed MB lower than the median MB of all of the firm's segments, while half divest a high MB segment. In 66.8% of the sample, a division with cash flow below the median of all segments of the firm is divested[9].

[8] We require that there are at least 5 stand-alone firms in same 3 digit SIC code; otherwise, we use the median MB for stand-alone firms in the same 2-digit SIC code. We calculate MB at the beginning of the year in which the investment decisions have to be made.

[9] 43.1% of firms in the sample divest their lowest MB division and 37.9% of sample firms divest their highest MB division. In 57.8% of cases, parents divest the division with the lowest cash flow and in 30.6% of cases, the segment with the highest cash flow ratio is divested.

We compute the change in the dispersion of investment opportunities using the sales-weighted standard deviation of MB divided by the average MB of all of the firm's segments. Rajan, Servaes, and Zingales (2000) use this variable to measure to the diversity in investment opportunities among segments. We compute the difference between the weighted standard deviation in years t-1 and t+1 to measure the change in diversity. On average, sample firms exhibit an increase in diversity after the divestiture, but a decrease in diversity is observed in 26.4% of the sample.

The divestitures are associated with an increase in corporate focus. We follow John and Ofek (1995) and compute the sales-based Herfindahl index as the sum of the squared segment sales, relative to firm sales. Table 2 shows that the change in the sales-based Herfindahl index around the divestiture is significantly positive.

II. Changes in the Diversification Discount

We examine how the diversification discount changes around the divestiture. We use Berger and Ofek's (1995) methodology that estimates the difference between the market value of a diversified firm and the sum of the imputed value of all the firm's segments, based on the valuation of stand-alone firms. Specifically, we compute the diversification discount[10] using a sales multiplier as follows:

$$\text{Diversification Discount} = 1 - \log\left(\frac{V}{I(V)}\right), \text{ where } I(V) = \sum_{i=1}^{n} Sales_i \times \left[M_i \left(V / Sales\right)_{MS}\right],$$

where V is the sum of market value of equity and book value of assets less the book value of equity and deferred taxes at year t-1, I(V) is the imputed firm value at year t-1, $Sales_i$ is the segment i's sales at time 0, $M_i(V/Sales)_{MS}$ is the sales multiplier (calculated as the median of the single-segment firms in the same 3-digit SIC code industry) at year t-1, and n is the number of segments per firm at year 0.

Berger and Ofek (1995) find that the discount averages 0.10. Table 3 shows that in year t-1, diversified parents have a mean discount of 0.33, which is significantly different from zero at the 1%

[10] The diversification discount calculation is similar to the Berger and Ofek (1995) excess value measure, with the exception that our formulation treats the discount as a positive number. We avoid the term "excess value" because we have not established that the discount arises because diversification actually destroys value.

level. The mean discount decreases after the divestiture to 0.17. Inspection of medians indicates a similar decrease in the discount. The change in the discount is statistically significant at the 10% level using a t-test and at the 4% level using a Wilcoxon test. Firms that remain diversified continue trading at a discount relative to stand-alone firms.

Berger and Ofek (1995) show that the change in the discount is largest when a firm goes from operating as a single segment firm to operating as a dual segment firm. Thus, we might expect that moving in the opposite direction – from multiple segments to one segment – should have a large impact on the discount. Table 3 shows that for firms that become single segment, mean discount in year t–1 is 0.23. After the divestiture, the discount drops to 0.14. Inspection of medians reveals a much larger decrease in the discount. The median discount falls from 0.32 in year t–1 to 0.06 in year t+1 and a Wilcoxon test indicates that the change is statistically significant. Nonetheless, these firms continue to trade at a discount relative to other stand-alone firms, even though they become single segment firms after the divestiture.

One explanation for the decline in the diversification discount is that firms are simply divesting highly discounted segments, which causes a mechanical decrease in the discount. According to this explanation, a reduction in imputed value rather than an increase in market value might be largely responsible for the decrease in the discount. To address this issue, Panel B of Table 3 reports the percentage change in firm value from year t-1 to year t+1. On average, firm value rises for the full sample, as well as for the subsamples of diversified parents and the single segment parents. In addition, we calculate the change in firm value as a percentage of imputed value in year t-1. This ratio is not mechanically dependent on the imputed value of the divested segment. Panel B shows that, on average, this ratio rises significantly around the divestiture. Therefore, the possibility that firms are selling deeply discounted segments cannot fully explain the change in the discount for the sample.

To gauge the discount of the divested segment more directly, we measure the market value of the divested segment in year t+1 using the transaction value, presented in Panel E of Table 1, and compare this to the imputed value. We are able to collect data on the transaction value of all the

divestitures associated with a segment decline for 98 firms in our sample.[11] For these firms, the average ratio of the transaction market value to the imputed value of the segment in year t+1 is 1.05[12] and is not significantly different from one. Therefore, the change in the discount does not arise mechanically because firms primarily sell segments that are highly discounted.

We also compute cumulative abnormal returns (CARs) for divestiture announcements. As noted earlier, several firms remove a segment by initiating a divestiture program or engage in multiple asset sales. In these cases, we use the first announcement of divestiture activity as the announcement date, but also track announcement dates of subsequent asset sales when multiple assets are sold. Excluding events that are contaminated by concurrent news or where announcements are unavailable, we are able to compute CARs for 188 divestiture announcements.

Table 4 reports CARs for two, three, five, and eleven-day windows surrounding the first announcement of divestitures. We look at CARs over several windows because relevant news and details about the specific assets to be divested are sometimes disclosed after the initial announcement. We find significantly positive CARs, and the CARs are similar for diversified and single-segment parents. The 3-day CAR averages 3.4% for the full sample, 3.4% for diversified parents, and 3.5% for the single segment parents. The CAR ranges from 2.2% to 3.4% for the full sample, depending on the event window. All CARs are statistically significant at the 1% level. We find no significant difference in the CAR across diversified and single-segment parents[13].

Since many firms divest a segment using multiple asset sales, we also calculate the CAR for each announcement and cumulate the CARs for each firm. The average cumulative CAR for all asset sales is 4.2% for the entire sample. The average cumulative CAR is virtually identical for diversified

[11] Though suggestive, we advocate caution in interpreting the data on transaction values. We find systematic differences between firms for which we are able to collect transaction values for all divestitures and those where this data is unavailable. Firms where data on all divestiture transaction values are missing tend to be significantly larger and engage in multiple asset sales. This raises the likelihood that we are unable to obtain data on at least one of the asset sales.

[12] This ratio averages 1.05 for the diversified parents and 1.06 for the single segment parents.

[13] The average CARs in our sample are larger than that documented in prior studies. Alexander, Benson, and Kampmeyer (1984), Hite, Owers, and Rogers (1987), and Jain (1985) document CARs between 0.5% and 1.66% for asset sale announcements. The two-day CAR in our sample is about twice the CAR of 1.4% documented in Lang, Poulsen, and Stulz (1994). The higher CARs for our sample are not surprising because the sample consists of relatively large divestitures that are associated with a decline in an entire business segment.

and single segment parents. The cumulative CAR is also significant at the 1% level for the entire sample as well as the two subsamples.

In sum, we find a significant decrease in the diversification discount as well as a significantly positive announcement return associated with divestitures. Table 4 shows that these effects are related. The correlation between the two-day CAR and the change in the discount is -0.25 for the entire sample, and is statistically significant. The two-day CAR and the change in the discount are also negatively correlated for both the diversified and single segment subsamples. The negative correlation between the change in the discount and CAR persists for other announcement windows, but declines steadily with the length of the CAR window.

III. Changes in Investment Policy

In this section, we conduct tests related to segment investment. We define segment investment as the ratio of segment investment to sales in a given year. We first document the changes in segment investment around the divestiture. We examine whether these changes in segment investment are associated with an improvement in the efficiency of capital allocation. We then test predictions of the corporate focusing, financing, and kick-in-the-pants hypotheses to understand the source of the change in investment policy.

A. Changes in Segment Investment

Table 5 shows segment investment around the divestiture for the firms' retained segments. We focus on retained segments to avoid results that are driven by the investment of the divested division. For example, if a firm were to divest a capital-intensive division, we would observe a decline in total segment investment even when there are no other changes in the firm's investment policy.

Panel A shows that segment investment does not change meaningfully around the divestiture. We also compute the relative segment investment ratio (RSI) as the difference between the segment's

investment ratio and the median investment ratio of stand-alone firms in the same 3 digit SIC code. In year t–1, RSI averages 0.3%, indicating that investment by segments of divesting firms is virtually identical to investment by stand-alone firms. After the divestiture, RSI is 1.3% and is significantly different from zero. Thus, relative to stand-alone firms, investment increases; however, this increase is not significantly different from zero.

For diversified parents, there is no evidence of a change in segment investment on either an absolute level or relative to other stand-alone firms basis. The mean segment investment ratio for single-segment parents rises from 9.3% in year t–1 to 9.7% in year t+1, but the change is not significant. For these firms, mean RSI prior to the divestiture is 1.1% and not significantly different from zero. After the divestiture, mean RSI rises to 3.7% and is significantly greater than zero. The change in average RSI for single-segment parents is significant at the 5% level.[14]

The financing hypothesis predicts that divestitures allow constrained segments to increase investment. We attempt to identify constrained segments by comparing their investment levels to that of stand-alone firms. We classify segments as underinvesting if RSI is negative – i.e. they invest less than stand-alone firms. Segments are classified as overinvesting if RSI is positive. Panel B of Table 5 shows that for diversified parents, investment in underinvesting segments rises from 3% in year t–1 to 5% in year t+1. This increase is significant at the 5% level. For these segments, RSI averages –4% in year t–1 and rises to –2% in year t+1 and the change is significant using a Wilcoxon test. Thus, for diversified parents, investment in underinvesting segments increases after divestiture. However, it is worth noting that even after the divestiture, relative segment investment remains negative, suggesting that underinvesting segments continue to underinvest relative to their stand-alone counterparts. Underinvesting segments of single-segment parents also display a large increase in investment. Investment rises from 4% in year t–1 to 8% in year t+1, while RSI rises from –5% to 3%. A t-test for the change in RSI displays a p-value of 6%, while the p-value from a Wilcoxon test is 11%.

[14] We examine whether single segment and diversified parents differ in the proportion on highly profitable ongoing segments. Defining a highly profitable segment as one that has a cash flow to sales ratio that is in the top quartile of all stand-alone firms in that year, we find comparable proportions of high performing segments in diversified and single segment subsamples in year t–1 and year t+1. In year t–1, 29% of segments of diversified parents, and 26% of segments of single segment parents are classified as high performers. Using MB to define a high performing segment portrays a similar picture.

In contrast to underinvesting segments, Panel C shows that investment declines for overinvesting segments after the divestiture. For diversified parents, investment in overinvesting segments declines from 9% in year t-1 to 8% in year t+1, and the change is statistically significant at the 5% level. For these segments, RSI also declines significantly after divestiture. A similar pattern is also observed for the single-segment parents. For their overinvesting segments, investment declines from 13% to 10%, while RSI declines from 6% to 4%.

We also calculate the percentage change in segment investment from year t-1 to year t+1. The advantage of this approach is that we can gauge whether changes in investment levels are responsible for the changes in the investment to sales ratio described above. However, the drawback of this approach is that it does not account for the change in the size of the continuing segments. If investment is fairly low in year t-1, as is the case for some segments in our sample, a relatively modest increase in investment can lead to a large percentage increase. To avoid this issue in interpreting the results, we concentrate our discussion on median percentage changes. Panel A of Table 5 shows that the median percentage change in investment for segments is 7%. The median change is also is significantly positive for both the diversified and single-segment subsamples. However, the increase in investment is concentrated primarily in underinvesting segments. Panel B shows the median change in investment is 24% for underinvesting segments of both single-segment and diversified parents, and is significant at the 1% level using a Wilcoxon test. However, as shown in Panel C, the median percentage change in investment for overinvesting segments is small and statistically insignificant.

The change in investment policy can be observed in Figure 2, which displays the percentage of the firms' total capital expenditures invested in over and underinvesting segments. In years t-3 to t-1, the average investment in underinvesting segments is 29%, and it rises to 37% in years t+1 to t+3. The rise in investment for underinvesting segments that is apparent after year 0 is also associated with a decline in investment for the firms' overinvesting segments. For diversified parents, the divestiture appears to be associated with a meaningful shift in investment policy.

As an illustration of these changes, consider the case of Disney that divested its community development segment in 1987 for $400 million. Disney concurrently increased investment in its

consumer products division from $0.3 million in 1986 to $6.6 million in 1988, representing an increase of 2100%. Disney also increased investment in its filmed entertainment and theme parks and resorts segments. Over this period, total investment by Disney rose from $380 million to $821, an increase of $441 million. Disney's case is unique in that it represents the largest percentage increase in segment investment in our sample, but it also provides an example where proceeds from divestiture can provide financing for segment investment. If divestitures allow retained segments to fund some positive NPV projects, such increases in investment should represent an improvement in investment policy. Alternatively, it is possible that divestitures might simply provide a cash windfall to the retained segments beyond the level needed to fund valuable projects. Therefore, to understand the effects of these changes in investment policy, we conduct an analysis of the change in the diversification discount in section IV.

B. Efficiency of Investment Policy

To evaluate the efficiency of investment policy, we perform two tests. First, we estimate fixed effects regressions of the ratio of segment capital expenditures to segment sales, using data from three years prior to and three years after the divestiture. As with the previous analysis, the models include only retained segments and we restrict the analysis to the subsample of diversified parents. Second, we compute a firm-level measure of the efficiency of segment investment and examine changes in efficiency around the divestiture.

Model 1 of Table 6 shows that before the divestiture, resources do not appear to be allocated to segments with the best investment opportunities. An F-test indicates that the sum of coefficients on segment MB and the interaction between MB and the post-divestiture indicator is positive and significant at the 9% level. This suggests that segment investment becomes sensitive to segment MB after the divestiture, indicating an improvement in the efficiency of divisional investment allocation. Segment investment also becomes more sensitive to the segment's cash flow after the divestiture.

Model 2 includes an indicator that equals 1 for underinvesting segments and an interaction between this indicator and the post-divestiture indicator. According to the financing hypothesis, investment in these segments should rise after the divestiture. The estimates in Table 6 are consistent

with the financing hypothesis - the interaction between underinvesting segments and the post divestiture indicator is significantly positive.

Model 3 shows that before the divestiture, the cash flow of other segments is negative and significant. After the divestiture, however, the sensitivity of investment to other segment cash flow increases. An F-test shows that the sum of the coefficients of other segment cash flow and the interaction between this variable and the post divestiture indicator is significantly positive.

Overall, these results show that segment investment in our sample firms prior to the divestiture is not typical of the broad sample of firms studied by Shin and Stulz (1998) who find that segment investment is positively related to MB and to the cash flow of other segments. This is not surprising, since our sample does not consist of randomly selected firms, but rather those that have chosen to alter their divisional structure. If inefficient investment motivates firms to divest, then one may not expect investment to be related to MB. After the divestiture, divisional investment follows the pattern in Shin and Stulz (1998) more closely. We find that segment investment is positively related to MB and to cash flow of other segments. In addition, underinvesting segments have a greater increase in investment than other segments after the divestiture.

Our second set of tests to determine the efficiency of investment policy use the sales-weighted sensitivity of segment investment to segment MB for each firm. This variable, termed the Weighted Investment Ratio (WIR), provides a summary measure of the efficiency of investment allocation across all of a firm's segments. We follow Rajan, Servaes, and Zingales (2000)[15] and first compute the difference between the relative segment investment ratio and a weighted average of the relative segment investment ratio for each segment in the firm as follows:

$$\frac{I_j}{Sales_j} - \frac{I_j^{SS}}{Sales_j^{SS}} - \sum_{j=1}^{n} w_j \left(\frac{I_j}{Sales_j} - \frac{I_j^{SS}}{Sales_j^{SS}} \right)$$

[15] Our calculation of the Weighted Investment Ratio follows that of Rajan, Servaes, and Zingales (2000), who term this metric the Relative Value Added from Investment Allocation.

where I_j is capital expenditure for segment j, $Sales_j$ is the sales of segment j, and $\frac{I_j^{SS}}{Sales_j^{SS}}$ is the sales-weighted average capital expenditure to assets ratio for stand-alone firms in the corresponding industry, and w_j is segment j sales divided by firm sales. This variable measures the relative transfer of funds between segments and is positive if a segment is a net receiver of funds and is negative for segments that are net suppliers of funds.

We weight this ratio by the difference between the segment's imputed MB and the average imputed MB of all segments in the firm. WIR is then computed by summing the sales-weighted ratios across all of the firm's segments:

$$\frac{\sum_{j=1}^{n} Sales_j (MB_j - \overline{MB})\left(\frac{I_j}{Sales_j} - \frac{I_j^{SS}}{Sales_j^{SS}} - \sum_{j=1}^{n} w_j \left(\frac{I_j}{Sales_j} - \frac{I_j^{SS}}{Sales_j^{SS}}\right)\right)}{Sales}$$

where $\overline{MB}$ is the sales- weighted average of segment MB's for the firm and MB_j is the median MB ratio of single segment firms that operate exclusively in segment j.

WIR is higher for firms when high MB segments invest more than average, and low MB segments invest less than the average segment in the firm. Rajan, Servaes, and Zingales (2000) show that WIR is negatively related to the diversification discount and argue that an increase in WIR represents an improvement in the efficiency of investment policy.

Table 7 shows that for diversified parents, WIR in year t-1 averages –0.26, and is significantly different from zero. Thus, investment policy appears to be suboptimal prior to the divestiture. After the divestiture, WIR increases to –0.10 and is no longer significantly different from zero. The average change in WIR is 0.15 and statistically significantly different from zero. Although the medians are smaller in magnitude, they portray a qualitatively similar picture. Overall, for diversified parents, we find an improvement in the efficiency of investment policy.

Table 7 also shows WIR for the single segment parents. The average WIR in year t-1 for these firms is –0.08 and significantly different from zero. Like the diversified sample, single-segment

parents also exhibit distorted investment allocation before divestiture. However, since these firms have only one ongoing segment, it is not possible to compute WIR after divestiture.

In summary, investment policy changes around a divestiture. Firms increase investment in underinvesting segments and decrease it in overinvesting segments. Investment efficiency, as measured by WIR, also improves indicating that firms tend to allocate more investment to segments with better investment opportunities. Thus, are associated with an improvement in the efficiency of investment policy.

C. Multivariate Analysis

To understand why investment becomes more efficient after the divestiture, we test the predictions of the corporate focus, financing, and the kick-in-the-pants hypotheses by analyzing the relation between the change in investment and divestiture characteristics. According to the corporate focus hypothesis, companies with more diversified operations tend to invest less efficiently. Thus, divestitures that result in a substantial reduction in diversification should lead to an improvement in investment efficiency. Following John and Ofek (1995), we measure corporate focus using the Herfindahl index based on segment sales. Model (1) of Table 8 shows that, consistent with the corporate focus hypothesis, the change in the Herfindahl index is positively related to the change in WIR. A 10% increase in the Herfindahl index, which is the average increase for this sample, results in a 0.15 increase in WIR

In models (2) and (3), we test the specific predictions of the rent-seeking and diversity arguments to understand why corporate focus is associated with efficient investment. According to Scharfstein and Stein (2000), divisions with poor future prospects face the lowest opportunity cost to engage in rent seeking behavior. Therefore, divestitures of low MB divisions should improve the investment efficiency of the remaining divisions. However, model (2) shows that divestitures of low MB divisions do not appear to be associated with an improvement in WIR

Rajan, Servaes and Zingales (2000) argue that diversity of investment opportunities across divisions creates incentives for rent seeking. In model (3), we test whether divestitures that lower the diversity of MB across divisions lead to more efficient investment. We find no association between

the change in WIR and an indicator that equals one if diversity decreases following the divestiture. Thus, while increased corporate focus leads to more efficient divisional investment, our results suggest that changes in rent-seeking behavior are not the primary cause of this improvement.

If certain segments are constrained in their investment levels, divestitures potentially improve investment policy by relaxing such constraints. According to the financing hypothesis, divestiture of an overinvesting segment allows resources to be allocated more efficiently among the remaining segments. Model (4) of Table 8 provides some support for this view and shows that divesting an overinvesting segment is associated with a 0.32 improvement in WIR. However, the importance of the overinvesting segment indicator decreases when other variables are added to the regression in models 5 and 6.

According to the kick-in-the-pants hypothesis, the positive association between change in WIR and divestiture characteristics is caused by an omitted common factor. As shown in Table 1, several firms experiences changes such as management turnover, takeover threats or pressure, and shareholder activism. It is possible that these control events leads to simultaneous changes in corporate focus and investment efficiency. To address this issue, we exclude firms that experienced external control events in model (7). The results are qualitatively similar in this specification and show that focus-increasing divestitures lead to a significant improvement in WIR. Therefore, the kick-in-the-pants hypothesis does not appear to explain the role of corporate focus in the improvement in investment efficiency.

For single segment parents, the lack of multiple divisions after divestiture precludes computation of WIR. Therefore, an alternative metric to measure changes in investment of the ongoing segment is needed. For these firms, we measure changes in investment policy using the change in the relative segment investment ratio (RSI) for the retained segment from year t-1 to t+1. This measure, reported in Table 5, is akin to an industry-adjusted change in investment, where only non-divesting stand-alone firms comprise the industry benchmark.

Models (8) to (12) examine changes in RSI. Similar to the results for diversified parents, the change in RSI is positively related to the change in corporate focus using the sales based Herfindahl index for single segment parents. In addition, divestitures of low MB segments and overinvesting

segments are associated with an increase in RSI. However, in model 12, where divestitures preceded by external control events are excluded, the low MB divestiture indicator is no longer significant, but the change in corporate focus and the divestiture of overinvesting segments retain statistical significance at the 3% and 9% level, respectively. If an increase in RSI represents an improvement in investment efficiency, these results are consistent with the predictions of the corporate focus and financing hypotheses.

IV. Divisional Investment and Changes in the Diversification Discount

The findings show that divestitures are associated with a reduction in the diversification discount and with an improvement in investment policy. We now examine if the changes in discount are related to changes in investment policy around divestitures.

A. Analysis of Parents that Remain Diversified

If suboptimal investment is responsible for the diversification discount, improvements in WIR should be associated with decreases in the diversification discount. Since WIR is only computed for diversified parents, we focus on these firms in models (1) – (4) of Table 9. For single segment parents, we study the link between the change in the discount and RSI in models (5) – (10).

We estimate regressions using the change in discount from year t-1 to t+1 as the dependent variable and the change in WIR for diversified parents as an explanatory variable. Model (1) shows that that the change in WIR is significantly related to the change in the discount around the divestiture. The point estimate suggests that a 10% increase in WIR decreases the discount by almost 2%, implying an economically meaningful link between changes in the discount and investment policy. Model (2) includes variables describing the divestiture since the characteristics of the divested segment might have an independent effect on the discount. Model (2) shows that divesting a low MB segment reduces the discount while divesting an overinvesting segment and the change in corporate focus do not have a significant effect on the discount. Model (2) also includes an indicator for divestitures that decrease diversity, but this variable is not statistically significant. The change in WIR remains statistically significant.

If a kick-in-the-pants effect dominates, we expect that firms that experience external control events would drive the relation between the change in the discount and WIR. However, models (3) and (4) illustrate that changes in WIR are related to changes in the discount even for the subsample of firms without any corporate control events. The coefficient on the change in WIR is positive, of comparable magnitude, and significant at the 10% level for this subsample. This suggests that a kick-in-the-pants hypothesis is not the primary explanation for the effect of investment policy on the discount.

A potential concern is that both the change in the discount and WIR are constructed using segments' imputed market values. This creates the potential for a mechanically induced relationship between changes in the discount and changes in WIR. To examine this possibility, we orthogonalize the change in WIR with respect to the change in imputed value. Specifically, we estimate a regression using the change in WIR as the dependent variable and the change in the imputed value to sales ratio (the denominator in the discount calculation), as the independent variable. The residual from this regression, which is stripped of the imputed value effect, is then used as an independent variable to explain the change in the discount. We find that the orthogonalized change in WIR has a similar association to the discount as does the unorthogonalized WIR. Because the orthogonalized change in WIR controls for imputed value, this suggests that a mechanical relation between the imputed value and WIR does not drive the relation between the change in the discount and WIR.[16]

As an additional check, we estimate the Table 9 regressions using simulated discounts. We generate the simulated discount as the logarithm of the ratio of simulated market value to actual imputed value. Simulated market value is calculated as the imputed value plus noise.[17] Therefore, the calculation of simulated discount does not involve actual market value but rather depends only on imputed value. We then examine the relation between the simulated change in the discount and the

[16] As an alternative test, we examine scatter plots of the discount and WIR and regressions estimating the relation between the change in the discount and the change in WIR excluding the year of the divestiture. In either years t-3 to t-1 or in year t+1 to t+3 we do not detect any relation between the discount and WIR, implying that the results we document around the divesture are not driven by a mechanical link between the two variables. This finding also provides evidence against the sample firms undergoing a lengthy performance improvement process, because the link between change in discount and the change in WIR occurs around the year of the divestiture

[17] We assume noise follows a inverse cumulative non-central chi-squared distribution. We generate 1000 runs in the simulations.

change in WIR. If the empirical relation between the actual discount and WIR is due to the imputed value link, we should also observe a similar relation between the simulated discount and WIR. We find that there is no systematic relation between the change in the simulated discount and the change in WIR. This indicates that the empirical relation between the discount and WIR is not due to a mechanical link caused by the use of imputed value in constructing the discount.

B. Analysis of Parents that become Single Segment Firms

For single-segment parents, the lack of multiple divisions precludes the computation of the change in WIR. For these firms, we measure changes in investment policy using the change in relative segment investment (RSI) of the retained segment from year t-1 to t+1. The drawback with using RSI is that a clear theoretical prediction on how changes in this variable should affect the change in the discount is lacking. If funds were diverted from retained segments to fund investment in other segments, retained segments could be constrained from pursuing the value-maximizing level of investment. If the divestiture allows the ongoing segment to increase investment, the increase in RSI should be negatively related to the change in the discount.

We estimate regressions using the change in the discount from year t-1 to t+1 for single segment parents as the dependent variable and the corresponding change in RSI as an explanatory variable. Model 5 of Table 9 shows that an increase in RSI is associated with a decline in the diversification discount. The coefficient on RSI is significant at the 6% level and suggests that a 10% increase in RSI is associated with a 4.5% decrease in the discount.

Model 6 estimates the relation between the change in the discount and the change in RSI controlling for the nature of the divestiture. Consistent with arguments by Schipper and Smith (1983) and John and Ofek (1995), we find that an increase in corporate focus leads to a reduction in the discount.

According to the financing hypothesis, increased investment should only be beneficial for segments that were initially constrained. To test this, model 7 includes an interaction term between the change in RSI and an indicator that equals 1 if the retained segment is underinvesting relative to stand-alone firms. Supporting the financing hypothesis, we find that the negative association between

changes in RSI and the discount is strongest for firms with underinvesting segments. The distinction between underinvesting and overinvesting segments is economically meaningful. The coefficient on RSI is about 10 times the magnitude as that for overinvesting segments.

Model 8 includes characteristics of the divested segment. Again, the change in corporate focus is significantly related to the change in the discount, but none of the other characteristics appear related to the change in the discount. The interaction between the change in RSI and indicator for underinvesting segments remains negative and significant.

In models 9 and 10, we drop firms that experience external control events prior to the divestiture. Despite the smaller sample size, we obtain similar coefficient estimates with this specification and find a meaningful difference in the effect of increased investment for overinvesting and underinvesting segments. However, the change in corporate focus no longer has an independent effect on the change in the discount.

Overall, the results indicate the changes in investment policy are an important determinant of changes in the discount around divestitures. This supports the view that inefficient investment policies are partly responsible for the diversification discount.

V. Conclusions

We study a sample of firms that divest an entire business segment. Such divestitures are associated with a significant decrease in the diversification discount. The decrease in the discount occurs for firms that remain diversified as well as those that operate as single segment firms after the divestiture. However, all firms, including those that have only one ongoing segment, continue to trade at a discount relative to other stand-alone firms. Announcements of divestitures elicit significantly positive abnormal returns, and these returns are correlated with the change in the diversification discount.

We document significant changes in the investment policy of the firm's remaining segments around the divestiture. Relative to stand-alone forms, investment increases for those segments that were underinvesting prior to the divestiture. We also find that segment investment is not sensitive to segment growth opportunities prior to divestiture, but that this sensitivity becomes positive and

statistically significant after the divestiture. This suggests that divisional investment policy becomes more efficient after the divestiture. Supporting this conclusion, we document a significant increase in the weighted investment ratio for parents that remain diversified, indicating an improved allocation of capital across divisions for these firms. This improvement in investment is attributable to the increase in corporate focus that occurs with the divestiture. However, the results do not provide evidence that the improvement is due to a reduction in rent seeking. Additionally, there is some evidence that the improved investment is related to the financing provided by the divestiture.

We use these changes in investment to explain the changes in the diversification discount. We find that the change in weighted investment ratio is strongly related to changes in the diversification discount. We also find that increasing investment relative to stand-alone firms, particularly for underinvesting segments, decreases the diversification discount.

The results make four primary contributions. First, they indicate that changes in organizational structure have a significant impact on the investment policies of retained segments. Second, they illustrate that changes in divisional investment are associated with changes in the diversification discount. This finding is particularly relevant in light of the substantial debate surrounding the source of the diversification discount. The results suggest that inefficient divisional investment policies are at least partially responsible for the discount. Third, the results support the view that corporate focus leads to more efficient investment policies. Finally, the paper contributes to the literature on the source of gains from asset sales. The findings show that improvement in the management of the firm's existing assets is an important source of gains from asset sales. The evidence identifies investment policy as a specific mechanism by which firms improve the management of their remaining assets after asset sales.

Our evidence comes from a sample of firms that chose to undertake a large reorganization of their divisional structure by divesting an entire business segment. Therefore, by design, our sample is much more likely to contain firms where the divisional structure is inefficient prior to the divestiture. Several pieces of evidence in the paper point to the non-random nature of the sample. First, the average diversification discount for sample firms is substantially greater than that reported in broader samples, such as Berger and Ofek (1985). Second, the determinants of segment investment in our

sample firms prior to the divestiture also does not appear similar to the pattern reported by Shin and Stulz (1998) who show that segment growth opportunities are an important determinant of investment. Therefore, caution should be exercised in generalizing our results to broader samples. Our empirical design biases us in favor of uncovering inefficiencies associated with diversification and works against documenting possible advantages of diversification.

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Table 1
Sample Characteristics

Description of the sample of 278 divestitures that reduce the number of reported business segments in Compustat from 1983 to 1994 by divesting or spinning off assets according to the SDC database. The diversified sample consists of firms that remain diversified after the divestiture. The single segment sample consists of firms that report a single segment after the divestiture. Panel A reports the number of divesting firms across calendar time. Panel B reports the number of firms and segments by the year relative to the event. Panel C shows the number of segments dropped in each divestiture. Panel D describes the frequency of announcements of divestitures occurring in the Wall Street Journal and Lexis-Nexis. Panel E reports summary data on transaction values of divestitures, collected from SDC. Panel F presents the relatedness of divested assets to the assets of the divesting and acquiring firm. Panel G reports the frequency of external control events for divesting firms for the 14 months prior to the initial divestiture announcement, using data from the Wall Street Journal and Lexis-Nexis. Panel H shows the changes in the leverage ratio, total debt to market value at t-1, that occur around the divestiture.

Panel A: Observations by calendar year

	Number of Divesting Firms		
Year of Event	Full Sample	Diversified Parents	Single Segment Parents
1983	8	6	2
1984	21	17	4
1985	24	12	12
1986	22	13	9
1987	27	15	12
1988	27	14	13
1989	20	7	13
1990	24	10	14
1991	27	16	7
1992	13	1	12
1993	34	20	14
1994	35	13	22
TOTAL	278	144	134

Panel B: Observations relative to event year

	Number of Divesting Firms			Number of Segments		
	Full Sample	Diversified Parents	Single Segment Parents	Full Sample	Diversified Parents	Single Segment Parents
t-3	275	143	132	914	571	343
t-2	277	144	133	916	581	335
t-1	278	144	134	913	590	323
t	278	144	134	563	429	134
t+1	253	137	116	525	402	123
t+2	238	129	109	490	375	115
t+3	225	121	104	473	353	120

Panel C: Change in the number of segments

	Number of Divesting Firms		
	Full Sample	Diversified Parents	Single Segment Parents
-4	5	0	5
-3	8	1	7
-2	41	15	26
-1	224	128	96

Panel D: Frequency of divestiture announcements

Number of announced divestitures per decline in business segment	Number of firms
1	186
2	48
3	27
4	3
5	8
6	4
7-10	2
Mean number of announced divestitures per decline in business segment	1.64

Panel E: Size and value of announced divestitures

	Mean (median)		Mean (median)	
	Average for all announced divestitures per firm	Number of firms	Sum of all announced divestitures per firm	Number of firms
Average Transaction Value ($ million)	123.47 (40)	191	141.23 (34.5)	144
Average Transaction Value ÷ Firm Value $_{t-1}$	0.22 (0.12)	181	0.31 (0.15)	136
Average Transaction Value ÷ CAPX $_{t-1}$	5.79 (1.77)	187	7.3 (2.78)	141

Panel F: Industrial relatedness of divested segment to divesting and acquiring firms

Measure of industry relatedness:	Number of observations where acquirer and divested segment are related	Number of observations where divesting firm and divested segment are related	Z statistic for equality of proportions
Segment and firm share the same 4 digit primary SIC code	101	33	6.40
Segment and firm share the same 3 digit primary SIC code	126	52	6.24
Total number of observations with available data	428	428	

Panel G: Frequency of external control events before divestiture announcement

	Number of firms	Percentage of firms
Turnover of CEO and/or Board chairman	56	20
Merger attempt	26	9.4
Block purchase of shares	10	3.6
Shareholder activism	4	1.4
Financial distress	9	3.2
Number of firms with at least one external control event	91	32.7
Number of firms without any external control event	187	67.3

Panel H: Leverage ratios

	t-1	t+1	Difference t+1 – t-1	P-value Diff t+1 – t-1 = 0	Difference t+3 – t-3	P-value Diff t+3 – t-3 = 0
Debt / Market Value Equity t-1	0.66	0.60	-0.13	0.00	0.03	0.50
	(0.34)	(0.35)	(-0.03)	(0.00)	(0.03)	(0.04)
Number of observations	241	225	218		190	

Table 2
Characteristics of Divested and Retained Segments

Summary statistics for divested and retained segments. The MB of a segment is the median MB of all single segment firms in the same 3-digit SIC code as the segment. Segment cash flow is the segment operating income plus depreciation. A segment is defined as low MB, low cash flow, or small if its MB, cash flow to sales ratio, or assets, respectively, is lower than the median of the firm's segments. Diversity is the standard deviation of segment sales-weighted MB divided by the average MB of all the firm's segments. A divestiture is classified as diversity decreasing if diversity declines between t-1 and t+1. The diversified parents subsample consists of firms that remain diversified after the divestiture. The single segment parents subsample consists of firms with only one ongoing segment after the divestiture. The change in focus variables are tested to determine if they are different from zero using a t-test and Wilcoxon test. *a*, *b*, and *c* indicate significantly different from zero at the 10%, 5%, and 1% level, respectively.

	Full Sample Mean (median)	Diversified Parents Mean (median)	Single Segment Parents Mean (median)
Sales of divested segments at t-1 ($ million)	214.43 (62.03)	332.01 (119.50)	128.26 (43.151)
Sales of retained segments at t-1 ($ million)	832.87 (188.64)	891.50 (235.77)	692.33 (144.06)
MB of divested segments at t-1	1.42 (1.27)	1.38 (1.22)	1.42 (1.26)
MB of retained segments at t-1	1.39 (1.27)	1.38 (1.28)	1.45 (1.33)
(Cash Flow / Sales) for divested segments at t-1	0.05 (0.08)	0.12 (0.11)	0.05 (0.07)
(Cash Flow / Sales) for retained segments at t-1	0.12 (0.12)	0.11 (0.10)	0.13 (0.12)
Change in variance of segment MB from t-1 to t+1	--	-0.12 *c* (-0.07)	--
Change in diversity of segment MB from t-1 to t+1	--	0.05 *c* (0.05)	--
Change in the Herfindahl index from t-1 to t+1	0.22 *c* (0.17)	0.11 *c* (0.11)	0.32 *c* (0.32)
Percentage of firms divesting the lowest MB segment	43.1%	26.4%	58.2%
Percentage of firms divesting a low MB segment	49.6%	41.8%	56.6%
Percentage of firms divesting the highest MB segment	37.9%	27.3%	41%
Percentage of firms divesting the smallest segment	68.1%	51.8%	83%
Percentage of firms divesting the largest segment	30.2%	20.9%	39%
Percentage of firms divesting a small segment	75.4%	67.3%	83%
Percentage of firms divesting the highest cash flow segment	30.6%	20.9%	39%
Percentage of firms divesting the lowest cash flow segment	57.8%	43.6%	70%
Percentage of firms divesting a low cash flow segment	66.8%	60.9%	72%
Percentage of firms that decrease diversity	--	26.4%	--

Table 3
Change in Diversification Discount

Change in diversification discount using Berger and Ofek (1995) discount measure with a sales multiplier. The Berger and Ofek (1995) discount measure is

$$1 - \log\left(\frac{V_t}{I(V_t)}\right), \quad \text{where } I(V_t) = \sum_{i=1}^{n} Sales_{i,t} \times \left[M_{i,t}\left(V_t / Sales_t\right)_{MS}\right],$$

where V is the market value of the firm (market value of equity plus book value of assets minus book value of equity minus deferred taxes), I(V) is the imputed V, $Sales_i$ is segment i's sales, $M_i(V/Sales)_{MS}$ is the sales multiplier calculated as the median of single-segment firms in the same three-digit SIC code, and n is the number of segments. Diversified parents are firms that remain diversified after the divestiture. Single segment parents are firms with one ongoing segment after the divestiture. P-values from t-test and signed-rank test of difference from zero are reported in parentheses.

Panel A: Level of Discount

	All Firms			Diversified Parents			Single Segment Parents		
	Year t-1	Year t+1	Change	Year t-1	Year t+1	Change	Year t-1	Year t+1	Change
Mean discount	0.28	0.16	-0.08	0.33	0.17	-0.09	0.23	0.14	-0.07
	(0.00)	(0.00)	(0.06)	(0.00)	(0.02)	(0.10)	(0.00)	(0.02)	(0.16)
Median discount	0.34	0.13	-0.09	0.35	0.24	-0.09	0.32	0.06	-0.09
	(0.00)	(0.01)	(0.01)	(0.00)	(0.02)	(0.04)	(0.00)	(0.02)	(0.06)
Number of observations	212	210	179	106	113	98	106	97	81

Panel B: Change in value from t-1 to t+1

	All Firms	Diversified Parents	Single Segment Parents
Mean change in firm value $\left[\frac{V_{t+1}}{V_{t-1}}\right]$ -1	0.12	0.14	0.17
Median change in firm value $\left[\frac{V_{t+1}}{V_{t-1}}\right]$ -1	0.01	0.09	-0.10
Mean change in value divided by imputed value in t-1 $\left[\frac{V_{t+1} - V_{t-1}}{I(V_{t-1})}\right]$	0.16	0.17	0.15
Median change in value divided by imputed value in t-1 $\left[\frac{V_{t+1} - V_{t-1}}{I(V_{t-1})}\right]$	0.01	0.05	-0.06
Number of observations	204	100	104

Table 4
Cumulative Abnormal Returns

Cumulative abnormal returns (CARs) for announcements of divestitures in the year of and the year preceding a decline in the number of reported business segments in Compustat. Market model parameters are computed over days –220 to –20 relative to the announcement date. Data on announcements is collected from the Wall Street Journal and wire reports in Lexis-Nexis. Announcements occurring concurrently with earnings releases or other material corporate information are excluded. The diversified parents subsample consists of firms that remain diversified after the divestiture. The single segment parents subsample consists of firms with only one ongoing segment after the divestiture. P-values for test of significance using a Z statistic are in parentheses.

	Full Sample	Diversified Parents	Single Segment Parents
CAR (day –1 to day 0)	0.022	0.030	0.026
	(0.00)	(0.00)	(0.00)
CAR (day –1 to day +1)	0.034	0.034	0.035
	(0.00)	(0.00)	(0.00)
CAR (day –2 to day +2)	0.032	0.027	0.037
	(0.00)	(0.00)	(0.00)
CAR (day –5 to day +5)	0.029	0.028	0.031
	(0.00)	(0.01)	(0.02)
Sum of CAR (day –1 to day +1) for all divestitures announced by a firm	0.042	0.041	0.043
	(0.00)	(0.00)	(0.00)
Correlation of CAR with change in diversification discount from year t-1 to t+1			
CAR (day –1 to day 0)	-0.25	-0.27	-0.24
	(0.00)	(0.01)	(0.05)
CAR (day –1 to day +1)	-0.16	-0.18	-0.14
	(0.04)	(0.09)	(0.24)
CAR (day –2 to day +2)	-0.15	-0.18	-0.10
	(0.06)	(0.09)	(0.38)
CAR (day –5 to day +5)	-0.15	-0.17	-0.24
	(0.06)	(0.12)	(0.05)
Number of observations	188	91	97

Table 5
Segment Investment Around Divestitures

Mean (median) ratio of segment investment ratio, segment capital expenditures to sales, and relative segment investment ratio (RSI), segment investment ratio minus the median of the segment investment ratio for all single segment firms operating in the same 3 digit SIC code. Underinvesting segments are those that invest less than single-segment firms in year t-1. Only retained segments are included in the analysis. The diversified parents subsample consists of firms that remain diversified after the divestiture. The single segment parents subsample consists of firms with only one ongoing segment after the divestiture. The p-values columns report p-values from t-tests (Wilcoxon Rank-sum tests) comparing the difference between investment at t-1 and t+1. t-tests and Wilcoxon Rank-sum also test if the relative segment investment is significantly of different from zero: *a*, *b*, and *c* indicate significantly different from zero at the 10%, 5%, and 1% level.

Panel A: All Segments

	All Firms (N = 445)			Diversified Parents (N = 314)			Single Segment Parents (N = 131)		
	Year t-1	Year t+1	p-value	Year t-1	Year t+1	p-value	Year t-1	Year t+1	p-value
Segment Investment Ratio	0.074	0.080	0.47	0.066	0.074	0.39	0.093	0.097	0.82
	(0.039)	(0.038)	(0.91)	(0.039)	(0.035)	(0.76)	(0.040)	(0.044)	(0.82)
Relative Segment Investment Ratio	0.003	0.013 [c]	0.24	0.00	0.005	0.59	0.011	0.037 [b]	0.03
	(0.00)	(0.00)	(0.60)	(-0.001)	(0.00)	(0.68)	(0.003)	(0.002)	(0.40)
Percentage change in segment investment from t-1 to t+1	0.51		0.00	0.42		0.00	0.78		0.00
	(0.07)		(0.00)	(0.05)		(0.01)	(0.10)		(0.04)

Panel B: Underinvesting Segments

	All Firms (N = 197)			Diversified Parents (N = 144)			Single Segment Parents (N = 53)		
Segment Investment Ratio	0.04	0.06	0.04	0.03	0.05	0.04	0.04	0.08	0.18
	(0.02)	(0.03)	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.22)
Relative Segment Investment Ratio	-0.04 [c]	-0.01	0.01	-0.04 [c]	-0.02	0.13	-0.05 [c]	0.03	0.06
	(-0.02) [c]	(-0.01) [c]	(0.00)	(-0.02) [c]	(-0.01) [c]	(0.02)	(-0.02) [c]	(0.00)	(0.11)
Percentage change in segment investment from t-1 to t+1	0.75		0.00	0.59		0.00	1.29		0.03
	(0.24)		(0.00)	(0.24)		(0.00)	(0.24)		(0.04)

Panel C: Overinvesting Segments

	All Firms (N = 248)			Diversified Parents (N = 170)			Single Segment Parents (N = 78)		
Segment Investment Ratio	0.10	0.09	0.24	0.09	0.08	0.03	0.13	0.10	0.20
	(0.06)	(0.04)	(0.00)	(0.05)	(0.04)	(0.00)	(0.08)	(0.04)	(0.45)
Relative Segment Investment Ratio	0.05 [c]	0.02 [c]	0.02	0.04 [c]	0.02 [b]	0.02	0.06 [c]	0.04 [b]	0.17
	(0.02) [c]	(0.01) [c]	(0.00)	(0.02) [c]	(0.01) [c]	(0.00)	(0.03) [c]	(0.01)	(0.07)
Percentage change in segment investment from t-1 to t+1	0.32		0.03	0.29		0.13	0.41		0.07
	(-0.03)		(0.46)	(-0.07)		(0.69)	(0.04)		(0.42)

Table 6
Multivariate Analysis of Segment Investment for Diversified Parents

Fixed effect regressions of segment capital expenditures to sales on segment characteristics for diversified parents for the three years prior to and subsequent to divestiture. 'After' is an indicator variable that equals one if the observation occurs after the divestiture and is zero otherwise. Segment MB is the median of the single segment MB in the same 3-digit SIC code if 5 firms are in same SIC code, otherwise median in the 2-digit SIC is used. Cash flow is the operating income plus depreciation. A firm-year is dropped if any segment's absolute cash flow to sales ratio is greater than 2 or if any segment's capital expenditures to sales ratio is less than 0 or greater than 1. Only retained segments are included in the analysis. P-values in parentheses and the F-statistic and corresponding p-value testing if the coefficient plus its interaction with the 'After' indicator is significantly different from zero is presented at the bottom of each column.

Dependent Variable:	(1)	(2)	(3)
Segment Capital Expenditures/ Segment Sales			
Segment MB	0.00	0.00	0.00
	(0.95)	(0.60)	(0.68)
Segment MB x After Indicator	0.01	0.01	0.01
	(0.12)	(0.18)	(0.21)
Segment cash flow to sales	0.18	0.17	0.18
	(0.00)	(0.00)	(0.00)
Segment cash flow to sales x After Indicator	0.09	0.10	-0.08
	(0.00)	(0.00)	(0.06)
Other segment's cash flow to sales			0.14
			(0.00)
Other segment's cash flow to sales x After Indicator			0.06
			(0.01)
Underinvesting segment		-0.04	-0.04
		(0.00)	(0.00)
Underinvesting segment x After Indicator		0.02	0.02
		(0.01)	(0.07)
After Indicator	-0.03	-0.04	-0.06
	(0.02)	(0.00)	(0.00)
Intercept	0.05	0.06	0.06
	(0.00)	(0.00)	(0.00)
R squared (within)	0.16	0.17	0.17
Number of segment-years	1758	1758	1735
Number of firms	136	136	133
F-Stat: (H_0: MB + After*MB = 0)	2.83	3.73	3.19
	(0.09)	(0.05)	(0.07)
F-Stat: (H_0: Cash flow/ Sales + After*Cash flow/Sales = 0)	244.28	242.83	172.85
	(0.00)	(0.00)	(0.00)
F-Stat: (H_0: Other Cash flow/Sales + After*Other Cash flow/Sales = 0)			5.79
			(0.02)

Table 7
Efficiency of Investment Policy

Mean and median *Weighted Investment Ratio* (WIR) for single segment and diversified parents for years t-1 and t+1, and the change between these two years. Only the t-1 period is reported for single segment parents since these firms have only one segment after the divestiture. WIR is defined as:

$$\frac{\sum_{j=1}^{n} Sales_{\ j}(MB_{\ j} - \overline{MB})\left(\frac{I_j}{Sales_{\ j}} - \frac{I_j^{SS}}{Sales_{\ j}^{SS}} - \sum_{j=1}^{n} w_j\left(\frac{I_j}{Sales_{\ j}} - \frac{I_j^{SS}}{Sales_{\ j}^{SS}}\right)\right)}{Sales}$$

where I_j is capital expenditure for segment j, and $\frac{I_j^{SS}}{Sales_{\ j}^{SS}}$ is the median capital expenditure to sales ratio for single segment firms in the corresponding industry, $\overline{MB}$ is the sales weighted average of segment MB's for the firm and MB_j is the median MB ratio of single segment firms that operate exclusively in segment j's industry. For all industry variables, the median of single segment firms in the same 3 digit SIC code is used as long as there are 5 firms in the industry, otherwise the median for those in the same 2 digit SIC code is used. The diversified parents subsample consists of firms that remain diversified after the divestiture. The single segment parents subsample consists of firms with only one ongoing segment after the divestiture. P-values from a t-test and signed rank test for difference from zero are reported in parentheses.

	Diversified Parents			**Single Segment Parents**		
	Year t-1	Year t+1	Change from t-1 to t+1	Year t-1	Year t+1	Change from t-1 to t+1
Mean Weighted Investment Ratio	-0.26 (0.00)	-0.10 (0.14)	0.15 (0.05)	-0.08 (0.05)	--	--
Median Weighted Investment Ratio	-0.01 (0.04)	0.00 (0.69)	0.04 (0.00)	-0.00 (0.07)	--	--
Number of Observations	108	116	102	122	110	110

Table 8
Multivariate Analysis of the Change in Investment

Regressions using the change in investment as the dependent variable. The change in investment is the change in the weighted relative investment (WIR), defined in Table 7, for the diversified parent sample and is the change in relative segment investment (RSI), defined as the segment's capital expenditures to sales ratio minus the median of the corresponding ratio for all single segment firms operating in the same 3 digit SIC code, for the single segment parent sample, which is presented in Table 5. If fewer than 5 firms have the same 3 digit SIC code, then a 2 digit SIC code is used. A firm-year is dropped if any segment's absolute cash flow to sales ratio is greater than 2 or if any segment's capital expenditures to sales ratio is less than 0 or greater than 1. Only retained segments are included in the analysis. The diversified parents subsample consists of firms that remain diversified after the divestiture. The single segment parents subsample consists of firms with only one ongoing segment after the divestiture. Underinvesting segments are those that invest less than single-segment firms in year t-1. The MB of a segment is the median MB of all single segment firms in the same 3 digit SIC code as the segment. A segment is defined as low MB or small if its MB or assets, respectively, is lower than the median of the firm's segments. Diversity is the standard deviation of segment sales-weighted MB divided by the average MB of all the firm's segments. A divestiture is classified as diversity decreasing if diversity declines between t-1 and t+1. Columns 7 and 14 exclude firms that had any control events. p-values in parentheses and tests of significance use White (1980) standard errors.

	Diversified Parent Sample							**Single Segment Parent Sample**				
	Dependent Variable: Change in Weighted Investment Ratio							**Dependent Variable: Change in Relative Segment Investment**				
	(1)	(2)	(3)	(4)	5)	(6)	(7) No External Control Events	(8)	(9)	(10)	(11)	(12) No External Control Events
Divest low MB Segment indicator		-0.18 (0.27)				-0.15 (0.33)	-0.13 (0.46)	0.08 (0.09)			0.17 (0.07)	0.01 (0.79)
Change in Herfindahl index	1.54 (0.06)				1.52 (0.06)	2.25 (0.05)	2.99 (0.03)		0.27 (0.02)		0.1923 (0.062)	0.28 (0.03)
Divest overinvesting segment indicator				0.32 (0.08)	0.32 (0.09)	0.28 (0.13)	0.26 (0.22)			0.14 (0.08)	0.14 (0.09)	0.15 (0.09)
Diversity decreases indicator			0.06 (0.78)			0.15 (0.49)	0.33 (0.13)					
Intercept	-0.03 (0.77)	0.22 (0.03)	0.14 (0.11)	0.09 (0.29)	-0.08 (0.44)	-0.14 (0.32)	-0.20 (0.28)	0.00 (0.95)	-0.04 (0.10)	0.01 (0.55)	-0.09 (0.03)	0.08 (0.10)
R Squared	0.06	0.01	0.00	0.04	0.06	0.08	0.13	0.03	0.04	0.07	0.08	0.16
Number of firms	102	102	100	102	102	100	74	95	95	95	95	66

Table 9
Multivariate Analysis of the Change in Diversification Discount

Regressions using the change in diversification discount as the dependent variable. If fewer than 5 firms have the same 3 digit SIC code, then a 2 digit SIC code is used. A firm-year is dropped if any segment's absolute cash flow to sales ratio is greater than 2 or if any segment's capital expenditures to sales ratio is less than 0 or greater than 1. Only retained segments are included in the analysis. The diversified parents subsample consists of firms that remain diversified after the divestiture. The single segment parents subsample consists of firms with only one ongoing segment after the divestiture. Change in investment is the change in the weighted relative investment (WIR), which is defined in Table 7, for the diversified parent sample and is the change in relative segment investment ratio (RSI), defined as the segment's capital expenditures to sales ratio minus the median of the corresponding ratio for all single segment firms operating in the same 3 digit SIC code, for the single segment parent sample, which is presented in Table 5. Underinvesting segments are those that invest less than single-segment firms in year t-1. The MB of a segment is the median MB of all single segment firms in the same 3 digit SIC code as the segment. A segment is defined as low MB or small if its MB or assets, respectively, is lower than the median of the firm's segments. Diversity is the standard deviation of segment sales-weighted MB divided by the average MB of all the firm's segments. p-values in parentheses and tests of significance use White (1980) standard errors.

	Diversified Parent Sample				**Single Segment Parent Sample**					
	Dependent Variable: Change in Diversification Discount				**Dependent Variable: Change in Diversification Discount**					
	(1)	(2)	(3) No External Control Events	(4) No External Control Events	(5)	(6)	(7)	(8)	(9) No External Control Events	(10) No External Control Events
Change in Investment	-0.19	-0.17	-0.21	-0.20	-0.45	-0.43	-0.41	-0.38	-1.15	-1.10
	(0.02)	(0.05)	(0.04)	(0.09)	(0.06)	(0.09)	(0.09)	(0.15)	(0.00)	(0.01)
Change in RSI *x* Underinvesting segment indicator							-3.34	-3.48	-2.62	-2.55
							(0.01)	(0.06)	(0.03)	(0.06)
Divest low MB segment indicator		0.27		0.19		0.03		0.02		-0.11
		(0.04)		(0.30)		(0.87)		(0.87)		(0.54)
Change in Herfindahl index		-0.09		-0.49		-0.74		-0.76		-0.42
		(0.92)		(0.63)		(0.05)		(0.04)		(0.35)
Divest overinvesting segment indicator		0.03		0.10		0.18		0.18		0.18
		(0.86)		(0.58)		(0.32)		(0.31)		(0.36)
Diversity decreases indicator		0.09		0.10						
		(0.61)		(0.55)						
Intercept	-0.05	-0.19	0.00	-0.07	-0.07	-0.10	-0.04	0.13	0.04	0.18
	(0.44)	(0.16)	(0.98)	(0.65)	(0.35)	(0.58)	(0.60)	(0.45)	(0.74)	(0.44)
F-test Chg in RSI *x* Underinvesting segment indicator + Chg in RSI = 0							0.01	0.04	0.01	0.01
R Squared	0.06	0.10	0.07	0.10	0.02	0.09	0.04	0.11	0.14	0.14
Number of firms	98	96	73	72	74	74	74	74	50	50

Figure 1
External Financing Around Divestitures

Figure 1 illustrates the mean net financing as a percentage of market value at t-1. Net financing is defined as equity and debt issues less equity repurchases and debt repayments and net excess financing is net financing less net financing of other multi-segment firms.

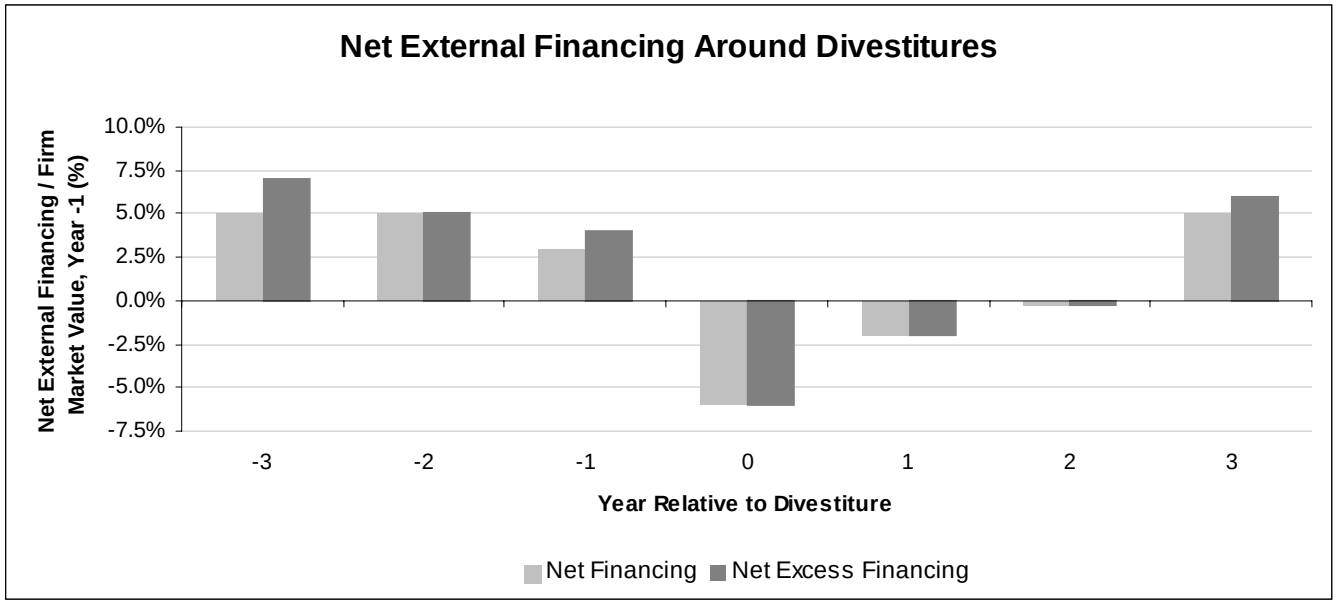

Figure 2
Firm Investment Allocation

Figures 2 a and b illustrate the mean (a) and median (b) of the percentage of firm capital expenditures allocated to under- and over-investing segments. This percentage is calculated as the sum of all over (under) investing segments capital expenditures for a year divided by the firm capital expenditures. Underinvesting segments are those that invest less than single-segment firms in year t-1.

Figure a

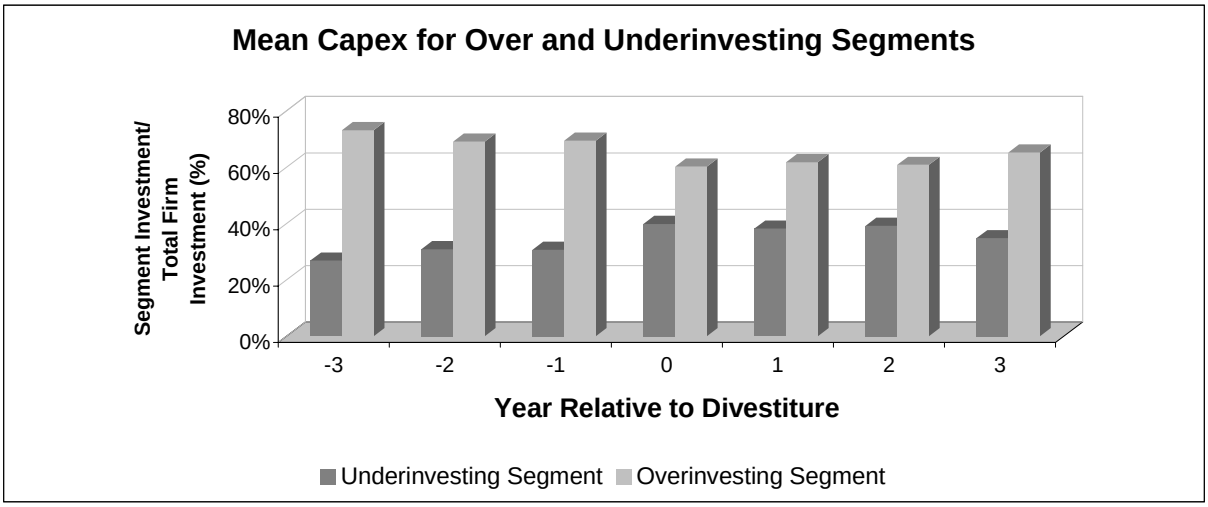

Figure b