Excess Cash Flows and Diversification Discount

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We study the impact of diversification on firm cash flows and excess value. Specifically, we investigate whether there is a direct link between the discount to diversification and excess cash flow reductions around related and unrelated acquisitions. Our results provide empirical support for a positive and significant association between excess cash flow declines and excess value losses after the acquisition. Our findings also show that bidders who conduct unrelated acquisitions experience larger excess cash flow declines and valuation discounts than do bidders who engage in related acquisitions. Our results are robust to the targets' excess cash flow and valuation characteristics.

Recent empirical studies find that the average diversified firm trades at a discount relative to a portfolio of comparable single-segment firms. This literature suggests that diversification itself might be the reason that diversified firms produce cash flows different from those they would generate if broken into single-segment firms operating in the same line of business with diversified firm's distinct lines of business (see Berger and Ofek, 1995 among others).[1] The possibility that conglomeration might reduce cash flows motivates this article. However, several papers (Campa and Kedia, 2002; Chevalier, 2000; Graham, Lemmon, and Wolf, 2002; Whited, 2001; and Villalonga, 2004a, 2004b) in one way or another are skeptical about the diversification discount. Moreover, Mansi and Reeb (2002) show that the measure of excess value, as developed by Lang and Stulz (1994), and Berger and Ofek (1995), creates a downward bias in diversified firms, because it captures only the shareholder value of the firm. They argue that diversification reduces firm risk and, therefore, it does not have adverse bearing on the cash flows of the firm. However, they do not provide evidence in support of this conjecture. While the Lamont and Polk (2001) study, based on aggregate data, shows that firm value is inversely related with subsequent returns and that the diversification discount manifests itself in both expected returns and expected cash flows, it does not provide direct evidence in support of a link between firm cash flows and excess value.

If the value of the firm is the discounted value of its cash flows and if there is a discount to diversification, then the discount should be either because cash flows decline, or the discount rate rises with diversification. In this article, we examine the impact of diversification on firm cash flows and excess values and investigate whether there is a direct association between changes in cash flows and the diversification discount (i.e., excess value) around the act of diversification.[2] We examine this relation for multi-segment firms that engage in related and

[1]Lins and Servaes (1999, 2002) and Doukas, Holmen, and Travlos (2002) provide similar evidence using non-US data sets.

[2]Most prior diversification discount studies examine the phenomenon of corporate diversification at the aggregate level with the exception of Graham et al. (2002) who analyze changes in excess value for single-segment firms that increase the number of reported segments by either internal growth or acquisitions.

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unrelated acquisition transactions and compare their differences. We also analyze the impact of targets on the bidders' excess cash flows and diversification discount. To address these issues, we use a sample of 742 firm-year acquisitions completed by US firms over the 1991-1997 period.

Our results provide empirical support for a positive association between reductions in cash flows and changes in the diversification discount subsequent to acquisitions. Our findings show that a 10% decline in bidders' excess cash flows is associated with a 3.7% excess value loss. Second, we find that bidders that acquire unrelated targets experience greater excess cash flow declines and valuation discounts than do bidders involved in related acquisitions. Third, our results are robust to the targets' excess cash flow and valuation characteristics. Finally, our evidence indicates that industrial diversification is driven by bidders' industry growth opportunities.

The article proceeds as follows. Section I describes our data sources, sample selection procedure, and sample characteristics. Section II presents the pre-acquisition excess cash flow and valuation performance of bidders. In Section III, we assess the change in the excess performance of multi-segment bidders involved in related and unrelated acquisitions in subsequent years, and examine the relation between changes in bidders' excess value and excess cash flows. Section IV examines the impact of targets' characteristics on bidders' post-acquisition excess cash flows and valuation. Section V concludes.

I. Data Sources, Sample Selection, and Industrial Classification of Bidders

We begin by describing the sources of data, sample selection procedure, industrial classification of bidders, and sample characteristics.

A. Sources of Data and Sample Selection

Our sample consists of domestic acquisitions conducted by the US bidders between January 1, 1991 and December 31, 1997 as reported in the Domestic Acquisitions roster of Securities Data Corporation's *Mergers & Acquisitions (M&A) Journal*. The rosters of the *M&A Journal* include all acquisitions of $5 million value or higher and report the name of the target, the Standard Industrial Classification (SIC) code (at the 2-digit level before 1993, at the 4-digit level starting 1993), the business definition of target firms or businesses, the name, and the business definition of bidder firms. The rosters also report the value of acquisition, the method of payment, whether the target is divested or not, the completion day of the acquisition, and the advisors to both parties. We exclude from the sample all transactions associated with target firms in non-manufacturing industries (i.e., Finance, Insurance and Real Estate, with 2-digit SIC codes from 60 to 67, and Services, with 2-digit SIC codes from 70 to 89). We also exclude bidders involved in both domestic and cross-border acquisitions in the same calendar year. Our initial sample covers 10,128 domestic acquisitions over the 1991-1997 period. We also use Compact Disclosure/Worldscope Global CDs to obtain insider and institutional ownership information for the sample firms.

B. Industrial Classification of Bidders

We use the Compustat Industry Segment File (CISF) to determine the business segments of bidders. SEC regulation S-K and FASB-SFAS No. 14 require firms to report segment information for fiscal years ending after December 15, 1977 for segments that represent 10%

or more of consolidated sales.[3] The CISF reports net sales, operating profit (earnings before interest and taxes, EBIT), depreciation, assets, and capital expenditures on a segment level for all active Compustat firms other than utility subsidiaries. Compustat assigns primary and secondary SIC codes to each business segment of the firm, as well as a main SIC code to the firm at 4-digit level.

Following Servaes (1996), we define a line of business at the 2-digit SIC level.[4] The rationale for using 2-digit SIC codes is that industries with the same 2-digit SIC codes are closely related and require comparable management skills. Our procedure of identifying business segments is similar to those used by Lamont (1997) and Scharfstein (1998). We treat the primary and secondary SIC codes of business segments as being of equal weight, hence we divide the sales, operating income, assets, capital expenditures, and depreciation of bidders' each reported segment into two components. We aggregate the resulting figures into distinct business segments based on their 2-digit SIC code to determine the sales, operating income, assets, capital expenditures and depreciation of each distinct segment defined at the 2-digit SIC code level.

Unlike Scharfstein (1998), who pools related segments into "divisions" depending on his judgment of relatedness, our measure of relatedness for distinct business segments is based on segments sharing the same 2-digit SIC code. We define the "core business" of the bidder by the 2-digit SIC code of the business segment that has the highest share of aggregated sales of the firm. To do so, we use information in the year before the acquisition. We count all the remaining business segments of the bidder as "non-core business" segments. To classify the nature of acquisition, we also use bidder's segment information at the announcement year to identify its core and non-core business. This procedure yields similar results. Throughout the study, we report results based on the classification prior to the year of the acquisition (year-1).

We define acquisitions as "unrelated" (diversifying) when the 2-digit SIC code of the target does not match the 2-digit SIC code of the bidder's core business. We define acquisitions as "related" (non-diversifying or focus increasing/maintaining) when the 2-digit SIC code of the target is identical to that of the bidder's core business.

C. Sample Characteristics and Summary Statistics

Initially, we identify 10,128 domestic acquisition announcements in the *M&A Journal*. These announcements are also confirmed by *The Wall Street Journal*. In our initial sample, only 5,440 transactions represent the acquisitions of full target firms. The remaining 4,688 transactions represent asset, plant, or partial acquisitions by bidders. Out of the 10,128 acquisitions we cannot find any information about bidders in Compustat for 4,881 acquisitions. This reduces the sample size to 5,247 acquisitions.

We eliminate 393 acquisitions by bidders whose core businesses are in non-manufacturing industries (Finance, Insurance and Real Estate, with 2-digit SIC codes from 60 to 67, and Services, with 2-digit SIC codes from 70 to 89). We also drop another 845 acquisitions by

[3]Our data set covers firms that engage in M&As before SFAS 131. Since June 1997, SFAS requires management to report segment information according to how the firm internally organizes its business activity for resource allocation and performance assessment.

[4]Servaes (1996) points out that a straightforward examination of the 4-digit SIC codes of the segments of the firm does not necessarily reveal the degree of diversification of the firm. He argues that the use of the 4-digit SIC code would be too wide to identify the industrial structure of the firm. Similarly, Kahle and Walkling (1996) demonstrate how a 4-digit SIC code firm assigned to a firm might be misleading with regard to the most reasonable 2- or 3-digit classifications.

bidders that acquire several targets operating both within (related) and outside (unrelated) their core line of business. Our final sample comprises 4,009 acquisitions. Of 4,009, 803 targets are full target firms. The remaining 3,206 targets are plant, asset, or partial acquisitions.

In addition, we identify 829 acquisitions as multiple acquisitions of bidders and consolidate them as one firm-year acquisition. We focus exclusively on the acquisitions of multi-segment (industrially diversified) bidders. Out of 3,180 firm-year acquisitions, we exclude 2,438 acquisitions conducted by single-segment (focused) bidders. Therefore, our final sample consists of 742 firm-year observations undertaken by multi-segment bidders, spanning 42 2-digit SIC code industries.

Panel A of Table I shows the frequency of 742 domestic firm-year acquisitions. The number of acquisitions exhibits an increasing trend over the years. The majority of acquisitions is unrelated in nature throughout the 1991-1997 period. About 60% (445) of acquisitions represent investments outside the core business of the bidder, and 40% (297) of the acquisitions are directed within the core business of the multi-segment bidders.

Panel B, Table I, reports, the summary statistics and sample characteristics. The mean [median] annual sales of bidders is $ 2.943 billion [$748 million]. The average [median] market value of bidders is $2.637 billion [$600 million] and the average [median] value of total assets of bidders is $3.129 billion [$756 million]. These statistics suggest that bidders are medium to large sized firms. The average [median] debt to total capital ratio is 45.24% [43.17%] which suggests that bidders are significantly levered. The average [median] insider ownership is 13.41% [4.66%], indicating that the insiders of bidding firms have considerably less ownership stake compared to institutional owners. The average [median] institutional ownership is 38.72% [39.70%].

The summary statistics also show that the average [median] number of lines of business (number of business segments) is 2.93 [3.00] in this sample. The average [median] number of acquisitions in a single year is 1.28 [1.00]. The average [median] size of firm-year acquisitions is $384 million [$58.30 million].

II. Bidder's Pre-Acquisition Performance

To gain insights about the effects of diversification on the performance of the bidders after the acquisition, we compute bidders' pre-acquisition excess operating cash flow (ECF) and excess shareholder value (EV). We estimate excess operating cash flow by subtracting bidders' imputed cash flow from their raw cash flow and estimate excess shareholder value using the Berger and Ofek (1995) methodology (i.e., EV is the natural logarithm of bidder's market value to its imputed value). We define the operating cash flow (CF) as operating income before depreciation divided by total sales (EBITD/Sales).

We compute the imputed cash flow by multiplying sales-based (asset-based) weights of the distinct business segments at the 2-digit SIC level with the median cash flow obtained from single-segment firms operating in the same 2-digit SIC industries. We compute the sales-based (asset-based) weights as the ratio of annual segment sales (assets) for each distinct line of business defined at 2-digit SIC code divided by the total sales (assets) of the bidder firm in that year. Sales- and asset-based computations yield similar results. Therefore, we report results based on sales-multiples computations. In our study, the construction of our imputed performance measure controls for the size of the business segments of the bidder. We require that the size of the stand-alone firms be within the 50% to 200% range of the size of the business segment of the bidder in that year. If the number of stand-alone firms

Table I. Sample Selection and Summary Statistics

The table presents the number and frequency of 742 firm-year acquisition announcements reported in the *M&A Journal* and confirmed by the *Wall Street Journal* for the 1991-1997 period. The sample excludes single-segment (focused) bidders and bidder firms that make overseas acquisitions in the same calendar year. We also exclude acquisitions less than $5 million and in non-manufacturing industries. We define an acquisition as "unrelated" when the 2-digit SIC code of the bidder's core business does not match that of the target firm, and as "related" when the 2-digit SIC code of the bidder's core business is identical to that of the target. We define Total Sales as the gross sales of the bidder firm net of sales discounts in million $; Market Value as the number of shares multiplied by the average stock price of the bidder firm in million $; Total Assets as current assets plus net property, plant, and equipment plus other non-current assets of the bidder firm in million $. Debt/Total Capital is percentage of total debt divided by invested capital. Number of Segments is the number of distinct lines of business the bidder firm is operating at the 2-digit SIC code level. Number of Acquisitions is the total number of acquisitions completed by the bidder firm in the year of the acquisition. Insider ownership and institutional ownership are the average number of shares held by insiders and held by institutions divided by the average number of shares outstanding for the bidder firm respectively. We compute Tobin's Q as the market value of outstanding shares plus liquidation value of preferred stock plus net current assets plus long-term debt divided by total assets of the bidder firm. All values are for the year prior to the acquisition.

Panel A. Number and Frequency of Acquisitions by Year

	1991	1992	1993	1994	1995	1996	1997	1991-97
No. of firm-year Acquisitions	89	97	79	110	129	114	124	742
No. and frequency of Related Acquisitions	37 41.57%	35 36.08%	28 35.44%	46 41.82%	49 37.98%	47 41.23%	55 44.35%	297 40.03%
No. and frequency of Unrelated Acquisitions	52 58.43%	62 63.92%	51 64.56%	64 58.18%	80 62.02%	67 58.77%	69 55.65%	445 59.97%

Panel B. Summary Statistics and Sample Characteristics

	Mean	Median	Minimum	Maximum
Total Sales (million $)	2,942.66	747.73	10.00	107,893.00
Market Value (million $)	2,636.86	599.61	10.02	99,981.00
Total Assets (million $)	3,129.89	755.47	10.04	105,533.00
Debt/Total Capital (%)	45.24	43.17	0.00	94.93
No. of Segments	2.93	3.00	2.00	7.00
No. of Acquisitions/year	1.28	1.00	1.00	10.00
Size of Acquisition(s) (million $)	384.16	58.30	5.00	18,860.00
Insider Ownership (%)	13.41	4.66	0.00	84.70
Institutional Ownership (%)	43.60	47.86	0.00	89.74
Tobin's Q	1.092	0.912	0.11	6.28

is less than five in a year, we extend the size restriction to 25% and 400% of the size of the segment's assets. We obtain the imputed cash flow (I_CF) for bidders as the weighted sum of the median cash flows of size-matched stand-alone firms that have the same 2-digit SIC codes with bidders' business segments.

$$I_CF = \sum_{j=1}^{n} w_j CF_{IND\,j} = \sum_{j=1}^{n} w_j \text{ median } \{CF_{1j}, CF_{2j}, \ldots, CF_{Nj}\} \quad (1)$$

where w_j is the sales-based (asset-based) weight of the bidder's sales (assets) in business segment j, and $CF_{IND\,j}$ is the size-matched median operating cash flow performance of single-segment bidders that have the same 2-digit SIC code as the business segment j of the bidder. Therefore, we estimate the excess operating cash flow performance measure (ECF) as:

$$ECF_t = CF_t - I_CF_t \quad (2)$$

Table II reports the mean [median] excess performance measures of bidders in year -1, the year prior to the acquisition. Multi-segment bidders have positive, significant mean and median excess operating cash flows in year -1, regardless of the type of acquisition they conduct. Furthermore, in year –1, bidders that carry out related acquisitions have higher excess cash flows than do those firms involved in unrelated acquisitions. However, this result is not statistically significant at any conventional level. Unlike the excess cash flow results, bidders suffer from significant shareholder valuation losses in year -1 with mean [median] shareholder value losses of 19.05% [17.61%]. This result appears to be consistent with the diversification discount literature.

Overall, the pre-acquisition cash flow findings show that multi-segment bidders have superior cash flow performance to that of a comparable portfolio of stand-alone firms. In contrast with the cash flow results, the excess valuation evidence shows that multi-segment bidders suffer from significant shareholder discounts in year –1. These findings suggest that current cash flows (over and above the imputed cash flows of the firm) do not play a prominent role in the market's valuation of these firms.

One possible explanation for the divergence between excess cash flows and the discount to diversification is that the market may attach greater value on the bidder's growth and/or its industry prospects. If the diversification decision loads more on the firm's future prospects or its industry growth opportunities, that might explain why these bidders trade at a discount despite having positive excess cash flows prior to the acquisition year.

We use logistic regression analysis to determine whether industry growth opportunities drive unrelated acquisitions.[5] Our findings indicate that the bidder's decision to diversify is affected by industry growth opportunities rather than their excess cash flows. Bidders' industry growth opportunities, for which the imputed value of their Tobin's Q serves as a proxy, have a negative, significant impact on the decision to diversify. This finding provides additional support for the important role played by bidders' industry growth opportunities. Our findings also suggest that diversifying investments are more pronounced in firms with lower insider and institutional ownership, and that the tendency to acquire targets outside the core business of the bidder increases with firm size. To the extent that institutional ownership and size reflect agency costs, this result is consistent with the view that diversification is influenced by bidders' agency costs.[6]

[5]The results are not reported here, but are available on request.

[6]Hyland and Diltz (2002) find evidence in support of the agency cost hypothesis for firms that seek to diversify.

Table II. Bidders' Pre-Acquisition Excess Performance

The table presents multi-segment bidders' mean [median] excess performance measures in year –1, the year prior to the acquisition. The sample consists of 742 US firm-year acquisitions over the 1991-97 period. The sample excludes single-segment (focused) bidders and acquisitions of less than $5 million value. The sample does not cover bidder firms in non-manufacturing industries. We define an acquisition as "unrelated" when the 2-digit SIC code of the bidder's core business does not match that of the target firm, and as "related" when the 2-digit SIC code of the bidder's core business is identical to that of the target. We compute Cash Flow (CF) as operating income before depreciation divided by total sales (EBITD/Sales); Excess CF (ECF) by subtracting the imputed cash flow of bidders from raw cash flow; Imputed cash flow by multiplying the sales weights of bidders' business segments with the median operating cash flow of industry (at the 2-digit SIC code level) and size (within 50%-200% of the size) matched stand-alone firms with bidders' business segments. We compute Excess Value (EV) by using the Berger and Ofek (1995) methodology. Year 0 is the year of acquisition. We use one-way ANOVA [Non-parametric Wilcoxon Rank-Sum test] to test for difference of means [medians].

	All Acquisitions	Related Acquisitions	Unrelated Acquisitions	Related–Unrelated [Related–Unrelated]
ECF_{-1}	2.05***	2.17*	1.97***	0.20
	[1.61***]	[2.19***]	[1.19***]	[1.00]
EV_{-1}	-19.05***	-20.64***	-18.04***	-2.60
	[-17.61***]	[-14.95***]	[-17.71***]	[2.76]

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

III. Change in Bidders' Excess Performance

Here, we examine the change in the excess performance of multi-segment bidders that undertake related or unrelated acquisitions. We do so to gain additional insights about the cash flow and valuation effects of these investment decisions. We are interested to see if there is a direct link between the change in the diversification discount and the decline in cash flows.

A. Univariate Results: Change in Multi-segment Bidders' Excess Cash Flow and Excess Value

Table III reports bidders' mean [median] change in the excess cash flow and valuation measures from year -1 to +1. The excess cash flow results demonstrate that bidders' excess operating cash flows deteriorate from year -1 to +1. This decline is more pronounced for bidders that conduct unrelated acquisitions. The mean [median] decline is 2.12% [0.22%] and statistically significant at the 10% level. Furthermore, the change in the excess cash flows of multi-segment bidders that acquire unrelated targets is significantly below that of bidders buying core-related targets.

The excess valuation results show that bidders do not experience any significant excess value declines. Surprisingly, while diversifying bidders realize a mean excess value decline of 4.05% it is not statistically significant at any conventional level. In general, multi-segment bidders experience marginal cash flow declines and shareholder value losses when they engage in diversifying acquisitions.

Table III. Change in Bidders' Excess Measures

The table presents multi-segment bidders' mean [median] change in excess performance measures from year –1 to +1. Year 0 is the year of acquisition. The sample consists of 742 US firm-year acquisitions over the 1991-97 period. The sample excludes single-segment (focused) bidders and acquisitions of less than $5 million value. The sample does not cover bidder firms in non-manufacturing industries. We define an acquisition as "unrelated" when the 2-digit SIC code of the bidder's core business does not match that of the target firm, and as "related" when the 2-digit SIC code of the bidder's core business is identical to that of the target. We compute Cash Flow (CF) as operating income before depreciation divided by total sales (EBITD/Sales); Excess CF (ECF) by subtracting the imputed cash flow of bidders from raw cash flow; Imputed cash flow by multiplying the sales weights of bidders' business segments with the median operating cash flow of industry (at the 2-digit SIC code level) and size (within 50%-200% of the size) matched stand-alone firms with bidders' business segments. We compute Excess Value (EV) by using the Berger and Ofek (1995) methodology. Year 0 is the year of acquisition. We use one-way ANOVA [Non-parametric Wilcoxon Rank-Sum test] to test for difference of means [medians].

	All Acquisitions	Related Acquisitions	Unrelated Acquisitions	Related–Unrelated [Related–Unrelated]
Δ ECF	-1.02	0.60	-2.12*	2.72*
–1 to +1	[-0.05]	[0.11]	[-0.22]*	[0.33]
Δ EV	-1.95	1.29	-4.05	5.34
–1 to +1	[-0.54]	[-0.37]	[-0.65]	[0.28]

*Significant at the 0.10 level.

The difference in excess cash flow changes between related and unrelated investment strategies indicates that unrelated acquisitions do not necessarily result in improved cash flow performance. The evidence also shows that diversifying acquisitions fail to enhance shareholder value. Overall, these findings support that the change in the diversification discount reflects bidders' declining cash flows.

B. Diversification and Change in Bidders' Excess Operating Cash Flows and Excess Valuation

To the extent that both the excess cash flows and the excess valuation of diversifying multi-segment bidders show similar degrees of deterioration around acquisitions, we assume that the change in the bidders' diversification discount is related to the change in cash flows. We investigate this relation around the acquisition.

Panel A of Table IV shows that the Pearson correlation coefficient between the change in excess value and excess cash flows is positive and significant at the 1% level in all cases. As we expected, these results show that an increase (decrease) in excess cash flows around the acquisition is followed by a similar change in bidders' excess value.

To gain additional insights about the cash flow and valuation effects of related and unrelated acquisitions, we regress the change in the excess performance measures from year -1 to +1 against the type of acquisition (related or unrelated) while controlling for the relative size of target, method of payment, whether the target firm or asset is divested or not, and the change in the market for corporate control using calendar year dummies.

Panel B of Table IV presents the regression results. The first regression, as the insignificant intercept points out, indicates that related acquisitions do not have an adverse impact on the excess cash flow of bidders. The negative and statistically significant coefficient estimate

Table IV. Change in Bidders' Excess Operating Cash Flow and Excess Value

Panel A reports the Pearson correlation between the change in bidders' excess value and excess operating cash flow from year –1 to year +1. Year 0 is the year of acquisition. Panel B reports the regression results in which the dependent variable is the change in bidders' excess value from year –1 to +1. The sample consists of 742 US firm-year acquisitions over the 1991-97 period. The sample excludes single-segment (focused) bidders and acquisitions of less than $5 million value. The sample does not cover bidder firms in non-manufacturing industries. We define an acquisition as "unrelated" when the 2-digit SIC code of the bidder's core business does not match that of the target firm, and as "related" when the 2-digit SIC code of the bidder's core business is identical to that of the target. We compute Cash Flow (CF) as operating income before depreciation divided by total sales (EBITD/Sales); Excess CF (ECF) by subtracting the imputed cash flow of bidders from raw cash flow; Imputed cash flow by multiplying the sales weights of bidders' business segments with the median operating cash flow of industry (at the 2-digit SIC code level) and size (within 50%-200% of the size) matched stand-alone firms with bidders' business segments. We compute Excess Value (EV) by using the Berger and Ofek (1995) methodology. We define Relative size of targets as the size of acquisitions scaled by the bidders' total assets as of year –1.

Panel A. Correlation Between Change in Bidders' Excess Operating Cash Flow and Excess Value

	All Acquisitions	Related Acquisitions	Unrelated Acquisitions
Δ ECF vs. Δ EV -1 to +1 -1 to +1	0.226***	0.158***	0.321***

Panel B. Cross-Sectional Regressions: Change in Excess Value on Change in Excess Operating Cash Flow

Independent Variables	Δ ECF -1 to +1	Δ EV -1 to +1	Δ EV -1 to +1
Intercept	0.97 (0.532)	1.42 (0.326)	1.06 (0.247)
Δ ECF -1 to +1			0.37 (4.245)***
Relative Size of Targets	-2.70 (-0.799)	14.31 (1.779)*	15.31 (1.924)*
Dummy = 1 if bidder makes an unrelated acquisition	-2.70 (-1.663)*	-5.12 (-1.325)	-4.13 (-1.078)
Dummy = 1 if payment is settled in stock	1.94 (0.845)	-20.81 (-3.807)***	-21.52 (-3.981)***
Dummy = 1 if payment is settled in cash	1.44 (0.905)	-2.56 (-0.675)	-3.09 (-0.824)
Dummy = 1 if target is divested by parent	-2.43 (-1.431)	2.70 (0.669)	3.60 (0.899)
R^2	0.009	0.025	0.049
Adj-R^2	0.003	0.019	0.041

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

of the unrelated acquisition dummy (-2.70%, significant at the 10% level), however, shows that diversifying acquisitions lead to significant reductions in bidders' excess cash flows. Consistent with our previous findings, this result indicates that unrelated acquisitions hurt bidders' excess cash flow performance.

In the second regression, the positive but insignificant intercept suggests that core related acquisitions do not cause significant declines in bidders' excess value. The coefficient estimate of the unrelated acquisition indicator variable is -5.12 (with a t-value of -1.325). This negative coefficient implies that bidders acquiring unrelated targets do not experience dramatic excess value declines relative to a comparable portfolio of stand-alone firms. The relative size of the target enters the regression with a positive and significant coefficient, implying that larger targets have a greater impact on bidders' excess valuation. The indicator variable for the stock method of payment is -20.81% and statistically significant at the 1% level (with a t-value of -3.897), which suggests that when bidders pay with equity they incur significant declines in their excess value. This result is consistent with Rappaport and Sirower (1999), who argue that riskier acquisitions are more likely to be settled in stock rather than in cash.

In the third regression, we include the change in bidders' excess cash flows as another independent variable to explain the change in their excess values. The coefficient estimate of the change in excess cash flows is 0.37 and statistically significant at the 1% level (with a t-value of 4.245). This result is also economically significant, suggesting that a 10% decline in bidders' excess cash flows translates into 3.7% excess value loss. This finding provides additional evidence to support the hypothesis that the change in the diversification discount is positively related to the declining cash flows of the bidder after the acquisition.[7] The rest of the variables enter this regression with similar signs and statistical significance, as in the second regression.

IV. Additional Tests: Excess Cash Flows and Excess Value of Targets

It is possible that the discount documented thus far may be because bidders acquire targets trading at a discount.[8] Therefore, we analyze the pre- and post-acquisition excess cash flows and valuation of bidders while controlling for the excess cash flow and value of targets in year -1. We concentrate only on whole acquisitions in which bidders acquire identifiable target firms, and for which Compustat has information on these targets. We eliminate all firm-year acquisitions in which the bidders acquire units, assets, plants or partial targets because of difficulties in identifying the performance of these targets.

An advantage of the whole-acquisitions subsample is that it allows us to control for possible size effects, because we expect these targets to be comparable in size to bidders. Our selection procedure produced a subsample of 43 identifiable bidder-target pairs over our sample period. Appendix A reports the bidders and targets included in this subsample by year.

[7]We have also been able to identify and study the core and non-core cash flows of all bidders before and after the acquisition. Our results demonstrate that before the acquisition, diversifying (non-diversifying) bidders generate more cash flows from their non-core (core) than core (non-core) business. This evidence indicates that bidders expand the line of business that appears to generate higher cash flows. Our results also show that after the acquisition, the same pattern persists. However, the diversifying bidders' cash flow performance relative to their benchmark portfolio (i.e., excess cash flows) shows that they underperform their industry peers. Hence, from a relative cash flow perspective, this result suggests that diversification is harmful. On the other hand, the excess cash flows of non-diversifying bidders, do not deteriorate. These results are available on request.

[8]Graham et al. (2002), who examine single-segment firms that expand through acquisitions or increase their reporting business segments, provide evidence in support of the view that bidders' value loss is driven by already-discounted acquisition targets.

Table V shows that the 43 identifiable bidder-target pairs and the remaining 699 firm-year observations of our complete sample have different size characteristics. As expected, the size of fully identifiable targets is much greater, with a mean [median] value of $1.288 billion [$175 million], than that of the remaining acquisitions in which the bidders acquire units, assets, plants, or partial targets, with a mean [median] value of $270 million [$50 million]. The table also shows that the relative size of targets as a percentage of the bidders' total assets is considerably higher in the fully identifiable targets, with a mean [median] of 34.27% [15.09%], than in the rest of acquisitions with a mean [median] of 20.22% [8.91%]. These sample characteristics indicate that the size of targets in our subsample of 43 identifiable bidder-target pairs is more comparable to the assets of bidders than to the assets of the remaining 699 asset or partial acquisitions.

Therefore, we re-estimate the regressions of Table IV. We introduce an indicator variable for the subsample of 43 identifiable bidder-target pairs, its interactive terms with the change in excess cash flows (ΔECF), and the relative size of targets as additional explanatory variables. The coefficients of the indicator variable and its interactive terms suggest that our previous results remain robust.[9]

A. Bidders' and Targets' Pre-Acquisition Excess Performance

Table VI reports the pre-acquisition excess cash flows and value measures for both bidders and targets in our subsample of identifiable bidder-target pairs. In a careful inspection of the subsample of 43 pair observations we detected two outliers, both associated with related acquisitions (Bidder: Summa Industries (Core Business SIC 30) vs Target: Calnetica Corp (SIC 30) and Bidder:Bell Industries Inc. (Core Business SIC 50) vs Target: Milgray Electronics Inc (SIC 50)) with projected changes in excess value greater than 35%. All other target-bidder pairs had a projected change in excess value within the -15% to +15% range. Therefore, we decided to drop these two outliers from the original subsample. When we replicate the tests with the outliers, the results are slightly different.[10] Consistent with the evidence reported in Table II for the original sample, Panel A shows that bidders have positive and significant excess operating cash flows. Targets also appear to generate mean [median] cash flows greater than those of their industry peers. This evidence suggests that neither bidders nor targets have inferior excess cash flows prior to the acquisition.

The results in Panel B show that bidders, whether they acquire related or unrelated targets, do not appear to trade at a discount. Furthermore, in line with Graham et al. (2002), the evidence shows that targets trade at a significant discount. These findings show that bidders with superior excess cash flows and valuations at par with their industry peers acquire targets with above-industry cash flows but negative excess valuations.

B. Bidders' Actual and Projected Post-Acquisition Excess Performance

To gain additional insights into the effects of targets on bidders' excess performance, we estimate the excess cash flows and valuation measures of the combined firm in year –1. We deem these estimates to represent the projected value of excess cash flows and valuation measures as of year +1 and compare them with the actual excess cash flows and valuation measures observed one year after the acquisition. Following Graham et al. (2002), we estimate the projected excess cash flows (PECF) and excess values (PEV) of the combined firm in year

[9]These results are available on request.

[10]These results are available on request.

Table V. The Relative Size of Acquisitions in Two Subsamples

The table presents mean [median] of the size of the acquisitions, the total assets of multi-segment bidders and the relative size of the targets. We define Total Assets as current assets plus net property, plant, and equipment plus other non-current assets of bidders in million$ in year -1. We define Relative size of targets as the size of acquisitions scaled by bidders' total assets in year –1. The first subsample covers 43 identifiable bidder-target pairs and the second subsample covers the remaining 699 firm-year acquisitions in which the bidders acquire units, assets, plants, or partial targets.

	Subsample of Identifiable Bidder-Target Pairs N=43	Subsample of Remaining Firm-Year Acquisitions N=699
Size of Acquisition(s) (million $)	1,288.04 [175.39]	270.44 [50.40]
Bidders' Total Assets (million $)	5,217.99 [1,581.90]	2,998.62 [701.11]
Relative size of Targets (%)	34.27 [15.09]	20.22 [8.91]

+1 as follows:

$$PECF_{+1}=\{[(MV_{B-1}*CF_{B-1})+(MV_{T-1}*CF_{T-1})]-[(MV_{B-1}*I_CF_{B-1})+(MV_{T-1}*I_CF_{T-1})]\}/(MV_{B-1}+MV_{T-1}) \quad (3)$$

$$PEV_{+1}=\ln[(MV_{B-1}+MV_{T-1})/(IV_{B-1}+IV_{T-1})] \quad (4)$$

Table VII reports the mean [median] actual and projected changes in bidders' excess cash flows and valuations from year -1 to year +1. We define the projected change as the difference between the projected post-acquisition excess measure (as of year +1) minus the pre-acquisition excess measure (as of year -1). Panel A shows that bidders' projected change in excess cash flows consistently exceeds their actual change in excess cash flows. The mean and median difference between the actual and projected change in excess cash flows for bidders is negative, but significant only in diversifying bidders. This result indicates that the cash flows of diversifying bidders deteriorate in the post-acquisition year.

Panel B also shows that the bidders' mean [median] actual change in excess value is far below the projected change, and that it is consistent with the observed decline in actual excess cash flows. The mean and median actual changes are negative and significant, especially for diversifying bidders. The mean and median projected changes in excess values for non-diversifying bidders are not significantly different from zero. Consistent with our previous findings, these results support that there is a positive and significant relation between actual excess cash flow and value changes, indicating that the value reduction to diversification arises in part from the decline in cash flows.

C. Relation Between Bidders' Actual and Projected Post-Acquisition Excess Performance

The difference between the actual and the projected excess cash flows and excess values of bidders suggests that acquisitions might work in different ways for bidders that acquire core related and unrelated target firms. Therefore, the question is whether the decline in

Table VI. Bidders' and Targets' Pre-Acquisition Excess Performance

The table presents bidders' and targets' mean [median] excess operating cash flow and excess value of multi-segment bidders and their targets in year –1. The sample consists of 41 identifiable bidder-target firm-acquisitions over the 1991-97 period. We use one-way ANOVA [Non-parametric Wilcoxon Rank Sum test] to test for difference of means [medians].

Panel A. Bidders' and Targets' Pre-Acquisition Excess Cash Flow (ECF)

		All Acquisitions	Related Acquisitions	Unrelated Acquisitions	Related–Unrelated [Related–Unrelated]
ECF_{-1}	Bidders	4.07*** [4.96]***	4.92** [6.78]**	3.21* [2.29]*	1.71 [4.49]
	Targets	5.07* [2.00]	3.72* [2.00]	6.52* [2.52]*	-2.80 [-0.52]

Panel B. Bidders' and Targets' Pre-Acquisition Excess Value (EV)

		All Acquisitions	Related Acquisitions	Unrelated Acquisitions	Related–Unrelated [Related–Unrelated]
EV_{-1}	Bidders	-10.73 [-6.22]	-12.82 [1.92]	-8.52 [-6.64]	-4.30 [8.56]
	Targets	-30.34** [-38.96]**	-26.55* [-11.88]	-34.43* [-60.06]*	7.88 [48.18]*

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

excess value and excess cash flows is associated with the acquisition of unrelated targets.

We first address this issue by using the subsample of identifiable bidder-target pairs. Panel A of Table VIII shows that there is a positive correlation between actual changes in excess cash flows and excess value. We also find a positive association between the actual and the predicted changes in bidders' excess value. The correlation between the actual change in excess value and the unanticipated change in excess cash flows (ΔECF-PΔECF) is negative. This relation purports that our predicted change in excess cash flows was overly optimistic.

In cross-sectional regressions, reported in Panel B of Table VIII, we find that unrelated acquisitions have a negative and significant impact on the excess value of the bidder around the acquisition. Consistent with the correlation results, the actual change in excess cash flows enters the regressions with a positive sign. Similarly, the projected change in excess value and the unanticipated change in excess cash flows enter the regressions with the same signs of the correlation coefficients reported earlier.

Using the entire sample, we also examine this issue in a multivariate framework by regressing the change in actual excess cash flow and valuation of bidders on their projected changes. In this set of regressions, we introduce the interactive terms of the indicator variable for the

Table VII. Actual and Projected Change in Bidders' Excess Performance in Small Subsample

The table presents the mean [median] change in actual and projected excess operating cash flow (ΔECF and PΔECF) and excess value (ΔECF and PΔECF) of bidders from year –1 to +1. The sample consists of 41 identifiable bidder-target firm-acquisitions over the 1991-97 period. We use Paired samples t-test [Wilcoxon Rank Sum test] to test for difference of means [medians].

		All Acquisitions	Related Acquisitions	Unrelated Acquisitions
Panel A. Actual and Projected Change in Bidders' Excess Operating Cash Flow (ΔECF and PΔECF)				
Actual Change	ΔECF	-2.97**	-3.01*	-2.93**
	-1 to +1	[-2.38]**	[-2.81]*	[-1.37]**
Projected Change	PΔECF	-0.92	-1.84	-0.01
	-1 to +1	[-0.01]	[-0.21]	[0.11]
Difference	ΔECF–PΔECF	-2.05*	-1.17	-2.92**
Actual – Projected	[ΔECF–PΔECF]	[-2.37]*	[-2.60]	[-1.48]**
Panel B. Actual and Projected Change in Bidders' Excess Value (ΔEV and PΔEV)				
Actual Change	ΔEV	-14.43*	0.17	-29.89***
	-1 to +1	[-17.29]*	[-10.00]	[-25.92]**
Projected Change	PΔEV	-0.13	-0.49	0.28
	-1 to +1	[-0.64]	[-1.54]	[0.05]
Difference	ΔEV–PΔEV	-14.30*	0.66	-30.17**
Actual – Projected	[ΔEV–PΔEV]	[-16.65]*	[-8.46]	[-25.97]*

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

subsample of identifiable bidder-target pairs with the projected change in excess cash flows (PΔECF) and excess valuation (PΔEV). In regressions where the dependent variable is the change in actual excess cash flow and excess value of bidders around the acquisition, respectively, the interactive terms enter these regressions with insignificant coefficients, which suggest that the projected changes in both excess performance measures do not have a bearing on bidders' actual performance changes when we account for the characteristics of the identifiable targets.[11] More importantly, consistent with the evidence reported in Panel B of Table IV, we find the coefficient of the change in excess cash flows is 0.37 and statistically significant (with a t-value of 4.089). This result confirms that there is positive association between the change in excess cash flows and excess valuation. Finally, consistent with the subsample regression results, we find that unrelated acquisitions have a negative impact on bidders' excess cash flows and valuation one year after the acquisition.

V. Conclusion

In this article, we study the impact of diversification on firm cash flows and excess values. We examine whether there is a direct association between the discount to diversification and

[11]The results are not reported here, but are available on request.

Table VIII. Relation Between Change in Bidders' Excess Operating Cash Flow and Excess Value

Panel A reports the Pearson correlation coefficients among change in bidders' excess value (ΔEV), change in excess operating cash flow (ΔECF), projected change in excess value (PΔEV) and unanticipated change in excess cash flows (ΔECF-PΔECF) from year –1 to year +1. Year 0 is the year of acquisition. Panel B reports the regression results in which the dependent variable is the change in bidders' excess value from year –1 to +1. The sample consists of 41 identifiable bidder-target firm-acquisitions over the 1991-97 period. We define an acquisition as "unrelated" when the 2-digit SIC code of the bidder's core business does not match that of the target firm, and as "related" when the 2-digit SIC code of the bidder's core business is identical to that of the target. We compute Cash Flow (CF) as operating income before depreciation divided by total sales (EBITD/Sales); Excess CF (ECF) by subtracting the imputed cash flow of bidders from raw cash flow; Imputed cash flow by multiplying the sales weights of bidders' business segments with the median operating cash flow of industry (at the 2-digit SIC code level) and size (within 50%-200% of the size) matched stand-alone firms with bidders' business segments. We compute Excess Value (EV) by using the Berger and Ofek (1995) methodology.

Panel A. Correlation Coefficients: Change in Bidders' Excess Value (ΔEV) in Small Subsample

	ΔECF -1 to +1	PΔEV -1 to +1	(ΔECF-PΔECF) -1 to +1
ΔEV -1 to +1	0.049	0.047	-0.102

Panel B. Cross-Sectional Regressions: Change in Bidders' Excess Value (ΔEV) in Small Subsample

Independent Variables	ΔEV -1 to +1	ΔEV -1 to +1	ΔEV -1 to +1	ΔEV -1 to +1	ΔEV -1 to +1	ΔEV -1 to +1
Intercept	-1.92 (-0.199)	-1.15 (-0.115)	-1.76 (-0.181)	-2.96 (-0.299)	-1.13 (-0.112)	-2.79 (-0.278)
Dummy = 1 if bidder makes an unrelated acquisition	-25.65 (-1.863)*	-25.67 (-1.843)*	-25.85 (-1.853)*	-25.82 (-1.857)*	-25.84 (-1.830)*	-26.01 (-1.846)*
ΔECF -1 to +1		0.25 (0.321)			0.22 (0.265)	
PΔEV -1 to +1			0.44 (0.311)		0.37 (0.254)	0.42 (0.294)
(ΔECF-PΔECF) -1 to +1				-0.41 (-0.535)		-0.40 (-0.521)
R^2	0.082	0.084	0.084	0.089	0.086	0.091
Adj-R^2	0.058	0.036	0.036	0.041	0.012	0.017

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

Appendix A. List of Target and Bidder Companies included in Our Small Subsample

Year of Acquisition	Target Name	Target SIC Code	Bidder Name	Bidder Core Business SIC Code	Type of Acquisition
1991	CoCa Mines Inc	10	Hecla Mining Co	10	Related
1991	Milton Ray Co	35	Sundstrand Corp	37	Unrelated
1991	Sedco Pipe Products	36	Harsco Corp	37	Unrelated
1991	Contel Corp	48	GTE Corp	48	Related
1992	Teleco Oilfield Service Inc	13	Baker Hughes Inc	35	Unrelated
1992	Cyclops Industries Inc	33	Armco Inc	33	Related
1992	Cessna Aircraft Co	37	Textron Inc	37	Related
1992	Midwest Commun Inc	48	CBS Inc	35	Unrelated
1992	Durr-Fillauer Medical Inc	51	Bergen Brunswig Corp	50	Unrelated
1993	Naylor Industries Inc	16	Insituform Tech. Inc	16	Related
1993	Engraph Inc	26	Sonoco Products	26	Related
1993	Ameriscribe Corp	27	Pitney Bowes Inc	35	Unrelated
1993	Applied Biosystems Inc	38	Perkin-Elmer Corp	38	Related
1993	Costar Corp	38	Corning Inc	32	Unrelated
1994	American Cyanamid Co	28	Amer. Home Products	28	Related
1994	Deltak Corp	34	Jason Inc	22	Unrelated
1994	Radiation Systems Inc	36	COMSAT Corp	48	Unrelated
1995	Offshore Pipelines Inc	16	McDermott Int'l Inc	35	Unrelated
1995	Multimedia Inc	27	Gannett Co, Inc	27	Related
1995	Shannon Group Inc	35	Manitowoc Co Inc	35	Related
1995	Joslyn Corp	36	Danaher Corp	35	Unrelated
1995	Margaux Inc	36	Dover Corp	35	Unrelated
1995	Bird Medical Technologies Inc	38	Thermo Electron Corp	38	Related
1995	Renaissance Comm.	48	News Corp Ltd	27	Unrelated

excess cash flows in related and unrelated acquisitions undertaken by multi-segment bidders over the 1991-1997 period. Our findings provide empirical evidence that supports a direct relation between excess valuation and cash flow changes subsequent to diversification. We find that a 10% decline in bidders' excess cash flows is associated with a 3.7% excess value loss. This relation between reductions in cash flows subsequent to the acquisition and declines in excess value is incremental relative to the diversification discount that has been previously identified in the literature. The evidence also shows that bidders acquiring unrelated targets experience larger excess cash flow decreases and valuation discounts than do bidders who buy related targets. These results are robust to the targets' excess cash flow and valuation characteristics. Overall, our results suggest that post-acquisition cash flow declines drive the diversification discount.■

Appendix A. List of Target and Bidder Companies included in Our Small Subsample (*Continued*)

Year of Acquisition	Target Name	Target SIC Code	Bidder Name	Bidder Core Business SIC Code	Type of Acquisition
1996	Dual Drilling	13	ENSCO Int'l	13	Related
1996	Uniroyal Chemical Co	28	Crompton & Knowles Corp	28	Related
1996	Brenco Inc	35	Varlen Corp	37	Unrelated
1996	Interpoint Corp	36	Crane Co	50	Unrelated
1996	Transcisco Industries Inc	37	Trinity Industries Inc	37	Related
1996	MediSense Inc	38	Abbott Labs	28	Unrelated
1996	Southern Pacific Rail Corp	40	Union Pacific Corp	40	Related
1996	Capital Cities/ABC Inc	48	Walt Disney Co	48	Related
1996	Spectravision Inc	48	Ascent Entertainment Grp	48	Related
1996	Coastwide Energy Services Inc	49	Tesoro Petroleum Corp	51	Unrelated
1996	Proler Int'l Corporation	50	Schnitzer Steel Ind. Inc	33	Unrelated
1997	Melamine Chemicals Inc	28	Borden Chemical Inc	30	Unrelated
1997	Calnetics Corp	30	Summa Industries Inc	30	Related
1997	Gelman Sciences Inc	35	Pall Corp	35	Related
1997	United Air Specialists Inc	35	CLARCOR Inc	35	Related
1997	Measurex Corp	36	Honeywell Inc	38	Unrelated
1997	TPC Corp	49	PacifiCorp	49	Related
1997	Milgray Electronics Inc	50	Bell Industries Inc	50	Related
1997	Eckerd Corp	59	J.C. Penney Co	59	Related

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