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Divestitures and the liquidity of the market for corporate assets ☆

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Abstract

The liquidity of the market for corporate assets plays an important role in explaining whether a firm divests a business segment, which segment the firm divests, and whether it divests a core segment or an unrelated segment. Firms are more likely to divest segments from industries with a more liquid market for corporate assets, unrelated segments, poorly performing segments, and small segments. Strikingly, the segment with the least liquid market is less likely to be divested than the best-performing segment, while the worst-performing segment is less likely to be divested than the segment with the most liquid market.

JEL classificaion: G30; G34

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1. Introduction

The finance literature has identified several reasons for corporate divestitures. Among these reasons, three are prominent: (1) to have specific assets operated by those who can operate them most efficiently (the efficiency explanation); (2) to make the firm more efficient by reducing its degree of diversification (the focusing explanation); and (3) to relax credit constraints (the financing explanation).[1] Given the need to restructure, however, not all firms actually divest assets. We find that about half of the firms that reduce their number of business segments do not appear to divest a segment; instead, most of these choose to reorganize segments internally. We argue that if a firm has fundamental reasons to restructure, asset liquidity plays an important role in the process. In particular, asset liquidity can explain (a) why some firms choose to divest a business segment while other similar firms choose to restructure it, and (b) which business segment is most likely to be divested.

The market for corporate assets is like other markets. That is, for a transaction to occur, there must be a buyer and a seller. Since there is no organized market where corporate assets are traded, a firm that wants to dispose of an asset has to search for a buyer. If the market for the asset is liquid, buyers are easy to find and, therefore, a firm can sell the asset at a price close to the present value of its cash flows. If the market for the asset is not liquid, however, the selling firm has to offer a liquidity discount to attract a buyer in order to sell the asset. Attempts to sell an asset in an illiquid market can thus yield a price below the firm's reservation price, so that no sale takes place (see Shleifer and Vishny, 1992).

Firms divest a segment to accomplish operating, funding, or strategic objectives, not because that segment is liquid. In this paper, we consider "focusing" firms, which we define broadly to be firms that reduce their number of reported segments, and explore how asset liquidity helps explain whether such firms divest assets and which assets they divest. Firms that divest segments can do so to improve performance and raise funds. Firms do not generally have to sell a specific asset: selling any asset unrelated to the main activity of the firm can make the firm more efficient if it is a poor diversifier, and selling any asset will raise funds.[2] Consequently, liquidity has the potential to be important for focusing firms that have a choice of which assets to sell. We therefore view firms that seek to become more focused as providing a good exploring ground for the role of asset liquidity. When firms seek to divest assets but have a choice of assets to sell, we expect that assets that are relatively more liquid assets are more likely to be divested (we call this the asset liquidity hypothesis). Further, not all firms that seek to divest assets succeed in doing so. Conditional on the need to divest, we expect firms with assets that are more liquid to be more likely to actually divest them (we call this the firm liquidity hypothesis).

[1] For papers that emphasize these reasons, see Hite et al. (1987) and Maksimovic and Phillips (2001) for the efficiency hypothesis, John and Ofek (1995) and Berger and Ofek (1999) for the focusing explanation, and Shleifer and Vishny (1992) and Lang et al. (1994) for the financing explanation.

[2] See Daley et al. (1997) provide evidence that focusing makes the firm's remaining segments more efficient.

To investigate our two hypotheses about the role of liquidity in divestitures, we require (1) a sample of focusing firms, (2) a set of comparison firms, (3) data on the firms' divested and retained assets, and (4) a measure of asset liquidity. The business segment disclosures of firms allow us to identify the firm's business segments and their characteristics. With the segment data, we can look at firms as portfolios of segments and measure the liquidity of the markets for these segments. We start with a sample of firms that have reduced their number of reported business segments. According to the literature, such a sample includes all focusing firms that have decided to divest or restructure.[3] Our analysis of this sample divides the firms into two categories: firms that divest segments and firms that stop reporting segments but do not divest them. We refer to the latter as discontinuing firms. Applied to business segments, the firm liquidity hypothesis predicts that a firm seeking to divest segments is more likely to succeed if it has segments that are more liquid, and the asset liquidity hypothesis predicts that selling firms are more likely to divest their more liquid segments.

The microstructure literature has investigated liquidity in financial markets extensively. This literature uses bid–ask spreads, market depth, and volume as proxies for liquidity. Unfortunately, the markets for corporate assets do not have market makers who hold an inventory of corporate business segments to facilitate transactions; bid–ask spreads and market depth cannot be measured. Shleifer and Vishny (1992) and others argue that a high volume of transactions in an industry is evidence of high liquidity; discounts that sellers must offer to attract buyers are smaller in more active markets. Consequently, we use the volume of transactions in an industry as a measure of the liquidity of that industry's corporate assets. We proxy the liquidity of the market for a segment by the liquidity of its industry. The liquidity of an industry (at the two-digit SIC code level) is measured by taking the ratio of the value of the industry's corporate transactions (excluding the divested segments analyzed in this study) to the value of the industry's total assets. The liquidity index of a firm is the asset-weighted average of the liquidity indexes of its segments.

To test the firm liquidity hypothesis, we have to investigate whether our divesting firms have segments that are more liquid than those of other firms with the same fundamental reasons to focus. We therefore compare our divesting firms to other focusing firms that do not divest. Using traditional accounting measures of financial condition and performance, we find that firms that reduce their number of segments but do not divest are statistically indistinguishable from those that divest segments. Firm characteristics emphasized by the focusing and financing explanations of divestitures cannot differentiate between these firms. In contrast, the firm liquidity hypothesis helps to explain why the actions of these firms differ. We show that focusing firms that divest a segment have higher liquidity indexes than focusing firms that do not divest a segment—evidence supportive of the firm liquidity hypothesis.

[3] Berger and Ofek (1999) use an increase in the Herfindahl index based on segment sales rather than the number of segments to identify focusing firms. However, firms that decrease their number of segments normally experience an increase in their Herfindahl index. In our sample, 159 divesting firms out of 168 experience an increase in the sales-based Herfindahl index of at least 5%.

And given that a firm divests a segment, a segment with a higher liquidity index has a higher probability of being divested even after controlling for the segment's performance and for other segment characteristics. This supports the asset liquidity hypothesis.

The paper proceeds as follows. We describe our sample in Section 2. In Section 3, we show that the financing and focusing explanations are useful for explaining why some diversified firms divest a segment while others do not. Nevertheless, these explanations cannot differentiate between focusing firms that divest and focusing firms that do not divest. In Section 4, however, we show that liquidity differentiates among these firms. In Section 5, we find that liquidity also helps explain which segment the selling firm divests. Section 6 concludes.

2. The sample

We expect the firm liquidity hypothesis to be most relevant when the focusing or financing explanations of divestitures apply. We therefore investigate divestiture decisions for a sample of focusing firms. We use the broadest definition of focusing in the literature (see, e.g., Comment and Jarrell, 1995; John and Ofek, 1995) in that we define a firm to be focusing if it reduces the number of segments it reports. To construct the sample, we therefore begin with firms that decrease the number of reported industry segments for the first time during the period 1979–1994. For fiscal years ending after December 15, 1977, SFAS No. 14 requires that firms report information for segments that represent 10% or more of consolidated sales. The Business Information File of Compustat contains this information. We use the Compustat Full-Coverage Industry Segment File (CISF) database, including the Research Tapes, to identify these firms. The Full-Coverage File consists of all companies that file 10-Ks with the Securities and Exchange Commission. We exclude firms that have either a Compustat SIC or an Industry Segment Identification (SID) code between 6000 and 6999 (financial services industry), or between 4900 and 4999 (regulated utilities). We also exclude American Depository Receipts and firms with assets below $100 million. This leaves us with a sample of 325 firms. Our sampling criteria are similar to the criteria used by Berger and Ofek (1999), except that they use the Herfindahl index instead of the number of segments as a measure of diversification. Like us, they only include firms with more than $100 million in assets. They also investigate press announcements to find out how firms focus, so that their final sample has only firms for which they can identify how the firm focused. To construct our sample of focusing firms that divest a segment, we investigate each firm using LEXIS NEXIS to identify firms for which the decrease in the number of segments coincides with an actual divesting transaction reported in the financial press. The following sources are used in LEXIS NEXIS: PR Newswire, The Financial Times, Reuters Financial Service, The New York Times, The Chicago Tribune, Business Wire, and The Wall Street Journal. These criteria result in an initial sample of 168 divesting firms, each with total assets in excess of $100 million.

The remaining 157 focusing firms have no divestiture; we call these discontinuing firms. An important concern with our approach is that the discontinuing firms might

be firms that, unbeknownst to us, actually divested one or more segments. We check in the Securities Data Corporation Mergers and Acquisitions Files for transactions involving these firms and find none. We also searched annual reports to investigate what happened to the segments no longer reported by the discontinuing firms, which we call the discontinued segments. We have annual reports available for 93 firms. For these 93 firms, 38 annual reports are uninformative. Twelve firms indicate that they changed their reporting. Ten firms discuss a restructuring that involves the merging of one segment into another. Nineteen firms report discontinued operations and sales of some assets, while seven firms report sales of assets without discontinued operations. Finally, two firms report a spinoff. There is a possibility that some of the firms that report asset sales or a spinoff should be in our divesting sample. However, we do not find a reported transaction corresponding to a segment divestiture for any of these firms. In any case, the classification of these firms does not affect our results.

The distribution of segments no longer reported, classified by whether or not they belong to divesting firms, is shown by year in Panel A of Table 1. The year 1981 has with 38 cases, the highest number of segments no longer reported. Not surprisingly, since our sample includes only the first time that a firm decreases its number of segments, the number of observations per year falls over time.

Panel B of Table 1 reports the decrease in the number of segments for the divesting firms as well as for the discontinuing firms. It shows that 142 divesting firms divested one segment, 22 divested two segments, and four divested three segments. Firms that decrease their number of reported segments for the first time but have no divestitures stop reporting 382 segments, or 2.43 segments per firm. In contrast, firms that divest a segment stop reporting 207 segments, or 1.23 segments per firm. In a number of cases, firms that stop reporting a segment in year t stop reporting all their existing segments from year $t-1$. In these cases, they report either only one segment in year t or one segment fewer than they did at $t-1$ but all the segments have a new name. As a result, 27 firms that had more than two segments before the change in reporting do not report any preexisting segment after the change. Finally, Panel C of Table 1 shows that most of our divestitures are in manufacturing (two-digit SIC code 20-39).

3. Comparison of divesting firms to other diversified firms and to discontinuing firms

Asset liquidity per se does not give rise to divestitures. In testing the firm liquidity hypothesis, we therefore attempt to control for the fundamental factors that initiate the divestiture process by selecting focusing firms for our sample. To investigate whether our sample selection criterion achieves this objective, we compare our divesting firms to other diversified firms and to focusing firms that do not divest a segment.

3.1. Comparison firms

We want to evaluate whether our divesting firms have fundamental reasons to divest that are consistent with the existing explanations for divestitures, and whether

Table 1
Sample breakdown
Our sample consists of all firms identified by the Compustat Business Information file as reporting a decrease in the number of segments over the period 1979–94. We exclude firms smaller than $100 million in assets, American Depository Receipts, and firms that have either a Compustat SIC or an Industry Segment Identification Code (SID) between 6000 and 6999 (financial services industry) and between 4900 and 4999 (regulated industries). Firms for which we could not confirm a transaction through *Lexis-Nexis* coinciding with the decrease in segments are labeled discontinuing firms. Firms for which we could identify a corresponding transaction are labeled divesting firms. Panel A presents the yearly distribution of the sample of firms. Panel B presents a frequency distribution of the number of segments within each firm that disappeared during the event year. Panel C presents the industry distribution over the following industries: mining (10–14), construction (15–19), manufacturing (20–39), transportation, communication, electric, gas, and sanitary services (40–49), wholesale trade (50–51), retail trade (52–59), and services (70–89).

Panel A: *Yearly distribution of sample firms*

	Divesting firms		Discontinuing firms		Total	
Event year	Frequency	Percent	Frequency	Percent	Frequency	Percent
79	9	5.36	22	14.01	31	9.54
80	11	6.55	13	8.28	24	7.38
81	21	12.50	17	10.83	38	11.69
82	12	7.14	19	12.10	31	9.54
83	9	5.36	9	5.73	18	5.54
84	18	10.71	16	10.19	34	10.46
85	14	8.33	9	5.73	23	7.08
86	14	8.33	13	8.28	27	8.31
87	11	6.55	4	2.55	15	4.62
88	10	5.95	6	3.82	16	4.92
89	9	5.36	8	5.10	17	5.23
90	5	2.98	2	1.27	7	2.15
91	9	5.36	8	5.10	17	5.23
92	5	2.98	2	1.27	7	2.15
93	6	3.57	6	3.82	12	3.69
94	5	2.98	3	1.91	8	2.46
Total	168	100	157	100	325	100

Panel B: *Decrease in reported segments*

	Divesting firms		Discontinuing firms		Total	
Decrease in segments	Frequency	Percent	Frequency	Percent	Frequency	Percent
1	142	84.52	125	79.62	267	82.15
2	22	13.10	24	15.29	46	14.15
3	4	2.38	5	3.18	9	2.77
4			1	0.64	1	0.31
5			2	1.27	2	0.62
Total	168	100	157	100	325	100

Panel C: *Two-digit major industry classification of sample firms*

	Divesting firms		Discontinuing firms		Total	
Two-digit SIC range	Frequency	Percent	Frequency	Percent	Frequency	Percent
10–14	4	2.4	4	2.6	8	2.5
15–19	.	.	1	0.6	1	0.3
20–39	131	78.0	134	85.4	265	81.7
40–49	9	5.4	3	1.9	12	3.6
50–51	13	7.7	5	3.2	18	5.5
52–59	6	3.6	6	3.8	12	3.7
70–89	5	3.0	4	2.6	9	2.8
Total	168	100	157	100	325	100

the focusing firms that do not divest have the same fundamental reasons. To do that, we compare our divesting firms to similarly diversified firms that do not focus (i.e., do not stop reporting a segment) as well as focusing firms that do not divest.

The sample of non-focusing firms is defined as follows. For each year t in which a sample firm reduces its number of segments, we identify a set of comparison firms. These are firms in the same annual sales decile in year $t-1$ with the same number of segments as the divesting firm, but that do not reduce their number of reported segments in year t. Size deciles are based on the annual sales deciles of all firms listed on Compustat. For any variable that we consider, we compare a sample firm to the average of its comparison firms provided that there are at least five comparison firms. In some analyses, the number of firms is reduced because the relevant data are not available for comparison or sample firms. The sample of focusing firms that do not divest is our sample of 157 discontinuing firms discussed in Section 2.

3.2. Size, growth, investment, and diversification efficiency

Table 2 compares characteristics of divesting firms, comparison firms, and discontinuing firms. The financing explanation would help explain divestitures if divesting firms are financially constrained relative to comparison firms. The focusing explanation would help explain why firms divest if divesting firms are poor diversifiers relative to comparison firms. Our results support both explanations. We find that divesting firms are growing significantly more slowly than comparison firms. The growth rates in sales, assets, capital expenditures, and cash flow are all significantly lower for divesting firms. The ratio of capital expenditures to sales for divesting firms is barely half that for comparison firms. The fact that divesting firms invest so little relative to the comparison firms is consistent with divesting firms being financially more constrained or having poorer investment opportunities. Divesting firms have significantly lower market-to-book asset ratios. We also compute the excess value measure of Berger and Ofek (1995). Unfortunately, the sample size is cut sharply when we compute excess value, which is calculated as the percentage difference between a firm's total value and the sum of imputed values for its segments as stand-alone entities.[4] Based on the excess value measure, divesting firms have a

[4] We follow the methodology of Berger and Ofek (1995) to calculate the firm's excess value due to its multi-segment character. This measure is calculated as the percentage difference between a firm's total value and the sum of imputed values for its segments as stand-alone entities. From the Compustat Industry Segment (CIS) database, we collect all non-financial (SIC codes outside the 6000–6999 range) single-segment firms during the 1984–95 period that satisfy the following criteria. The firm's total sales, as reported by Compustat, must be within a $\pm 1\%$ range of the total of the firm's segment sales, as reported in the CIS database. The market value of common equity (Compustat data items 199×25), the book value of debt (Compustat data items $5+34$), the carrying value of preferred stock (Compustat item 130), and sales (Compustat data item 12) must be available from the Compustat database. Finally, firm total sales must be at least \$20 million. Excess values that are smaller (larger) than -1.386 ($+1.386$), are considered outliers (see Berger and Ofek, 1995) and hence eliminated from the sample. Industry medians necessary to calculate the imputed values are based on four-digit SIC codes and a minimum of five firms to define an industry. Whenever the number of firms within an industry is less than five, we use the broader three-digit SIC codes, and, finally, if necessary, two-digit SIC codes.

Table 2
Firm characteristics
Columns present (respectively) medians and differences in medians of firm performance variables for the divesting firms (1), comparison firms (2), and the discontinuing firms (3). Each comparison value is calculated as the mean value of the performance measure for a portfolio that consists of a minimum of five firms in the same year, with the same number of segments, and in the same annual sales decile as the sample firm. Comparison firms cannot reduce the number of segments during the event year. Excess value is calculated as in Berger and Ofek (1995). The firm's q is defined as the sum of the book value of assets and the market value of equity net of the book value of equity divided by the book value of assets. The coefficient of variation in q (see Rajan et al., 2000) is multiplied by one hundred. Debt divided by assets denotes the firm's total liabilities divided by assets. The coverage ratio is defined as EBIT plus depreciation divided by interest expense. Cash includes inventories and is normalized by assets. Cash flow is defined as operating income before depreciation. Dividend yield is defined as the ratio of dividends per share to the market price per share. Statistical significance of the median difference is based on a Wilcoxon signed-rank test and is denoted with ***, **, and * for 1%, 5%, and 10% rejection levels, respectively.

	Divesting firms					Discontinuing firms			
	n	Sample (1)	Benchmark (2)	Difference (1)−(2)	p-Value	n	Sample (3)	Difference (1)−(3)	p-Value
A. Size									
Market value of equity	153	12.736	12.876	−0.056	*0.294*	131	12.208	0.528*	*0.070*
Sales	155	6.686	6.649	−0.066*	*0.097*	125	6.316	0.369	*0.273*
B. Growth rates, investment, and growth opportunities									
$(Sales_{t-1}/Sales_{t-2})-1$	153	0.067	0.103	−0.032**	*0.021*	123	0.102	−0.036	*0.177*
$(Assets_{t-1}/Assets_{t-2})-1$	153	0.075	0.105	−0.046***	*0.004*	123	0.089	−0.014	*0.539*
Cap. $Exp_{t-1}/Sales_{t-2}$	152	0.050	0.084	−0.035***	*0.001*	122	0.046	0.004	*0.324*
(Cap. Exp_{t-1}/Cap. Exp_{t-2})−1	152	0.104	0.168	−0.053	*0.296*	120	0.066	0.039	*0.237*
Excess value	91	−0.246	−0.108	−0.140**	*0.016*	69	−0.104	−0.142	*0.128*
q	151	1.089	1.243	−0.127**	*0.023*	124	1.037	0.052	*0.355*
Coefficient of variation in q	119	81.147	86.775	−3.022	*0.419*	71	91.170	−10.023	*0.287*
C. Leverage									
$Debt_{t-1}/Assets_{t-1}$	144	0.540	0.611	−0.080***	*0.001*	123	0.535	0.005	*0.947*
Coverage ratio	144	5.140	5.133	0.120	*0.557*	119	5.103	0.082	*0.999*
D. Cash flow and dividends									
$Cash/Assets_{t-1}$	144	0.031	0.063	−0.030***	*0.001*	123	0.029	0.002	*0.947*
Net $Income_{t-1}/Sales_{t-2}$	153	0.038	0.046	−0.007**	*0.011*	123	0.043	−0.005	*0.713*
Cash $Flow_{t-1}/Sales_{t-2}$	153	0.111	0.150	−0.034***	*0.001*	123	0.121	−0.010	*0.713*
Dividend yield	142	0.033	0.042	−0.014***	*0.001*	112	0.035	0.002	*0.715*

substantially larger diversification discount than comparison firms, which is consistent with their being poor diversifiers. We also estimate the Rajan et al. (2000) diversity measure.[5] According to this measure, diversification is more costly when investment opportunities differ more across segments. We find that this measure does not differ between divesting firms and comparison firms.

Turning to the discontinuing firms, we find that they are not significantly different from the divesting firms. Strikingly, the discontinuing firms invest little relative to the comparison firms, and their capital expenditures grow much less than the comparison firms'. However, the excess value of the discontinuing firms is similar to the excess value of the comparison firms. Unfortunately, the excess value estimate is available for only 69 discontinuing firms. Tobin's q can also be used as a proxy for whether a firm is a good diversifier. We compute Tobin's q as the ratio of the book value of assets minus the book value of equity plus the market value of equity to the book value of assets. The median Tobin's q for discontinuing firms is insignificantly lower than the Tobin's q for divesting firms, but is significantly lower than the Tobin's q for the comparison firms.

3.3. Cash flow and financial condition

In the third panel of Table 2, we report measures of leverage and interest coverage. Perhaps surprisingly given that they appear financially constrained, divesting firms have a lower ratio of debt to assets than comparison firms. The coverage ratio of divesting firms is insignificantly lower than for comparison firms. We also present cash to assets, net income to sales, cash flow to sales, and dividend yield for divesting firms and comparison firms. Comparison firms are significantly more profitable than divesting firms based on net income to sales or cash flow to sales. In addition, the ratio of cash to assets of divesting firms is half that for comparison firms. Finally, divesting firms have a significantly lower dividend yield than comparison firms. This evidence indicates that divesting firms are more likely to be credit constrained than comparison firms. Thus, our divesting firms seem to be poor diversifiers that are likely to be credit constrained.

3.4. Logit regressions

Based on accounting ratios, divesting firms differ significantly from diversified firms that do not focus, but do not differ significantly from focusing firms that do not divest. Consequently, the focusing and financing explanations cannot explain why some focusing firms divest and others do not. We now check whether this conclusion holds in multiple regressions. Panel A of Table 3 presents logit regressions in which

[5] Rajan et al. (2000) use the coefficient of variation of the weighted segment's q, CVQ, which is calculated as $\mathrm{CVQ} = \sqrt{\sum_{i=1}^{n}(\mathrm{SALES}_i/\sum_{i=1}^{n}\mathrm{SALES}_i) \times (q_i - \bar{q})^2}/\bar{q}$, where subscript i refers to segment i of the diversified firm, n to the total number of segments in the diversified firm, SALES to the segment sales, q is the median level of q for all Compustat firms in the same two-digit SIC code as the segment's two-digit SIC code, and $\bar{q}$ is the sales-weighted average q across the n segments of the diversified firm.

Table 3
Firm-level logit regression results
Logit regressions with a binary dependent variable that takes on the value zero for a comparison firm and one for a divesting firm (Panel A) and takes on the value zero for a discontinuing firm and one for a divesting firm (Panel B). Cells present (respectively) the coefficient, p-value, and the slope (defined as $\partial E[y]/\partial \mathbf{x}$, for the binary model $y_{(0,1)} = \boldsymbol{\beta}'\mathbf{x} + \varepsilon$, evaluated at the mean of $\mathbf{x}$), the pseudo-R^2, and the value of -2 times the log likelihood. Cash flow (CF) is defined as operating income before depreciation. Capital expenditures (CPX) are the firm's net capital expenditures. Debt divided by assets denotes the firm's total liabilities divided by assets. Excess value is calculated as in Berger and Ofek (1995). The coefficient of variation in q (see Rajan et al., 2000) is multiplied by one hundred. Accounting numbers are based on the firm-level data. The numerator in the ratios is measured in year -1 and the denominator in year -2. Statistical significance is denoted with ***, **, and * for 1%, 5% and 10% percent rejection levels, respectively.

Model	Intercept	CF/sales	CPX/sales	Debt/assets	Excess value	CVQ
Panel A: Divesting versus comparison firms						
(1)	−2.670***	−3.366***	−0.401	−0.558		
	0.001	*0.006*	*0.795*	*0.342*		
		−0.788	−0.100	−0.139		
	Pseudo-R^2 = 1.30%		−2 log likelihood = 1,200.7			
(2)	−2.733***	−2.805*	−1.455	−0.105	−0.400*	
	0.001	*0.082*	*0.561*	*0.894*	*0.041*	
		−0.670	−0.362	−0.026	−0.100	
	Psuedo-R^2 = 1.94%		−2 log likelihood = 753.6			
(3)	−2.564***	−1.233	−3.112	0.005		0.005*
	0.001	*0.374*	*0.135*	*0.994*		*0.089*
		−0.306	−0.756	0.001		0.001
	Pseudo-R^2 = 0.75%		−2 log likelihood = 871.2			
Panel B: Divesting versus discontinuing firms						
(1)	0.128	−0.810	1.273	−0.144		
	0.668	*0.619*	*0.524*	*0.852*		
		−0.234	0.432	−0.042		
	Pseudo-R^2 = 0.12%		−2 log likelihood = 387.3			
(2)	−0.112	0.383	1.301	0.246	−0.387	
	0.804	*0.887*	*0.719*	*0.815*	*0.256*	
		0.092	0.245	0.062	−0.891	
	Psuedo-R^2 = 0.63%		−2 log likelihood = 242.9			
(3)	0.761	−0.979	0.769	0.114		−0.005
	0.153	*0.673*	*0.786*	*0.906*		*0.241*
		−0.283	0.146	0.023		−0.001
	Pseudo-R^2 = 0.63%		−2 log likelihood = 258.2			

the dependent variable takes a value of one if the firm divests and zero otherwise. The regressions are estimated using the combined sample of divesting and comparison firms. Regression (1) uses cash flow, capital expenditures, and leverage as independent variables. Firms with higher cash flow are less likely to divest, but the

other variables are not significant. The coefficient on cash flow is consistent with the efficiency, focusing, and financing explanations; the lack of significance of the other coefficients is not supportive of the financing explanation. Regression (2) adds excess value to the regression, but data constraints reduce the number of divesting firms in the sample by more than one third. Firms with a higher excess value (or, equivalently, a lower diversification discount) are less likely to divest. Cash flow is again negative and significant in that regression. Regression (3) uses the Rajan et al. (2000) measure of diversity instead of excess value. Firms with a higher diversity measure are more likely to divest. Cash flow is not significant in that regression.

In Panel B of Table 3, we estimate logit regressions in which the dependent variable takes a value of one for divesting firms and zero for discontinuing firms. The explanatory variables in the first regression are cash flow, capital expenditures, and leverage. No variable is significant. As in Panel A, Regression (2) adds the excess value and Regression (3) adds the Rajan et al. (2000) measure of diversity. Still, no coefficients are significant. In other regressions not shown, we find that other firm characteristics are not helpful in distinguishing between divesting and discontinuing firms. Tobin's q has a significant positive coefficient in some specifications.

These regressions show that while the focusing and financing explanations for divestitures apply to our sample, they cannot help explain why some focusing firms divest a segment and others do not.

4. The liquidity of the market for corporate assets and the divestiture decision

With the focusing and financing explanations for divestitures, a firm is more likely to divest if the market for a segment is more liquid since it is more likely to get a price close to the segment's fundamental value. With the financing explanation, variation in the liquidity of the market for corporate assets across industries helps explain why, among firms facing similar financial pressures, some firms divest a segment and others do not. With the focusing explanation, a firm is more likely to divest non-core segments when the market for non-core segments is more liquid. Consequently, the liquidity of the market for corporate assets can help to explain why, among otherwise comparable firms, some divest assets and others do not. However, a firm with no other motivation to divest a segment will not do so simply because the liquidity of the market for that segment increases. Consequently, absent a motive for divestiture, there is no reason for liquidity to differentiate between divesting and comparison firms. We therefore have no predictions for how the liquidity of segments of comparison firms differs from the liquidity of segments of divesting firms.

An asset market is more liquid if assets can be sold quickly without a discount. If the market has more transactions taking place, it means that buyers and sellers are active in that market, so that a potential seller can find buyers without having to discount the price as much relative to its fundamental value as it would in a less liquid market. We therefore use the "intensity" of corporate asset transactions within an industry as our proxy for that industry's asset market liquidity. We

construct our segment liquidity measure by estimating a liquidity index at the two-digit SIC code level each year. To construct this index, we first collect from the SDC Mergers and Acquisitions database all corporate transactions at the two-digit SIC code level for each sample year. Corporate control transactions include all disclosed and completed leveraged buyouts, tender offers, spinoffs, exchange offers, minority stake purchases, acquisitions of remaining interest, privatizations, and equity carve-outs.[6] Buybacks (e.g., repurchases and self-tenders) are excluded from the sample. We then take the ratio of the value of corporate control transactions in a year (excluding the divestitures in our sample) to the total book value of assets of firms in the two-digit SIC code for that year as the industry's liquidity index. We recognize that the SIC codes reported by Compustat will differ from those of SDC (see Kahle and Walkling, 1996). We do not believe this materially affects our results. It is important to remove the divestitures in our sample from the transactions used to compute the liquidity index, otherwise an industry would show increased liquidity because of the divestitures we are examining.

The numerator of the liquidity index uses market values of transactions. In contrast, the denominator uses book values of industry assets. This makes it possible for the liquidity index for an industry to exceed one. We only use the liquidity index if it is between zero and one and if the industry has at least ten firms. Because of these constraints, we are unable to obtain a liquidity index for 16 out of 753 segments. Our results are qualitatively similar if we use the market value of firms (defined as total assets minus the book value of equity plus the market value of equity) in the denominator of the index rather than the book value of assets of firms. The liquidity measure based on book value is more appropriate because market values incorporate anticipatory takeover premia.

Fig. 1 shows how the liquidity index varies across industries and across time. Note that the figure includes all industries, not just those of our sample. Liquidity could not explain much if it varied little through time or across industries. Fig. 1 shows that there is significant variation in the index. Some industries have a low index throughout the period. Other industries have a high index during part of the period. No industry has a consistently high index value. We have index values for 73 industries. All but five industries have at least one year in which the index value is zero, indicating the absence of any transactions. The grand average of the index values is 0.05. Ten industries have an average that exceeds 0.10. The highest industry average of the index is 0.23. Fig. 2 shows the average and the standard deviation of the index for each industry. We again see substantial variation in these statistics across industries.

[6] We are grateful to Jeff Allen for providing us the sample of carve-outs used in Allen and McConnell (1998). In the sample period we start with 218 equity carve-outs with the announcement year and two-digit SIC code. For 199 observations we are able to find the corresponding transaction value. We use two methods to find the transaction value. First, we match the observations through the SDC New Issues database and find a transaction value for 170 observations. For 29 observations we use CRSP to obtain a proxy for the transaction value by taking the share price times the number of outstanding shares on the first trading day for the carved-out entity. For 19 observations we are unable to find a transaction value using either methodology. Our results are unchanged by taking into account carve-outs.

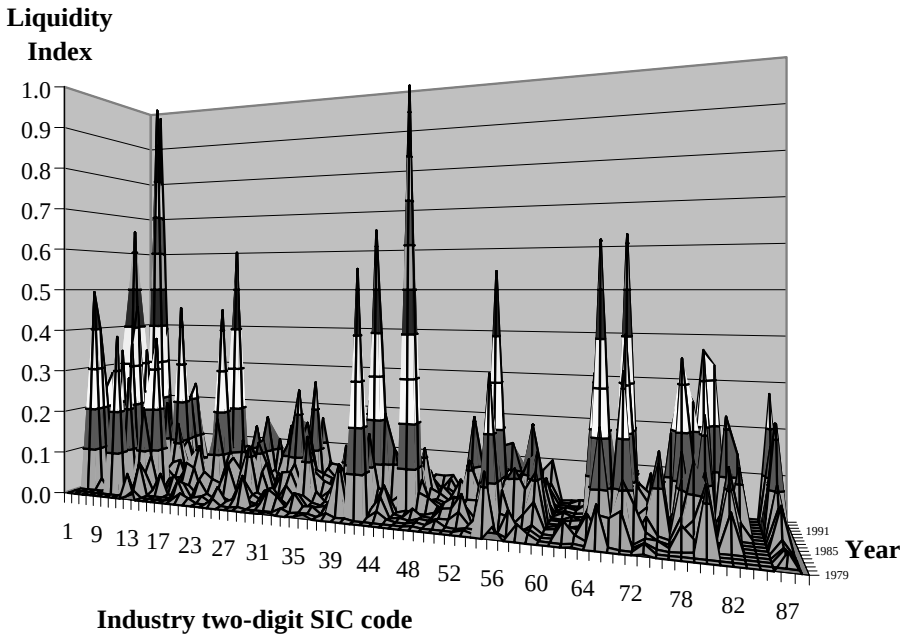

Fig. 1. Asset liquidity across time and industries. The graph plots average liquidity values for each of 73 industries defined at the two-digit SIC code level for each of the sample years 1979–1994. Liquidity is defined as the ratio of the value of all corporate control transactions in a year (excluding the sample observations) from SDC and the Allen and McConnell (1998) equity carve-out database divided by the total assets of firms in the same two-digit SIC code for that year.

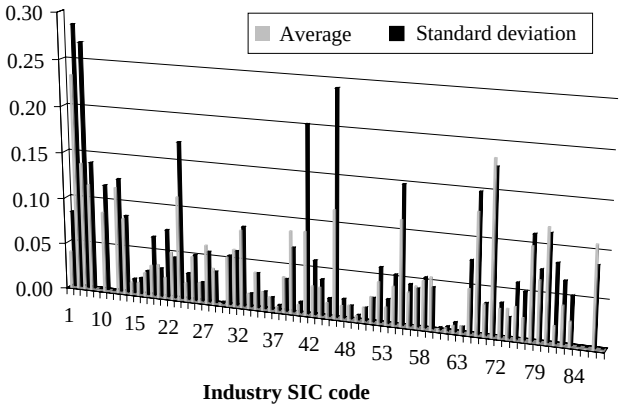

Fig. 2. Average and standard deviation of asset liquidity across industries. The graph plots the average and standard deviation of the liquidity values for each of 73 industries defined at the two-digit SIC code level for the sample years 1979–1994. Liquidity is defined as the ratio of the value of all corporate control transactions in a year (excluding the sample observations) from SDC and the Allen and McConnell (1998) equity carve-out database, divided by the total assets of firms in the same two-digit SIC code for that year.

Though the question of why one industry might have more corporate control transactions than another is important, we make no attempt to answer it in this study.[7] One reason for a high level of corporate transactions is that an industry has suffered a shock that makes it optimal for corporate assets to be rearranged within the industry. A situation in which many parties want to trade is one in which liquidity is high. Yet there is more to liquidity than industry clustering. In particular, we construct a liquidity index that attempts to measure whether divesting a segment would represent a large transaction relative to the volume of transactions in the industry. We therefore use as the liquidity index the assets of the segment divided by the sum of the value of the transactions in the industry as obtained from SDC. This index yields qualitatively similar but statistically weaker conclusions.

At the firm level, we define liquidity to be the asset-weighted average of the liquidity index corresponding to the industries of the firm's segments. In Panel A of Table 4, we report the asset-weighted average liquidity index for divesting firms, comparison firms, and discontinuing firms. We have no prediction for how the liquidity index of divesting firms should differ from the liquidity index of comparison firms, but we expect the liquidity index of divesting firms to be higher than the liquidity index of discontinuing firms. Panel A shows that there is no significant difference between the liquidity index of divesting firms and comparison firms. As expected, however, the liquidity index of divesting firms is significantly higher than the liquidity index of discontinuing firms. It is important to remember that in Table 2, none of the firm characteristics related to the focusing and financing explanations are significantly different between the divesting firms and the discontinuing firms. The liquidity index therefore has the potential to explain why, among otherwise comparable firms, some firms divest a segment and others do not.

If firms want to sell assets to raise funds, the weighted average of the liquidity indexes of all segments is not the relevant measure of liquidity. A firm might have mostly illiquid segments, but might also have one segment that is highly liquid. The financing explanation predicts that a firm considering selling assets to raise cash would be more likely to sell the segment that is highly liquid. Consequently, the liquidity index of the most liquid segment of the firm is another important liquidity measure to consider. We call this measure the firm's maximum liquidity index. Although we have no prediction for how the maximum liquidity index of divesting firms should compare to the maximum liquidity index of comparison firms, our univariate analysis shows that the maximum liquidity index is lower for the divesting firms than for the comparison firms. We expect the maximum liquidity index of divesting firms to be higher than the maximum liquidity index of discontinuing firms. Our univariate results indicate that it is insignificantly higher.

[7] Mitchell and Mulherin (1996) document that corporate acquisitions are clustered in industries. Mulherin and Boone (2000) confirm that this is true for the 1990s also, but surprisingly they show that there is an insignificant negative correlation between the rate of acquisitions and the rate of divestitures across industries. Industry shocks also play an important role in the model of Maksimovic and Phillips (2002). Andrade and Stafford (2000) document the role of industry expansions and contractions in mergers and acquisitions over the last three decades.

We now investigate whether adding liquidity to the multiple regressions of Table 3 helps explain why, among firms that have similar fundamental reasons to divest, some firms divest a segment while others do not. Since liquidity is not a sufficient motive for divestiture, it is not surprising that liquidity is not significant in differentiating between comparison firms and divesting firms. This is shown in Regressions (1) and (2) in Panel B of Table 4. It is also not significant in other specifications not shown here. But according to the firm liquidity hypothesis, liquidity should help differentiate between divesting and discontinuing firms. Section 3 shows that the focusing and financing explanations for divestitures apply equally well to divesting and discontinuing firms. Therefore, when comparing divesting firms to discontinuing firms, we are comparing firms that are similar in their fundamental reasons to divest, and we expect the firms with the more liquid segments to be more likely to divest a segment. We find that this is the case. In Regressions (1) and (2) in Panel C of Table 4, we find that the probability that a firm is a divesting firm increases significantly with both firm liquidity and maximum liquidity. In fact, the liquidity variable is the only significant variable in these regressions. The liquidity variable is also significant if we add it to regressions (2) and (3) in Panel B of Table 3. Thus, unlike firm characteristics such as cash flow, capital expenditures, excess value, and leverage, liquidity can explain why some firms stop reporting a segment without divesting it while others stop reporting a segment and divest it.

5. Which segments are divested?

In this section, we investigate the firm's choice of segment to divest. The focusing explanation predicts that unrelated segments are more likely to be divested to increase the firm's concentration on core assets. The efficiency explanation predicts that segments that perform poorly relative to their industry are more likely to be divested. The financing explanation predicts that segments with low cash flow and high capital expenditures are more likely to be divested because they drain the resources of credit-constrained firms. Our asset liquidity hypothesis builds on the focusing and financing explanations, asserting that a firm is more likely to divest a segment if the market for that segment is liquid.

We first compare performance and liquidity variables for divested and retained segments. Logit regressions are then used to evaluate the importance of these variables as determinants of the segment divestiture decision. We conclude the section by showing that segment liquidity is helpful in explaining whether a firm divests a core segment or an unrelated segment.

5.1. Divested segments versus retained segments

Table 5 provides information on how the SIC codes of the divested and retained segments relate to the main SIC code of the firm. Fewer than 9% of the divested segments have the same four-digit SIC code as the parent and only 30% of the divested segments have the same two-digit SIC code as the parent. Consequently,

Table 4
Firm liquidity
In Panel A, columns present (respectively) medians and differences in median of firm performance variables for the divesting firms (1), the comparison firms (2), and the discontinuing firms (3). Each comparison value is calculated as the mean value of the performance measure for a portfolio that consists of a minimum of five firms in the same year, with the same number of segments, and in the same annual sales decile as the sample firm. Comparison firms cannot reduce the number of segments during the event year. Logit regressions in Panel B and C have a binary dependent variable that takes on the value zero for a comparison firm and one for a divesting firm (Panel B) and takes on the value zero for a discontinuing firm and one for a divesting firm (Panel C). Cells present, respectively, the coefficient, p-value, and the slope (defined as $\partial \mathrm{E}[y]/\partial \mathbf{x}$, for the binary model $y_{(0,1)} = \boldsymbol{\beta}'\mathbf{x} + \varepsilon$, evaluated at the mean of $\mathbf{x}$), the pseudo-R^2, and the value of -2 times the log likelihood. Cash flow (CF) is defined as operating income before depreciation. Capital expenditures (CPX) are the firm's net capital expenditures. Debt divided by assets denotes the firm's total liabilities divided by assets. The firm liquidity index is defined as the size-based weighted average of the firm's segment values for the liquidity index. Segment liquidity is calculated as the ratio of the value of corporate control transactions within a year and two-digit SIC class and to the assets of all firms on Compustat in the same year and two-digit SIC class. The maximum liquidity is the maximum value for the liquidity index within the firm for a divested/non-reported segment. Accounting numbers are based on the firm-level data. The numerator in the ratios is measured in year -1 and the denominator in year -2. Statistical significance of the median difference in Panel A is based on a Wilcoxon signed-rank test. Statistical significance is denoted with ***, **, and * for 1%, 5%, and 10% rejection levels, respectively.

Panel A: Univariate analysis

	Divesting firms					Discontinuing firms			
	n	Sample (1)	Benchmark (2)	Difference (1)−(2)	*p*-Value	*n*	Sample (3)	Difference (1)−(3)	*p*-Value
Liquidity index	145	0.019	0.029	−0.002	*0.160*	125	0.012	0.013*	*0.062*
Maximum liquidity index	145	0.035	0.063	−0.013***	*0.001*	125	0.025	0.012	*0.271*

Model	Intercept	CF/sales	CPX/sales	Debt/assets	Firm liquidity	Maximum liquidity
Panel B: Divesting versus comparison firms						
(1)	−2.696***	−3.381**	−0.410	−0.569	1.040	
	0.001	*0.006*	*0.790*	*0.332*	*0.614*	
		−0.791	−0.102	−0.141	0.260	
	Pseudo-R^2 = 1.32%		−2 log likelihood = 1,200.5			
(2)	−2.684***	−3.362***	−0.424	−0.564		0.277
	0.001	*0.006*	*0.785*	*0.337*		*0.793*
		−0.787	−0.106	−0.140		0.069
	Pseudo-R^2 = 1.30%		−2 log likelihood = 1,200.7			
Panel C: Divesting versus discontinuing firms						
(1)	−0.046	−1.118	1.471	−0.363	9.641**	
	0.883	*0.498*	*0.464*	*0.647*	*0.028*	
		−0.256	0.347	−0.086	2.456	
	Pseudo-R^2 = 1.44%		−2 log likelihood = 382.2			
(2)	−0.026	−0.833	1.093	−0.194		3.536*
	0.933	*0.610*	*0.586*	*0.803*		*0.075*
		−0.183	0.234	−0.458		0.919
	Pseudo-R^2 = 1.02%		−2 log likelihood = 383.9			

Table 5
Industry classification of divesting firms, discontinuing firms, divested segments, and discontinued segments
Cells present the frequency and percentage of segments with the same (different) SIC code as the firm, for the divestiture sample and the sample of discontinuing firms. Panel A is for segments that have disappeared and Panel B is for retained segments. SIC codes are measured at the four-digit, three-digit, and two-digit level.

SIC code level	Number of segments with same (different) SIC code as firm				Number of segments with same (different) SIC code as firm			
	Divesting firms				Discontinuing firms			
	Frequency		Percent		Frequency		Percent	
Panel A: Relatedness between firm and segments no longer reported								
4-digit	18	(191)	8.6	(91.4)	62	(320)	16.2	(83.8)
3-digit	24	(185)	11.5	(88.5)	94	(288)	24.6	(75.4)
2-digit	63	(146)	30.1	(69.9)	168	(214)	44.0	(56.0)
Panel B: Relatedness between firm and retained segments								
4-digit	110	(357)	23.6	(76.5)	49	(213)	18.7	(81.3)
3-digit	170	(297)	36.4	(63.6)	77	(185)	29.4	(70.6)
2-digit	254	(213)	54.4	(45.6)	112	(150)	42.8	(57.3)

whether we use the four-digit or the two-digit SIC code, almost 70% of the divested segments can be classified as belonging to an industry unrelated to the core activities of the parent. In contrast, more than 50% of the retained segments belong to the same two-digit SIC code as the firm. To capture the segments least likely to be related to the main activities of the firm, we classify segments that share their two-digit SIC code with the firm as core segments and the other segments as non-core segments. The typical divested segment is therefore a non-core segment, which is consistent with the focusing hypothesis.

Table 6 compares divested segments to retained segments. It is clear that the divested segments are smaller than the retained segments. Divested segments are less efficient, and they have poorer growth opportunities based on both sales growth and the median q of the two-digit SIC code of the segment.[8] Divested segments also are less profitable, and have lower capital expenditures.[9] Finally, as predicted by the

[8] Recent papers by Chevalier (2000) and Whited (2001) provide evidence that segments of conglomerates may differ systematically from their single-segment firm counterparts, making the median q of the two-SIC code industry of the segment a questionable estimate of the segment's growth opportunities. However, sales growth uses within-firm data rather than industry data to proxy for investment opportunities and leads to the same conclusion as the industry median q.

[9] Wysocki (1998) finds that segments no longer reported are less profitable. Based on the work of Francis et al. (1996), he raises the concern that firms write down assets of segments in preparation for selling them or liquidating them. If this were an important issue in our data, we would overstate the importance of profitability as a determinant of the divestiture decision.

Table 6
Univariate analysis for divested, discontinued, and retained segments
Cells represent median values of performance. Segment accounting data are taken from the Compustat CISF Full-Coverage Segment File. Cash flow (CF) is defined as operating profits plus depreciation. Tsales denotes the aggregated sales for the firm. Capital expenditures (CPX) are net capital expenditures (i.e., gross capital expenditures minus depreciation). Segment median industry q is calculated as the fraction of the book value of total assets minus the book value of equity plus the market value of equity and the book value of total assets of all Compustat firms with the same two-digit SIC code as the segment. Segment liquidity is calculated as the ratio of the value of corporate control transactions within a year and two-digit SIC class to the assets of all firms on Compustat in the same year and two-digit SIC class. The difference in q is between divested (non-reporting) non-core segments and all retained segments. The change in the coefficient of variation in Tobin's q (ΔCoefficient of Variation in q) is denoted in percent change. The t subscript refers to the year relative to the focusing year t. Ratios are truncated at minus and plus one, growth variables at -100% and $+200\%$. Asset and sales numbers are in \$ millions. Statistical significance of the difference in medians is denoted with ***, **, and * for 1%, 5%, and 10% rejection levels, respectively.

	Divesting firms				Discontinuing firms	Difference between divested and discontinued segments	
	Divested (1)	Retained (2)	Difference (1)−(2)	p-value	Discontinued (3)	Difference (1)−(3)	p-Value
Size							
ln $(\text{Sales})_{t-1}$	4.621	5.452	−0.831***	*0.001*	4.817	−0.196	*0.436*
ln $(\text{Assets})_{t-1}$	4.240	5.158	−0.918***	*0.001*	4.312	−0.072	*0.430*
Growth rates, investment, and growth opportunities							
$(\text{Sales}_{t-1}/\text{Sales}_{t-2})-1$	0.016	0.047	−0.031	*0.163*	0.021	−0.005	*0.911*
$(\text{Sales}_{t-1}/\text{Tsales}_{t-2})-1$	0.097	0.231	−0.134***	*0.001*	0.146	−0.049***	*0.003*
$(\text{Sales}_{t-2}/\text{Tsales}_{t-3})-1$	0.107	0.223	−0.116***	*0.001*	0.156	−0.049**	*0.016*
$((\text{Sales}/\text{Tsales})_{t-1}/(\text{Sales}/\text{Tsales})_{t-2})-1$	−0.030	0.003	−0.033**	*0.014*	−0.017	−0.013	*0.150*
$((\text{Sales}/\text{Tsales})_{t-2}/(\text{Sales}/\text{Tsales})_{t-3})-1$	−0.033	−0.007	−0.026	*0.198*	−0.015	−0.018	*0.284*
Net $\text{CPX}_{t-1}/\text{Sales}_{t-2}$	0.027	0.040	−0.013***	*0.006*	0.036	−0.009***	*0.008*
Net $\text{CPX}_{t-2}/\text{Sales}_{t-3}$	0.032	0.042	−0.010**	*0.022*	0.038	−0.006	*0.151*
$(\text{CPX}_{t-1}/\text{CPX}_{t-2})-1$	−0.150	−0.016	−0.134**	*0.022*	−0.003	−0.147*	*0.056*
$(\text{CPX}_{t-2}/\text{CPX}_{t-3})-1$	0.056	0.014	0.042	*0.658*	0.029	0.027	*0.618*
Segment Median Industry q	1.156	1.269	−0.113**	*0.024*	1.197	−0.041	*0.737*
ΔCoefficient of Variation in q ($\times 100\%$)	−0.151	−0.171	0.020	*0.709*	−0.186	0.035	*0.686*
Cash flow							
$\text{CF}_{t-1}/\text{Sales}_{t-2}$	0.071	0.122	−0.051***	*0.001*	0.100	−0.029**	*0.011*
$\text{CF}_{t-2}/\text{Sales}_{t-3}$	0.097	0.131	−0.034***	*0.001*	0.112	−0.015*	*0.082*
Liquidity measures							
Segment Liquidity	0.025	0.016	0.009**	*0.014*	0.020	0.004*	*0.067*
Segment Liquidity (Core Segments)	0.022	0.018	0.004	*0.623*	0.021	0.000	*0.999*
Segment Liquidity (Non-core Segments)	0.027	0.016	0.110**	*0.012*	0.020	0.006*	*0.086*

asset liquidity hypothesis, the liquidity index of divested segments is significantly higher than the liquidity index of retained segments.

In Section 3, we find that, among firms that stop reporting a segment, firms with a higher liquidity index are more likely to divest that segment. If the focusing firms that divest do so because they have segments that are more liquid, we should find that divested segments are more liquid than discontinued segments. We find that divested segments are more liquid than discontinued segments, but the difference in liquidity between divested and discontinued segments is only significant for non-core segments. There are few other significant differences between divested and discontinued segments. Discontinued segments are larger, more profitable, and have better investment opportunities than divested segments. The size difference between divested and discontinued segments could be interpreted as further evidence of the importance of liquidity, if one believes, as Shleifer and Vishny (1992) argue, that liquidity decreases with size.

A potentially confounding factor in this analysis is that firms are required to report segments with sales that exceed 10% of the firm's total sales. Thus, small segments might no longer be reported simply because their sales fall below the threshold. This could explain why firms stop reporting a segment without divesting it. They would still want to keep the segment, so that they would not divest it, but they would not be required to report it. We do not find that the 10% threshold explains our results. Instead, we find that divested segments are more likely to have sales below 10% of total sales than discontinued segments. For the firms that divest segments, 46.9% of the divested segments have sales of less than 10% of the firm's total sales. In contrast, only 19.9% of segments retained by these firms have sales of less than 10% of the firm's total sales. For the discontinuing firms, 36.4% of the discontinued segments have sales below 10%, and 22.5% of the segments still reported have sales below 10%.

5.2. *Industry-adjusted comparisons*

The efficiency explanation predicts that divested segments are inefficient relative to their industry. In Table 7, we provide industry-adjusted comparisons of divested segments relative to retained segments and discontinued segments. The table reveals that divested segments perform poorly relative to their industry. The fact that these segments invest less than their industry and have lower sales growth is consistent with divesting firms being financially constrained. The discontinued segments also have lower industry-adjusted sales growth and capital expenditures than their industry, which is consistent with the discontinuing firms having financial constraints. Since their level of cash flow to sales significantly exceeds that of their industry, however, the discontinued segments do not appear to be less efficient than their industry.

Segments retained by divesting firms have higher industry-adjusted cash flows. However, the retained segments invest less than their industry, which is again consistent with the hypothesis that divesting firms are financially constrained. Finally, retained segments have lower sales growth than their industry.

Table 7
Univariate analysis for industry-adjusted segment performance
Cells represent median values of industry-adjusted performance of divested segments, discontinued segments, and retained segments. Segment accounting data are taken from the Compustat CIS Full-Coverage Segment File. Cash flow (CF) is defined as operating profits plus depreciation. Tsales denotes the aggregated sales for the firm. Capital expenditures (CPX) are net capital expenditures (i.e., gross capital expenditures minus depreciation). Industry adjustments are based on the difference between the variable and the median value of all Compustat firms with the same two-digit SIC code in the fiscal year before the event. Ratios are truncated at minus and plus one and capital expenditures growth at minus and plus 200%. Asset and sales numbers are in $ millions. Statistical significance of the difference in medians is denoted with ***, **, and * for 1%, 5%, and 10% rejection levels respectively.

		Segments no longer reported (1)			Retained segments (2)			Difference (1)−(2)	
Variable	Event	*n*	Median	*p*-Value	*n*	Median	*p*-Value	Median	*p*-Value
CF/sales	Divestiture	120	−0.017***	*0.001*	290	0.024***	*0.001*	−0.042***	*0.001*
	Discontinued	231	0.013***	*0.009*					
	Difference		−0.030***	*0.008*					
CPX/sales	Divestiture	118	−0.024**	*0.030*	289	−0.016***	*0.001*	−0.008***	*0.005*
	Discontinued	230	−0.016***	*0.001*					
	Difference		−0.008**	*0.013*					
CPX growth	Divestiture	113	−0.228***	*0.001*	276	−0.082	*0.227*	−0.145**	*0.037*
	Discontinued	220	−0.102	*0.181*					
	Difference		−0.126*	*0.054*					
ln (Sales)	Divestiture	119	0.707***	*0.001*	290	1.219***	*0.001*	−0.512***	*0.002*
	Discontinued	231	0.739***	*0.001*					
	Difference		−0.032	*0.910*					
Sales growth	Divestiture	119	−0.060***	*0.001*	289	−0.022***	*0.003*	−0.037**	*0.012*
	Discontinued	231	−0.062***	*0.001*					
	Difference		0.002	*0.910*					

5.3. Relative ranking for divested segments

Stein (1997) argues that an advantage of internal capital markets is that they can better allocate resources by ranking performance across divisions. This suggests that firms might choose to divest segments that perform poorly relative to other segments within the firm. In Table 8, we examine how the relative ranking of the segments within the firm helps explain the divestiture decision. To construct the table, we rank segments according to various financial characteristics. We then compare these rankings to the likelihood of the segment being divested. Consider, for example, all firms with five segments with the segments ranked within each firm according to liquidity. If liquidity does not matter for the divestiture decision, we would expect 20% of the segment divestitures to occur in each of the five ranked segments. We use a Pearson chi-square statistic to test for an equal distribution of divestitures across the ranked segments. We then report in the table the number of segments no longer reported for each rank for each characteristic. The first characteristic we consider is the cash flow performance of the segment. We find that 49 out of 124 (40%) divested segments have the lowest cash flow performance in their firm. At the same time,

Table 8
Relative ranking of within firm performance of divested segments
Cells present the number of divested segments within a ranking for different variables. The number of divisions denotes the total number of segments within a firm and the rank denotes the relative magnitude, from low to high, of the variable. Cash flow (CF) is defined as operating profits plus depreciation. Capital expenditures (CPX) are net capital expenditures (i.e., gross capital expenditures minus depreciation). Segment q is calculated as the book value of total assets minus the book value of equity plus the market value of equity divided by the book value of total assets of all Compustat firms with the same two-digit SIC code as the segment. Segment liquidity is calculated as the ratio of the value of all corporate control transactions within a year and two-digit SIC class and the assets of all firms on Compustat in the same year and two-digit SIC class. The last row denotes the total number of divested segments, n, for each firm. Ties are assigned to the higher rank. The last column denotes the Pearson χ^2 test-statistic for a uniform distribution across ranks. Significance is denoted with ***, **, and * for 1%, 5%, and 10% rejection levels and indicates rejection of equality of the variation across the rankings.

		Number of segments within firm							Pearson χ^2 test-statistic
Variable	Rank	2	3	4	5	6	7	n (row)	
CF/sales	1 (low)	9	17	14	5	3	1	49	
	2	5	7	9	8	9	1	39	39.15*
	3		6	7	4	1	0	18	
	4			6	3	3	1	13	
	5				3	1	0	4	
	6					0	0	0	
	7 (high)						0	0	
ln(Sales)	1 (low)	13	21	20	6	6	0	66	
	2	1	7	10	8	4	2	32	72.65***
	3		2	5	4	2	0	13	
	4			1	4	1	1	7	
	5				1	2	0	2	
	6					2	0	2	
	7 (high)						0	0	
CPX/sales	1 (low)	11	11	10	5	4	2	43	
	2	3	8	10	6	4	1	32	22.15
	3		10	6	7	2	0	25	
	4			9	3	4	0	16	
	5				3	3	0	6	
	6					0	0	0	
	7 (high)						0	0	
	n	14	30	36	24	17	3		
CPX growth	1 (low)	8	13	13	3	4	0	41	
	2	6	5	6	7	5	2	31	28.10
	3		7	10	5	2	0	24	
	4			4	4	4	0	12	
	5				5	1	1	2	
	6					0	0	0	
	7 (high)						0	0	

Table 8 (*continued*)

Variable	Rank	Number of segments within firm							Pearson χ^2 test-statistic
		2	3	4	5	6	7	*n* (row)	
Segment *q*	1 (low)	5	12	8	6	2	0	33	
	2	9	8	7	7	1	0	32	23.09
	3		10	8	0	4	1	23	
	4			11	2	2	0	15	
	5				8	5	0	13	
	6					3	0	3	
	7 (high)						0	0	
Segment liquidity	1 (low)	1	5	4	2	1	0	13	
	2	11	4	6	3	1	0	25	66.73***
	3		18	14	1	1	0	34	
	4			9	7	0	0	16	
	5				9	3	0	12	
	6					8	1	9	
	7 (high)						2	2	
	n	14	30	36	24	17	3		

however, 20 divested segments have the best cash flow performance in their firm. Strikingly, 66 divested segments are the smallest in their firm, but only seven are the largest. A segment is more likely to be divested when it is small rather than when it performs poorly. Forty-one divested segments have the highest industry *q* among firm segments but 33 have the lowest *q*, suggesting that segment growth opportunities measured by the industry *q* of single-segment firms in the industry are not important to the divestiture decision. However, among divested segments, 51% have the highest liquidity index in the firm and only 12% have the lowest liquidity index.

From this analysis, it is clear that a segment's size, liquidity, cash flow, and relatedness to the firm's core activities affect its probability of divestiture. Using a Pearson chi-square test, we can reject at the 10% level or better the equality of the variation across ranks for cash flow over sales, sales, and liquidity for the divested segments. The largest segment and the most illiquid segment are highly unlikely to be divested. Table 8 provides an interesting perspective on the economic importance of segment performance versus liquidity: the least-liquid segment is less likely to be divested than the best-performing segment, while the worst-performing segment is less likely to be divested than the most-liquid segment.

5.4. Logit analysis predicting which segments are divested

Given that divested segments are smaller, are more liquid, and have lower cash flow than other segments in their firm, we investigate whether each one of these variables is important. In Table 9, we report logit regressions for the probability that a segment is divested rather than retained. We first use a segment's cash flow, size,

Table 9
Retained versus divested segments logit regression results
Logit regressions with a binary dependent variable that takes on the value one for divested segments and zero for retained segments. Models (1)–(3) are for the divesting firms and model (4) is for the discontinuing firms. Cells represent (respectively) the coefficient, p-Value, and the slope (defined as $\partial E[y]/\partial \mathbf{x}$, for the binary model $y_{(0,1)} = \boldsymbol{\beta}'\mathbf{x} + \varepsilon$, evaluated at the mean of $\mathbf{x}$), the pseudo-R^2, and the value of -2 times the log likelihood. Cash flow (CF) is defined as operating income before depreciation. Capital expenditures (CPX) are the firm's net capital expenditures. Industry median variables are calculated as the median value of all Compustat firms within the same two-digit SIC code as the segment during the same year. The non-core dummy takes on a value of one when the 2-digit segment SIC code is different from the two-digit firm SIC code. Segment liquidity is calculated as the ratio of the value of all corporate control transactions within a year and two-digit SIC class and the assets of all firms on Compustat in the same year and 2-digit SIC class. The size < 10% dummy is equal to one if the segment sales are less than 10% of the firm's total sales and zero otherwise. Accounting numbers are based on the firm-level data. The numerator in the ratios is measured in year -1 and the denominator in year -2. Statistical significance is denoted with ***, **, and * for 1%, 5%, and 10% rejection levels, respectively.

Model	Intercept	CF/sales	Ind. median CF/sales	CPX/sales	Ind. median CPX/sales	Segment sales/ firm sales	Non-core dummy	Segment q	Segment liquidity	Size < 10% dummy
(1)	−0.183	−2.269**		−0.567		−4.992***	0.512*	−0.044	6.653**	
	0.774	*0.043*		*0.721*		*0.001*	*0.071*	*0.912*	*0.011*	
		−0.384		−0.104		−0.833	0.086	−0.007	1.121	
	Pseudo-R^2 = 16.14%					−2 log likelihood = 393.8				
(2)	−0.382	−2.433**	0.115	−0.945	3.367	−4.943***	0.484*	−0.078	6.741***	
	0.572	*0.047*	*0.969*	*0.548*	*0.567*	*0.001*	*0.087*	*0.734*	*0.009*	
		−0.401	0.019	−0.161	0.467	−0.829	0.082	−0.015	1.112	
	Pseudo-R^2 = 16.76%					−2 log likelihood = 393.5				
(3)	−0.629	−2.377**	0.044	−1.071	3.861	−4.454***	0.516*	−0.022	6.321**	0.249
	0.412	0.049	*0.991*	*0.496*	*0.543*	0.001	*0.074*	*0.958*	0.016	*0.470*
		−0.403	0.007	−0.182	0.662	−0.747	0.086	−0.004	1.082	0.046
	Pseudo-R^2 = 16.91					−2 log likelihood = 383.8				
(4)	1.438**	0.634	−1.271	−1.586	−10.274	−0.071	−0.028	−0.152	0.493	0.987***
	0.043	*0.446*	*0.743*	*0.281*	*0.084*	*0.897*	*0.931*	*0.745*	*0.824*	*0.004*
		0.137	−0.279	−0.347	−2.233	−0.021	−0.007	−0.034	0.102	0.214
	Pseudo-R^2 = 5.28%					−2 log likelihood = 398.4				

capital expenditures, industry q, liquidity index, and whether it is a core segment as independent variables. The dependent variable is set to one for divested segments and zero for retained segments. In Regression (1), we find that a segment is more likely to be divested if its cash flow is low, if it is a small segment, if it is a non-core segment, and if its liquidity index is high. The significance for non-core segment dummy is consistent with the focusing explanation. The significance of the cash flow variable is consistent with the financing explanation.

A segment with low cash flow can be divested for two separate reasons. One reason, provided by the efficiency explanation, is that the firm is unsuccessful at operating the segment efficiently. A second reason, coming from the financing explanation, is that the segment is consuming excessive corporate resources because its cash flow is too low and, as a result, a financially constrained firm can be less constrained without the segment. The efficiency explanation implies that a segment is more likely to be divested when the industry median cash flow is higher, since this means that the performance of the segment is poor relative to its industry. In Regression (2), we test this explanation by adding the industry median cash flow to Regression (1) as well as industry median capital expenditures. We find that the industry medians have insignificant coefficients. As a result, performance relative to the industry does not appear to be an important determinant of the divestiture decision. Following the model of Maksimovic and Phillips (2002) in which industry shocks reduce the comparative advantage of small segments proportionately more than the comparative advantage of large segments within a firm, one could also interpret industry cash flow as a proxy for industry shocks. With this interpretation, the evidence suggests that industry shocks are unlikely to be a sufficient explanation for why firms are more likely to divest small segments since the size variable remains significant after controlling for industry cash flow.

To this point, the importance of segment size is surprising. As previously mentioned, it is possible that the effect of size is due to segments that are below 10% of sales, so that the firm would no longer have to report them. In Regression (3), we add an indicator variable for segments smaller than 10% of firm sales. This dummy variable is not significant. Regression (4) estimates the same regression for discontinued segments. In Regression (4), the indicator variable is significant, while the other segment characteristics, except for the industry median capital expenditures to sales, are not significant. A second possibility is that size matters for the divested segments because, as advanced by Shleifer and Vishny (1992), liquidity is inversely related to size. If we add the log of segment sales or segment assets to the regressions, it has a negative coefficient but is not significant. Recent models (see, in particular, Meyer et al., 1990; Scharfstein and Stein, 2000) are consistent with the hypothesis that small segments draw rents in diversified firms. These models provide an alternate explanation for the importance of segment size in the divestiture decision.

5.5. *Core versus non-core segments*

In the analysis of Shleifer and Vishny (1992), firms sell assets to raise funds. Their analysis predicts that the most liquid segments of firms that divest to raise funds are

more likely to be non-core segments than core segments. If firms that divest segments are firms whose core business is performing poorly and if this poor performance is the result of an industry effect, the bidders who would be best equipped to operate a core segment are financially constrained as well and hence will not be the highest bidders. Pulvino (1998) finds evidence supportive of the prediction that buyers outside the industry pay less. We find that for divesting firms, the most liquid segment among non-core segments has a significantly higher liquidity index than the most liquid segment among core segments. The importance of liquidity is again apparent: among firms that divest segments, the greater liquidity of non-core segments raises the possibility that the firm divests a non-core segment not because it wants to focus but because that segment can be sold most advantageously.

To investigate further whether differences in liquidity explain why some firms divest core segments and others divest non-core segments, we estimate a logit regression that takes a value of one if the firm divests a core segment and zero otherwise. The focusing argument for why firms divest non-core segments is that they are inefficient diversifiers. We proxy for the extent to which a diversified firm is an efficient diversifier by its excess value measure. The efficiency explanation predicts that a firm is more likely to divest segments that underperform relative to their industry. We therefore include in the regression the difference between the weighted average of industry-adjusted cash flows for core segments and non-core segments. The greater that difference, the more likely it is that a firm will divest non-core segments. Finally, the liquidity argument implies that a firm is more likely to divest a non-core segment if the liquidity of the non-core segment is higher than the liquidity of the firm's core segments. We therefore use as independent variables the liquidity index of the core (non-core) segment with the highest liquidity index defined as Max Core (Max Non-Core).

The regression estimates are as follows (p-values in parentheses):

Divest core segment =		
−1.056	+24.186 Max Core	−59.565 Max Non-Core
(*0.072*)	(*0.043*)	(*0.030*)
+1.063 Excess value	+3.473 Industry-adjusted cash flow difference.	
(*0.224*)	(*0.484*)	

Segment liquidity is a significant determinant of whether a firm divests core or non-core segments. The higher the maximum core liquidity, the more likely it is that a core segment is divested. The higher the maximum non-core liquidity, the less likely it is that a core segment is divested. The excess value and segment cash flow performance measures have no explanatory power in explaining why a firm divests core or non-core segments. These results are inconsistent with the view that firms shed non-core segments because they are poor diversifiers or because the segments underperform their industry.

Our regression estimates provide limited support for explanations of divestitures that rely on firms discovering that diversification is costly for them. Moreover, the coefficient for excess value is positive, as one would expect with the focusing

explanation. In the regressions of Table 9, firms are more likely to divest non-core segments, and the intercept of the regression has this same interpretation. However, specific measures of diversification costs cannot explain this result. We also include a variable to investigate whether a firm is more likely to divest segments that would reduce the Rajan et al. (2000) diversity measure the most. The coefficient of this variable is never significant.

6. Conclusion

In this paper, we examine why firms divest assets and which assets they divest. The literature has argued that firms divest because they are inefficient diversifiers, have segments that could be operated more efficiently elsewhere, and/or are financially constrained. Though we find empirical support for these reasons in our sample, we show that they are only part of the story. These reasons cannot distinguish between "focusing" firms that reduce their number of segments through divestitures and those that do not. We show that differences across firms in asset liquidity can help explain why, among apparently similar firms, some firms divest a segment and others do not. We measure an industry's asset liquidity by the volume of corporate transactions relative to total industry assets. We show that firms with segments in industries that are more liquid are more likely to divest segments and we provide evidence that segment liquidity helps explain which segment is retained or divested by a divesting firm. Consistent with the arguments of Shleifer and Vishny (1992), part of the reason for why firms divest unrelated segments is that they tend to be in more liquid industries. These results are supportive of the hypothesis that segment liquidity plays an important role in explaining the divestiture decision.

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