The Design of Financial Policies in Corporate Spinoffs*

by

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Abstract

We investigate differences in financial leverage in pairs of firms that emerge from corporate spinoffs. These capital structure choices are of special interest because they are made in the absence of information problems or market timing considerations, and without regard for the costs of adjusting capital structure. Our evidence shows that managers allocate more financial leverage to the firm with a greater proportion of fixed assets, higher cash flow return on assets, and lower variability of industry operating income to assets. Unlike most cross-sectional studies of capital structure, we provide direct evidence that the design of capital structure is related to the traditional idea of ability to cover debt payments as well as to the default-related costs of assets. We find no evidence of agency costs and governance characteristics affecting the choice of leverage.

The Design of Financial Policies in Corporate Spinoffs

Spinoffs provide a unique opportunity to investigate how characteristics of assets influence managers' design of capital structure. In a corporate spinoff managers break up a company by allocating a segment of a firm's assets to a newly formed publicly traded company. Shares of the new company are distributed *pro rata*, as a stock dividend, to stockholders of the parent company. In addition to dividing the firm's assets, managers design the financial structures of the two companies and allocate existing debt to the parent and the spun-off unit. Thus, assets and financial claims are distributed between the two companies, while keeping the total amounts of assets and debt unchanged. A well-documented example is the 1993 Marriott spinoff analyzed by Parrino (1997). In that case, managers created quite different capital structures for the firms that emerged with different asset characteristics.

We investigate the financial leverage of companies that emerge from corporate spinoffs. In particular, we test whether the difference in financial leverage in pairs of firms created by spinoffs is explained by the default-related costs of assets and a firm's ability to cover debt payments. We also explore the possibility that the agency costs of equity affect the design of financial policies, and examine whether the allocation of leverage depends on governance characteristics.

A distinctive feature of our analysis is that we study the consequences of managerial decisions that jointly determine the composition of assets and financial structure. This feature is important for two reasons. First, there are few instances where managers make decisions that comprehensively affect both asset and capital structure without a significant infusion or distribution of capital. Spinoffs are such a situation. The capital structure decisions that result from spinoffs do not involve the issuance of securities. The design of capital structure in spinoffs, therefore, is not determined by the information problems implied by the pecking order hypothesis. This is desirable because the pecking order hypothesis implies that a firm does not have a target leverage ratio.

The second reason to study spinoffs is that spinoffs are discrete events that require managers to design the post-spinoff firms' capital structures. For firms in general it is difficult to identify an explicit financial policy at an arbitrary point in time. The cross-sectional relation between financial leverage and factors believed to determine financial leverage is obscured to

some extent by the costs of adjusting capital structure, as documented by Gilson (1997), or simply by managerial inertia. Because the costs of adjusting capital structures are not incremental to the decision of how to allocate debt in spinoffs, the capital structure decision in spinoffs presumably is independent of adjustment costs. Relative to most cross-sectional studies of capital structure, therefore, we believe our study of spinoffs represents a cleaner test and provides more direct evidence of how traditional notions of default-related costs and coverage determine capital structure.

The 104 spinoffs in our sample occurred in the years 1979-1997 and distributed a substantial portion of pre-spinoff assets. At the end of each of the first three fiscal years following a spinoff, we measure the difference in financial leverage for each pair of firms that emerges from a spinoff. We relate differences in leverage in pairs of post-spinoff firms to differences in various characteristics of assets as well as to differences in attributes of the CEO and board of directors.

Controlling for the significant influence of differences in industry peers' financial leverage, our tests consistently show that firms with a higher ratio of property, plant and equipment to total assets are allocated greater financial leverage. We believe these findings are consistent with the argument that more financial leverage is matched with assets that lead to lower expected costs of financial distress. They are also consistent with the argument of Myers (1977) that assets with lower liquidation costs support more debt financing.

Most of our tests also show that the level and variability of cash flow influence the allocation of financial leverage. We believe these findings are particularly important. We suspect that most finance scholars would intuitively argue that the level and variability of cash flow are important determinants of leverage. However, there is little evidence to support this view. In fact, most research finds a negative relation between profitability and leverage, as implied by the pecking order hypothesis. In the design of capital structure in spinoffs, a decision that is free of information problems, cash flow or profitability is related positively to the use of financial leverage. Thus, we find evidence that the ability to cover debt payments determines the design of capital structure.

One concern is that managers' ability to redesign capital structure may be constrained by characteristics of the parent firm's debt, such as the use of specific assets as collateral. These constraints presumably weaken the observed relation between differences in leverage and

differences in asset characteristics. After controlling for the effects of some of these constraints, we observe significant relations between differences in leverage and our measures of differences in asset characteristics.

Proxies for managerial incentives, however, do not explain differences in financial leverage. In our sample of spinoffs, we find no support for agency theories that imply capital structure choices serve managers' private interests.

I. Prior literature

Our study complements a number of studies of corporate leverage ratios, such as Baskin (1989), Gaver and Gaver (1993), Long and Malitz (1984), Smith and Watts (1992), and Titman and Wessels (1988). For the most part, these studies document a cross-sectional relation between asset characteristics of firms and their leverage ratios at arbitrary points in time. It is unclear, however, to what extent these relations reflect the outcome of conscious decisions of managers. For instance, a series of highly profitable years increases a company's retained earnings and obscures the relation between debt and coverage because the issuance of debt occurs discretely. Our contribution is to document the link between asset characteristics and financial structure in situations where managers explicitly match assets and financial leverage.

Our paper is most closely related to a contemporary study by Dittmar (2000). Dittmar also uses a sample of spinoffs to study capital structure choices made by the pre-spinoff firm. While our overall results provide similar conclusions, we believe there are important differences between her study and ours. Dittmar's main focus is on explaining the subsidiary's capital structure, while our approach relies on explaining the *difference* between the parent and subsidiary's capital structure following the spinoff. In the absence of new net financing around the time of the spinoff, we believe that capital structure for the spinoff entities are co-determined. By examining the difference in leverage of the companies that emerge from a spinoff, we can observe how managers cope with the constraint that the spinoff firm faces in designing two separate capital structures from the parent company's capital structure. A second important difference between Dittmar's approach and ours is that Dittmar compares the subsidiary's capital structure to its predicted capital structure based on a cross-sectional model of all firms that were not in the spinoff sample. We believe that cross-sectional model estimation is subject to some of the same criticism that motivates the use of spinoffs to study capital structure choice, most

notably information problems and the cost of continually adjusting leverage in response to past profits. Finally, our study differs from Dittmar's in that we also investigate the effect of agency and governance variables on leverage allocation in a spinoff.

Our paper is also related to Alderson and Betker's (1995) and Gilson's (1997) studies of the capital structures of distressed firms that reorganized under Chapter 11 of the U.S. Bankruptcy Code. Alderson and Betker find that firms with high liquidation costs of assets emerge from financial distress with relatively low debt ratios, and with more flexible forms of debt. Gilson finds that tax status is important, and that firms with more net operating loss carryforwards have less debt. Our study is similar in that we investigate situations in which managers must make explicit choices about how to design financial structure. However, our study is different from Gilson's in that spinoffs do not occur in the presence of financial distress.

Our paper also contributes to the literature on corporate spinoffs. Although in most cases operating and strategic considerations appear to drive the parent firm's decision to spin off assets to shareholders, it is not uncommon for company documents to state that a spinoff would allow heterogeneous business units to establish capital structures that are better suited to the nature of their assets or growth prospects. The idea that spinoffs lead to potential gains from separating business units with different optimal capital structures is also discussed in Hite and Owers (1983), John (1993) and Jongbloed (1998).[1]

Most research on spinoffs focuses on the valuation consequences of spinoffs or on subsequent performance.[2] There is limited evidence on how spinoffs affect capital structures. Schipper and Smith (1983), however, report that the average ratio of book value of debt to total assets is 0.59 prior to the spinoff and is 0.51 for the spunoff subsidiary firms. In contrast,

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[1] Previous research identifies several additional motives for corporate spinoffs. Daley, Mehrotra, and Sivakumar (1997) and Desai and Jain (1999) identify gains from focusing operations as an important reason for spinoffs. Krishnaswami and Subramaniam (1999) argue that the advantage of spinoffs, relative to other methods of divestiture, is to correct the market's undervaluation of a firm's assets. Jongbloed (1998) explains that spinoffs can improve contracting with managers and overcome rent-seeking behavior among competing divisional managers. Schipper and Smith (1983) and Hite and Owers (1983) also cite the possible benefits of reduced regulatory constraints.

[2] Hite and Owers (1983), Schipper and Smith (1983), Miles and Rosenfeld (1983), and Krishnaswami and Subramaniam (1999) focus on the stock price effects of announcements of spinoffs. Cusatis, Miles and Woolridge (1993) examine long-run stock returns following spinoffs. Daley, Mehrotra, and Sivakumar (1997) study the stock price response to announcements of spinoffs as well as subsequent accounting performance. Desai and Jain (1999) study stock returns and operating performance following spinoffs. Burch and Nanda (1999) estimate and compare the excess value of firms prior to and following spinoffs.

Michaely and Shaw (1995) provide evidence that spinoffs of master limited partnerships result in increases in leverage for the spunoff companies and reductions in leverage for the parent companies. This evidence, however, does not tell us how the capital structures of firms in spinoffs are established.

Daley, Mehrotra, and Sivakumar's (1997) study of spinoffs provides some evidence that is related to the main question examined in our study. They contrast cross-industry spinoffs, involving a parent and subsidiary in different lines of business, with own-industry spinoffs, involving firms in the same industry. They find that cross-industry spinoffs lead to a small decline in the leverage ratio of the combined assets following the spinoffs, but there is no change in leverage associated with own-industry spinoffs. This pattern is consistent with the argument that spinoffs that undo diversification, and therefore likely increase the variability of cash flows, lead to declines in financial leverage. We explicitly explore the role of cash flow variability, among other factors, in our study.

II.   Potential determinants of financial policy choices in spinoffs

A.   Determinants implied by value maximization

Our primary tests presume that managers choose financial structures that are aligned with stockholders' interests. Given that a spinoff allocates shares of the spunoff firm *pro rata* to current stockholders, alignment of managers' and stockholders' interests implies that spinoffs maximize the combined equity value of the firms that emerge from a spinoff. Because no capital is raised in spinoffs, there are no confounding effects of conflicts between old and new securityholders as implied by the pecking order hypothesis.

We examine four potential determinants of capital structure, based on traditional theories that relate the costs of leverage to characteristics of assets. The first determinant is the nature of the firm's assets, as represented by liquidation costs. Myers (1977) and Williamson (1988) argue that assets that lose more value in financial distress or liquidation are matched with more adaptable or flexible financing arrangements, such as equity. We test whether the relative liquidation costs of assets of the parent and subsidiary companies in our sample of spinoffs explain the allocation of debt between the two companies. As suggested by Alderson and Betker (1996), we use two proxies for liquidation costs, the ratio of fixed assets to total assets and the

ratio of market value to book value of assets. We assume that high liquidation costs are associated with low ratios of fixed to total assets and high market to book ratios.

The second determinant of capital structure is the amount of free cash flow available for the payment of interest, measured as operating income before depreciation minus capital expenditures. Other things equal, firms that generate lower free cash flow face a higher likelihood of default and correspondingly higher costs of debt financing. Lower cash flow also means greater probability of incurring financing costs to meet cash shortfalls or of foregoing profitable investment opportunities. To minimize these costs we expect that in a spinoff more debt is assigned to the company that generates more free cash flow. In contrast, the pecking order hypothesis of Myers (1984) implies that the firm with greater free cash flow will finance internally and have less leverage. However, the pecking order hypothesis describes financing choices over time, and makes no predictions about how capital structure is initially designed.

The third determinant of capital structure is the variability of cash flows. In general, we expect firms with more variable cash flows to use less debt financing. Debt is costlier for firms with greater variability in cash flows because the likelihood of default, as well as the need for costly external financing, is greater. Greater variability leads not only to higher expected default costs, but also to higher agency costs associated with conflicts of interest between creditors and stockholders. For example, the underinvestment problem identified by Myers (1977) is worsened when debt is riskier. To minimize these costs, in a spinoff we expect a greater allocation of financial leverage to the firm with lower variability of cash flows.

Unfortunately, measuring the variability of the spunoff unit's prior cash flows is difficult, because it is not possible to reliably measure the past performance of the spunoff subsidiary. Instead, we match each parent and spunoff subsidiary with the set of all firms in the Compustat database with the same three-digit SIC code, and calculate the variability of the operating income scaled by assets for these matched sets. We use the median standard deviations of the industry-matched firms as proxies for the variability of cash flows of the parent and spunoff companies. The number of years of data used to generate industry standard deviation ranges from three to twenty years, with a median of nine years.

The fourth variable we investigate is firm size. Smith and Watts (1992) and Berger, Ofek, and Yermack (1997), for example, document a positive association between financial leverage and company size, as measured by total assets. However, the reasons for an association

between company size and use of debt are unclear. It is possible that firm size is correlated with lower volatility in operating earnings. It is also possible that size is negatively related to growth prospects, so smaller firms face greater default-related costs and use more equity financing. We examine whether the allocation of debt between companies is related to their relative sizes, as measured by total assets. We obtained the data to construct all of the financial variables from the Compustat database.

B. Determinants implied by managerial self-interest

As shown by Dann and DeAngelo (1988) and Berger, Ofek, and Yermack (1997), financing policies can also be shaped by self-serving behavior of managers. Jensen (1986) and Stulz (1988) describe the private benefits managers derive from avoiding debt financing. Presumably if the oversight of managers is weak, or if the incentives of managers and stockholders are poorly aligned, firms will employ low amounts of financial leverage. Lower leverage is attractive to managers because low debt financing reduces the pressure to generate cash flow and therefore decreases the prospects of default and dismissal. Alternatively, however, some entrenched managers may prefer a high degree of debt financing in order to increase their proportionate voting power in the firm and reduce the likelihood of a takeover.

We investigate the possibility that the design of capital structures in spinoffs reflects the desires of entrenched managers. Controlling for financial determinants of leverage, we test whether less financial leverage is assigned to the post-spinoff firm that retains the pre-spinoff company's chief executive officer. We also examine the role of managers' incentives, measured by the proportions of the firm's equity owned by the chief executive officer and all officers and directors, as well as by the size and composition of the board of directors. We hypothesize that lower leverage will be employed by the firm that retains the pre-spinoff chief executive officer, has lower ownership of managers, or has a weaker board of directors. The data for these tests come from proxy statements for both the parent and the spinoff subsidiary approximately one year after the spinoff.[3]

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[3] We are unable to incorporate a satisfactory measure of the tax benefits of debt. Measures derived directly from Compustat data, such as those proposed by Graham (1996), are unacceptable because any measure of tax status is influenced in part by a firm's level of debt financing. Thus, these measures do not provide an *ex ante* measure of tax benefits of debt financing. To overcome this problem of joint determination, we investigated John Graham's personal database of simulated measures of marginal tax

III. Descriptive statistics

A. Sample

The 104 spinoffs in our sample occurred in the period 1979 through 1997. Our initial list of spinoffs came from Daley, Mehrotra, and Sivakumar (1997), who analyzed spinoffs through 1991. We identified more recent spinoffs by searching *The Wall Street Journal Index* and obtaining a list of divestiture events from Securities Data Corporation.

Our sample firms satisfy three requirements. First, both the parent and the subsidiary firm must be included in the Compustat Annual Industrial File at the fiscal year-end following the spinoff. Second, we must be able to identify the ex-dividend date and the terms of the spinoff. Third, we require that all shares of the subsidiary be distributed in the spinoff. We eliminate spinoffs that were preceded by a public offering of shares of the spunoff company and partial spinoffs in which the parent retains ownership of shares following the spinoff.

Our sample is described in table 1. The number of spinoffs per year, shown in the second column, ranges from one to thirteen. Nearly one-half of the spinoffs occurred in the last four years of our sample period. The third column shows that the pre-spinoff firms are quite large. The median value of the parent's assets prior to the spinoff is $1.59 billion. There is, however, considerable variation in the sizes of the parent, ranging from a median of $28 million in 1982 to nearly $16 billion in 1986. The last column shows that the fraction of assets spunoff is also substantial. At the median 21% of the parent's assets were distributed in the spinoff.

B. Analysis of differences in leverage

Research on capital structure focuses almost exclusively on the relative amounts of debt and equity financing. Consistent with this literature, we define debt as long-term debt plus debt in current liabilities net of cash and equivalents. We subtract cash and equivalents from debt because cash should offset some effects of financial leverage. Moreover, in many spinoffs, debt allocation is achieved by having the subsidiary selling new debt and transferring the proceeds to the parent just before the spinoff. The parent's debt position is then offset by the cash proceeds from the subsidiary debt sale, since it can use the cash to reduce outstanding debt. We scale debt

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rates. Unfortunately, few of our firms are covered in Graham's database for the years immediately following the spinoff.

by both the market value and the book value of assets.[4] Although from a theoretical perspective, market value-based definitions of leverage are preferable, book value-based measures are not without merit. Rating agencies use book measures, and many debt covenants are tied to accounting ratios. More importantly, accounting-based measures of leverage avoid spurious correlations between market value leverage and determinants of leverage such as the ratio of market value to book value of assets and the ratio of cash flow to assets. For this reason, in most of our multivariate analysis we use book value measures of leverage. Our main results, however, are not affected by the use of market value leverage ratios, nor by leverage ratios that include cash holdings.

Capital structure can also be characterized by coverage ratios such as the amount of promised debt payments relative to the amount of cash flow available for payment of interest. Arguably financial managers are as concerned, if not more concerned, with their firm's ability to meet near-term debt payments as with their firm's leverage ratio. Therefore, we also examine the allocation of commitments to pay interest scaled by operating income. We use the inverse of coverage, or interest expense divided by operating income before depreciation, so that increases in both the leverage ratio and our measure of coverage correspond to greater debt financing. Firms with negative values of operating income before depreciation are excluded from our analysis of coverage ratios.

In tables 2 and 3 we analyze the differences in financial characteristics of pairs of firms involved in spinoffs, as of the end of the fiscal year of the spinoff. In table 2 we examine differences between financial characteristics of the parent firm and the spunoff unit, in order to investigate whether managers systematically allocate higher or lower leverage to either the parent or the subsidiary. We report median leverage for each group separately, but perform statistical tests on differences for each pair of firms involved in a spinoff. We believe that the capital structure of either the parent or the subsidiary cannot be designed in isolation since the pre-spinoff debt must be divided between the parent and the subsidiary. Therefore, jointly determining two new capital structures implies that the unit with a higher *relative* ability to carry the debt is allocated a larger share of the pre-spinoff debt.

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[4] Accounting rules that apply to spinoffs imply that the total assets of the pre-spinoff firm are identical to the sum of the total assets held by the parent and the subsidiary immediately after the spinoff.

We find that the median difference in leverage ratios of the parents and spunoff companies are insignificant. Following the spinoff, the median ratio of debt to assets is 0.18 for parent companies, and is 0.17 for the spunoff firms. The median ratios of cash and equivalents to assets also do not differ between the parents and spunoff firms. We find, however, that interest coverage ratios differ. The median ratio of interest to operating income before depreciation is 50% higher for the parent firms. In almost two-thirds of spinoffs, interest to operating income before depreciation is higher for the parent.

We also look at dividend policies because, like leverage, dividend policies typically are viewed as a commitment to pay out cash. We do find significant differences in dividend policy between parents and spunoff subsidiaries. Three-fourths of parent firms pay dividends at the fiscal year-end following the spinoff, while only one-third of the spunoff companies pay any dividends. Parents also pay greater dividends as a proportion of operating income before depreciation. These differences most likely reflect the fact that parent firms, with an established record of paying dividends, face large costs of cutting dividends. In contrast, the spunoff subsidiaries are newly formed publicly traded companies and therefore have greater flexibility to pay no dividends. Combined dividends of the two companies after the spinoff do not differ from pre-spinoff dividends.

Table 2 demonstrates that managers do not appear to have a tendency, or follow a rule of thumb, to allocate the parent more or less financial leverage than the spunoff unit. However, this does not imply that spinoffs do not result in systematic differences in the capital structures of the post-spinoff firms. It is possible that subsidiaries differ in their ability to sustain debt; in fact, there is no *a priori* reason to suspect that subsidiaries and parents differ systematically along dimensions that affect leverage choice. The parent/subsidiary dichotomy, is therefore not suitable to understand capital structure choice at the time of the spinoff.

In table 3 we analyze differences between the firm that emerged from each spinoff with greater leverage and the corresponding firm that emerged from the spinoff with lower leverage. The measure of financial leverage we use to make this classification is long-term debt plus debt in current liabilities net of cash and equivalents, divided by total assets. For ease of interpretation, we again report summary financial characteristics of the higher leverage and lower leverage groups separately. Statistical tests are performed on the pair-wise differences.

The first column in table 3 represents median financial, asset and industry characteristics of the firms that emerged from a spinoff with more financial leverage, and the second column in table 3 contains median values of firms that emerged with less financial leverage. This classification reveals that spinoffs do result in large differences in capital structure. At the fiscal year-end following the spinoff, row 1 of table 3 shows that the median leverage ratio is 0.28 for the group of higher leverage firms and 0.06 for the lower leverage firms. The median of the inverse of the coverage ratio is also greater for the higher leverage firms. Consistent with these patterns in leverage, the higher leverage firms have lower holdings of cash and equivalents to assets, but this is partly induced by measuring leverage net of cash and equivalents. There are no differences in dividend policy between the higher and lower leveraged firms.

In panel B we compare characteristics of assets allocated in the spinoff. Firms allocated more leverage in spinoffs have a larger proportion of assets in property, plant and equipment, and lower industry variance of operating income to assets. Higher leverage firms are also larger. Thus, several factors implied by theories of value-maximizing capital structure are related to the allocation of debt in spinoffs. However, cash flow is not greater for the higher leverage firms. The positive difference between market to book ratios of assets is not predicted by theories of capital structure. Other research, such as the cross-sectional study by Smith and Watts (1992), finds a negative relation.

Practitioners, as well as some academic studies, suggest that companies' use of financial leverage is determined in part by industry norms. Matching or benchmarking industry peers' use of leverage can reflect strategic considerations in the product market. It can also reflect managerial rules of thumb that guide setting of capital structure. Managers may simply keep leverage within certain industry guidelines rather than devote much effort to designing a capital structure.

To investigate this issue, we examine the leverage ratios of firms in the same industries as firms that emerge from spinoffs. For each firm created in a spinoff, we calculate the median leverage ratio of firms with the same four-digit SIC code, using data from Compustat. The medians of the industry-adjusted leverage ratios, reported in the last row of table 3, show the tendency to match industry leverage. An intriguing finding is that firms emerging from spinoffs with higher leverage (those in column 1) more closely match industry leverage than firms that emerge with lower leverage. For example, measures not reported in the tables show that a little

more than one-half of the higher leverage firms have leverage that falls above their industry's median leverage, while only one out of ten of the lower leverage firms have leverage that falls above their industry's median. This suggests that the net costs of excess leverage are asymmetric and greater for firms that employ less leverage. We suspect that the costs of excess leverage are higher for firms that face higher liquidation or default-related costs.

IV.   Regression analysis

We undertake a regression analysis of the differences in leverage ratios between pairs of firms involved in a spinoff, as of the end of the fiscal year of the spinoff. Independent variables are differences between asset characteristics of the same pairs of firms, measured at the same point in time. One possible specification is to define each difference as the attribute of the firm that emerged from the spinoff with greater leverage minus the attribute of the corresponding firm that emerged with less leverage. However, in that case we expect to lose power in our tests because all values of the dependent variable, the difference in leverage, are defined to be positive. To avoid this problem, we analyze the difference between attributes of the parent firm and attributes of the spunoff unit, and report these results. However, we recognize that this specification can lead to spurious rejections of the null hypothesis of no relation. We also estimate, and discuss below, regressions in which all variables are defined as the differences between firms that emerged from spinoffs with higher leverage and firms that emerged with lower leverage.

The equation below describes our regression.

$$\Delta LEV_j = \alpha + \beta_1 \cdot \Delta PPE_j + \beta_2 \cdot \Delta MKTBK_j + \beta_3 \cdot \Delta CF_j$$
$$+ \beta_4 \cdot \Delta VAR_j + \beta_5 \cdot \Delta IND_j + \beta_5 \cdot \Delta ASSETS_j + \varepsilon_j \qquad (1)$$

where

α, β_1–β_5, and ε are the intercept, coefficient, and error terms,

Δ represents the difference in attribute between the pair of parent and spunoff firms j,

LEV is long-term debt plus debt in current liabilities net of cash and equivalents,

PPE is the ratio of property, plant and equipment to assets,

MKTBK is the ratio of market to book value of assets,

CF is free cash flow defined as operating income less capital expenditures,

VAR is the median variability of free cash flow for the industry,

IND is the median leverage for the industry, and

ASSETS is the book value of assets

The regression in column 1 of table 4 shows a significant relation between the difference in leverage ratios and the difference in the proportion of assets in property, plant, and equipment. Firms allocated larger proportions of assets in property, plant and equipment emerge from spinoffs with significantly higher leverage ratios, consistent with theories relating the liquidation costs of assets to the use of debt financing. Similarly, firms with greater free cash flow relative to assets emerge from spinoffs with significantly higher leverage ratios. This is consistent with theories that relate the use of debt to default-related costs and the costs of external financing. In addition, the difference in leverage is related negatively to the difference in the industry median standard deviation of operating return on assets, as we expected. The difference in total assets in nominal, as well as in real dollars, is unrelated to the difference in leverage ratios.

In column 2 we use an alternative measure of liquidation costs, the difference in market to book ratio of assets, which we expect to be inversely related to leverage. We find that the difference in market to book ratios is unrelated to the difference in leverage, contrary to our expectations. One possible explanation for this result is that the market to book ratio is a proxy for variables other than liquidation costs of assets, such as expected profitability of assets in place.

Our findings are not robust to using coverage ratios in place of leverage ratios. There is no relation between the difference in the inverse of interest coverage and differences in characteristics of assets and cash flow. Overall, the F-statistics of these regressions are insignificant, and therefore not reported in a table. Although we expected theories relating asset characteristics to financial leverage to be valid for leverage ratios as well as interest coverage, we recognize that coverage measures debt commitments for only one year.

In the last two columns of table 4 we present regressions that include the difference between median leverage ratios of firms with the same four-digit SIC codes as the firms emerging from a spinoff. The simple regression in column 3 shows that the difference between leverage ratios of the post-spinoff companies is significantly related to the difference between corresponding median industry leverage ratios. Of course, industry leverage in large part reflects

the various asset and other firm-specific characteristics that determine managers' choice of capital structure, so this finding need not alter our conclusion that the proportion of fixed assets and cash flow return on assets shape capital structures following spinoffs.

In column 4 we provide evidence on whether managers simply match industry leverage within some bounds or actively manage capital structure. We regress differences in leverage on the four potential determinants of capital structure used in our earlier regressions as well as on the difference in industry median leverage ratios. If managers passively match leverage to industry norms, rather than make deliberate choices, we expect industry leverage to be the only significant variable.

In the multivariate regression, the coefficient on the difference in industry median leverage ratios is reduced by more than 40%, and its significance level falls to 0.09. Differences in the ratios of property, plant, and equipment to assets, cash flows to assets, and industry standard deviations are significantly related to the post-spinoff difference in leverage ratios. These variables explain variation in managers' capital structure choices that is not explained by industry leverage ratios. Managers appear to be guided by more than industry leverage ratios.

V.   Additional tests

A.   *Market value measures of leverage*

We examine whether the results of our regression analysis are robust to defining leverage as liabilities scaled by market value, rather than the book value, of assets. In the first column of table 5 the dependent variable is long-term debt plus debt in current liabilities less cash and equivalents, divided by the market value of assets. Market value of assets is the sum of the market value of common stock and the book values of preferred stock and debt. These regressions are quite similar to the regressions on differences in leverage defined using the book value of assets. The use of market value of assets in defining leverage does not affect our inferences.

B.   *Contractual restrictions on the allocation of debt*

Managers' flexibility to allocate debt between the two firms emerging from a spinoff may be constrained by contractually binding links between certain assets and debt. Links between assets and debt can be enforced through the use of secured debt. Constraints may also take the

form of covenants, such as those that require firms to maintain a certain ratio of debt to total assets or those that restrict firms' ability to pledge assets as collateral to additional lenders. Our concern is that the positive relation we find between the difference in the proportions of fixed assets and the difference in leverage ratios may simply reflect the constraints managers face, rather than deliberate policy choices.

We address this concern in two ways. To control for the effect of contractual ties between assets and liabilities, we remove secured debt from our measures of leverage and investigate how managers allocate non-secured debt.   Presumably managers have more flexibility in allocating non-secured debt, so that a relation between differences in the proportions of fixed assets and leverage exclusive of secured debt would be stronger evidence of managers actively managing capital structure in corporate spinoffs.

In the regression in column 2 of table 5, secured debt has been eliminated from our measure of leverage. The median level of secured debt is 5.1% of the parent's total debt and 7.8% of the subsidiary's total debt, where total debt is defined as long-term plus debt in current liabilities. The regression results are robust to the exclusion of secured debt from our measure of leverage. However, we recognize that removing secured debt from our analysis without also removing the assets tied to that debt may simply add noise to our analysis. We therefore delete all observations where the parent had more than 25% of its liabilities in secured debt, and reestimate the regression on the remaining 61 spinoffs. The results are similar to those reported in table 5. We conclude that our previous findings are not driven by a contractual link between fixed assets and secured debt.

The second way we investigate the effect of financing constraints is to look at changes in the use of leverage over time. Financing constraints imposed by covenants or secured debt may prevent managers from setting capital structures at optimal levels at the time of the spinoffs. However, financing constraints presumably become less binding over time. Therefore, we analyze, but do not report in a table, leverage ratios for several years after the spinoffs. If the differences in leverage we observe at the time of the spinoffs persist, then it is more likely that managers were not constrained in allocating leverage at the time of the spinoffs.

In the year of the spinoff, the median difference in leverage between the firms allocated greater leverage and the firms allocated less leverage is 0.21. This difference largely persists for the ensuing five years. At the end of the first fiscal year following the spinoffs, the median

difference in leverage ratios is 0.24 for the 88 surviving pairs of firms. At the end of the second fiscal year following the spinoffs, the median difference in leverage is 0.20 for the 71 surviving pairs. We have five years of data for 38 pairs of firms. For this subset, the median differences in leverage range from 0.22 in the fiscal year of the spinoffs to 0.16 at the end of the fifth fiscal year following the spinoffs. These differences in leverage are statistically significant. The year to year change in the median difference in leverage ratios is -0.02 and significant during the first full fiscal year following the spinoff. However, the median changes from year to year are not significant in the following fours years. The permanent nature of the differences in leverage established in the fiscal year of the spinoffs suggests that managers were not constrained in allocating leverage at the time of the spinoff.

In columns 3 and 4 of table 5, we investigate this issue further using regression analysis. The independent variables, as in our earlier regressions, are differences in asset characteristics measured at the end of the fiscal year of the spinoffs. However, the dependent variables measure the difference in leverage subsequent to the spinoffs. In column 3, the dependent variable is the difference in leverage ratios measured at the end of the first full fiscal year following the spinoffs, and the dependent variable in column 4 is measured at the end of the second fiscal year. Like earlier regressions, the difference in these subsequent leverage ratios is related to the difference in cash flow divided by assets and to the difference in industry standard deviation of operating return on assets. However, the association with the difference in the ratio of property, plant, and equipment to assets is weaker. The evidence suggests that contractual restrictions do not explain our findings, and that the assignment of capital structure in the year of the spinoff is neither transitory nor spuriously related to asset characteristics.

C. *Parent company dividends, the Marriott episode, and the size of the spinoff*

We explore three additional potential determinants of the allocation of leverage in spinoffs and report the results in the last column of table 5. The first is the dividend payout of the parent company prior to the spinoff. We conjecture that because managers are reluctant to cut dividends, parent firms that have had higher dividend payouts will allocate more debt to the subsidiary. A lower level of debt will reduce the likelihood of having to cut dividends or incurring the costs of additional financing to pay interest. We find, however, that dividends paid

by the pre-spinoff parent relative to operating income before depreciation are unrelated to the allocation of leverage in spinoffs.

The second potential determinant of the allocation of debt is a time dimension. As documented in Parrino (1997), the large differences in assets, cash flows, and leverage in the firms emerging from Marriott's 1993 spinoff significantly reduced the value of outstanding Marriott debt. We conjecture that the publicized debate and legal action that surrounded this spinoff inhibited firms from making such disparate allocations of debt in subsequent spinoffs. Thus, we add a dummy variable for spinoffs following the announcement of the Marriott spinoff in October 1992. This dummy variable is not significantly related to allocations of leverage.

The third variable added to the regressions is the fraction of the parent company's assets distributed to the spunoff unit. Our concern is that managers are more likely to make an arbitrarily small allocation of debt when a spinoff is a small proportion of assets. We find no significant relation between the difference in leverage and the fraction of assets that are spun off.

D. Grouping by higher minus lower leverage

An alternative specification of our regressions is to analyze differences in firms that emerged from spinoffs with higher and lower leverage, as opposed to differences between parents and spunoff units. We estimate, but do not report in a table, regressions in which all variables are defined as the differences between firms that emerged from spinoffs with higher leverage and firms that emerged with lower leverage. As we expect, the explanatory power of the regression is reduced. However, the differences in ratios of property, plant, and equipment to assets and cash flow to assets are still significantly related to the difference in leverage ratios. However, the difference in industry standard deviation of operating return on assets is insignificant.

As an additional test, we explore an alternative specification that is more robust to nonlinear relations in the data. We rank our sample by the differences in leverage between the two firms that emerged from spinoffs, and analyze the upper and lower thirds of the distribution. The median difference in leverage ratios is 0.41 in the group with big differences in leverage and is 0.07 in the group with small differences, as shown in row 1 of table 6. We expect that relations between differences in leverage ratios and asset characteristics will be more pronounced in the third of the sample with the largest differences in leverage. For example, the median

difference in property, plant and equipment to assets is 0.09 and statistically significant when the differences in leverage are large. The median difference in property, plant and equipment is -0.04 and statistically insignificant when the differences in leverage are small. Similarly, we find a significant intragroup difference in our cash flow variable for the subsample with large differences in leverage, but not for the subsample with small differences in leverage. Differences in the industry standard deviation of operating income to assets are statistically significant in both subsamples.

Panel B of table 6 presents a logistic regression on the two thirds of our spinoffs with the largest and smallest differences in leverage. The dependent variable equals one for spinoffs with the largest differences in leverage, and equals zero for spinoffs with the smallest differences in leverage. Similar to our earlier results in tables 4 and 5, we find that the difference in the proportions of assets in property, plant and equipment and the difference in the ratios of cash flow to assets are positively related to the likelihood of a spinoff having a large difference in leverage. However, the difference in industry standard deviation of operating return on assets is not related significantly to leverage.

The various tests reported in this section demonstrate that our main findings are robust. The difference in proportions of fixed assets as well as the difference in cash flow returns on assets consistently explains the difference in leverage of the companies created by a spinoff, regardless of how the difference in leverage is defined. When differences in leverage are defined as the leverage ratio of the parent firm minus the leverage ratio of the spunoff unit, the difference in industry standard deviation of operating return on assets is also a significant determinant of the difference in leverage ratios. Our results suggest that managers match the use of leverage to the nature of assets as predicted by factors that determine the expected costs of leverage. It is also possible that managers choose financial leverage to serve their private interests. We turn to this possibility next.

VI.   Governance characteristics

Berger, Ofek, and Yermack (1997) investigate the relation between the use of debt financing and measures of managerial entrenchment. They find that the ratio of total debt to total assets is significantly negatively related to board size and significantly positively related to

the stock ownership of the CEO, and that leverage tends to increase after threats to managerial security. They conclude that entrenched managers avoid debt.

We investigate whether the allocation of debt in spinoffs is related to measures of managerial entrenchment such as board size, the proportion of inside directors, and stock ownership of the chief executive officer. Larger boards of directors are less effective in monitoring managers, as suggested by the evidence in Yermack (1996), and therefore may not object to the design of capital structures with less debt. Similarly, boards with a greater proportion of insider members presumably are less vigilant in monitoring management, as suggested by Byrd and Hickman (1992) and others, and may be associated with lower levels of debt. Finally, chief executive officers who own a small proportion of the firm's equity can have incentives that are not closely aligned with outside shareholders, and are more likely to have less debt.

We also examine whether the surviving firm that retains the pre-spinoff firm's chief executive officer has less leverage following the spinoff, controlling for the asset characteristics analyzed above. Presumably the chief executive officer of a firm that undertakes a spinoff is centrally involved in shaping the companies that emerge from a spinoff. A systematic negative relation between the retention of the chief executive officer and leverage would be consistent with the results of Berger, Ofek, and Yermack (1997).

Table 7 compares governance characteristics of the higher and lower levered firms that emerge from spinoffs. We find virtually no difference in financial leverage between the firm that retains the pre-spinoff chief executive officer and the other firm created in each spinoff. The incumbent CEO is retained by the firm with less financial leverage in 35% of the spinoffs, and is assigned to the firm with greater financial leverage in 45% of the spinoffs. In addition, there are no differences in leverage ratios net of median industry leverage ratio between the firms that retain and do not retain the pre-spinoff CEO. There is no tendency for the pre-spinoff CEO to emerge from the spinoff with an underlevered firm. The companies that emerge from a spinoff with higher leverage have a larger median board and lower CEO ownership stake, but these orderings are not implied by the idea that weaker boards or smaller ownership stakes lead managers to employ less financial leverage. None of the other differences in governance characteristics are statistically significant.

We estimate, but do not report, regressions on financial characteristics augmented by variables that measure differences in governance characteristics for the firms that emerge from spinoffs. None of the variables associated with governance or management characteristics are related to differences in leverage. We conclude that the design of capital structures in spinoffs is not explained by measures of agency problems such as the CEOs' ownership stakes or board characteristics. We recognize, however, that managerial agency problems may be less important among firms whose managers voluntarily undertake a significant restructuring of assets.

VII.   Conclusions

At arbitrary points in time, leverage ratios of firms reflect the cumulative effect of sequential decisions, and thus are influenced by the costs of adjusting capital structure and information problems, as identified by the pecking order hypothesis of Myers (1984). That is, leverage ratios wander in response to the sequence of financing choices and are adjusted toward target leverage ratios only periodically. These complications make it difficult to identify the determinants of capital structure in cross-sectional studies.

In corporate spinoffs managers must allocate liabilities to complement the allocation of assets. Spinoffs represent distinct points in time when managers make explicit financing decisions that are independent of market timing or information problems, as well as the costs of adjusting capital structure. Therefore, spinoffs provide a unique opportunity to analyze how characteristics of assets affect the design of capital structure. We use a sample of spinoffs to conduct a direct and unambiguous test of the effect of asset characteristics on capital structure.

We find that the allocation of financial leverage in spinoffs is related to the difference in characteristics of assets of the firms that emerge from the spinoff. In particular, the proportion of assets represented by property, plant, and equipment is positively related to the amount of financial leverage a company is assigned in a spinoff. The effect of property, plant and equipment on the post-spinoff use of leverage is robust to a number of alternative tests, such as using market value based definitions of leverage and removing secured debt from the analysis. We conclude that liquidation costs of assets influence firms' choice of financial leverage. We also find that the ratio of cash flow to assets and the industry variability of operating income to assets explain differences in leverage following a spinoff, results that are particularly noteworthy. Differences in firm size do not reliably explain the difference in financial leverage

ratios. Our findings indicate that managers match assets and liabilities, and in particular that managers focus on characteristics that affect the expected costs of financial distress in setting capital structure policies.

The difference in median industry leverage ratio appears to be an important determinant of the leverage of firms following spinoffs. However, after controlling for the effects of industry leverage, the difference in the ratios of property, plant, and equipment to assets and in cash flow to assets are related significantly to the post-spinoff leverage ratios. We conclude that managers do more than simply let industry benchmarks of leverage guide the choice of leverage.

We believe our findings that the level and variability of cash flow determine the design of capital structure are particularly important. We suspect that most finance scholars intuitively argue that level and variability of cash flow are important determinants of leverage even though there is little evidence to support this view. In fact, most research finds a negative relation between profitability and leverage, as implied by the pecking order hypothesis. In the design of capital structure in spinoffs, which is free of pecking order effects, cash flow or profitability is related positively to the use of financial leverage. Thus, we are able to provide evidence that the ability to cover debt payments determines the design of capital structure.

We do not find evidence that the allocation of financial leverage is explained by conflicts of interest between managers and stockholders. For example, the allocation of debt is not influenced by differences in board size, board composition, and CEO ownership stock, nor by which company retains the pre-spinoff firm's CEO. It does not appear that managerial agency problems influence the design of capital structure in spinoffs.

Our research also raises two issues that merit further investigation. First, our results are not robust to a definition of leverage based on interest coverage. We believe that interest coverage is of primary concern to financial managers in designing financial structure, and it is troubling that we cannot explain variation in coverage ratios. Second, the ratio of market to book value, which is widely used as a proxy for growth opportunities, is consistently unrelated to the allocation of financial leverage in spinoffs. Our evidence raises a concern about what is being measured by market to book ratios in corporate finance research.

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Table 1

Sample spinoffs in the period 1979-1997

Year of spinoff	Number of spinoffs	Median assets of parent prior to spinoff ($ millions)	Median fraction of assets spunoff
1979	6	259	0.23
1980	3	185	0.51
1981	2	3,526	0.31
1982	2	28	0.70
1983	2	758	0.07
1984	3	2,813	0.07
1985	4	653	0.26
1986	3	15,966	0.29
1987	1	355	0.35
1988	8	600	0.26
1989	7	1,015	0.13
1990	4	6,385	0.09
1991	3	88	0.22
1992	3	505	0.41
1993	5	1,939	0.19
1994	11	2,877	0.18
1995	11	3,514	0.21
1996	13	5,879	0.14
1997	13	2,366	0.23
Total sample	104	1,592	0.21

Table 2

Univariate comparisons of financial characteristics of post-spinoff parent and subsidiary firms

The sample is 104 spinoffs in the years 1979 through 1997. Leverage is long-term debt plus debt in current liabilities less cash and equivalents divided by total assets. Sample sizes for specific variables are in parentheses.

	Median of parent companies	Median of spunoff companies	p-value of sign rank test on paired differences	Proportion of positive / negative differences
Long-term debt plus debt in current liabilities minus cash / Assets (104)	0.18	0.17	0.29	0.60/0.40
Interest / Operating income before depreciation (89)	0.11	0.07	0.00	0.65/0.27
Cash and equivalents / Assets (104)	0.06	0.05	0.72	0.51/0.49
Proportion of firms with positive dividends (100)	0.76	0.34	0.00	0.45/0.03
Dividends / Operating income before depreciation (82)	0.12	0.00	0.00	0.73/0.12

Table 3

Univariate comparisons of financial, asset, and industry characteristics of post-spinoff firms grouped by higher and lower financial leverage

The sample is 104 spinoffs in the years 1979 through 1997. In each spinoff we identified the firm with higher and lower leverage at the end of the fiscal year of the spinoff. Leverage is long-term debt plus debt in current liabilities less cash divided by total assets. Market value of assets is book value of debt and preferred stock plus market value of equity. Sample sizes for specific variables are in parentheses.

	Median of post-spinoff firm with higher leverage	Median of post-spinoff firm with lower leverage	p-value of sign rank test on paired differences	Proportion of positive / negative differences
Panel A - Financial characteristics:				
Long-term debt plus debt in current liabilities minus cash / Assets (104)	0.28	0.06	.	.
Long-term debt plus debt in current liabilities minus cash / Market value of assets (104)	0.24	0.06		
Interest / Operating income before depreciation (89)	0.14	0.07	0.00	0.63 / 0.29
Cash and equivalents / Assets (104)	0.04	0.09	0.00	0.22 / 0.78
Proportion of firms with positive dividends (100)	0.58	0.52	0.39	0.27 / 0.21
Dividends / Operating income before depreciation (82)	0.05	0.02	0.12	0.52 / 0.32
Panel B - Asset and industry characteristics:				
Property, plant, and equipment / Assets (103)	0.36	0.28	0.01	0.62 / 0.38
Market value / Book value of assets (95)	1.49	1.31	0.07	0.61 / 0.39
Cash flow[a] / Assets (104)	0.08	0.06	0.36	0.57 / 0.43
Industry standard deviation of operating income to assets[b] (103)	0.058	0.067	0.00	0.24 / 0.76
Total assets ($ millions) (104)	581	410	0.01	0.62 / 0.38
Leverage ratio adjusted for median leverage ratio of firms with the same four-digit SIC (104)	0.01	-0.18	0.00	0.85 / 0.12

[a] Cash flow is operating income before depreciation less capital expenditures.
[b] Standard deviation is calculated for firms with the same three-digit SIC code prior to the spinoff.

Table 4

Regression estimates of the relation between differences in financial leverage and differences in asset characteristics of parent and subsidiary firms at the end of the fiscal year of spinoffs.

Sample is 104 spinoffs in the years 1979 through 1997. The numbers in parentheses are p-values.

	Leverage is long-term debt plus debt in current liabilities minus cash divided by assets			
Constant	-0.02 (0.58)	0.01 (0.88)	0.02 (0.49)	-0.02 (0.55)
Property, plant and equipment / Assets	0.40 (0.01)			0.35 (0.01)
Market value / Book value of assets		0.01 (0.66)		
Cash flow[a]/Assets	0.52 (0.00)	0.48 (0.01)		0.50 (0.00)
Industry standard deviation of operating income to assets[b]	-4.03 (0.00)	-4.07 (0.00)		-3.47 (0.00)
Total assets ($ billions)	0.002 (0.64)	0.002 (0.72)		0.0025 (0.63)
Median leverage ratio of firms with the same four-digit SIC code			1.07 (0.00)	0.60 (0.09)
Adjusted R^2	0.25	0.20	0.08	0.20
F-statistic (p-value)	7.87 (0.00)	5.76 (0.00)	9.41 (0.00)	7.03 (0.00)
Sample size	84	75	103	84

[a] Cash flow is operating income before depreciation less capital expenditures.
[b] Standard deviation is calculated for firms in the same three-digit SIC code prior to the spinoff.

Table 5

Regression estimates of the relation between differences in financial leverage and differences in asset and other characteristics of parent and subsidiary firms at the end of the fiscal year of spinoffs.

Sample is 104 spinoffs in the years 1979 through 1997. The numbers in parentheses are p-values.

	Leverage is long-term debt plus debt in current liabilities less cash divided by market value of assets[a]	Leverage is long-term debt plus debt in current liabilities less secured debt and cash divided by book value of assets	Leverage is long-term debt plus debt in current liabilities less cash divided by book value of assets at the end of the first full fiscal year (+1) after the spinoff	Leverage is long-term debt plus debt in current liabilities less cash divided by book value of assets at the end of the second full fiscal year (+2) after the spinoff	Leverage is long-term debt plus debt in current liabilities less cash divided by book value of assets
Constant	0.01 (0.85)	-0.01 (0.80)	-0.04 (0.29)	-0.03 (0.56)	-0.01 (0.95)
Property, plant and equipment / Assets	0.39 (0.00)	0.38 (0.01)	0.24 (0.10)	0.20 (0.18)	0.32 (0.05)
Cash flow[b]/Assets	0.40 (0.00)	0.51 (0.01)	0.50 (0.00)	0.48 (0.01)	0.14 (0.66)
Industry standard deviation of operating income to assets[c]	-2.80 (0.00)	-3.48 (0.00)	-2.76 (0.02)	-3.33 (0.02)	-3.03 (0.04)
Total assets ($ billions)	-0.000 (0.91)	0.006 (0.24)	0.004 (0.49)	-0.000 (0.99)	0.002 (0.80)
Dividends / Operating income before depreciation of pre-spinoff company					0.09 (0.54)
Dummy for spinoffs following the 1992 announcement of the Marriott spinoff					0.05 (0.56)
Fraction of the firm's assets spunoff					-0.26 (0.31)
Adjusted R^2	0.26	0.21	0.18	0.13	0.24
F-statistic (p-value)	7.13 (0.00)	5.95 (0.00)	4.52 (0.00)	3.59 (0.01)	2.72 (0.02)
Sample size	71	75	84	68	67

[a]The market value of assets is the sum of the market value of common stock and the book values of preferred stock and debt. [Why does this result in 13 fewer observations than in table 4?]

[b]Cash flow is operating income before depreciation less capital expenditures.

[c] Variance is calculated for firms in the same three-digit SIC code prior to the spinoff.

Table 6

Comparisons of groups of spinoffs defined by differences in financial leverage. The group of spinoffs with large differences in leverage contains 35 spinoffs in which the differences in leverage ratios are greater than 0.30. The group of spinoffs with small differences in leverage contains 34 spinoffs in which the differences in leverage ratios are less than 0.10. In each subsample, differences in financial and asset characteristics of the firms with higher and lower leverage are calculated at the end of fiscal year of spinoffs.

Leverage is long-term debt plus debt in current liabilities less cash divided by book value of assets.

Panel A – Financial and asset characteristics

	Large differences in leverage		Small differences in leverage	
	Median difference of higher and lower leverage firms	p-value of difference	Median difference of higher and lower leverage firms	p-value of difference
Long-term debt plus current debt less cash / Assets	0.41		0.07	
Property, plant, and equipment / Assets	0.09	0.00	-0.04	0.26
Cash flow[a] / Assets	0.05	0.06	-0.05	0.19
Industry standard deviation of operating income to assets[b]	-0.0059	0.00	-0.0231	0.00
Total assets ($ millions)	59	0.28	363	0.04

Panel B: Logistic regressions on spinoffs in the highest and lowest thirds of differences in financial leverage

Dependent variable equals one for spinoffs in the group with the largest differences in leverage.

Constant	-0.54 (0.16)
Property, plant and equipment / Assets	4.37 (0.01)
Cash flow[a]/Assets	3.47 (0.06)
Industry standard deviation of operating income to assets[b]	-8.27 (0.52)
Total assets ($ billions)	0.007 (0.87)
χ^2-statistic (p-value)	17.4 (0.00)
Sample size	54

[a] Cash flow is operating income before depreciation less capital expenditures.
[b] Standard deviation is calculated for firms in the same three-digit SIC classification prior to the spinoff.

Table 7

Univariate comparisons of median measures of governance characteristics of the firms with higher and lower leverage at the end of fiscal years of spinoffs.

The sample is 104 spinoffs in the years 1979 through 1997. Leverage is long-term debt plus debt in current liabilities less cash divided by book value of assets. Sample sizes for specific variables are in parentheses.

	Post-spinoff firm with higher leverage	Post-spinoff firm with lower leverage	p-value of sign rank test on difference	Proportion of positive / negative differences
Retention of pre-spinoff CEO (103)	0.45	0.35	0.17	0.43/0.31
Board size (103)	8	7	0.06	0.49/0.35
Proportion of inside directors (103)	0.29	0.27	0.56	0.47/0.47
Proportional stock ownership of CEO (98)	0.003	0.005	0.07	0.40/0.60
Directors' and officers' proportional ownership (100)	0.04	0.04	0.26	0.40/0.60