Financial Conservatism:
Evidence on Capital Structure from Low Leverage Firms

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Abstract

A persistent and puzzling empirical regularity is the fact that many firms adopt conservative financial policies. These "under-leveraged" firms carry substantially less debt than predicted by dominant theories of capital structure (Graham (2000) and Myers (1984)). This paper examines the phenomenon of financial conservatism by studying firms that adopt a persistent policy of low leverage. Our major findings are as follows. 1) Conservative firms follow a pecking order style financial policy. A high flow of funds and substantial cash balances allow them to fund the bulk of discretionary expenditures internally. 2) Financial conservatism is largely transitory. Seventy percent of low leverage firms drop their conservative financial policy; almost 50% do so within five years. 3) Conservative firms stockpile financial slack or debt capacity. Their "stockpiles" are utilized later to finance discretionary expenditures, particularly acquisitions and capital expenditures.. 4) Financial conservatism is not an industry-based phenomenon. Conservative firms do, however, have relatively high market-to-book and operate relatively frequently in industries thought to be sensitive to financial distress. 5) Conservative firms do not have low tax rates, high non-debt tax shields or face severe information asymmetries.

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1. Introduction

A persistent and puzzling empirical regularity is the fact that many firms adopt conservative financial policies. These firms appear "under-leveraged" in that their borrowings are much lower than predictions of dominant capital structure theories would suggest. Myers (1984) describes the challenge that the well-documented, negative relation between profitability and leverage poses for capital structure theories. More recently, Graham (2000) finds that conservative debt policy is a persistent and pervasive capital structure puzzle; a typical firm borrows considerably less than the amount predicted to be optimal.

This paper examines the phenomenon of financial conservatism by studying firms that adopt a persistent policy of low leverage. We have five main findings. First, financially conservative firms follow a pecking order style financial policy. Conservative firms have a high flow of funds surplus and large cash balances relative to more leveraged firms. These internal funds are sufficient to fund the bulk of both operations and discretionary outlays. We use the term "pecking order style" because conservative firms do not literally follow pecking order.[1] Specifically, low leverage firms do not exhaust all internal funds, including cash balances, prior to seeking external funds. When low leverage firms raise external capital, they turn largely, but not exclusively to debt financing. This finding is consistent with Stafford (1999) who documents similar financing behavior in the funding of major investments.

Second, financial conservatism is largely a transitory financial policy. Seventy percent of low leverage firms eventually drop their conservative financial policy. Almost 50% of conservative firms, substantially increase their leverage after five years. The vast majority of firms that drop

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[1] Also, it is worth noting that our study does not conduct a "horse race" between pecking order and trade-off theory, as do Shyam-Sunder and Myers (1999) and Frank and Goyal (2001). As such, we are not in a position to say that our evidence is either consistent or inconsistent with pecking order as literally formulated.

financial conservatism (over 90%) never return to a policy of low leverage. The transitory nature of low leverage is similar to the transitory nature of high leverage, documented most thoroughly in studies of leveraged buyouts (LBOs). Kaplan (1991), for example, documents that one-third of LBO firms return to lower leverage and some form or public ownership within five years; the median firm remains private for about seven years. Similar to low leverage firms, the vast majority of LBO firms never return to high leverage. This suggests that extreme capital structures are transitory.

Third, and related to the transitory nature of low leverage, conservative firms seem to stockpile financial slack or debt capacity. As long as their internal flow of funds and cash balances are relatively high and discretionary outlays are low, they maintain low leverage. When the internal flow of funds surplus falls and/or discretionary outlays increase, low leverage firms drop their conservative financial policy by significantly increasing long-term leverage. Thus, conservative firms utilize their "stockpiles" when sources of internal funding decline and/or to finance acquisitions and capital expenditures. Mirroring these results, non-conservative firms adopt a low leverage financial policy when sources of internal funding increase and/or discretionary spending declines.

This third finding begins to tie together the capital structure and cash balances literature—an effort we believe will yield rich evidence on how firms choose their financial policies. For example, it provides a potential explanation for the puzzling "under-leveraged" firms identified by Graham (2000) and for the accumulation of cash balances that are "too large" (Opler, Pinkowitz, Stulz and Williamson (1999) and Harford (1999)). That is, perhaps both "under-leverage" and "excess cash balances" are largely transitory, and are reduced or eliminated when firms undertake major discretionary investments.

Fourth, financial conservatism is not an industry-based phenomenon. In our analysis and robustness checks, we control for industry in a variety of ways. None of the industry controls eliminate, or even dampen, the significance of our major findings. There are, however, two characteristics related to a firm's investment opportunities and industry characteristics that are important. Conservative firms have relatively high market-to-book and operate relatively frequently in industries thought to be sensitive to financial distress (Titman (1984)). The former characteristic is consistent with a large body of prior work documenting an inverse relation between

leverage and market-to-book (e.g. Smith and Watts (1992) and Jung, Kim and Stulz (1996)). Conservative firms' strong flow of funds, large cash balances and apparent lack of severe information problems suggest that their high market-to-book ratios are more likely to be due to market expectations of continued strong cash flow, rather than to the discovery of new technologies or products. The relatively strong presence in "sensitive" industries is consistent with Titman and Wessels (1988).

Fifth and finally, conservative firms do not appear to have low tax rates or have high non-debt tax shields. We do not infer from these findings that tax factors are unimportant in capital structure decisions in general. Prior research, including MacKie-Mason (1990) and Graham (1996a), provide evidence that taxes do play a role. Rather, we conclude that tax considerations are not a primary factor in the decision to adopt a conservative financial policy.

The paper proceeds as follows. Section 2 describes our sample selection and research design, and presents descriptive statistics on the characteristics of low leverage firms relative to firms that adopt a less conservative financial policy. Section 3 presents an analysis of the firm characteristics associated with the adoption of a conservative financial policy. In this section, we draw on alternative capital structure theories to develop hypotheses about financial conservatism. We then present the results of our tests of these hypotheses and conduct robustness checks. In section 4, we present evidence on the transitory nature of conservative financial policies. We then analyze the circumstances under which firms abandon a conservative financial policy, the circumstances under which they adopt one, and conduct robustness checks. Section 5 identifies potential avenues for future research raised by our major findings.

2. Sample selection and research design

2.1 Definition of financial conservatism and identification of sample firms

Our initial pool of firms includes all domestic firms with data on both CRSP and Compustat (research and current files). Our sample period runs for 25 years, from 1974 through 1998. To ensure the consistent data availability, we eliminate firms with total real assets (in 1998 dollars) less

than $100 million, negative sales data on Compustat, and missing long-term debt data. In addition, firms in the financial services industry (Standard Industrial Classification (SIC) codes between 6000 and 6999) and regulated utilities (SIC codes between 4900 and 4999, but not equal to 4953 or 4959 (refuse systems and waste management)) are eliminated. The final pool contains 5,613 unique firms and 46,675 firm years of data.

For the purposes of this study, we define financial conservatism as a persistent financial policy of low leverage. To capture persistence over time, we measure financial policy over five-year time periods. A firm is classified as being financially conservative (i.e, having low leverage) if its annual ratio of long-term debt (including the current portion of long-term debt) to total assets is in the bottom 20% of all firms for five consecutive years. Firms are classified as control firms if they survive for five consecutive years and do not meet our definition of low leverage. Throughout our analysis low leverage firms are compared to control firms. This helps control for the survivorship bias imposed by our five-year definition of financial policy. Firms that do not survive a five year time period are utilized to determine the 20% cutoff for low leverage and for industry-adjustments, but are not otherwise included in the analysis.

To conduct our analysis, we divide the 25-year sample period into five-year panels as illustrated in fig. 1. Two approaches are taken to ensure the consistency of our results. First, as shown in panel A, five non-overlapping five-year panels are formed as follows: 1974-1978, 1979-1983, 1984-1988, 1989-1993 and 1994-1998. Second, as shown in Panel B, 21 overlapping five-year panels are formed, beginning with 1974-1978, followed by 1975-1979 and ending with 1994-1998. When analyzing the five non-overlapping panels, data are pooled because observations are independent and statistical analysis indicates that it is appropriate. In analyzing the 21 overlapping panels, a Fama and MacBeth (1973) type approach is adopted. Specifically, analysis is conducted for each panel separately and results are then averaged across panels. (For convenience, we refer to each panel by its final year. For example, the panel comprised of 1974-1978 is the “1978 panel.”)

As in all studies, our research design has both costs and benefits. For example, our five-year definition of financial policy clearly reduces our sample size relative to the one-year definition implicitly adopted by studies such as Fama and French (1999), Graham (2000), and Titman and

Wessels (1988). A benefit of our approach, however, is that our data are potentially less noisy and less subject to problems generated by mean reversion. On the other hand, our five-year survivorship requirement is less restrictive than that of Shyam-Sunder and Myers (1999). They require that firms survive their entire 19-year sample period, reducing their sample size to 157 firms.

2.2. Sample statistics and measures of leverage

Table 1 reports descriptive statistics for the low leverage and control samples. Statistics presented are based on the five non-overlapping panels, but results are similar utilizing statistics from the 21 overlapping panels. Means (medians) are computed first for each firm, then for each panel and then across panels. As panel A shows, the five non-overlapping panels provide us with a sample of 673 low leverage and 5,736 control observations.

By construction, low leverage firms have a lower ratio of long-term debt to total assets (hereafter referred to as the debt ratio) than control firms. Overall, the debt ratio averages 0.0276 for low leverage and 0.2932 for control firms. Panel by panel statistics show that the average debt ratio declines over time for low leverage firms, falling from 0.0377 in the 1978 panel to 0.0086 for the 1998 panel. Medians follow a similar pattern. The cutoff debt ratio (that determines whether a firm is classified as financially conservative) also falls from 11.8% for the 1978 panel to 5.4% for the 1998 panel, as does the number and percentage of firms that carry literally zero long-term debt. In contrast, average and median debt ratios for control firms remain relatively constant.

Clearly, the definition of financial conservatism changes over time. Thus, it is possible that firms classified as financially conservative in one panel, might not be classified as conservative in the next panel or vice versa—even if their capital structure does not change. (In fact, this seldom happens and does not affect our results as we discuss in section 4.3.) On the other hand, the declining leverage cutoff reflects changing market conditions and thus changing patterns in firms' financial policies over time.

Panel B of table 1 presents statistics on alternative measures of financial conservatism and leverage for sample firms. Industry-adjusted leverage ratios show that low leverage firms are financed conservatively relative to their industry peers, while control firms are not. The difference between

the two groups is statistically significant. (Industry adjustments are made based on annual medians for all firms with the same two-digit Compustat SIC code.)

Short-term borrowings and liabilities net of long-term debt (both relative to total assets) show that low leverage firms are not borrowing elsewhere, and do not carry large non-debt liabilities. Rather, financially conservative firms carry significantly less short-term debt than control firms and approximately the same amount of liabilities net of long-term debt. Finally, debt ratios net of cash and marketable securities also shows that low leverage firms are significantly more conservatively financed than control firms. Low leverage firms have negative net leverage both on average (-0.1771) and at the median (-0.1470). In contrast, the net debt ratios of control firms average 0.2418 (0.2314 at the median).

In summary, the statistics in table 1 suggests that our definition yields a sample of financially conservative firms. Our low leverage firms are not clustered in a handful of industries (not reported in a table), nor do they offset their low debt ratios through other forms of borrowings. In the following two subsections, we present univariate statistics on other characteristics of our sample firms. These statistics serve two purposes. First, the data confirm that our sample firms are similar in many respect to samples used in other studies. Second, many of the variables presented are used as explanatory variables in logistic regression analysis in section 3. We defer the development and testing of hypotheses based on alternative theories of capital structure to that section.

2.3 Flow of funds, cash balances, expenditures and external financing

Extant theories of capital structure, particularly pecking order, emphasize a firm's flow of funds relative to expenditures as a determinant of financial policy. Overall, the evidence in table 2 indicates that low leverage firms are highly profitable, generate cash flow sufficient to fund discretionary expenditures and, in addition, carry substantial cash balances. This raises the possibility that financially conservative firms are stockpiling financial slack or debt capacity—a point to which we will return again later.

Low leverage firms have significantly higher flow of funds and profitability than control firms, both unadjusted and adjusted for industry (panel A). Because we examine discretionary expenditures separately, our flow of funds is computed prior to capital spending, research and

development and acquisitions.[2] Consistent with the descriptive evidence on net debt, low leverage firms have significantly higher cash balances (relative to total assets) than control firms. In fact, for low leverage firms, cash and marketable securities comprise 21% of total assets on average (17.5% at the median)—almost three times that of the typical control firm. This puts our financially conservative firms squarely in the category of "cash-rich" firms as defined, for example, by Harford (1999) and Opler, Pinkowitz, Stulz and Williamson (1999).

Panel B presents evidence on three categories of expenditures: research and development, capital spending and net acquisitions. Consistent with prior evidence, low leverage firms spend a significantly higher portion of sales on research and development than control firms. However, this finding is driven by the 1993 and 1998 panels, the only panels with a significant difference in R&D spending. In contrast, control firms persistently spend significantly more on capital expenditures and acquisitions (relative to total assets) than low leverage firms.[3] We also examine advertising relative to sales (not reported), and find that low leverage firms spend more on advertising relative to sales than control firms. However, the 1978 panel is the only individual panel that shows a significant difference.[4]

Panel C presents evidence on external financing. Not surprisingly, control firms issue more debt than low leverage firms. Perhaps more surprisingly, however, control firms repurchase significantly more debt and issue more equity than low leverage firms. In contrast, low leverage firms repurchase somewhat more equity than control firms. Looking across all issuance and repurchasing activities, low leverage firms are net repurchasers of securities while control firms are net issuers (not reported separately). Thus, the low leverage ratios of financially conservative firms do not seem to result from a higher reliance on external equity financing.

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[2] The adjustment for R&D takes into account the tax benefits of expensing R&D. The tax rate used is Graham's (1996) marginal tax rate. Where that rate is not available, we use the appropriate statutory tax rate.

[3] Relatedly, we examine net property plant and equipment relative to total assets. Consistent with higher capital spending, control firms have significantly higher net property plant and equipment (NPPE) than low leverage firms (not reported). Indeed, the capital expenditures and NPPE variables are so highly positively correlated, that we use only capital expenditures in subsequent analysis.

[4] In addition, many missing values for this variable make it unproductive for use in cross-sectional analysis.

2.4. Investment opportunities, asymmetric information and tax status

Table 3 presents proxies for investment opportunities, asymmetric information and tax status. Extant tradeoff and contracting theories of capital structure predict that these factors are associated with financial policy. Consistent with prior work, see, e.g., Graham (2000), Jung, Kim, and Stulz (1996), and Smith and Watts (1992), panel A shows that conservative firms have an average market-to-book ratio of 1.70, which is significantly higher than the 1.11 mean for control firms. Results for medians are similar. Adjusting for industry shows that, in contrast to control firms, low leverage firms have investment opportunities superior to their industry peers.

Panel B presents statistics on proxies for asymmetric information and the expected costs of financial distress. The first three variables are the coefficient of variation in firm EBITDA/total assets, the coefficient of variation in industry EBITDA/assets and, following Sharpe and Nguyen (1995) and Graham (2000), a variable equal to the percentage of panel years in which the firm does not pay cash dividends on common stock. Taken together, the statistics indicate that, if anything, low leverage firms face less asymmetric information and a lower likelihood of distress than control firms. Altman's (1968) Z-score, as modified by MacKie-Mason (1990), is another proxy for the probability of financial distress.[5] Again, low leverage firms appear less likely to encounter distress, as evidenced by their significantly higher modified Z-Score.

Finally, panel C reports four measures of tax status. Statistics for these measures indicate that low leverage firms pay higher taxes relative to their income (which we know is high, see table 2) and face higher tax rates than control firms. This is inconsistent with the notion that low leverage firms pay little in taxes and thus do not value the tax shields generated by borrowing.

[5] The modified Z-score is computed prior to the direct effects of capital structure, as follows: Z=(3.3 x earnings before interest and taxes + sales + retained earnings + working capital)/total assets.

3. Predicting financial conservatism

3.1. A logit regression approach

Logit regression analysis is used to identify firm characteristics associated with a conservative financial policy. We present two sets of regressions. The first estimates the relation between firm characteristics and the probability of adopting a conservative financial policy (see table 4). Here, the dependent variable equals one if the firm is classified as low leverage and zero if it is a control firm. The second set of regressions estimates the relation between firm characteristics and the probability of switching financial policy; that is the probability of a low leverage firm taking on enough debt to be reclassified as a control firm (see table 6) or of a control firm reducing debt sufficiently to be reclassified as a low leverage firm (see table 7). In these regressions, the dependent variable equals one if the firm switches financial policy and zero if it does not switch. Details of our definition of switches in financial policy are discussed in section 4.

For each set of regressions, we present results using two estimation methods. For the first set, pooled data from the five non-overlapping five-year panels are used to generate coefficient estimates. For the second set, a logit regression is estimated for each of the 21 overlapping five-year panels; mean coefficients, mean changes in probabilities as defined below and Z-statistics for significance across panels are presented. For all regressions, firm means within a five-year panel constitute one observation. Each model is estimated using two different tax variables. Because logit coefficients are difficult to interpret, we report the change in probability associated with a one standard deviation change centered on the mean for all continuous variables (i.e., -0.5σ to 0.5σ, holding other variables at their means). For indicator variables, we report the change in probability associated with a change from zero to one.

3.2. The probability of adopting a conservative financial policy

Table 4 reports the results of logit regressions for the probability of adopting a conservative financial policy. Two sets of explanatory variables are included: 1) flow of funds and expenditures (see table 2 for descriptive statistics) and 2) investment opportunity set, asymmetric information and tax status variables (see table 3 for descriptive statistics). Below, we discuss predictions from

theory and empirical findings for each set of variables in turn. Overall, the models presented in table 4 are highly significant, with pseudo R-squareds ranging from 33% to 49% and p-values of 0.0000.

3.2.1. Flow of funds and expenditures

These variables allow us to test hypotheses about financial conservatism implied by pecking order. Pecking order theory predicts that firms use external financing only when internal funds are insufficient to fund discretionary expenditures. When internal funds fall short, managers turn first to debt financing and then, only as a last resort, to equity financing (Myers 1984). Myers and Majluf (1984) postulate that this allows firms to avoid issuing securities when they are undervalued due to asymmetric information.[6] Asymmetric information is directly addressed in the next section.

Pecking theory order predicts that, all else constant, more plentiful internal funds increase the likelihood of adopting a low leverage financial policy; firms with sufficient internal funds will avoid using any type of external financing, including debt financing. Additionally, pecking order predicts that, all else constant, higher discretionary expenditures will be negatively associated with financial conservatism. This is because, all else constant, higher expenditures increase the likelihood that a firm will have to raise funds externally.

The firm's flow of funds prior to research and development, capital expenditures and acquisitions is our primary measure of internally available funds. Many capital structure studies use profitability to test pecking order hypotheses (e.g. Fama and French (2000), Graham (2000)). Although profits and flow of funds are highly correlated, pecking order theory explicitly pertains to flow of funds (Shyam-Sunder and Myers (1999)). As measured here, flow of funds differs from profits by taking into account changes in working capital, cash dividends and required debt repayments. In addition, because we include R&D as a separate variable, we add back tax-adjusted R&D to the flow of funds. (Our measures of discretionary expenditures are R&D spending, capital

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[6] Heinkel and Zechner (1990) and Narayanan (1988) develop models in which information asymmetries lead to a pecking order of financing instruments. There are, however, other models that include asymmetric information but do not support pecking order. For example, Brennan and Kraus (1987), Constantinides and Grundy (1989) and Noe (1988) demonstrate that a pecking order does not necessarily obtain if financing choices include hybrid securities or share repurchases. Nor does it obtain if the potential loss of future project is large enough that managers issue a risky security to finance investment instead of cash or debt (Viswanath, 1993).

expenditures and net acquisitions. Note that, by definition, the latter two are not included in the flow of funds so no adjustment need be made.)

Donaldson (1961) and extensions of pecking order theory predict that a firm will, if possible, maintain financial slack or stockpile debt capacity to provide flexibility in financing future investments (e.g., Myers 1984). One form that this financial slack or debt capacity can take is a large balance of cash and marketable securities. Indeed, recent studies explore the implications of cash balances for management decision-making and firm value (e.g. Opler, Pinkowitz, Stulz and Williamson (1999) and Harford (1999)). We are not aware, however, of studies that include cash balances as a potential source of internal funds.[7] Yet, theory suggests that cash balances should be included because they are both a source of internal funds and a means of avoiding an undesirable future equity issues. Thus, we include it here.

Consistent with pecking order hypotheses, table 4 results show that financially conservative firms have high flow of funds *and* substantial cash balances relative to control firms. In all four models, flow of funds and cash balances are significant and positively associated with the probability of adopting a conservative financial policy. The changes in probability associated with these variables are fairly large and consistent across models: 0.031-0.036 for flow of funds and 0.016-0.022 for cash balance.

Also consistent with pecking order hypotheses, two of the three types of discretionary spending are significant and negatively associated with financial conservatism. The probability of adopting a low leverage financial policy falls by 0.022-0.023 for a one standard deviation increase in capital expenditures and by 0.026-0.044 for acquisitions. R&D does not enter significantly in the pooled regressions, but it is negative and significant in 70% (column 3) and 52% (column 4) of the 21 separate panel regression models.

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[7] Some studies do include current or quick ratios as measures of asset liquidity and financial constraints, see e.g., Graham (2000).

3.2.2. Investment opportunities, asymmetric information and the trade-off theory

At least two theories suggest that a firm's investment opportunity set affects whether or not it pursues a low leverage financial policy. Both theories predict that firms whose value is comprised predominately of future growth opportunities will adopt more conservative financial policies. Myers (1984) argues that debt creates the potential for under-investment when bondholders and shareholders are in conflict over the exercise of valuable real options. Jensen (1986) argues that debt forces managers of firms with strong cash flow and limited growth opportunities to disgorge free cash flow. Following this logic, conservatively financed firms should have strong growth opportunities. If their growth opportunities are weak and cash flow permits, they will optimally be highly leveraged.

Following many others, we use the firm's market-to-book ratio as a proxy for investment opportunities (e.g. Smith and Watts (1992), Jung, Kim and Stulz (1996)). Consistent with predictions, financially conservative firms have higher market-to-book ratios than control firms. In all models, the coefficient of market-to-book is significantly positive. The associated change in probability ranges from 0.011 to 0.014. It is worth noting that capital spending/total assets and R&D/sales are used as proxies for growth opportunities or asset specificity in other studies. From this perspective, interpreting our negative coefficient on capital spending is straightforward. Capital spending creates assets-in-place and is, in fact, highly positively correlated with proxies for assets-in-place such as net property, plant and equipment. Not surprisingly, conservatively financed firms are less reliant on assets-in-place than control firms.

The lack of significance of R&D in pooled regressions, and its negative coefficient in some individual panels, is perhaps more puzzling.[8] Consider, however, that a firm can have a high market-to-book ratio for several reasons, ranging from the anticipated future cash flow of current businesses to the anticipated discovery of new technologies or products. Reasons like the latter are more commonly given in the literature, but financially conservative firms seem to fit better with the

[8] Dropping market-to-book from logit models does not affect the sign and significance of other regression coefficients, including R&D.

former set of reasons—especially given their strong flow of funds and large cash balances. Evidence on asymmetric information, to which we turn next, lends additional credibility to this interpretation.

Regression results show that, if anything, conservative firms operate in a more favorable information environment than control firms. This is inconsistent with the hypothesis that firms adopt conservative financial policies to deal with severe information asymmetries (Myers and Majluf (1984)).[9] Our models include two proxies for information asymmetries: industry earnings volatility and a dividend indicator variable (both as defined in table 3). Industry volatility is generally insignificant. The dividend indicator has a significant negative coefficient—the opposite of the predicted sign if information asymmetry drives financial conservatism. Other models (not presented) include the firm earnings volatility (see table A1, panel D). This variable also is generally insignificant. Some studies use size as a proxy for volatility and/or asymmetric information (e.g., Fama and French (1999), Graham (2000)). In table 4, firm size has a significant and negative coefficient. This negative association indicates that, all else constant, smaller firms are more likely to be financially conservative. This is our only evidence supporting information problems for conservative firms. In light of our other findings, we interpret it as fairly weak evidence.

Trade-off theory predicts that firms will choose conservative financial policies if they face high expected costs of financial distress and/or attach a low value to interest tax shields. To test whether or not this holds, we include variables that proxy for the probability of financial distress, the firm's tax status and the potential costs of financial distress. Overall, we find little evidence that trade-off theory influences the decision to adopt a conservative financial policy.

Following MacKie-Mason (1990), the modified Z-score is one proxy for the likelihood that a firm will experience financial distress. Other capital structure studies use this variable similarly (e.g., Helwege and Liang (1996) and Graham (2000)). The Z-Score coefficient is consistently positive and significant, indicating that financially conservative firms are *less*, rather than more, likely to

[9] Rather than proxying for information asymmetries, our earnings volatility measures might proxy for the anticipated costs of financial distress. If this is the case, then the zero/negative coefficients are inconsistent with the hypothesis that financially conservative firms face a high expected financial distress costs than control firms.

encounter financial distress. Given our prior results on flow of funds and cash balances, perhaps this is not surprising.

As mentioned earlier, we include two tax variables in our models. The first is the net operating loss indicator (defined in table 3). Firms incurring such losses regularly are likely to attach a lower value to interest tax shields. Our second tax variable is the marginal tax rate before interest from Graham (1996a).[10] Firms with higher tax rates prior to interest expense are more likely to value the tax shields of debt. This variable also provides some indication of a firm's non-interest tax (DeAngelo and Masulis (1980)). Both tax variables are significant, but they carry the "wrong" sign. Specifically, the evidence indicates that financially conservative firms face *higher* tax rates than control firms. Using alternative measures of tax status (see table A1, panel C) yields similar results. In addition, evidence on capital expenditures and R&D counter the notion that conservative firms have substantial non-debt tax shields. The negative coefficient on capital spending suggests that control firms have more depreciation (as does direct evident on depreciation expense and net property plant and equipment (not presented)). The zero/negative coefficient on R&D suggests that conservative and control firms experience similar benefits from expensing R&D for tax purposes.

To further assess sensitivity to financial distress, we identify industries in which firms are likely to experience significant costs of financial distress (see e.g., Titman (1984) and Graham (2000)). Sensitivity to distress, for example, could be due to a high value of on-going relationships with customers through warranties, repairs or upgrades. Indicator variables are included for the computer industry, specialty manufacturing, retail and pharmaceutical/biotechnology firms. Three of the four industry classifications are significantly associated with the probability of financial conservatism.[11] Firms in the computer industry and in specialty manufacturing are more likely to be financially conservative than other firms. In contrast, retail firms are less likely to follow a low

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[10] Graham's data begins in 1980. To maximize the number of observations, when Graham's data is missing, we use the closest estimate in time for that firm. Results are qualitatively similar if we exclude all observations prior to 1980.

[11] Alternative models include a dummy variable for service firms. It never enters significantly in pooled regressions, and drops out in many of the 21 panel regressions due to lack of industry membership.

leverage policy (significant in model 1). Perhaps this is because their real estate serves as strong collateral for borrowing.

3.2.3. Robustness checks and summary

We conduct a variety of robustness checks of our logit model specification. A summary of the findings of these checks is reported in table A1. Perhaps the most important of our robustness checks are alternative methods of controlling for industry effects to assure that financial conservatism is not driven predominately by industry membership. Thus, we conduct three sets of industry-based robustness checks (see table A1, panel A).

First, we re-estimate logit regressions correcting standard errors for industry clustering (omitting the industry dummy variables included in table 4). Our main results persist; all coefficient and average coefficient estimates retain their sign and significance levels. For the 21 individual panels, some firm characteristics are significant in a lower percentage of panels and others are significant in a higher percentage of panels. There is, however, little evidence of systematic changes in results. Second, we re-estimate our models and include industry dummy variables for each two-digit SIC code (omitting the industry dummy variables used in table 4). Our results in terms of significance of the models, and sign and significance of coefficient estimates remain. Finally, we re-estimate the model with industry fixed effects (omitting the industry dummy variables and industry earning volatility included in table 4). Again, our findings remain largely unchanged. The only change worth noting is that in the 21 individual regressions, the Z-score coefficient is significant in 62% of the panels, compared with 95% in table 4.

In another set of robustness checks, we include equity repurchases as a discretionary use of funds (see table A1, panel B). We do not include dividends as a discretionary expenditure because they are generally considered "sticky," with changes being viewed as more permanent than temporary. We include equity issuances to test whether financially conservative firms are low leverage because they choose equity over debt financing. Share repurchases are negatively associated with low leverage. The probability of adopting a low leverage financial policy falls by 0.010-0.016 for a one standard deviation increase in equity repurchases. Equity issuance is not significant in the pooled model, and is significant in only four of the 21 overlapping panel regressions (and then with

inconsistent coefficient signs). Thus, equity issuance behavior does not distinguish financially conservative and control firms.

In summary, evidence thus far indicates that financially conservative firms follow a pecking order-style financing strategy—but apparently not to avoid problems of severe asymmetric information. Financially conservative firms have an internal flow of funds sufficient to fund discretionary spending and, in addition, carry substantial cash balances. Indeed, financially conservative firms appear to have substantial financial slack and/or stockpiled debt capacity. These findings raise a number of additional important questions. Are conservative financial policies temporary or permanent? Under what conditions do financially conservative firms adopt less conservative policies and vice versa? Finally, and relatedly, for what purpose do financially conservative firms utilize their financial slack and/or tap into their unutilized debt capacity? Our analysis of switches in financial policy addresses these questions.

4. Switches in Financial Policy

This section focuses on the relation between firm characteristics and the probability of adopting or dropping a low leverage financial policy. To conduct this analysis, we divide the 25-year sample period into ten-year panels. Each panel is comprised of two five-year sub-panels as illustrated in figure 2. The first five-year sub-panel establishes a firm's initial financial policy; we refer to this panel as the pre-switching period. In the second five-year panel, we observe whether or not each firm switched financial policy; we refer to this panel as the switching period. If a firm is a control firm in the pre-switching period and low leverage in the switching period, it is classified as adopting a conservative financial policy. If a firm is low leverage in the pre-switching period and a control firm in the switching period, it is classified as dropping a conservative financial policy. Note that to be included in this analysis, a firm must survive for at least ten years (only five-year survival is required for inclusion in prior analysis.)

As in Section 3, we present results using two estimation methods. First, we conduct pooled analysis of data for four ten-year panels in which the switching periods do not overlap. As shown in

panel A of fig.1, they are formed as follows: 1974-1983, 1979-1988, 1984-1993 and 1989-1998. Second, as shown in Panel B, we form 16 overlapping ten-year panels, beginning with 1974-1983, followed by 1975-1984 and ending with 1989-1998.

Table 5, panel A, describes the sample of firms that drop their conservative financial policy. Panel B describes the sample of firms that adopt a conservative financial policy. Panel A shows that, for many firms, financial conservatism is a transitory financial policy. Of the 432 low leverage firms, 46.8% adopt a less conservative policy during the switching period. The frequency of switching is spread evenly across the four change periods (not shown in table 5). Similarly, for the 16 overlapping periods, an average of 46.2% of firms drop their conservative financial policy; the percentage of firms switching ranges from 37.9% to 55.2%. Following all low leverage firms over time reveals that eventually, 70% drop their conservative financial policy (not shown in table 5). In general, movements away from conservatism are permanent. Of the 202 switches in the pooled sample, 93.1% (188) represent firms that switch and remain control firms permanently (not shown in table 5).

Firms moving away from financial conservatism show a substantial increase in leverage. On average, low leverage firms increase their debt ratio from 0.0417 to 0.1271 (pooled sample)—more than a 200% increase. Median increases are of a similar magnitude. These changes are large relative to what others classify as major changes in leverage. For example, Graham (1996a) classifies a 0.02 change in the debt ratio as a major change.

Panel B shows that relatively few control firms adopt a conservative financial policy. Of the 3,186 control firms in the pooled sample, only 3.7% adopt a conservative financial policy during the switching period. Again, the changes are fairly evenly spread over time (not reported in table 5). Over the 16 overlapping change periods, an average of 3.5% adopt conservative financial policies; the percentage of switchers ranges from 2.4% to 4.7%. The transitory nature of conservatism is also evident here. Switches to financial conservatism are not only infrequent, but for the majority of firms the switch is temporary; 52.1% (62) subsequently return to a less conservative financial policy (not reported in table 5). Firms adopting conservative financial policies reduce leverage

significantly. For the pooled sample, switching firms reduce their debt ratio from 0.1237 to 0.0419 on average—a 66% reduction. Median changes are similar.

4.1. Dropping a conservative financial policy

Table 6 reports the results of logit regressions for the probability of switching away from a conservative financial policy. All firms included in this analysis are low leverage during the pre-switching period. The dependent variable equals one if the firm drops its conservative financial policy in the switching period, and zero if it remains low leverage. Explanatory variables are firm means over the switching period. As in the prior section, we present one logit model for each of two tax variables. All logit models are highly significant, with pseudo R-squareds ranging from 30% to almost 64%, and p-values of 0.000.

Prior analysis shows that financially conservative firms seem to "stockpile" financial flexibility (see table 4). This analysis documents the circumstances under which they utilize it. Specifically, regression results show that conservatively financed firms tap into unutilized debt capacity when internal funds fall off and/or to undertake discretionary expenditures. These findings support Donaldson (1961) and others, including Myers (1984), who predict that, if possible, firms will set current financial policy to provide future financial flexibility. The coefficient on flow of funds is negative and significant in all regression models. In addition, the change in probability associated with a one standard deviation change around the mean is large, ranging from –0.30 to –0.38. The coefficient on cash balance is negative as well, but it is insignificant in the pooled model and significant in only 28% (column 3) and 25% (column 4) of the 16 individual period regressions, respectively. Although both flow of funds and cash balances are potential sources of internal funds, our results suggest that flow of funds surplus is more important than cash balances for predicting changes to a less conservative financial policy.

Firms that drop financial conservatism have greater discretionary expenditures than firms that maintain a conservative financial policy. The coefficients for R&D, capital expenditures and acquisitions are significant and positive in the pooled model. In the 16 individual period models, acquisitions and capital spending are also strongly and consistently significant. The coefficient for R&D is consistently positive, but significant in less than half of the individual models. The change in

probability associated with discretionary expenditures is large, particularly for acquisitions (0.37-0.44) and capital expenditures (0.21-0.31). The change in probability associated with R&D is somewhat smaller, ranging from 0.14 to 0.16. Thus, our results suggest that acquisitions and capital spending are more strongly associated with movements away from financial conservatism than R&D. One potential explanation for this is that both acquisitions and capital expenditures are more likely to be associated with additional tangible assets than R&D, providing a stronger base for borrowing.

Switching firms are also larger, have lower modified Z-scores and are less frequently in the computer or specialty manufacturing industries than non-switchers.[12] Neither of these variables, however, are as strongly and persistently significant as flow of funds and discretionary expenditures.

Also interesting are the variables that are not significant. Specifically, market-to-book, asymmetric information variables and tax status variables are all insignificant. It does not, therefore, appear that differences in investment opportunities distinguish low leverage firms that drop their conservative financial policy from those that do not. Nor do differences in information environments or tax status seem to play a role. The exception is Graham's marginal tax rate, which is *negative* and significant in the pooled regression model. As in table 4, the negative sign is the opposite of that predicted by trade-off theory, under which a higher tax rate would motivate firms to take on more debt.

As stated earlier, explanatory variables are firm means computed during switching period. It is possible that differences in the characteristics of switching and non-switching firms are present in the pre-switching period as well. This would imply that low leverage firms fall into two distinct groups that can be identified *ex ante*. To explore this possibility, we estimate the same regression models using firm means in the pre-switching period as explanatory variables (not reported). The models are not significant and none of the variables have consistently significant coefficients. This result implies that differences between switchers and non-switchers emerge in the switching period, lending

[12] Many of the industry dummy variables fall out of the 16 individual change period regressions due to lack of industry membership.

credibility to the idea that changes in firm-specific characteristics motivate changes in financial policy. In section 4.3, we explore this issue further.

4.2. Adopting a conservative financial policy

Table 7 reports the results of logit regressions for the probability of adopting a conservative financial policy. All firms included in this analysis are control firms during the pre-switching period. The dependent variable equals one if the firm adopts a conservative financial policy in the switching period, and zero if it remains a control firm. Again, explanatory variables are firm means over the switching period. All logit models are highly significant, with pseudo R-squareds ranging from 21% to 45%.

With a few exceptions, results in table 7 mirror those in table 6. This implies a symmetry between the factors associated with movements toward and away from financial conservatism. In addition, it strengthens the credibility of our findings in the prior section; the samples used in table 6 and table 7 regressions are different, yet the findings reinforce one another.

The results in table 7 are consistent with the hypothesis that firms adopting a conservative financial policy are in a stronger position to build financial slack and/or stockpile debt capacity than other control firms. The coefficients of flow of funds surplus and cash balances are both positive and significant, indicating that switching firms have greater flow of funds and larger cash balances than other control firms. In addition, the coefficients on discretionary spending variables are negative and, with the exception of R&D, statistically significant. This indicates that, with the exception of R&D, firms moving to low leverage have lower discretionary expenditures than other control firms.

Increased investment opportunities, as reflected in market-to-book, are also associated with the adoption of a conservative financial policy. The coefficient of market-to-book is positive and significant. This stands in contrast to the results in table 6, where market-to-book did not enter significantly. Taken together, the results from tables 6 and 7 identify a potentially important asymmetry in switches to and from low leverage with respect to the investment opportunity set.

Firms switching to a conservative financial policy have a higher Z-score, and are more likely to be in the computer and specialty manufacturing industries than other control firms. Also, mirroring table 6 results, none of the tax status variables are significant.

Again in contrast to the analysis in table 6, the coefficient of industry volatility is significant and positive, and the coefficient of firm size is insignificant. This implies that asymmetric information influences movements to a conservative financial policy, but not away from one. It appears that all else constant, firms in industries with higher earnings volatility are more likely to adopt conservative financial policies.

As in the prior section, we re-estimate regressions using five-year means from the pre-switching period as explanatory variables. The models are not significant, and coefficient estimates are not consistently significant. Again, this indicates that differences between switchers and non-switchers emerge during the switching period rather than *ex ante*.

4.3. Robustness checks

4.3.1. The definition of switches in financial policy

As described earlier, we define financial conservatism relative to the annual cross-sectional distribution of debt ratios. Using debt ratios raises the question of whether switches in financial policy are driven by changes in the numerator (long-term debt) or changes in the denominator (total assets). The decline in the annual 20% cutoff debt ratio over time (reported in table 1) raises the question of whether financially conservative firms are reclassified as control firms simply because the annual cutoff changes. To determine the extent to which these issues are present, table 8, panel A, presents evidence on percentage changes in total assets and long-term debt for switching firms.

Overall, table 8 shows that for the vast majority of firms classified as switching financial policy, switches are driven by changes in the level of long-term borrowings rather than by changes in total assets or changes in the cutoff debt ratio. Panel A presents percentage changes in total assets and long-term debt based on changes in firm medians from the pre-switching to the switching period. Grand medians are presented for the pooled sample. Grand medians and the range of medians are presented for the 16 individual periods.

For firms dropping a conservative financial policy, average total assets increases by 70.5% at the median, with only 3.5% of firms experiencing a decline in average total assets. Findings for the 16 individual periods are similar. This implies that the debt ratio increases associated with switches away from conservatism are not driven by reductions in total assets. This interpretation is

reinforced by evidence on the percentage changes in long-term debt for these firms: 405.4% at the median, with only 1.0% of the firms experiencing a decrease in long-term debt. Findings for the 16 individual periods are similar.

For firms adopting a conservative financial policy, average total assets increases by 64.0% at the median, with 10.1% of the firms experiencing a decline in total assets. Thus, it is possible that these firms have lower debt ratios due to increases in total assets rather than reductions in debt. Examining percentage changes in long-term debt, however, reveals a change of –49.4%—a dramatic reduction. Median percentage changes range from –85.8% to –17.3% across the 16 individual periods. In addition, 82.4% of firms adopting a conservative financial policy experience a decline in long-term debt between the pre-switching and switching periods.

To summarize, in general our definition of switches in financial policy is capturing large changes in the level of long-term debt financing. There are, however, a few firms that are classified as switchers due to changes in total assets or the time series decline in the cutoff debt ratio. This is an outcome of our choice to define financial conservatism relative to the marketplace at the time. We think that, if anything, the inclusion of these observations adds noise to our analysis and so works against us in terms of finding statistical significance.

4.3.2. Changes in the characteristics of switching firms

The analysis of switches in financial policy presented in tables 6 and 7 compares the characteristics of firms that change financial policy and those that do not. Another approach would be to examine changes in the characteristics of switching firms between the pre-switching and switching periods. In panel B of table 8, we present such changes for firm characteristics shown to be important in logit regressions. Not unexpectedly, these univariate results are weaker statistically than logit results. They do, however, confirm an association between the firm characteristics identified by logit models and switches in financial policy.

Firms dropping a conservative financial policy experience a significant decline in both flow of funds and cash balances between the pre-switching and switching periods. In addition, they show a significant increase in acquisitions. R&D and capital spending also increase, but the changes are not

statistically significant. Firms dropping financial conservatism also show a decline in market-to-book, but the decline is statistically insignificant.

Firms adopting a conservative financial policy experience a significant increase in both flow of funds and cash balances. In addition, they show a significant increase in R&D. Results for capital expenditures and acquisitions are mixed. Market-to-book, however, shows a large and significant increase for firms adopting financial conservatism.

5. Conclusions

Our analysis provides new insights into the behavior of financially conservative firms. It also raises a number of interesting and potentially important areas for future research. We document that conservative firms follow a pecking order style financial policy. Conservative firms have a high flow of funds surplus and large cash balances relative to more leveraged firms. These internal funds are sufficient to fund the bulk of both operations and discretionary outlays. However, low leverage firms do not strictly follow pecking order theory, which postulates an inflexible hierarchy of financial instruments. This finding calls attention to seemingly inconsistent financing decisions made by financially conservative firms, and other firms as well. For example, why and under what circumstances do firms simultaneously raise funds externally and carry large cash balances? Or raise external equity and undertake share repurchases?

We also find that low leverage is largely a transitory capital structure. This result calls attention to the time dynamics of financial policy. Our findings suggest, not only that capital structure dynamics are interesting and important, but that a deeper understanding of capital structure dynamics has the potential to yield a deeper understanding of capital structure in the cross-section.

Finally, financially conservative firms appear to stockpile financial slack and/or debt capacity. They tap into their "stockpiles" when internal funds fall off and/or to undertake large discretionary outlays. Do these stockpiles constitute valuable financial slack that results in optimal investment? Or do they constitute the accumulation of free cash flow (Jensen (1986)) that results in over-investment? Or when we look across firms is it some combination of both? Work by Opler,

Pinkowitz, Stulz and Williamson (1999) on cash balances and by Harford (1999) on acquisitions by cash-rich bidders tackles these questions. Our findings suggest, however, that the issues are broader than cash balances and that much work in this area remains.

References

Altman, Edward, 1968, Financial Ratios, Discriminant Analysis, and the Prediction of Corporate Bankruptcy, *Journal of Finance* 23, 589-609.

Brennan, Michael and A. Kraus, 1987, Efficient financing under asymmetric information, *Journal of Finance* 42, 1,225-1,243.

Constantinides, George and Bruce Grundy, 1989, Optimal investment with stock repurchases and financing as signals, *Review of Financial Studies* 2, 445-466.

DeAngelo, Harry, and Ronald Masulis, 1980, Optimal Capital Structure Under Corporate and Personal Taxation, *Journal of Financial Economics* 8, 3-29.

Donaldson, Gordon, 1961, *Corporate debt capacity: A study of corporate debt policy and the determination of corporate debt capacity*, Harvard Business School.

Fama, Eugene, and Ken French, 1999, Testing tradeoff and pecking order predictions about dividends and debt, working paper, University of Chicago.

Fama, Eugene and James MacBeth, 1973, Risk, Return, and Equilibrium, *Journal of Political Economy*, 607-636.

Frank, Murray and Vidham Goyal, 2001, Testing the Pecking Order Theory of Capital Structure, unpublished working paper, University of British Columbia and Hong Kong University.

Graham, John, 1996a, Debt and the marginal tax rate, *Journal of Financial Economics* 41, 41-73.

Graham, John, 1996b, Proxies for the marginal tax rate, *Journal of Financial Economics* 42, 187-221.

Graham, John, 2000, How big are the tax benefits of debt?, *Journal of Finance* 55, 1901-1942 .

Harford, Jarrad, 1999, Corporate cash reserves and acquisition, *Journal of Finance* 54, 1969-1997.

Heinkel, Robert and Josef Zechner, 1990, The role of debt and preferred stock as a solution to adverse investment incentives *Journal of Financial and Quantitative Analysis* 25, 1-24.

Helwege, Jean, and Nellie Liang, 1996, Is there a pecking order? Evidence from a panel of IPO firms, *Journal of Financial Economics* 40, 429-458.

Huber, Peter, 1967, The behavior of maximum likelihood estimates under non-standard conditions, *Proceedings of the Fifth Berkeley Symposium in Mathematical Statistics and Probability*, University of California Press, Berkeley, CA, 221-233.

Jensen, Michael, 1986, Agency costs of free cash flow, corporate financing, and takeovers, *American Economic Review* 76, 323- 329.

Jung, Kooyul, Yong-Cheol Kim, and Rene Stulz, 1996, Timing, investment opportunities, managerial discretion, and the security issuance decision, *Journal of Financial Economics* 42, 159-185.

MacKie-Mason, Jeffrey, 1990, Do taxes affect corporate financing decisions? *Journal of Finance* 45, 1471-1493.

Myers, Stewart, 1977, Determinants of corporate borrowing, *Journal of Financial Economics* 3, 799-819.

Myers, Stewart, 1984 , The capital structure puzzle, *Journal of Finance* 39, 799-819.

Myers, Stewart, and N. Majluf, 1984, Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics* 13, 187-221.

Narayanan, M.P., 1988, Debt versus equity under asymmetric information, *Journal of Financial and Quantitative Analysis* 23, 39-51.

Noe, Thomas, 1988, Capital structure choice and signaling game equilibria, *Review of Financial Studies* 1, 331-356.

Opler, Timothy, Lee Pinkowitz, Rene Stulz, and Rohan Williamson, 1999, The determinants and implications of corporate cash holdings, *Journal of Financial Economics* 52, 3-46.

Sharpe, Steven and Hien Nguyen, 1995, Capital market imperfection and the incentive to lease, *Journal of Financial Economics* 39, 271-294.

Shyam-Sunder, Lakshmi and Stewart Myers, 1999, Testing static tradeoff against pecking-order models of capital structure, *Journal of Financial Economics* 51, 219-244.

Smith, Clifford, and Ross Watts, 1992, The investment opportunity set and corporate financing, dividend and compensation policies, *Journal of Financial Economics* 32, 263-292.

Stulz, Rene, 1990, Managerial discretion and optimal financing policies, *Journal of Financial Economics* 26, 3-27.

Stafford, Erik, 1999, Managing financial policy: Evidence from the financing of extraordinary investments, unpublished manuscript, Harvard Business School.

Titman, Sheridan, 1984, The effect of capital structure on a firm's liquidation decision, *Journal of Financial Economics* 13, 137-151.

Titman, Sheridan, and Roberto Wessels, 1988, The determinants of capital structure choice, *Journal of Finance* 43, 1-19.

Viswanath, P.V, 1993, Strategic considerations, the pecking order hypothesis, and market reactions to equity financing, *Journal of Financial and Quantitative Analysis* 28, 213-234.

White Halbert, 1980, A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity, *Econometrica* 48, 817-838.

Fig. 1. Illustration of the method used to form five-year panels for analysis of low leverage and control firms. Firms are selected from public, domestic firms with both CRSP and Compustat data and real total assets greater than $100 million in 1998 dollars. Financial service firms and utilities are eliminated. To form the five non-overlapping panels, firms are assigned to panels based on survivorship and leverage for the five-year periods ending in 1978, 1983, 1988, 1993 and 1998, as shown in panel A. To form the 21 overlapping panels, firms are assigned to panels for the 21 five-year periods ending in 1978 through 1998, as shown in panel B. A firm is classified as a low leverage firm if its ratio of long-term debt to total assets falls in the bottom 20% of all firms for all five panel years. Control firms are other firms that survive for the corresponding five-year period. Long-term debt includes the current portion of long-term debt.

Panel A: Formation of 5 non-overlapping five-year panels

1.	2.	3.	4.	5.
[1974-1978]	**[1979-1983]**	**[1984-1988]**	**[1989-1993]**	**[1994-1998]**

Panel B: Formation of 21 overlapping five-year panels

1. [1974-1978]
2. [1975-1979]
3. [1976-1980]
4. [1977-1981]
5. [1978-1982]
6. [1979-1983]
7. [1980-1984]
8. [1981-1985]
9. [1982-1987]
10. [1983-1988]
11. [1984-1988]
12. [1985-1989]
13. [1986-1990]
14. [1987-1991]
15. [1988-1992]
16. [1989-1993]
17. [1990-1994]
18. [1991-1995]
19. [1992-1996]
20. [1993-1997]
21. [1994-1998]

Table 1. Sample size, ratio of long-term debt to total assets and other measures of debt. Firms are selected from public, domestic firms with both CRSP and Compustat data and real total assets greater than $100 million in 1998 dollars. Financial service firms and utilities are eliminated. Firms are assigned to panels based on survivorship and leverage during five non-overlapping five-year periods ending in the years 1978, 1983, 1988, 1993 and 1998. A firm is assigned to a low leverage panel if its ratio of long-term debt to total assets falls in the bottom 20% of all firms for each of the five panel years. Control firms are other firms that survive for the corresponding five-year period. Long-term debt includes the current portion of long-term debt. Industry adjustments are made on an annual basis using medians for each variable based on two-digit Compustat SIC codes. All firms, regardless of their survivorship or leverage characteristics, are used in computing industry medians; this utilizes a total of 46,675 firm years of data. Statistics are computed in the following sequence: 1) the mean (median) for each firm within a panel, 2) the mean (median) across firms within a panel, 3) the mean (median) across panels. T-tests assuming unequal variances are used to compare means and a Wilcoxon ranked sign test is used to compare medians. ** (*) denotes significance at the 1% (5%) level. NM is not meaningful.

Panel A: Sample size and ratio of long-term debt to total assets

	Pooled across 5-year non-overlapping panels	**1978 Panel**	**1983 Panel**	**1988 Panel**	**1993 Panel**	**1998 Panel**
Sample size						
Low leverage firms	673	156	140	103	138	136
Control sample of five year survivors	5736	1217	1041	989	1149	1340
Zero long-term debt for five panel years, number	114	17	21	11	27	38
% of low leverage firms	16.9%	10.9%	15.0%	10.7%	19.6%	27.9%
Long-term debt/total assets—mean (median)						
Low leverage firms	.0276	.0377	.0373	.0319	.0219	.0086
	(.0244)	(.0259)	.0337)	(.0244)	(.0128)	(.0000)
Control sample of five year survivors	.2932	.2922	.2791	.2816	.3140	.2956
	(.2643)	(.2689)	(.2501)	(.2492)	(.2844)	(.2643)
Annual 20% cutoff for long-term debt /total assets	NM	.1182	.1117	.1019	.0898	.0543
		(.1149)	(.1146)	(.0987)	(.0875)	(.0511)

Panel B: Other measures of debt, pooled across 5-year non-overlapping panels—mean (median)

	Low leverage firms	**Control sample of five year survivors**	**t-statistic (Z-statistic) for diff. in means (medians)**
Industry adjusted long-term debt /total assets	-.1902	.0328	-65.2**
	(-.1847)	(.0107)	(-36.9)**
Short-term debt /total assets	.0126	.0492	-24.9**
	(.0008)	(.0263)	(-18.7)**
(**Total liabilities less long term debt**) /total assets	.2830	.2807	0.4
	(.2447)	(.2590)	(-2.3)*
(**Total debt less cash & marketable securities**)/total assets	-.1772	.2418	-61.0**
	(-.1470)	(.2314)	(-39.0)**

Table 2. Flow of funds, cash balances and profitability, expenditures and external financing. Firms are selected from public, domestic firms with both CRSP and Compustat data and real total assets greater than $100 million in 1998 dollars. Financial service firms and utilities are eliminated. Firms are assigned to panels based on survivorship and leverage during five non-overlapping five-year periods ending in the years 1978, 1983, 1988, 1993 and 1998. A firm is assigned to a low leverage panel if its ratio of long-term debt to total assets falls in the bottom 20% of all sample firms for each of the five panel years. Control firms are other firms that survive for the corresponding five-year period. Long-term debt includes the current portion of long-term debt. The number of observations in the low leverage panel (control sample panel) is 156 (1217) for 1978, 140 (1041) for 1983, 103 (989) for 1988, 138 (1149) for 1993 and 136 (1340) for 1998. Flow of funds surplus is defined as funds from operations (Compustat data item 110 or data item 308 adjusted to the equivalent of data item 110) less the sum of cash dividends and the net change in working capital plus research and development adjusted for taxes. EBITDA is earnings before interest, taxes, depreciation and amortization. Industry adjustments are made on an annual basis using medians for each variable based on two-digit Compustat SIC codes. All firms, regardless of their survivorship or leverage characteristics, are used in computing industry medians; this utilizes a total of 46,675 firm years of data. Statistics are computed in the following sequence: 1) the mean (median) for each firm within a panel, 2) the mean (median) across firms within a panel, 3) the mean (median) across panels. T-tests assuming unequal variances are used to compare means and a Wilcoxon ranked sign test is used to compare medians. ** (*) denotes significance at the 1% (5%) level.

	Low leverage firms	Control sample of five year survivors	t-statistic (Z-statistic) for diff. in means (medians)
Panel A: Flow of funds, cash balances and profitability			
Flow of funds surplus	.0895	.0189	19.9**
before R&D, cap. ex. and acq./total assets	(.0900)	(.0192)	(14.6)**
Industry-adjusted flow of funds surplus	.0473	-.0170	20.0**
before R&D, cap. ex. and acq./total assets	(.0473)	(-.0173)	(15.2)**
EBITDA	.2165	.1580	14.0**
/total assets	(.2106)	(.1539)	(14.7)**
Industry-adjusted EBITDA	.0489	-.0012	12.8**
/total assets	(.0561)	(-.0032)	(13.4)**
Cash & marketable securities	.2108	.0747	23.7**
/total assets	(.1754)	(.0437)	(29.2)**
Panel B: Expenditures			
R & D expenditures	.0334	.0194	2.9**
/sales	(.0000)	(.0000)	(4.9)**
Capital expenditures	.0713	.0867	-8.0**
/ total assets	(.0588)	(.0650)	(-4.5)**
Net acquisitions	.0067	.0212	-19.9**
/total assets	(.0000)	(.0000)	(-8.0)**
Panel C: External financing (cumulative over five panel years)			
Debt issuance	.0273	.4541	-37.7**
/total assets	(.0272)	(.4434)	(-36.9)**
Debt repurchases	.0366	.3598	-29.5**
/total assets	(.0364)	(.3510)	(-34.5)**
Equity issuance	.0564	.0712	-3.0**
/total assets	(.0566)	(.0710)	(-5.6)**
Equity repurchases	.0692	.0529	3.0**
/total assets	(.0703)	(.0522)	(3.4)**

Table 3. Investment opportunities, asymmetric information and tax status. Firms are selected from public, domestic firms with both CRSP and Compustat data and real total assets greater than $100 million in 1998 dollars. Financial service firms and utilities are eliminated. Firms are assigned to panels based on survivorship and leverage during five non-overlapping five-year periods ending in the years 1978, 1983, 1988, 1993 and 1998. A firm is assigned to a low leverage panel if its ratio of long-term debt to total assets falls in the bottom 20% of all firms for each of the five panel years. Control firms are other firms that survive for the corresponding five-year period. Long-term debt includes the current portion of long-term debt. The number of observations in the low leverage panel (control sample panel) is 156 (1217) for 1978, 140 (1041) for 1983, 103 (989) for 1988, 138 (1149) for 1993 and 136 (1340) for 1998. In computing market-to-book, market value is the sum of the market value of equity at fiscal year end, the book value of preferred stock and the book value of total debt. Book is the book value of total assets. Industry adjustments are made on an annual basis using medians for each variable based on two-digit Compustat SIC codes. All firms, regardless of their survivorship or leverage characteristics, are used in computing industry medians; this utilizes a total of 46,675 firm years of data. Coefficient of variation of EBITDA/book value of total assets is the standard deviation divided by the mean for an industry or a firm during a five-year panel period. No dividend indicator variable is based on dividends to common stock holders. Modified Z-Score is computed as follows: Z=(3.3 x earnings before interest and taxes + sales + retained earnings + working capital)/total assets, and is based on Altman (1968) as modified by MacKie-Mason (1990). Net operating loss indicator variable is based on Compustat data item 52. Marginal tax rate prior to interest is from Graham (1996) and is available beginning in 1980. Negative income tax indicator variable is based on current taxes, defined as Compustat data item 16 (income taxes-income statement) less Compustat data item 50 (deferred taxes-income statement). Average tax rate is cumulative current taxes over five panel years/cumulative pretax income (Compustat data item 170) over the corresponding period. Statistics are computed in the following sequence: 1) the mean (median) for each firm within a panel, 2) the mean (median) across firms within a panel, 3) the mean (median) across panels. T-tests assuming unequal variances are used to compare means and a Wilcoxon ranked sign test is used to compare medians. ** (*) denotes significance at the 1% (5%)

	Low leverage firms	Control sample of five year survivors	t-statistic (Z-statistic) for diff. in means (medians)
Panel A: Investment opportunities			
Market-to-book	1.70 (1.29)	1.11 (0.89)	11.6** (13.0)**
Industry adjusted market-to-book	0.68 (0.32)	0.12 (-0.02)	12.1** (14.0)**
Panel B: Asymmetric information			
Firm earnings volatility Coef. of variation firm EBITDA/total assets	.2262 (.1798)	.4888 (.2178)	-2.4* (-5.3)**
Industry earnings volatility Coef. of variation of industry EBITDA/total assets	.4692 (.4558)	.4636 (.4364)	0.7 (2.7)**
No dividends indicator % of panel years firm does not pay dividends	21.7% (22.3%)	31.5% (30.8%)	-6.0** (-5.1)**
Modified Z-Score	3.21 (3.16)	2.38 (2.38)	19.3** (19.4)**
Panel C: Tax status			
Net operating loss indicator % of panel firm years with net operating losses	8.6% (0.0%)	17.4% (0.0%)	-8.5** (-5.4)**
Marginal tax rate prior to interest from Graham (1996)	.3745 (.3501)	.3652 (.3500)	2.6** (2.2)*
Negative income tax indicator % of panel firm years with negative income taxes	1.0% (0.0%)	6.0% (0.0%)	-9.8** (-5.3)**
Average tax rate taxes/ pretax income cumulative over panel years	.4097 (.3839)	.4073 (.3405)	0.1 (7.1)**

Table 4. Logit analysis of low leverage and control firms. The dependent variable equals one if the firm is a low leverage firm and zero if the firm is a control firm. Analysis is conducted using means for each firm within a panel. Standard errors are corrected for cross-sectional heteroskedasticity using the method of Huber (1967) and White (1980). The marginal change (Δ) in probability measures the change in probability resulting from a one standard deviation change around the mean of a continuous explanatory variable holding all other variables at their means. For dummy variables, the marginal change in probability is the change in probability associated with a switch from zero to one. ** (*) denotes significance at the 1% (5%) level. Detailed definitions of explanatory variables follow the table.

	Pooled data using 5 non-overlapping 5-year panels				**Avg. coeffs., 21 logits using 21 overlapping 5-year panels**			
	(1)		(2)		(3)		(4)	
Variable	**Coefficient** (Z-statistic)	**Marginal Δ in probability**	**Coefficient** (Z-statistic)	**Marginal Δ in probability**	**Avg. coefficient** (Z-statistic, % panels signif.)	**Avg. marginal Δ in probability**	**Avg. coefficient** (Z-statistic, % panels signif.)	**Avg. marginal Δ in probability**
Flow of funds and expenditures								
Flow of funds surplus before R&D, cap. exp. and acq./total assets	9.06 (10.9)**	0.031	8.94 (10.3)**	0.032	16.29 (13.7, 100%)	0.035	16.42 (14., 100%)	0.036
Cash balance at beginning of panel/total assets	8.82 (13.1)**	0.022	8.55 (13.0)**	0.022	9.13 (12.0, 100%)	0.016	8.87 (11.3, 95%)	0.016
Research and development /sales	-2.63 (-1.7)	-0.013	-2.43 (-1.4)	-0.013	-11.53 (-7.9, 70%)	-0.008	-11.65 (-8.6, 52%)	-0.009
Capital expenditures /total assets	-11.06 (-9.0)**	-0.023	-11.49 (-9.0)**	-0.023	-16.93 (-9.9, 100%)	-0.022	-17.25 (-9.9, 100%)	-0.023
Net acquisitions /total assets	-36.41 (-10.3)**	-0.044	-35.45 (-10.2)**	-0.045	-36.30 (-19.8, 100%)	-0.026	-36.24 (-19.7, 100%)	-0.027
Investment opportunities, asymmetric information and tax status								
Market-to-book Market value/total assets	0.77 (7.6)**	0.013	0.58 (7.8)**	0.014	0.58 (11.6, 86%)	0.011	0.59 (11.2, 86%)	0.012
Industry volatility Coef. of variation of EBITDA/total assets	0.44 (1.0)	0.002	0.56 (1.4)	0.003	0.81 (2.7, 24%)	0.001	0.78 (2.5, 19%)	0.001
No dividends indicator % of panel years does not pay dividends	-1.03 (-5.8)**	-0.026	-1.05 (-5.8)**	-0.027	-1.04 (-2.7, 39%)	-0.014	-1.14 (-3.3, 3%8)	-0.016
Size (Real) Natural log of total assets in 1998 dollars	-0.29 (-6.1)**	-0.012	-0.30 (-6.2)**	-0.012	-0.27 (-8.3, 67)	-0.007	-0.28 (-8.1, 62%)	-0.008
Modified Z-Score	0.44 (9.0)**	0.016	0.43 (8.5)**	0.015	0.46 (7.7, 76%)	0.013	0.46 (7.4, 76%)	0.014
Net operating loss indicator % of panel years with net operating losses	-0.92 (-3.6)**	-0.021	—	—	-0.48 (-4.3, 24%)	-0.009	—	—
Marginal tax rate before interest Graham (1996)	—	—	2.98 (3.2)**	0.007	—		0.61 (1.2, 0%)	0.001

Industry Control Dummy Variables								
Computer and high tech *(1 if two-digit SIC code 35, 36 or 73)*	0.53 (3.7)**	0.018	0.46 (3.2)**	0.016	0.73 (7.7,76%)	0.019	0.69 (13.5, 726)	0.014
Specialty manufacturing *(1 if two-digit SIC code 34, 37, 38, or 39)*	0.29 (2.0)*	0.010	0.26 (1.7)	0.009	0.52 (15.0, 81%)	0.013	0.49 (9.0, 29%)	0.012
Retail *(1 if two-digit SIC code 54-59)*	-0.39 (-2.1)**	-0.010	-0.30 (-1.5)*	-0.008	-0.45 (-2.7, 33%)	-0.007	-0.42 (-2.5, 24%)	-0.007
Pharmaceutical and biotech *(1 if in three-digit SIC code 283)*	0.18 (0.5)	0.006	0.21 (0.6)	0.007	0.14 (1.0, 10%)	0.012	0.29 (1.7, 10%)	0.015
Number of observations	6,366		6,137		1,211 avg. 25,431 total		1,182 avg. 24,825total	
p-value of model	0.0000		0.0000		.0000 all panels		.0000 all panels	
Pseudo R2	34.9%		34.4%		40.1% range 33.4-47.7%		39.9% range 32.7-48.7%	

Flow of funds surplus is defined as funds from operations (Compustat data item 110 or data item 308 adjusted to the equivalent of data item 110) less the sum of cash dividends and the net change in working capital plus research and development adjusted for taxes. In computing market-to-book, market value is the sum of the market value of equity at fiscal year end, the book value of preferred stock and the book value of total debt. Book is the book value of total assets. Coefficient of variation of EBITDA/book value of total assets is the standard deviation divided by the mean for an industry during a five-year panel period. Industry classifications are based on Compustat two-digit SIC codes. No dividend indicator variable is based on dividends to common stock holders. Modified Z-Score is computed as follows: Z=(3.3 x earnings before interest and taxes + sales + retained earnings + working capital)/total assets, and is based on Altman (1968) as modified by MacKie-Mason (1990). Net operating loss indicator variable is based on Compustat data item 52. Marginal tax rate prior to interest is from Graham (1996).

Fig. 2. Illustration of the method used to form ten-year change panels for analysis of switches in financial policy by low long-term leverage and control firms. Firms are selected from public, domestic firms with both CRSP and Compustat data and real total assets greater than $100 million in 1998 dollars. Financial service firms and utilities are eliminated. Switches in financial policy occur when a firm is classified as a low long-term leverage (control) firm in one five-year panel and is classified as a control (low long-term leverage) firm in the subsequent panel. Switching firms are compared to firms that begin with the same financial policy classification but do not change financial policy in the subsequent panel. Thus, all firms included in the analysis of changes in financial policy survive for at least 10 years. For each ten-year panel, the first five-year period is used to establish the initial financial policy classification, the second five-year period is used to determine whether or not the firm switches financial policy. As shown in panel A, the four non-overlapping change panels are comprised of the ten-year periods ending in 1983, 1988, 1993 and 1998. None of the second five-year periods (the switching periods) overlap. As shown in panel B, the 16 overlapping change panels are comprised of the ten-year periods ending in each year 1983-1998. Recall that a firm is classified as a low long-term leverage firm if its ratio of long-term debt to total assets falls in the bottom 20% of all firms for five consecutive years. Control firms are other firms that survive for the corresponding five-year period. Financial data are taken from the Compustat data files. Long-term debt includes the current portion of long-term debt.

Panel A: Formation of 4 non-overlapping ten-year change panels

	Initial financial policy	Switch in financial policy?
1.	**[1974-1978]**	**[1979-1983]**
2.	**[1979-1983]**	**[1984-1988]**
3.	**[1984-1988]**	**[1989-1993]**
4.	**[1989-1993]**	**[1994-1998]**

Panel B: Formation of 16 overlapping ten-year change panels

	Initial financial policy	Switch in financial policy?
1.	**[1974-1978]**	**[1979-1983]**
2.	[1975-1979]	[1980-1984]
3.	[1976-1980]	[1981-1985]
4.	[1977-1981]	[1982-1987]
5.	[1978-1982]	[1983-1988]
6.	**[1979-1983]**	**[1984-1988]**
7.	[1980-1984]	[1985-1989]
8.	[1981-1985]	[1986-1990]
9.	[1982-1987]	[1987-1991]
10.	[1983-1988]	[1988-1992]
11.	**[1984-1988]**	**[1989-1993]**
12.	[1985-1989]	[1990-1994]
13.	[1986-1990]	[1991-1995]
14.	[1987-1991]	[1992-1996]
15.	[1988-1992]	[1993-1997]
16.	**[1989-1993]**	**[1994-1998]**

Table 5. Switches in financial policy for low leverage and control panel firms. Switches in financial policy are defined as follows. A) Dropping a conservative financial policy (from low leverage to control): when a firm is classified as low leverage in one panel is classified as a control firm in the subsequent panel, it is defined as switching financial policy**.** B) Adopting a conservative financial policy (from control to low leverage): when a firm is classified as a control firm in one panel and is classified as a low leverage firm in the subsequent panel, it is defined as switching financial policy. Switching firms are compared to firms that begin with the same financial policy classification but do not change financial policy in the subsequent panel. Thus, all firms included in the analysis of changes in financial policy survive for at least two successive panel periods or a total of 10 years. Recall that a firm is assigned to a low leverage panel if its ratio of long-term debt to total assets falls in the bottom 20% of all sample firms for each of the five panel years. Control firms are other firms that survive for the corresponding five-year period. Long-term debt includes the current portion of long-term debt. T-tests assuming unequal variances are used to compare means and a Wilcoxon ranked sign test is used to compare medians. ** (*) denotes significance at the 1% (5%) level.

	Pooled across non-overlapping 10-year change periods	**Avg. across 16 overlapping 10-year change periods**
Panel A: Dropping a conservative financial policy (low leverage to control)		
N for initial low-debt sample	432	105.2 range 85-130
Switch to control panel, n (%)	202 (46.8%)	48.6 (46.2%) range 37.9-55.2%
Remain in low leverage panel, n (%)	230 (53.2%)	56.6 (53.8%) range 44.8-62.1%
For switchers: Long-term debt/total assets, mean (median)		
After the switch	.1271 (.1126)	.1334 (.1222) range .0948-.2026
Before the switch	.0417 (.0404)	.0418 (.0408) range .0327-.0496
Difference (After-Before)	.0855** (.0649)**	.0916** (.0831)**
Panel B: Adopting a conservative financial policy (from control to low leverage)		
N for initial control sample	3,186	785.6 range 696-877
Switch to low leverage panel, n (%)	119 (3.7%)	27.4 (3.5%) range 2.4-4.7%
Remain in control panel, n (%)	3,067 (96.3%)	756.2 (96.5%) range 95.3-97.6%
For switchers: Long-term debt/total assets, mean (median)		
After the switch	.0421 (.0439)	.0391 (.0473) range .0128-.0601
Before the switch	.1239 (.1167)	.1268 (.1142) range .1044-.1649
Difference (After-Before)	-.0818** (-.0682)**	-.0877** (-.0919)**

Table 6. Logit analysis of the switch from a low leverage financial policy to a less conservative financial policy. The dependent variable equals one if the low leverage firm switches to a control firm in the subsequent panel, and zero if it remains in a low leverage firm. Standard errors are corrected for cross-sectional heteroskedasticity using the method of Huber (1967) and White (1980). The marginal change (Δ) in probability measures the change in probability resulting from a one standard deviation change around the mean of a continuous explanatory variable holding all other variables at their means. For dummy variables, the marginal change in probability is the change in probability associated with a switch from zero to one. ** (*) denotes significance at the 1% (5%) level. Detailed definitions of variables follow the table.

	Pooled data using 4 non-overlapping 10-year change periods				**Avg. coeffs., 16 logits using overlapping 10-year change periods**			
	(1)		(2)		(3)		(4)	
Variable	**Coefficient** (Z-statistic)	**Marginal Δ in probability**	**Coefficient** (Z-statistic)	**Marginal Δ in probability**	**Avg. coefficient** (Z-statistic, % panels signif.)	**Avg. marginal Δ in probability**	**Avg. coefficient** (Z-statistic, % panels signif.)	**Avg. marginal Δ in probability**
Flow of funds and expenditures								
Flow of funds surplus before R&D, cap. exp. and acq./total assets	-15.03 (-5.5)**	-0.297	-15.03 (-5.4)**	-0.298	-21.51 (-16.7, 94%)	-0.382	-20.67 (-17.1, 94%)	-0.370
Cash balance at beginning of panel/total assets	-2.84 (-2.0)	-0.082	-2.74 (-1.8)	-0.076	-4.96 (-5.3, 28%)	-0.119	-4.33 (-4.4, 25%)	-0.098
Research and development /sales	14.54 (2.4)**	0.143	15.22 (2.5)*	0.149	20.86 (6.9, 44%)	0.161	19.45 (6.5, 38%)	0.143
Capital expenditures /total assets	18.02 (4.9)**	0.206	18.02 (4.8)**	0.205	29.83 (16.7 94%)	0.309	28.31 (17.2, 100%)	0.293
Net acquisitions /total assets	53.63 (6.2)**	0.370	54.10 (6.1)**	0.375	79.33 (19.5, 100%)	0.439	75.51 (19.7, 100%)	0.426
Investment opportunities, asymmetric information and tax status								
Market-to-book Market value/total assets	-0.04 (-0.2)	-0.011	-0.14 (-0.7)	-0.037	0.38 (-3.1, 19%)	-0.073	-0.43 (-3.6, 19%)	-0.084
Industry volatility Coef. of variation of EBITDA/total assets	0.55 (0.5)	0.018	0.38 (0.4)	0.012	0.37 (0.4, 25%)	0.014	0.33 (0.4, 25%)	0.013
No dividends indicator % of panel years does not pay dividends	0.61 (0.9)	0.149	0.58 (0.9)	0.143	0.99 (3.3, 19%)	0.205	1.00 (3.1, 19%)	0.191
Size (Real) Natural log of total assets in 1998 dollars	0.31 (2.8)**	0.094	0.31 (2.8)**	0.093	0.40 (4.5, 44%)	0.104	0.40 (4.5, 44%)	0.012
Modified Z-Score	-0.26 (-1.6)	-0.064	-0.22 (-1.3)	-0.056	-0.40 (-2.9, 44%)	-0.090	-0.43 (-3.1, 31%)	-0.096
Net operating loss indicator % of panel years with net operating losses	1.17 (2.0)*	0.270	—	—	0.45 (2.2, 25%)	0.136	—	—
Marginal tax rate before interest Graham (1996)	—	—	-3.86 (-1.9)*	-0.068	—	—	0.69 (0.4, 6%)	0.006

Industry Control Dummy Variables								
Computer and high tech *(1 if two-digit SIC code 35, 36 or 73)*	-0.92 (-2.7)**	-0.223	-0.92 (-2.7)**	-0.224	-0.83 (-6.6, 25%)	-0.180	-0.84 (-7.2, 19%)	-0.186
Specialty manufacturing *(1 if two-digit SIC code 34, 37, 38, or 39)*	-0.53 (-1.2)	-0.130	-0.54 (-1.3)	-0.134	—	—	—	—
Retail *(1 if two-digit SIC code 54-59)*	-0.15 (-0.3)	-0.038	-0.35 (-0.7)	-0.087	—	—	—	—
Pharmaceutical and biotech *(1 if in three-digit SIC code 283)*	-1.04 (-1.3)	-0.240	-1.03 (-1.3)	-0.238	—	—	—	—
Number of observations	432		425		105 avg., 1,688 total		104 avg., 1,657 total	
p-value of model	0.0000		0.0000		.0000 all panels		.0000 all panels	
Pseudo R2	30.6%		30.1%		43.6% range 30.8-63.5%		42.0% range 30.2-58.9%	

A switch from low leverage to control is defined as follows: when a firm is classified as low leverage in one panel is classified as a control firm in the subsequent panel, it is defined as switching financial policy. Switching firms are compared to firms that begin with the same financial policy classification but do not change financial policy in the subsequent panel. Thus, all firms included in the analysis of changes in financial policy survive for at least two successive panel periods or a total of 10 years. (Recall that a firm is assigned to a low leverage panel if its ratio of long-term debt to total assets falls in the bottom 20% of all sample firms for each of the five panel years. Control firms are other firms that survive for the corresponding five-year period. Long-term debt includes the current portion of long-term debt.) Flow of funds surplus is defined as funds from operations (Compustat data item 110 or data item 308 adjusted to the equivalent of data item 110) less the sum of cash dividends and the net change in working capital plus research and development adjusted for taxes. In computing market-to-book, market value is the sum of the market value of equity at fiscal year end, the book value of preferred stock and the book value of total debt. Book is the book value of total assets. Coefficient of variation of EBITDA/book value of total assets is the standard deviation divided by the mean for an industry during a five-year panel period. Industry classifications are based on Compustat two-digit SIC codes. No dividend indicator variable is based on dividends to common stock holders. Modified Z-Score is computed as follows: Z=(3.3 x earnings before interest and taxes + sales + retained earnings + working capital)/total assets, and is based on Altman (1968) as modified by MacKie-Mason (1990). Net operating loss indicator variable is based on Compustat data item 52. Marginal tax rate prior to interest is from Graham (1996).

Table 7. Logit analysis of the switch from a less conservative financial policy to a low leverage financial policy. The dependent variable equals one if the control panel firm switches to a low leverage firm in the subsequent panel, and zero if it remains in the control panel. Standard errors are corrected for cross-sectional heteroskedasticity using the method of Huber (1967) and White (1980). The marginal change (Δ) in probability measures the change in probability resulting from a one standard deviation change around the mean of a continuous explanatory variable holding all other variables at their means. For dummy variables, the marginal change in probability is the change in probability associated with a switch from zero to one. ** (*) denotes significance at the 1% (5%) level. Detailed definitions of variables follow the table.

	Pooled data using 4 non-overlapping 10-year change periods				**Avg. coeffs., 16 logits using overlapping 10-year change periods**			
	(1)		(2)		(3)		(4)	
Variable	**Coefficient** (Z-statistic)	**Marginal Δ in probability**	**Coefficient** (Z-statistic)	**Marginal Δ in probability**	**Avg. coefficient** (Z-statistic, % panels signif.)	**Avg. marginal Δ in probability**	**Avg. coefficient** (Z-statistic, % panels signif.)	**Avg. marginal Δ in probability**
Flow of funds and expenditures								
Flow of funds surplus before R&D, cap. exp. and acq./total assets	7.29 (4.5)**	0.010	7.24 (4.2)**	0.010	12.09 (10.2, 81%)	0.009	11.96 (9.8, 81%)	0.009
Cash balance at beginning of panel/total assets	6.95 (6.0)**	0.006	7.02 (6.2)**	0.006	9.87 (15.3, 100%)	0.003	9.6 (16.9, 100%)	0.004
Research and development /sales	-2.03 (-0.6)	-0.001	-1.72 (-0.5)	-0.001	-1.74 (-0.9,0%)	-0.001	0.03 (0.9, 0%)	0.000
Capital expenditures /total assets	-8.86 (-3.2)**	-0.006	-9.52 (-3.3)**	-0.006	-15.92 (-7.0, 56%)	-0.005	-16.36 (-7.1, 56%)	-0.007
Net acquisitions /total assets	-29.59 (-4.9)**	-0.013	-29.41 (-4.9)**	-0.013	-26.56 (-14.7, 75%)	-0.004	-25.91 (-14.5, 81%)	-0.006
Investment opportunities, asymmetric information and tax status								
Market-to-book Market value/total assets	0.60 (4.5)**	0.005	0.62 (4.4)**	0.005	0.72 (8.5, 75%)	0.003	0.78 (9.1, 69%)	0.003
Industry volatility Coef. of variation of EBITDA/total assets	1.32 (4.9)**	0.003	1.38 (5.3)**	0.004	-0.44 (1.3, 38%)	0.000	-0.44 (1.3, 31%)	0.000
No dividends indicator % of panel years does not pay dividends	-0.48 (-1.3)	-0.005	-0.45 (-1.2)	-0.005	-0.58 (-1.6, 6%)	-0.001	-0.56 (-1.7, 6%)	-0.001
Size (Real) Natural log of total assets in 1998 dollars	-0.23 (-2.2)*	-0.003	-0.22 (-2.1)	-0.004	-0.31 (-7.4, 31%)	-0.002	-0.34 (-8.2, 28%)	-0.004
Modified Z-Score	0.56 (6.7)**	0.008	0.54 (6.3)**	0.008	0.53 (7.8, 69%)	0.004	0.50 (6.7, 63%)	0.005
Net operating loss indicator % of panel years with net operating losses	-0.50 (-1.1)	-0.005	—	—	-0.10 (-0.3, 25%)	0.000	—	—
Marginal tax rate before interest Graham (1996)	—	—	2.73 (1.3)	0.003	—		1.60 (0.1, 6%)	0.000

Industry Control Dummy Variables								
Computer and high tech *(1 if two-digit SIC code 35, 36 or 73)*	0.66 (2.2)*	0.010	0.62 (2.0)*	0.010	0.25 (2.7, 6%)	0.002	0.23 (2.6, 6%)	0.001
Specialty manufacturing *(1 if two-digit SIC code 34, 37, 38, or 39)*	1.02 (3.5)*	0.018	0.94 (3.2)**	0.017	—	—	—	—
Retail *(1 if two-digit SIC code 54-59)*	-0.45 (-1.1)	-0.005	-0.41 (-1.0)	-0.004	—	—	—	—
Pharmaceutical and biotech *(1 if in three-digit SIC code 283)*	0.09 (0.1)	0.001	0.02 (0.0)	0.000	—	—	—	—
Number of observations	3,162		3,115		778 avg. 12,441 total		765 avg. 12,242 total	
p-value of model	0.0000		0.0000		.0000 all panels		.0000 all panels	
Pseudo R2	26.1%		25.4%		32.2% range 20.0-42.6%		31.4% range 19.4-45.1%	

A switch from a less conservative financial policy to a low leverage policy is defined as follows: when a firm is classified as control in one panel is classified as a low leverage firm in the subsequent panel, it is defined as switching financial policy. Switching firms are compared to firms that begin with the same financial policy classification but do not change financial policy in the subsequent panel. Thus, all firms included in the analysis of changes in financial policy survive for at least two successive panel periods or a total of 10 years. (Recall that a firm is assigned to a low leverage panel if its ratio of long-term debt to total assets falls in the bottom 20% of all sample firms for each of the five panel years. Control firms are other firms that survive for the corresponding five-year period. Long-term debt includes the current portion of long-term debt.) Flow of funds surplus is defined as funds from operations (Compustat data item 110 or data item 308 adjusted to the equivalent of data item 110) less the sum of cash dividends and the net change in working capital plus research and development adjusted for taxes. In computing market-to-book, market value is the sum of the market value of equity at fiscal year end, the book value of preferred stock and the book value of total debt. Book is the book value of total assets. Coefficient of variation of EBITDA/book value of total assets is the standard deviation divided by the mean for an industry during a five-year panel period. Industry classifications are based on Compustat two-digit SIC codes. No dividend indicator variable is based on dividends to common stock holders. Modified Z-Score is computed as follows: Z=(3.3 x earnings before interest and taxes + sales + retained earnings + working capital)/total assets, and is based on Altman (1968) as modified by MacKie-Mason (1990). Net operating loss indicator variable is based on Compustat data item 52. Marginal tax rate prior to interest is from Graham (1996).

Table 8. Changes in characteristics of firms switching financial policy. Switches in financial policy are defined as follows. A) Dropping a conservative financial policy (from low leverage to control): when a firm is classified as low leverage in one panel is classified as a control firm in the subsequent panel, it is defined as switching financial policy**.** B) Adopting a conservative financial policy (from control to low leverage): when a firm is classified as a control firm in one panel and is classified as a low debt firm in the subsequent panel, it is defined as switching financial policy. Thus, all firms that are defined as having switched financial policy have survived for at least two successive panel periods or a total of 10 years. (Recall that a firm is assigned to a low leverage panel if its ratio of long-term debt to total assets falls in the bottom 20% of all sample firms for each of the five panel years. Control firms are other firms that survive for the corresponding five-year period. Long-term debt includes the current portion of long-term debt.) Changes are computed by subtracting a firm's post-switch mean (median) from its pre-switch mean (median). Means and medians are computed over the appropriate five-year panel. For the 16 overlapping 10-year change panels, statistics are computed on a panel-by-panel basis, then across panels. Flow of funds surplus is defined as funds from operations (Compustat data item 110 or data item 308 adjusted to the equivalent of data item 110) less the sum of cash dividends and the net change in working capital plus research and development adjusted for taxes. In computing market-to-book, market value is the sum of the market value of equity at fiscal year end, the book value of preferred stock and the book value of total debt. Book is the book value of total assets. T-tests assuming unequal variances are used to compare means and a Wilcoxon ranked sign test is used to compare medians. ** (*) denotes significance at the 1% (5%) level.

	Pooled data, using 4 non-overlapping 10-year change periods		**Median, using 16 overlapping 10-year change periods** (range in parentheses)	
Switching classification	**Dropping conservative financial policy**	**Adopting conservative financial policy**	**Dropping conservative financial policy**	**Adopting conservative financial policy**
Panel A: Changes in total assets and long-term debt, range in parentheses where relevant				
Total Assets				
Median percentage change	70.5%**	64.0%**	75.4%** (55.6 to 92.4%)	53.6%** (29.4 to 96.4%)
Percentage with decline	3.5%	10.1%	3.8% (0.0 to 10.7%)	10.9% (0.0 to 24.2%)
Long-term debt				
Median percentage change	405.4%**	-49.4%**	361.0%** (197.7 to 627.6%)	-51.2%** (-85.8 to -17.3%)
Percentage with decline	1.0%	82.4%	0.0% (0.0 to 7.1%)	84.9% (68.4 to 100.0%)
Panel B: Changes in flow of funds, cash balances, expenditures and market-to-book, mean (median or range)				
Δ Flow of funds surplus before R&D, cap. ex. and acq./total assets	-.0352** (-.0283)**	.0235** (.0240)**	-.0420** (-.1139 to -.0115)	.0282** (-.0053 to .0619)
Δ Cash & marketable securities /total assets	-.0173** (-.0192)**	.0291** (.0163)**	-.0159** (-.0395 to .0064)	.0348** (.0122 to .0619)
Δ R & D expenditures /sales (non-zero only)	.0037 (.0019)	.0077** (.0018)**	.0026** (-.0065 to .0073)	.0067** (-.0036 to .0149)
Δ Capital expenditures /total assets	.0002 (-.0006)	-.0032 (.0011)	-.0006 (-.0154 to .0097)	-.0072** (-.0183 to .0076)
Δ Net acquisitions /total assets	.0197** (.0059)**	-.0029 (.0000)	.0174** (.0090 to .0254)	-.0027 (-.0125 to .0048)
Δ Market-to-book	-.0679 (.0138)	.2240** (.1319)**	-.0385 (-.2242 to .2403)	.2038** (-.0440 to .5093)

Table A1. Summary of robustness checks performed for logit analysis of low leverage firms and control firms (see also Table 4).

Panel A: Industry Effects—Do they drive the results? (Using two-digit SIC classifications)

	Pooled data using 5 non-overlapping 5-year panels	**Avg. coeffs., 21 logits using 21 overlapping 5-year panels**
1. **Adjust standard errors for industry grouping** (omitting four industry indicator variables used in table 4).	All coefficient estimates retain their signs and significance levels.	All averages of coefficient estimates retain signs and significance levels. o Some coefficients are no longer statistically significant in some years. The percentage of panels with significant coefficient estimates declines for market-to-book (86%), no dividends indicator (29%), modified Z-score (52%) and net operating loss indicator (19%). o Some coefficients are statistically significant in a larger percentage of panels: coefficient on equity issuance (33%), industry volatility (29%) and size (57%)
2. **Include an indicator variable for each two-digit SIC classification** (these replace the four industry indicator variables used in table 4).	Certain industry indicator variables are significant. All coefficients estimates for other variables retain their sign and significance levels.	Certain industry indicator variables are significant. Average coefficient estimates for all other variables retain sign and significance levels.
3. **Estimate model with industry fixed effects** (these replace the four industry indicator variables used in table 4).	All coefficient estimates retain their signs and significance levels.	All average coefficient estimates retain their sign and significance level, with the exception of the no dividends indicator, which is not statistically significant in any panel. Coefficients of modified Z-score and net operating loss indicator coefficients are most affected. o Modified Z-score coefficient is statistically significant in 62% of the panels. o Net loss operating indicator coefficient is statistically significant in 19% of the panels.

Panel B: Equity Issuance and Equity Repurchases—Do low leverage firms issue more (repurchase less) equity than control firms?

1. **Equity issuance over total assets and equity repurchases over total assets** are included as explanatory variables.	Equity issuance has a positive, insignificant coefficient. Equity repurchases has a significant, negative coefficient.	Equity issuance has a negative average coefficient and is significant in only 19% of the models. Equity repurchases has a significantly negative average coefficient and is significant in 86% of the 21 individual panel regressions.

Panel C: Tax Status—Are alternative measures better?		
1. **Negative income tax (two variables used)**. Variable equal to percentage of panel years the firm has negative income taxes, indicator variable equal to one if the firm has negative cumulative income taxes over the panel (variables used one at time, replacing the tax variables used in table 4). (Income taxes is defined as income tax expense less deferred taxes-income statement).	Both variables have a negative and significant coefficient, as does the net operating loss indicator variable used in table 4. In each case, coefficient estimates for all other variables retain their signs and significance levels.	For the percentage of panel years with negative income taxes, estimated coefficient is negative and significant in nine of the 21 panels. All other average coefficient estimates retain their signs and significance levels. For the variable equal to one if cumulative income taxes are negative, the estimated coefficient is negative and significant in three of 19 panels. The 1978 and 1991 panels cannot be estimated because this variable equals zero in all observations. All other average coefficient estimates retain their signs and significance levels.
2. **Statutory tax rate.** Corporate tax rate as defined by the U.S. tax code for corporations, equals 0.46 if prior to 1987, 0.38 in 1987, and 0.34 after 1987.	The coefficient is positive and significant, as is the Graham (1996) marginal tax rate used in table 4. All other coefficient estimates retain their signs and significance levels.	Coefficient estimate on the corporate tax rate not statistically significant in any panel. All other average coefficient estimates retain their signs and significance levels.
3. **Average tax rate (two variables used).** Average of income taxes/pretax income over the panel period and cumulative income taxes/cumulative pretax income for the panel. (Income taxes is defined as income tax expense less deferred taxes-income statement).	Estimated coefficients for both variables are not statistically significant. All other coefficient estimates retain their signs and significance levels.	For the annual average, the estimated coefficient is negative and significant in four of the 21 panels. All other average coefficient estimates retain their sign and significance levels. For the five year cumulative, the estimated coefficient is negative and significant in eight of the 21 panels. Again, all other average coefficient estimates retain their signs and significance levels.
Panel D: Volatility—Should it be measured at the firm level?		
1.**Firm volatility (two variables used).** Coefficient of variation of firm EBITDA/total assets and coefficient of variation of industry-adjusted EBITDA/total assets, both measured over the five-year panel period.	Neither firm volatility nor industry-adjusted firm volatility is statistically significant. All other coefficient estimates retain their signs and significance levels.	The estimated coefficient on firm volatility is negative and significant in 11 of the 21 panels. The estimated coefficient on industry-adjusted firm volatility is positive and significant in five of the 21 panels. All other average coefficient estimates retain their signs and significance levels.