In Search of a Residual Dividend Policy

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ABSTRACT

We analyze 309 dividend-paying firms that maintain consistently low levels of free cash flow net of dividends, which is behavior consistent with a residual dividend policy. Compared to a sample of industry-matched firms, residual policy firms (RPFs) are larger, more profitable, more liquid, and less highly levered. RPFs are less prone than matched firms to change the direction of their dividend trend. A survey of all 618 firms reveals that RPFs are more likely than their counterparts to maintain a long-term dividend payout ratio, use long-run earnings forecasts in setting the dividend, and be unconcerned about the cost of raising external funds. The overall conclusion is that firms behaving as though they follow a residual dividend policy do not profess to follow the policy. At best RPFs follow a "modified" residual policy, in which they manage their payout ratio and dividend trend carefully. Although it may not be an explicit goal of such a policy, consistently low free cash flow typically results.

In Search of a Residual Dividend Policy

I. Background and Purpose

Dividends have long been an enigma in corporate finance. Miller and Modigliani (M&M) (1961) argue that under certain simplifying assumptions, the dividend decision does not affect the value of a firm and is, therefore, irrelevant. Yet, conventional wisdom with changed assumptions suggests that a properly managed dividend policy is important to shareholders because it can affect share prices and shareholder wealth.[1] Much empirical evidence on dividends is inconsistent with the irrelevance of dividend policy to a firm's value. If dividend policy counts, some of M&M assumptions, especially those involving perfect market assumptions, must be modified. The more important market imperfections include signaling (asymmetric information), agency costs, and taxes but other imperfections such as transaction costs, flotation expenses, and behavioral factors also exist.[2]

Since the M&M study, researchers have attempted to model dividend behavior mathematically and relate dividend policy to share-price levels. In their study on the evolution of dividend policy, Frankfurter and Wood (1997, p. 31) conclude, "Accordingly, it (dividend policy) cannot be modeled mathematically and uniformly for all firms at all times." This is because different firms may want to adopt different dividend policies depending on firm-specific factors such as the economic and behavioral characteristics of their stockholders. Thus, despite voluminous research on dividends, corporate managers and financial economists still face what

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[1] By dividend policy, we mean the practice that management follows in making dividend payout decisions, which determines the size and pattern of cash distributions over time to shareholders. These distributions may be through dividends and share repurchases. In recent years an increasing percentage of the distribution has been in the form of share repurchases.

[2] Lease et. al. (2000) develop a competing frictions model and show how imperfections individually can influence a dividend decision.

Black (1976) once described as a dividend "puzzle" with "pieces that just don't seem to fit." That is, sometimes corporations pay dividends when logic implies that they should not. Recent works by Lease et. al. (2000) and Bierman (2001) attempt to pick up the pieces and to put them together so that different dividend policies make sense in different situations.

When deciding how much cash to distribute to stockholders, corporate managers should consider two points: (1) the overriding goal of the firm is to maximize shareholder value (share price), and (2) the firm's excess cash belongs to its shareholders. Excess cash refers to the cash that a corporation has in excess of capital expenditures. Although one dividend policy does not fit all firms, managers can select between at least two major types of dividend policies. With a managed dividend policy, management attempts to achieve a specific pattern of dividend payments. Alternatively, with a residual dividend policy, management simply pays out the amount "left over" after deducting capital expenditures from internally generated cash flows. Under this latter policy, management should refrain from retaining income unless the firm's real internal investments offer returns greater than the comparable risk after tax returns available to stockholders. If excess cash flows exist, however, the firm should distribute the residual amount as a cash distribution. As a third alternative, a firm may follow a "modified" residual dividend policy, which shares characteristics of both a residual and managed dividend policy.

Rigidly following a residual dividend policy would almost certainly lead to high volatility of dividend payments. Such a policy would be sensible only if investors are indifferent to fluctuating dividends. Yet, empirical studies by Asquith and Mullins (1983), Healy and Palepu (1988), Michaely, Thaler, and Womack (1995) and others document share-price increases on the announcement of dividend increases and dramatic share-price decreases when firms reduce dividends. Survey research by Baker and Powell (1999) and Baker, Veit, and Powell (2001) also shows that managers, especially of large, mature firms, realize their investors

typically prefer stable, dependable dividends. These findings suggest that managers should be cautious about making large changes in dividends.

Managers following a "modified" residual model might attempt to smooth their firm's dividends in relation to expected cash available over time instead of using the residual policy as a guide to the payout in any one year. Managers can accomplish this objective of having stable, dependable dividends by taking three steps. First, they can estimate their firm's earnings (or cash flows) and investment opportunities over an appropriate time horizon, such as five years or so. Next, managers can use this forecasted information to find the average residual model payout ratio and dollars of dividends during the planning period. Finally, they can set a target payout ratio based on the average projected data. Thus, the residual policy can help a firm establish its long-run target payout ratios. Such a policy should allow a firm to reduce its cost of equity and maximize the stock price assuming investors prefer stable dividends.

Although the residual dividend model is often touted in the financial literature, especially in corporate finance textbooks, as a "theoretically" correct model, little research exists on the prevalence of this model in practice or the characteristics of firms following such a policy. The purpose of this study is twofold: (1) to identify firms that follow a residual dividend policy and their financial characteristics, and (2) to learn the views of managers of these firms and their matched counterparts about how they set their dividend policies. Because we expect to find few firms that rigidly follow a "pure" residual dividend policy on a yearly basis, our focus in on firms that use a residual policy to set long-run target payout ratios as described above. The managed dividend policy and residual policy tend to converge when considering multiple periods.

Our findings add to the existing literature on dividend policy by providing current evidence on the residual theory of dividends. The few available studies on residual dividend policy are confined to indirect evidence obtained from cross-sectional comparisons of firm characteristics. Such indirect evidence cannot reveal the motivation behind such a policy.

Unlike most previous research, the current study uses survey methods to obtain direct evidence of managerial attitudes about a residual dividend policy.

II. Literature Review

Although several common explanations exist for the relevance of dividends, perhaps the dominant theoretical argument for dividends (Miller and Rock, 1985) is that a firm's management uses dividends to signal private information to investors. The empirical literature generally shows that the market reacts favorably to news of dividend initiations and unexpected increases, and negatively to unexpected dividend decreases. Researchers have interpreted these findings as supporting the idea that the market views the announcement of unexpected changes in dividends as signals about the firm's future prospects. Numerous studies support the signaling explanation including Asquith and Mullins (1983), Woolridge (1983), Benesh, Keown, and Pinkerton (1984), Ghosh and Woolridge (1988), Healy and Palepu (1988), Bajaj and Vijh (1990), Michaely, Thaler, and Womack (1995), Impson (1997), and Lipson, Macquieira, and Megginson (1998).

Lang and Litzenberger (1989) provide results supporting the value of a residual-type policy. They find the market reacts more strongly to dividend changes made by firms whose Tobin's Q ratios (i.e., market value to replacement book value) are less than 1.0. Firms with low Q values indicate poor performers implying that they earn less than the required rate of return. They conclude that for firms showing evidence of over-investment, dividend decisions are more important than for firms with a positive marginal return on investment.

Although the literature documents a linkage between earnings and dividends, debate exists about which factor leads the other. A signaling hypothesis would suggest that dividends (or at least a component of dividends) lead earnings, while a residual hypothesis would have earnings leading dividends. Olson and McCann (1994) conclude that the direction of causality varies across firms. In fact, they find that some firms appear to follow both a signaling and

residual policy. Similarly, Alli, Khan and Ramirez (1993) develop a multivariate specification for a sample of 105 firms that yields results consistent with the existence of a residual dividend policy.

III. Research Design

The research design consists of three major elements: the sample, survey, and limitations.

Sample

Using Research Insight from 1990-99, our first step was to identify firms that follow a residual dividend policy. We followed the approach used by Lehn and Poulsen (1989) in which undistributed cash flow = operating income before depreciation expense − total income taxes − gross interest expense − preferred stock cash dividends − common stock cash dividends. From each year's undistributed cash flow, we determined free cash flow (FCF) by subtracting capital expenditures. We then calculated standardized FCF by dividing the variable by the firm's then-prevailing market value of equity (MktVal).

For firms consistently using a residual policy, both the mean and StdDev of standardized FCF should be near zero. We sorted firms into quintiles based on mean standardized FCF (1 = lowest to 5 = highest). We then re-sorted firms into quintiles based on StdDev (1 = lowest to 5 = highest). The sample consists of the 309 firms in quintiles 1 or 2 for both mean standardized FCF and StdDev. We excluded real estate investment trusts (REITs, SIC = 6798) before the sorting process, because REITs have little discretion in setting dividend policy. By law, these firms must pay out more than 95% of earnings.

For the firms surviving the screen the average standardized FCF is 1.46%, and the average StdDev is 1.93%. Median values are 1.51% and 1.94%, respectively. For firms not

surviving the screen, the average (median) for standardized FCF and StdDev is 23.62% (4.42%) and 56.05% (5.72%), respectively.

One advantage of screening using MktVal over an extended period is that it lessens the chance that our results are driven by relative performance in any particular market capitalization sector. During the 10-year sample period, each market capitalization sector enjoyed a bull market phase. For example, during the early-1990s, large-capitalization stocks performed well relative to small-capitalization stocks. If the sample screening had been limited to that period, the average FCF/MktVal numbers would be biased downward, resulting in a sample dominated by large-capitalization firms. The situation was reversed in the late 1990s, when small-capitalization stocks were in favor. Later, we consider how the screening method may affect the results.

Panel A of Table 1 shows the results of the multiple screens in our sample selection process. Although we do not claim that the firms surviving our screen follow a residual policy in an absolute sense, their behavior during the 1990s was most consistent with a residual policy relative to other firms in the Research Insight universe. Our survey results, presented later, address this issue more directly.

(Insert Table 1 about here)

Next, we identified the Standard Industrial Classification (SIC) code of firms in the sample of residual policy firms (RPFs). The 309 sample firms come from 162 distinct industries as defined by 4-digit SICs. No dramatic clustering is apparent. Panel B of Table 1 shows the top 15 industry affiliations of the RPFs, along with the rank of those industries among all 18,609 dividend-paying firms in the Research Insight database. Somewhat disproportionately represented in the residual firm sample are the electric service, paper, and newspaper publishing industries.

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Our next step was to match each RPF with a firm having the same SIC code. In cases where multiple potential matching firms were available, we chose the matching firm with a MktVal closest to the sample firm's MktVal. In some cases no matching firm was available with the same four-digit SIC code as the sample firm, so we matched on a three-, two-, or one-digit SIC code. Panel C of Table 1 shows the results of this matching process.

Our hypotheses involving potential financial characteristics are as follows:

- **Cash balances.** We expect RPFs to have a lower percentage of assets in cash than their matched counterparts because accumulating a large cash balance would be more difficult if firms are paying out most of their excess funds as dividends.

- **Earnings volatility.** We expect RPFs to have more earnings volatility than their matched counterparts do because maintaining a managed policy of level or increasing dividends would be more difficult if earnings are volatile.

- **Agency costs of equity.** Managers can expropriate wealth from stockholders by wasteful spending of corporate funds. According to agency theory, firms can lessen agency problems by paying out excess funds to shareholders. Firms with high potential agency costs are more likely to maintain a residual dividend policy to reduce free cash flow.

- **Tobin's Q.** We expect RPFs to have higher Tobin's Qs (market value to replacement book value) than their matched counterparts do because the temptation to over invest should be less for RPFs.

- **Propensity to repurchase shares.** We expect RPFs to engage in less intensive share repurchase activity than their matched counterparts because, by definition of RPF, regular cash disbursement in the form of dividends will leave insufficient funds for share repurchases. Although recent evidence from Jagannathan, Stephens, and Weisbach (2000) and Guay and Harford (2000) suggests that dividend changes are typically caused by permanent earnings shocks and share repurchases are associated with temporary earnings

shocks, a firm using a pure residual policy will pay dividends based on both permanent and temporary earnings shocks.

Testing for differences between the sample of RPFs and their matched counterparts involved using both univariate and multivariate tests. The univariate tests include a matched-pairs t-test (a parametric test) and a Wilcoxon matched-pairs signed-ranks test. We used logistic regression as our multivariate approach.

Survey Instrument

We surveyed managers of RPFs passing the screens and investigated their rationales for following what appears to be a residual policy. We also sent an identical survey to their matched counterparts. The one-page survey consists of three parts.[3] The first part contains background information in which we asked managers about their involvement in dividend policy, their current position, and whether their firm forecasts its earnings (or cash flows) and investment opportunities and uses this information to set a long-run target dividend payout ratio. The second part of the survey instrument asked managers to indicate the level of importance of 16 factors (later identified as F#) in determining their firm's dividend policy using a four-point scale where 0 = none, 1 = low, 2 = moderate, and 3 = high. We also asked them to indicate the two most important factors in determining their firm's dividend policy. The third part of the survey asked managers to indicate their level of agreement on seven statements about their firm's dividend policy using a five-point scale in which –2 = strongly disagree, –1 = disagree, 0 = no opinion, +1 = agree, and +2 = strongly agree.

The survey addresses three major research questions:

(1) Do firms typically use forecasted information about earnings (or cash flows) and investment opportunities to set a long-run target dividend payout ratio?

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[3] The survey instrument is available from the authors upon request.

(2) What factors are most important in influencing the dividend policy of firms paying cash dividends?

(3) What are the views of managers about key issues involving dividend policy?

For all three questions, we tested whether the responses differ significantly between the residual and matched sample firms.

Accordingly, we advance several empirical predictions in response to these questions. First, we expect that a significantly larger proportion of residual firms than matched firms use forecasted information to set a long-run target dividend payout ratio. This finding would be consistent with the model discussed earlier about how residual firms set a long-term target dividend payout ratio.

Second, consistent with Lintner's (1956) behavioral model of dividend policy, we expect that the most important factors influencing a firm's dividend policy are the level of current and expected future earnings (or cash flows) and the pattern or continuity of past dividends. Based on their empirical analysis of changes in dividends, Benartzi, Michaely, and Thaler (1997) conclude that "... Lintner's model of dividends remains the best description of the dividend setting process available." These factors would also be similar to those reported from surveys conducted by Baker, Farrelly, and Edelman (1985), Pruitt and Gitman (1991), and Baker Veit and Powell (2001). Survey evidence by Baker and Powell (2000) also suggests "… the key determinants of dividend policy have remained remarkably stable over time." Therefore, we have little reason to suspect that the major determinants of dividend policy differ from those identified in previous studies.

We also expect few significant differences to exist between the levels of importance that residual and matched firms attach to the factors used to determine their firm's dividend policy. However, we expect that residual firms attach a significantly higher level of importance to the "desire to maintain a long-term target dividend payout ratio" than their matched counterparts.

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Again, this difference would be consistent with the model set forth on how residual firms set a target dividend payout ratio.

Finally, we expect respondents to agree, on average, with most statements (later identified as S) involving dividend policy discussed in the third part of the survey. Specifically, we expect agreement, on average, with S1 through S4, but not with S5 through S7. We do not hypothesize any significant differences between the responses of the residual and matched firms. Our rationale for these beliefs follows.

S1.   *My firm strives to formulate its dividend policy to produce maximum value for its shares.* We expect that most respondents pay careful attention to their choice of a dividend policy because they believe that dividend policy decisions affect common stock share prices and, in turn, the wealth of their shareholders. Because managers serve as agents for their firm's stockholders, their role is to make decisions that maximize shareholder wealth. In less-than-perfect capital markets, dividend policy may be relevant in affecting firm value.

S2.   *My firm strives to maintain an uninterrupted record of dividend payments.* We expect that most respondents believe that dividend stability is desirable because they are aware of the informational content that a dividend omission conveys. For example, Healy and Palepu (1988) present evidence that share price decreases upon dividend omissions. Thus, we assert that managers desiring to avoid such share price reactions attempt to maintain an uninterrupted record of dividend payments.

S3.   *My firm avoids increasing its dividend if it expects to reverse the dividend increase in a year or so.* We expect that most respondents will agree with this statement because of the desire to reduce the volatility of their firm's dividend payments. This finding would be consistent with Lintner (1956), who reports a concern for increasing the dividend too much and a strong aversion to dividend cuts. Lintner observed that managers typically

increase dividends when they believe that the level of the firm's earnings has permanently increased

S4. *My firm views its investment, financing, and dividend decisions as interrelated.* We expect that most respondents agree that interactions exist among investment, financing, and dividend decisions. The existence of market imperfections effectively prohibits the independence of a firm's investment and financing decisions. According to the "modified" residual dividends model, these interactions flow from the former to the latter. Researchers such as Peterson and Benesh (1983), Prezas (1988), and Ravid (1988) suggest that interactions exist between a firm's investment and financing decisions. Using stakeholder theory, Holder, Langrehr, and Hexter (1998) find a relationship between the dividend-policy decisions and investment decisions of a firm.[4]

S5. *My firm's expenditures on new capital investments typically affect its dividend payments.* We expect that respondents, on average, disagree with this statement. If firms use a "modified" residual or other type of managed dividend policy, instead of a "pure" residual dividend policy, they would set a long-run target payout ratio and undertake desirable investments while maintaining their dividend payout policies. Thus, new capital investments would not affect the dividend payments, despite the firm's desire to maintain a predictable dividend payout. If firms have good investment projects requiring outlays that exceed free cash flow (net of the desired dividend), they could obtain external financing.

S6. *My firm views cash dividends as a residual after funding desired investment from earnings*. We expect that most respondents disagree with this statement because we believe that the typical firm does not follow a "pure" residual policy or leave its dividend

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[4] Fama (1974) and Smirlock and Marshall (1983) suggest no significant linkage between the investment, financing, and dividend decisions of firms.

payout to chance. Instead, we expect firms to follow a "modified" residual or other type of managed dividend policy.

S7.   *My firm often needs additional external financing as a result of paying cash dividends.* We expect that respondents, on average, also disagree with this statement at least with respect to additional equity financing. If firms follow a "modified" residual or other type of managed dividend policy, they will consider investment opportunities and their target capital structure before they determine their target payout ratios over some period.

After pre-testing the initial survey with a small group of finance academicians, we mailed a cover letter requesting participation in this study, along with a stamped, self-addressed return envelope and the survey instrument, to the chief executive officer of the 309 sample and 309 matched firms. We used multiple mailings over the period March through September 2001 to increase the response rate and thereby reduce potential non-response bias. The cover letter requested that if the recipients were not actively involved in determining their firm's dividend policy that they give the survey to someone in their company who was involved. The survey contained a code number to identify the respondents and to avoid including duplicate responses in the analysis.

Limitations

Our study has several potential limitations. One limitation is the possibility of non-response bias. This is true despite taking the normal precautions to avoid such bias. To test for non-response bias, we used an approach similar to that suggested by Moore and Reichert (1983), which compares characteristics of responding firms to those of non-responding firms. If the characteristics of the two groups are similar, this would lessen the concern about potential non-response bias.

We compared mean values of 15 different company characteristics for both the RPF and matched samples using t-tests and Wilcoxon signed-rank tests. Differences between

respondent firms and non-respondent firms are generally insignificant. The Wilcoxon nonparametric test revealed four exceptions: sample firms have lower levels of cash and gross profit margin than do non-respondents, and matched respondent firms have lower levels of sales growth and Tobin's Q than do non-respondents. The other 56 parametric and nonparametric tests indicate no significant differences between respondents and non-respondents. Given the overall test results and the fact that the four exceptions are not confirmed by parametric tests, we conclude that non-response bias is small.[5]

Accepting that non-response bias may be small, concerns may still exist about the survey data. For example, the respondents may not have answered truthfully or carefully. Given that we guaranteed confidentially to respondents, we believe that the former problem is minimal. We believe that respondents would not take the time to complete a survey if their intent was to be untruthful. Despite our efforts to design and pre-test the questions, respondents might not properly understand some questions. Other questions might not elicit the appropriate information. Finally, in order to more completely illuminate all issues about residual dividend policy, we could have asked more questions or asked questions in a different manner. Little can be done to change this situation without conducting a follow-up survey, which is impractical at this time. Having said this, we believe that these data are representative and provide much useful information about dividend policy.

IV. Results

In discussing our results, we focus on four areas: characteristics of residual and matched firms, logit regression analysis, survey results, and further analysis.

Characteristics of Residual and Matched Firms

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[5] These tests are available from the authors upon request.

The results of the comparisons of residual and matched firms are both reassuring and surprising. Table 2 shows that firms that appear to follow a residual dividend policy are different in many respects from their matched counterparts. Panels A and B show various characteristics involving the balance sheet and income statement. Panel A shows that, contrary to our expectations, residual firms have a significantly higher percentage of cash balances than their matched counterparts do. Residual firms are also significantly larger than the matched firms based on total assets and market value of equity. Median total asset size is $1.637 billion higher and market value of equity is $4.394 billion higher for firms following a residual policy. Panel B shows that residual firms are more profitable than their matched counterparts based on all profitability measures. This finding was also surprising because we expected residual firms to have lower equity returns than their matched counterparts. Residual firms also have lower earnings volatility than their matched counterparts, which was unexpected.

The remaining three panels also show some significant differences between the two groups. Panel C surprisingly shows that RPFs pay a higher fraction of earnings out as dividends (about 44% to 32%). Panel D indicates that the price-earnings ratio is higher for RPFs, but numbers that contribute to the denominator of P/E — the gross, operating, and net profit margins (and their growth rates) — are also higher for that group. The number of common shares outstanding, the number of shareholders, and the fraction of the shares held by institutional shareholders is significantly higher for RPFs. As expected, Panel D shows that RPFs have higher Tobin's Q than their counterparts.

(Insert Table 2 about here)

With respect to the prevalence of share buybacks for one group versus another, we evaluate the data based on how frequently the number of shares outstanding declines. For both groups the average decline in the number of shares, in years when they do fall, is about 3%. Since we collected ten years of data, there are nine share-change numbers per firm. The

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average proportion of years (out of nine) in which the number of shares fell by at least 5% is 0.04 for the residual firms and 0.07 for the matched firms. The difference is statistically significant. Similarly, the fraction of years in which number of shares fell by at least 10% is significantly lower for the residual firms than for the matched counterparts. This result is consistent with expectations because residual firms are unlikely to have excess capital available for buybacks. These firms have clearly elected to use excess cash for dividend payments as opposed to share repurchases. Matched firms are comparatively more likely to engage in buybacks.

We identify a firm as a residual policy firm because it has a consistently low level of funds remaining after making payments for various purposes. A commonly held notion is that the dividends paid under a residual dividend policy exhibit high variability, which may be disadvantageous for the firm (Lease et al., 2000). The t-tests in Table 2 show that the standard deviations of dividend payout ratio and dividend yield do not differ between the two groups, but the nonparametric test indicates that the RPF sample has significantly lower standard deviations. Thus, RPFs clearly do not have more erratic dividends than their matched counterparts.

Despite the fact that the dividends for residual firms are not more variable than the dividends of their matched counterparts, perhaps residual firms have a higher propensity to reverse the direction of the previously established dividend trend. We expect that a manager committed to following a residual policy would cut the dividend, even to zero, in a year when the level of pre-dividend cash flow is unusually low. Table 3 provides information on the frequency of change in the dividend trend. Dividends per share changed more than 3,500 times during the 5,562 firm-years, with the vast majority being positive changes. For both residual and matched firms, dividend increases during the 1990s far outnumbered dividend cuts. However, contrary to expectations, RPFs were consistently less likely to cut dividends than were firms in the matched

sample. The most remarkable finding is in Panel B, which shows that over the ten years examined, a larger number of matched firms than residual firms changed the direction of the previously established trend.[6] Thus, firms having low FCF net of dividends do not tend to change the dividend level or trend dramatically over time.

<center>(Insert Table 3 about here)</center>

Logistic Regression Analysis

We specify a multivariate logistic regression (logit) model to supplement the univariate results reported above. The purpose of the logit model is to identify factors related to the likelihood of a firm following a residual policy. In the model, the dependent variable takes on a value of 0 if the observation is a matched sample firm, and 1 if a RPF. A subset of the factors from the earlier univariate results is used as independent variables. The factors, proxy variables, and hypothesized sign of the regression coefficients are as follows:

(1) **Company size.** The proxy is the natural logarithm of total sales. The hypothesized sign of the coefficient is positive.

(2) **Tobin's Q.** This is measured as total market value of equity plus book value of debt, all divided by book value of assets. The hypothesized sign is positive.

(3) **Agency.** Following Holder, Langrehr, and Hexter (1998), the proxy variable is the residual from the regression of the log of the number of shareholders on the log of total sales. The number of shareholders, a measure of ownership dispersion, should be positively related to the magnitude of potential agency problems. Agency theory suggests that atomistic shareholders find it more difficult to monitor managers than do firms with concentrated

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[6] One of the firms in the matched sample, Graco, Inc., changed its dividend trend (which was initially negative) seven different times. Research Insight reports that Graco's respective dividends per share between 1990 and 1999 were $0.12, $0.10, $0.18, $0.15, $0.93, $0.20, $0.22, $0.19, $0.29, and $0.29.

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shareholdings. The regression residual is used because larger firms tend naturally to have a broader shareholder base. We also used an alternative specification: the fraction of shares owned by institutional investors. The hypothesized sign is positive.

(4) **Earnings volatility.** This is measured as the standard deviation of the firm's operating profit margin. Firms with a high degree of earnings volatility are likely to have difficulty maintaining a managed dividend policy, particularly if the policy involves a high payout ratio. A residual policy appears well suited to firms with highly variable earnings. The hypothesized sign is positive.

(5) **Propensity to do share buybacks.** The variable used is the fraction of years during the 1990s in which the number of shares declined by 5% or more. The expected sign is negative.

Table 4 shows the results of the logistic regression. The coefficients for the first three variables have the predicted signs and are statistically significant. Larger firms, firms with higher levels of Tobin's Q, and firms with a higher degree of potential agency costs are more likely to follow a residual-type policy. These findings support our hypothesis that firms with greater access to capital will be in a position to maintain low levels of FCF. Firms with high levels of Tobin's Q show little evidence of over-investment, and the results indicate that such firms are more likely to follow a residual policy than an alternative type of policy. The level of agency costs, as reflected in ownership dispersion, is positively related to the propensity to follow a residual policy.

The signs of the coefficients for the final two factors are contrary to our hypotheses. Only the first is statistically significant. The standard deviation of operating profit margin is negatively related to the likelihood of following a residual policy. This is a surprising result given that if profit variability over the years is known to be high, investors may be more forgiving of a relatively erratic dividend policy. Recall from the univariate results that the payout ratio is lower

for the matched firms. This would be expected in cases where profits are volatile. The signaling value to investors of a dividend change should be higher if the degree of profit uncertainty is high. Finally, for the share repurchase factor, the coefficient is not statistically significant.

(Insert Table 4 about here)

We conducted several robustness checks. First, to test whether the logit results were affected by our SIC matching process, we re-ran the model using only the 232 pairs of firms that were matched on the basis of 3- and 4-digit SIC. Deleting the pairs matched based on 1- and 2-digit SIC does not change the logit results; the regression coefficients have the same signs and significance levels as in the analysis for the full sample.

Firms following a pure residual policy will be likely to change their dividend trend periodically. That is, following a period of rising (falling) dividends the firm may cut (raise) the dividend. As another robustness check, we retained only the 106 residual sample firms that changed their dividend trend at least once between 1990 and 1999. Re-running the logit model with only these firms and their matched counterparts yields logit results that are qualitatively identical to those generated by the full sample.

One possibility is that screening using FCF divided by MktVal results in a sample of high MktVal firms as opposed to our objective: a sample of low standardized FCF firms, which was the objective. We re-screened the Research Insight universe by standardizing FCF using total assets. From the original sample of 309 pairs, 116 pairs also pass the FCF/total assets screen. Re-running the model using this trimmed sample of 116 pairs does not change the signs of the logit regression coefficients. The only difference from the full sample results is that the Tobin's Q coefficient is no longer significant at the 0.10 level (p value = 0.169).

We also re-screened using raw (unstandardized) FCF. From the initial sample, 77 pairs also pass the raw FCF screen. Running the model using this trimmed sample changes the results in several ways. The intercept is statistically insignificant. The coefficient on the ln(Sales)

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variable is negative and significant at the 0.10 level. The agency variable (residual from the regression of log of shareholders on log of sales) has a statistically insignificant coefficient. Retaining its negative sign, the earnings variability coefficient is significant at only the 0.10 level.

Next, we re-screened the data and identified the firms that had positive FCF in at least 80% of the years. Our concern is that if a firm passes the "residual policy" screen by having a close-to-zero mean and standard deviation, the mean FCF could still be a negative number. If so, the firm would need to raise capital externally to cover the deficiency. This situation is not fully consistent with a pure residual policy. After re-running the logit analysis with these 116 firms and their matches, we find results very similar to those reported for the full sample in Table 4. The only exception is that the ln(Sales) factor becomes statistically insignificant (positive sign, but p-value = 0.20).

For a final robustness check, we re-defined FCF to take into account each firm's capital structure. We assumed that firms issued debt each year to pay for a fraction of capital expenditures, where the fraction is equal to the book value of debt divided by (book value of debt + market value of equity). We standardized the resulting FCF with MktVal. Using the revised definition of FCF, 201 pairs from the initial sample passed the screen. The logit results are qualitatively identical to those presented in Table 4, with the exception of the ln(Sales) variable, whose coefficient becomes statistically insignificant. Alternatively, scaling this redefined FCF using total assets (resulting in 62 pairs of firms) generates results essentially identical to those for the entire sample of 309 when standardizing with total assets.

Survey Results

The survey resulted in 115 usable responses, 67 from the residual firms (21.7% response rate) and 48 usable responses from the matched firms (15.5% response rate).[7] Some respondents did not answer every question. Of the total respondents, 93.9% said that they were actively involved in determining their firm's dividend policy.[8] The most common position or title of respondents was chief financial officer, vice president of finance, and treasurer (41.2%), followed by chief executive officer, president, or chairman (39.5%), and "other" (19.3%).[9] Based on chi-square tests no significant differences exist at the 0.05 level between the residual and matched firms concerning involvement in the dividend policy decision or the position of respondents.

In discussing the survey results, we focus on three areas: setting target dividend payout ratios, determinants of dividend policy, and other issues about dividend policy.

Setting Target Dividend Payout Ratios. The results in Table 5 provide information about our first research question, which concerns whether firms typically use forecasted information about earnings (or cash flows) and investment opportunities to set a long-run target dividend payout ratio. The evidence shows that about 75% of both the residual and matched firms forecast earnings (or cash flows) and a majority of both groups (63.5% for residual firms and 53.2% for matched firms) forecast investment over a five or so year planning period. As predicted, of those

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[7] Of the 309 surveys sent to each group, 23 surveys (9 residual and 14 matched) were undeliverable, typically due to the CEO no longer being with the company; and 75 surveys (45 residual and 30 matched) were returned but the addressee declined to participate often due to company policy.

[8] Excluding respondents who were not actively involved in dividend policy decisions has little effect on the results.

[9] Baker and Powell (2000) report that the chief executive officer and chief financial officer are the most influential in developing the dividend policy ultimately approved by the board of directors.

firms forecasting earnings (or cash flows) or investment opportunities, a significantly larger percentage of residual compared with matched firms, 66.7% and 41.0% respectively, uses this forecasted information to set a long-run target dividend payout ratio. This response lends support to the notion presented earlier that firms use the residual policy to find a dividend pattern over the forecast period.

<center>(Insert Table 5 about here)</center>

Determinants of Dividend Policy. Our second research question involved identifying the most important factors in determining a firm's dividend policy. Table 6 presents descriptive statistics showing the importance level of each of 16 factors, later identified as F#, considered by managers in setting their firm's dividend policy. Because of the large number of factors examined, we focus primarily on the most important determinants of dividend policy for the residual and matched firms. Both groups ranked the same five factors (F1 through F4 and F13), as measured by their means, as most important in influencing their firm's dividend policies. With one exception, these factors have means above 2 (moderate level of importance). These factors are: stability of earnings (or cash flows) (F2), pattern of past dividends (F1), level of current earnings (or cash flows) (F3), level of expected future earnings (or cash flows) (F4), and desire to maintain a long-term target dividend payout ratio (F13). Four of these factors (F1 through F4) are consistent with the top ranked factors reported by Baker and Powell (2000) in their survey of NYSE firms and by Baker, Veit, and Powell (2001) in their study of Nasdaq firms and with earlier survey research by Baker, Farrelly, and Edelman (1985) and Pruitt and Gitman (1991). As we predicted, most of these factors are very similar to those contained in Lintner's (1956) partial-adjustment model.

We conducted chi-square tests to determine whether significant differences in the level of importance exist between all pairs of the five most highly ranked factors for both the residual and matched firms. Where appropriate, we collapsed the categories to avoid inadequate cell

<center>21</center>

counts. Of the 10 chi-square tests conducted for the residual firms, the only significant differences at the 0.10 level are between F2 and F3, F2 and F13, and F2 and F4. For the matched firms, significant differences occurred between F2 and F13 and F1 and F13 at the 0.10 level and between F4 and F13 and F3 and F13 at the 0.05.[10] These results suggest that no statistically significant differences exist in the responses to the three highest ranked factors (F2, F1, and F4) for the residual firms and the four highest ranked factors (F2, F4, F3, and F1) for the matched firms.

Not surprisingly, a high correlation exists between the rankings of the 16 factors of the residual and matched firms. The Spearman rank correlation coefficient (r_s = 0.765) is statistically significant at the 0.01 level (t = 4.450 with df = 14). Chi-square tests show no significant differences between the residual and matched firms on any of the five top-ranked factors. As predicted, however, residual firms attach a significantly higher level of importance to the desire to maintain a long-term target dividend payout ratio (F13) than the matched firms. This finding is consistent with the results reported in Panel C of Table 5. Apparently, firms use the residual policy to help them set their long-run target payout ratios, but not as a guide to the payout in any one year. Such firms may follow a "modified" instead of "pure" residual dividend policy to avoid highly volatile dividend payments.

The only other factor in which the importance differs significantly between the residual and matched firms is the cost of raising external funds (F8). The residual firms attach less importance to this factor than do the matched firms. Why may this be the case? As our results in Table 5 show, residual firms are more likely than their matched counterparts to use forecasted earnings (or cash flows) and investment opportunities to set a long-run target dividend payout ratio. Such a payout is likely to provide enough internal equity to support the capital budget without having to sell new common stock or move the capital structure ratios outside the optimal

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[10] The results of these chi-square tests are available from the authors upon request.

range. Thus, firms using a "modified" residual model attach less importance to the cost of raising external funds.

(Insert Table 6 about here)

To help ensure that we identified all relevant factors, we asked respondents to list the two most important factors in determining their firm's dividend policy. If the list of 16 contained the two most important determinants, respondents simply had to write the number matching the factor. Otherwise, they had to describe the factor in the space provided. We received a total of 116 responses from the residual firms and 86 responses from the matched firms.

As shown in Table 7, the top ranked factors are similar to those shown in Table 6. However, the most important factor is the pattern of past dividends (F1), instead of the stability of earnings (or cash flows) (F2) as previously shown. Table 7 contains another noteworthy finding. Namely, at least one respondent viewed each factor, except cost of raising external funds (debt and equity) (F8), as among the most important in determining his or her firm's dividend policy. Because firms consider a wide array of factors, this implies that modeling dividend behavior uniformly for firms is difficult, if not impossible.

(Insert Table 7 about here)

Other Issues about Dividend Policy. Our third research question sought to determine the views of managers about key issues involving dividend policy. As Table 8 shows, the results are consistent with our expectations. The majority of respondents agrees with S1 through S4, but disagrees with S5 through S7. The respondents express the highest level of agreement with the statement that "my firm strives to maintain an uninterrupted record of dividend payments" (S2). In fact, 87.7% of the residual firms and 80.9% of the matched firms agreed with this statement. This finding highlights the importance that managers attach to maintaining dividends. Not surprisingly, managers strive to formulate a dividend policy to produce maximum value for shareholders (S1). Dividend policies may differ substantially from firm to firm because the

relative importance of various factors and market imperfections affecting these firms also differs. In attempting to arrive at a desirable dividend policy, managers consider the complex interrelationships among investment, financing, and dividend decisions (S4). This finding is also consistent with the view expressed by Bierman (2001). Managers are apparently reluctant to increase their firm's dividend if they expect to reverse the dividend increase in a year or so (S3). This reluctance may result from their awareness of the signaling effects associated with a dividend cut.

(Insert Table 8 about here)

Consistent with our expectations, the respondents, on average, also disagree with three statements. The majority of both groups disagrees that cash dividends are a residual after funding desired investments from earnings (S6). As previously stated, firms are unlikely to follow a "pure" residual theory because doing so could lead to high volatility of dividends. For example, following such a policy could result in a firm paying no dividends during a period when investment opportunities are great and paying high dividends when investment opportunities are scarce. This policy would conflict with the importance that respondents place on maintaining an uninterrupted record of dividend payments. However, dividends do not have to be "the tail that wags the dog." If firms develop a long-term perspective, they do not have to reject desirable investment opportunities (i.e., positive net present value projects) to maintain their dividends. Instead, they can forecast earnings (or cash flows) and investment opportunities over a five- to ten-year planning horizon, and use this forecasted information along with a target capital structure to set a long-run target dividend payout ratio. As shown in Table 5, the majority of residual firms take this approach. Finding that respondents generally disagree with the statements that "my firm's expenditures on new capital investments typically affects its dividend payments" (S5) and "my firm often needs additional external financing as a result of paying cash dividends" (S7) is not surprising.

Further Analysis. In view of the seeming disparities between our screening results and the survey findings, we examined more closely the firms that responded to item S6. Respondents agreeing with statement S6, "My firm views cash dividends as a residual after funding desired investment from earnings," express a view consistent with some form of a residual dividend policy. We re-ran the t-tests,[11] Wilcoxon nonparametric tests, and logistic regression for the 21 firms responding "agree" or "strongly agree" to item S6 versus the 66 firms responding "disagree" or "strongly disagree." The self-described residual firms have lower sales growth, lower gross, operating, and net profit margins, fewer shareholders, and lower dividend payout ratios and dividend yields than non-residual firms. The standard deviations of payout and yield are similar for the two groups, as are company size, leverage, and liquidity.

Worth noting is the fact that the small sample of residual firms may affect the reliability of any logistic regression results. Applying to these data the same logistic regression model used earlier results in generally insignificant parameter estimates. The two coefficients that are statistically significant are the agency variable, with a negative sign (i.e., the size-adjusted number of shareholders is negatively related -- and the incidence of a 5% or more decrease on shares outstanding is positively related -- to the existence of a residual policy). Both of these results are contrary to what we would hypothesize. As mentioned earlier, we would expect residual policy firms to have a higher potential agency problem and a lower propensity to repurchase shares. Next, choosing a logistic regression model using various stepwise procedures results in the following specification: (1) standard deviation of dividend yield; (2) the fraction of years in which shares outstanding fall by 5% or more, and (3) the size-adjusted number of shareholders. The coefficient signs (reflecting the variable's relationship with the incidence of a residual policy) are positive, positive, and negative, respectively.

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[11] The tests in this case were two-sample t-tests, not paired t-tests.

V. Conclusions

A pure residual dividend policy involves paying out most or all cash flow after capital expenditures. The finance literature suggests that various benefits exist to following a residual policy if a company pays dividends. Chief among them is the reduction in agency costs.

We identify 309 firms as residual policy firms (RPFs) if they maintained consistently low levels of free cash flow (net of dividends) during the 1990s. For comparison purposes, we develop a matched sample based on primary SIC code. Univariate tests show that the RPFs differ from their matched counterparts in various ways. In many respects, RPFs are financially healthier than their matched counterparts, which is confirmed by the fact that RPFs are larger, faster growing, more profitable, and less highly leveraged. RPFs also have higher dividend payout ratios and dividend yields, despite having higher price/earnings ratios and 1-year returns on common stock than their matches.

We use logistic regression to simultaneously evaluate factors associated with a firm's dividend policy. The likelihood of following a residual policy is positively related to firm sales, Tobin's Q, and agency costs, and negatively related to the variability of operating profit margin, but unrelated to the firm's propensity to make share repurchases. These results exhibit a moderate degree of robustness to various screening methods.

We surveyed managers to gain insight into the determinants of dividend policy. For firms in both the RPF and matched samples, the pattern of past dividends, the level and stability of earnings, and desire to maintain a long-term dividend payout ratio elicit the highest level of agreement from respondents. Relative to the matched firms, RPFs consider maintaining a long-term dividend payout ratio to be more important. Moreover, RPFs claim that the cost of raising external capital is comparatively unimportant. In this case, the survey findings are consistent with the logit results, in which dividend policy is highly dependent on firm size. Raising capital is

easier for larger firms, so a residual policy would impose a lower cost on large firms than on small firms.

Perhaps the most surprising finding is that only a small fraction of firms having the lowest levels of free cash flow profess to maintain a residual dividend policy. There are several potential reasons for this discrepancy. Our screening process measures free cash flow net of dividends on an annual basis. The survey results suggest that firms plan their dividend payments over a longer time horizon than one year. Indeed, firms following a residual policy were more likely than their matched counterparts to respond that they set long-run dividend payout ratios using five-year earnings forecasts. This is buttressed by the fact that in setting dividend policy RPFs claim to focus much less on current earnings and more on future earnings than their matched counterparts.

An overall conclusion from this study is that the process for identifying residual dividend payout behavior is neither simple nor obvious. Even firms exhibiting classic residual dividend behavior claim to be giving close attention to the past payment pattern and the market's perception of dividend changes. Thus, during the 1990s the closest most firms came to maintaining a residual policy was a "modified" residual policy. In this case, firms carefully managed their dividend stream. While consistently low free cash flows were an outcome, they were not necessarily a corporate goal.

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TABLE 1. Screen of Firms Following a Residual Dividend Policy, and Matching Results

This table shows the number of firms remaining after each screen, the SIC characteristics of the firms examined in the study, and the SIC criteria used when choosing matched sample firms.

Panel A: Screening Results

Description	Firms Remaining
Research Insight Active and Research files, November 2000	20,707
Delete firms with headquarters outside U.S.	19,067
Delete REIT firms (SIC = 6798), REITs pay out more than 95% out by law.	18,647
Retain firms that pay a dividend in at least 4 years between 1990-99	2,140
Retain firms with free cash flow (FCF) and market value of equity (MktVal) data for at least 7 years between 1990-99	1,320
Calculate FCF/MktVal for each year between 1990-99. Create quintiles of Abs(mean FCF/MktVal), with quintile 1 containing firms with the lowest values. Create quintiles of StdDev(FCF/MktVal), with quintile 1 containing firms with the lowest values. Retain firms in quintiles 1 and 2 for both criteria.	309

Panel B: SIC Characteristics of Firms in Sample

SIC	SIC Description	Firms in Present Study (n = 618)		All Dividend Payers Except SIC=6798 (n = 18,609)	
		Rank	Rel Freq	Rank (of 442)	Rel Freq
2834	Pharmaceutical preparations	1	4.21%	11	1.19%
4813	Telephone communications, except radiotelephone	2	3.56%	8	1.56%
4931	Electric and other services combined	3	3.56%	74	0.31%
4911	Electric services	4	3.24%	42	0.49%
3714	Motor vehicle parts and accessories	5	2.59%	32	0.60%
5411	Grocery stores	6	2.27%	33	0.60%
2670	Miscellaneous converted paper products	7	1.94%	71	0.31%
2890	Miscellaneous chemical products	8	1.62%	123	0.21%
5812	Eating and drinking places	9	1.62%	10	1.47%
2711	Newspapers: publishing, or publishing and printing	10	1.29%	142	0.19%
2761	Manifold business forms	11	1.29%	248	0.10%
3663	Radio and TV broadcasting and comm. equipment	12	1.29%	19	0.73%
4011	Railroads, line-haul operating	13	1.29%	81	0.29%
5912	Drug stores and proprietary stores	14	1.29%	96	0.26%
2030	Canned, frozen & preserved fruit, veg & food spec	15	0.97%	154	0.17%

Panel C: Matching results

1-digit SIC: 309 matches
2-digit SIC: 284 matches (i.e., lose 25 sample firms)
3-digit SIC: 232 matches (lose 52 sample firms)
4-digit SC: 204 matches (lose 28 sample firms)

TABLE 2. Means for Financial Variables

Financial characteristics, between 1990 and 1999, of firms maintaining consistently low levels of residual cash flow (residual firms) versus firms maintaining high and variable levels of residual cash flow (matched firms). Unless otherwise noted, the median is calculated for each firm over time and means of these values are calculated across firms. The t-statistics from paired t-tests are shown. The rightmost column contains the z-statistic (normal approximation) from Wilcoxon two-sample tests.

Variable	n	Mean, Residual Firm	Mean, Matched Firm	t-stat (diff)	Wilcoxon z stat
Panel A. Balance Sheet					
Total Assets	309	5715.01	4077.95	1.69*	2.02**
Cash	307	176.73	97.87	2.31***	3.89***
Cash/Total Assets	306	0.06	0.04	3.16***	2.53**
Current ratio	291	2.32	1.87	2.88***	0.38
Total Liabilities	309	1672.48	1191.96	1.09	−0.50
Long-Term Debt/Equity	309	44.51	70.93	−3.37***	−5.48***
Market Value of Equity	309	7158.22	2764.58	6.23***	5.56***
Receivables Turnover	305	23.86	15.34	1.32	−1.04
Inventory Turnover	283	12.51	11.73	0.81	−0.83
Fixed Asset Turnover	302	5.15	5.52	−0.69	0.26
Panel B. Income Statement					
Sales	307	6482.08	4043.29	3.16***	2.58***
1-Year Change in Sales	309	8.55	5.91	5.20***	4.66***
Gross Profit Margin	309	40.71	34.57	5.63***	4.08***
Operating Profit Margin	309	15.98	11.44	7.24***	5.80***
R&D Expenses/Total Assets	111	0.05	0.04	2.11**	1.42
Capital Expenditures/Market Value Equity	309	0.05	0.10	−9.02***	−7.98***
EBIT	309	640.09	357.42	4.12***	4.14***
EBITDA/Sales	309	20.86	16.65	6.55***	4.39***
StdDev(Operating Profit Margin)	309	2.46	3.79	−4.77***	−5.47***
Net Profit Margin	321	10.18	6.29	6.39***	7.87***
Return on Assets	307	9.10	5.21	7.60***	9.24***
Return on Equity	307	18.48	12.73	7.46***	7.29***
1-Year Change in Net Income	309	10.33	7.37	2.24**	1.26***

*, **, *** Significant at the 0.10, 0.05, and 0.01 level, respectively.

TABLE 2. Means for Financial Variables -- Continued					
Variable	n	Mean, Residual Firm	Mean, Matched Firm	t-stat (diff)	Wilcoxon z stat
Panel C. Dividends					
Dividend Payout Ratio	309	43.92	32.47	6.57***	6.55***
StdDev(Dividend Payout)	309	544.16	459.40	0.17	−5.16***
Dividend Yield	309	2.70	2.51	1.43	2.14**
StdDev(Dividend Yield)	309	1.69	2.11	−0.45	−4.20***
Panel D. Common Stock					
1-Year Return on Common Stock	309	13.43	9.80	3.67***	3.26***
Price/Book Ratio	304	11.63	2.18	1.21	9.77***
Price/Earnings Ratio	308	20.45	15.08	7.53***	8.94***
Number of Shareholders	307	65.84	22.17	3.88***	3.29***
Common Shares Outstanding	309	348.92	110.62	5.12***	5.24***
Institutional Ownership/Total Shares Outstanding	193	50.61	45.38	2.35**	1.84*
Shares Outstanding Change When Negative	204	−0.03	−0.03	1.37	−7.98***
Average Fraction Years when Shares Down > 5%	309	0.04	0.07	−4.08***	−4.07***
Average Fraction Years when Shares Down > 10%	309	0.01	0.02	−3.02***	−3.28***
Beta	308	0.69	0.66	0.68	0.38
Panel E. Other					
Tobin's Q	309	2.11	1.17	5.28***	10.75***
StdDev(Tobin's Q)	309	0.66	0.37	5.76***	5.85***
Z-Score	283	5.58	3.54	6.47***	6.51***

*, **, *** Significant at the 0.10, 0.05, and 0.01 level, respectively.

TABLE 3.   Dividend Changes

This table presents dividend changes, between 1990 and 1999, for 309 firms maintaining consistently low levels of residual cash flow (residual firms) versus 309 firms maintaining high and variable levels of residual cash flow (matched firms).   In Panel A, the second and third columns show the respective number of *times* dividends increased and decreased.   Figures in parentheses indicate the number of times the company initiated or omitted dividends, respectively.   The fourth and fifth columns show the respective number of *firms* that increased or decreased dividends.   Figures in parentheses indicate the number of firms initiating or omitting dividends, respectively.   Panel B shows the number of firms increasing dividends or decreasing dividends that never changed the direction of dividends (change = 0), firms increasing dividends or decreasing dividends that changed the direction of dividends one or more times (change = 1 to 5).

Panel A. Frequency of Dividend Changes

	Times Dividends Per Share		Firms for which Dividends Per Share	
	Increased (from 0)	Decreased (to 0)	Increased (from 0)	Decreased (to 0)
Residual firms	1913 (29)	195 (47)	294 (29)	112 (47)
Matched firms	1357 (43)	345 (79)	278 (42)	176 (77)

Panel B. Frequency of Changes in Previous Dividend Trend

Number of Changes in the Previous Trend	Residual Firms	Matched Firms
0	203	153
1	56	88
2	25	36
3	12	18
4	7	8
5	4	3
Total Firms Changing	106	156

TABLE 4. Logistic Regression Results

This table provides the logistic regression (logit) output for firms maintaining consistently low levels of residual cash flow (residual firms) versus firms maintaining high and variable levels of residual cash flow (matched firms). The dependent variable assumes a value of 1 (0) for residual firms (matched firms). The independent variables are (1) the natural logarithm of sales; (2) Tobin's Q; (3) the residual from the regression of the log of the number of shareholders on the log of sales; (4) the standard deviation of the operating profit margin; and the fraction of years in which shares outstanding fall by at least 5%. Maximum likelihood parameter estimates are presented, along with asymptotic standard errors, and the associated chi-square and p-values. The number of observations is 615.

Panel A: Parameter Estimates

Variable	Parameter Estimate	Standard Error	χ^2	p-value
Intercept	−2.81	0.53	27.82	0.00
ln(Sales)	0.17	0.05	9.52	0.00
Tobin's Q	1.43	0.17	68.06	0.00
Residual from ln(shareholders) on ln(Sales)	0.25	0.08	9.61	0.00
StdDev(Operating Profit Margin)	−0.12	0.03	11.82	0.00
Fraction of Years when Shares Down > 5%	0.70	1.22	0.33	0.57

Panel B: Model Statistics

Test	χ^2	p-value
Likelihood ratio	151.70	0.00
Score	47.47	0.00
Wald	88.83	0.00

TABLE 5. Forecasts of Earnings (or Cash Flows) and Investment Opportunities

This table reports the responses to the question "Does *your firm* forecast its earnings (or cash flows) and investment opportunities over a five or so year planning period?" The chi-square tests show whether the distribution of responses differs significantly between the residual and matched groups. For Panel C, the cells are collapsed to avoid potential problems when the cells have expected counts less than 5.

Forecast	n	Yes	No	Don't Know	χ^2	Group
A. Earnings (or cash flows)	66	75.8%	13.1%	0.0%	0.025	Residual
	47	75.5	25.5	0.0		Matched
B. Investment opportunities	63	63.5	36.5	0.0	1.182	Residual
	47	53.2	46.8	0.0		Matched
C. If "yes" to either A or B, does your firm use this forecasted information to set a long-run (over five or so years) target dividend payout ratio?	48	66.7	33.3	0.0	4.664**	Residual
	39	41.0	56.4	2.6		Matched

*, **, *** Significant at the 0.10, 0.05, and 0.01 level, respectively.
Percentages may not add to 100 due to rounding.
For the chi-square tests, the degrees of freedom (df) = 2 for A and B and df = 1 for C.

TABLE 6. Determinants of Dividend Policy

This table shows the importance that respondents gave to each of 16 factors in determining their firm's dividend policy. The factors are ranked in order of importance from highest to lowest according to the means of the residual group. The chi-square tests show whether the distribution of responses between the residual and matched groups differs significantly. In some case, the cells are collapsed to avoid potential problems when the cells have expected counts less than 5.

F#	Factor	n	None 0	Low 1	Mod 2	High 3	Mean	Rank	χ^2	Group
2	Stability of earnings (or cash flows)	64	4.7%	4.7%	23.4%	67.2%	2.53	1	0.078	Residual
		46	0.0	10.9	23.9	65.2	2.54	1		Matched
1	Pattern of past dividends	64	1.6	9.4	31.3	57.8	2.45	2	0.448	Residual
		46	0.0	15.2	30.4	54.4	2.39	4		Matched
4	Level of expected future earnings (or cash flows)	63	6.4	7.9	27.0	58.7	2.38	3	1.253	Residual
		46	2.2	6.5	34.8	56.5	2.46	2		Matched
3	Level of current earnings (or cash flows)	63	1.6	14.3	38.1	46.0	2.29	4	2.261	Residual
		46	0.0	10.9	28.3	60.9	2.50	3		Matched
13	Desire to maintain a long-term target dividend payout ratio	63	9.5	11.1	25.4	54.0	2.24	5	6.320**	Residual
		46	8.7	17.4	43.5	30.4	1.96	5		Matched
5	Concern about affecting the stock price	63	7.9	20.6	49.2	22.2	1.86	6	4.276	Residual
		46	8.7	39.1	34.8	17.4	1.61	15		Matched
16	Concern that changing the dividend may send a false signal to the market	63	15.9	15.9	38.1	30.2	1.83	7	1.797	Residual
		46	8.7	19.6	45.6	26.1	1.89	6		Matched
15	Desire to send favorable signals to the market	63	11.1	20.6	46.0	22.2	1.79	8	2.812	Residual
		46	10.9	19.6	58.7	10.9	1.70	14		Matched
7	Desire to maintain a target capital structure	63	15.9	23.8	33.3	27.0	1.71	9	2.392	Residual
		46	2.2	30.4	47.8	19.6	1.85	7.5		Matched
14	Investors' preferences for dividends versus capital gains	64	10.9	35.9	34.4	18.8	1.61	10	2.556	Residual
		45	4.4	31.1	46.7	17.8	1.78	10		Matched
12	Availability of profitable investment opportunities	63	19.1	20.6	42.9	17.5	1.59	11	2.096	Residual
		46	10.9	19.6	43.5	26.1	1.75	7.5		Matched
6	Current degree of financial leverage	63	17.5	25.4	39.7	17.5	1.57	12	0.499	Residual
		46	6.5	30.4	41.3	21.7	1.78	9		Matched
10	Expected rate of return on the firm's assets	63	14.3	33.3	36.5	15.9	1.54	13	2.696	Residual
		46	2.2	32.6	52.2	13.0	1.76	11		Matched
9	Liquidity constraints such as the availability of cash	62	24.2	22.6	33.9	19.4	1.48	14	4.155	Residual
		46	10.9	32.6	30.4	26.1	1.72	12		Matched
11	Plans to repurchase the firm's common stock	64	18.8	35.9	34.4	10.9	1.38	15	4.018	Residual
		45	11.1	24.4	46.7	17.8	1.71	13		Matched
8	Cost of raising external funds	63	14.3	41.3	38.1	6.4	1.37	16	5.564*	Residual
		46	8.7	47.8	23.9	19.6	1.54	16		Matched

*, **, *** Significant at the 0.10, 0.05, and 0.01 level, respectively.
Percentages may not add to 100 due to rounding.
For the chi-square tests, the degrees of freedom (df) = 3 for F9, F11, F12, F14, F15, F16 and F3; and 2 for F1, F2, F3, F4, F5, F6, F7, F8, F10, and F13.

TABLE 7. Most Important Determinants of Dividend Policy

This table shows the responses to the question "What are the *two* most important factors in determining **your firm's** dividend policy?" The residual and matched firms gave a total of 116 and 86 responses, respectively.

F#	Factor	n	% of Total	Rank	Group
1	Pattern of past dividends	26	22.4	1	Residual
		15	17.4	1	Matched
4	Level of expected future earnings (or cash flows)	18	15.5	2.5	Residual
		9	10.5	4.5	Matched
13	Desire to maintain a long-term target dividend payout ratio	18	15.5	2.5	Residual
		9	10.5	4.5	Matched
2	Stability of earnings (or cash flows)	15	12.9	4	Residual
		14	16.3	2	Matched
5	Concern about affecting the stock price	8	6.9	5	Residual
		3	3.5	8.5	Matched
3	Level of current earnings (or cash flows)	5	4.3	6.5	Residual
		13	15.1	3	Matched
16	Concern that changing the dividend may send a false signal to the market	5	4.3	6.5	Residual
		3	3.5	8.5	Matched
14	Investors' preferences for dividends versus capital gains	4	3.4	8	Residual
		6	7.0	6	Matched
12	Availability of profitable investment opportunities	3	2.6	10	Residual
		3	3.5	8.5	Matched
11	Plans to repurchase the firm's common stock	3	2.6	10	Residual
		3	3.5	8.5	Matched
15	Desire to send favorable signals to the market	3	2.6	10	Residual
		2	2.3	11.5	Matched
7	Desire to maintain a target capital structure	2	1.7	13	Residual
		1	1.2	14.5	Matched
10	Expected rate of return on the firm's assets	2	1.7	13	Residual
		1	1.2	14.5	Matched
17	Other	2	1.7	13	Residual
		1	1.2	14.5	Matched
6	Current degree of financial leverage	1	0.9	15.5	Residual
		2	2.3	11.5	Matched
9	Liquidity constraints such as the availability of cash	1	0.9	15.5	Residual
		1	1.2	14.5	Matched
8	Cost of raising external funds	0	0.0	17	Residual
		0	0.0	17	Matched

Percentages may not add to 100 due to rounding.

TABLE 8. Other Issues About Dividend Policy

This table presents descriptive statistics on seven issues about dividend policy. The responses are ranked in order of level of agreement from highest to lowest according to the means of the residual group. The chi-square tests show whether the distribution of responses between the residual and matched groups differs significantly. In some case, the cells are collapsed to avoid potential problems when the cells have expected counts less than 5. None of the responses between the residual and matched groups differ significantly at normal levels.

S#	Statement	n	Level of Agreement					Mean	χ^2	Group
			Strongly Disagree -2	Disagree -1	No Opinion 0	Agree +1	Strongly Agree +2			
2	My firm strives to maintain an uninterrupted record of dividend payments.	65	3.1%	0.0%	9.2%	32.3%	55.4%	1.369	2.020	Residual
		47	2.1	8.5	8.5	38.3	42.6	1.106		Matched
1	My firm strives to formulate its dividend policy to produce maximum value for its shareholders.	66	6.1	0.0	9.1	37.9	47.0	1.197	0.156	Residual
		47	2.1	4.3	6.4	40.4	46.8	1.255		Matched
4	My firm views its investment, financing, and dividend decisions as interrelated.	65	3.1	4.6	13.9	36.9	41.5	1.092	0.461	Residual
		47	4.3	8.4	4.3	36.2	46.8	1.128		Matched
3	My firm avoids increasing its dividend if it expects to reverse the dividend increase in a year or so.	65	9.2	9.2	20.0	15.4	46.2	0.800	0.567	Residual
		47	8.5	8.5	17.0	12.8	53.2	0.936		Matched
6	My firm views cash dividends as a residual after funding desired investments from earnings.	65	23.1	36.9	24.6	9.2	6.2	–0.615	2.384	Residual
		46	26.1	34.8	15.2	13.0	10.8	–0.522		Matched
5	My firm's expenditures on new capital investments typically affect its dividend payments.	65	30.8	30.8	21.5	12.3	4.6	–0.708	0.922	Residual
		47	34.0	23.4	21.3	14.9	6.4	–0.638		Matched
7	My firm often needs additional external financing as a result of paying cash dividends.	65	56.9	15.4	10.8	12.3	4.6	–1.077	1.802	Residual
		47	63.8	10.6	14.9	8.5	2.1	–1.255		Matched

*, **, *** Significant at the 0.10, 0.05, and 0.01 level, respectively.
Percentages may not add to 100 due to rounding.
For the chi-square tests, the degrees of freedom (df) = 4 for S5 and S6; 3 for S3 and S7; 2 for S1, S2, and S4.

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