The Dividend Policies of All-equity Firms: A Direct Test of the Free Cash Flow Theory

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This paper finds support for Jensen's (1986) hypothesis that dividends and debt are substitute mechanisms for controlling the agency costs of free cash flow. We find that dividend payout ratios of a sample of all-equity firms are significantly higher than those of a control group of levered firms. Further, within the group of all-equity firms, firms with lower managerial holdings have higher payout ratios. These results hold after controlling for free cash flow and growth rates. Overall, our evidence suggests that dividends and managerial ownership are substitute mechanisms for reducing agency costs in all-equity firms.

INTRODUCTION

Since Miller and Modigliani's (1961) seminal work showing the irrelevance of dividend policy, there has been a considerable amount of research done rationalizing the existence of dividends. In some models, dividends act as a signal that reduces the information asymmetry between insiders and outsiders about current and future earnings (e.g. Bhattacharya, 1979). In others, dividends act as a 'bonding' mechanism to reduce the agency costs arising due to the conflict between managers and outside shareholders (see e.g. Jensen and Meckling, 1976; Rozeff, 1982; Easterbrook, 1984; Jensen, 1986).

Rozeff (1982) and Easterbrook (1984) argue that the payment of dividends, by causing firms to visit capital markets more frequently for financing needs, brings them under greater scrutiny of capital markets. By paying dividends, the firm makes a quasi-fixed commitment to shareholders to pay out cash at regular intervals.[1] This commitment reduces the discretionary resources under the control of managers and subjects them to greater monitoring by capital markets that occurs when the firm seeks new capital. Jensen (1986) persuasively argues that debt is an effective substitute mechanism for divi-

dends in this respect. By issuing debt instead of equity, managers give bondholders the right to take the firm into bankruptcy court if managers do not maintain their promise to make the interest and principal payments. Thus, like dividends, debt reduces the agency costs of free cash flow (FCF) by reducing the discretionary resources under managers' control.[2] This substitutability between debt and dividends as alternative mechanisms for reducing the agency costs of FCF implies that firms that use low debt ratios will tend to follow a policy of high-dividend payout.[3] This is the first hypothesis that we examine in this paper.

Second, Jensen and Meckling (1976) argue that a manager, who owns a fraction, α, of the firm's outstanding equity, bears α fraction of the cost of his or her divergent behavior. Jensen (1986) argues that waste of corporate resources is an important instance of such behavior. As α increases, so does a manager's incentive to avoid corporate waste. This argument implies that the agency costs of free cash flow are a decreasing function of α. Thus, managers' equity ownership serves as another mechanism, in addition to debt and dividends, for reducing the agency costs of free cash flow.[4] If dividends and managerial ownership are substitute mechanisms for reducing the agency costs of FCF, we would

expect them to be negatively related. Further, the negative relationship between dividends and managerial ownership should be more pronounced in all-equity firms, since they lack one mechanism for controlling agency costs. This is the second hypothesis that we examine in this paper.

In a recent article, Agrawal and Nagarajan (1990) find that all-equity firms are characterized by larger managerial equity ownership and greater family involvement than an industry- and size-matched group of levered firms. The choice of an all-equity capital structure by these firms may be driven by their managers' extreme aversion to bankruptcy risk, given that they make large non-diversifiable investments of personal wealth and family human capital in the firm. The lack of fixed contractual payments to bondholders implies, however, that these firms have greater free cash flows, *ceteris paribus*. The first hypothesis says that debt and dividends are alternative ways of reducing the agency costs of free cash flow. This suggests that all-equity firms should follow a policy of greater dividend payout than levered firms. The second hypothesis implies that there should be a negative relation between dividend payout and managerial ownership, because they are substitute mechanisms for controlling the agency costs of FCF. This relation should be more pronounced in all-equity firms, since they lack one mechanism for controlling these agency costs.

We find that dividend payout ratios are significantly larger in all-equity firms than in a control group of levered firms. This finding is consistent with the hypothesis that dividends act as substitutes for debt as a mechanism to reduce the agency costs of free cash flow (FCF) in all-equity firms. Within the group of all-equity firms, firms with lower managerial ownership pay larger dividends than those with higher ownership. These results hold after controlling for differences across firms in the levels of free cash flow and growth opportunities. Overall, our evidence is consistent with the hypothesis that dividends and managerial ownership are alternative mechanisms for reducing the agency costs of free cash flow in all-equity firms.

This paper is organized as follows. The next section briefly discusses recent research on the interactions of financial leverage, dividend policy and managerial ownership. The third section provides sample selection criteria and data; the fourth section reports the results of the empirical tests and the final section concludes the paper.

PRIOR RESEARCH

Several recent studies examine whether firms choose financial leverage simultaneously with other key decisions such as dividend policy, the level of managerial equity ownership and the structure of executive compensation. Jensen *et al.* (1992) find that managerial ownership affects the choice of debt and dividend policies, but not vice versa. Holthausen and Larcker (1991) find little evidence that financial leverage, managerial ownerwhip and pay–performance sensitivity are simultaneously determined. Both these studies estimate systems of simultaneous equations. Jensen *et al.* argue that one cannot directly examine systematic trade-offs in these policies (e.g. through an OLS regression of one policy choice as a linear function of the others) without controlling for other potential determinants of each policy.

Crutchley and Hansen (1989) examine the hypothesis that financial leverage, dividends and managerial ownership are jointly determined by firms' attempts to minimize the total agency costs of debt and equity. Their findings are consistent with this hypothesis. Chaplinsky and Niehaus (1992) examine whether financial leverage and managerial ownership share common determinants. In addition to the agency costs of debt and equity, they also assess whether these decisions are governed by the tax advantage of debt, the costs of issuing securities and the demand for risk sharing by insiders. Unlike Crutchley and Hansen, they find little evidence to support the hypothesis that the choice of financial leverage and insider ownership can be explained by the same set of variables. Both these studies estimate reduced-form equations by OLS. Chaplinsky and Niehaus argue that the simultaneous-equations approach is not suited for their study. Identification of such a system requires one to specify at least one unique independent variable for each dependent variable. This econometric requirement, however, is inconsistent with their hypothesis.

Our approach is complementary to that taken in the above studies, all of which examine a cross-section of firms. We examine the substitution between dividend policy and managerial ownership in a special group of firms, those that choose an all-equity capital structure. This approach has two important advantages. First, if dividends and debt are substitute mechanisms, this substitution should be even more evident in all-equity firms, since they use no debt. Second, this approach avoids the need

for measurement of capital structure, which is an inherently complex task, given the covenants, conversion, call provisions, etc. in a firm's fixed claims.

In addition, as discussed in Agrawal and Nagarajan (1990) and Gardner and Trzcinka (1992), all-equity firms represent an enigma, a puzzle, which makes them worth special attention. These firms choose a 'corner solution' to the capital structure problem. They have substantial debt capacity. Yet, despite the clear tax advantages of debt, they take on no long-term and little short-term debt.

SAMPLE SELECTION AND DATA

We use the sample of all-equity and levered firms from Agrawal and Nagarajan (1990). All-equity firms are defined as those that use no long-term debt throughout a continuous five-year period. The COMPUSTAT Annual Industrial and Research files are used to identify all firms with zero long-term debt[5] over the period from two years before to two years after 1981, the year of our analysis.[6] A control sample is constructed by matching each all-equity firm with the levered firm having the same

4-digit Standard Industrial Classification (SIC) code whose asset size is closest to that of the test company. Each levered firm is required to maintain a ratio of book value of long-term debt to firm value of at least 5% in each of the years from 1979 to 1983.[7]

Managerial ownership data are obtained from the 1982 proxy statements filed with the Securities and Exchange Commission (SEC).[8] These data are obtained separately for each of the two highest-ranked officers[9] and for the group of 'directors and officers'. The final sample consists of 71 matched pairs. The all-equity sample represents about 68% of the population of all-equity firms on COMPUSTAT in 1981. The Appendix provides a list of the sample firms. The financial and operating characteristics of these firms are summarized in Table 1.

All-equity firms tend to be relatively small, with median sales of $83 million. The control group of levered firms have high leverage ratios, with a median ratio of book value of long-term debt/firm value of 39.7%. All-equity firms tend to be averse to debt of any kind. They have lower ratios of short-term debt to total assets and higher ratios of current

Table 1. Financial and Operating Characteristics of All-equity and Levered Firms

	Mean			Median		
	All-equity	Levered	t-statistic	All-equity	Levered	Wilcoxon probability
Net Sales ($ million)	332.21	375.96	−0.44	83.00	126.50	0.355
Market Value of Equity ($ million)	277.30	188.33	1.75[d]	73.00	33.00	0.003
Employees ('000)	3.54	3.94	−0.36	0.78	1.73	0.017
Stockholders ('000)	4.88	6.90	−1.84[d]	1.73	3.84	<0.001
Long-term Debt/Firm Value[a] (%)	0.00	40.07	−15.60[c]	0.00	39.68	<0.001
Short-term Debt/Total Assets (%)	2.59	6.54	−3.52[c]	0.00	2.77	<0.001
Current Assets/Current Liabilities	3.83	2.28	5.15[c]	3.15	2.12	<0.001
(Current Assets-Inventories)/ Current Liabilities	2.59	1.24	5.14[c]	2.10	1.17	<0.001
(Cash + Marketable Securities)/ Total Assets (%)	22.57	6.25	7.03[c]	17.43	3.67	<0.001
Free Cash Flow[b]/Total Assets	0.058	0.023	4.23[c]	0.068	0.031	<0.001

Data are reported for 71 industry-size matched pairs of all-equity and levered firms for 1981.
[a] Firm Value = Market Value of Equity plus Book Value of Long-term Debt.
[b] Free Cash Flow = Operating Income Before Depreciation − Interest Expense − Income Tax − Dividend on Preferred Stock − Dividend on Common Stock.
[c, d] Statistical significance in two-tailed tests, at the 1% and 10% levels, respectively.
The t-statistic is for the significance of the (paired) differences between the means of the two groups. The two-tailed test probability for the Wilcoxon signed-ranks test is for equality of the medians of the two groups.

assets to current liabilities than levered firms. These firms also seem to maintain considerable reserves of liquid assets. The median all-equity firm has about 17.4% of its total assets in the form of cash and marketable securities. This ratio is only 3.7% in the median levered firm. The all-equity sample also has a higher median ratio of 'free cash flow' to total assets than levered firms.[10] The results are similar in terms of average values. All the differences are statistically significant at the 1% level in both the t-test and the Wilcoxon signed-ranks test.

Table 2 summarizes the ownership structures of all-equity and levered firms. All-equity firms are characterized by substantial managerial ownership of equity. Directors and officers of these firms own a median of 32% of the outstanding equity of their firms. Of this, about 17% is owned by the CEO. Managerial ownership is significantly lower in levered firms. The median ownership of their directors and officers, and the CEO are 16% and 5%, respectively. Both groups of firms have relatively small institutional ownership, consistent with

the fact that these are small firms. The average institutional ownership is 17.2% in all-equity firms (median = 7.6%) and 15% in levered firms (median = 6.6%).

EMPIRICAL FINDINGS

Dividend Policy and Financial Leverage

The first hypothesis we examine is that all-equity firms follow a policy of higher dividend payout than levered firms, in order to reduce the agency costs of free cash flow (FCF). We use two measures of dividend payments. The first measure is *PAYOUT*, which is the ratio of dividends per share to earnings per share.[11] An alternative measure is dividend yield, defined as cash dividends/stock price at the end of the year. This variable is called *DIVYLD*.

Table 3 reports the results of our findings about the dividend policies of all-equity firms and the control group of levered firms. The first and second columns of the table report the average payouts for

Table 2.   Ownership Structures of All-equity and Levered Firms

	Mean			Median		
	All-equity	Levered	t-statistic	All-equity	Levered	Wilcoxon probability
Ownership (%) of						
—CEO	22.4	11.0	4.06[a]	17.0	5.0	<0.001
—President	5.5	3.2	1.35	0.0	1.0	0.164
—Directors and officers	33.1	19.6	4.69[a]	32.0	16.0	<0.001
—Institutions	17.2	15.0	0.85	7.6	6.6	0.061
Number of institutions	37.4	34.7	0.32	7.0	6.0	0.774

Data are reported for 71 industry-size matched pairs of all-equity and levered firms for 1981.
The t-statistic is for the significance of the (paired) differences between the means of the two groups. The two-tailed test probability for the Wilcoxon signed-ranks test is for equality of the medians of the two groups.
[a] Statistical significance in two-tailed tests at the 1% level.

Table 3.   Dividend Policies and Growth Rates of All-equity and Levered Firms

	Mean			Median		
	All-equity	Levered	t-statistic	All-equity	Levered	Wilcoxon probability
Dividend per share/ earnings per share	0.325	0.188	3.20[b]	0.318	0.167	0.001
Dividend yield	0.038	0.030	1.31	0.036	0.021	0.020
Growth rate[a]	0.147	0.166	−0.58	0.133	0.137	0.683

Data are reported for 71 industry-size matched pairs of all-equity and levered firms for 1981.
[a] Growth rate is measured as the arithmetic average of the annual rate of sales growth over the preceding five years.
[b] Statistical significance in two-tailed tests at the 1% level.
The t-statistic is for the significance of the (paired) differences between the means of the two groups. The two-tailed test probability for the Wilcoxon signed-ranks test is for equality of the medians of the two groups.

all-equity and levered firms, respectively. Column 3 shows the matched pairs test statistics for the test of the null hypothesis that the two group means are equal. The next two columns show the median values for all-equity and levered firms, followed by the probability value for the Wilcoxon test.

Both measures of dividends (payout ratio and dividend yield) are larger for all-equity firms than levered firms. From each dollar of earnings, the median all-equity firm paid out about 32 cents as dividends to shareholders, while the corresponding levered firm paid out only about 17 cents. The median dividend yield of the all-equity sample is 3.6%, while it is only 2.1% for the levered sample. These differences are statistically significant at the 5% level or better. The results are similar in terms of average values, though only the differences in payout ratios are statistically significant.[12] These results are consistent with the hypothesis that dividends act as an alternative mechanism to debt for reducing the agency costs of FCF.[13]

Rozeff (1982) argues that firms with greater growth opportunities choose lower payout ratios in order to reduce the need for costly external financing. Thus, the higher payout we observe in all-equity firms may be because they have lower growth opportunities than levered firms. Following Rozeff (1982) and Lehn and Poulsen (1989), we proxy growth opprotunities by the average annual growth rate of sales over the five years immediately preceding 1981. As can be seen from Table 3, we are unable to detect any significant differences in growth rates between all-equity and levered firms.[14]

Payout Policy and Managerial Ownership

The second hypothesis we examine is that, within the group of all-equity firms, firms with lower managerial ownership follow a higher payout policy, because the agency costs of free cash flow are even higher in such firms. To examine this hypothesis, we subdivide our all-equity sample into two equal-sized groups after ranking them by the percentage of outstanding equity owned (α) by managers.[15] The results are presented in Table 4.

Columns 1 and 2 of Table 4, Panel A, present the mean dividend payout ratios of all-equity firms with 'low' (i.e. below the median) versus 'high' managerial ownership (α), respectively. Column 3 shows the t-statistic for the test of the null hypothesis of equality of the two means. Columns 4 and 5 report the median payout ratios for the low α and the high α groups, respectively. Column 6 shows the probability value for the Wilcoxon rank sum test. The first row of Panel A, where α is measured as the percentage ownership of the CEO, shows that both the mean and the median values of the dividend payout ratio are significantly higher in all-equity firms with low α than those with high α. The average payout ratio for the two groups is 40.8% and 24.8%, respectively. The remaining two rows in Panel A report the results from repeating the above test based on the ownership of the President and the group of all directors and officers, respectively. The results are similar. Panel B shows that dividend yields are also significantly higher in all-equity firms with low managerial ownership than those with

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Table 4. Dividend Payout and Dividend Yield in All-equity Firms with Managerial Ownership Not Above the Median ('Low α') versus Above the Median ('High α')

% of outstanding equity owned by	Mean			Median		
	Low α	High α	t-statistic	Low α	High α	Wilcoxon probability
Panel A: Dividend payout						
CEO	0.408	0.248	2.58[a]	0.366	0.237	0.017
President	0.384	0.272	1.74[c]	0.385	0.253	0.088
Directors and officers	0.403	0.252	2.42[b]	0.378	0.235	0.017
Panel B: Dividend yield						
CEO	0.043	0.032	1.61	0.040	0.031	0.109
President	0.043	0.033	1.45	0.041	0.032	0.096
Directors and officers	0.046	0.029	2.53[b]	0.040	0.030	0.024

The t-statistic is for the significance of the differences between the means of the two groups. The two-tailed test probability for the Wilcoxon rank sum test is for the equality of the medians of the two groups.
[a]–[c] Statistical significance in two-tailed tests, at the 1%, 5% and 10% levels, respectively.

high ownership. This evidence is consistent with the hypothesis that dividends and managerial equity ownership serve as alternative mechanisms for reducing the agency costs of free cash flow in all-equity firms.

Multivariate Regression Analysis

Finally, we examine if there is a linear relationship between dividend policies and managerial ownership in all-equity firms, and whether this relation is different from that found in levered firms, after controlling for other potential determinants of dividend policy. First, other things being the same, firms with larger amounts of free cash flow have greater flexibility in their dividend policies. Jensen (1986) argues that the control function of debt is more important in organizations that generate large cash flows but have low growth prospects. Therefore, the effects of dividends and debt on agency costs is sensitive to the level of free cash flow the firm possesses. We measure free cash flow as described in note 10 above. To control for differences in the level of free cash flow caused by firm size, we normalize it by total assets.

Second, one would expect high-growth firms to pay lower dividends to reduce their reliance on costly external financing. Therefore, we need to control for differences across firms in growth rates, even though we did not find growth rates to be significantly different in the univariate test in Table 3.

We estimate the following linear regression by ordinary least squares:[16]

$$DIV = b_0 + b_1 \, LEVERED + b_2 \alpha$$
$$+ b_3 \, LEVERED \cdot \alpha$$
$$+ b_4 \, FCF + b_5 \, GROWTH \qquad (1)$$

where $DIV = PAYOUT$ or $DIVYLD$, $LEVERED$ = 1, if the firm is levered; 0, if it is all-equity, α = percentage of outstanding equity owned by directors and officers, FCF = Free Cash Flow/Total Assets, $GROWTH$ = average annual growth rate of sales over the previous five years, and $PAYOUT$ and $DIVYLD$ are as defined earlier in this section.

In this regression, b_1 measures the difference in the intercept terms between all-equity and levered firms. If levered firms follow a policy of lower dividend payout as the first hypothesis implies, b_1 should be negative. The second hypothesis says that

dividends and managerial ownership (α) are substitute mechanisms for reducing the agency costs of free cash flow, particularly in all-equity firms. This implies that b_2 should be negative. The coefficient b_3 measures the difference in the coefficients of α between all-equity and levered firms. In the latter, debt serves as another mechanism for reducing the agency costs of free cash flow. Therefore, the negative relation between dividends and α may be less pronounced for levered firms, suggesting that b_3 should be positive. We expect b_4 to be positive, since firms with greater free cash flow have the ability to pay higher dividends. Finally, b_5 should be negative, if firms with greater growth opportunities retain more earnings to finance new projects.

The results of the OLS regressions are shown in Table 5. Column 1 shows the estimate of Eqn (1), with dividend $PAYOUT$ as the dependent variable. Column 2 shows the estimate of a similar equation, except that the interaction term, $LEVERED \cdot \alpha$, is omitted. The estimation in column 1 allows the relation between dividend policy and α to differ between all-equity and levered firms; the regression in column 2 forces them to be the same. Columns 3 and 4 present results of similar regressions of $DIV-YLD$. Consistent with the first hypothesis, the coefficient of $LEVERED$ is significantly negative in all four estimations. Both dividend payout and dividend yield are substantially lower in levered firms than in all-equity firms. The dividend payout ratio of levered firms is lower than all-equity firms by about 0.26, after controlling for the other variables;[17] their dividend yield is lower by about 0.024.

Consistent with the second hypothesis, the coefficient of α is significantly negative within the group of all-equity firms (estimations (1) and (3)) as well as in the group of all firms (estimations (2) and (4)). A 10% increase in the equity ownership of directors and officers (e.g. from 10% to 20%) in all-equity firms is associated with a reduction in payout ratio and in dividend yield of 0.04 and 0.004, respectively. The coefficient of α is somewhat larger in levered firms (see the coefficients of $LEVERED \cdot \alpha$ in estimations (1) and (3)), though the difference is statistically significant (at the 10% level) only in the regression of $PAYOUT$. The coefficients of both FCF and $GROWTH$ are insignificant. All four models are statistically significant at better than the 1% level. The adjusted R^2 of the models varies from 0.10 to 0.17. Overall, the results of these regressions are consistent with the hypothesis that control of agency problems of free cash flow is an important

Table 5. The Relation between Dividend Policy, Managerial Ownership and Control Variables in All-equity and Matched Levered Firms

Independent variable	Expected sign	Dependent variable PAYOUT		DIVYLD	
		(1)	(2)	(3)	(4)
Constant		0.501 $(9.30)^a$	0.459 $(9.42)^a$	0.056 $(8.74)^a$	0.052 $(9.06)^a$
LEVERED	—	−0.300 $(-4.68)^a$	−0.218 $(-4.96)^a$	−0.028 $(-3.65)^a$	−0.020 $(-3.85)^a$
α	—	−0.004 $(-3.03)^a$	−0.002 $(-2.46)^b$	−0.0004 $(-2.73)^a$	−0.0002 $(-2.36)^b$
LEVERED·α	+	0.003 $(1.76)^c$	—	0.0003 (1.40)	—
FCF	+	−0.302 (-0.89)	−0.301 (-0.88)	−0.016 (-0.40)	−0.016 (-0.40)
GROWTH	—	−0.072 (-0.66)	−0.075 (-0.69)	−0.013 (-0.98)	−0.013 (-0.98)
Adjusted R^2		0.17	0.16	0.11	0.10
p-value of F-test		0.0001	0.0001	0.002	0.002
Sample size		124	124	129	129

The table reports the estimates of the following linear model for 1981:

$$DIV = b_0 + b_1 \ LEVERED + b_2 \ \alpha + b_3 \ LEVERED \cdot \alpha + b_4 \ FCF + b_5 \ GROWTH$$

where

$DIV = PAYOUT$ or $DIVYLD$,
$PAYOUT$ = dividend payout ratio,
$DIVYLD$ = dividend yield,
$LEVERED = 1$, if levered; 0 if all-equity,
α = percentage of outstanding equity owned by directors and officers,
FCF = Free Cash Flow/Total Assets and
$GROWTH$ = average sales growth over the previous five years.
[a-c] Statistical significance in two-tailed tests at the 1%, 5% and 10% levels, respectively.

consideration in a firm's choice of its dividend policy.

CONCLUSIONS

We investigate the dividend policies of all-equity firms and find support for Jensen's (1986) hypothesis that dividends can be viewed as a substitute for debt in mitigating the agency costs of free cash flow. Based on a sample of all-equity firms and an industry- and size-matched control sample of levered firms, our results indicate that dividend yields and payout ratios of all-equity firms are signific-

antly higher than those of levered firms. The median payout ratio of all-equity firms is 90% higher than levered firms. Similarly, their median dividend yield is 71% higher than levered firms. These results are robust to the choice of the time period used for measuring these variables. We also find that within the group of all-equity firms, firms with higher managerial holdings have lower dividend payout ratios. These results hold after controlling for differences across firms in the levels of free cash flow and growth rates of firms. Overall, our findings are consistent with the hypothesis that dividends and managerial ownership act as substitute mechanisms for reducing the agency costs of free cash flow in all-equity firms.

Acknowledgements

APPENDIX

No.	All-equity firm	Matched levered firm
1	Callahan Mining Corp.	Sunshine Mining Co.
2	Wrigley (WM.) JR Co.	Hershey Foods Corp.
3	Frantz Mfg Co.	Clopay Corporation
4	Skyline Corp.	National Enterprises
5	Fleetwood Enterprises Inc.	Redman Industries Inc.
6	Tambrands Inc.	Bemis Co.
7	Harland (John H.) Co.	Heritage Communications Inc.
8	Bowne & Co. Inc.	Lehigh Press Inc.
9	American Home Products Corp.	Abbottt Laboratories
10	Bolar Pharmeceutical Co. Inc.	ICN Pharmaceutical
11	Thompson Medical Co. Inc.	IROQUOIS Brand
12	Intl. Flavors and Fragrances	Cooper Laboratories
13	Johnson Products	Del Laboratories Inc.
14	Fairmount Chemical Co.	Publicker Industries Inc.
15	Park Chemical Co.	Kinark Corp.
16	O'Sullivan Corp.	Buckhorn Inc.
17	Caressa Group Inc.	Barry (R. G.)
18	Penobscot Shoe	Suave Shoe Corp.
19	RE Capitol	Seton Co.
20	Northwestern Steel & Wire Co.	Nucor Corp.
21	Amsted Industries	Hayes-Albion Corp.
22	Starrett (L. S.) Co.	Vermont American-CL
23	Penn Engineering & Mfg Corp.	R.B. & W. Cor.
24	Automatic Switch	Keystone International
25	Briggs & Stratton	Outboard Marine Corp.
26	Monarch Machine Tool Co.	Wean United Inc.
27	Gorman-Rupp Co.	Milton Roy Co.
28	Tecumseh Products Co.	Unidynamics Corp.
29	Health-Mor Inc.	Reece Corp.
30	Esquire Radio & Electronic Corp	Altec
31	Porta Systems Corp.	Lynch Communication Systems
32	Andrea Radio Corp.	Barnes Engineering Co.
33	Auditronic	Knogo Corp.
34	Sunair Electronics Inc.	Torotel Inc.
35	Sparton Corp.	Watkins Johnson
36	Dataram Corp.	Raymond Industries Inc.
37	Winnebago Industries	Coachmen Industries Inc.
38	United Aircraft Products Inc.	Macrodyne
39	Speed-O-Print Bus Machines	Visual Graphics
40	Webcor Electronics Inc.	Talley Industries Inc.
41	Cross (A.T.) & Co.-CL A	Binney & Smith Inc.
42	Roadway Services Inc.	Tyler Corp.
43	Gross Telecasting	Taft Broadcasting Co.
44	Diversified Industrial CP-KS	Midwest Energy Co.
45	Johnston Inds.	Mid-America Inds.
46	A I C Photo	Greenman Brothers Inc.
47	Sargent-Welch Scientific	GNC Energy Corporation
48	Ronco Teleproducts Inc.	Action Industries Inc.
49	INTL Seaway Trading Corp.	Nolex Corp.
50	Family Dollar Stores	Nichols (S. E.)
51	Weis Markets Inc.	General Host Corp.
52	Brooks Fashion Stores	Winkleman Stores Inc.
53	Longs Drug Stores Inc.	Pay Less Drug Stores Inc.
54	Omnicare Inc.	Revco D. S. Inc.
55	New Process Co.	Horn & Hardart Co.
56	Tandycrafts Inc.	Pier 1 Inc.
57	Union National Corp-Pennsylvania	Continental Illinois Corp.
58	Dreyfus Corp.	Integrated Resources Inc.
59	Colonial Penn Group Inc.	Capital Holdings Corp.
60	U S L I C O	Protective Corp.
61	Jefferson-Pilot Corp.	USLIFE Corp.
62	USF&G Corp.	Safeco Corp.
63	Corroon & Black Corp.	Marsh & Mclennan Cos
64	Real Estate Investment Property	California Real Estate Invt
65	Mission West Pptys	Derwood
66	ASA Ltd	Heizer Corp.
67	Logicon Inc.	Applied Data Research Inc.
68	Culline Software Inc.	Computer Scientific
69	Dun & Bradstreet Corp.	Anacomp Inc.
70	General Emply Enterprises	School Pictures Inc.
71	MCA Inc.	MGM UA Entertainment

NOTES

1. Even though dividend payments are not contractual, managers appear reluctant to cut dividends in response to lower current earnings, unless they think the firm will be unable to maintain the current level of dividends in the future. Lintner (1956) provides some behavioral evidence consistent with this view.
2. Jensen defines free cash flow as cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital.

3. We do not address the issue of the optimal mix of debt and dividends. A firm's choice of debt policy depends upon, in addition to agency costs, factors such as corporate and personal taxes, bankruptcy costs, operating leverage, and growth opportunities (see Brealey and Myers, 1991, for a review). In this paper, we examine the role of agency costs of free cash flow in a firm's choice of its dividend policy, given its debt policy.

4. Managers decide the level of their equity investment in the firm based on the costs and benefits of such investment, and subject to personal wealth constraints. The costs arise from the reduction in portfolio diversification from investing an amount in addition to their already substantial human capital investment in the firm. The benefits come from greater control over the firm and the job security and the opportunities for perk consumption it provides. They also benefit from the reduction in agency costs of equity and the resultant increase in the value of their investment. For a more detailed discussion, see e.g. Jensen and Meckling (1976) and Demsetz and Lehn (1985).

5. Long-term debt is defined as in COMPUSTAT. Accordingly, capitalized lease obligations are included. Off-balance sheet substitutes for debt, such as contingent liabilities and unfunded pension liabilities, are excluded.

6. The five-year all-equity requirement is imposed to obtain a sample of firms that normally employ an all-equity capital structure, rather than levered firms that may have retired a debt issue just before 31 December 1981 and made another issue of debt soon after that.

7. Firm value = Market value of equity + Book value of long-term debt.

8. The ownership of a manager is defined to include shares held by his or her family members as well as trusts for their benefit. Stock to be received upon option exercise is excluded. One firm in the all-equity sample has dual classes of common stock. Here, the ownership of the two classes is simply added together.

9. For simplicity, we call them the 'Chief Executive Officer' (CEO) and 'President'. The top-ranked officer often has multiple titles. Together, the two top officers generally carry titles of Chairman, CEO, President and Vice President.

10. Following Lehn and Poulsen (1989), we measure free cash flows (FCF) as: FCF = Operating income − Income Tax − Interest Expense − Dividends on Preferred Stock − Dividends on Common Stock.

11. We use the primary earnings per share excluding extraordinary items. If a firm has negative earnings, we treat its payout ratio as a missing observation, because of the inherent difficulty in interpreting the payout ratio in such a case. This treatment is consistent with the prior literature on earnings (see e.g. Basu, 1983).

12. These results are not sensitive to the choice of the time period used for computing dividend yields and payout ratios. We find similar results when we look at the average values of these variables over the previous two, three, four or five years, instead of only the current year.

13. Levered firms may commit not to pay large dividends when issuing debt. About 60% of the firms in our levered sample had dividend covenants in at least one of their debt contracts at the end of 1981.

14. The results are robust to the choice of the five-year period for measuring sales growth. We find similar results when we measure growth over two, three and four years.

15. The results are similar when we subdivide firms into three groups instead of two.

16. We do not adopt a simultaneous-equations approach for two reasons. First, unlike prior studies, we do not examine a cross-section of firms with a broad spectrum of leverage ratios. Instead, we focus on the dividend policy and managerial ownership in all-equity firms and contrast them with a control sample of levered firms. Second, as discussed in the section on prior research, there is little empirical evidence that these variables are determined simultaneously.

17. The coefficient of *LEVERED* in estimations (1) and (2) is −0.3 and −0.22, respectively. The figure reported in the text is the average of these two figures.

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