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The Method of Payment in Corporate Acquisitions, Investment Opportunities, and Management Ownership

KENNETH J. MARTIN*

ABSTRACT

This article examines the motives underlying the payment method in corporate acquisitions. The findings support the notion that the higher the acquirer's growth opportunities, the more likely the acquirer is to use stock to finance an acquisition. Acquirer managerial ownership is not related to the probability of stock financing over small and large ranges of ownership, but is negatively related over a middle range. In addition, the likelihood of stock financing increases with higher pre-acquisition market and acquiring firm stock returns. It decreases with an acquirer's higher cash availability, higher institutional shareholdings and blockholdings, and in tender offers.

THE LINK BETWEEN A FIRM'S investment opportunities and its corporate finance activities has long been an interesting subject of corporate finance research. For example, Myers (1977) recognizes the similarity between investment opportunities and call options. He acknowledges that firms with risky debt outstanding may fail to exercise a real investment option if doing so transfers wealth from equityholders to debtholders. His conclusion is that firms whose value depends more on growth options should finance themselves more with equity than with debt. However, the empirical evidence on this topic is somewhat mixed. Titman and Wessels (1988) find no evidence that debt ratios are related to a firm's expected growth, although Smith and Watts (1992) and Bradley, Jarrell, and Kim (1984) report a significantly negative relation between growth opportunities and financial leverage. Whereas these articles focus on the relation between investment opportunities and how firms finance their portfolio of projects, this article examines how firms finance a particular type of investment, namely, a corporate acquisition. How do the characteristics of the acquiring firm, the target firm, and the acquisition itself contribute to the method of financing?

In addition, the study of payment methods in corporate acquisitions is intriguing because previous research documents that the acquiring firm's

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stock typically experiences a negative price reaction in stock-financed acquisitions. For example, Travlos (1987), Wansley, Lane, and Yang (1987), Franks, Harris, and Mayer (1988), Asquith, Bruner, and Mullins (1987), and Servaes (1991) report either significantly negative returns to bidders or significantly higher bidder returns for cash offers compared to stock offers. In addition, Amihud, Lev, and Travlos (1990) report significantly negative bidder returns for stock-financed acquisitions, but only for those bidders with low management ownership.

Poor acquiring firm performance is not confined just to the announcement period. Agrawal, Jaffe, and Mandelker (1992) note that in both tender offers and mergers, postacquisition returns are lower for stock-financed acquisitions than for cash-financed acquisitions. Linn and Switzer (1994) find that acquiring firms experience significantly worse industry- and size-adjusted operating performance for up to five years following an acquisition. Thus, an important issue in this study is the motivation of acquiring firms to use stock vis-à-vis cash financing.

Previous theoretical studies examining the method of payment in corporate acquisitions focus on the role of asymmetric information about the bidder's or target's value. For example, because the bidder is uncertain about the target's value, Hansen's (1987) model includes a role for common stock due to its "contingency pricing effect." Stock financing forces target shareholders to share the risk that the acquirer may have overpaid. Fishman's (1989) model incorporates bidder competition. Cash not only signals a high value for the target, but also preempts other firms from bidding. Eckbo, Giammarino, and Heinkel (1990) include a role for mixed financings in which higher-valued bidders are more likely to use more cash to finance the acquisition.

To investigate the relation between payment method and uncertainty in bidder and target value, this article examines characteristics of bidders and targets such as size and investment opportunities. These two characteristics are predicted to be positively related to uncertainty in bidder and target value. My analysis shows that both the acquirer's and the target's investment opportunities are important determinants of the method of payment, although acquiring firm size is not related to payment method. Consistent with Jung, Kim, and Stulz (1995), higher investment opportunities, whether measured using Tobin's q -ratio or historical sales growth, lead to a greater probability of stock financing.¹

In addition, I examine other characteristics of the acquisition, such as the acquirer's ownership structure, its ability to pay cash, and the mode of the acquisition. Consistent with Stulz (1988) and Amihud, Lev, and Travlos (1990), lower managerial ownership is negatively related to the likelihood of stock financing, although I find a nonlinear relationship. Higher institutional blockholdings tend to decrease the probability of stock financing, thus giving support to the notion that institutions act as outside monitors of managerial

¹ Carleton, Guilkey, Stewart, and Harris (1983) report that target market-to-book ratios are positively related to the probability of stock financing.

behavior (Jensen, 1991). However, I find no relation between the method of payment and outside blockholdings by individuals. Contrary to Chaney, Lovata, and Philipich (1991), but consistent with Crawford (1987), acquirers with higher cash balances tend to prefer cash-financed acquisitions, while cash is the predominant means of financing in tender offers (Gilson (1986) and Fishman (1989)). These results hold after controlling for business cycle factors likely to influence the method of payment, such as pre-acquisition changes in the overall stock market, in interest rates, and industrial production (Choe, Masulis, and Nanda (1993)).

The article proceeds as follows. Section I describes the hypotheses on the choice of method of payment. Section II discusses the data and presents descriptive statistics of the variables, while Section III presents a logistic regression analysis of the determinants of payment methods. Section IV provides a summary and conclusions.

I. Hypotheses

A. Investment Opportunities Hypothesis

Myers (1977) links the existence of growth opportunities and corporate borrowing activity. In his model, a firm's borrowing is inversely related to the extent that the firm's value depends on the value of future investment opportunities. This result stems from the fact that the spending to undertake valuable future investment opportunities may not occur. That is, the state of the world the firm faces in the future may be so unfavorable as to preclude the firm from undertaking the investment. Thus, managers tend to base target debt ratios on assets-in-place rather than on investment opportunities. A higher proportion of assets-in-place implies a higher debt ratio. Smith and Watts (1992) provide evidence consistent with this idea.

Combining the agency costs of debt with the asymmetric information model of Myers and Majluf (1984), Jung, Kim, and Stulz (1995) argue that managers with growth objectives prefer to raise capital with equity because it gives them more discretion over the funds raised than debt financing.² In contrast to equity, debt requires management to pay out cash flows so that they cannot use cash flows to invest in poor projects. Consequently, debt financing maximizes firm value for firms with poor investment opportunities. In contrast, the discretion associated with equity financing is valuable for firms with good investment opportunities since it makes it more likely that these firms can fully take advantage of their investment opportunities. With this analysis, firms with valuable investment opportunities issue equity. Firms with poor investment opportunities issue debt if management is monitored by the capital providers to the firm and issue equity otherwise. Jung, Kim, and Stulz (1995)

² Indeed, survey evidence tends to confirm this idea. Pinegar and Wilbricht (1989) survey Fortune 500 firms and report that financial planning principles such as "maintaining financial flexibility" and "ensuring long-term survivability" are the two most important characteristics for managers when considering sources of funds.

report that firms with valuable investment opportunities are more likely to issue equity and the stock-price reaction to equity issues is more favorable for firms with valuable investment opportunities.

This article uses three different variables to measure investment opportunities. Following prior studies,³ growth opportunities are first measured by the market-to-book ratio, denoted as Q to proxy for Tobin's q -ratio.⁴ The Q numerator is the sum of the acquiring firm's market value of equity, long-term debt, short-term debt, and preferred stock divided by book value of assets, calculated as of the fiscal year-end preceding the acquisition announcement date. The second variable used to measure growth opportunities in SALESGR5, the average annually compounded growth rate in sales over the five-year period preceding the year in which the acquisition is announced.⁵

The third variable recognizes that acquiring firms often experience a run-up in their stock prices prior to the acquisition (see Asquith, Bruner, and Mullins, 1983). This run-up may reflect recent increases in growth opportunities for the acquiring firm that lead to an increased use of stock financing. The variable PRECAR proxies for this run-up. PRECAR is the abnormal return cumulated over the 250 days preceding event day -5 , where event day zero is the day the acquisition is announced in the *Wall Street Journal*. The market model, whose parameters are estimated over event days -500 through -301 , is used to estimate the normal return on each event day.

B. Risk Sharing Hypothesis

An important feature of corporate acquisitions is the availability of detailed information about the target, if it is a publicly traded firm. The Risk Sharing Hypothesis exploits this information. Hansen (1987) models the choice of payment medium under conditions of asymmetric information between the target and the bidder. If the target knows its value better than does the bidder, the bidder would rather use stock thus forcing the target to share in any post-acquisition revaluation effects. This paper uses two ways to proxy for this effect.

First, as Hansen predicts, the problem of asymmetric information should be larger as the target's size increases. Thus, if the target firm is a significant addition to the acquiring firm, the acquirer would be more likely to use stock. This reasoning implies that as the acquiring firm's size increases, all else equal, stock financing should be less likely, but as the target's size increases, stock financing should be more likely. Acquiring firm size is denoted MVALUE and is measured as the acquiring firm's market value of equity 20 days before the announcement date, measured in constant 1988 dollars. Similarly, target

³ For example, see Barclay and Litzenberger (188), Dierkens (1991), Smith and Watts (1992), Pilotte (1992), and Denis (1994).

⁴ Chung and Pruitt (1994) find that this approximation to Tobin's q -ratio is highly correlated to the more sophisticated method of estimating q developed by Lindenberg and Ross (1981).

⁵ Rozeff (1982) and Lehn and Poulsen (1989) uses sales growth to proxy for growth opportunities.

firm size can be measured in absolute terms as the amount paid for the target in constant 1988 dollars. It is denoted TVALUE. In addition, target size is measured on a relative basis as RVALUE, which is the ratio of TVALUE to MVALUE + TVALUE.⁶

Second, the target's investment opportunities are used to proxy for asymmetric information. If the acquirers are less sure whether the target's investment opportunities will, in fact, be realized, they may want to use equity as the financing medium. The use of stock is even more likely to occur when both the acquirer and the target have high investment opportunities, since targets would be more motivated to accept stock if the acquirer had high investment opportunities. Therefore, the interaction between investment opportunity sets of the acquirer and the target may be an important determinant of the method of payment. In this analysis, Tobin's q is used to proxy for the investment opportunity sets of both the acquirer and target.

C. Control Hypothesis

Stulz (1988) and Jung, Kim, and Stulz (1995) argue that managers will be reluctant to use stock to finance acquisitions if doing so will dilute their control and lead to outside intervention. Thus, managers with larger ownership stakes should be less likely to issue stock to finance acquisitions. Amihud, Lev, and Travlos (1990) report evidence consistent with this hypothesis.

However, managerial ownership may have a nonlinear effect on the likelihood of stock financing.⁷ At both very low and very high levels of ownership, managers are likely to be unconcerned about the impact of dilution of control. However, over some middle range of managerial ownership, managers may be concerned about their control of the firm; thus, over this range, increases in ownership would lead to a lower likelihood of stock financing. The variable for management control, OFFDIR, is ownership by all officers and directors (including stock options that can be exercised within 60 days), as reported in proxy statements published just prior to the acquisition announcement.

D. Cash Availability Hypothesis

The pecking order theory of financing (Myers (1984)) states that managers follow a financing hierarchy as follows: internal finance, then borrowing, then external equity financing. In addition, Jensen (1986) argues that large amounts of free cash flow leads firms to finance acquisitions with cash. Thus, firms that have large amounts of cash, or high cash flow, or sufficient debt capacity are more likely to use cash to finance their investments.

⁶ Using size as a proxy for the degree to which the acquirer desires to "share the risk" of the acquisition with the target is less than ideal. One could also argue that size is important for the Cash Availability Hypothesis explained below. For example, the larger is the target firm, the greater the amount of cash will be necessary to accomplish a cash transaction. All else constant, larger target firms may require stock in order to complete the acquisition.

⁷ I thank the referee for pointing out this effect to me.

Three variables reflect an acquiring firm's ability to pay cash for a target. The first variable CASHVAL, is calculated as the level of cash plus securities on the balance sheet as of the fiscal year-end preceding the announcement date, divided by VALUE, the amount paid for the target. The second variable, CASHFLOWVAL, is the ratio of CASHFLOW to VALUE. CASHFLOW is based on the definition used by Lehn and Poulsen (1989), and is computed as:

$$\text{CASHFLOW} = \text{EBIDT} - \text{INTEREST} - \text{TAX} - \text{PREFDIV} - \text{COMDIV} \quad (1)$$

where EBIDT equals earnings before interest, depreciation, and taxes, INTEREST equals interest expense, TAX equals income tax expense plus (minus) the decrease (increase) in the deferred tax liability, PREFDIV equals preferred stock dividends, and COMDIV equals common stock dividends.

The third variable, IADEBTCAP, measures the acquiring firm's financial leverage adjusted for its industry average. IADEBTCAP is computed as the difference between the acquiring firm's debt-to-capital ratio and the average debt-to-capital ratio for its industry based on the 2-digit Standard Industrial Classification (SIC) code. Debt is defined as the sum of long-term and short-term debt, whereas capital is the sum of long-term and short-term debt, preferred stock, and MVALUE.

E. Outside Monitoring Hypothesis

Jensen (1991) argues that active investors provide benefits because of their incentive to undertake costly monitoring. Blockholders and institutional shareholders are examples of potentially active investors. Black (1992) argues that institutional shareholders can take actions that more properly align managers' interests with those of shareholders. For example, institutional shareholders and blockholders are in a position to facilitate the rollback of antitakeover devices, to promote an appropriate management compensation structure, to strengthen the institutional voice on the board of directors, and possibly to serve on the board itself. In addition, some institutional shareholders communicate directly with senior managers and thus may influence the terms of acquisition bids. Since empirical evidence indicates that stock-financed acquisitions typically reduce the wealth of the acquiring firm's shareholders, the likelihood of acquisitions being financed in this manner should be lower when institutional shareholdings and blockholdings are higher.

The extent of potential outside monitoring is measured by three variables. The first variable, INST, is the percentage ownership of institutional shareholders as of the month prior to the acquisition announcement date. The other two monitoring variables measure blockholder ownership. The first of these variables is outside individual blockholdings, OUTBLK. These holdings are percentage shareholdings of at least 5 percent as of the proxy date just prior to the acquisition announcement, which are held by individuals who are not part

of the management team. The second blockholder variable is institutional percentage blockholdings, INSTBLK.

F. Mode of Acquisition Hypothesis

The mode of acquisition may be an important determinant in the choice of payment method. A tender offer in which the consideration given is cash is subject only to the Williams Act, and upon filing the appropriate documents with the Securities and Exchange Commission (SEC) and after complying with the required waiting period, the offer may commence. Acquisitions using stock as consideration, whether structured as a tender offer or a merger, must be made in accordance with the Securities Act of 1933, which can lead to a substantial delay, since a registration statement must be reviewed by the SEC (see Gilson (1986)). Thus, the Williams Act is triggered by the transactional form, while the Securities Act is triggered by the consideration given. The practical effect of this distinction in regulatory acts is that cash is typically given as consideration in tender offers.⁸

G. Business Cycle Variables

Finally, business cycle conditions are likely to have an influence on the choice of stock or cash. First, an increase in overall economic activity has been shown to boost the likelihood of using stock financing (see Taggart (1977), Marsh (1982), and Choe, Masulis, and Nanda (1993)). Choe, Masulis, and Nanda (1993) argue that this happens because firms face lower adverse selection costs, more promising investment opportunities, and less uncertainty about assets-in-place. These conditions can be proxied by several different variables, of which five are included in this study. Using BUS to denote a business cycle variable, the change in BUS is calculated as $\ln[BUS(-1)/BUS(-12)]$, where -1 and -12 refer to the months relative to the announcement month of the acquisition. The specific business cycle variables are PRESPCHNG, the change in the Standard and Poor's 500; PREINTCHNG, the change in Moody's BAA bond yield; LEADCHNG, the change in the index of 11 leading economic indicators; COINCCHNG, the change in the index of 4 coincident indicators; and IPCHNG, the change in industrial production.

II. Data and Descriptive Statistics

The sample includes domestic acquisitions by firms that are listed on either the New York (NYSE) or American Stock Exchanges (AMEX). The first source

⁸ The mode of acquisition may also capture an effect on the method of payment due to actual or potential target managerial resistance. In tender offers, the offer is made directly to the shareholders, whereas the typical merger is consummated after negotiations with target management. Cash may indeed be used to preclude resistance; however, that effect is difficult to measure since those negotiations are seldom made public.

for the sample is the merger roster as published in various issues by *Mergers and Acquisitions (M&A)*. This sample includes mergers and acquisitions of both publicly and privately held corporations as well as comprehensive acquisitions of the assets of individual firms completed during the 1978–1988 period.⁹ This sample is then compared with a sample of tender offers from the same time period that appears in the *Merc Tender Offer Database* over the 1978–1984 period, which is then updated for 1985–1988 by Martin and McConnell (1991). The combined data sources total 4,239 acquisitions completed during 1978–1988.

Because the *M&A* merger roster contains only completed acquisitions, the sample does not contain unsuccessful acquisitions. This restriction may imply that the sample contains proportionately more stock offers than would a combined sample of successful and unsuccessful acquisitions. For example, Huang and Walkling (1987) find that cash acquisitions are more likely to be hostile, and Walkling (1985) reports that hostile acquisitions are more likely to be unsuccessful. Thus, the results of this study may not be generalizable to the universe of both successful and unsuccessful acquisitions.

A total of 2,105 acquisitions is deleted due to missing announcement dates, as determined from inspection of the *Wall Street Journal Index*. Eighty-six acquisitions are announced prior to 1978, and are therefore excluded. The method of financing is unavailable for an additional 323 acquisitions, and acquired-firm value is not reported for a further 245 acquisitions.

Ownership data is collected from proxy statements contained in the *SEC File* provided by the Q-Data Corporation. An additional 387 acquisitions are deleted due to missing proxy statements or nonreporting of officer and director ownership.¹⁰ Accounting information is obtained from the Primary-Supplementary-Tertiary, Research, and Full Coverage COMPUSTAT tapes. COMPUSTAT data availability yields a sample of 922 acquisitions. I restrict the sample to acquisitions financed entirely with common stock, cash, or combinations of cash and common stock, or securities that could be converted into common stock. This results in the deletion of an additional 52 acquisitions. Finally, I delete a total of 24 financial firms, defined as those in 2-digit SIC codes 60–64, because their COMPUSTAT data were inappropriate for calculating *Q*.

The final sample consists of 846 acquisitions grouped into three financing categories. The first category includes 250 acquisitions that are financed solely with common stock. The second category includes 483 acquisitions financed solely with cash, or cash plus debt, or the assumption of liabilities. Debt and the assumption of liabilities are included in the cash financing

⁹ The *M&A* merger roster was matched against a listing of firms on the daily returns tape provided by the Center for Research in Security Prices to identify those acquirers listed on the New York Stock Exchange or the American Stock Exchange.

¹⁰ In the late 1970s, some firms simply did not report officer and director ownership in their proxy statements.

Table I
Mean Values of Variables Hypothesized to Affect the Method of Payment in Corporate Acquisitions

The financing category STOCK includes payments made solely in common stock. The financing category CASH includes payments made solely in cash, cash plus straight debt, or cash plus the assumption of the target firm's liabilities. The financing category MIXED includes payments consisting of both cash and stock or both cash and securities that can be converted into stock. All accounting variables are measured as of the fiscal year-end just prior to the acquisition announcement. Unless stated otherwise, all variables relate to the acquiring firm. Q is (market value of equity + book value of long-term debt + book value of short-term debt + preferred stock at carrying value)/book value of assets. SALESGR is the average annually compounded growth rate in sales for five years preceding the year of the acquisition. PRECAR is the cumulative abnormal return over event days -255 through -6 , where event day zero is the announcement day of the acquisition. The market model parameters are estimated over event days -500 through -301 . MVALUE is the market value of equity in millions of 1988 dollars as of 20 trading days before the acquisition announcement date. TVALUE is the amount paid for the acquisition in millions of 1988 dollars. RVALUE is $TVALUE/(MVALUE + TVALUE)$. CASHVAL is (cash + marketable securities)/amount paid for target firm. OFFDIR is the percentage beneficial ownership of all officers and directors, including stock options that can be exercised within 60 days. CASHFLOWVAL is CASHFLOW/amount paid for target firm. CASHFLOW is earnings before interest, depreciation, and taxes—taxes paid—interest expense—preferred dividends—common dividends. Taxes paid is income tax expense + (deferred tax liability _{$t-1$} —deferred tax liability _{t}). IADEBTCAP is (long-term debt + short-term debt) divided by (long-term debt + short-term debt + preferred stock + market value of common stock) minus the industry average debt-to-capital ratio. INST is the percentage shareholdings of all institutional shareholders as of the month-end just preceding the acquisition. INSTBLK (OUTBLK) is the percentage beneficial ownership of institutional (non-management) shareholders who individually own more than 5 percent of the common stock. TENDER is 1 if the acquisition is a tender offer and is 0 otherwise. The following business cycle variables are calculated as changes over event months -12 to -1 . PRESPCHNG is the change in the Standard & Poor's 500 index. PREINTCHNG is the change in the yield on Moody's BAA-rated bonds. LEADCHNG is the change in the index of 11 leading economic indicators. COINCCHNG is the change in the index of 4 coincident economic indicators. IPCHNG is the change in industrial production. The F -statistic tests the null hypothesis of no difference between the mean values for stock-, cash-, and mixed-financed acquisitions. The χ^2 -statistic for TENDER tests the null hypothesis of no difference in financing type by whether the acquisition was a tender offer. The sample period is 1978–1988.

Variables	Financing Types			F -statistic (p value)
	Stock	Cash	Mixed	
Number of acquisitions	250	483	113	
Panel A: Investment Opportunities Hypothesis				
Q	1.20	0.94	0.97	21.03 (0.000)
SALESGR5 (%)	16.59	13.03	15.38	4.07 (0.018)
PRECAR (%)	1.03	0.97	0.98	2.09 (0.125)
Panel B: Risk Sharing Hypothesis				
MVALUE	\$1,326	\$1,779	\$1,336	3.66 (0.026)
TVALUE	\$ 144	\$ 342	\$ 594	16.99 (0.000)
RVALUE (%)	12.10	18.95	25.64	26.37 (0.001)

Table I. (Continued)

Panel C: Control Hypothesis				
OFFDIR (%)	8.89	12.05	11.24	4.14 (0.016)
Panel D: Cash Availability Hypothesis				
CASHVAL	2.86	3.38	0.80	2.96 (0.052)
CASHFLOWVAL	4.85	3.23	0.67	6.21 (0.002)
IADEBTCAP (%)	-1.96	0.70	-1.23	1.84 (0.159)
Panel E: Outside Monitoring Hypothesis				
INST (%)	31.86	35.22	31.77	2.90 (0.055)
INSTBLK (%)	4.59	6.75	5.39	4.49 (0.011)
OUTBLK (%)	3.56	3.75	4.42	0.32 (0.728)
Panel F: Mode of Acquisition Hypothesis				
TENDER (% of acquisitions)	2.33	88.95	8.72	$\chi^2 = 96.013$ (0.001)
Panel G: Business Cycle Variables				
PRESPCHNG	0.1295	0.1014	0.1147	3.17 (0.043)
PREINTCHNG	0.0357	0.0097	-0.0222	5.92 (0.003)
LEADCHNG	0.0108	0.0094	0.0094	0.14 (0.873)
COINCCHNG	0.0245	0.0260	0.0219	1.25 (0.287)
IPCHNG	0.0330	0.0336	0.0214	2.49 (0.084)

category, since borrowings are often the source of the cash used in an acquisition. The third category consists of 113 acquisitions financed with cash and common stock, or securities that can be converted into common stock.

Table I presents the mean values of the data variables by the three payment methods. For the continuous variables, F -statistics are computed to test whether the mean values are equal between the three financing types. For the categorical variable TENDER, which describes the mode of acquisition, a χ^2 -statistic is used to test for a significant difference between the financing types. In Table II, all three financing types are analyzed using a logistic regression.

Variables not significantly different at the 0.10 level of confidence are PRECAR, IADEBTCAP, OUTBLK, LEADCHNG, and COINCCHNG. However, PRECAR is significant at the 0.13 level, while IADEBTCAP is significant at the 0.16 level. Because Hosmer and Lemeshow (1989) recommended a p -value cutoff to 0.25 to determine whether a variable should be included in a logistic regression model, both PRECAR AND IADEBTCAP are included, whereas OUTBLK, LEADCHNG, and COINCCHNG are not. All other variables are included in the model.

Table II

Logistic Regression Analysis of Factors Affecting Method of Payment in Corporate Acquisitions

The financing category STOCK includes payments made solely in common stock. The financing category CASH includes payments made solely in cash, cash plus straight debt, or cash plus the assumption of the target firm's liabilities. The financing category MIXED includes payments consisting of both cash and stock or both cash and securities that can be converted into stock. A total of 250 acquisitions are categorized as STOCK, 483 as CASH, and 113 as MIXED. All accounting variables are measured as of the fiscal year-end just prior to the acquisition announcement. Unless stated otherwise, all variables relate to the acquiring firm. Q is (market value of equity + book value of long-term debt + book value of short-term debt + preferred stock at carrying value)/book value of assets. PRECAR is the cumulative abnormal return over event days -255 through -6 , where event day zero is the announcement day of the acquisition. The market model parameters are estimated over event days -500 through -301 . MVALUE is the market value of equity in millions of 1988 dollars as of 20 trading days before the acquisition announcement date. TVALUE is the amount paid for the acquisition in millions of 1988 dollars. RVALUE is TVALUE/(MVALUE + TVALUE). CASHVAL is (cash + marketable securities)/amount paid for target firm. OFFDIR is the percentage beneficial ownership of all officers and directors, including stock options that can be exercised within 60 days. OFFDIR(0, 5%) = OFFDIR if OFFDIR < 5%, otherwise OFFDIR(0, 5%) = 5%. OFFDIR(5%, 25%) = 0 if OFFDIR < 5%, OFFDIR(5%, 25%) = OFFDIR - 5% if 5% ≤ OFFDIR < 25%, OFFDIR(5%, 25%) = 20% if OFFDIR ≥ 25%. OFFDIR(>25%) = 0 if OFFDIR < 25%, OFFDIR(>25%) = OFFDIR - 25% if OFFDIR ≥ 25%. CASHFLOWVAL is CASHFLOW/amount paid for target firm. CASHFLOW is earnings before interest, depreciation, and taxes—taxes paid—interest expense—preferred dividends—common dividends. Taxes paid is income tax expense + (–) the decrease (increase) in deferred tax liability. IADEBTCAP is (long-term debt + short-term debt) divided by (long-term debt + short-term debt + preferred stock + market value of common stock) minus the industry average debt-to-capital ratio. INST is the percentage shareholdings of all institutional shareholders as of the month-end just preceding the acquisition. INSTBLK (OUTBLK) is the percentage beneficial ownership of institutional (non-management) shareholders who individually own more than 5 percent of the common stock. TENDER is 1 if the acquisition is a tender offer and is 0 otherwise. The following business cycle variables are calculated as changes over event months -12 to -1 . PRESPCHNG is the change in the Standard & Poor's 500 index. PREINTCHNG is the change in the yield on Moody's BAA-rated bonds. LEADCHNG is the change in the index of 11 leading economic indicators. COINCCHNG is the change in the index of 4 coincident economic indicators. IPCHNG is the change in industrial production. The sample period is 1978–1988. p -values are in parentheses.

Variable	Predicted Sign	Dependent Variable					
		1 if STOCK 0 if CASH (1)	1 if MIXED 0 if CASH (2)	1 if STOCK 0 if MIXED (3)	3 if STOCK 2 if MIXED 1 if CASH (4)		
Investment Opportunities Hypothesis							
Q	+	1.000 (<0.001)	0.003 (0.990)	1.296 (<0.001)		0.949 (<0.001)	
PRECAR	+	0.354 (0.086)	0.004 (0.986)	0.460 (0.143)		0.373 (0.026)	
Risk Sharing Hypothesis							
Log(TVALUE)	+	-0.173 (0.036)	0.016 (0.877)	-0.194 (0.135)		-0.138 (0.041)	
RVALUE	+	-0.090 (0.911)	1.561 (0.067)	-1.262 (0.289)		0.935 (0.124)	
Control Hypothesis							
OFFDIR(0, 5%)	0	-0.063 (0.348)	-0.091 (0.306)	-0.059 (0.565)		-0.078 (0.158)	
OFFDIR(5%, 25%)	-	-0.055 (0.005)	0.010 (0.659)	-0.070 (0.013)		-0.040 (0.012)	
OFFDIR(>25%)	0	-0.017 (0.341)	-0.049 (0.040)	0.041 (0.149)		-0.026 (0.081)	

Table II. (Continued)

Cash Availability Hypothesis						
CASHVAL	–	–0.031 (0.029)	–0.121 (0.165)	0.051 (0.523)	–0.033 (0.011)	
CASHFLOWVAL	–	0.011 (0.304)	–0.263 (0.007)	0.273 (0.013)	0.014 (0.160)	
IADEBTCAP	+	0.348 (0.535)	–1.100 (0.102)	1.498 (0.092)	0.203 (0.655)	
Outside Monitoring Hypothesis						
INST	–	–0.012 (0.033)	–0.008 (0.320)	0.001 (0.893)	–0.009 (0.046)	
INSTBLK	–	–0.023 (0.027)	–0.021 (0.140)	0.0001 (0.999)	–0.020 (0.019)	
Mode of Acquisition Hypothesis						
TENDER	–	–3.163 (<0.001)	–1.704 (<0.001)	–1.327 (0.064)	–2.053 (<0.001)	
Business Cycle Variables						
PRESPCHNG	+	1.855 (0.017)	0.184 (0.850)	2.467 (0.032)	1.439 (0.019)	
PREINTCHNG	+	0.562 (0.434)	–1.438 (0.159)	2.638 (0.018)	0.660 (0.259)	
IPCHNG	+	–0.735 (0.660)	–4.799 (0.032)	2.259 (0.406)	–1.131 (0.412)	

III. Logistic Regression Results

A. Logistic Regression Results—Full Sample

Table II presents binomial logistic regression results for various subsamples and a multinomial logistic regression for the full sample.¹¹ In regression (1), the dependent variable is 1 if the acquisition is financed with stock, and 0 if financed with cash. In regression (2), the dependent variable is 1 if financed with mixed forms, and 0 if financed with cash, whereas in regression (3), the dependent variable is 1 if the acquisition is financed with stock and 0 if financed with mixed forms. In regression (4), a multinomial logistic regression is estimated where the dependent variable is 3 if the acquisition is stock-financed, 2 if mixed-financed, and 1 if cash-financed.

Many of the coefficients are significant and in the predicted directions. First, consistent with the Investment Opportunities Hypothesis, the coefficient on *Q* is positive and highly significant in regressions (1), (3), and (4).¹² This result indicates that acquiring firms with greater growth opportunities are more likely to use stock to finance the acquisition. In addition, *PRECAR* is positive and significant at the 0.07 level in regression (1), and at the 0.03 level in

¹¹ In the multinomial logistic regression, the intercepts are necessary for determining the probability an acquisition will be stock-, mixed-, or cash-financed. The computer procedure employed by SAS fits a parallel lines regression model. This model is based on cumulative distribution probabilities of the response categories. Thus, to determine the probability of, say, mixed financing as opposed to stock financing, one would subtract the cumulative distribution probability of stock financing (computed using the first intercept) from that of mixed financing (computed using the second intercept).

¹² Qualitatively similar results are found when using *SALESGR5*. Therefore, only the results using *Q* are reported.

regression (4). Given that Q is measured as of the most recent fiscal year-end prior to the announcement of the acquisition, considerable time may have elapsed since that date and the announcement date of the acquisition. Thus, a run-up in an acquiring firm's stock price just prior to an acquisition financed with stock may imply that the market has recently increased its estimates of the growth opportunities available to the firm.

The results in Table II do not support the Risk Sharing Hypothesis.¹³ TVALUE, the target firm's size, is significantly negative at the 0.05 level in regressions (1) and (4), whereas its predicted sign is positive. In addition, RVALUE, the target's relative size, is not significant at the 0.05 level in any of the regressions. One interpretation of these results is that firm size may be a poor indicator of whether the acquiring firm desires to share the risk of the acquisition with the target. In Section III.B below, the Risk Sharing Hypothesis is re-examined by focusing on the acquirer's and target's investment opportunities.

The Control Hypothesis is tested using a spline variable for OFFDIR. The first segment of the spline is from 0 percent to 5 percent ownership, the second segment is from 5 percent to 25 percent, and the third is ownership greater than 25 percent. Each coefficient measures the slope of the regression line over those intervals. The variables are defined as follows:

$$\begin{aligned}
 \text{OFFDIR (0.5\%)} &= \text{OFFDIR} && \text{if OFFDIR} < 5\% \\
 &= 5\% && \text{if OFFDIR} \geq 5\% \\
 \text{OFFDIR (5\%, 25\%)} &= 0 && \text{if OFFDIR} < 5\% \\
 &= \text{OFFDIR} - 5\% && \text{if } 5\% \leq \text{OFFDIR} < 25\% \\
 &= 20\% && \text{if OFFDIR} \geq 25\% \\
 \text{OFFDIR (>25\%)} &= 0 && \text{if OFFDIR} < 25\% \\
 &= \text{OFFDIR} - 25\% && \text{if OFFDIR} \geq 25\%
 \end{aligned}$$

In the full sample of 846 acquisitions, 422 fall in the first interval, 299 in the second interval, and 125 in the third interval.

The selection of the intervals involves some subjective judgment. However, these cut-offs represent commonly used levels of managerial ownership (e.g., Morck, Shleifer, and Vishny (1988)) and are fairly robust to alternative specifications. For example, in regression (1), similar results are obtained when the first cut-off is as high as 7 percent and the second cut-off as low as 20 percent. The results in Table II support the Control Hypothesis, since the coefficients over the first interval are generally not significant, while over the middle range of OFFDIR, the coefficients are significantly negative in three of the four regressions. Over the third interval, the coefficient in regression (4) is significantly negative at the 0.08 level. Therefore, these results are consistent with

¹³ A test for multicollinearity between the explanatory variables was performed using the procedure of Belsley, Kuh, and Welsch (1980), and described in Johnston (1984). The only variable determined to be adversely affected was MVALUE. When MVALUE is included in the regression without TVALUE and RVALUE, it is never significant. Therefore, MVALUE is excluded from the regressions displayed in Table II.

the notion that managers with low ownership stakes are unconcerned about dilution of control, while those with higher stakes, particularly those with stakes from 5 percent to 25 percent, consider dilution of control important in the choice of financing method in acquisitions.

The results provide some support for the Cash Availability Hypothesis. However, of the cash availability variables, only CASHVAL is significant at the 0.05 level in regressions (1) and (4). The negative sign on the coefficient indicates that the greater the acquiring firm's cash balances relative to the amount paid for the acquisition, the smaller the likelihood the acquisition will be financed with common stock. CASHFLOWVAL is significant in regressions (2) and (3), but it is negative in regression (2) and positive in regression (3). IADEBTCAP is not significant at the 0.05 level in any of the regressions.

Of the monitoring variables, both INST and INSTBLK are negative and significant at the 0.05 level in regressions (1) and (4), thus providing support for the Outside Monitoring Hypothesis. Higher institutional shareholdings and blockholdings lead to a lower probability of stock financing in acquisitions. Institutional blockholders may therefore be able to exert some form of influence on corporate managers' financing decisions. However, outside individual blockholders, who may, in fact, have the greatest incentive to monitor, apparently have no impact on the choice of payment method. Consistent with the results of Table I, OUTBLK is not significant in any of the regressions (result not shown in Table II).

Consistent with the univariate statistics, the dummy variable for tender offers is negative and highly significant in all four regressions. This result is consistent with the Mode of Acquisition Hypothesis. The bidder's desire to complete the acquisition as quickly as possible, due to actual or potential competition from other bidders, combined with the different regulatory treatment of cash-financed versus stock-financed tender offers often necessitates the use of cash in tender offers.

Of the business cycle variables, only PRESPCHNG is consistently significant and in the predicted (positive) direction. This result suggests that recent increases in the overall stock market tend to increase the use of stock financing, possibly, as suggested by Choe, Masulis, and Nanda (1993), as a result of reduced costs of asymmetric information between managers and the market. PREINTCHNG is positive and significant in regression (3), but is not significant in regressions (1), (2), or (4). Contrary to Choe, Masulis, and Nanda (1993), neither IPCHNG (shown in Table II), LEADCHNG, nor COINCCHNG are in the predicted direction and significant. This divergence in results may be due to the fact that the sample used in this study contains cash-financed acquisitions that do not directly involve the issuance of bonds.

Finally, in all four regressions, the likelihood ratio statistic is highly significant. This implies that the independent variables provide more explanatory power than does a model including just an intercept alone. To gauge the model's goodness-of-fit, Table II also presents the Hosmer-Lemeshow statistic (see Hosmer and Lemeshow (1989)). In this procedure, the observations are divided into ten groups of approximately equal size, based on the estimated

probabilities from the regression. A Pearson chi-square statistic is used to summarize the difference between the observed and expected number of observations in these groups. This statistic is then compared to a chi-square distribution with eight degrees of freedom. In regression (1), (2), and (3), the Hosmer-Lemeshow statistic cannot reject the null hypothesis of equal proportions of observations in the ten groupings. If the null hypothesis had been rejected, it would have signified that more (or fewer) observations had been observed in one or more groups than had been expected given the parameters of the model. Since the null was not rejected, the model does a statistically good job in classifying observations. In the multinomial regression, the statistic cannot be calculated, so is not reported for regression (4).

B. Risk Sharing Hypothesis Re-examined

Hansen (1987) suggests that acquiring firms are more likely to use stock financing to mitigate the riskiness of the target firm. In this article, a high q -ratio is interpreted as indicating that a firm has abundant growth opportunities, that is, much of a firm's value comes from profitable investments that, while not yet made, are anticipated. However, these opportunities may not be realized. Hence, a high q -ratio may also mean that a target is a riskier investment, particularly if it is more difficult to value growth opportunities than assets-in-place.¹⁴ To mitigate this risk, the acquiring firm may use stock, or securities that can be converted into stock. By doing this, target firm shareholders share in the upside as well as the downside risk of the growth opportunities.

To explore this idea further, I use data from the COMPUSTAT Annual Industrial Research file to estimate target firm q -ratios in a manner similar to that for acquiring firms.¹⁵ Only 199 target firms are found on the Research tape, and due to missing data on the tape for the period ending just prior to the acquisition announcement date, only 86 target firms had sufficient data to compute Q . I match these targets with the appropriate acquiring firm to test whether acquirers try to share the acquisition risk with the target.

Table III shows the fraction of acquisitions according to method of payment. The sample is partitioned into groups based on whether the acquiring firm Q is "high" ($Q > 1.0$) or "low" ($Q \leq 1.0$), and whether the target firm Q is similarly high or low.¹⁶ The results are striking. Whereas 40 percent of the total sample of 86 acquisitions are financed with stock and 35 percent with cash, when the acquiring firm's Q is high and the target's Q is high, 68 percent are financed with stock, and only 16 percent are financed with cash. When both Q s are low, only 26 percent are financed with stock compared with 42 percent financed with cash.

¹⁴ Chung and Charoenwong (1991) present evidence that higher growth opportunities are associated with higher riskiness of common stock.

¹⁵ I search only the COMPUSTAT Research tape, since successfully acquired target firms are presumed to be delisted and subsequently moved from the Primary-Supplementary-Tertiary and Full Coverage tapes.

¹⁶ Lang, Stulz, and Walkling (1991) similarly partition their sample of bidding firms.

Table III

**Percentage of Corporate Acquisitions by Financing Type and Q -ratio
for a Sample of 86 Matched Acquiring and Target Firms**

The financing category STOCK includes payments made solely in common stock. The financing category CASH includes payments made solely in cash, cash plus straight debt, or cash plus the assumption of the target firm's liabilities. The financing category MIXED includes payments consisting of both cash and stock or cash and securities that can be converted into stock. Each cell shows the percentage of acquisitions in that cell financed with STOCK, CASH, or MIXED, and the total number of acquisitions in that cell. Investment opportunities are estimated using Tobin's q -ratio, which is estimated by the variable Q . $Q = (\text{market value of equity} + \text{book value of long-term debt} + \text{book value of short-term debt} + \text{preferred stock at carrying value}) / \text{book value of assets}$. All variables are measured as of the fiscal year-end prior to the acquisition announcement date. The Q -ratio is considered to be high if Q is greater than 1.0; otherwise Q is considered to be low. The sample period is 1978–1988.

Acquiring Firm Q -ratio	Financing Type	Target Firm Q -ratio		Total
		Low	High	
Low	STOCK	26%	45%	34%
	CASH	42%	36%	40%
	MIXED	32%	18%	26%
	N	31	22	53
High	STOCK	21%	68%	48%
	CASH	43%	16%	27%
	MIXED	36%	16%	24%
	N	14	19	33
Total	STOCK	24%	56%	40%
	CASH	42%	27%	35%
	MIXED	33%	17%	26%
	N	45	41	86

These results are confirmed in Table IV, in which logistic regressions are estimated for dummy variables based on whether the acquiring firm and target Q s are high or low. The dummy variable left out of the regression is Low acquiring firm Q /Low target Q . This is the category in which one would expect to find the smallest fraction of stock-financed acquisitions based on the Risk Sharing Hypothesis. The results of the regressions confirm the results of Table III. The dummy variable High acquiring Q /High target Q is positive and highly significant in regressions (1), (3), and (4), whereas none of the other dummy variables is significant. Thus, these results support the Risk Sharing Hypothesis; the combination of acquiring firm and target q -ratios is important in determining the method of payment.

IV. Conclusions

Many reasons influence the method of payment in corporate acquisitions. These reasons include characteristics of the acquirer and target, as well as characteristics of the environment in which the acquisition takes place. In this

Table IV
Logistic Regression Analysis of Factors Affecting Method of
Payment in Corporate Acquisitions for a Sample of 86 Matched
Acquiring and Target Firms

The financing category STOCK includes payments made solely in common stock. The financing category CASH includes payments made solely in cash, or cash plus straight debt, or cash plus the assumption of the target firm's liabilities. The financing category MIXED includes payments consisting of both cash and stock or both cash and securities that can be converted into stock. A total of 34 acquisitions are categorized as STOCK, 30 as CASH, and 22 as MIXED. $Q = (\text{market value of equity} + \text{book value of long-term debt} + \text{book value of short-term debt} + \text{preferred stock at carrying value}) / \text{book value of assets}$. All variables are measured as of the fiscal year-end prior to the acquisition announcement date. The Q -ratio is considered to be high if Q is greater than 1.0, otherwise Q is considered to be low. The sample period is 1978–1988. p -values are in parentheses.

Variable	Dependent Variable is:			
	1 if STOCK 0 if CASH (1)	1 if MIXED 0 if CASH (2)	1 if STOCK 0 if MIXED (3)	3 if STOCK 2 if MIXED 1 if CASH (4)
High acquiring firm Q /High target Q	1.952 (0.013)	0.262 (0.775)	1.690 (0.034)	1.644 (0.006)
High acquiring firm Q /Low target Q	-0.208 (0.804)	0.080 (0.914)	-0.288 (0.741)	-0.101 (0.867)
Low acquiring firm Q /High target Q	0.709 (0.278)	-0.431 (0.562)	1.139 (0.133)	0.553 (0.285)
Intercept	-0.486 (0.280)	-0.262 (0.533)	-0.223 (0.638)	-0.915 (0.011)
Intercept2				0.236 (0.494)
Likelihood Ratio χ^2 -statistic (p -value)	8.932 (0.030)	0.607 (0.895)	7.531 (0.057)	9.789 (0.020)
Hosmer-Lemeshow χ^2 -statistic (p -value)	4.957 (0.838)	16.414 (0.037)	8.855 (0.263)	not available
% correctly classified	50.0	15.4	67.9	not available

article, I examine many of these characteristics, using a sample of 846 corporate acquisitions from the period 1978–1988. According to the results of this article, two of the most important characteristics are the mode of acquisition and the investment opportunity set faced by the acquiring firm.

Tender offers tend to be cash-financed. One important reason is that, due to regulatory reasons, they are faster to consummate than mergers. Thus, when real or potential competition for a target exists, bidders are more likely to use a cash-financed tender offer to preempt the competition (Fishman (1989)).

The results of this article strongly support the idea that higher acquiring-firm investment opportunities lead to an increased use of stock financing in corporate acquisitions. Equity financing conveys lower potential constraints on managers, thus giving them increased flexibility in their current investing and future financing plans. An estimate of Tobin's q -ratio measures the investment opportunity set. The logistic regression results suggest that a firm with a

Tobin's q of 2.0 is 2.7 times more likely to use stock financing than a firm with a q -ratio of only 1.0.

Other results indicate a nonlinear relationship between acquiring firm management ownership and the probability of stock financing. Higher ownership between 5 percent and 25 percent implies a lower probability of stock financing. This result is attributable to the dilution of control that managers would suffer. To mitigate the possibility of overpayment, acquirers tend to use stock financing when the acquirer's and the target's q -ratios are high. Acquiring firms that have lower cash balances relative to the price of the acquisition tend to use stock financing. In addition, higher institutional shareholdings and blockholdings significantly increase the probability of stock financing, although blockholdings by individuals unaffiliated with management are not significantly related to the method of payment.

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