

Acquiring Firm Characteristics and the Medium of Exchange

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Abstract

An analysis of 35 cash mergers and 88 stock mergers shows that acquiring firms that use cash as the medium of exchange in a merger have different financial and operating characteristics than acquiring firms that use stock. Acquiring firms with large asset bases, low leverage, low return on assets, and high price/earnings ratios tend to exchange stock in order to acquire other companies while highly levered small firms with high return on assets prefer to use cash. Because the characteristics of acquiring firms differ across exchange mediums, research contrasting returns to shareholders based upon the medium of exchange must control for the underlying factors differentiating the firms in each group.

Introduction

Prior research on medium of exchange for mergers has noted higher abnormal returns to shareholders of acquiring firms when cash is exchanged rather than stock (Travlos, 1987; Wansley, Lane, and Yang, 1983 and 1987). Although several explanations such as tax incentives have been proposed in the literature, Halpern (1983) points out that this finding may be due to the underlying characteristics of firms choosing the different mediums of exchange.

A prior study by Carleton, Guilkey, Harris, and Stewart (1983) investigated the characteristics of acquired firms with respect to medium of exchange. The objective of this paper is to examine the link between medium of exchange and the characteristics of the acquiring firm. The results indicate that acquiring firms that exchange stock to acquire other companies have large asset bases, low

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leverage, and low return on assets. Conversely, highly levered small firms with high return on assets prefer to use cash.

Prior Research

A growing area of interest among researchers is the role of medium of exchange in mergers. Travlos (1987) investigated returns to acquiring firm shareholders contrasting the medium of exchange used. He found that acquiring firm shareholders receive negative returns in a 21 day interval around the merger announcement date when stock is used to acquire the target firm. For cash mergers, zero abnormal returns were earned by the acquiring firm's shareholders. Wansley, Lane, and Yang (1983) also found higher returns to acquired firm shareholders when cash is used to consummate the merger. In a subsequent study, Wansley, Lane, and Yang (1987) conclude that this difference can be explained by a signalling model, whereby if management views its stock to be undervalued, cash is exchanged.

Carleton, Guilkey, Harris, and Stewart (CGHS) (1983) explored the relationship between the medium of exchange used in mergers and the acquired firm characteristics. They suggest that the choice of stock or cash to complete a merger is motivated by tax implications and managerial preference. Generally, cash transactions result in taxable gains to the acquired firm's shareholders while stock transactions are tax deferred. Using a sample of 61 target firms that merged during 1976 and 1977, CGHS found that firms acquired in stock exchanges were significantly different from cash acquisitions with respect to the acquired firm's dividend policy and market-to-book ratio. Acquired firms with lower dividend payout ratios and lower market-to-book value ratios were more likely to be acquired with cash. Due to a small sample size, they were not able to investigate fully the acquiring firms.

Finally Shrieves and Pashley (1984) found that firms using cash experience a systematic increase in leverage after the merger while firms using stock do not. Prior to the merger, however, they found no difference in leverage between acquiring firms using stock and acquiring firms using cash. Book values rather than market values of equity, however, were used to measure leverage. Bowman (1980) found that the book versus market difference does not matter for debt, but the market value of equity is preferable when using debt/equity as a measure of leverage.

From this brief discussion, it can be seen that acquiring and acquired firms may have certain characteristics that affect merger behavior and the market's response to mergers. The purpose of this paper is to examine acquiring firms for characteristics that influence the decision to use stock or cash to consummate the merger. This is intended to complement the work of CGHS on acquired firms.

Medium of Exchange Considerations

Huang and Walkling (1987) discuss some of the factors influencing the choice of payment method. A brief synopsis of four factors suggested in the literature (taxes—Carleton, Guilkey, Harris, and Stewart, 1983; capital structure effect—Lewellen, 1971; free cash flow—Jensen, 1986; and signalling—Fishman, 1989) will be presented.

There are tax ramifications dependent on the medium of exchange used. A stock exchange results in a tax deferred merger. In this case, no current taxes accrue to the recipient of the new shares. Also, the acquired firm's tax basis in the assets and liabilities is carried to the acquiring firm's tax books.

On the other hand, when cash is used to finance the merger, the excess of the cash payment over the tax basis of the target shareholders' stock is taxable to the shareholders. The acquiring firm then can elect to record the acquired firm's assets and liabilities at fair market value and depreciate on that basis. In most cases, this increases the depreciation tax shield. (The tax shield increases if the market value of the depreciable assets exceeds the book value of the assets.) As long as the net tax benefits to the merged firm exceed the tax payments by shareholders, there are tax incentives to merge using cash.

The medium of exchange also has a profound effect on the capital structure of the firm. According to the increased debt capacity hypothesis, merging firms with less than perfect correlation of returns decrease their probability of default. Thus, the combined firms' debt levels can be increased over that of the individual firms without sacrificing default risk (Lewellen, 1971). A cash merger often is financed by issuing new debt, in which case increased debt capacity may play a role in management's overall merger strategy. Also, it has been shown that highly levered firms tend to have reduced cash variability, which may influence the medium of exchange used (Lys, 1984).

Two more recent hypotheses are signalling and free cash flow. The free cash flow hypothesis (Jensen, 1986) suggests that management's fiduciary responsibilities are bonded through the use of debt. Also, managers of firms with high free cash flow have incentives to invest in low return projects. It is therefore in the shareholders' best interest for these types of organizations to incur more debt in order to force management to invest wisely. Accordingly, shareholders of firms with large free cash flows would be less likely to be involved in stock mergers.

Finally a signalling hypothesis¹ suggests that the medium of exchange is chosen based on management's evaluation of the firm's current stock price (Fishman, 1989). If management believes the stock is undervalued, cash is offered; if management judges the stock to be overvalued, stock will be offered.

Given these managerial considerations in determining medium of exchange and the noted differences between acquired firms, it is probable that the characteristics of acquiring firms are not uniform across mediums of exchange. Each group may be inherently different and should be segregated when mergers are examined. Also, when contrasting returns to shareholders involved in each type of merger, it is essential to know if the firms are inherently different prior to the merger (Halpern, 1983). The remainder of this paper examines potential differences in the financial characteristics of acquiring firms.

Data Selection, Hypotheses, and Model

The sample was identified in *Mergers and Acquisitions* for the years 1971 to 1978 and verified in the *Wall Street Journal Index*. The sample period parallels the works of others (CGHS, 1983 used 1976-1977; Wansley *et al.*, 1983, 1987 used 1970-1978; Travlos, 1987 used 1972-1981) and avoids the change in merger behavior that occurred during the early '80s (Travlos and Waagelein, 1989).²

The sample was restricted to those acquisitions where a second merger was not concluded six months before or after the merger date, subject to the availability of data on Compustat. Financial and service industries were omitted. The result was 123 mergers, 35 using cash and 88 exchanging stock.

In the sample, all stock mergers were accounted for by the pooling of interests method, and all cash acquisitions were accounted for by the purchase method. In all cases, the purchase price exceeded the net book value of the acquired firm. In addition, the final sample did not include any hostile takeovers. Therefore, the method of payment may be presumed to be acceptable to (and likely negotiated between) both firms.

¹The term *signalling* refers to any action by management that conveys information to the market (intentional or not) and does not necessarily imply the strict relationship found in the signalling equilibrium models.

²As noted by one referee, the change in the merger environment after 1980 suggests a potentially interesting extension: an examination of changes in acquiring firm characteristics, if any, resulting from a change in environment.

Acquiring Firm Characteristics

The variables included in the model were chosen based on their ability to discriminate between acquiring firms using stock and acquiring firms using cash. Five characteristics that can be derived from arguments presented by CGHS (1983) and others are liquidity, price/earnings, size, profitability, and leverage.³ Subsequent to CGHS, two additional variables have been suggested in the literature. Jensen (1986) indicates that sales growth opportunities may result in a shortage of free cash flows, thereby influencing payment method. Also, arguments presented by Agrawal and Mandelker (1987) and Fishman (1989) imply that the variance of stock prices may influence the medium of exchange. Each characteristic is defined in Table 1 and discussed in turn below.

The liquidity variable is net working capital divided by total assets (WC). Working capital is included in the model for three reasons. First, working capital may reflect the firm's ability to finance a cash acquisition. Second, a firm with an abundance of working capital may prefer to use cash to consummate the merger, possibly to avoid being a takeover target. Third, this variable could proxy for free cash flows as discussed by Jensen (1986). All three rationales for including working capital would predict a higher probability of cash mergers when working capital is high. One limitation of the use of working capital as a proxy for firm liquidity is that firms whose working capital includes a relatively large portion of nonliquid assets such as inventory may not have sufficient cash to consummate a merger. Although analysis of the specific components of working capital may provide further insight, net working capital provides a reasonable approximation of liquidity across firms.

The price/earnings variable is the market value of equity divided by total earnings (PE). This variable reflects the market's perception of the firm's future cash flows in relation to its current reported earnings. The PE ratio is one indicator of the firm's growth potential, i.e., firms with higher PE ratios are viewed by the market as having more promising futures relative to their current performance than firms with lower ratios. Taking advantage of these opportunities places demands on their cash flows, however, thus leaving less cash available for mergers. The association among growth opportunity, free cash flow, and medium of exchange is examined in Jensen (1986).

³The book value-to-market value and the dividend policy ratios used by CGHS are not used here, as theoretically they only relate to the target firms. The book-to-market value used by CGHS indicates the marketability of the acquired firm. They included dividend policy in order to evaluate the clientele effect that would explain the target firm's tax preference. Neither of these should differentiate between acquiring firms. If these variables are included in the current analysis, neither is significant nor does either influence the other variables.

The size variable is measured by the log of total assets (SZ). The size of the acquiring firm may be an important variable for a number of reasons. Banz (1981) attributes the positive abnormal returns found for smaller firms to the limited information concerning these companies available to shareholders. This reduction in available information discourages some investors from acquiring this stock (Klein and Bawa, 1977) which forces returns upward. The implication for mergers is that when the acquiring firm is small, a subset of the target firm's shareholders may not be willing to accept stock. Resistance may be reduced by using cash. From the small acquiring firm's perspective, because management knows its returns are relatively high, they may prefer to use cash rather than provide the target firm's shareholders with relatively high return common stock (Wansley, Lane, and Yang, 1987). Alternatively, smaller firms are more likely to be manager controlled. Accordingly, these owner/managers may be less likely to distribute ownership when merging (Jensen and Ruback, 1983). Both perspectives lead to the prediction that smaller acquiring firms will elect cash as the medium of exchange.

The profitability variable is measured as operating income (after depreciation and interest but before taxes) divided by total assets (ROA). A high return on assets may reflect the ability of the firm to take advantage of increased tax shields from increased debt and depreciation and therefore lead to cash mergers. Although there are other tax shields such as operating loss carryforwards available to firms involved in stock exchanges, the tax incentives generally will be greater if cash is used. The less profitable the acquiring firm, the less likely the firm will be able to benefit from the additional tax shields; therefore, stock would be preferred.

The leverage ratio is measured by the book value of total liabilities divided by the market value of equity (LEV).⁴ The sign of the debt/equity ratio is difficult to hypothesize *a priori*. Hansen (1987) develops a signalling model that predicts that high debt levels of the acquiring firm result in the use of stock exchanges. Also, a high debt/equity ratio may reveal that a firm is unable to raise debt and therefore must use stock. Another possibility is that a high value of leverage before the merger may indicate that the nature of the firm's assets supports higher debt levels or that management has a preference (for whatever reason) for greater use of debt financing. The method of payment may be chosen to preserve this general capital structure. Thus, there would be some aversion

⁴Debt-to-market value of equity is chosen as the measure of leverage due to the theoretical basis of that measure. Galai and Masulis (1976) show that this ratio is most reflective of the increased debt capacity incentive. Also, Bowman (1980), in assessing the systematic risk of a firm, shows that the market value of equity is superior to book value, while using the market value of debt does not add significantly to the model.

(preference) for the use of stock when the value of the leverage variable is high (low).

Alternatively, Lewellen's (1971) model posits that a firm that is already highly levered may find it advantageous to increase debt capacity. A firm is more likely to use cash if the overall merger strategy involves increasing debt capacity because the dynamics of the increased debt capacity incentive reflect the protection of shareholder wealth (Galai and Masulis, 1976). If stock is issued, the original shareholders' interests are diluted. This theory, therefore, predicts that high debt/equity firms will use cash. Accordingly, with alternative theories predicting different signs for LEV, the sign of LEV is indeterminate.

Jensen (1986) suggests that stock acquisitions are different from cash acquisitions and are more likely to be associated with growth opportunities and a shortage of free cash flows. Jensen states that the agency problem related to free cash flows is that managers have an incentive to increase the size of firms under their control by expending free cash flows even though this expansion is accomplished by investing in projects that do not yield the cost of capital. Firms that have been expanding rapidly, whether in this fashion or in value-increasing projects, are likely to exhibit rapid growth in sales revenues over the period preceding the merger and to be characterized by a shortage of free cash flow. As predicted by Jensen, firms with a shortage of free cash flows will elect stock mergers. Thus, sales growth (GRTH) is related inversely to the cash flow position before the merger and directly related to the likelihood of stock as the medium of exchange. GRTH is measured by regressing sales over time for the four year period prior to the merger. The beta coefficient from this regression is used to proxy growth. A four year time horizon is chosen based on data availability constraints. A longer time horizon would have eliminated many of the early mergers.

The variance in stock prices (VAR) is suggested by Agrawal and Mandelker (1987) and Fishman (1989) as influencing the medium of exchange. The proposed effects are related to the acquiring firm's managers' stock holdings and to the information available to the acquired firm's management. For example, as suggested by Fishman, one difference between a cash offer and a securities offer is that the value of the cash is known to all parties while the value of the securities is not and is, in fact, dependent upon the success of the acquisition itself. In the presence of asymmetric information about the value of the acquiring firm's stock, the variability of the acquiring firm's stock may be useful as a measure of risk. It therefore is included as a control variable in the model. Stock price variability is measured as the average yearly variance of the monthly stock prices for the two years prior to the merger.

These arguments result in seven explanatory variables. Five of these variables are financial characteristics: 1) working capital (WC), 2) price/earnings

(PE), 3) size (SZ), 4) return on assets (ROA), and 5) leverage (LEV). These variables as well as price variability (VAR) are measured as the average of the two years prior to the merger. The sales growth variable (GRTH) is measured over the preceding four years.

Differences between acquiring firms using stock and those using cash first are examined with univariate t-tests. Next, logistic regression is applied to the data to capture multivariate effects. The following logistic regression model is estimated:

$$\text{Medium of exchange} = b_0 + b_1\text{WC} + b_2\text{PE} + b_3\text{SZ} + b_4\text{ROA} + b_5\text{LEV} + b_6\text{GRTH} + b_7\text{VAR}$$

where:

Medium of exchange = 1 if stock merger, 0 if cash merger.

Data Analysis

Table 2 reports the means of the individual variables used in the regression analysis and the t-tests for differences in these means.⁵ The mean values for PE, SZ, and GRTH are statistically different between acquiring firms using cash and acquiring firms using stock in the hypothesized directions. The two variables, LEV and VAR, with indeterminate signs are also significant. The t-tests indicate that high leverage and low stock price variability are associated with cash mergers.

The results of the logistic regression are reported in Table 3 and the correlation coefficients are reported in Table 4. The regression is significant at the .001 level, indicating that firms exchanging cash are different from those exchanging stock.⁶

As predicted, the coefficient on return on assets is negative and significant at the .01 level, indicating that firms with high return on assets tend to use cash. The sign on leverage was not predictable but the significantly negative sign indicates that acquiring firms with higher leverage also use cash. This supports Lewellen's increased debt capacity incentive as well as the theory of a predisposition toward preserving, in general, the capital structure.

⁵The results remain consistent when nonparametric two sample t-tests are performed.

⁶The coefficients in logistic regression are interpretable if multicollinearity is not severe. Although correlation does exist among the variables, it is not especially high. See Table 4.

Size and price/earnings ratios are significant with positive signs. This indicates that larger firms with high price earnings ratios tend to exchange stock. Again, these significant differences are in the direction hypothesized.

Finally, working capital, stock price variance, and sales growth are not significant. Although two of these three variables are significant using the individual t-tests, they became insignificant when combined with the other variables. This indicates that much of their explanatory power is captured more effectively by the other variables included in the model.

Overall, many of the hypothesized differences in the characteristics of firms using cash versus stock to merge are supported by these results. The sign and significance of the leverage variable indicates that more highly levered firms are more likely to use cash; this result supports Lewellen's (1971) increased debt capacity theory. The results for the price/earnings variable (higher price/earnings result in stock mergers) supports the contention of Wansley *et al.* (1987) that managers who view their stock as undervalued may wish to use cash. The size variable, drawing on Banz's (1981) small firm effect arguments, indicates that smaller acquiring firms use cash. Last, the sign and significance of the return on assets variable indicate that tax effects are also significant to the acquiring firm's medium of exchange decision.

Most importantly, these results indicate that financial characteristics of acquiring firms that choose to use stock to consummate a merger are different prior to the merger than firms using cash. Therefore, research examining these acquiring firms after a merger should recognize the fact that these acquiring firms may be inherently different.

Summary

CGHS (1983) show that target firms acquired with stock are significantly different from those purchased with cash. Due to small sample size, they were unable to examine the acquiring firms for characteristic differences. This study shows that the acquiring firms are also different. Those involved in a stock exchange are larger with lower debt/equity and return on assets ratios and a higher price/earnings ratio. Acquiring firms involved in cash mergers tend to be smaller with higher leverage and return on asset ratios. As CGHS state, mergers are marriages between two companies that generally are acceptable to both parties. The results of this study in combination with CGHS provide evidence that both acquiring and acquired firms merging with cash are different from those merging with stock prior to the merger. Accordingly, when analyzing the medium of exchange used in a merger, researchers must consider explicitly the different underlying factors associated with firms involved in each type of merger.

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Table 1
Variable Definitions

Characteristic	Name	Definition
Liquidity	WC	Net Working Capital/Total Assets
Price/Earnings	PE	Market Value of Equity/Total Earnings
Size	SZ	Log of Total Assets
Profitability	ROA	Income Before Taxes/Total Assets
Leverage	LEV	Total Liabilities/Market Value of Equity
Sales Growth	GRTH	Beta Coefficient of Four Year Sales
Stock Price Variability	VAR	12 Month Price Variability Trend

Table 2
Mean Values and t-tests for Variables Employed*

	Cash	Stock	t-test Probability
WC (Liquidity)	0.373 (0.19)	0.333 (0.14)	.12
PE (Price/Earnings)	4.625 (11.59)	19.182 (11.23)	.01
SZ (Size)	4.234 (1.35)	5.581 (1.27)	.01
ROA (Profitability)	0.094 (0.09)	0.104 (0.08)	.27
LEV (Leverage)	1.411 (1.50)	0.583 (0.55)	.01
GRTH (Sales Growth)	21.252 (33.68)	73.056 (113.15)	.01
VAR (Stock Price Variability)	4.156 (4.42)	6.986 (6.12)	.01

*Standard deviations in parentheses

Table 3
Logistic Regression Results
(88 Stock Mergers, 35 Cash Mergers)

$$\text{Medium of exchange} = b_0 + b_1 \text{WC} + b_2 \text{PE} + b_3 \text{SZ} + b_4 \text{ROA} + b_5 \text{LEV} + b_6 \text{GRTH} + b_7 \text{VAR}$$

where:

Medium of exchange = 1 if stock merger; 0 if cash merger

Variable	Expected Sign	Beta	Standard Error	χ^2	Probability
Constant		-0.93	2.10	0.20	0.66
WC	-	-1.45	2.21	0.43	0.25
PE	+	0.15	0.04	10.65	0.00
SZ	+	0.55	0.32	2.91	0.04
ROA	-	-14.09	5.01	7.90	0.00
LEV	?	-1.25	0.53	5.50	0.00
GRTH	+	0.01	0.01	1.13	0.15
VAR	?	0.02	0.06	0.16	0.34

Model $\chi^2 = 70.70$ ($p=0.00$)

One-tailed χ^2 tests are used for all variables except constant, LEV, and VAR

Table 4
Correlation Coefficients

	PE	SZ	ROA	LEV	GRTH	VAR
WC	.08	-.37*	.37*	-.31*	-.17	.11
PE		.23*	.43*	-.46*	.08	.43*
SZ			.03	-.02	.54*	.15
ROA				-.41*	.06	.29*
LEV					-.07	-.27*
GRTH						.05

* Significantly different from zero at the .01 level