

# **Cash or Stock?**

## **Method of Payment and Post-Merger Investment**

ALBERTA DI GIULI\*

### **ABSTRACT**

This paper uses the level of post-merger investments to test the effect of the investment opportunities and the market misvaluation theories of takeovers on the choice of the method of payment in mergers. Unlike previous proxies for investment opportunities, the amount of post-merger investments does not lead to ambiguous interpretations. Results from an analysis of 1,642 U.S. mergers suggest that both the market misvaluation and the investment opportunities of firms drive the choice of the method of payment in mergers. Findings confirm that the two effects can coexist, and suggest a possible link between the investment opportunities and the market misvaluation theories of takeovers; it might be the case that both managers and the market are overly optimistic about the growth potential of firms.

JEL Codes: G31 - Capital Budgeting; Investment Policy; G34 - Mergers; Acquisitions; Restructuring; Corporate Governance

### **INTRODUCTION**

This paper examines the determinants of the payment method in mergers by analyzing post-merger investments. Specifically, I test the effects of the investment opportunities and market misvaluation theories of takeover on the method of payment in mergers, based on Lamont's (2000) findings on investment and investment plans.

Although several studies have examined the role of investment opportunities and market misvaluation theories of takeover in the choice of payment method in mergers (see Martin, 1996, Shleifer and Vishny, 2003, and Dong *et al.*, 2006), the issue remains unsettled. This is because Tobin's Q (or a similar proxy) is used to test both effects, and it is difficult to disentangle which effect (investment opportunities or market

---

\* Bocconi University, Milan, Italy. Email: [alberta.digiuli@unibocconi.it](mailto:alberta.digiuli@unibocconi.it). I thank Malcolm Baker, Stefano Caselli, Francesco Corielli, Giacomo De Laurentis, Daniel Ferreira, Stefano Gatti and Harrison Hong for helpful comments and suggestions.

misevaluation) really Tobin's Q represents (see Dong *et al.*, 2006). By using the actual post-merger investments, I try to understand the impact of the two effects and find a possible link between them.

The investment opportunities theory has its foundation in Myers' (1977) study, in which a firm's borrowing is inversely related to its investment opportunities. When a firm is burdened with risky debt, some of the gains of its future investments accrue to existing creditors. Therefore, managers who want to maximize shareholders' value will be reluctant to undertake those additional investments. Hence, firms that have access to many investment opportunities tend to make less use of debt.

Myers' (1977) theory can be applied to the merger context. A merger is a particular kind of large investment with an uncertain outcome (it can result in a successful and profitable merged entity, or an unsuccessful and unprofitable one). The method of financing the takeover might affect managers' future discretion to take advantage of other investment opportunities. Hence, firms that have investment opportunities prefer to use stock as a method of payment, and invest more after the merger than firms that use cash.

In the merger context, the investment opportunities theory has been tested by Martin (1996), who uses the Tobin's Q as a measure of investment opportunities. A high market value compared to the book value of the assets is an indicator of a well-run firm or one with good business opportunities. Martin's (1996) results confirm that firms with high Tobin's Q are more willing to use stock as a method of payment in mergers.

The market misvaluation theory states that managers' decisions about financing (regarding equity issue, see Baker and Wurgler, 2000, among the others) and investments (regarding takeovers, see Shleifer and Vishny, 2003) are influenced by market inefficiencies. Managers make financial decisions to best exploit the overvaluation or undervaluation of their firms.

In the context of mergers, bidders' managers exploit market inefficiencies by acquiring the target with stock when the bidder is overvalued and/or more overvalued than the target, or by paying cash when the target is undervalued (see Shleifer and Vishny, 2003). Market inefficiencies influence takeover characteristics other than the method of payment; they also affect the timing of the bid, the form (merger or tender offer), and the bid premium (see Shleifer and Vishny, 2003, and Dong *et al.*, 2006).

The Tobin's Q or related measures (price to book value of the equity) are also used to test this theory (see Dong *et al.*, 2006), being commonly adopted as a good proxy for market misvaluation. Hence, the same proxy, i.e., the Tobin's Q (or similar measures), is used to test both the market misvaluation and the investment opportunities theories, leading to ambiguous interpretation of the results.

I propose a different measure of the investment opportunities of a firm: the amount of post-merger investments of the merged entity (measured by the average ratio of capital expenditures to assets in the four years following the merger). According to Lamont (2000), there is a very high correlation between the level of planned investments and the investments actually made. Hence, managers must plan out investments in advance based on the beliefs about the firms investment opportunities, and then follow their plan strictly. According to Lamont's (2000) findings, it can be argued that the level of post-merger investments is a proxy for the planned ones and, therefore, for the manager's "believed" investment opportunities of the merged entity.

Therefore, using post-merger investments, I can distinguish the impact of the investment opportunities (proxied by post-merger capital expenditures) from the impact of the market misvaluation (proxied by the Tobin's Q effect not captured by the capital expenditures) on the method of payment.

Using this new proxy allows for a better measure of the investment opportunities of the firm, and *jointly* tests the two theories, leading to a clearer understanding of the effects of both the investment opportunities and the market misvaluation on choice of method of payment in mergers. Moreover, the work analyzes the level of pre- and post-merger investments, an area that has thus far received little academic study.

In the empirical analysis, I examine a sample of 1,462 completed U.S. mergers (both acquirers and targets are publicly traded U.S.-based firms) announced between 1984 and 2000. 574 are mergers in which the acquirer used cash as a method of payment ("cash mergers" or "cash acquirers" henceforth), 598 are mergers in which the acquirer has used stock as a method of payment ("stock mergers" or "stock acquirers" henceforth), and 290 are mergers in which the acquirer has used both cash and stock as a method of mixed payment ("mixed mergers" or "mixed acquirer," henceforth). The period analyzed for capital expenditures and for accounting data in general is four years before and four years after the mergers (9 years in total).

In the data section, I study the pattern of the acquirer's ratio of capital expenditures to assets (C/A) in the four years before the merger and in the four years after the merger. In the univariate analysis, I test the differences in means of the average C/A of the merged entity in the four years after the merger ( $\overline{CA}_{merged\_after}$ ) between acquirers that have used different methods of payment. I also test the differences in means of the average acquirer's Tobin's Q in the four years before the merger between bidders that have used different means of payment. In the multivariate analysis, I run a logit regression of investment opportunities (proxied by  $\overline{CA}_{merged\_after}$ ) and market misvaluation (proxied by the Tobin's Q) on the method of payment.

Although results will be presented in full later in the paper, I summarize here the most salient findings. Both stock and cash acquirers show a stable though slightly declining level of C/A. Immediately after the merger, the level of C/A drops systematically. However, over the four years following the merger, the ratio becomes stable again and declines slightly. The findings suggest that in the four years before and after the merger, managers seem to choose a certain level of capital expenditures, with little change from one year to another. Based on the stable pattern of C/A and on Lamont's (2000) findings, I argue that the amount of the post-merger capital expenditures can be considered a proxy for the investment opportunities of the merged entity.

The univariate analysis shows that the  $\overline{CA}_{merged\_after}$  of the "new firm" is significantly lower for merged entities that have used cash as a method of payment than for merged entities that have used stock. The univariate analysis is in line with the investment opportunities theory and suggests that an acquirer with high internal investment opportunities would be less willing to use cash as a method of payment.

The second univariate analysis reveals that acquirers that make stock mergers have significantly higher Tobin's Q in the four years preceding the merger. Results thus support the market misvaluation theory. However, in the univariate analysis, the investment opportunities portion of the Tobin's Q is not captured by the capital expenditures, as is the case in the multivariate analysis. Hence, the results might also support the investment opportunities theory.

The logit regressions show that the investment opportunities proxy ( $\overline{CA}_{merged\_after}$ ) is strongly significant. Hence, investment opportunities do drive the choice of the method of payment in mergers, confirming the investment opportunities theory. However, the Tobin's Q, the proxy for market misvaluation, is strongly significant too. Firms with high Tobin's Q prefer to make stock mergers. Therefore, the misvaluation effect has an impact on the method of payment too.

Overall evidences demonstrate that both the investment opportunities and investor misvaluation drive the takeover market. Results might also suggest a link between the growth opportunities and the market misvaluation theories. It might be that both managers and the market are too optimistic about the growth potential of the firm. The "believed" investment opportunities lead both to the managers' overconfidence (choosing stock mergers and making high post-merger investments) and to the market misvaluation.

To check the robustness of these results I use different specifications of the logit regression. I change the time-window of the control variables and I add dummies for the year of the merger to control for the time fixed effect. Furthermore, I test for the effect of an acquirer making other mergers in the four years before and after the merger, and for the acquirer's total number of mergers during the five years before and after the merger. Finally, I restrict my sample to the firms that made a single merger in the eleven-year time frame (five years before and after the merger). Results do not change in each of these specifications, showing the robustness of the findings.

I also control for the possible endogeneity problem between the method of payment and the level of post-merger investments. The logit regressions with an instrumental variable confirm the results.

The paper is structured as follows. Section I explains the data and variables. Section II presents the univariate analysis while Section III presents the multivariate analysis. Section IV discusses the results. Section V concludes.

## **I. DATA AND VARIABLES**

Data on mergers are obtained from the Securities Data Company Platinum U.S. mergers and acquisitions database (SDC). The sample includes only successful and

completed mergers between publicly traded acquirers and targets (based in the U.S.) announced between January 1, 1984 and December 31, 2000. Acquirers and targets do not belong to financial, insurance and real estate industries, and I consider only mergers in which capital expenditures of the acquirer (merged entity) are available for at least one of the four years before (after) the merger.

The final sample includes 1,462 mergers of which 574 are cash mergers, 598 stock mergers, and 290 mixed merger. Unfortunately, SDC does not always provide the percentage of cash and stock used as payment in mixed mergers.

Table I shows information about the number of mergers in the sample, mean value per transaction and percentage of cash, stock and mixed merger by calendar year.

**\*\*\* Add Table I here\*\*\***

The number of mergers is higher in the mid-1980s and in the second half of the 1990s. The mean value per transaction (shown in current U.S. dollar), underlines that the size of transaction increases greatly in the second half of the 90s. The acquisition wave of the second half of the 90s is also characterized by a higher use of stock as a method of payment (see Andrade *et al.*, 2001). Data on number of mergers per year, mean value per transaction and method of payment are consistent with Dong *et al.* (2006) and Andrade *et al.* (2001).<sup>2</sup>

In the next subsections, I explain and measure the proxies used for investment opportunities and market misvaluation. The methodology followed to calculate capital expenditures, Tobin's Q, and liquidity measures is based on Kaplan and Zingales (1997). Accounting data are from COMPUSTAT, stock prices from CRSP.

### ***1.A Measure of Investment Opportunities***

Lamont (2000) finds that there is a strong link between planned and actual investments. Specifically, planned investments accurately predict actual investments.

---

<sup>2</sup> However, the number of mergers analyzed in the present study is less than that examined by Andrade *et al.* (2001) and Dong *et al.* (2006), since I only analyze mergers in which the capital expenditures of the acquirer (merged entity) are available for at least one of the four years before (after) the merger.

His study is based on a survey of capital expenditure plans run by the U.S. Commerce Department between 1947 and 1993.

The author finds that more than three-quarters of the variation in aggregate investment in a year can be forecasted at the beginning of the year using plans. The variation in expected investments is a large part of the variation in actual investment. Hence, most of this year's investments are decided last year by managers.

Another interesting result of Lamont's study is in regards to the relationship between return and investment. Mispricing or market misvaluation can lead managers of overvalued firms to issue equity and to use the proceeds in new investments, whether profitable or not. In the merger context, issuing new equity is equivalent to making a stock merger (instead of a cash one). Hence, it might be argued that managers would both make stock mergers and invest more after the merger because the firm is overvalued. However, Lamont's (2000) evidence does not support this explanation.

Based on the findings above, I can argue that planned investments are a good proxy for actual investments. In the merger context, post-merger investments should be correlated with the investments that managers plan to make after the merger, thus mirroring the investment opportunities of the new merged entity.

My proxy for the investment opportunities  $\overline{CA}_{merged\_after}$  is the average ratio of capital expenditures (Compustat item 128) to assets (item 6) in the four years after the merger.

Hence,

$$(C/A)_{it} = \frac{CapitalExpenditures_{it}}{Assets_{it}}$$

and

$$\overline{CA}_{merged\_after} = \frac{\sum_{t=1}^4 (C/A)_{it}}{4}$$

$$\overline{CA}_{acquirer\_before} = \frac{\sum_{t=-4}^{-1} (C/A)_{it}}{4},$$

$i = 1, \dots, 1462$  firms i.e. acquirers (before the merger) or merged entities (after the merger);

$merged\_after = 1, \dots, 1462$  merged entities;

$acquirer\_before = 1, \dots, 1462$  acquirers;

and  $t = -4 \dots +4$  years from/to the merger.

I examine the ratio of the capital expenditures over the assets (C/A) in the four years before and after the merger for the acquirer and the merged entity, respectively. The aim of the analyses provided in this subsection is to show that the level of capital expenditures is stable before and after the merger, and seems to follow a predetermined path, rather than a random one.

Table II illustrates the mean of the C/A ratio in the sample analyzed in each of the four years before and after the merger for the acquirer and merged entity, respectively. C/A\_m1 is the ratio measured one year before the merger, C/A\_m2 is the ratio measured two years before the merger, and so on. C/A\_p1 is the ratio measured one year after the merger, C/A\_p2 is the ratio measured two years after the merger, and so on.

**\*\*\* Add Table II here\*\*\***

Table II shows that the C/A ratio is relatively stable in the four years preceding the merger. The ratio decreases slightly during the four years, but there are no sudden drops. After the merger, the C/A ratio of the merged entity is lower than before the merger. The level of the C/A ratio in the four years after the merger is again stable and slightly decreasing.

The high correlations between the C/A ratio of subsequent years further underlines the strong link between the C/A ratio of succeeding years (results are shown in Tables III and IV).



**\*\*\* Add Table III and IV here\*\*\***

The evidence of a stable pattern of investments and a strong link between subsequent years of the C/A ratio support my interpretation of the actual investments as being determined by the planned ones, and hence by the investment opportunities of the firm. However, the findings will be further discussed in Section IV.

### ***I.B Measure of Market Misvaluation***

Managers of overvalued acquirers prefer to make stock mergers instead of cash ones. If a manager knows that his firm is overvalued (or is more overvalued than the target firm), he will be more inclined to use its stock as a method of payment. According to Shleifer and Vishny (2003), takeovers are driven by stock market valuations of the merging firms. In their model, financial markets are inefficient and some firms are not valued correctly, while managers are rational, understand stock market inefficiencies, and exploit them through merger choices. In the authors' model, mergers are a form of arbitrage done by rational managers working in inefficient markets. Hence, the model has opposite assumption of Roll's (1986) hubris hypothesis of corporate takeover, where financial markets are efficient while corporate managers are irrational.

In the Shleifer and Vishny (2003) model there is asymmetric information between managers and market about the real value of the firm's stock. Managers "time the market" to take advantage of the overvaluation of their firms both by using stock as a method of mergers, and by choosing almost the time in which the stock are more overvalued to make the merger. Shleifer and Vishny (2003) illustrate some implications of their model for the returns of the acquirer, target and merged entity, and for the mergers waves of the 1980s and 1990s.

As was previously stated, the most common way to measure the market misvaluation is by using Tobin's Q or similar ratios, such as the market value of the common equity over the book value of common equity (see Dong *et al.*, 2006).

However, as was mentioned earlier, the Tobin's Q can be a proxy for the misvaluation and/or the investment opportunities of the firm. In this paper, I use the

acquirer Tobin's Q as a measure of the market misvaluation; in the multivariate analysis the level of capital expenditures (the proxy for investment opportunities) should capture the part of the Tobin's Q that represents the investment opportunities and leave the sole meaning of market misvaluation to the variable.

Tobin's Q is calculated as the market value of assets divided by the book value of assets (Compustat item 6), where the market value of the asset equals the book value of assets, plus the market value of common equity less the sum of the book value of common equity (item 60) and the balance sheet deferred taxes (item 74).

Table V reports the value of the acquirers' Tobin's Q in the four years before the merger and its average.

**\*\*\* Add Table V here\*\*\***

## **II. UNIVARIATE ANALYSIS**

This section presents the relationship between the proxies of investment opportunities and market misvaluation and the method of payment in mergers.

### ***II.A. Post-Merger Capital Expenditures in Cash, Stock and Mixed Mergers***

I measure the average C/A of the acquirer during the four years before the merger ( $\overline{CA}_{acquirer\_before}$ ) and the average C/A of the merged entity ( $\overline{CA}_{merged\_after}$ ) during the four years after the merger.

Table VI reports the test of differences in means of  $\overline{CA}_{acquirer\_before}$  between acquirers that use different method of payment (cash, stock or mixed), and the test of differences in means of  $\overline{CA}_{merged\_after}$  between merged entities that have used different methods of payment (cash, stock or mixed).

**\*\*\* Add Table VI here\*\*\***

The  $\overline{CA}_{acquirer\_before}$  of cash acquirers is significantly lower at the 5% level if compared to the  $\overline{CA}_{acquirer\_before}$  of stock and mixed acquirers. Specifically, before the mergers, the  $\overline{CA}_{acquirer\_before}$  is 0.074 for the stock acquirers, 0.076 for the mixed acquirers and 0.067 for the cash acquirers. Mixed acquirers seem to behave similarly to stock acquirers.

Furthermore, the  $\overline{CA}_{merged\_after}$  of the “new firm” is significantly lower for the merged entities that have used cash as a method of payment than the ones that have used stock (at the one percent level) or mixed (at the five percent level) payment. In particular, after the merger,  $\overline{CA}_{merged\_after}$  is 0.058 for stock merged entities, 0.059 for mixed merged entities and 0.052 for cash merged entities. Again, firms that have used stock and mixed methods of payment behave similarly in terms of the amount of investments made.

Acquirers that have used cash as a method of payment have invested less before the merger and invest less after the merger. Hence, evidence suggests that firms with low investment opportunities make cash mergers.

It is interesting to analyze if in each single year the level of C/A is significantly higher for the stock mergers than for the cash ones, and to study in which years the difference is more significant. I am particularly interested in the level of C/A post-merger, since, as I stated, my proxy for the investment opportunities of a firm is the  $\overline{CA}_{merged\_after}$ . It is therefore particularly important to analyze the significance of the difference between the C/A ratio of stock and cash mergers in each year after the merger.

Hence, I test the difference in means for each of the four years before and after the merger. Results (not reported) confirm that merged entities that have used stock and mixed methods of payment have significantly higher levels of pre- and post-merger investments in *each* of the four years after the merger and in the three years before.

## ***II.B. Tobin's Q in Cash, Stock and Mixed Mergers***

Previous studies have found that the acquirer's Tobin's Q (either interpreted as investment opportunities or as market misvaluation) and similar proxies (price over

book ratio of the equity) are significantly lower for the cash mergers than for the stock mergers (see Martin, 1996, and Dong *et al.*, 2006). I examine if the acquirer's Tobin's Q is higher for stock than for cash mergers in this study's sample.

Specifically, I run a test of differences in means of the average of the acquirer's Tobin's Q in the four years before the merger between different methods of payment (cash, stock and mixed). I also run a test of differences in means of the one year before the merger Tobin's Q of the acquirer for different methods of payment.

It is important to study the level of Tobin's Q even in the year before the merger, since the market misvaluation theory states that managers decide the method of payment in mergers (and the timing of merger) based on the market's overvaluation of their firm in the period before the merger. They almost choose the moment to effect the merger, timing the market. Hence, in the analysis I have to take into account the average level of market valuation in the years before the merger as well as the market valuation of the firm in the period nearest (one year before) the merger.

Results are reported in Table VII.

**\*\*\* Add Table VII here\*\*\***

For the four years before the merger, the average Tobin's Q of stock acquirers is 3.20, significantly higher (at the one percent level) than that of cash acquirers (1.85). Similarly, the year before the merger, the Tobin's Q of stock acquirers is 3.42, significantly higher (at the one percent level) than that of cash acquirers (1.88).

Interestingly in the case of the Tobin's Q variable, cash firms seem to behave similarly to mixed ones, the opposite of what I have found in the analysis of post-merger investments.

Results are consistent with the findings of Martin (1996) and Dong *et al.* (2006): firms that make stock mergers are characterized by higher Tobin's Q.

### **III. MULTIVARIATE ANALYSIS**

The multivariate analysis allows me to test the investment opportunities together with the market misvaluation theories on the method of payment. Using the post-merger investments, I can distinguish the impact of investment opportunities (proxied by post-

merger capital expenditures) from the impact of market misvaluation (proxied by the acquirer's Tobin's Q) on the choice of the method of payment in mergers. Furthermore, the multivariate analysis allows me to control for several other variables that might affect the choice of the method of payment.

### ***III.A Model and Variables***

I perform three logit regressions. *Method* is the dummy dependent variables for the different methods of payment (cash vs. stock, cash vs. mixed, stock vs. mixed).

As independent variables in the three regressions, I introduce the level of investment opportunities (i.e.,  $\overline{CA}_{merged\_after}$ , the average ratio of the capital expenditures over the assets in the four years after the merger) and the market misvaluation (the average Tobin's Q of the acquirer in the four years before the merger).

Furthermore, I control for liquidity measures (the pre-merger acquirer's level of cash flow, cash, cash dividend and leverage), relative size of the target, relatedness of the two merging firms in terms of sector, industry of the acquirer, and time fixed effect.

The choice of the method of payment can be affected by the liquidity constraints of the firm. As a measure of liquidity constraints, I use four different variables often used in the literature: cash flow, leverage, cash and cash dividends.

Cash flow is measured as the sum of earnings before extraordinary items (Compustat item 18), and depreciation (item 14).<sup>3</sup> The leverage is measured as the ratio of debt to capital. Debt is the sum of the book value of short-term debt and long-term debt (items 9 and 34), while total capital is the sum of debt, book value of preferred stock (item 130), and book value of common equity (item 60). Cash is measured as the sum of cash and short-term investments (item 1). Cash dividend is Compustat item 26.

I deflate cash flow, cash and cash dividend by the assets (item 6) and calculate the average of the ratios in the four years before the mergers. As for the leverage, I also calculate the average of the variable in the four years before the merger.

Variables that can affect the method of payment include the relative size of the target compared to the acquirer. A large target relative to the size of the acquirer would

---

<sup>3</sup> See Kaplan and Zingales (1997)

probably lead to a stock merger instead of a cash merger. Raising enough cash to buy a target of similar size seems unlikely.

However, the size of the target relative to the acquirer has been used to control for the risk-sharing hypothesis (see Martin, 1996). The risk sharing-hypothesis is based on the assumption of asymmetric information between target and bidder. Hansen (1987) analyzes the choice of method of payment under the circumstance of asymmetric information between target and bidder. If the target knows its value better than the bidder, then the bidder would choose stock as a method of payment, making the target to distribute between the two firms the post-acquisition revaluation.

The problem of asymmetric information should be larger as the value of the target increases compared to the acquirer's value. Hence, the use of stock as a method of payment should be more likely to take place as the size of the target increases compared to the acquirer's size. Thus, to control for the risk-sharing hypothesis I use the relative size of the target compared to the acquirer (*Rsize*), measured as the ratio of the market value of the target to the market value of the acquirer, both calculated 20 days before the announcement of the merger.

Finally I control for industries, time fixed effect and relatedness in terms of sector of acquirer and target. Acquirer and target are related in terms of sector if the first two digits of the acquirer's SIC code are the same of the first two digits of the target's SIC code.

Hence, the regression I run has the following specification:

$$Method = \beta_0 + \beta_1(\overline{CA}_{merged\_after}) + \beta_2 AcqQ + \beta_3(CF / A) + \beta_4 Leverage + \beta_5(Cash / A) + \beta_6(CDiv / A) + \beta_7 RSize + \beta_8 Relsect + \beta_9 Industries + \varepsilon$$

*Method* = dummy for the method of payment. In regression 1 the dummy dependent variable has value 1 if the method is cash, 0 if it is stock; in regression 2 the dummy dependent variable has value 1 if the method is cash, 0 if it is mixed; in regression 3 the dummy dependent variable has value 1 if the method is stock, 0 if it is mixed.

The independent variables and their expected signs for logit regression 1 (cash vs. stock) are summarized in Table VIII. I do not have any prediction for logit regressions 2 and 3 since SDC often does not provide the percentage of cash and stock.

A mixed merger with a higher percentage of stock vs. cash would most likely behave more like a stock merger and vice versa. Aggregating mixed mergers with different percentages of cash and stock might lead to unexpected results.

**\*\*\* Add Table VIII here\*\*\***

### ***III.B Logit Regressions***

Table IX shows the results of the three logit regressions.

**\*\*\* Add Table IX here\*\*\***

The first column of table IX is a logit regression with dummy dependent variable 1 if the method of payment is cash and 0 if it is stock. The measure used as a proxy for the investment opportunities is significant at the one percent level with a negative coefficient, thus confirming that firms with high investment opportunities prefer to use stock as a method of payment. Tobin's Q, the proxy for market misvaluation, has a negative and significant (at the one percent level) coefficient; firms that are overvalued prefer to use stock as a method of payment instead of cash. I interpret the significance of both the coefficients of the capital expenditure and the Tobin's Q as a sign of the coexistence of two effects that are not mutually exclusive: investment opportunities and market misvaluation.

Among the proxies for the liquidity constraints, the level of acquirer's cash flow is significant at the one percent level with a positive coefficient (as expected). The only other variable significant is leverage (at the one percent level) with a positive coefficient (contrary to my expectation). It might be that firms with low investment opportunities raise funds through debt to finance cash mergers. They do not care about burdening the firm with risky debt since they will not make investments in the future (thus they are not concerned about the problem raised by debt overhang). The other proxies for liquidity constraints are not significant. Interestingly RSize do not affect the method of payment.

Results regarding mixed mergers are somewhat weak and difficult to interpret since, as mentioned, the percentage of cash and stock in a mixed merger is often unknown. The choice of a mixed method of payment seems to be driven by the same

characteristics as the stock one, although with some differences. Acquirers with high investment opportunities prefer to use mixed payment instead of cash ( $\overline{CA}_{merged\_after}$  is significant at the five percent level in regression 2 of Table IX), while the variable  $\overline{CA}_{merged\_after}$  is not significant in regression 3 (stock vs. mixed method of payment). The market misvaluation (Tobin's Q) leads to mixed mergers instead of cash ones, and to stock mergers instead of mixed.

Leverage is marginally significant (not significant) in the choice between mixed method of payment and cash (stock). The level of cash flow does not affect the choice between stock and mixed payment, though it is significant in regression 2 (cash vs. mixed method of payment). The level of cash is significant in both the regressions 2 and 3, and interestingly the coefficient is (unexpectedly) positive even in regression 3. The relative size of the target compared to the acquirer leads to mixed mergers instead of cash ones and (unexpectedly) to mixed merger instead of stock ones.

It is interesting that investment opportunities ( $\overline{CA}_{merged\_after}$ ) strongly lead to non-cash mergers (either mixed or stock); even if the firm decides to use some cash (perhaps because it has a high level of internal funds), it will not burden the firm too much with debt for the reasons previously explained and will prefer mixed mergers to cash ones. Overall, results of mixed mergers versus cash and stock mergers confirm the findings of regression 1.

It might be that the value of Tobin's Q and the liquidity constraints in the year before the merger affect the choice of payment more than the average values. Regarding the Tobin's Q, a high overvaluation in the year before the merger might lead the manager to use stock as a method of payment. On the other side, a shortage of liquidity in the year before the merger might force the firm not to use cash as a method of payment. Hence, I have run the three logit regressions, which appear in Table IX, using the Tobin's Q and the liquidity constraints of the acquirer calculated in the one year before the merger instead of in the four years before the merger. Results confirm the findings shown in Table IX.<sup>4</sup>

---

<sup>4</sup> In the regressions, as a proxy of the market misvaluation instead of the Tobin's Q I have also introduced the average of the acquirer's ratio of the price to the book value of the equity in the four years before and in the one year before the merger. Results do not change (not reported but available upon request).



The total number of mergers made by a firm would probably affect the method of payment in the takeover analyzed. It might be unlikely that an acquirer will buy more than seven firms with cash, unless their size is very small. It is interesting how many mergers have been made by single acquirers in 11 years (5 years before and after the merger). Almost 24% of the firms analyzed have made at least two mergers, 14% made three mergers, and, amazingly, near 5% made more than seven mergers.

Moreover, the length of time from the previous merger (one, two, three or four years before the merger) could influence the merger in consideration. If a firm has acquired a target with cash last year (or plans to make a merger of an undervalued target next year), it might be less willing to use cash as a method of payment in a merger this year.

In Table X, I introduce in the logit regressions eight dummies to control for other mergers made by the acquirer (apart from the one analyzed) in each of the four years before and after the merger studied. For example, the dummy Merger\_m1 has value 1 if the acquirer studied has made at least one merger in the year before the merger analyzed, 0 otherwise; the dummy Merger\_m2 has value 1 if the acquirer studied has made at least one merger in the second year before the merger analyzed, 0 otherwise, and so on.<sup>5</sup>

**\*\*\* Add Table X here\*\*\***

Results do not change from the previous regression. However, Merger\_p1 is significant and has a negative sign in regressions 1; firms that make a merger in the year after the takeover are less willing to use cash (vs. stock) in the merger analyzed. Firms that make subsequent mergers are most likely either growing firms with investment opportunities or firms that are exploiting their overvaluation. In both cases, bidders' managers will prefer to use stock as a method of payment. Interestingly and unexpectedly, Merger\_p2 is significant at the 5 percent level but with a positive sign.

---

<sup>5</sup> The dummy Merger\_p1 has value 1 if the acquirer studied has made at least one merger in the year after the merger analyzed, 0 otherwise; the dummy Merger\_p2 has value 1 if the acquirer studied has made at least one merger in the second year after the merger analyzed, 0 otherwise, and so on.

I also perform logit regressions adding as independent dummy variables the total number of mergers done by the acquirer in the five years before and after the merger.<sup>6</sup> The findings do not change and none of the dummies for the total number of mergers is significant.<sup>7</sup> Hence, results seem to be robust. However, it might be argued that the previous logit regressions do not take into account the size of previous or subsequent mergers made by an acquirer before or after the merger analyzed. Hence, as a final step in my analysis, I reduce the sample to the acquirers that have made only one merger in eleven years (five years before and after the merger).

**\*\*\* Add Table XI here\*\*\***

Results presented in Table XI confirm the findings of the analysis made on the whole sample.<sup>8</sup> The only changes are related to the control variables. Interestingly the industry dummies seem to lose significance in the analysis of the reduced sample.

Finally, I check for the possible problem of endogeneity; it might be that the choice of the method of payment drives the level of post-merger investments. I use treatment effect model. As the instrument in the logit regression, I use the ratio of the property plant and equipment to the assets of the merged entity, measured in the year after the merger (the level of post-merger investments is the instrumented variable).

The results of the logit regressions with the instrumental variable are similar to the previously run logit regressions and the investment opportunities proxy behaves as before: it is significant with negative sign in regressions 1 (stock vs. cash) and 2 (cash vs. mixed). Results are shown in Table XII.<sup>9</sup> The Wald statistic underlines that I do not

---

<sup>6</sup> Specifically the dummies are 2Mergers, 3Mergers, 4Mergers, 5to7Mergers, and Over7Mergers (the acquirer has made two, three, four, five to seven, and more than 7 mergers, respectively).

<sup>7</sup> I have also run logit regressions introducing a single independent dummy variable More1Merger that takes a value of 1 if the firm has made more than one merger, and zero otherwise. Results are similar to those shown in Table IX, and the variable More1Merger is not significant (results are not reported).

<sup>8</sup> As was previously done, I also introduce as independent variable the Tobin's Q and the liquidity constraints of the acquirer, calculated in the year before the merger instead of in the four years before the merger. Results confirm the findings shown in Table XI (results are not reported)

<sup>9</sup> I also run logit regressions with the same instrumental variable on the whole sample with the variables shown in Table X. Results do not change (results are not reported).

incur in the endogeneity problem. Furthermore, even if the coefficient of  $\overline{CA}_{merged\_after}$  is lower in Table XII than in Table XI, if we consider the standard error of  $\overline{CA}_{merged\_after}$  in Tables XI and XII, the confidence intervals of the variable  $\overline{CA}_{merged\_after}$  in the two specifications are overlapping

**\*\*\* Add Table XII here\*\*\***

#### **IV DISCUSSION**

In this section, I will discuss the results of the empirical analysis run to test the investment opportunities and the market misvaluation effects on the method of payment in mergers.

In the investment opportunities theory, managers choose not to load the firm with risky debt, so that the gain from future company investments will not accrue to creditors (as in Myers, 1977). In this case, managers, in order not to damage shareholders, will not (or will be less inclined to) make additional investments. As a consequence, firms that have many investment opportunities (i.e., firms that have real growth options) would be less willing to make use of debt and, in the case of merger, to use cash as a method of payment.<sup>10</sup>

In the market misvaluation theory of takeover, managers use the method of payment to exploit market mispricing (see Shleifer and Vishny, 2003). They will make a stock merger if their firm is overvalued, obtaining a good real exchange ratio, and use cash to buy an undervalued target, acquiring the firm at a price below its fundamental value.

Martin (1996) has tested the investment opportunities theory on the method of payment using, as a proxy for the investment opportunities, the Tobin's Q. Results show that firms with higher investment opportunities make stock mergers.

---

<sup>10</sup> Similarly, the investment opportunity theory can be applied in the equity issue context (see Jung *et al.*, 1996)

Shleifer and Vishny (2003) provide empirical examples of the market misvaluation. Furthermore, several studies of the post-merger returns (see Loughran and Vijh, 1997, among others) show that firms that make stock mergers have lower return compared to cash acquirers and matching firms (similar in size and book to market ratio) that do not merge, thus supporting the market misvaluation theory.

Finally Dong *et al.* (2006) have tested the two theories analyzing several features of the takeover market. However, given the proxy used to understand the effect of the two theories, several findings can support both the investment opportunities and the market misvaluation theory.

The post-merger investments used as a proxy of the investment opportunities should overcome this problem. Hence, in this paper I have proposed a different proxy of the investment opportunities of a firm, i.e. post-merger investments. Those investments should be highly correlated to the investments planned before the merger (see Lamont, 2000) and thus they should mirror the investment opportunities that the manager believes the firm has.

In the data and variables, univariate and multivariate analysis sections, I have provided support for my investment opportunity proxy (Section II), tested the two theories separately (Section III) and jointly (Section IV).

If, as postulated, investments follow a plan made by managers before the mergers, I expected post-merger investments to have a stable pattern, without sudden drops. It is unlikely that a manager would plan levels of investment that change suddenly year by year.

Therefore, in Section II I have studied the pattern of the capital expenditures before and after the merger. I found that the level of the investments, measured by the ratio of capital expenditures to assets (C/A), is stable in the four years before and after the merger, without sudden drops. The high correlations of the C/A ratio in subsequent years further confirm the strong link between C/A ratio of succeeding years. Hence, the characteristics of post-merger investments are consistent with the supposed predetermined pattern. The results support my decision to use post-merger investments as a measure of investment opportunities.

In the discussion of the univariate and multivariate analysis sections' findings, I examine only the differences between stock and cash mergers (and not mixed ones),

given that results are difficult to interpret since the weight of cash and stock might be vastly different in the various transactions.

In the univariate analysis, the average ratio of capital expenditures to assets in the four years after the merger is significantly higher for stock mergers than for cash ones. Furthermore, the ratio of capital expenditures to assets is significantly higher for stock mergers than for cash ones in *each* of the four years after the merger. Therefore, the findings support the investment opportunities theory.

Moreover, the average ratio of capital expenditures to assets in the four years before the merger is significantly higher for stock mergers than for cash ones. In addition, the ratio of capital expenditures to assets is significantly higher for stock mergers than for cash ones in *each* of the three years before the merger. It is likely (though not always true) that a merged entity with high investment opportunities was, before the merger, an acquirer with high investment opportunities. Results confirm this hypothesis.

On the other hand, the average Tobin's Q of stock acquirers in the four years before the merger is significantly higher than that of cash acquirers. Furthermore, the Tobin's Q of stock acquirers measured one year before the merger is significantly higher than that of cash acquirers. Results support the market misvaluation theory.

However, given that the Tobin's Q can be used as proxy for investment opportunities, the results might be read as supporting the investment opportunities theory too. Hence, to disentangle the two effects, another variable, the post-merger investments, is used to capture the investment opportunities portion of the Tobin's Q. The multivariate analysis allows me to leave to the Tobin's Q the sole meaning of the market misvaluation and to test jointly the two theories.

The multivariate analysis shows that both theories affect the choice of the method of payment in mergers. The results underline that investment opportunities lead managers to choose stock as a method of payment. However, findings also provide further empirical support that irrational investors affect corporate decisions and, specifically, takeover characteristics. The two drivers have been tested by the literature separately, while this study has analyzed them singularly and in combination, indicating that the two effects can coexist.

The results have been shown to be robust. Adding several control variables, changing the period of measure of some independent variables, controlling for time fixed effects, multiple mergers (in different ways), reducing the sample studied to the sole acquirers that have made a single merger and controlling for endogeneity problems do not change the results.

## V. CONCLUSIONS

The debate about the influences of the market misvaluation and the investment opportunities theories on takeover characteristics is still open (see Dong *et al.*, 2006). The discussion involves the efficiency of the market. The investment opportunities theory postulates that the market is efficient and able to recognize the real growth opportunities of a firm, which are then pursued by rational and non-opportunistic managers; the market misvaluation theory suggests that rational and opportunistic managers exploit an inefficient market.

I tested the two theories in terms of choice of the method of payment in mergers, proposing a new proxy for investment opportunities (the level of post-merger investments) that is able to disentangle the two theories' effects, which might coexist. Planned investments are strongly correlated with actual investments (see Lamont, 2000) and should be based on the investment opportunities that the manager believes the firm has. Hence, the actual investments of the *merged* entity are a good proxy for the investment opportunities that the manager believed the merged entity itself would have.

In the empirical analysis performed, it becomes clear that firms that make stock mergers have a higher level of post-merger investments in the four years after the merger (average ratio of capital expenditures to assets in the four years after the merger) than firms that make cash mergers. Results are similar for the four years before the merger and support the investment opportunities theory.

On the other hand, firms that use stock instead of cash as a method of payment show a higher average of Tobin's Q in the four years before the merger and a higher

level of the ratio in the year before the merger. Those latter results might be interpreted as supporting both the market misvaluation and the investment opportunities theory.

The logit analysis allowed me to test jointly and to disentangle the effects of investment opportunities and market misvaluation theories on the method of payment. Results show that *both* the market misvaluation *and* the investment opportunities affect the method of payment in mergers.

Previous measures of investment opportunities *and* market misvaluation have been the Tobin's Q and similar ratios (the price over the book value of the acquirer's equity), while the ratio of the price to residual income valuation or the stock abnormal return has been mainly used as proxy for mispricing. However, using those proxies, it is difficult to disentangle the effect of the market misvaluation and the investment opportunities theories, given the fact that the two theories sometimes share similar implications and results can support both theories (see Dong *et al.* 2006). Furthermore, the use of the stock abnormal return as proxy for the market misvaluation has been criticized since there is much disagreement about how to interpret and to calculate the long-run post-event returns (see Dong *et al.*, 2006).

This aim of this paper is to offer further empirical findings to the debate, introducing a new proxy for investment opportunities. Results are complementary to previous papers on the topic, and shed some light on the impact of market misvaluation and investment opportunities in the takeover context.

A final remark: several studies analyze the post-merger performance of companies and some works show that firms that have made stock mergers perform worse than firms that have made cash mergers. Specifically, Loughran and Vijh (1997) analyze the long-run (five years after the merger) performance of firms that have made a merger. Their findings show that stock acquirers perform poorly compared to cash acquirers and matching firms (similar in size and book to market ratio) that do not merge. These findings support the market misvaluation theory.

On the other hand, evidence of the different level of post-merger investments between cash and stock merged entities appear to imply that managers' choice to use stock as a method of payment can be driven by their belief in the investment opportunities of their firm.

In this latter case, it might be that both the market and the managers are overconfident about the growth opportunities of the firms, and that the commonly perceived growth opportunities lead to market misvaluation, suggesting a possible link between the market misvaluation and growth opportunities theories in the merger context.



## References

- Andrade, Gregor, Mark L. Mitchell, and Erik Stafford, 2001, New evidence and perspectives on mergers, *Journal of Economic Perspectives* 15, 103–120.
- Baker, Malcolm P., and Jeffrey Wurgler, 2000, The equity share in new issues and aggregate stock returns, *Journal of Finance* 55, 2219–2257.
- Black, Bemard, 1992, Agents watching agents: The promise of institutional investor voice, *UCLA Law Review* 39, 811-893.
- Dong, Ming, David Hirshleifer, Scott Richardson and Siew Hong Teoh, 2006, Does investor misvaluation drive the takeover market? *Journal of Finance* 61, 725-762.
- Hansen, Rohert G., 1987, A theory for the choice of exchange medium in mergers and acquisitions, *Journal of Business* 60, 75-95.
- Healy, Paul M., Krishna G. Palepu and Richard S. Ruback, 1992. Does corporate performance improve after mergers? *Journal of Financial Economics* 31, 135–176.
- Jensen, Michael C, 1986, Agency costs of free cash flow, corporate finance, and takeovers, *American Economic Review* 76, 323-329.
- Jensen, Michael C, 1991, Corporate control and the politics of finance, *Journal of Applied Corporate Finance* 4, 13-33.
- Jung, Kooyul, Yong-Cheol Kim, and René Stulz, 1995, Timing, investment opportunities, managerial discretion, and the security issue decision, *Journal of Financial Economics* 42, 159–185.
- Kaplan, Steven N., and Luigi Zingales, 1997, Do investment-cash flow sensitivities provide useful measures of financing constraints? *The Quarterly Journal of Economics* 112 (1), 169-215.
- Lamont, Owen A., 2000, Investment plans and stock returns, *Journal of Finance* 55 (6), 2719-2745.
- Lang, Larry H. P., René Stulz, and Ralph A. Walkling, 1989, Managerial performance, Tobin's q, and the gains from successful tender offers, *Journal of Financial Economics* 24, 137–154.
- Loughran, Tim, and Anand M. Vijh, 1997, Do long-term shareholders benefit from corporate acquisitions? *Journal of Finance* 52, 1765–1790.

- Martin, Kenneth J., 1996, The method of payment in corporate acquisitions, investment opportunities, and management ownership, *Journal of Finance* 51, 1227–1246.
- Myers, Stewart C., 1977, Determinants of corporate borrowing, *Journal of Financial Economics* 5, 147-175.
- Roll, Richard, 1986, The hubris hypothesis of corporate takeovers, *Journal of Business* 59, 197–216.
- Shleifer, Andrei, and Robert W. Vishny, 2003, Stock market driven acquisitions, *Journal of Financial Economics* 70, 295–311.
- Stulz, René M., 1988, Managerial control of voting rights: Financing policies and the market for corporate control, *Journal of Financial Economics* 20, 25-54.

**Table I**  
**Descriptive Statistics of the Sample**

Number of mergers, mean value per transaction and percentage of cash, stock and mixed mergers by calendar year. The sample includes all successful and completed mergers of U.S. publicly traded acquirers and targets announced between 1984 and 2000. Acquirers and targets do not belong to the financial, insurance and real estate industries. Mergers in which capital expenditures of the acquirer (merged entity) are not available for at least one of the four years before (after) the merger are dropped from the sample.

<b>Year</b>	<b>N</b>	<b>Mean Value Per Transaction</b>	<b>Cash (%)</b>	<b>Stock (%)</b>	<b>Mixed (%)</b>
1984	27	728.2	7.4	22.2	70.4
1985	44	398.9	54.5	27.3	18.2
1986	63	545.7	69.8	25.4	4.8
1987	58	218.7	70.7	13.8	15.5
1988	53	278.7	73.6	15.1	11.3
1989	50	574.5	54.0	38.0	8.0
1990	34	308.7	52.9	41.2	5.9
1991	37	508.2	37.8	46.0	16.2
1992	29	322.2	34.5	44.9	20.7
1993	30	226.9	40.0	23.3	36.7
1994	64	776.9	32.9	48.4	18.7
1995	99	636.7	36.4	49.5	14.1
1996	120	800.1	28.3	55.0	16.7
1997	165	899.0	29.5	48.5	22.0
1998	189	1,259.8	35.3	45.5	19.2
1999	214	1,681.9	38.7	39.8	21.5
2000	186	2,810.1	32.2	41.4	26.3

**Table II****Level of Pre- and Post-Merger Investments by Calendar Year**

Sample mean of the C/A ratio in each of the four years before and after the merger for the acquirer and merged entity, respectively. C/A\_m1 is the ratio measured one year before the merger, C/A\_m2 is the ratio measured two years before the merger, and so on. C/A\_p1 is the ratio measured one year after the merger, C/A\_p2 is the ratio measured two years after the merger, and so on.

CA_m1	CA_m2	CA_m3	CA_m4
0.068	0.072	0.076	0.073
CA_p1	CA_p2	CA_p3	CA_p4
0.062	0.057	0.052	0.049

**Table III****Correlation of the C/A Ratio between Subsequent Years before the Merger**

Correlation of the acquirer's C/A ratio. Correlations are measured in the four years before the merger. C/A\_m1 is the ratio measured one year before the merger, C/A\_m2 is the ratio measured two years before the merger, and so on.

	C/A_m1	C/A_m2	C/A_m3.	C/A_m4
C/A_m1	1.00			
C/A_m2	0.76	1.000		
C/A_m3.	0.58	0.72	1.00	
C/A_m4	0.52	0.61	0.69	1.00

**Table IV****Correlation of the C/A Ratio between Subsequent Years after the Merger**

Correlations of the merged entities' C/A ratio. Correlations are measured in the four years after the merger. C/A\_p1 is the ratio measured one year after the merger, C/A\_p2 is the ratio measured two years after the merger, and so on.

	C/A_p1	C/A_p2	C/A_p3.	C/A_p4
C/A_p1	1.00			
C/A_p2	0.76	1.00		
C/A_p3.	0.65	0.81	1.00	
C/A_p4	0.60	0.69	0.80	1.000

**Table V****Tobin's Q**

Acquirer's Tobin's Q in the four years before the merger and its average. Tobin's Q\_m1 is the Tobin's Q of the acquirer measured one year before the merger, Tobin's Q\_m2 is Tobin's Q of the acquirer measured two years before the merger, and so on.

Tobin's Q_m1	Tobin's Q_m2	Tobin's Q_m3.	Tobin's Q_m4	Mean
2.48	2.30	2.13	2.04	2.39

**Table VI**  
**Methods of Payment and Investments**

$\overline{CA}_{acquirer\_before}$  and  $\overline{CA}_{merged\_after}$  for cash, stock and mixed mergers.

Method of payment	Acquirer average C/A (4y before merger)	N	Merged entity average C/A (4y after merger)	N
	Mean		Mean	
Stock	0.074	598	0.058	598
Cash	0.067	574	0.052	574
Difference	0.006**		0.006***	
Tot		1172		1172
Mixed	0.076	290	0.059	290
Cash	0.067	574	0.052	574
Difference	0.008**		0.006**	
Tot		864		864
Mixed	0.076	290	0.059	290
Stock	0.074	598	0.058	598
Difference	0.001		0.000	
Tot		888		888

\*\*\*, \*\*, and \* indicates variables are significant at the 1%, 5%, and 10% levels, respectively.

**Table VII**  
**Method of payment and Tobin's Q**

Acquirer's average Tobin's Q for cash, stock and mixed acquirers in the four years before the merger, and the acquirer's Tobin's Q for cash, stock and mixed acquirers one year before the merger.

Method of payment	Acquirer average Tobin's Q (4y before merger)	N	Acquirer Tobin's Q (year before the merger)	N
	Mean		Mean	
Stock	3.20	533	3.42	506
Cash	1.85	526	1.88	509
Difference	1.35***		1.54***	
Tot		1,059		1,015
Mixed	1.81	259	1.81	251
Cash	1.85	526	1.88	509
Difference	-0.03		-0.06	
Tot		785		760
Mixed	1.81	259	1.81	251
Stock	3.20	533	3.42	506
Difference	-1.39***		-1.61***	
Tot		792		757

\*\*\*, \*\*, and \* indicates variables are significant at the 1%, 5%, and 10% levels, respectively.

**Table VIII**  
**Independent Variables**

Variable Name	Variable	Method of measurement	Exp. sign
$\overline{CA}_{merged\_after}$	Level of capital expenditures after the merger. Proxy for investment opportunities of the merged entity.	Average capital expenditures (Compustat item 128) to assets (item 6) of the merged entity in the four years after the merger.	-
AcqQ	Tobin' Q of the acquirer. Proxy for market misvaluation.	Average Tobin's Q of the acquirer in the four years before the merger. Tobin's Q is calculated as market value of the assets divided by the book value of assets (Compustat item 6), where the market value of the asset equals the book value of the assets plus the market value of common equity less the sum of the book value of common equity (item 60) and the balance sheet deferred taxes (item 74).	-
CF/A	Level of cash flows of the acquirer before the merger. Proxy for liquidity constraints.	Average ratio of cash flow to assets (Compustat item 6) of the acquirer in the four years before the merger. Cash flow is measured as the sum of earnings before extraordinary items (item 18), and depreciation (item 14).	+
Leverage	Leverage of the acquirer. Proxy for liquidity constraints.	Average leverage of the acquirer in the four years before the merger. Leverage is measured as the ratio of debt to capital. Debt is the sum of the book value of short-term debt and long-term debt (Compustat items 9 and 34), while total capital is the sum of debt, book value of preferred stock (item 130), and book value of common equity (item 60).	-
Cash/A	Cash availability of the acquirer. Proxy for liquidity constraints.	Average ratio of cash and short term investments (Compustat item 1) to assets (item 6) of the acquirer in the four years before the merger.	+
CDiv/A	Level of cash dividend of the acquirer. Proxy for liquidity constraints.	Average ratio of cash dividends (item 26) to assets (item 6) of the acquirer in the four years before the merger.	+
RSize	Relative size of the target compared to the acquirer.	Market value of the target over the acquirer, each calculated twenty days before the merger announcement	-
Relsect	Level of relatedness in term of sector of the acquirer and the target.	Dummy variable 1 if the first two digits of the acquirer SIC code are the same of the first two digits of the target (related sector), 0 otherwise (unrelated sector).	?
Mining, Construction, Transportation, Communication Utilities, Retail Trade, Services, Wholesale Trade, Manufacturing	Industry of the acquirer.	Dummies for industries of the acquirers. The benchmark industry dummy is the manufacturing one.	?

**Table IX**  
**Logit regressions**

Logit regressions with dummy dependent variables for the method of payment. In regression 1 the dummy dependent variable has value 1 if the method is cash, 0 if it is stock; in regression 2 the dummy dependent variable has value 1 if the method is cash, 0 if it is mixed; in regression 3 the dummy dependent variable has value 1 if the method is stock, 0 if it is mixed.  $\overline{CA}_{merged\_after}$  is the average ratio of capital expenditures to assets of the merged entity in the 4 years after the merger. AcqQ, CF/A, Leverage, Cash/A, CDiv/A are respectively the acquirer's average 1) Tobin's Q, 2) ratio of cash flows over assets, 3) the ratio of debt to capital, 4) ratio of cash and short term investments over assets, 5) ratio of cash dividends over assets in the 4 years before the merger. RSize is the ratio of market value of the target to market value of the acquirer, each calculated twenty days before the merger announcement. Relsect is the relatedness in term of sector of acquirer and target. I add dummies for industries and I control for the time fixed effect.

	<b>1-cash vs. stock</b>	<b>2-cash vs. mixed</b>	<b>3-stock vs. mixed</b>
Cons.	0.42	0.47	-0.54
	(0.84)	(0.80)	(0.65)
$\overline{CA}_{merged\_after}$	-8.28***	-6.10**	0.70
	(2.71)	(2.90)	(2.69)
Acq Q	-0.64***	-0.32***	0.46***
	(0.10)	(0.12)	(0.13)
CF/A	10.50***	10.50***	1.20
	(2.01)	(2.23)	(1.38)
Leverage	1.35***	0.06	-0.93*
	(0.49)	(0.56)	(0.56)
Cash/A	-0.77	3.32***	2.35***
	(0.76)	(1.27)	(0.93)
CDiv/A	0.83	2.63	0.20
	(5.03)	(6.44)	(6.82)
RSize	-0.13	-0.53**	-0.44**
	(0.20)	(0.21)	(0.21)
Relsect	-0.01	-0.36*	-0.30
	(0.15)	(0.19)	(0.21)
Mining	-2.04***	-2.24***	-0.11
	(0.56)	(0.65)	(0.42)
Construction	-0.04	0.16	-0.45
	(1.02)	(1.31)	(0.91)
Transportation	0.33	-0.27	-0.40
	(0.47)	(0.51)	(0.55)
Communication	-0.55	-1.09***	-0.46
	(0.37)	(0.33)	(0.32)
Utilities	-1.93***	-1.11**	0.72**
	(0.40)	(0.46)	(0.35)
Wholesale Trade	0.24	0.14	-0.34
	(0.41)	(0.50)	(0.50)
Retail Trade	-0.16	-0.33	0.00
	(0.30)	(0.35)	(0.37)
Services	-0.46**	-0.52**	-0.05
	(0.20)	(0.26)	0.25
Dummy for year of merger	Y	Y	Y
N	1,013	741	760
Pseudo R sq	0.24	0.22	0.19

\*\*\*, \*\*, and \* indicates variables are significant at the 1%, 5%, and 10% levels, respectively.

**Table X**

**Logit Regressions with Multiple Mergers Dummies**

Dependent and independent variables are the same as in Table IX. I add dummies to control for other mergers made by the acquirer (apart from the one analyzed) in each of the 4 years before and after the merger.

	<b>1-cash vs. stock</b>	<b>2-cash vs. mixed</b>	<b>3-stock vs. mixed</b>
Cons.	0.35	0.55	-0.51
C/A after the merger	-8.50***	-6.58**	0.99
	(2.74)	(3.06)	(2.79)
Acq Q	-0.64***	-0.33***	0.43***
	(0.10)	(0.12)	(0.13)
CF/A	10.36***	10.82***	0.88
	(2.05)	(2.30)	(1.42)
Leverage	1.38***	0.06	-1.03*
	(0.50)	(0.57)	(0.58)
Cash/A	-0.95	3.52***	2.57**
	(0.77)	(1.30)	(0.93)
CDiv/A	1.55	2.68	0.41
	(5.07)	(6.40)	(7.12)
RSize	-0.14	-0.51**	-0.42**
	(0.20)	(0.22)	(0.21)
Relsect	-0.03	-0.39**	-0.25
	(0.15)	(0.19)	(0.21)
Mining	-2.01***	-2.25***	-0.10
	(0.59)	(0.69)	(0.42)
Construction	-0.09	0.28	-0.49
	(0.98)	(1.25)	(1.04)
Transportation	0.30	-0.25	-0.40
	(0.48)	(0.52)	(0.58)
Communication	-0.54	-1.15***	-0.63*
	(0.38)	(0.34)	(0.34)
Utilities	-1.99***	-1.12**	0.72**
	(0.40)	(0.45)	(0.36)
Wholesale Trade	0.19	0.19	-0.27
	(0.40)	(0.48)	(0.51)
Retail Trade	-0.16	-0.33	-0.04
	(0.31)	(0.37)	(0.37)
Services	-0.41*	-0.53**	-0.11
	(0.21)	(0.27)	(0.26)
Merger_m4	0.050	0.11	-0.27
	(0.33)	(0.38)	(0.35)
Merger_m3	0.08	0.15	0.30
	(0.30)	(0.35)	(0.32)
Merger_m2	-0.49*	0.17	0.49
	(0.27)	(0.36)	(0.30)
Merger_m1	0.26	0.36	0.15
	(0.23)	(0.29)	(0.26)
Merger_p1	-0.49**	0.02	0.54**
	(0.21)	(0.28)	(0.26)
Merger_p2	0.57**	-0.28	-0.31
	(0.26)	(0.31)	(0.29)
Merger_p3	0.05	-0.17	-0.24
	(0.29)	(0.32)	(0.31)
Merger_p4	-0.42	-0.35	0.37
	(0.29)	(0.34)	(0.36)
Dummy for year of merger	Y	Y	Y



Pseudo R sq	0.25	0.23	0.21
-------------	------	------	------

\*\*\*, \*\*, and \* indicates variables are significant at the 1%, 5%, and 10% levels, respectively.

**Table XI**

**Logit Regressions on the Reduced Sample**

Dependent and independent variables are the same as in Table IX. The regressions are run on a reduced sample with acquirers that have made only one merger in the eleven year time-window analyzed.

	<b>1-cash vs. stock</b>	<b>2-cash vs. mixed</b>	<b>3-stock vs. mixed</b>
Cons.	2.09 (0.95)	0.34 (1.01)	-2.06 (0.95)
$\overline{CA}_{merged\_after}$	-13.54*** (4.20)	-17.06*** (5.67)	0.84 (3.38)
Acq Q	-1.13*** (0.25)	-0.69*** (0.27)	0.54*** (0.16)
CF/A	11.74*** (3.52)	15.61*** (4.69)	2.73* (1.56)
Leverage	1.12 (0.75)	0.80 (0.85)	0.21 (0.78)
Cash/A	-2.51* (1.37)	2.10 (1.76)	3.73*** (1.26)
CDiv/A	6.75 (8.88)	19.66** (10.95)	12.41 (11.81)
RSize	0.26 (0.28)	-0.39 (0.31)	-0.59** (0.29)
Relsect	0.11 (0.26)	-0.03 (0.32)	-0.38 (0.32)
Mining	-0.99 (0.81)	-0.58 (0.99)	-0.05 (0.68)
Transportation	0.37 (0.79)	0.01 (0.82)	-0.60 (0.76)
Communication	-1.02 (0.75)	-1.50*** (0.56)	-0.41 (0.58)
Utilities	-3.46*** (0.73)	-2.58*** (0.71)	0.63 (0.51)
Wholesale Trade	1.23* (0.69)	0.24 (0.74)	-1.01 (0.77)
Retail Trade	-0.03 (0.44)	0.97 (0.62)	0.94 (0.62)
Services	-0.71* (0.39)	-0.75 (0.46)	-0.26 (0.37)
Dummy for year of merger	Y	Y	Y
N	477	345	347
Pseudo R sq	0.36	0.31	0.19

\*\*\*, \*\*, and \* indicates variables are significant at the 1%, 5%, and 10% levels, respectively.

**Table XII**

**Logit Regressions on the Reduced Sample with Instrumental Variable**

Dependent and independent variables are the same as in Table IX. The regressions are run on a reduced sample using only acquirers that have made one merger in the eleven year time-window analyzed. The instrumental variable is the ratio of the property plant and equipment to the assets of the merged entity measured in the year after the merger; the instrumented variable is  $\overline{CA}_{merged\_after}$

	<b>1-cash vs. stock</b>	<b>2-cash vs. mixed</b>	<b>3-stock vs. mixed</b>
Cons.	0.70	-0.95	-1.14
	(0.57)	(0.56)	(0.51)
$\overline{CA}_{merged\_after}$	-7.56**	-12.97***	-1.07
	(3.22)	(4.13)	(3.19)
Acq Q	-0.60***	-0.35***	0.29***
	(0.12)	(0.14)	(0.08)
CF/A	6.48***	8.10***	1.67*
	(1.86)	(2.39)	(0.87)
Leverage	0.67	0.44	0.02
	(0.41)	(0.45)	(0.45)
Cash/A	-1.34*	1.03	2.12***
	(0.76)	(0.85)	(0.70)
CDiv/A	4.02	12.24**	5.85
	(4.99)	(6.09)	(6.68)
RSize	0.14	-0.21	-0.39**
	(0.16)	(0.16)	(0.16)
Relsect	0.01	-0.06	-0.18
	(0.14)	(0.17)	(0.17)
Mining	-0.63	-0.01	0.13
	(0.46)	(0.62)	(0.48)
Transportation	0.14	0.18	-0.28
	(0.45)	(0.45)	(0.50)
Communication	-0.42	-0.75	-0.21
	(0.39)	(0.35)	(0.34)
Utilities	-1.98***	-1.41***	0.41
	(0.39)	(0.39)	(0.30)
Wholesale Trade	0.76*	0.14	-0.61
	(0.38)	(0.34)	(0.50)
Retail Trade	-0.04	0.66*	0.63*
	(0.26)	(0.34)	(0.36)
Services	-0.43*	-0.43	-0.15
	(0.22)	(0.27)	(0.22)
Dummy for year of merger	Y	Y	Y

\*\*\*, \*\*, and \* indicates variables are significant at the 1%, 5%, and 10% levels, respectively.