

Post-Merger Performance Revisited

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Abstract

This paper examines the post-merger performance puzzle. Previous literature has shown that acquirers face long run negative abnormal returns if they use equity to finance their acquisition. This anomaly does not hold for cash-financed transactions. This paper is guided by the central question: why do companies engage in stock-financed mergers? The answer is intuitive; firms use stock-financed transactions to lessen the decline in their stock price. I show that when firms succeed in a stock-financed merger, they face little if any negative abnormal returns. Yet, when acquirers fail to purchase the target, they face large negative abnormal returns. After making a case for pre-treatment parallel trends, I contend that the difference between successful acquirers and failed acquirers is the effect of a successful merger. These results do not hold for cash. This paper builds on the work of previous literature, extends the analysis to include mergers announced until 2016, explores mergers that cluster by industry, and examines whether certain characteristics of a merger predict abnormal return.

Introduction

What is the long run effect of merger on an acquirer? Why does an acquirer suffer negative abnormal performance following equity financed mergers? These questions guide the post-merger performance puzzle. Loughran and Vijh (1997) state that firms issue stock when overvalued and issue debt when undervalued. This idea is further developed in Stein (1996) and Baker, Stein, and Wurgler (2003) who see the firm as a macro arbitrageur, willing to issue as

much equity (debt) as possible when overvalued (undervalued). Hence, an overvalued firm may finance an acquisition with its own stock rather than cash because the former is less expensive. The choice of financing in an acquisition has large implications for the valuation of the acquirer. Financing a large acquisition with stock indicates that a company sees its equity as overvalued. The acquirer benefits from bringing in another company, which it uses to lessen the decline of their stock price. This effect comes at the expense of the target shareholders, who essentially give up their company at a discount. As Shleifer and Vishny (2003) put it, “What the target gains the bidder loses.” Shleifer and Vishny (2003) also propose a model that explains which firms acquire other firms, the choice of payment, and the consequences of a merger on the acquirer. They predict that acquisitions favor stock (cash) when valuations are high (low).

The key idea underlying macro-arbitrage is that firms sitting on overvalued equity will put it to work by acquiring an undervalued firm, financing the transaction with stock. The acquirer gets valuable assets and know-how from the target for a bargain. This purchase can lessen the decline of the acquirer’s stock price over time and be interpreted as a form of arbitrage done by the company itself. When financial observers discuss who is best suited to perform arbitrage, hedge funds and savvy asset managers come to mind.¹ This paper challenges this view, asserting that the structure of firms makes them best suited to arbitrage themselves. This counterintuitive proposition is best illustrated when the counterfactual is properly examined: What would have happened if the merger failed?

This paper follows in the footsteps of Savor and Lu (2009) and tests the counterfactual. Savor and Lu (2009) construct an “exogenous failed” sample, where mergers fail for reasons independent of the valuation of the acquirer. Savor and Lu track the abnormal returns of

¹ This idea stems from a remark made by Professor Stein in his lecture on macro-arbitrage.

successful acquirers and failed acquirers, arguing that the difference can be interpreted as a causal effect of a successful merger. In this paper, I replicate Savor and Lu's results with some error for the first three years following a merger event, divide the analysis to see the effect of mergers on certain industries, and extend the sample period to 1978-2015 merger announcements. My main finding is that failed acquirers do worse than successful acquirers only when they use equity to finance and acquisition. In the first year following the event, I find that on average a successful acquirer has 14.9% higher cumulative return than a failed acquirer. This paper will focus on the abnormal returns following the first year of terminated or consummated merger as it provides indications for what happens in the following years and allows for a fruitful analysis of the topic. My results are consistent with the proposition that stock mergers create value for the acquirer and with the theme of macro-arbitrage: acquirers lessen the decline of their stock price. None of these results hold for cash-financed acquisitions. Finally, when I divide my results by industry, I find that failed acquirers in the consumer staples and telecom industries face the steepest declines in cumulative returns, perhaps indicative of the richly valued industries during the time period.

Section I provides a brief overview of a brief history of mergers and the relevant literature. **Section II** examines the construction of my sample and the methodology used to calculate long-run abnormal returns. **Section III** presents my results, explores mergers by industry and extends the analysis from 2003 to 2015. Finally, **Section V** concludes and underscores areas for further research.

Section I. A History of Mergers

Mergers closely track economic activity. They tend to occur in waves and are clustered by industry according to Andrade, Mitchell, and Stafford, 2003, AMS thereafter. The first fact is illustrated in the construction of my sample (see Figure 1). Following the 1980's, deregulation enabled companies to engage in more acquisitive behavior. Accordingly, about half of all US corporations received a takeover bid in the 1980s (AMS, 2003). Surprisingly, the 1990's saw even more merger bids. The lax regulatory environment created a huge incentive to acquire. The sheer volume of bids in the late 1990's is consistent with the beginning of the Dot-Com boom. Following economic downturns, merger activity is quite restrained as companies tighten their belts and lucrative valuations are checked. This fact holds in both the minor recession in 2001 and the Global Financial Crisis in 2007. Further, AMS show that mergers cluster by industry. Thus, in any analysis that deals with post-merger performance returns, the results should focus on a cumulative-returns in a particular industry. Notwithstanding large macroeconomic trends, mergers are driven by industry specific trends, i.e. they cluster by industry. Within a merger wave, specific industries dominate the wave. Savor and Lu (2009) do not address industry clustering. I add to their work by finding cumulative returns for each specific industry, highlighting industry specific returns.

Another important distinction between the 1980's and 1990's is the method payment. AMS report that approximately 70% of all deals in the nineties used stock as a method of payment. This marked a dramatic shift in financing from the 1980's where debt was the primary method of financing. Hostile leveraged buyouts were common in the 1980s. In contrast with 80's, the 1990's represented an era of "friendly" mergers.² These stock-based acquisitions are

² See *Barbarians at The Gate* by Bryan Burrough and John Helyar

mostly seen as friendly. In fact, they are labeled as such in SDC Platinum, the major database that aggregates information on all mergers and acquisitions since the 1970s. With the principles of macro-arbitrage in mind, this paper contends that these acquisitions should be seen as anything but. In stock-financed transactions, acquirers gain at the expense of the target. In other words, overvalued acquirers lessen the decline of their stock price because they claim hard assets and capital of the target at a discount. Stock-based mergers should not be viewed as “friendly” by target shareholders because chances are that the acquirer is overvalued and likely purchases the target at a discount. In the data, the presence of takeovers marked hostile is limited to smaller firms and smaller deal sizes. This is consistent with the proposition put forth by AMS that hostile stock-based takeovers are limited to small deals.

Section II. Sample Construction and Empirical Design

This paper uses merger data from SDC Platinum, a comprehensive database that includes mergers announced and deal-specific characteristics since 1978. Deal specific characteristics include: date announced, date failed, date consummated, deal size, and identifying information. Second, I find pricing data from the Center for Research in Security Prices (CRSP) housed by Wharton Research Data Services (WRDS). CRSP provides identifying information and daily returns. Finally, I use the Fama-French factors to benchmark returns, which are also found on WRDS. In short, the data aggregation process involved combining event, return, and benchmark data.

Table 1 in the appendix breaks down the mergers in my sample by year, payment, and success.

My sample includes firms that meet the following criteria.³

³ Sample construction is similar to that of Savor and Lu (2009), except that my sample covers a longer time frame. Savor and Lu look at announcements between 1978-2003. I extend this period to 2015.

1. The acquirer is an American public firm with data available in WRDS
2. The announcement falls between 1978 and 2015. More recent merger data is available, but this allows for three years of post-merger returns.
3. The method of payment is either all-cash or all-equity. Note: the sample excludes more complicated transactions that include mixtures of the two and other forms financing. The method of payment theory only makes predictions for these two extreme cases.⁴
4. The size of the deal is above \$90 million. This deal size must be large enough to make a financial impact on the acquirer. That is, small deals relative to the company market capitalization may not financially affect an acquirer in a meaningful way.

Central to a long-run study is the particular method of benchmarking returns. Often times, returns are benchmarked to a capital asset pricing model, taking residuals to be the abnormal return. It is important to understand that simply reporting returns for each company without benchmarking can make our results susceptible to general trends in the market. Further, benchmarking our returns to an index like the S&P 500 is not helpful because the S&P includes large market cap stocks while our sample includes a variety of market capitalizations. Thus, a nimbler type of benchmarking is required.

The idea behind benchmarking is to track the performance of a firm relative to an asset-pricing model. In this paper, I use the Fama French four factor model to estimate the abnormal return for each firm involved in a merger. I take α^i in the French Fama regression to be my abnormal return:

$$R_t^i - R_t^f = \alpha^i + \beta^i(R_t^{market} - R_t^f) + \gamma^i SMB_t + \delta^i HML_t$$

$R_t^i - R_t^f$ is defined as excess return, where R_t^i is the return on a stock and R_t^f is the risk-free rate.

β^i is a measure of how much a firm's excess returns are correlated with the market.

Further, SMB_t is the return on a portfolio of small cap stocks minus a portfolio of high cap stocks. Finally, HML_t is the return on a portfolio of high book to market stocks minus low book

⁴ Savor and Lu (2009)

to market stocks. To put it simply, French and Fama have shown that these factors do a good job at predicting the cross section of stock market returns.

I estimate the Fama French model out of sample in a period (-2.0, -0.5) years preceding the event. I define the date of my event (trading day=0) to be the date that a merger is fully consummated (successful) or officially withdrawn (failure). I then calculate abnormal returns beginning 30 trading days before the event date and ending 750 trading days following the event. Importantly, the official success date and failure date follow the announcement date of the merger.

After I estimate abnormal returns for each company event-company pair, I calculate the cumulative return by summing the abnormal returns. I also calculate and graph the mean cumulative for successful/failed stock-financed acquisitions and compare them to those of cash-financed acquisitions. Finally, my analysis also tracks cumulative return by industry, and other covariates such indicators for whether the acquirer was diversifying by acquiring a target in a different industry.

Section III. Results

The main goal of this paper is to compare benchmarked returns of successful acquirers with those of failed acquirers by method of payment. A second goal of this paper is to divide the results by industry. My results provide evidence for three claims. First, failing to acquire another firm in a stock financed merger results in a steep decline in returns over the subsequent one to three years. Second, a successful acquirer faces small negative returns and avoids a large negative decline over the next three years. Third, I reject the null hypothesis that the treatment effect is the same for every industry. In fact, some industries like the telecom industry face

enormous negative returns when a participant fails to acquire another firm while others do not face any negative return at all. This may be indicative of richly valued industries where acquisitive behavior is crucial to success.

Results for Stock-Financed Mergers

If we take the method of payment hypothesis to be true, overvalued firms engage in stock-financed acquisitions to avoid a steep decline in their stock price. Hence, we would expect large negative returns when acquirers fail. Figure 2 in the appendix provides evidence for this prediction. It shows the mean cumulative return for stock-financed transactions, charting the mean return of successful and failed acquirers. 30 days before the merger, cumulative returns are already different. This difference is consistent with the fact that news of a failed bid reaches the public before an official termination date. Hence, failed acquirers already take a hit in the stock market. Further, at day 250 following the event, failed acquirers underperform successful acquirers by 14.9%. This number is consistent with the literature and the number found by Savor and Lu (2009). They find that failed acquirers underperform by 19.3% in the first year using their calendar-time portfolio and 13.2% using Buy and Hold Abnormal Returns (BHAR).⁵ My finding lies in between these two results.

Notably, I find that successful acquirers avoid a blow to their returns and face a small positive return following day 250. It is important to note that previous research shows negative abnormal return to successful acquirers. This negative return is not seen in Figure 2 yet it is better uncovered when I divide the results by industry, which I will discuss at the end of this

⁵ The difference between the mean abnormal return for the successful stock acquirer and the failed stock acquirer in Savor and Lu (2009), 1079, 1082.

section. Some outliers may be driving up the mean for the successful acquirers, notably firms in the materials and media and entertainment industry.

To test the significance of the difference between failed acquirers and successful acquirers, I regress 250-day cumulative return for each company on an indicator of success and a few other covariates. These results are displayed in Table 2 in the appendix. The coefficient (0.149 which corresponds to 14.9%) in front of the indicator for successful is positive and statistically significant. The differential effect of completing a merger is 14.9%. Further, when I add industry fixed effects and other covariates the coefficient remains positive and does not lose its significance.

$$Cumulative_Return_{i,t=250} = \beta_1 I_{success,i} + Industry\ Fixed\ Effects + Covariates$$

Results for Cash Financed Mergers

The method of payment hypothesis predicts that negative abnormal returns will not hold for cash-financed transactions. Hence, we should not expect a statistically significant difference between successful acquirers and failed acquirers. Figure 3 provides evidence supporting this prediction. The cumulative returns of successful and failed acquires are not statistically different than each other. At a glance, one can tell that the red line and blue line cross each other at multiple points, indicating that there is likely no statistical difference between the two groups.

To test the significance of the difference, I regress the 250-day cumulative return for each company on an indicator of success and a few covariates similar to above. The coefficients on the indicator are not statistically significant and adding covariates does not change the significance. In other words, the differential effect of completing a cash-financed merger is not statistically different than zero. This finding is consistent with the literature that cash-financed mergers are not undertaken to lessen the decline of the stock price. One could argue that cash

financed mergers do not significantly affect the valuation of a company and through this lens there is little value in acquiring another firm (unless, of course, the firm sits on overvalued equity).

$$Cumulative_Return_{i,t=250} = \beta_1 I_{success,i} + Industry\ Fixed\ Effects + Covariates$$

Cumulative Returns by Industry

Andrade, Mitchell, and Stafford (2001) document that within a merger wave, acquiring firms tend to be in the same industry. This phenomenon is called industry clustering. Further, a wave of acquisitive behavior is often induced by shocks like technological innovation, changing regulatory regimes, supply shocks, and other destabilizing macroeconomic activity.⁶

Understanding the effects of mergers in certain industries is a good first step. For the sake of time, this paper limits itself to exploring the cumulative returns by industry.

Figure 4 and Figure 5 in the appendix plot the 250-day cumulative return for stock-financed mergers by industry. The first figure plots the failed mergers. For emphasis, the bars are shaded in red. The second figure plots successful mergers. Overall, the graphs are consistent with the literature. We see negative cumulative returns following a successful merger for most industries, from the consumer products to industrials to the telecommunications category. Further, once a merger fails, we see even more negative return in the particular industry. The notable exceptions to our predictions are the materials and media/entertainment categories.

To properly test whether there are heterogeneous treatment effects, we start with the null hypothesis that there are no heterogeneous treatment effects between industries. I then regress the cumulative return on an indicator of merger success and an interaction term between merger

⁶ See Andrade, Mitchell, and Stafford (2001) for a more comprehensive explanation.

success and industry.⁷ I also calculate an F-statistic test on the indicator to determine whether there are heterogeneous treatment effects. The test rejects the null and I conclude that there are different effects of a merger by industry, giving more rigorous support to the graphs shown in Figure 4 and Figure 5. Of course, the F-statistic picks up the effect of the anomalies like media/entertainment and materials, but it nevertheless points to the fact that different industries react differently to mergers. A more helpful guide to the differential effect is the figures themselves. Interestingly, there are a few interesting patterns revealed. First, failed acquirers in the financial industry face little negative abnormal returns, while those in the consumer staples industry face stark negative returns when a merger fails. I contend that the financial industry is better at judging financial performance and is likely to know about the relevant literature, insuring themselves again declines in their stock price if they fail.

Mergers between 2003 and 2015

The final section of the paper delves into mergers announced from 2003 to 2015. Using the exact same methodology as above, I calculate mean abnormal returns for merger announced between 2003 and 2015. My results are qualitatively similar to merger announcements from 1979 to 2003.

Section IV. Conclusion

The findings of this paper support the idea that the overvalued firms use stock-financed acquisitions to lessen the decline of their stock price. Importantly, I find a differential effect between successful and failed acquirers, which gives evidence for this hypothesis. These findings

⁷ The results are not included in the paper because they do bring more insight than the Figure 3 and Figure 4.

do not hold for cash. I further explore the effects of successful vs. failed merger on individual industries, finding that the telecom and consumer staples industries face the largest negative return following a failed merger, while the financial industry faces marginal negative returns. It is important to note acquirers lessen the decline of their stock price at expense of the target company because they use overvalued equity to pay. With this in mind, target companies should not view a stock-financed takeover with open arms as they often get the short end of the stick.

One potential downside of the paper is the fact that pre-treatment trends are not properly established. Perhaps, acquirers fail due to drops in their valuation, which could result in steeper declines, making the difference more pronounced. A more thorough analysis requires going through each deal and ensuring that the reasons for failure had nothing to do with the valuation of the firm. This would go a long way in proving that successful and failed acquirers are fundamentally similar companies before the event and thus the difference in post-treatment returns can be interpreted as the treatment effect. Further, the paper could also benefit from exploring the overvalued nature of acquirers. It would be nice to know the degree of overvaluation and whether it has any impact on the ensuing return. Nevertheless, this paper backs the validity of the method of payment hypothesis, finds evidence consistent with the macro-arbitrage theory, and explores mergers in particular industries.

Table 1. Time Series of Successful and Failed Mergers by Method of Payment

Note: The successful sample incorporates all bids announced in a given year that resulted in acquisition. The failed sample contains unsuccessful bids announced in a given year that resulted in a withdrawal. The data corresponds with stock-based and cash-financed merger waves. Note the high volume in the late 1990s and early 2000s corresponding with the tech bubble.

Year Announced	Successful Stock	Failed Stock	Stock Total	Successful Cash	Failed Cash	All-Cash Total
1978	3	0	3	2	1	3
1979	0	0	0	3	2	5
1980	4	0	4	1	0	1
1981	12	1	13	11	0	11
1982	5	0	5	10	0	10
1983	15	0	15	10	0	10
1984	7	2	9	25	1	26
1985	9	5	14	30	5	35
1986	14	4	18	24	4	28
1987	6	3	9	22	6	28
1988	5	3	8	24	10	34
1989	12	1	13	27	5	32
1990	10	0	10	10	2	12
1991	18	2	20	10	1	11
1992	24	3	27	11	1	12
1993	26	1	27	16	1	17
1994	32	5	37	41	3	44
1995	56	5	61	34	4	38
1996	56	5	61	51	1	52
1997	77	11	88	63	8	71
1998	83	7	90	84	6	90
1999	98	8	106	68	8	76
2000	104	5	109	55	7	62
2001	30	4	34	64	4	68
2002	11	4	15	49	1	50
2003	15	1	16	73	2	75
Totals	732	80	812	818	83	901

Figure 1. Chart of Merger bids divided by method of payment and future success (1978-2003)
Note: This figure corresponds with all of the merger waves described by Andrade, Mitchell, Stafford (2003). High deal volume is exhibited in years of exuberance like the Dot-Com Bubble.

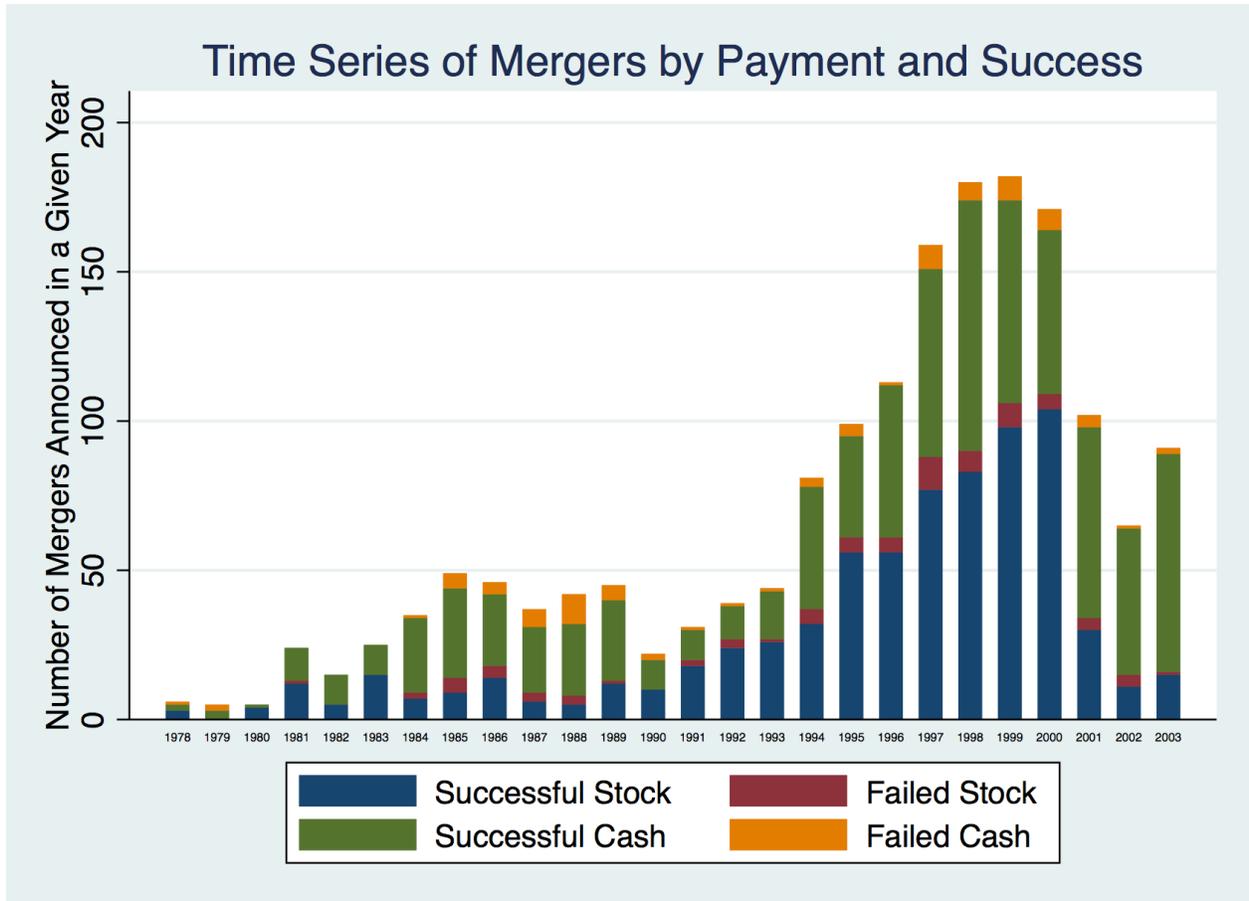
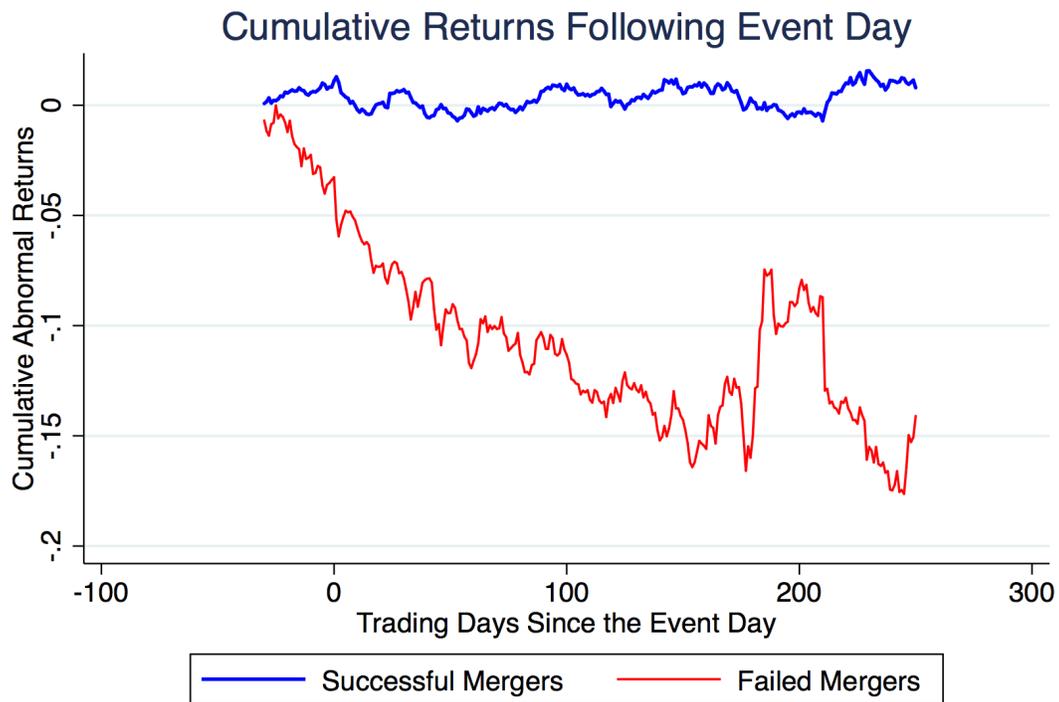
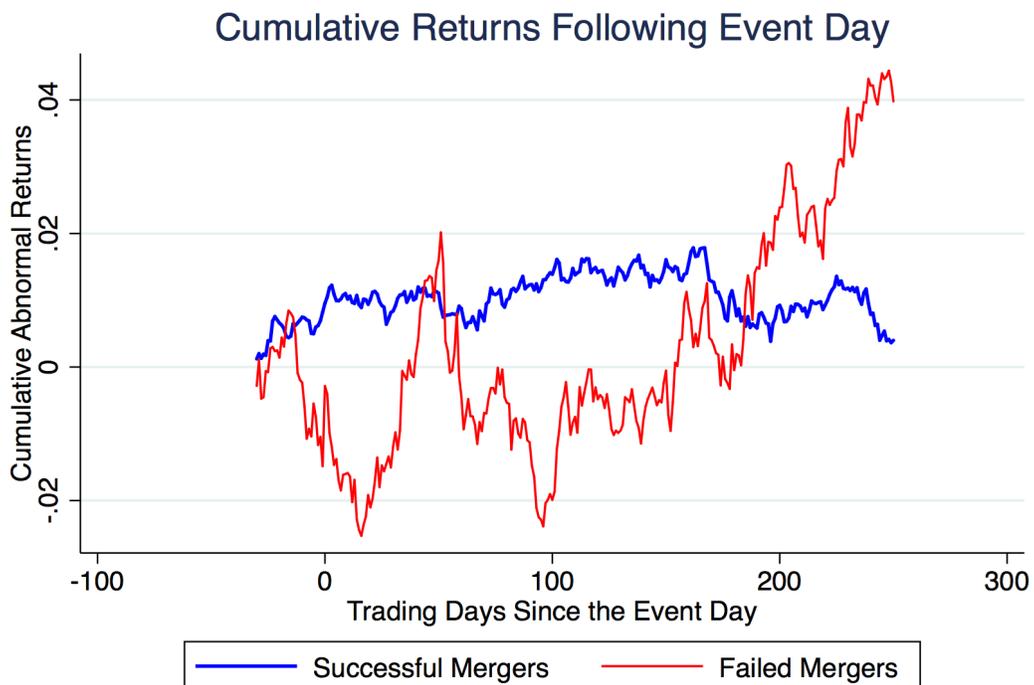


Figure 2. Cumulative Returns following Stock-Financed Transactions. 1978-2003.



Note: Cumulative returns are calculated by summing abnormal returns starting at the event date.

Figure 3. Cumulative Returns following Cash-Financed Transactions. 1978-2003.



Note: Cumulative returns are calculated by summing abnormal returns starting at the event date.

Table 2. Stock Financed Mergers. Regressions that test whether a successful acquirer is different than a failed acquirer in terms of cumulative return.

Stock Financed Mergers				
VARIABLES	(1) Cum_Ret.	(2) Cum_Ret.	(3) Cum_Ret.	(4) Cum_Ret.
Indicator for Successful	0.149** (0.074)	0.133* (0.073)	0.124* (0.074)	0.124* (0.074)
Transaction Val. Quartile = 2			0.054 (0.071)	0.054 (0.071)
Transaction Val. Quartile = 3			-0.079 (0.065)	-0.079 (0.065)
Transaction Val. Quartiles = 4			-0.037 (0.063)	-0.037 (0.063)
Indicator for Diversification				-0.020 (0.074)
Observations	703	703	703	703
R-squared	0.005	0.031	0.037	0.037
Industry Fixed Effects	No	Yes	Yes	Yes
Clustered Errors by Company	Yes	Yes	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1

Table 3. Cash Financed Mergers. Regressions that test whether a successful acquirer is different than a failed acquirer in terms of cumulative return.

Cash Financed Mergers				
VARIABLES	(1) cum_ret	(2) cum_ret	(3) cum_ret	(4) cum_ret
Indicator for Successful	-0.036 (0.042)	-0.018 (0.045)	-0.023 (0.043)	-0.023 (0.043)
Transaction Val. Quartile = 2			-0.002 (0.052)	-0.002 (0.053)
Transaction Val. Quartile = 3			-0.039 (0.054)	-0.040 (0.055)
Transaction Val. Quartile = 4			-0.059 (0.054)	-0.059 (0.054)
Indicator for Diversification				-0.004 (0.028)
Observations	841	841	841	841
R-squared	0.000	0.014	0.017	0.017
Industry Fixed Effects	No	Yes	Yes	Yes
Clustered Errors by Company	Yes	Yes	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1

Figure 4. Stock-Financed Failed Acquirer Average 250-day Cumulative Return by Industry

Note: The point of this chart is to compare the cumulative returns by industry to the figure below. Notably, failed mergers in Materials and Media and Entertainment do not behave how we would expect them to behave. Otherwise the behavior is consistent with current literature: firms face negative returns following a merger, but less negative than if they had failed.

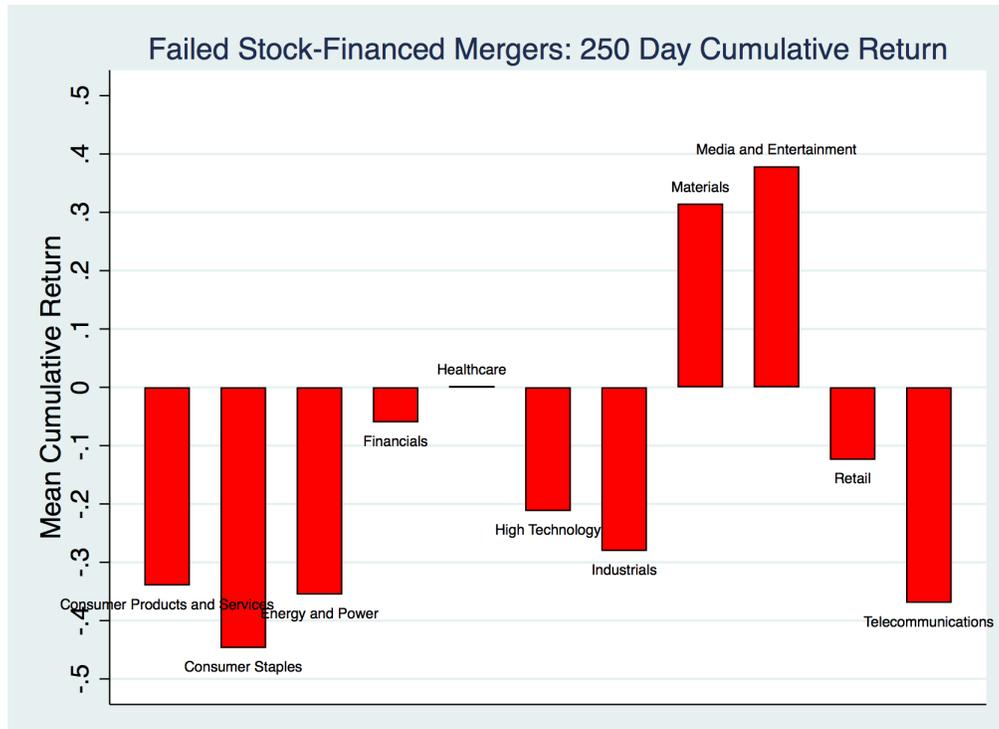


Figure 4. Stock-Financed Successful Acquirer Average 250 -day Cumulative Return by Industry. Note: Real Estate is omitted from failed mergers.

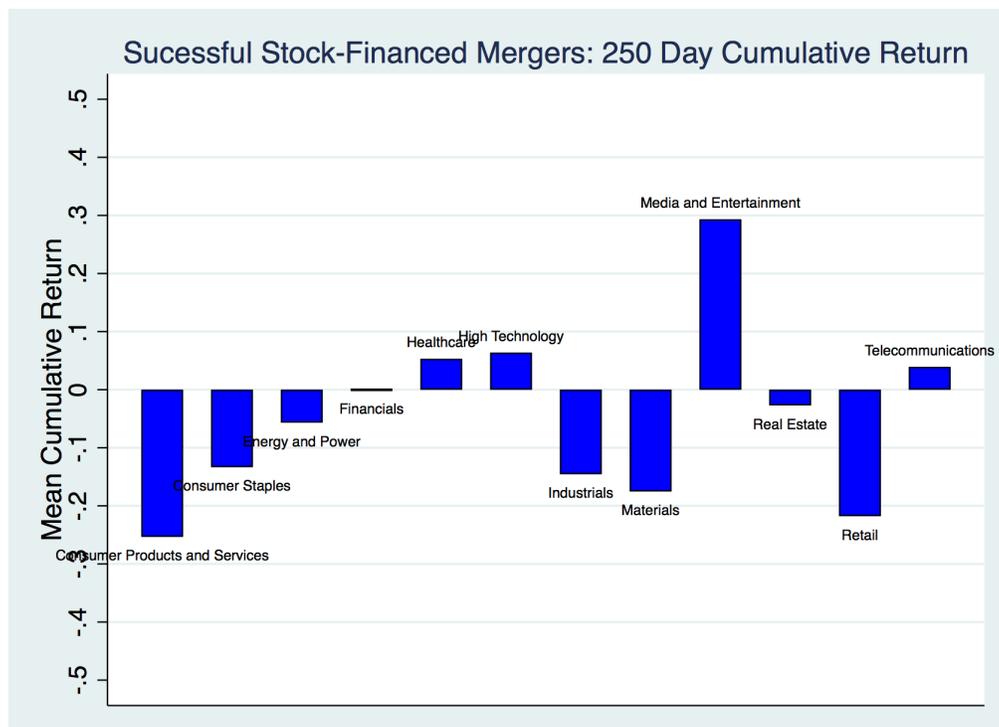
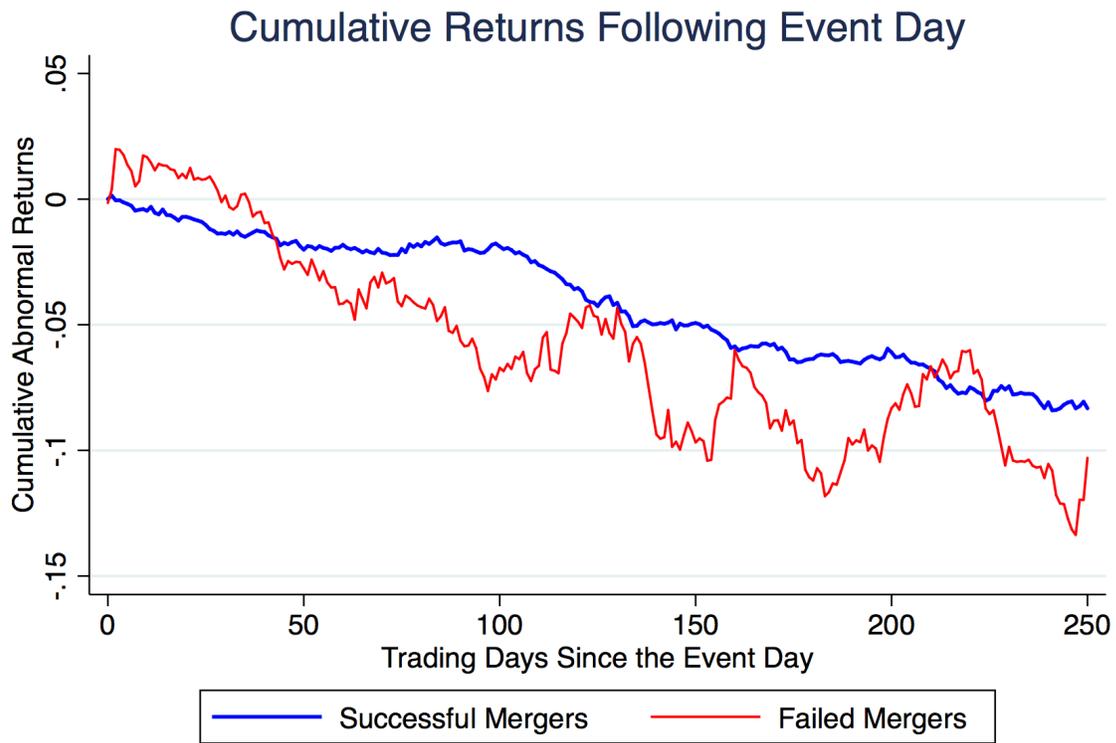


Figure 5. Cumulative Returns following Stock-Financed Transactions. 2003-2015.



Cumulative returns are calculated by summing abnormal returns starting at the event date.

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