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The Effect of Asymmetric Information on the Pricing of Equity Issuance

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Abstract

Purpose: This paper examined the adverse selection in the market for seasoned equity issuance.

Methodology: The asymmetric information explained the price reduction at the date of equity issuance. In particular, equity issuance tended to follow credible information releases since companies issued equity when the market was the most informed about the quality of their firms. The paper exploited brokerage mergers as a quasi-natural experiment that increased information asymmetry through their effect on the extent of research coverage by sell-side equity analysts.

Findings: The broker mergers unexpectedly terminated brokers operation, and the level of analyst coverage decreased for the firms previously covered by these analysts. This paper showed that the cumulative abnormal return was positive around the date of equity issuance when asymmetric information increased and more substantial for stocks that lost analyst coverage relative to the stocks that never lost any coverage. Moreover, affected companies by the brokerage mergers issued more equity after the events compared to the control group. This paper showed the causal impact of losing analyst coverage on price at the time of equity issuance.

Keywords: *Asymmetric Information, Equity Issuance, Brokerage Mergers, Quasi-Natural Experiment*

Introduction

The common stock price fell when firms issued seasoned equity (Schipper and Smith, 1986). Corporations experience approximately 3 percent decline in the price of their shares at the announcement of a new share issue with a further drop of 0.65 percent at the actual issue (Asquith and Mullins, 1986; Masulis and Korwar, 1986). One of the reasons behind this observation is insiders with superior information about the firm had an incentive to issue shares when the firm was overvalued. Consequently, outsiders lower their evaluation of the issuing firms quality. This

created a lemon market problem in equity market. Thus, the degree of information asymmetry between the insiders and investors created the negative price reaction at the time of equity issuance.

This paper examined the causal impact of information asymmetry on the price at the time of seasoned equity issuance. The reduction in analyst coverage as a result of broker mergers increased the level of information asymmetry for the affected stocks (Hong and Kacperczyk, 2010). The merger of analyst brokerage led to the firing of analysts because of redundancy or culture clash (Wu and Zang, 2009). If the merging brokerage houses had two analysts covering same stocks, they would only keep one of those analysts covering that stock after the merger. An increase in information asymmetry led to a fall in share prices at the time of brokerage merger and a reduction in uninformed investors' demand for risky assets (Kelly and Ljungqvist, 2012). This paper investigated stock price at the date of the seasoned equity issuance for stocks which lost their analyst coverage as a result of the brokerage merging event. The hypothesis is stocks affected by the reduction of analyst coverage as a result of merging brokerage may experience higher or lower reduction in price at the time of seasoned equity issuance relative to the control group of stocks.

To test this hypothesis, this paper used common stocks covered by both merging houses before the merger as the treatment group conditional on issuing equity at least once before and after the merger. I measured the change in analyst coverage for the stocks in the treatment sample from one year before the merger to one year after relative to a control group of stocks using a difference-in-differences approach. The control group is stocks that issued equity and have been covered by either of the merging brokers and not being affected by the merger event. I identified fifteen mergers of brokerage houses between 1980 to 2005 that affected 948 stocks (stocks covered by both merging houses before the merger). To mitigate concerns over the endogenous choice of equity issuance of each firm, the paper examined the differences between the treated and control group of stocks regarding the amount of equity issuance prior to the merging event. There are no significant differences between treated and control group regarding equity issuance prior to the merger.

To show the causal impact of information asymmetry on price at the time of the equity issuance is a challenging task. Suppose using the stock's bid-ask spread as a proxy for information asymmetry, then the coefficient of a simple regression of cumulative abnormal return in a close window during the time of equity issuance on the bid-ask spread is biased for two reasons. First, unobserved investment opportunity of the firm affected both bid-ask spreads as well as investors' reaction at the time of equity issuance. Secondly, low investors demand may raise stock bid-ask spread. The paper used an exogenous source variation in the level of information asymmetry to overcome omitted variable and reverse causality problems. The reduction in analyst coverage as a result of brokers merger affected the price at the time of equity issuance through changing the degree of

information asymmetry. The identification strategy requires that losing analyst coverage increases information asymmetry but does not correlate with investors demand. The paper measured the change in cumulative abnormal return in affected equity issuing firms relative to the control group of stocks before and after the time of broker merger using a difference-in-differences approach.

The results showed that the cumulative abnormal return at the time of equity issuance is higher for stocks which lost their analyst coverage relative to the control group. While there was no difference between affected stocks and control group regarding equity issuance before the merger event. The average of cumulative abnormal returns was 0.2 percentage and for treated stocks was by 1.1 percentage on average higher relative to the control group of stocks considering four days window around the time of equity issuance. The reduction in the number of analysts increased the information asymmetry for the treated group of stocks which lost their coverage. The reduction in analyst coverage for stocks covered by both merging houses before the merger was an exogenous source of variation in analyst coverage. Stocks who lost their analyst coverage issued higher amount of equity after the merger event relative to the control group of stocks. The reason could be attributed to the fact that they issued more equity after losing analyst coverage to make the market informed. It is plausible that these stocks were undervalued, so investors' reaction to equity issuance was positive.

This paper is related to the analyst literature using broker merger as a natural experiment. In the context of analyst earnings forecasts, competition reduced bias (Hong and Kacperczyk, 2010). They showed that the affected stocks had lower analyst coverage and experienced an increase in optimism bias after the merger relative to a control group of firms. Using broker closures, prices and uninformed demand fell as asymmetry increased (Kelly and Ljungqvist, 2012). Regarding the real impacts of a reduction in analyst coverage, firms that lost an analyst decreased their investment and financing because of an increase in the cost of capital (Derrien and Kecskés,2013). Losing analysts coverage caused a deterioration in financial reporting quality (Irani and Oesch, 2013). Analyst coverage has also been critical for corporate governance. Therefore, CEO received higher excess compensation; managers made more value-destroying acquisitions after losing analysts coverage (Chen et al., 2015). This paper shed light on the causal impact of losing analyst coverage on price at the time of equity issuance.

The paper proceeds as follows. Section 2 describes data, construction of the main outcome variables. Section 3 provides the empirical strategy. Section 4 presents the main results. Section 5 provides an overall picture of paper and concludes.

Data

The primary data source of security analysts was the Thomson Reuters Institutional Brokers Estimate System IBES database. The sample covers the period 1980 to 2005. The data on U.S. firms came from the Center for Research in Security Prices (CRSP) and COMPUSTAT. From the CRSP, I obtained monthly closing stock prices, monthly shares outstanding, volume and daily stock returns for NYSE, AMEX, and NASDAQ stocks over the period 1980–2005. I used four days window around the time of equity issuance to create the cumulative abnormal return. The annual data on corporate earnings, the book value of equity, and book value of assets during the same period came from COMPUSTAT. I followed other studies in focusing on companies' ordinary shares, which were companies with CRSP share codes of 10 or 11. To identify the relevant mergers, I started by selecting mergers in Securities Data Company (SDC) Mergers and Acquisitions database involving financial institutions (firms with standard industrial classification (SIC) code 6211, commodity investment firms, dealers, and exchanges). I retained mergers where there was coverage in IBES for both the bidder and the target. I required that both merging brokerages had overlapping coverage. In other words, I included analysts covering at least two of the same stocks. I identified 14 brokers' mergers between 1984 to 2005.

To examine the effect mergers on cumulative abnormal return around equity issuance, I proceeded as follows. First, I located the IBES identifiers of the merging houses and the merged entity. Using these identifiers, I extracted the lists of stocks covered by overlapping brokers for which earnings forecast were issued in the year before the merger. I considered the number of stocks covered by analysts at the acquirer brokerage house and the ones covered by target house analysts. The intersection of these two lists was the set of stocks covered by both houses in the year before the merger date. Table 1 shows the details of the 14 merger events (Irani and Oesch, 2013) and the number of stocks covered by each broker and the overlapping stocks one year before the merger. I provided the names and IBES identification numbers of the merging brokerage houses, listing the acquirer house in the top row and the target brokerage house in the bottom row of each merger. Table 1 reports the number of stocks covered by each brokerage houses in the year before the merger and the number of stocks covered by both brokerage houses as well. In the last column, I provided the number of overlapping stocks that continued to be covered by brokerage houses till one year after the merger. I also collected the data from SDC Platinum, new issues database between 1984 to 2005. The common stocks between merging brokers that issued equity at least once before and after the merger event were classified as the treatment group.

Empirical Strategy

In this section, I tested the hypothesis that the price reduction following the equity issuance was an increasing function of information asymmetry. Share price at the time of equity issuance

reduced more for affected stocks which lost their analyst coverage relative to the control group of stocks. Therefore, the hypothesis is cumulative abnormal return around the time of equity issuance is negative for stocks affected by brokerage merger. To test this hypothesis, I employed an event study around the date of equity issuance. I considered the overlapping stocks between target and acquirer brokers one year prior to the merger date who issued equity at least once before and after the merger as the treatment group. I identified 2488 number of stocks in the overlapping group. I considered only stocks that lost analyst coverage as a result of brokers merger and include only those that issued equity, at least, one time before and one time after the merger. I created the cumulative abnormal return with four days window around equity issuance date. The SDC data including the issuance equity information had 6010 observations between 1984 to 2005. The paper showed the treated stocks with at least one-time equity issuance before and one time after the merge in this sample. I ended up with 1232 number of firm date observations as treated group.

In equation 1, the outcome variable is cumulative abnormal return, CAR_{it} constructed within the four days window around the equity issuance date. I employed a difference-indifferences approach to identify the asymmetric information channel of pricing at the time of equity issuance. The variable $Post\ Merger_{it}$ has value of one if the date of equity issuance is after the merger event and zero otherwise. $Treatment_i$ is an indicator variable with the value of one for the overlapping stocks lose the analyst coverage one year before the merger who issued equity at least once both before and after the merger and zero otherwise. The β_3 is the coefficient of interest showing the effect of treatment after the merger period. I control for stock and year fixed effects in the estimation. According to the hypothesis, the sign for β_3 may be positive or negative. Thus, the cumulative abnormal return can be higher or lower for treated stocks which lost their analyst coverage relative to the control group of stocks. In other words, the change in information asymmetry affects the investors' reaction at the time of equity issuance.

$$CAR_{it} = \alpha_i + \gamma_t + \beta_3 Treatment_i * Post\ Merger_{it} + \varepsilon_{it} \quad (1)$$

According to the adverse selection theory of equity issuance, the share price was lower at the time of equity issuance, and information asymmetry explained the reason behind the reduction in stock prices (Myers and Majluf, 1984). Overvalued stocks issued equity before the market was fully informed and investors considered the lemon equity market and had an adverse reaction. This paper does not discuss how share price reacts to the change in the level of information asymmetry. The post-merger time referred to high information asymmetry period which was the time when treated stocks lost their analyst coverage. In other words, the price as a reaction to equity issuance could be higher or lower when the information asymmetry was high comparing to the time when the information asymmetry was weak. This depends on whether stocks were overvalued or undervalued before the equity issuance. To address concerns over endogenous equity issuance

choices. I used the amount of equity issuance for each stock at the different time, $Equity_{it}$, as an alternative outcome variable, there must be no differences between treated and control stocks before the merger.

Results

This section shows the main results of the paper. First, I used the cumulative abnormal return around the time of equity issuance as an outcome variable. I examined investors' reaction for stocks which lost analyst coverage after the merger event. Then, I investigated the equity issuance behavior of affected stocks. Finally, I discussed the number of analysts before and after the merger event.

Table 2 shows the main results of this paper. I created the cumulative abnormal return using different windows around the time of equity issuance. I used four days window before the equity issuance till four days after the time of issuance. Therefore, I considered windows of (-4,-1), (-4,+1), (-1,+4) and (-4,-4) in creating the cumulative abnormal return. The results showed that stocks which lost analyst coverage had higher cumulative abnormal return relative to the control group of stocks after the merger event. These results were consistent using different windows around the time of equity issuance. The average of cumulative abnormal returns was 0.2 percentage and for treated stocks was by 1.1 percentage on average higher relative to the control group of stocks considering four days window around the time of equity issuance.

Table 3 shows the results of using the amount of equity issuance as an outcome variable.

First, there were no significant differences between treated stocks and control group before the merger event. This mitigates concerns over the endogenous equity issuance choices. Second, stocks which lost analyst coverage issued more equity relative to the control group of stocks after the merger event. The reason could be related to the fact that stocks with higher information asymmetry were more inclined to issue equity in order to get the market informed. Stocks which lost analyst coverage issued equity more than the control group after the merger event by 0.32 of one standard deviation.

Table 4 shows the results of using the number of analysts as an outcome variable. There were significant differences between treated stocks and control group before the merger event. The difference was not large and only included two analysts. Therefore, the initial amount of analyst coverage did not determine the results of the share price. The number of analysts for treated stocks decreased after the merger event relative to the control group of stocks. The results showed that the merger event caused the reduction in analyst coverage for the group of stocks affected by the merger event.

Conclusion

This paper examined the importance of information asymmetry channel in pricing the equity issues by using a natural experiment. I found an increase in share price at the time of equity issuance after the merger date for the stocks which lost their analyst coverage. Adverse selection theory emphasized the asymmetric information as an explanation for the price drop after the equity issuance. The reason behind this argument is, firms issued equities when they are overvalued, and the share price declined at the time of equity issuance when the level of asymmetric information was higher. The results showed that the price at the issuance equity announcement increased in the degree of information asymmetry. I employed a shock to asymmetric information following brokerage mergers which was unexpected to the firms. The mergers led to a reduction in analyst coverage on the stocks that were covered by both the acquirer and target firms pre-merger events. If a stock was covered by both firms before the merger, they removed at least one analyst usually the target analyst. The price reaction at the time of equity issuance was potentially explained by information asymmetry. Therefore, I expected to find evidence for the asymmetric information channel for the price drop after the equity issuance.

In this paper, I established the empirical evidence for the existence of asymmetric information in the equity market. To do so, I exploited an identification strategy that allowed me to use the exogenous source of variation in analyst coverage and to examine the impact of information asymmetry on cumulative abnormal return around the time of equity issuance. The number of sell-side analysts who covered a stock reduced as a result of brokerage mergers using a natural experiment. The 14 brokerage firms in the United States merged between 1984 to 2005 leading to a total of 2488 coverage terminations. Brokerage merger was an exogenous source of variation in the extent of analyst coverage, and this change helped me to identify the channel in which equity issuance reduced the stock prices. Following the exogenous coverage terminations, information asymmetry increased while the share prices of equity issues were higher for stocks which lost analyst coverage comparing to the control group of stocks. There were no significant differences regarding the amount of equity issuance before the merger event. However, stocks which lost analyst coverage issued more equity after the merger event relative to the control group. Overall, this paper showed the causal impact of losing analyst coverage on price at the time of equity issuance.

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TABLE 1: Descriptive Statistics for Mergers. This table reports details of the merger events as exactly appeared in (Irani and Oesch, 2013). The name and dates of the merging brokerage houses are included. For each merger, the brokerage house in the top row is the acquirer and the brokerage house in the bottom row is the target. The table shows the number of stocks covered by each merging brokerage house one year prior to the merger and also the overlapping stocks covered by both brokerage houses. The overlap retained stocks are the overlapping stocks continued to be covered by the merging brokerage till one year after the merger.

Merger Number	Brokerage House	IBES Identifier	Merger Date	Stock Coverage	Overlap Stocks	Overlap Retained
1	Wheat First Securities Inc(WF)	282	10/31/1988	243	17	15
	Butcher and Co., Inc.	44		91		5
2	PainWebber Group, Inc.	189	12/31/1994	460	324	274
	Kidder Peabody and Co.	150		356		0
3	Morgan Stanley Group, Inc.	192	05/31/1997	695	353	318
	Dean Witter Discover and Co.	232		199		0
4	Smith Barney	254	11/28/1997	808	532	457
	Salomon Brothers	242		405		19
5	Everen Capital Corp.	829	01/09/1998	253	19	2
	Principal Financial Securities	495		160		0
6	DA Davidson and Co.	79	02/17/1998	80	24	22
	Jensen Securities Co.	932		49		4

7	Dain Rauscher Corp.	76	04/06/1998	443	66	47
	Wessels Arnold and Henderson LLC	280		109		21
8	First Union Corp., NC	282	10/01/1999	370	40	33
	Everen Capital Corp.	829		232		0
9	Pain Webber Group, Inc.	189	06/12/2000	723	35	22
	JC Bradford and Co.	34		180		0
10	CSFB	100	10/15/2000	688	566	487
	Donaldson Lufkin and Jenrette	86		462		0
11	UBS Warburg Dillon Read	85	12/10/2000	479	376	329
	Paine Webber	189		339		0
12	Chase Manhattan	125	12/31/2000	486	114	2
	JP Morgan	873		595		99
13	Fahnestock and Co.	98	09/18/2001	125	12	1
	Josephthal Lyon and Ross	933		144		12
14	Janney Montgomery Scott LLC	142	03/22/2005	140	10	9
	Parker/Hunter Inc.	860		54		5
Total				9368	2488	

TABLE 2: This table shows the main results of the regression. The dependent variable is the cumulative abnormal return around the time of the equity issuance using different time window. Column (1) shows the time window of four days before till the day before equity issuance. Treated firms is an indicator variable that is assigned a value of one if the firm lost its analyst coverage through brokerage merger and issued equity at least once before and after the merger event. Post is an indicator variable that is assigned a value of one for periods after the merger and a value of zero otherwise. The variable Treated*Post Merger is an interaction term of treated stocks and post merger. Including year and stock fixed effects are specified in each estimation. Standard errors are clustered at the firm level. *,**, and *** denote statistical significance at the 10%, 5%, and 1% level, and the standard error appears in parentheses.

	CAR	CAR	CAR	CAR
Window	(-4,-1)	(-4,+1)	(-1,+4)	(-4,+4)
Treated*Post Merger	0.0079**	0.0081**	0.0081**	0.0110**
	(0.0033)	(0.0041)	(0.0041)	(0.0049)
Ysd	0.0615	0.0777	0.0783	0.0946
Ymean	.0029	-.0064	-.0026	.0022
Adjusted R2	.1278	.1437	.1481	.1667
Number	3940	3940	3940	3940
Year Fixed Effect	Yes	Yes	Yes	Yes
Stock Fixed Effect	Yes	Yes	Yes	Yes

TABLE 3: This table shows the main results of the regression. The dependent variable is the amount of equity issuance. Column (1) shows the amount of equity issuance before the merger event. Column (2) shows the amount of equity issuance in general. Treated firms is an indicator variable that is assigned a value of one if the firm lost its analyst coverage through brokerage merger and issued equity at least once before and after the merger event. Post is an indicator variable that is assigned a value of one for periods after the merger and a value of zero otherwise. The variable Treated*Post Merger is an interaction term of treated stocks and post merger. Including year and stock fixed effects are specified in each estimation. Standard errors are clustered at the firm level. *,**, and *** denote statistical significance at the 10%, 5%, and 1% level, and the standard error appears in parentheses.

	Equity Amount Before Merger Event	Equity Amount
Treated	0.0087	
	(0.0148)	
Treated*Post Merger		.14***
		(.0206)
Ysd	0.3375	0.4497
Ymean	.1808	.2471
Adjusted R2	.5137	.3488
Number	1954	3940
Year Fixed Effect	Yes	Yes
Stock Fixed Effect	Yes	Yes

TABLE 4: This table shows the main results of the regression. The dependent variable is the number of analysts. Column (1) shows the number of analysts before the merger event. Column (2) shows the number of analysts in general. Treated firms is an indicator variable that is assigned a value of one if the firm lost its analyst coverage through brokerage merger and issued equity at least once before and after the merger event. Post is an indicator variable that is assigned a value of one for periods after the merger and a value of zero otherwise. The variable Treated*Post Merger is an interaction term of treated stocks and post merger. Including year and stock fixed effects are specified in each estimation. Standard errors are clustered at the firm level. *,**, and *** denote statistical significance at the 10%, 5%, and 1% level, and the standard error appears in parentheses.

	Number of Analysts Before the Merger Event	Number of Analysts
Treated	2.1099***	2.3805***
	(0.1222)	(0.1146)
Treated*Post Merger		-.5812***
		(.1537)
Ysd	2.4776	2.5008
Ymean	4.843	4.529
Adjusted R2	.1483	.1392
Number	1954	3940
Year Fixed Effect	Yes	Yes
Stock Fixed Effect	No	Yes