Information Effect, Risk Arbitrage and Effectiveness of Short selling Ban: Evidence from Mergers and Acquisitions during Globe Short Selling Bans

Abstract

Information Effect hypothesis and price pressure hypothesis are two major theories when explaining negative market reaction on acquiring firms' stock price during stock financed mergers and acquisitions. However, it is difficult to hold the information effects constant and to distinguish between these competing hypotheses. In this paper, I propose a methodology to investigate the information effects on stock financed mergers and acquisitions by studying acquiring firms' abnormal returns during short selling ban period between 2008 and 2013. This paper may also provide some evidence on effectiveness of short selling ban around the world by studying worldwide risk arbitrage activities during short selling ban period.

Section I. Introduction

Mergers and acquisitions are undoubtedly one of the most important corporate decisions made by managers and board of directors. Accordingly, the effects of such decisions have been well studied by financial economists. Previous research, for example, has documented significant abnormal returns associated with mergers and acquisitions. Depending on the types of offer and considerations offered during the transaction, acquiring companies may experience announcement period negative abnormal returns and target companies may experience positive abnormal returns after the mergers and acquisition announcement (see Mitchell, Pulvino and Stafford (2004), Travlos (1987)).

Several theories have been developed in order to explain these abnormal returns. In general, there are two categories of theories exist in previous research. The first group of research support information-based theories of financial and investment policy (Myers and Majluf (1984) and Jensen (1986)). These information-based theories take negative stock price reaction on acquiring firms as evidence that acquirers use overvalued stock as payment, and market are assumed to be information efficient and take such mergers and acquisitions decisions as the signal of overvaluation on acquirers' stocks. Even if the acquiring firms' stocks are not overvalued, market may still react negatively to the mergers and acquisitions announcement because it perceives the merger to be a value-destroying investment project. Both explanations assume that market is informational efficient and also imply that capital market are perfect and excess demand curves for stock are perfectly elastic.

Second group of theories is built on the work of Scholes (1972) and provides alternative explanations to the perfect capital market hypothesis. Specifically, these theories asset that vertical and fixed supply curves for stocks are unlikely to hold during mergers and acquisitions and price pressure results from activities of risk arbitrageurs may be the real reason of negative market reaction on acquiring firms stock price. For example, Mitchell, Pulvino and Stafford (2004) suggest that at least half of the negative announcement period stock price reaction of acquirers in stock-financed mergers reflects downward price pressure caused by short selling activities from risk arbitrageurs. Risk arbitrage is an investment strategy

that attempts to profit from arbitrage spread (the difference between the target firm's stock price and the acquiring firm's offer price). It is risky because if the merger is successful, the arbitrageur captures the arbitrage spread; if the merger fails, the arbitrageur incurs a loss that is much greater than the profits obtained if the deal succeeds. Risk arbitrage is common practice of hedge fund and other institutional investors because of substantial excess returns. Table 1 below provides estimated annualized returns by some of previous studies.

Table 1: Motivation of risk arbitrage: Substantial excess returns

Sample	Study	Returns
Cash Tender offers	Dukes, et al. (1992); Jindra and Walking (1999)	Over 100 percent annual excess return
Canadian stock and cash merger target in 1997	Karolyi and Shannon(1998)	26 percent annualized return
U.S. cash and stock mergers	Baker etc.(2002)	12.5 percent annual excess returns

Both Theories mentioned above have some explanation power, but in practice it is difficult to hold the information effects constant and to distinguish between competing hypotheses. For example, it is hard to prove that short selling activities by risk arbitrageurs are free of information effect during mergers and acquisitions. In this paper, I propose a research methodology in an attempt to better understand the information effect during mergers and acquisitions announcement period and its wealth effects on shareholders of acquiring firms.

Starting from 2008, many stock exchange regulators, in react to globe financial crisis resulted from breach of real estate bubble and collapse of financial institutions in the U.S., imposed bans or constrains in short selling. Such short selling bans, with the intention to restore the orderly functioning of stock market by constraining the short selling activities, may provide a perfect nature experiment to separate information effect and price pressure during merger and acquisition. As the ability of risk arbitragers to short sell acquirers stock after the announcement of stock financed merger and acquisition is limited, price

pressure may not impose as much effect as when short selling is allowed. Although many recent paper or articles (Zuckermann and Scannell (2008)) argue that arbitrageurs may bypass the short selling restriction by enter derivatives market, such as a long position in put options, and still gain short exposure, others (Grundy, Lim and Verwijmeren (2012)) provide empirical evidence that it might not be the case and there is a reduction in both short selling and option trading volume. The preliminary results provided by this paper also show some evidence that short selling bans are effective in reduce short selling activities of risk arbitrageurs.

This paper, to my best knowledge, is the first study attempt to test the information effect, free of effect of price pressure, on merger and acquisition and to study risk arbitrage activities during short selling ban in the globe scope, and the first to test effectiveness of short selling ban through studying mergers and acquisitions around the world during financial crisis.

Section II. Literature Review

Many previous researches have documented acquirer announcement period abnormal returns (Houston and Ryngaert (1997), Fuller (2003) and Andrade et. al. (2001)). Depending on the method of payment in mergers and acquisitions as well as the the public status of target (public or private), acquiring firms stock may experience either positive or negative announcement period returns. For example, Andrade, Mitchell and Stafford (2001) have reported that how acquirers financing merger transactions is important when study the value effects on acquiring firms. Specifically, mergers financed with stock, partially or fully, have different value effects from mergers that are financed without any stock. For instance, Andrade, Mitchell and Stafford (2001) find that, for acquirers, the announcement period abnormal returns are consistently negative from 1973 to 1998 for all stock financed mergers. Similarly, Hansen and Lott (1996), when comparing acquiring firms returns when target firms is private and when target firms is public, find that in 65 percent of the bids for public targets the bidder return was negative, while in only 43 percent of the bids for the private targets was the bidder return negative. In addition, Fuller (2003) find significant negative return for acquiring firms when they use collar offers in mergers. These findings are not new to us and many models have been developed to explain these results.

Before 2000, many of explanations are focusing on information differences between managers and outside investors (Myers and Majluf (1984), Jensen (1986) and Shleifer and Vishny (2003)). Specifically, the essence of this class of explanations is that managers of acquiring firms tend to use equity as their consideration offered when it is overvalued by the capital market. Consequently, investors tend to bid down the stock price if these overvalued stock are used by acquiring firm managers to finance the merger. Therefore, the negative stock price reaction to stock-financed mergers is taken as support for information-based theories, or an adverse selection problem. Houston and Dyngaert (1997), when study mergers and acquisitions within banking industry, find that such adverse selection problem can be alleviated by introducing the conditional stock offer in bank mergers. In other words, the role of offer types in bank mergers helps solve the information asymmetry problem.

Another class of explanation is based on price pressure hypothesis and downward sloping excess demand curves for stocks (Scholes (1972), Mitchell, Pulvino and Stafford (2004) and Harris and GUrel (1986)). Specifically, these authors argue that perfect capital market hypothesis, which states that excess demand curves for stocks are perfectly elastic, is not realistic in real world. Market frictions will limit market forces from keeping excess demand curves perfectly elastic and prices will temporarily diverge from their information-efficient values to compensate those that provide liquidity when uninformed shifts in excess demand exist. Evidences that support price pressure are provided by Harris and Gurel (1986) and Shleifer (1986). Both studies find that, without any new information arrival, market reacted positively to stocks that added to S&P 500 index. They argue that the abnormal returns for these firms are due to excess demand by fund managers who tract the S&P 500 index. In the setup of mergers and acquisition, price pressure comes from the activities of risk arbitrageurs. Risk arbitrage activities have been documented by several studies (Dukes, Frohlich, and Ma (1992), Laracker and Lys (1987) and Sender (1985) etc). In general, risk arbitrage is the investment strategy that applied by hedge funds and other institutional investors during the merger and acquisition. After the announcement of a merger or acquisition, the target company's stock typically trade at a discount to the price offered by the acquiring company. The difference between the targets stock price and the offer price is known as arbitrage spread. It is risky because the result of arbitrage depends on the result of merger or acquisition. The most convincing

evidence that connects risk arbitrage with price pressure for stocks during mergers and acquisition comes from the study by Michell, Pulvino and Stafford (2004). In their study, they find that about 50 percent of the negative announcement period stock price reaction for acquiring firms in stock-financed mergers reflects downward price pressure caused by risk arbitragers and their short selling activities. Accordingly, previous estimates of merger wealth effects derived from information based theories are downward biased. Price pressure effects can be significant and should be considered when quantifying the information content of merger announcement period returns.

Section III. Research Question and Preliminary Results.

3.1 Research Question

In this paper, I am interest in testing three hypotheses:

H1: Acquirers stock reaction after merger and acquisition announcement is less negative during short-selling ban.

H2: Increased abnormal returns for acquirers result from decreased risk arbitrage activities. Acquirers' abnormal returns during short selling ban reflect only information effects.

H3: The speed of adjustment to the equilibrium price for acquirers stock will be higher during short selling ban.

The first hypothesis is essentially to test the effectiveness of short selling ban in reducing short selling activities or risk arbitrage. If the short selling ban is effective and there are no significant loopholes to circumvent the ban by using synthetic short selling strategies in derivatives market, I expect to see less drop in acquirers stock price during stock financed mergers and acquisitions. The second hypothesis is conditional on the first one and asserts that information effect is purified out if price pressure from risk arbitrageur is no longer the case during the short selling ban. The changes in stock price of acquiring firms only reflect information effect rather than uninformed increase in supply of acquiring firms stock. The third hypothesis is built on first two and to test the speed of adjustment to equilibrium price for acquiring firms during the short selling ban. It is interesting to see that, without uninformed supply in short time interval, acquiring firms' stock price may present a different pattern in recovering to equilibrium level.

3.2 Data collection and preliminary results

In this paper, I restrict my sample to appropriate OECD countries because of their comparable capital markets relative to U.S. exchanges. Another reason that I use international sample rather than focusing only U.S. is the limitation on data. For example, SEC bans short selling only on 988 U.S. financial institutions with a short selling ban period from 09/19/2008 to 10/8/2008. During the ban period, there are only 10 merger transactions from SDC. In addition, notice that not all the exchange regulators from OECD countries impose short selling bans; I only look at OECD countries with initiation date (range from 09/19/2008 to 08/11/2011) and lift date (range from 10/08/2008 to 01/31/2013), different scope of bans (some bans only applied to financials while others applied to all stocks), and different stringency of bans (some bans applied to naked short sales while other applied to even covered short selling).

Table 2: Description of Short Selling Ban Data

Country	Scope of ban	Begin date	End date
Australia	All	9/22/2008	5/25/2009
Canada	Financial	9/19/2008	10/08/2008
Denmark	Financial (35 stocks)	10/13/2008	11/01/2012
France	Financial (10 stocks)	9/22/2008	2/13/2012
Germany	Financial (11 stocks)	9/20/2008	7/26/2010
Germany	All	7/27/2010	12/31/2012
Greece	All	10/10/2008	06/01/2009
Ireland	Financial (3 stocks)	9/19/2008	1/31/2009
Italy	Financial	9/22/2008	10/10/2008
Italy	All	10/11/2008	12/31/2009
Japan	All	11/04/2008	10/31/2010

Netherland	Financial (8 stocks)	9/22/2008	06/01/2009

Table 2: Description of Short Selling Ban Data (Continued)

Country	Scope of ban	Begin date	End date
Norway	Financial (4 stocks)	10/08/2008	09/28/2009
South Korea	All	10/01/2008	11/10/2011
Switzerland	All	9/19/2008	01/16/2009
UK	Financial (34)	9/19/2008	01/16/2009
US	Financial	09/19/2008	10/08/2008
Spain	Financial	08/11/2011	02/15/2012
Spain	Financial	07/23/2012	01/31/2013
Norway	Financial (4 stocks)	10/08/2008	09/28/2009

Mergers and acquisitions date: following prior literature, several filters are imposed on mergers and acquisitions database of SDC: 1. Both targets and acquirers are publicly traded firms; 2. The percent of shares sought by acquirers is larger than 50 percent; 3. Share price of the target on the day prior to the takeover announcement is above $1; 4. Deal values are above 1 million dollars; 5. Both targets and acquirers are domestic firms; 6. Acquirers own at least 90 percent of target after transaction; 7. Deals must be complete (only for preliminary test and will be expended to incomplete deals). In addition, acquirers' stock price and index price data are obtained from Bloomberg data base. After screening the short selling ban data conditional on mergers and acquisitions data. Table 3 below presents the number of transactions and their distribution among countries and across time.

Table 3: Descriptive Matrix of Number of Mergers and Acquisitions Deals

Country\Year	2008	2009	2010	2011	2012	Total
Australia	8	8	0	0	0	16
Canada	1	0	0	0	0	1
Denmark	0	1	2	0	3	6
France	0	0	0	2	0	2
Greece	1	0	0	0	0	0
Italy	0	3	0	0	0	3
Japan	5	36	22	0	0	63
South Korea	2	10	12	9	0	33
Germany	1	2	2	4	1	10
United States	2	0	0	0	0	2
Total	20	60	38	15	4	137

Table 4 and Table 5 below present some preliminary results. As expected, cash deals are not associated with significant abnormal returns during announcement period. CAAR (-1,1) are all statistically indifferent from zero in all years. Interestingly, stock deals are exhibiting different pattern compared with what was documented by previous studies. Specifically, CAARs are insignificant in all years for stock deals. Also, the sign of CAARs for cash deals are mostly negative but the sign for stock deals are mostly positive. The results here are contrary to previous studies and could be due to small sample size and uneven distributions of sample across countries. Further investigations are needed in future research.

Table 4 Preliminary results.

This table reports cumulative average abnormal returns (CAARs) for acquirers around merger announcement across time. CAR calculated as firm return minus the value-weighted market return for the period -1 to +1. And day 0 is the announcement date. Mergers are classified as stock merger, cash merger and combined merger based on the form of payment. Cash merger consist of deals where the consideration is 100% cash and stock merger consist of deals where the consideration is 100% stock. T-statistics (not reported here) are calculated using the standard error of the mean and p-value is based on the singed rank test for the median.

Year	Number of Announcements	Acquirer CAAR (-1,1)	p-value
Panel A: Cash Merger			
2008	2	-0.46%	0.39
2009	11	-1.06%	0.09
2010	7	0.55%	0.51
2011	2	-0.60%	0.57
Panel B: Stock Merger			
2008	9	1.78%	0.39
2009	25	0.12%	0.82
2010	19	2.45%	0.1
2011	5	-0.55%	0.68
2012	3	2.10%	0.51
Panel C: Combined Merger			
2008	1	4.42%	.
2009	3	1.53%	0.16

To confirm that short selling activities from risk arbitrageur are indeed decreased by short selling bans, I also test the CAARs around closing date. If risk arbitrageurs activities are restricted by short selling bans, no offset position is needed and there should be no significant reverse on acquirers' stock price at closing date. As expected, results in Table 5 shows that, for complete deals, there is no reverse in acquiring firms' stock price at closing date and all CAARs are statistically indifferent from 0. Again, this could due to sample size and uneven distributions of sample across countries.

Table 5 Preliminary results.

This table reports cumulative average abnormal returns (CAARs) for acquirers around merger closing date. CAR calculated as firm return minus the value-weighted market return for the period -1 to +1. And day 0 is the announcement date. Mergers are classified as stock merger, cash merger and combined merger based on the form of payment. Cash merger consist of deals where the consideration is 100% cash and stock merger consist of deals where the consideration is 100% stock. T-statistics (not reported here) are calculated using the standard error of the mean and p-value is based on the singed rank test for the median.

	Cash Merger	Stock Merger	Combined Merger	
Announcement Date [-1,+1]				
CAAR	-0.45%	1.14%	-1.46	
p	0.27	0.06	0.64	
N	22	61%	4	
Closing Date [-1,+1]				
CAAR	-0.09%	-0.50%	-2.26%	
p	0.73	0.26	0.08	
N	22	55	4	

Section IV: Conclusion

The empirical results shown above is only preliminary and far from completion. Currently I am working on a bigger sample which includes both incomplete and complete deals. Also, it is necessary to distinguish between naked-short-selling-ban and covered-short-selling-ban and test how different type of bans affects abnormal returns differently. In addition, it is necessary to consider the effects of derivatives market. For example, arbitrageurs may create synthetic short selling strategies even when acquiring firms' stock price cannot be short sold.

To summarize, information effects hypothesis and price pressure hypothesis are two major theories when explaining negative market reaction on acquiring firms' stock prices during stock financed mergers and acquisitions. However, it is difficult to hold the information effects constant and to distinguish between these two competing hypotheses. In this paper, I propose a methodology to investigate the information effects on stock financed mergers and acquisitions by studying acquiring firms' abnormal returns during short selling ban period. During financial crisis, regulators in many countries temporarily banned short-selling in stock market. Therefore, stock-financed mergers may be free of price pressure because of restriction on risk arbitrageur. Also, recent studies on effectiveness of short selling ban provide mixed results. This paper may provide some evidence on effectiveness of short selling ban around the world by studying risk arbitrage activities during short selling ban period.

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