Does Size Really Matter? in Mergers of Equals: An Event Study

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การศึกษาผลตอบแทนของผู้ถือหุ้นจากเหตุการณ์ศึกษาจากการควบรวมแบบขนาดเท่ากัน

น.ส.ปิยมาส ศรีถนอมวงศ์

สารนิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
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ปิยมาส ศรีถนอมวงศ์ : การศึกษาผลตอบแทนของผู้ถือหุ้นจากเหตุการณ์ศึกษาจากการควบรวมแบบขนาดเท่ากัน. (Does Size Really Matter? in Mergers of Equals: An Event Study) อ.ที่ปรึกษาหลัก : ผศ. ดร.นาถฤดี ศุภกิจจารักษ์

งานวิจัยนี้นำเสนอการศึกษาเชิงประจักษ์เกี่ยวกับผลกระทบของการควบรวมกิจการที่เท่ากันต่อความมั่งคั่งของผู้ถือหุ้น เนื่องจากปัญหาการรวมกลุ่มระหว่างบริษัทที่ควบรวมกัน ความล้มเหลวในการควบรวมกิจการของ Daimler-Chrysler ทำให้องค์กรคิดว่าการควบรวมกิจการเท่ากับการทำลายความมั่งคั่งของผู้ถือหุ้น อย่างไรก็ตาม การศึกษาผลกระทบของการควบรวมกิจการที่เท่ากันยังเป็นส่วนน้อย และไม่มีหลักฐานเชิงประจักษ์เกี่ยวกับผลตอบแทนของผู้ถือหุ้นที่เกี่ยวข้องกับขนาดของการควบรวมกิจการ ณ วันที่ประกาศควบรวมกิจการ ข้าพเจ้าจึงได้ทำการศึกษาการวิจัยนี้

นอกจากนี้ คุณลักษณะของการควบรวมกิจการที่เท่ากันที่เกี่ยวข้องกับผลกระทบความมั่งคั่งของผู้ถือหุ้น สามารถนำมาทดสอบได้สองแบบ: 1. การควบรวมกิจการที่เท่ากันของกิจการขนาดเล็กและขนาดใหญ่ – เพื่อตรวจสอบว่าผลตอบแทนที่ผิดปกติจากการควบรวมกิจการนั้นพิจารณาจากขนาดของผู้ซื้อและบริษัทเป้าหมายหรือไม่ 2. การควบรวมกิจการที่เท่ากันในประเทศและข้ามพรมแดน – เพื่อตรวจสอบว่าการควบรวมกิจการในประเทศหรือข้ามพรมแดนมีประสิทธิภาพดีกว่าในแง่ของผลตอบแทนที่ผิดปกติ ณ วันที่ประกาศในการทำธุรกรรม M&A

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This research presents empirical studies on the impact of mergers of equals on shareholders' wealth. Due to integration problems between combining corporations, Daimler-Chrysler merger failures caused the corporate sector to think that mergers of equals erode shareholder wealth. However, it is based on a small proportion of MOE transactions, and there is no empirical evidence on the shareholder's return on the announcement date implications of MOEs related to the size of the merger. I provide this research knowledge for the shareholder wealth at the announcement date for the implications of MOEs related to the size effect of the merger.

Furthermore, MOE characteristics associated with shareholder wealth impacts are evaluated to assess MOEs. Two tests will be used to determine the optimal structure of MOE transactions: i) small-size and large-size MOEs – to determine whether the merger abnormal return is determined by the size of the acquirer and target firms. ii) local and cross-border MOEs – to determine whether local or cross-border mergers outperformed in terms of abnormal returns at announcement date in MOE transactions.

Field of Study:	Finance	Student's Signature .....
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Piyamart Srithanomwong

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CHAPTER 1

Introduction

1.1 Background and Significance of the problem

In theory, linked mergers result in stronger operational synergies since they result in economies of scale (in horizontal mergers), increased price competition (due to lower competition and increased market share), and the combining of various functional capabilities.

In general, businesses engage in M&A to expand their business and gain competitive advantages (UNCTAD, 2000, 2007). The merging enterprises might combine their purchasing power to compel suppliers to stay competitive, therefore maximizing economies of scale. Edward Fee (2004) discovered that horizontal mergers and acquisitions announcements and changes in operational performance after the merger from 1980 to 1997 mostly benefit from increased productivity improvement, purchasing power, and monopolistic collaboration for the enterprises' corporate customers, suppliers, and competitors.

The merger of equals (MOEs) seems to be the coming together of two organizations of comparable size in establishing the new corporation. Another crucial component regarding MOEs is that two comparable enterprises collaborate to maintain a competitive edge. And so is the case with mergers in general creating synergy, which is defined as generating revenues while diminishing expenditures is the primary motive for enterprises of equals to integrate (Dealbook, 2009). The current understanding of MOEs is that they are largely strategic transactions, and so neither side obtains a premium (Dealbook, 2009). Through equity swap MOE transactions, in exchange for

preferring the stronger business, shareholders obtain premiums in the form of higher firm value. (Dealbook, 2009). The corporate sector, generally, has a negative attitude toward MOEs, owing to high-profile failures that wiped out shareholder money, such as the disastrous DaimlerChrysler merger (Dealbook, 2009). MOEs are also very complicated to achieve because of their increased adjustment costs (both direct and indirect). For direct costs, it is essential to harmonize organizational structures and wage levels, combine assigned tasks, as well as to reform human resource policies (Smeets, 2006). Indirect costs have included the adaptation of two merging organizations such as., corporate cultures, firm-specific human resources, career progression programs, and so forth.(Smeets, 2006). Nonetheless, MOEs have made a comeback in recent years as companies consider maintaining a competitive advantage (Dealbook, 2009). Since the 1990s, the United States government's stance on mergers has been favorable, since the government believes that interference would harm consumer welfare (Valentine, 1996). Due to a more favorable opinion of mergers and greater internationalization, merger, and acquisition (M&A) announcements have expanded significantly on a global scale during 1985-2020, with North America accounting for around 48% of M&A transactions. (Institute of Mergers, 2021).

There are several instances of mergers that have succeeded and failed in a variety of contexts, including diversified mergers, horizontal mergers, market expansion mergers, and vertical mergers. From another vantage point, mergers of equals might be successful or unsuccessful whether depending on the size of their merger or not.

However, it is based on a small proportion of MOE transactions, and there is no empirical evidence on the shareholder's return on the announcement date implications of MOEs related to the size of the merger. I provide this research knowledge for the shareholder wealth at the announcement date for the implications of MOEs related to the size effect of the merger.

1.2 The objective of the paper

The purpose of this article is to ascertain the effectiveness of MOE through an examination of the synergy gain or combined shareholder wealth impacts. The synergy gain is examined using an event study because it is a direct assessment of the impact of merger announcements on shareholder value (Bruner, 2002). In practice, however, there is often one corporation with somewhat more post-merger control, referred to as the "acquirer" or "bidder" and another with slightly less post-merger control, referred to as the "acquired." or "target". Thus, the shareholder wealth impacts of both merging organizations are also evaluated in order to compare them to the current research on mergers' shareholder wealth effects in general. Furthermore, other MOE characteristics associated with shareholder wealth impacts are evaluated to assess MOEs. Two tests will be used to determine the optimal structure of MOE transactions: i) small-size and large-size MOEs – to determine whether the merger abnormal return is determined by the size of the acquirer and target firms. ii) local and cross-border MOEs – to determine whether local or cross-border mergers outperformed in terms of abnormal returns at announcement date in MOE transactions;

Both MOEs and different sizes merged seem to generate synergy. Nevertheless, since the findings are contradictory, it is impossible to conclude definitively whether MOEs or different sizes merged together to generate greater synergy. MOEs provide little value to the shareholders of acquiring corporations, whereas target company shareholders benefit significantly. Another significant result is that both acquirers and targets benefit from participation in small-sized MOEs. By contrast, acquirers are more likely to suffer a loss in large-sized MOEs. This article conducts a complete examination of the shareholder wealth impacts of publicly listed MOE transactions since no previous research has studied the shareholder wealth implications of MOE transactions and the significant adjustment costs linked with such mergers.

This article conducts a complete examination of the shareholder wealth impacts of publicly listed MOE transactions since no previous research has studied the shareholder wealth implications of MOE transactions and the significant adjustment costs related to such mergers. Additionally, previous research on acquisition success has included MOEs in general M&A deals. This study's primary beneficiaries will be industry players contemplating participating in MOE transactions. Industry participants will get an understanding of MOE combined shareholder wealth implications and how any value generated by MOEs is allocated between the acquirer and target shareholders. Additionally, they will determine if small- and large-size MOEs and local and cross-border MOEs all contribute to shareholder wealth impacts for publicly listed MOEs.

CHAPTER 2

Literature Review

2.1 Concept and Theory

2.1.1 Theories of the M&A can create value

This is commonly believed that corporations engage in M&A predominantly for financial gain. As a consequence of the two businesses being inspired to collaborate, a new company entity is established. Synergy may be accomplished via diminishing fixed costs, gaining market share, cross-selling, improving economies of scale and scope, lowering taxes, and redistributing resources more efficiently.

Theories involving growing value. Manne (1965) discovered that acquiring corporations frequently operate in the same sector as their target counterparts, owing to the relative ease with which corporate control may be changed. This is because acquiring business managers are capable of successfully redeveloping target enterprises with corporate restructuring (Fred Weston, 1990). Bradley (1983) demonstrated by using a sampling of tender offers. Additionally, they discovered evidence of the possible synergies that the persistently positive evaluation of target firms' stock prices is contingent on acquiring firms being able to effectively use target firms' resources. The new entity's higher combined performance may be the result of improved management, economies of scale, improved manufacturing processes, enhanced market power (lower competition), and so on.

2.1.2 Theories of the M&A can destroy value

Culture-related issues are a naturally occurring element of the integration process in M&As. According to Olie (1990), managers and workers exhibit conflicts or reluctance to change. They prioritize personal advantage above corporate objectives. There seems to be a tendency for management on both sides to communicate incessantly, sometimes resulting in confrontations between acquirers and targets. As a result, the merged businesses' revenues and productivity deteriorated.

Theories that destroy value. Jensen (1986) observes that acquiring firm managers may squander significant free cash flow on questionable acquisitions rather than pay dividends to shareholders, a phenomenon referred to as “free cash flow agency costs.”. According to Andrei Shleifer (1989), managers might entrench themselves by investing to maximize their personal benefit rather than to improve shareholder value. As a result, it is costly for shareholders.

The theory of hubris. Roll (1986) asserts that acquiring firm managers’ overconfidence in their abilities to operate target firms more effectively results in acquiring firms paying larger premiums. This leads to a drop in the value of acquiring companies, which enhances the value of target companies. Jensen (1986) argues that extra free cash flow enables managers of firms to invest in low-return projects since they are not subject to external capital market monitoring. Larry H.P. Lang (1991), in tender offer data set, acquirer returns are strongly associated with cash flow, according to Jensen's free cash flow theory. Roll (1986) and Sara B. Moeller (2004) discover that big acquirers spend greater premiums as a result of their managers' overconfidence.

Additionally, Ming Dong (2006) show that high pre-merger market values acquirers often pay a premium.

2.1.3 Relevant research

Previous studies on the wealth implications of target companies have shown that shareholders enjoy substantial positive returns. In comparison, the typical return on equity for acquiring companies is either negative or negligible. For example, Jensen (1983) indicate that target enterprises' shareholders gain a cumulative abnormal return of 20% in successful corporate mergers, while the stock price of the acquiring company remains unaltered. Sara B. Moeller (2004) discovered a greater number of adverse outcomes for acquiring companies. They demonstrate that acquiring companies generate a negative value-weighted average abnormal return at the announcement date and shareholders lose $25.1 million.

Morck (1990) investigated 326 acquisitions in the United States from 1975 to 1987 and these findings imply that management motivations may motivate acquisitions that diminish the value of the acquirer company. Hence, Acquirer shareholders have lesser returns when their business diversifies, acquires a quickly rising target, or when its management performs badly prior to the acquisition.

Regarding the size of acquirers, Sara B. Moeller (2004) investigated 12,023 transactions by public corporations in the United States from 1980 to 2001 and found that smaller acquirers get a 2% greater abnormal announcement return than bigger companies. The rationale is that managers of small firms have more ownership than those of large firms. Consequently, large firms are more likely to suffer from problems and they found that because of management hubris, big enterprises often overpay and

offer higher acquisition premiums (Roll, 1986). For more explanation on managerial hubris, Malmendier (2002) find evidence that overconfident managers overestimated their abilities to make a profit on investment and make more acquisitions. As a consequence, they overpay for targets and abnormal returns are lower. Furthermore, when an acquisition requires internal financing, the likelihood of transaction completion rises by 65 percent. Mills (1985) discovered that small enterprises with few decision-makers seemed to be more adaptable to changes in the environment. As a result, small businesses are more resilient than bigger ones.

In terms of local and cross-border mergers, Cheol S. Eun (1996) investigated international mergers using a dataset of overseas acquisitions of US companies between 1979 and 1990 and found that cross-border mergers often result in considerable increased cumulative shareholder value and can create synergy. Notably, they discovered that shareholders of US targets always achieved wealth increases, regardless of the acquiring firm's country. Additionally, International acquirers benefit from targets' R&D expertise. As a result, they found that cross-border acquisitions are consistent with the synergy hypothesis. According to Robert L Conn (2005), they compared the acquirers and targets announcement returns and post-mergers returns from over 4,000 transactions of local and cross-border mergers in the United Kingdom and discovered that, on average, owing to differences in culture, cross-border mergers by UK public corporations generate lower announcement and long-run returns than local acquisitions. Finally, Ahern (2015) investigated 20,893 cross-border mergers and 83,759 local mergers across 52 nations between 1991 and 2008 and found that cultural dimensions have a significant impact on merger activity and synergy gain. Additionally, they discovered that the number of cross-border mergers is lower when countries are

culturally different. They argue that cultural variations impose significant adjustment costs on cross-border mergers and that any possible synergies may be insufficient to offset these costs, resulting in decreased cumulative announcement return. Edward R. Lawrence (2021) investigated the influence of cross-border cultural and firm-country differences on acquisition announcements. Mostly, when the acquirer company announces acquisition in the target nation, the likelihood of the transaction's completion increases. Additionally, they discovered that acquirers are more likely to employ top-tier financial advisors, which boosts the likelihood of a transaction's completion.

The fact that small businesses make higher returns than big businesses doesn't really imply the presence of a size effect. It is possible that the differential in returns is due to the fact that small and big businesses engage in transactions with distinct characteristics. Numerous scholarly publications have shown that specific deal characteristics might have an effect on the abnormal returns; Cornett (2011) indicate that the abnormal returns of combining businesses are inversely correlated to deal value, while Jensen (1983) discovered that combining firms benefit from successful tender offers, abnormal returns of 20% in mergers and 30% in tender offers that are statistically significant.

According to Loughran (1997), examining 947 transactions from 1970 to 1989, this research establishes a link between post-merger return and acquisition techniques and payment methods. Enterprises with stock payment receive considerably negative abnormal returns of -25% on average throughout five years after the acquisition, while the firms with cash payment generate positive and statistically significant abnormal returns of 61.7%. tender offers, which are often hostile acquisitions, generate bigger

wealth increases than other types of mergers. They account for the larger economic gain associated with tender offers as a result of the appointment of superior management. Additionally, Bradley (1988) demonstrate that competition among bidding firms improves the returns to target firms and reduces the returns to acquirers' companies.

Travlos (1987) examine the effect of the payment method in describing the abnormal return after the M&A announcement. The data indicate that the abnormal returns on equity-financed and cash-financed acquisitions are significantly different. He demonstrates that cash-financed purchases generate larger profits upon announcement than equity-financed acquisitions. It is possible that small businesses spend cash more often than big businesses. Due to the fact that cash payment leads to larger abnormal returns for a transaction, this fact may explain why small businesses enjoy higher CARs upon transaction announcement. Finally, Eckbo B. (1990) discovered that the average abnormal stock return for the medium of exchange as a mixed payment offer, where cash and stock are mixed as payment, is significantly higher than the average abnormal stock return for all stock payments or all cash payments.

To provide further empirical evidence on the impact of company size similarity, I evaluate the announcement-period return for small and large acquiring firms and targets of comparable size to determine if mergers of equals are more efficient when dealing with small firms.

CHAPTER 3

Hypothesis Development

To examine the cumulative wealth impacts of MOE transactions, empirical research of value creation in MOEs is essential. Preliminary studies on mergers have mostly ignored MOE transactions, either including or excluding them from the sample. As a result, no earlier research has evaluated the consequences of MOE transactions on shareholders' value and the significant adjustment costs associated with such mergers. In this analysis, all two of the study's hypotheses support mergers with minimal adjustment cost.

Large mature businesses are more likely to have depleted their growth potential. Thus, the agency cost of free cash flow motivates managers to pursue growth possibilities via mergers and acquisitions (Sara B. Moeller, 2004). Additionally, there are adjustment costs associated with big corporations entering M&A, whether as acquirers or targets. Adjustment costs associated with long-term culture in big mature organizations, such as direction, pay package, corporate culture, and management hubris (Olie, 1990), have a detrimental effect on the predicted synergy of transactions. He discovered that cross-border mergers and acquisitions typically fail as a result of cultural differences.

Smaller businesses, on the other hand, are often freshly created by their proprietors. They have a lot of room for development and an unsettled culture; in other words, they have lower agency and adjustment costs. Sara B. Moeller (2004) demonstrate

that there is a size effect in the US mergers and acquisitions market: smaller businesses gain much higher returns on acquisition announcements than bigger ones.

Additionally, to compare my findings to the current research on mergers and acquisitions, I studied two additional characteristics of MOE transactions and their influence on shareholders' wealth impacts for both acquiring and target corporations.

The first characteristic is small and large firm MOE transactions. And the second characteristic is local and cross-border mergers.

My hypothesis is characterized as follows in light of the current thinking on MOEs described previously. Hypothesis I involve in size effect and mention the first characteristic of merger and acquisition – small and large firms MOE transactions. Additionally, in accordance with Manne (1965) and Morck (1990), my hypothesis is as follows:

Hypothesis l: "Smaller firms MOEs earn significantly larger CARs than the large companies MOEs when announcing an acquisition."

The purpose of this research is to determine if the abnormal return on mergers is related to the size of the acquiring and target enterprises within the same industry. The average shareholders' wealth impacts of small-firm MOE transactions are compared to those of large firm MOE transactions. In this test, MOE transaction is considered a small firm if the market value four weeks prior to the announcement falls within the bottom 50% of the sample which is lower or equal to the median of the sample, and a large firm, if the market value is four weeks prior to the announcement, falls within the top 50% of the sample or higher than the median of the sample.

Jensen (1986) proposed that smaller firms with a higher percentage of management ownership should boost company value because managers are more concerned with shareholder value owing to their ownership of a significant portion of the stock. However, in big enterprises with widespread ownership, the agency costs of free cash flow issue become more problematic. As a consequence, management may behave selfishly and focus on empire building rather than on maximizing shareholder value. Demsetz (1985) studied a sample of 511 US company's ownership structures and further found that agency problems are reduced in small enterprises due to increased management ownership and managers' objectives being more aligned with those of shareholders.

The second distinguishing feature is MOE transactions involving local and cross-border mergers and acquisitions. According to the findings of Ahern (2015), my hypothesis is as follows: *Hypothesis II: "Cross-border MOEs generate less CARs than local MOEs."*

To determine whether local or international MOE transactions provide much more value to merging businesses. As with the last test, this one determines the average shareholder wealth impact of local MOEs and compares them to those of multinational MOEs. As a result, Johanson (1990) modern model developed in the 1970s of the process of internalization places a premium on firms increased commitments in foreign markets as a result of the associated risks. According to Kogut (1988) and Zaheer (1995), international businesses encounter an obligation associated with their foreignness and increased information asymmetry. Additionally, they demonstrate the

challenge organizations confront when attempting to replicate organizational techniques from other firms.

CHAPTER 4

Data and Sample Selection

The sample selection procedure is influenced by the paper's objective of quantifying the shareholders' wealth impacts of MOEs.

The sample is drawn from the SDC Platinum and contains worldwide merger and acquisitions transactions publicized between publicly traded companies between 1 Jan 1990 and 31 Dec 2020.

The SDC Database is also used to gather M&A transaction-related data, such as Date announcement, transaction value, deal status, payment method, and acquisition techniques (i.e., Merger of Equals, Tender Offer, Competing Bid, Cross-border) together with acquirers and targets' characteristics such as ticker, name, industry, and nation.

Datastream is used to obtain accounting data for businesses, such as total assets, book value, and operating cash flow. including some capital market data. For example, Total Return indices were used for evaluating the market reaction to merger announcements. Daily data on market indices and market value is also retrieved from Datastream. To maintain data integrity, all data is obtained in U.S. Dollars.

After gathering the information, only those samples are chosen in which (1) the deal value is more than $1 million, (2) the deal must have acquisition techniques such as Merger of Equals (MOEs), (3) the percentage of shares held by the acquiring firm prior to the announcement date to control is less than 50%, (4) the completed transaction, and (5) accounting data are provided.

The distribution of the final sample of MOEs by the merger size is shown in **Table 1** for the sample periods 1990-2020. The merger of equals sample as a whole consists of 163 worldwide merger announcements. If the market value of the two merging firms in the four weeks before the merger announcement was equivalent, I defined it as a "Merger of Equals" (MOEs). The sample is separated into two main groups associated with the merger size: small and large. 79 mergers are considered small deals due to their deal value or transaction value falling within the bottom 50% of the sample, whereas 84 mergers are classified as large deal MOEs because their deal value falls within the top 50% of the sample.

According to **Table 2**, about 64.4% of acquirer MOEs are announced by firms based in the United States, Australia (6.1%), United Kingdom (6.1%), Canada (4.9%), and France (3.7%). Similarly, the majority of the target sample was based in the United States (62.6%), Australia (7.4%), Canada (6.7%), the United Kingdom (4.9%), France, and the Netherlands (1.8%).

Table 3 shows the distribution of sample deals based on industry and indicate that about 26% of acquirer MOEs are announced by firms in the Financial sector, Material (14.7%), Energy and Power (12.3%), High Technology (11.7%), and Industrial (6.7%). Similarly, most of the target sample in the Financial industry (25.2%), Material (14.1%), Energy and Power (13.5%), High Technology (9.2%), Healthcare (9.2%) and Industrial (7.4%).

Table 4 shows the distribution of sample merger transactions by the payment method of the merging firms. It indicates that around 83% or 136 mergers of the MOEs

deal are paid by all stock payment, 16% or 26 mergers are classified as mixed payment and just 1 merger, or 0.6% of the sample period 1990-2020 is paid in all-cash payment.

Table 1
The final sample distribution of MOEs deals by transaction size across the study period.
The table illustrates the distribution of samples involving MOEs announced between 1990 and 2020 based on the deal values of the merging firms. Additionally, data on the merging businesses is accessible through the Datastream, including the return and market indices.

Year	Number of deals					
	Entire sample	%	Small	%	Large	%
All	*163*	*100%*	*79*	*48%*	*84*	*52%*
1990	0	*0.0%*	0	*0.0%*	0	*0.0%*
1991	1	*0.6%*	1	*1.3%*	0	*0.0%*
1992	1	*0.6%*	1	*1.3%*	0	*0.0%*
1993	0	*0.0%*	0	*0.0%*	0	*0.0%*
1994	2	*1.2%*	2	*2.5%*	0	*0.0%*
1995	5	*3.1%*	3	*3.8%*	2	*2.4%*
1996	5	*3.1%*	3	*3.8%*	2	*2.4%*
1997	8	*4.9%*	3	*3.8%*	5	*6.0%*
1998	2	*1.2%*	2	*2.5%*	0	*0.0%*
1999	7	*4.3%*	4	*5.1%*	3	*3.6%*
2000	8	*4.9%*	7	*8.9%*	1	*1.2%*
2001	10	*6.1%*	6	*7.6%*	4	*4.8%*
2002	3	*1.8%*	2	*2.5%*	1	*1.2%*
2003	5	*3.1%*	3	*3.8%*	2	*2.4%*
2004	3	*1.8%*	2	*2.5%*	1	*1.2%*
2005	9	*5.5%*	6	*7.6%*	3	*3.6%*
2006	11	*6.7%*	4	*5.1%*	7	*8.3%*
2007	5	*3.1%*	1	*1.3%*	4	*4.8%*
2008	4	*2.5%*	0	*0.0%*	4	*4.8%*
2009	1	*0.6%*	1	*1.3%*	0	*0.0%*
2010	4	*2.5%*	2	*2.5%*	2	*2.4%*
2011	8	*4.9%*	3	*3.8%*	5	*6.0%*
2012	5	*3.1%*	4	*5.1%*	1	*1.2%*
2013	7	*4.3%*	4	*5.1%*	3	*3.6%*
2014	4	*2.5%*	2	*2.5%*	2	*2.4%*

2015	6	*3.7%*	2	*2.5%*	4	*4.8%*
2016	11	*6.7%*	0	*0.0%*	11	*13.1%*
2017	4	*2.5%*	2	*2.5%*	2	*2.4%*
2018	5	*3.1%*	3	*3.8%*	2	*2.4%*
2019	11	*6.7%*	4	*5.1%*	7	*8.3%*
2020	8	*4.9%*	2	*2.5%*	6	*7.1%*

Table 2
Nation-by-nation distribution of the final sample.
Based on the market value of the merging firms, over half of the Merger of Equals are based in the United States both acquirer and target firms, with 105 transactions for acquirer firms and 102 deals for target firms, accounting for 63% of the worldwide MOEs announced during 1990-2020.

Acquirers' Nation	Number of firms				Targets' Nation	Number of firms			
	Entire sample	%	Small	Large		Entire sample	%	Small	Large
All	*163*	*100%*	*82*	*81*	*All*	*163*	*100%*	*79*	*84*
Australia	10	*6.1%*	7	3	Australia	12	*7.4%*	9	3
Austria	1	*0.6%*	0	1	Austria	1	*0.6%*	0	1
Belgium	1	*0.6%*	0	1	Belgium	1	*0.6%*	0	1
Canada	8	*4.9%*	7	1	Canada	11	*6.7%*	8	3
China (Mainland)	1	*0.6%*	0	1	China (Mainland)	1	*0.6%*	0	1
Finland	1	*0.6%*	0	1	France	3	*1.8%*	1	2
France	6	*3.7%*	1	5	Germany	2	*1.2%*	0	2
Germany	1	*0.6%*	0	1	Italy	2	*1.2%*	0	2
Italy	2	*1.2%*	0	2	Japan	1	*0.6%*	0	1
Mexico	1	*0.6%*	0	1	Luxembourg	2	*1.2%*	1	1
Netherlands	4	*2.5%*	2	2	Mexico	1	*0.6%*	0	1
Norway	2	*1.2%*	0	2	Netherlands	3	*1.8%*	1	2
Russia	1	*0.6%*	1	0	Norway	2	*1.2%*	0	2
Saudi Arabia	2	*1.2%*	0	2	Russia	1	*0.6%*	1	0
Spain	1	*0.6%*	1	0	Saudi Arabia	2	*1.2%*	0	2
Switzerland	2	*1.2%*	0	2	Spain	1	*0.6%*	1	0
Taiwan	1	*0.6%*	0	1	Sweden	2	*1.2%*	1	1
Thailand	1	*0.6%*	1	0	Switzerland	1	*0.6%*	0	1

United Arab Emirates	2	*1.2%*	1	1	Taiwan	1	*0.6%*	0	1
United Kingdom	10	*6.1%*	3	7	Thailand	1	*0.6%*	1	0
United States	105	*64.4%*	58	47	United Arab Emirates	2	*1.2%*	1	1
					United Kingdom	8	*4.9%*	0	8
					United States	102	*62.6%*	54	48

Table 3
Industry-specific distributions of the final sample.
The financial sector declares approximately 25.8 percent of MOEs, both acquirer and target firms, followed by materials, energy and power, high technology, and industrial.

Industry	Number of Acquirer firms				Number of Target firms			
	Entire sample	%	Small	Large	Entire sample	%	Small	Large
All	*163*	*100.0%*	*82*	*81*	*163*	*100.0%*	*79*	*84*
Consumer Products and Services	9	*5.5%*	5	4	9	*5.5%*	5	4
Consumer Staples	2	*1.2%*	1	1	1	*0.6%*	0	1
Energy and Power	20	*12.3%*	9	11	22	*13.5%*	9	13
Financials	42	*25.8%*	23	19	41	*25.2%*	21	20
Healthcare	9	*5.5%*	5	4	11	*6.7%*	6	5
High Technology	19	*11.7%*	13	6	15	*9.2%*	11	4
Industrials	11	*6.7%*	4	7	12	*7.4%*	4	8
Materials	24	*14.7%*	12	12	23	*14.1%*	11	12
Media and Entertainment	6	*3.7%*	3	3	8	*4.9%*	3	5
Real Estate	7	*4.3%*	2	5	6	*3.7%*	2	4
Retail	9	*5.5%*	3	6	8	*4.9%*	4	4
Telecommunications	5	*3.1%*	2	3	7	*4.3%*	3	4

Table 4
Sample transaction distribution based on payment method.
Payment methods were separated into three categories: all stock payment, all-cash payment, and mixed payment. Around 83% of the MOEs in the sample are entirely stock-based.

Payment Method	Number of deals			
	Entire sample	*%*	Small	Large
All	*163*	*100.0%*	*82*	*81*
All Stock	136	*83.4%*	70	66
All Cash	1	*0.6%*	0	1
Mixed	26	*16.0%*	12	14

CHAPTER 5

Methodology

An event study was conducted to evaluate a possible size effect and to test the two control hypotheses. To determine the economic effect of an acquisition, abnormal returns were assessed during the event's announcement.

Event studies are often used to assess market efficiency: if financial markets are informationally efficient, there should be an instantaneous response to an event on the day it is announced and no additional reaction on the following trading days.

This section will outline the steps involved in conducting an event study for this topic.

To indicate the time and date of this occurrence. The event date is specified as the date of the event's M&A announcement, or day '0'. Then, each company's M&A announcement date is distinctive.

I determined the test period (TP) and the estimated period for each event period (EP). Additionally, the test period is referred to as the “event window.” The effects of the acquirer and target firms on shareholders' wealth will be investigated throughout the test period, which is between $-T_2$ and T_3 around the event announcement date (day0), as shown in the timeline below:

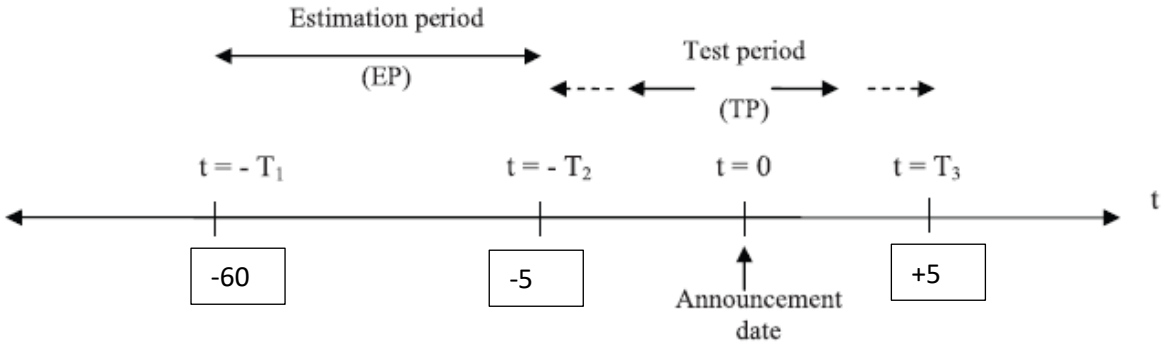

Figure 1: Timeline of an event study

The estimation period, which is between $-T_1$ and $-T_2$ as seen in the timeline of an event study, corresponds to the period during which the anticipated return on the sample stock will be calculated. The estimated time for this study was 60 days or about three months. I utilized eleven-day event windows (-5 to +5 days) around merger announcements.

The expected return $E(R_{i,t})$ is used to compare the actual return within the event window to the expected return in the usual circumstance. Market-model-adjusted return is the model used in this research to estimate expected returns.

$$E(R_{i,t}) = \hat{\alpha}_i + \hat{\beta}_i R_{m.t}$$

The calculation of the expected return is based on a single factor market model. The market model's parameters, namely, $\hat{\alpha}_i$ and β_i , are evaluated across the estimation period using Ordinary Least Square (OLS) regression. This methodology would be used to monitor the relationship between stock and market returns, as well as the risk of a particular stock.

Calculating abnormal (or excess) returns. An individual stock's abnormal return is the difference between its actual return on time (t) in the event window and its expected return of an individual stock. I evaluate the abnormal returns (AR) of acquiring and targeting businesses using the market model and the formula.

$$AR_{i,t} = R_{i,t} - E(R_{i,t})$$

$$AR_{i,t} = R_{i,t} - (\widehat{\alpha_i} + \widehat{\beta_i} R_{mt})$$

where $R_{i,t}$ denotes the target or acquiring firm's actual return on day t and R_{mt} denotes the market return on day t. I utilized the Datastream market index for the nation in which the business is constituted to determine the value of R_{mt}. Finally, α_{it} and β_i are estimates using OLS regression coefficients of security i return on market return using data from the estimation period.

The cumulative abnormal return (CAR) for an individual stock is calculated by aggregating the abnormal returns of each stock during the event window (-5 to +5 days).

$$CAR_{i,(-5.5)} = \sum_{t=-5}^{+5} AR_{i,t}$$

The following formula may be used to compute the average cumulative abnormal return for all sample stocks over time (t).

$$\overline{CAR_t} = \frac{1}{N} \sum_{i=1}^{N} CAR_{(-5,5)}$$

To test whether the *average CAR* is significantly different from zero, t-statistics were used. The following formulas provide parametric test statistics that are used to

determine if the average cumulative abnormal returns are equal to zero across companies.

$$t_{CAR} = \frac{\overline{CAR_{(-5,5)}}}{\sqrt{Var\ (CAR_{(-5,5)})}} \sim N(0,1)$$

where $\overline{CAR}$ is the average cumulative abnormal returns.

$\sqrt{Var\ (CAR_{(-5,5)})} = \bar{\sigma}$ is the standard deviation of $\overline{CAR}$

Due to the fact that abnormal returns are estimated using a market model and an equal weighting method, the variance of $\overline{CAR}$ was determined using an equation

$$Var\left(\widehat{CAR_{(-T2,T3)}}\right) = \frac{1}{n^2}\sum_{i=1}^{n}(-T_2 - T_3 + 1)\sigma_i^2(CAR_{(-T2,T3)})$$

Note that the time period from $-T_2$ to T_3 may include the entire event window. The variance of this CAR is derived by multiplying the number of observations in the event window plus one by the daily abnormal return variance obtained in the equation.

After determining the announcement period's excess returns, multiple regressions, called “Multivariate analysis,” with additional explanatory factors are undertaken to account for any effect of the variables on cumulative abnormal returns (CAR).

The equations for testing the first hypotheses: ***"Smaller firms MOEs earn significantly larger CARs than the large companies MOEs when announcing an acquisition."*** are as follows:

For acquirers: $CAR_i = \beta_0 + \beta_1 SMOE_i + \beta_2 Firm\ size_i + \beta_3 Volatility_i + \beta_4 Cashholding_i + \beta_5\ Deal\ value_i + \beta_6\ Relative\ size_i + \beta_7\ Tender\ offer_i + \beta_8\ Competing\ bid_i + \beta_9\ Allcash_i + \beta_{10} Allstock_i + \beta_{11} Mixed\ payment_i + \beta_{12}(SMOE_i\ x\ Volatility_i) + \beta_{13}(SMOE_i\ x\ Cashholding_i) + \beta_{14}(SMOE_i\ x\ Deal\ Value_i) + \beta_{15}(SMOE_i\ x\ Relative\ size_i) + \beta_{16}(SMOE_i\ x\ Tender\ offer_i) + \beta_{17}(SMOE_i\ x\ Competing\ bid_i) + \beta_{18}(SMOE_i\ x\ Allcash_i) + \beta_{19}(SMOE_i\ x\ Allstock_i) + \beta_{20}(SMOE_i\ x\ Mixpayment_i) + \varepsilon_i$

For targets: $CAR_i = \gamma_0 + \gamma_1 SMOE_i + \gamma_2 Firm\ size_i + \ldots\ldots\ldots + \gamma_{20}(SMOE_i\ x\ Mixpayment_i) + \varepsilon_i$

$SMOE_i$ defined as a dummy variable of interest; $SMOE_i$ equals 1 if the firm is small.

The equations for testing the second hypotheses: ***"Cross-border MOEs generate less CARs than local MOEs."*** are as follows:

For acquirers: $CAR_i = \delta_0 + \delta_1 CBMOE_i + \delta_2 Firm\ size_i + \delta_3 Volatility_i + \delta_4 Cashholding_i + \delta_5\ Deal\ value_i + \delta_6\ Relative\ size_i + \delta_7 Tender\ offer_i + \delta_8\ Competing\ bid_i + \delta 9\ Allcash_i + \delta_{10} Allstock_i + \delta_{11} Mixed\ payment_i + \delta_{12}(CBMOE_i\ x\ Volatility_i) + \delta_{13}(CBMOE_i\ x\ Cashholding_i) + \delta_{14}(CBMOE_i\ x\ Deal\ Value_i) + \delta_{15}(CBMOE_i\ x\ Relative\ size_i) + \delta_{16}(CBMOE_i\ x\ Tender\ offer_i) + \delta_{17}(CBMOE_i\ x\ Competing\ bid_i) + \delta_{18}(CBMOE_i\ x\ Allcash_i) + \delta_{19}(CBMOE_i\ x\ Allstock_i) + \delta_{20}(CBMOE_i\ x\ Mixpayment_i) + \varepsilon_i$

For targets: $CAR_i = \omega_0 + \omega_1 CBMOE_i + \omega_2 Firm\ size_i + \ldots + \omega_{20}(CBMOE_i\ x\ Mixpayment_i) + \varepsilon_i$

$CBMOE_i$ defined as a dummy variable of interest; $CBMOE_i$ equals 1 if the firm is cross-border.

Firm Characteristics control variables		
Variable	Definition / Measurement	Expected Sign
Firm size = ln (MV)	Acquirer and Target size are measured as the market value four weeks prior to the announcement falls within the bottom 50% of the sample which is lower or equal to the median of the sample, whereas a large firm is defined as the market value four weeks prior to the announcement falls within the top 50% of the sample or higher than the median of the sample.	-
Volatility	Calculated as the standard deviation of daily excess returns over the past 6 months before the bid announcement date (-130, -1 day); referred to as the acquirer and target's unsystematic risk.	+
Cash holding	We use Operating Cash Flow /Total Assets as a proxy for cash holding.	+

Deal Characteristics control variables		
Variable	Definition / Measurement	**Expected Sign**
Deal value	The announced value of merger; SDC defines deal value as the entire amount of consideration paid by the acquirer and denominated in U.S. dollars. As can be seen in the above equation, it was determined using ln (Deal value).	-
Relative size of the deal	The ratio of deal value to market value at the end of the fiscal year prior to the merger announcement. (Moeller S.B. et al.,2004)	-
Tender offer	A dummy variable is equal to 1 if the firm involves a tender offer.	+
Cross border	A dummy variable equal to 1 if an acquisition involves cross border.	-
All cash payment	A dummy variable equal to 1 if the deal is financed purely with cash.	+
All stock payment	A dummy variable equal to 1 if the deal is financed purely with stock.	-
Mix payment	A dummy variable equal to 1 if mixed payment deals.	+

CHAPTER 6

Empirical Results

In this chapter, the data will be presented the analysis of the empirical findings computed by statistical software in order to analyze the hypotheses which have already been identified in the previous chapter. At the beginning of this chapter, data will be presented by descriptive statistics and the regression model (ordinary least square method) is used to analyze factors that impact mergers of equals.

6.1 Descriptive Statistics

This part presents a statistical summary of variables which are stated as followings:

TCAR	CAR for targets
ACAR	CAR for acquirers
TVOL	Volatility for targets
AVOL	Volatility for acquirers
TSIZE	Firm size for targets
ASIZE	Firm size for acquirers
TCASH	Cash holding for targets
ACASH	Cash holding for acquirers
DEAL	Deal value
RST	The relative size of the deal to targets
RSA	The relative size of the deal to acquirers
TENDER	A dummy variable is equal to 1 if the firm involves a tender offer
COMPETE	A dummy variable equal to 1 if an acquisition involves competing for bids
CASH	A dummy variable equal to 1 if the deal is financed purely with cash
STOCK	A dummy variable equal to 1 if the deal is financed purely with stock
MIX	A dummy variable equal to 1 if mixed payment deals
SMOE	A dummy variable of interest; SMOEi equals 1 if the firm is small

CBMOE	A dummy variable equal to 1 if an acquisition involves cross border

Table 6.1 Descriptive Statistics

	Mean	**Median**	**Maximum**	**Minimum**	**Std. Dev.**	**Skewness**	**Kurtosis**
TCAR	0.020	0.000	0.551	-0.722	0.137	-0.827	11.105
TVOL	0.018	0.013	0.114	0.000	0.021	1.691	6.940
ACAR	-0.001	0.000	0.539	-1.152	0.152	-3.211	28.484
AVOL	0.021	0.018	0.122	0.000	0.025	1.797	6.706
TSIZE	6585.808	1128.850	83623.870	0.290	14211.650	3.203	13.475
ASIZE	19517.840	2341.759	356618.600	8.021	52259.990	4.340	23.251
TCASH	715.013	121.273	10984.090	-720.602	1645.169	3.701	18.717
ACASH	685.751	155.700	9758.312	-1320.221	1636.729	3.524	15.926
DEAL	7398.455	1703.552	164746.900	11.365	18032.750	5.447	40.875
RST	12.974	1.085	1927.098	0.419	150.852	12.649	161.004
RSA	0.944	0.836	4.298	0.317	0.521	2.577	14.255
TENDER	0.049	0.000	1.000	0.000	0.217	4.175	18.427
COMPETE	0.104	0.000	1.000	0.000	0.307	2.589	7.705
CASH	0.006	0.000	1.000	0.000	0.078	12.649	161.006
STOCK	0.834	1.000	1.000	0.000	0.373	-1.799	4.236
MIX	0.067	0.000	1.000	0.000	0.252	3.448	12.891

The summary statistics of mean and standard deviation show that TCAR has an average of 0.02 more than ACAR with less standard deviation of 0.137 and 0.152 respectively. The average volatility of Targets and Acquirers are both close to each other besides Acquirers which has higher market value. The average of the size of Acquirers is 19517.84 while the average for Targets is 6585.828. The average of deal value used in this study is 7398.455 with a standard deviation of 18032.75.

In terms of skewness, most variables have a positive value which is skew to the right, in general, the skewness statistic indicates a lack of normality in the distribution.

The ideal value of measurement of skewness is 0, the skew of the perfectly distributed normal bell curve. The most skewed of distribution is 12.65 which is from CASH. The summary statistics of small and large firms can be separately presented in the following tables.

Table 6.2 Descriptive Statistics of small firm size

	Mean	**Median**	**Maximum**	**Minimum**	**Std. Dev.**	**Skewness**	**Kurtosis**
TCAR	0.027	0.000	0.427	-0.510	0.130	-0.392	7.250
TVOL	0.017	0.012	0.114	0.000	0.022	1.769	7.398
ACAR	0.006	0.000	0.539	-0.548	0.143	0.131	7.793
AVOL	0.023	0.018	0.122	0.000	0.028	1.624	5.771
TSIZE	8004.932	1345.510	83623.870	0.290	16218.010	2.787	10.573
ASIZE	1399.444	566.573	9663.563	8.021	1904.999	2.416	9.243
TCASH	51.558	26.311	371.000	-100.956	74.672	1.484	6.468
ACASH	66.597	20.011	975.466	-103.100	142.064	4.010	25.204
DEAL	545.408	401.298	1539.424	11.365	469.948	0.690	2.248
RST	25.507	1.059	1927.098	0.419	216.689	8.718	77.012
RSA	0.982	0.829	4.298	0.350	0.625	2.832	13.197
TENDER	0.038	0.000	1.000	0.000	0.192	4.835	24.373
COMPETE	0.101	0.000	1.000	0.000	0.304	2.643	7.988
CASH	0.000	0.000	0.000	0.000	0.000	NA	NA
STOCK	0.873	1.000	1.000	0.000	0.335	-2.246	6.045
MIX	0.051	0.000	1.000	0.000	0.221	4.099	17.803

Table 6.3 Descriptive Statistics of large firm size

	Mean	**Median**	**Maximum**	**Minimum**	**Std. Dev.**	**Skewness**	**Kurtosis**
TCAR	0.012	0.000	0.551	-0.722	0.144	-1.144	13.591
TVOL	0.019	0.018	0.098	0.000	0.021	1.613	6.383
ACAR	-0.009	0.000	0.154	-1.152	0.162	-5.697	40.702
AVOL	0.019	0.017	0.113	0.000	0.023	2.003	8.076
TSIZE	5251.156	796.685	70928.670	26.360	11971.210	3.701	17.434
ASIZE	36108.190	10357.000	356618.600	631.965	68382.790	3.015	12.062
TCASH	1352.951	478.550	10984.090	-720.602	2120.498	2.517	9.854

ACASH	1214.297	388.490	9758.312	-1320.221	2088.701	2.415	8.398
DEAL	13843.580	5310.368	164746.900	1547.922	23403.850	4.049	23.322
RST	1.186	1.101	3.688	0.476	0.394	3.435	21.318
RSA	0.909	0.859	1.974	0.317	0.400	0.618	2.919
TENDER	0.060	0.000	1.000	0.000	0.238	3.723	14.863
COMPETE	0.107	0.000	1.000	0.000	0.311	2.540	7.453
CASH	0.012	0.000	1.000	0.000	0.109	9.001	82.012
STOCK	0.798	1.000	1.000	0.000	0.404	-1.482	3.195
MIX	0.083	0.000	1.000	0.000	0.278	3.015	10.091

6.2 The correlation analysis

In this part, the empirical findings use the correlation to analyze the relationship between each explanatory or independent variable which can help to explain the relationship with mergers of equals. The correlation always plays a significant role in the regression analysis because this can be the indicator to measure how independent variables have an impact on dependent variables. And it is also noticeable which variable has a higher impact, the results can be shown in the following table.

Table 6.4 Correlation analysis

Variable		**Correlation**	**t-Statistic**	**Probability**	**R-Squared**	**Tolerance**	**VIF**
AVOL	TVOL	0.6763	6.5573	0.0000*	0.4574	0.5426	1.8431
TSIZE	TVOL	0.1896	1.3789	0.174	0.0359	0.9641	1.0373
TSIZE	AVOL	0.2087	1.5243	0.1336	0.0436	0.9564	1.0456
ASIZE	TVOL	-0.0784	-0.5618	0.5767	0.0062	0.9938	1.0062
ASIZE	AVOL	-0.0181	-0.1294	0.8975	0.0003	0.9997	1.0003
ASIZE	TSIZE	-0.0946	-0.6786	0.5004	0.0089	0.9911	1.0090
TCASH	TVOL	0.0426	0.3043	0.7621	0.0018	0.9982	1.0018
TCASH	AVOL	0.1674	1.2129	0.2308	0.0280	0.9720	1.0288
TCASH	TSIZE	-0.1097	-0.7883	0.4341	0.0120	0.9880	1.0122
TCASH	ASIZE	0.5241	4.3953	0.0001*	0.2747	0.7253	1.3788
ACASH	TVOL	0.0938	0.6727	0.5042	0.0088	0.9912	1.0089
ACASH	AVOL	0.0560	0.4004	0.6905	0.0031	0.9969	1.0031

ACASH	TSIZE	-0.1232	-0.8864	0.3796	0.0152	0.9848	1.0154
ACASH	ASIZE	0.3838	2.9682	0.0046*	0.1473	0.8527	1.1728
ACASH	TCASH	0.8379	10.9610	0.0000*	0.7020	0.2980	3.3558
DEAL	TVOL	-0.0951	-0.6820	0.4983	0.0090	0.9910	1.0091
DEAL	AVOL	-0.0124	-0.0885	0.9298	0.0002	0.9998	1.0002
DEAL	TSIZE	-0.1653	-1.1970	0.2369	0.0273	0.9727	1.0281
DEAL	ASIZE	0.4071	3.1829	0.0025*	0.1657	0.8343	1.1986
DEAL	TCASH	0.4749	3.8536	0.0003*	0.2255	0.7745	1.2912
DEAL	ACASH	0.3983	3.1013	0.0031*	0.1587	0.8413	1.1886
RST	TVOL	-0.1036	-0.7440	0.4603	0.0107	0.9893	1.0109
RST	AVOL	-0.0996	-0.7149	0.4779	0.0099	0.9901	1.0100
RST	TSIZE	-0.0752	-0.5388	0.5923	0.0057	0.9943	1.0057
RST	ASIZE	-0.0834	-0.5979	0.5525	0.0070	0.9930	1.0070
RST	TCASH	-0.0884	-0.6341	0.5289	0.0078	0.9922	1.0079
RST	ACASH	-0.0235	-0.1679	0.8673	0.0006	0.9994	1.0006
RST	DEAL	0.0099	0.0706	0.944	0.0001	0.9999	1.0001
RSA	TVOL	-0.0651	-0.4658	0.6433	0.0042	0.9958	1.0043
RSA	AVOL	0.1433	1.0342	0.3059	0.0205	0.9795	1.0210
RSA	TSIZE	-0.1871	-1.3601	0.1798	0.0350	0.9650	1.0363
RSA	ASIZE	0.0115	0.0819	0.9351	0.0001	0.9999	1.0001
RSA	TCASH	0.3000	2.2462	0.0291*	0.0900	0.9100	1.0989
RSA	ACASH	0.2022	1.4743	0.1466	0.0409	0.9591	1.0426
RSA	DEAL	0.3534	2.6981	0.0094*	0.1249	0.8751	1.1427
RSA	RST	0.0169	0.1209	0.9042	0.0003	0.9997	1.0003

* Statistically significant at 0.05 level

This table illustrates the correlation between variables in the study, the results show that the most significant relationships that have the highest coefficient is between ACASH and TCASH with a coefficient of 0.8379 followed by between AVOL and TVOL with a coefficient of 0.6763, TCASH and ASIZE with the coefficient of 0.5241, DEAL and TCASH with the coefficient of 0.4749, respectively.

The abnormal return of selected firms used for the hypothesis analysis can be summarized in the following table.

Table 6.5 Average of Cumulative Abnormal Returns

Firm	Small	Large	Cross-border	Local
Acquirer	0.980%	-1.152%	2.311%	-0.492%
Target	2.556%	1.028%	1.478%	1.819%

Results from this table indicate that the cumulative abnormal return of a large target firm is lower than a small target firm similar to an acquirer firm, in which large acquirer firm has a negative average cumulative abnormal return. But when we consider if they are local or cross-border, cumulative abnormal returns of acquirer are higher than the target when the firms has cross-border. Nevertheless, when the firm has local MOEs the target firm has higher cumulative abnormal return in which the acquirer firm with local MOE has a negative average of cumulative abnormal return.

6.3 Regression analysis

Since the majority of time series econometric techniques are built upon that the time series variables are stationary, when the researcher applies standard estimations and test procedures in the dynamic time series model, as the first step, it is necessary to examine the stationary property of a series. A stationary series can be defined as one with a constant mean, constant variance, and constant autocovariance for each given lag. Many approaches can be performed to detect the stationarity of a time series. The most popular method is the Augmented Dickey-Fuller (ADF) test which has been

analyzed to confirm the integrational properties of the data series for all variables. The following table shows the results of unit root tests for each variable.

Table 6.6 Unit root tests (ADF)

Variable	ADF statistics	Probability	ADF 1st Difference	Probability
TCAR	12.4648	0.0000*		
TVOL	-2.5527	0.1100	-3.959957	0.038*
ACAR	-2.9763	0.0438*		
AVOL	-3.5617	0.0116*		
TSIZE	-5.6472	0.0000*		
ASIZE	-5.6377	0.0000*		
TCASH	-5.2360	0.0000*		
ACASH	-5.1721	0.0000*		
DEAL	-5.9956	0.0000*		
RST	-5.6240	0.0000*		
RSA	-4.5565	0.0002*		

* Statistically significant at 0.05 level

The results show that most variables are stationary at level, and the probability of the test is less than 0.05 which can reject the null hypothesis of having a unit root which means those series are stationary (has no unit root). The only variable that is not stationary at level is TVOL, although it is stationary at 1st difference of the ADF test.

Regression analysis was used to analyze the obtained data which are used to determine relationships between a dependent variable and one or more independent or explanatory variables. Simple regression is concerned with the relationship between a dependent variable and a single independent variable; a multiple regression is concerned with the relationship between a dependent variable and a series of independent variables. Linear regression is used to describe the relationship between the dependent and independent variable(s) as a linear function or line (or hyperplane in the case of multiple regression).

Traditionally regression-based factor analysis is extensively used in quantitative finance to analyze the performance of the factors in different factor models. These factor models assume that the expected return is linearly dependent on the risk factors, and hence ordinary least squares (OLS), is widely used to model the distribution. OLS regression is a generalized linear modeling technique that may be used to model a single response variable that has been recorded on at least an interval scale. The technique may be applied to single or multiple explanatory variables and categorical explanatory variables that have been appropriately coded. The model used in this study is set as the following equation.

The equations for testing the hypotheses: ***"Smaller firms MOEs earn significantly larger CARs than the large companies MOEs when announcing an acquisition"*** are as follows:

For acquirers: $CAR_i = \beta_0 + \beta_1 SMOE_i + \beta_2 Firm\ size_i + \beta_3 Volatility_i + \beta_4 Cashholding_i + \beta_5\ Deal\ value_i + \beta_6\ Relative\ size_i + \beta_7\ Tender\ offer_i + \beta_8\ Competing\ bid_i + \beta_9\ Allcash_i + \beta_{10} Allstock_i + \beta_{11} Mixed\ payment_i + \beta_{12}(SMOE_i\ x\ Volatility_i) + \beta_{13}(SMOE_i\ x\ Cashholding_i) + \beta_{14}(SMOE_i\ x\ Deal\ Value_i) + \beta_{15}(SMOE_i\ x\ Relative\ size_i) + \beta_{16}(SMOE_i\ x\ Tender\ offer_i) + \beta_{17}(SMOE_i\ x\ Competing\ bid_i) + \beta_{18}(SMOE_i\ x\ Allcash_i) + \beta_{19}(SMOE_i\ x\ Allstock_i) + \beta_{20}(SMOE_i\ x\ Mixpayment_i) + \varepsilon_i$

For targets: $CAR_i = \gamma_0 + \gamma_1 SMOE_i + \gamma_2 Firm\ size_i + \ldots\ldots + \gamma_{20}(SMOE_i\ x\ Mixpayment_i) + \varepsilon_i$

$SMOE_i$ defined as a dummy variable of interest; $SMOE_i$ equals 1 if the firm is small.\

Table 6.7 Regression analysis for Acquirers with SMOE

Source	**SS**	**df**	**MS**	**Number of obs**	=	109
				F(15,89)	=	0.79
Model	0.42751	19	0.022501	**Prob > F**	=	0.7087
Residual	2.523531	89	0.028354	**R-squared**	=	0.1449
				Adj R-squared	=	-0.0377
Total	2.951041	108	0.027324	**Root MSE**	=	0.16839

acar	**Coef.**	**Std.Err.**	**t**	**P>|t|**	**[95% Conf**	**Interval]**
log_asize	0.005006	0.024108	0.21	0.836	-0.042895	0.052907
avol	0.920763	1.203385	0.77	0.446	-1.470337	3.311862
acash	9.55E-06	0.00002	0.48	0.634	-3.02E-05	4.93E-05
log_deal	0.011034	0.047223	0.23	0.816	-0.082797	0.104866
rsa	0.100488	0.080519	1.25	0.215	-0.059501	0.260478
tender	0.103132	0.13037	0.79	0.431	-0.155911	0.362173
compete	-0.019725	0.120036	-0.16	0.87	-0.258234	0.218784
cash	0.092287	0.224854	0.41	0.682	-0.354494	0.539067
stock	0.031723	0.088209	0.36	0.72	-0.143545	0.206991
mix	-0.06085	0.137917	-0.44	0.66	-0.334889	0.213188
smoe	**0.312186**	**0.33529**	**0.93**	**0.354**	**-0.354029**	**0.9784**
smoelog_as~e	-0.008511	0.031745	-0.27	0.789	-0.071588	0.054566
smoeavol	0.19618	1.499945	0.13	0.896	-2.784178	3.176538
smoeacash	0.000265	0.000274	0.96	0.337	-0.00028	0.00081
smoelog_deal	-0.000364	0.053191	-0.01	0.995	-0.106054	0.105326
smoersa	-0.16534	0.08954	-1.85	0.068	-0.343254	0.012574
smoetender	0	(omitted)				
smoecompete	-0.008367	0.142234	-0.06	0.953	-0.290982	0.274248
smoecash	0	(omitted)				
smoestock	-0.015458	0.117511	-0.13	0.896	-0.248949	0.218033
smoemix	-0.094529	0.176751	-0.53	0.594	-0.44573	0.256672
_cons	-0.30224	0.300726	-1.01	0.318	-0.899776	0.295297

The result from regression analysis of CAR for acquirers as the dependent variable, with a level of significance of 0.1 shows that the interaction between SMOE and RSA is related to CAR for acquirers with a negative relationship.

Table 6.8 Regression analysis for Targets with SMOE

Source	**SS**	**df**	**MS**	**Number of obs**	=	120
				F(15,100)	=	1.35
Model	0.531999	19	0.028	**Prob > F**	=	0.1677
Residual	2.066448	100	0.020664	**R-squared**	=	0.2047
				Adj R-squared	=	0.0536
Total	2.598447	119	0.021836	**Root MSE**	=	0.14375

tcar	**Coef.**	**Std.Err.**	**t**	**P>|t|**	**[95% Conf**	**Interval]**
log_tsize	-0.521298	0.413648	-1.26	0.211	-1.341964	0.299368
tvol	-0.070408	1.285067	-0.05	0.956	-2.619944	2.479129
tcash	6.56E-06	3.05E-05	0.21	0.83	-0.000054	6.72E-05
log_deal	0.529873	0.417155	1.27	0.207	-0.297751	1.357496
rst	-0.637278	0.388046	-1.64	0.104	-1.407151	0.132595
tender	-0.023171	0.108606	-0.21	0.831	-0.238642	0.192301
compete	0.018857	0.082673	0.23	0.82	-0.145163	0.182878
cash	0.014037	0.183332	0.08	0.939	-0.349689	0.377762
stock	0.02406	0.077868	0.31	0.758	-0.130428	0.178548
mix	-0.064885	0.118117	-0.55	0.584	-0.299226	0.169457
smoe	**-0.397728**	**0.479722**	**-0.83**	**0.409**	**-1.349481**	**0.554026**
smoelog_ts~e	0.320103	0.41903	0.76	0.447	-0.511241	1.151447
smoetvol	-0.109054	1.521361	-0.07	0.943	-3.12739	2.909282
smoetcash	0.000393	0.000208	1.89	0.061	-0.000019	0.000804
smoelog_deal	-0.364449	0.422656	-0.86	0.391	-1.202987	0.474089
smoerst	0.6365	0.388047	1.64	0.104	-0.133374	1.406373
smoetender	0	(omitted)				
smoecompete	-0.037988	0.101145	-0.38	0.708	-0.238656	0.16268
smoecash	0	(omitted)				
smoestock	-0.007279	0.103357	-0.07	0.944	-0.212335	0.197778
smoemix	0.020794	0.151947	0.14	0.891	-0.280665	0.322252
_cons	0.584704	0.464803	1.26	0.211	-0.337452	1.50686

The result from regression analysis of CAR for targets as the dependent variable, with a level of significance of 0.05 shows that the interaction between SMOE and size of the target, SMOE, and CASH, SMOE, and DEAL are related to CAR.

Moreover, SMOE and the size of the target is the only pair that are negatively related to CAR.

The equations for testing the second hypothesis: ***"Cross-border MOEs generate less CARs than local MOEs."*** are as follows:

For acquirers: $CAR_i = \delta_0 + \delta_1 CBMOE_i + \delta_2 Firm\ size_i + \delta_3 Volatility_i + \delta_4 Cashholding_i + \delta_5\ Deal\ value_i + \delta_6\ Relative\ size_i + \delta_7 Tender\ offer_i + \delta_8\ Competing\ bid_i + \delta_9 Allcash_i + \delta_{10} Allstock_i + \delta_{11} Mixed\ payment_i + \delta_{12}(CBMOE_i\ x\ Volatility_i) + \delta_{13}(CBMOE_i\ x\ Cashholding_i) + \delta_{14}(CBMOE_i\ x\ Deal\ Value_i) + \delta_{15}(CBMOE_i\ x\ Relative\ size_i) + \delta_{16}(CBMOE_i\ x\ Tender\ offer_i) + \delta_{17}(CBMOE_i\ x\ Competing\ bid_i) + \delta_{18}(CBMOE_i\ x\ Allcash_i) + \delta_{19}(CBMOE_i\ x\ Allstock_i) + \delta_{20}(CBMOE_i\ x\ Mixpayment_i) + \varepsilon_i$

For targets: $CAR_i = \omega_0 + \omega_1 CBMOE_i + \omega_2 Firm\ size_i + \ldots + \omega_{20}(CBMOE_i\ x\ Mixpayment_i) + \varepsilon_i$

$CBMOE_i$ defined as a dummy variable of interest; $CBMOE_i$ equals 1 if the firm is cross-border.

Table 6.9 Regression analysis for Acquirers with CBMOE

Source	**SS**	**df**	**MS**	**Number of obs**	=	109
				F(15,89)	=	0.36
Model	0.208998	19	0.011	**Prob > F**	=	0.9934
Residual	2.742043	89	0.030809	**R-squared**	=	0.0708
				Adj R-squared	=	-0.1275
Total	2.951041	108	0.027324	**Root MSE**	=	0.17553

acar	**Coef.**	**Std.Err.**	**t**	**P>|t|**	**[95% Conf**	**Interval]**
log_asize	0.001531	0.014959	0.1	0.919	-0.028191	0.031253
avol	0.48128	0.74917	0.64	0.522	-1.007305	1.969864
acash	9.55E-06	1.84E-05	0.52	0.605	-0.000027	4.61E-05
log_deal	-0.011778	0.017361	-0.68	0.499	-0.046273	0.022717
rsa	-0.004081	0.034086	-0.12	0.905	-0.071808	0.063646
tender	0.053649	0.189954	0.28	0.778	-0.323786	0.431084
compete	0.012832	0.066165	0.19	0.847	-0.118636	0.144299
cash	0.010952	0.19811	0.06	0.956	-0.382688	0.404592
stock	-0.006063	0.059933	-0.1	0.92	-0.125147	0.113022
mix	-0.128589	0.089515	-1.44	0.154	-0.306454	0.049275
cbmoe	**0.0339**	**0.49104**	**0.07**	**0.945**	**-0.941785**	**1.009586**
cbmoelog_a~e	0.095635	0.120953	0.79	0.431	-0.144696	0.335966
cbmoeavol	0.019346	2.534952	0.01	0.994	-5.017549	5.056241
cbmoeacash	-2.11E-05	0.000208	-0.1	0.919	-0.000434	0.000392
cbmoelog_d~l	-0.071147	0.137733	-0.52	0.607	-0.344819	0.202525
cbmoesrsa	-0.002668	0.223145	-0.01	0.99	-0.446052	0.440715
cbmoetender	0	(omitted)				
cbmoecompete	0.030531	0.243501	0.13	0.901	-0.453299	0.514362
cbmoecash	0	(omitted)				
cbmoestock	-0.194145	0.275438	-0.7	0.483	-0.741434	0.353144
cbmoemix	-0.134629	1.727408	-0.08	0.938	-3.566951	3.297693
_cons	0.066761	0.109969	0.61	0.545	-0.151746	0.285268

The result from regression analysis shows no variables that have significantly related to CAR for acquirers at any level of confidence. The closest variable that might

have an impact on CAR is MIX with a probability of 0.154 which is negatively related to CAR.

Table 6.10 Regression analysis for Targets with CBMOE

Source	**SS**	**df**	**MS**	**Number of obs**	=	120
				F(15,101)	=	0.47
Model	0.199453	18	0.011081	**Prob > F**	=	0.9665
Residual	2.398994	101	0.023752	**R-squared**	=	0.0768
				Adj R-squared	=	-0.0878
Total	2.598447	119	0.021836	**Root MSE**	=	0.15412

tcar	**Coef.**	**Std.Err.**	**t**	**P>|t|**	**[95% Coinf**	**Interval]**
log_tsize	-0.209045	0.165536	-1.26	0.21	-0.537424	0.119334
tvol	0.210416	0.757998	0.28	0.782	-1.293249	1.714081
tcash	2.47E-05	2.38E-05	1.03	0.303	-2.26E-05	0.000072
log_deal	0.193101	0.164665	1.17	0.244	-0.133551	0.519752
rst	-0.067083	0.122353	-0.55	0.585	-0.309798	0.175633
tender	0	(omitted)				
compete	-0.020618	0.054493	-0.38	0.706	-0.128718	0.087483
cash	0.094244	0.17295	0.54	0.587	-0.248843	0.437331
stock	0.034269	0.05797	0.59	0.556	-0.080727	0.149264
mix	-0.036577	0.082732	-0.44	0.659	-0.200695	0.127542
cbmoe	**-0.439913**	**0.505514**	**-0.87**	**0.386**	**-1.442717**	**0.56289**
cbmoelog_t~e	-0.002586	0.590579	0	0.997	-1.174135	1.168964
cbmoetvol	3.150227	5.342006	0.59	0.557	-7.446875	13.74733
cbmoetcash	-6.88E-05	8.52E-05	-0.81	0.421	-0.000238	0.0001
cbmoelog_d~l	0.068882	0.624416	0.11	0.912	-1.16979	1.307555
cbmoerst	0.066318	0.122372	0.54	0.589	-0.176434	0.309071
cbmoetender	-0.041236	0.167435	-0.25	0.806	-0.373381	0.29091
cbmoecompete	0.065122	0.136747	0.48	0.635	-0.206147	0.33639
cbmoecash	0	(omitted)				
cbmoestock	-0.189587	0.317311	-0.6	0.552	-0.819046	0.439873
cbmoemix	0	(omitted)				
_cons	0.149666	0.161814	0.92	0.357	-0.171331	0.470662

The result from regression analysis shows no variables that have significantly related to CAR for targets at any level of confidence. The closest variable that might have an impact on CAR is the size of targets with the probability of 0.210 which is negatively related to CAR.

CHAPTER 7

Conclusion

This final chapter will present all the main findings in this study of the cumulative wealth impacts of MOE transactions. It will start with all main findings and conclusions related to the first research question and then move on to the second. This chapter will end with limitations and recommendations.

7.1 Conclusion

1. Summary statistics of mean and standard deviation show that TCAR has an average of 0.02 more than ACAR with less standard deviation of 0.137 and 0.152 respectively. The average volatility of Targets and Acquirers are both close to each other besides Acquirers which have a higher market value. The average size of Acquirers is 19517.84 while the average for Targets is 6585.828. The average deal value used in this study is 7398.455 with a standard deviation of 18032.75.

2. The correlation between variables in the study, the results show that the most significant relationships that have the highest coefficient is between ACASH and TCASH with the coefficient of 0.8379 followed by between AVOL and TVOL with the coefficient of 0.6763, TCASH and ASIZE with the coefficient of 0.5341, DEAL and TCASH with the coefficient of 0.4749, respectively.

3. Cumulative Abnormal Return (CAR) of a large target firm is lower than a small target firm similar to an acquirer firm, in which large acquirer firm has a negative average cumulative abnormal return. But when we consider if they are local or cross-border, cumulative abnormal returns of acquirer are higher than the target when the

firms has cross-border. Nevertheless, when the firm has local MOEs the target firm has higher cumulative abnormal return in which the acquirer firm with local MOE has a negative average of cumulative abnormal return.

4. Most variables are stationary at level; the probability of the test is less than 0.05 which can reject the null hypothesis of having a unit root which means those series are stationary (has no unit root). The only variable that is not stationary at level is TVOL, although it is stationary at 1st difference of the ADF test.

5. Regression analysis

5.1 The analysis of CAR for acquirers as the dependent variable with SMOE, with a level of significance 0.1 shows that the interaction between SMOE and RSA is related to CAR for acquirers with a negative relationship.

5.2 The analysis of CAR for targets as the dependent variable with SMOE, with the level of significance of 0.05 shows that the interaction between SMOE and size of the target, SMOE and CASH, SMOE and DEAL are related to CAR. Moreover, SMOE and size of the target is the only pair that are negatively related to CAR.

5.3 The analysis of CAR for acquirers as the dependent variable with CBMOE shows no variables that have significantly related to CAR for acquirers at any level of confidence. The closest variable that might have an impact on CAR is MIX with a probability of 0.154 which is negatively related to CAR.

5.4 The analysis of CAR for targets as the dependent variable with CBMOE, shows no variables that have significantly related to CAR for targets at any level of confidence. The closest variable that might have an impact on CAR is the size of targets with the probability of 0.210 which is negatively related to CAR.

7.2 Discussion

Many researchers claiming that small businesses make higher returns than big businesses do really imply the presence of a size effect. Most samples used in this study show average cumulative abnormal return of large target firms is lower than small firms. Cornett (2011) indicated that the abnormal returns of combining businesses are inversely correlated to deal value, while the results of this study found only evidence on target firms with the size effect, and Jensen (1983) discovered that combining firms benefit from successful tender offers, abnormal returns of 20% in mergers and 30% in tender offers that are statistically significant, this study shows no relationship of tender offers to abnormal return at all. Moreover, the results show no relation of payment methods like Loughran (1997), examining a link between post-merger return and acquisition techniques and payment methods, stated that enterprises with stock payment receive considerably less abnormal returns, while the firms with cash payment generate more and tender offers even bigger wealth increases than other types of mergers. Bradley (1988) additionally demonstrated that competition among bidding firms improves the returns to target firms and reduces the returns to acquirers' companies. Travlos (1987) shows the abnormal returns on equity-financed and cash-financed acquisitions are significantly different. It is possible that small businesses spend cash more often than big businesses. due to the fact that cash payment leads to larger abnormal returns for a transaction, this fact may explain why small businesses enjoy higher CARs upon transaction announcement. Moreover, Eckbo B. (1990) discovered that the average abnormal stock return for the medium of exchange as a mixed payment

offer, where cash and stock are mixed as payment, is significantly higher than the average abnormal stock return for all stock payments or all cash payments.

The evidence of the study on the effect of cross-border is not accorded to Cheol S. Eun (1996) who found that cross-border mergers often result in considerable increased cumulative shareholder value and can create synergy. Robert L Conn (2005) stated that cross-border mergers by UK public corporations generate lower announcement and long-run returns than local acquisitions. Finally, Ahern (2015) found that cultural dimensions have a significant impact on merger activity and synergy gain.

7.3 Limitation

Data uses in this study does not mean 100 percent accuracy, it could have selection bias, where individuals, groups or time period are more likely to take effect in the results. And statistical hypothesis testing, a test is said to be unbiased when the probability of statistical level in rejecting the null hypothesis is less than or equal to the significance level when the null hypothesis is true, and the probability of rejecting the null hypothesis is greater than or equal to the significance level when the alternative hypothesis is true.

The studied models used historical data to determine the effect of the past. While they are ex-post models based on analysis of past outcomes, they can be used after estimation to simulate effects of ex-ante factors, provided that these factors are implemented in comparable circumstances. Additionally, econometrics rely on the framework of induction, i.e., from specific to general. A sample cannot be used to generalize a phenomenon, nor it can be used to refute any existing economic theory. A

regression function only indicates generally a linear correlation or variation among the independent and the dependent variables, but not causation. A substantial theoretical review supported by economic literature is always necessary.

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