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Effect of pre-crisis capital on stock abnormal return at acquisition announcements.

The case of the Western European banking sector during the 2008 crisis.

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"One man's meat is another man's poison."

1. Introduction

One plus one is greater than two, a simple statement representing the rationale behind mergers and acquisitions (M&A's). But is it? The announcement of an M&A is to be reflected in the abnormal shareholder return, which anticipates the expected merger value arising from future synergies and/or wealth redistribution among stakeholders (Campa & Hernando, 2004). Though in several studies, abnormal returns around the announcement are measured to be significantly negative for acquiring firms, indicating a lack of confidence to profit from the merger (Hagendorff et. al., 2008; Ferretti, 2000; Campa & Hernando, 2006).

In the mid of 2007, unrest started in the banking-system. Bulge bracket bank Lehmann Brothers fell, and some are talking about 'the great recession'. In Europe Basel II appeared insufficient and the crisis resulted in failing of large banks, forced nationalization and a decrease of mergers and acquisitions (M&A). This pressured banks to rethink their capital structure and corporate strategy in the financial industry. But where some fail, the situation created opportunities others. Berger & Bouwman found that during crises in the United States (US), banks with higher capital ratios could benefit by increasing market share through M&A's, and by buying targets at distressed prices. A recent study on European M&A's provided evidence that the abnormal return around the announcement during a crisis is different (significantly positive) from the return outside a crisis.

Even though the subject of M&A's is widely researched, several shortcomings in the literature indicate that this phenomenon in the European banking industry is not fully understood. At first, it is noticeable that financial institutions are often left out of an M&A study because the financial sector is adherent to different regulations, leading to different capital structures. Secondly, most studies in banking M&A focus on the US market, while in Europe, banks are obligated to follow a different set of regulation. Thirdly, over 2013 to 2015 Basel III regulations are introduced to the European financial sector which effects' on M&A are not well researched. Lastly, the creation of shareholder value is important because shareholders are a firm's owner and can decide upon the future; if an M&A deal does not provide them with any benefits through value creation, they could block a merger.

This paper examines if there is abnormal return on stocks price of an acquirer around the M&A announcement and whether or not acquirers' pre-crisis capital has significant impact on the return around announcement. In particular this study will contribute to the literature by testing the theory from Berger & Bouwman (2008) that during a crisis banks with higher capital

ratios are able to take advantage from M&A opportunities because assets are purchased at distressed prices. Besides, this study supports the findings of Beltratti & Palladino that M&A announcement is different during a crisis. The focus is on abnormal return from stock price, and will lead to a deeper insight into M&A announcement and its consequences to the acquirer. With the indication of a gap in the literature due to the recent disorder in the banking system, the following research question has been formulated:

"What is the effect of pre-crisis capital on stock price reaction to merger and acquisition announcements in the Western European banking sector during the 2008 crisis?"

In order to assess the impact of M&A announcements on the shareholder value, I perform an event study to analyze if the stock returns of acquiring banks involved in M&A's have undergone an abnormal trend around the announcement date. The effect of pre-crisis capital on abnormal returns around announcement is measured by an ordinary least squares (OLS) regression model. To identify M&A-transactions of European banks I will rely on the following data sources: Thomson One Banker's Mergers and Acquisitions Database, and Datastream in order to acquire stock returns around the event dates. Data from pre-crisis capital and other bank-characteristic variables are retrieved from Compustat-Global. The final sample includes a total of 88 announced M&A deals in the EU-17 countries plus Norway and Switzerland during a period of banking crisis between October 2008 and December 2012.

This paper provides evidence that the abnormal return for acquiring banks around the announcement of an M&A is different than measurements in a non-crisis period. A significant positive abnormal return was found in the period of a month after the announcement. I argue that this is due to opaqueness of target assets, and an uncertain sentiment during the crisis which delays the due diligence process of the merger. In this event window and various others, pre-crisis capital was found to have a positive and significant association to abnormal return of the acquiring bank.

The following sections of this paper review the literature and thereby aid the formulation of hypotheses in order to establish the relationship between pre-crisis capital, shareholder value and M&A announcements. This is presented in chapter 2. Chapter 3 presents methodology used, and chapter 4 provides data sources and descriptive statistics of abnormal returns and capital ratios. In chapter 5, the analysis is presented of the relations between abnormal return and other covariates at several time windows. Finally, chapter 6 discusses the implications of the results and provides concluding remarks.

2. Literature review and hypotheses

2.1 Features and evolution of European Banking

European banks have been heavily regulated by e.g. the rationing of licenses, restricting branches and credit, and the diversification between financial activities (Wilson et. al., 2010). Several benefits could occur by deregulation such as lessening fragmentation and excess capacity, achieving higher efficiency and increasing product offerings. Therefore in the 1990's a deregulation allowed for free competition, only by the regulation of monitoring such as on asset quality and capital requirements. Today's principle goes by the idea that the banking system, under the influence of competition, would be stronger and more resilient to shocks. The regulatory change that took place in Europe integrated domestic markets, leading to the creation of a united European banking market. The following regulations which the European Commission initiated changed the banking market and affected banking M&A:

- The second banking directive in 1992 introduced a single banking license where the domestic firm's country had ultimate control and supervision on the cross-border activity of the banks. It laid the principle of mutual recognition of regulations among EU banks.

- The Basel Committee obliged banks from G10 countries to comply with a minimum risk asset ratio (RAR), and attempted to accommodate market risk exposure of banks. In 1996 EU members adopted the Capital Adequacy Directive.

- The introduction of the Euro currency in 12 countries (1999) allowed for a more liquid capital market, providing new financing sources, but also benefited cross-border markets by eliminating currency volatility (Fiordelisi, 2009). Because commitment between EU countries of the Euro existed towards the political and economic agenda, they lowered transaction costs for cross-border M&A's as well.

- The diversification of banks in other sectors such as insurance and securities was influenced by the Financial Conglomerate Directive implemented in 2002. This framework under supervision regulates financial firms that are involved in cross-sector activities.

- The Takeover Directive proposed in 2004 harmonized takeover laws across the EU. This new structure relieved cross-border M&A's.

- In order to catch up with developments and criticisms of Basel I, the Basel committee proposed improved regulatory capital requirements with a foundation of

three pillars (2004). The first, minimum capital requirements would now be based upon external risk assessments. Added by a second pillar, supervisory review of the capital adequacy and internal assessment process, and a third pillar of improved market discipline (Hall, 2012).

In the United States of America (USA), deregulation took place in a series of less well-coordinated actions to stimulate consolidation of financial institutions. Restrictions on interstate banking eroded gradually through the course of the following stages (Berger et. al., 2000):

- During the 1980's, individual states of the USA began passing laws to permit for cross-state acquisition of existing banks. However, these laws where often only extended on a reciprocal basis between states with similar laws.

- In 1994, the Riegle-Neal Interstate Banking and Branching Efficiency Act removed the remaining restrictions on interstate banking. This act was fully implemented in June 1997. In terms of geographic expansion of banks in the USA, the effects of the Riegle-Neal act show similarities to those of the second directive in the EU.

- Untill 1999 however, types of universal banking where still forbidden and separated commercial banks from securities and insurance activities. The Gramm-Leach-Bliley Act of 1999 removed these restrictions and allowed for consolidated organization.

2.1.1 Fundamentals of bank performance

Because the banking system influences capital allocation, growth of companies and in general economic development, it is important to study how banks can increase their performance. In a changing and competitive environment, European banks have successfully expanded through internally generated growth or through M&A's. Fiordelisi (2009) argues that growth is a banks foremost method to increase bank performance because it realizes scale and scope economies, reduces labour and other variable costs, and reduces operational inefficiencies. The aim for any bank in a competitive environment is to create shareholder value which is a measurement of its performance. The following actions are known to create shareholder value:

1. Increasing of cash flow to equity; for example by increasing deposits, loans, or reducing operating costs.

2. Reducing the costs of capital; for example reducing systematic risk by diversifying activities

These results can be obtained either by implementing strategies within the bank, or by involving external parties; performing M&A's, joint ventures, and strategic alliances. Fiordelisi (2009) argues that implementing internal strategies to create sustained shareholder value of the bank, requires intense focus on delivering benefits to customers in the most efficient way, attracting and keeping motivated employees, and sustaining highly effective supplier relations. For this reason, the focus is on optimal management of the bank stakeholders; e.g. customer satisfaction and human resource management. The involvement of external parties (through M&A) is complementary to above activities of creating shareholder value, and is also a common corporate strategy among banks to allow for economies of scale, (geographical) diversification, increased profitability and/or asset growth, increased efficiency, reduction of risk and increased market power (Haynes & Thompson, 1998).

2.2 M&A as a tool to increase bank performance

There are several theoretical arguments, which present a variety of motives to explain the reasons of banks to take part in M&A's. Three main motives widely discussed in literature are the "information hypothesis" (occuring when the economic gains of two entities merging together create more value than both separated), "the inefficient management hypothesis" (assuming that M&A's are mainly driven by the self-interest of the acquiring firm's management predicting that M&A's take place in order to increase the acquirer's management wealth at the cost of shareholders), and the "Hubris hypothesis" (suggesting that M&A's are motivated by mistakes of management and there are no synergy gains.) (Asimakopoulos & Athanasoglou, 2009). According to these theories, M&A's create shareholder value for targets, but not always for the acquiring banks. The hubris and inefficient-management theories argue a negative impact for acquiring banks, and only the information theory predicts positive total returns.

However, according to the abovementioned arguments the expected changes in acquirer bank share price from an M&A announcement are positive when the involved banks provide similar services and are active in the same market. A negative reaction however, may entail when the M&A serves personal interest of the acquiring banks' management only, instead of the shareholders' interest. Deals that involve cross-border M&A's or lesser known banks (e.g. unlisted) are also expected to have a negative reaction because investors face information asymmetries.

2.2.1 Overview of M&A activity in recent years

Europe has undergone an increase of value in banking M&A's between 2000 and 2007. Wilson et al. (2010) measured in this period a significant reduction of credit institutions. For cross-border M&A's within and outside the EU, there has been an increase of M&A's within the EU of 18.5%, and outside the EU with 9.1% between 2000 and 2007. Domestic M&A's within the EU have shown a decrease of 27.6% in that same period. The most transactions within the EU that have taken place were between banks within the EU-15, accounting for 88% of the amount of M&A's and 97% of the total value of M&A's in the EU (Fiordelisi, 2009). As these numbers suggest, the deregulation in the EU and European legislation implemented in the late 1990's have created a rewarding environment for M&A's in Europe.

The research by Hagendorff, Collins & Keasey (2008) provides information on a wide timeframe of mergers from the US and EU-15 countries in the period 1996 to 2004 on deals of at least $100 million. The research shows that even though the total number of mergers is less in Europe (53) than in the US (151), the average value of European mergers has been higher than US mergers with $4,997 million and $3,275 million respectively. The total number of EU mergers was 26% of all EU and US deals from 1996 till 2004, but these accounted for 35% of the total value. In a later study, Fiordelisi (2009) shows that this difference existed at least until 2007 when data for M&A deals completed by financial institutions is slightly higher in the US in number of deals, but the value of the deals was higher in Europe.

From the year 2008 onwards however, the economic crisis produced an impact on both the banking system and on M&A trends. Worldwide, the course of M&A's in the financial sector shrunk greatly compared to the level reached by 2007. In the year of 2007 to 2008, there were 292 M&A announcement in the EU financial sector, with a total value of €345 billion. But after the fall of Lehmann Brothers and the start of the credit-crisis, in 2009 the number of M&A announcements dropped to 49 deals (of which 38 included government activity) with a total value of €80 billion. In 2010 government reductions where sharply reduced, and the total M&A deal value in the EU financial sector dropped to €50 billion.

Even though M&A has been researched extensively; some deficiencies remain as the literature indicates that the European banking industry has met severe changes since the recent turmoil of the subprime crisis. Because due to the credit crisis, banks have suffered large losses, and many banks had to raise additional capital or be bailed out by their respective national governments. Berger & Bouwman (2013) argue that there has also been a lack of clearly defined national anti-crisis measures. These developments led academics and policy-makers to revise what used to be a consensus on the governance, performance and the safety of financial

institutions (Wilson et. al, 2010). It is due to the lack of liquidity or equity capital that many banks found themselves in financial struggle, and became attractive targets to banks which were relatively unharmed by the crisis, persisted high liquidity, and found themselves in a strong position to acquire other banks, given also the decreased number of rivals on the M&A market.

2.3 Effects of banking M&A in Europe and the rest of the world

The market efficiency theory, as determined by Fama (1970), has found strong support in several studies. This theory holds that market (stock) prices reflect all available information (the degree of market efficiency ranges from a strong to a weak form) (Fama & Malkiel, 1970). In the assumption of an efficient market, where assets are priced rationally, the revaluation effects of banking M&A announcements is an accurate measurement to assess the net benefits which shareholders can extract from an M&A announcement. Also, in various finance studies on both M&A as other topics, the stock prices are used as a measure (e.g. Alexandridis, Petmezas & Travos, 2010; Campa & Hernando, 2004; Campa & Hernando, 2006; Chi, Sun, Young, 2011; Croci & Petmezas, 2010). Usually, the evidence of the results are based on returns computed on a pre-announcement period to a post-announcement period basis. When the pre- and post-announcement stock returns are compared with benchmark returns, possible abnormal returns as a result of the M&A announcement can be found (Scholtens& de Wit, 2004. P. 219). Previous studies have computed benchmarks from portfolio returns such as a stock exchange (Intrisano & Rossi, 2012), or stock returns from a sample of banks which are similar or comparable banks (Scholtens & Wit, 2004), or from a sample of banks which were not included in an M&A during the sample period (Fiordelisi, 2009), or even using multiple benchmarks to compare the results to (Cybo-Ottone & Murgia, 2000).

Some studies have used data from a period of 15 days before and after the announcement (Hannan & Wolken, 1989) while others use a timeframe of -20 and +20 relative to the announcement (Asimakopoulos & Athanasoglou, 2009) and yet other research has been conducted in a asymmetric time frame such as -3 and +31 relative to the M&A announcement (Scholtens & Wit, 2004). Earlier studies on this subject have focused on the acquiring firm, target firm, or both types, depending on the main research question. Beitel & Schiereck measured the stock returns on both types of firms, in assessing the returns of European banks around M&A announcement (2001). Alexandridis, Petmezas & Travos also use the same kind information in a study that is focusing on stock markets returns in general (both financial as non-financial firms that are listed) around such an announcement (2010).

The general conclusion drawn from literature is that in banking M&A at times of completion the abnormal returns tend to be positive for acquiring banks. The results around M&A announcements from acquiring firms are mixed, but the tendency for abnormal returns at announcement exists to be negative or statistically insignificant in most cases. The theory by Gottschalg & Zipser (2006) clarifies that the returns at announcements for acquirers can be explained due to the competition for a limited number of attractive investment opportunities. The authors shows that acquisition performance decreases when a large number of private equity investors are looking for suitable acquisition targets, and the performance increases when macroeconomic conditions are such that demand for private equity financing is high. This theory of supply and demand for acquisition performance is closely linked to the more fundamental theory of the efficiency of financial markets in the pricing of investment opportunities. This efficient market hypothesis claims that security prices fully reflect all available information at all times (Fama, 1970). Demand should then be perfectly elastic, and exogenous supply or demand shifts would then not lead to a change in market price. A counterargument comes from behavioral finance theory and considers the systematic and significant deviations from the market price under certain conditions. Such condition is the price pressure effect, explaining that an exogenous shock in supply or demand for a security leads to a short-term change in the price for this security[1].

For the US M&A market, studies showed that the stock price reaction of the acquiring bank to a merger announcement realized losses of about 2%. Europe however, showed slightly more favorable market reactions to mergers with no effect on the firm value and insignificant (Asimakopoulos & Athanasoglou, 2012; Scholtens & Wit, 2004; De Long, 2011, Beitel & Schiereck, 2001; Campa & Hernando, 2006; Cybo-Ottone and Murgia, 2000). Table 1 shows an overview of the several research outcomes from different studies on banking M&A announcement returns for acquiring banks[2]. This table confirms expectations found from the literature in banking M&A that abnormal returns around M&A announcements tend to be negative or statistically insignificant in most cases. According to Hagendorff, Collins & Keasey (2008), there is no convincing argument to date that explains the different reactions to bank

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[1] On a side note, I would like to mention that I do not postulate strong market efficiency in the European banking M&A market. But a weaker form of the law of supply and demand is a reasonable presumption in the absence of any counter arguments.

[2] It is noteworthy to mention that many studies have focussed their attention on the combined effects of both target and acquirer, the results therefore showed value creation on an aggregated basis rather than studying the target or acquirer separately. This may explain the positive results from several banking M&A event studies. Throughout this study however, comparisons are made, and evidence is given, solely from previous studies which focussed on the returns of acquiring banks only.

mergers in the US and the EU. A noticeable difference in EU M&A's however, is that in the early 1990's positive abnormal returns where reported while from 1998 onwards less favorable and negative abnormal returns where found. An explanation could be the in 1999 implemented EU law allowing for bank diversification of activities. The studies that consider the time-window well after the announcement (to 31 days after the announcement), show to be insignificant and a mix of both negative and positive returns. Caves (1989) argues that findings in this window may reflect the publication of new information on the merger or 'second thoughts' by bidder's shareholders. However, it is complicated to interpret returns over a longer time period due to possibly confounding events that have nothing to do with the transaction but do affect the abnormal return measured.

Table 1 - Literature summary of acquirer abnormal return at M&A announcement

An overview of studies on the topic of banking M&A, sorted by author, period of time studied, the region under study (US = United States, EU = European Union), sample size (N), and the several event windows (*t*) used to calculate the Cumulative Abnormal Return (CAR) at announcement. All studies included publicly traded firms only in their sample and used the market model to calculate CAR. The CAR is expressed as a percentage of change to the market model and calculated for acquiring banks only. Significance of the CARs was calculated by all authors using the t-statistic and is denominated by respectively *Significance level 10%; **significance level 5%; ***significance level 1%.

Author(s)	Period studied	Region/ Country	N	t = 0	t = -1, +1	t = -10, +1	t = -5, +5	t = -10, -5	t = -3, +31	t = -20, +20
Cornett et. al. (2003)	1988 - 1995	US	423	-0.23	-0.74***					
De Long & De Young (2007)	1987- 1999	US	216			-2.39***		-3.16***		
Hagendorff et. al. (2008)	1996 - 2004	US	151	-1.40**	-0.70***	-0.25***				
Scholtens & De Wit (2004)	1990 - 2000	US	61						-1.86	
Cyob-Ottone & Murgia (2000)	1989 - 1997	EU	54		0.99**		1.08			2.19***
Scholtens & De Wit (2004)	1990 – 2000	EU	20						2.56	
Ferretti (2000)	1998 – 2000	EU	75	-0.53**						
Campa & Hernando (2006)	1998 -2002	EU	244		-0.87**				-1.20	
Beltratti & Palladino (2011)[1]	2007 – 2010	EU	139		0.0008			-0.0007	0.009***	

2.3.1 Bank and deal characteristics influencing the effect of M&A

When one observes the results of Table 1, differences are shown in significance and positive or negative results in abnormal returns around the M&A announcement. The stock returns around M&A announcements are associated with the improvement in post-merger operating performance. This suggests that anticipated gains drive the share price at announcement. The returns gained upon completion of a merger or acquisitions depend on the transparency of the target firm and relates greatly to less volatility and risk associated with more transparent deals (Asimakopoulos & Athanasoglou, 2009). Several studies found a number of interesting insights about the drivers of M&A profitability upon which investors tend to anticipate.

a. **Domestic M&A's.** Across European countries, a substantial difference can be found in the structure of the banking system. Even though the Financial Services Action Plan (FSAP) was implemented in 1999 to create a fully integrated and competitive market for financial services in Europe (mainly by introducing a coherent legal framework), there are still substantial differences among countries which can be found in terms of number of banks, concentration, and distribution channels. Fiordelisi (2009) suggests that *"(...) significant barriers to the integration of banking markets still exist and these may arise from national economic conditions, culture, language and differences in fiscal and legal systems"* (Fiordelisi, 2009, p23). In retail banking, such barriers mainly relate to the doubt of consumers toward foreign banks and the information advantage of local banks on borrower's creditworthiness. Berger, de Young, Genay & Udell (2000) add to the above by indicating that foreign institutions are generally less-efficient than domestic institutions, which occurs in part from operating problems such as high costs for managers to work abroad, and problems of monitoring to evaluate performance.

b. **Diversification of activities.** In the context of diversifying activities of the acquiring bank, M&A's have indicated losses. Even though diversifying mergers in Europe show to be more prevalent than in the United States, it is generally suggested that conglomeration in the financial sector increases the concern of investors because the true value of the target and any opportunities in synergy from the M&A deal are difficult to assess (Hagendorff et. al., 2008). In the study from De Long (2000) on US mergers (N=280) from 1988 to 1995, the average CAR of diversifying (acquiring) banks was -2.17 (significant at 1%) and the average CAR of activity focussing banks was -0.95

(significant at 5%). In Europe, results are generally positive as confirmed by the study from Hagendorff et. al. (2008). The study was performed on European bank acquirers (N=53) between 1996 and 2004, and the result of focusing activities was 0.50% whereas diversifying banks had a result of 0.11%.

c. **Return on Equity (ROE).** In the study from Berger & Bouwman (2013), the authors argue that profitable acquiring banks (i.e. with a high relative return on equity) generate higher abnormal returns at announcement. Asimakopoulos & Athanasoglou (2012) support this statement from Berger & Bouwman and explained that banks with a higher ROE can withstand shocks in the economy (e.g. in times of crises). According to Asimakopoulos & Athanasoglou (2012) ROE explains the abnormal return of acquirers by an OLS regression coefficient of 0.911% (N=204, significant at 1% level) in a European M&A between 1996 and 2004. The study from Becher (2008) also confirmed positive returns for high ROE banks with a p-value of 0.02. Again, this suggests likely acquirer gains.

d. **Efficiency.** Asimakopoulos & Athanasoglou (2012) argue that efficiency is a representation for successfully employing the banks' expenses in order to efficiently generate income. De Young (1997) showed with the study of a sample of 348 deals, that 58% of the acquirers generated cost efficiency. "An efficient bank can transfer its superior skills to another bank through a deal in an attempt for the overall entity to realize efficiency potentials" (Asimakopoulos & Athanasoglou, 2012, p19).

e. **Relative deal size.** Through a large merger the acquirer may entail more benefits from cost reduction through synergy (i.e. scale economies). However, the procedure is far more complex when the target is relatively large. Asimakopoulos & Athanasoglou (2012)

The size of the acquiring bank is a variable which can be included to take into account the effects of economies of scale. According to short (1979), the size of the bank is also related to the capital adequacy because large banks tend to raise less expensive capital and therefore appear more profitable.

2.3.2 How financial crises influence banking M&A

The start date of a banking crisis corresponds to the first signs of significant financial distress, while a banking crisis is systematic when also "significant banking policy intervention

measures in response to significant losses in the banking system" can be identified (Laeven & Valencia, 2012, p.4). The banking policy interventions are significant only when 3 of the following conditions are met;

- "extensive liquidity support (5 percent of deposits and liabilities to non-residents)
- bank restructuring gross costs (at least 3 percent of GDP)
- significant bank nationalizations
- significant guarantees put in place
- significant asset purchases (at least 5 percent of GDP)
- deposit freezes and/or bank holidays" (Laeven & Valencia, 2012, p.4).

According to the European Commission (2009) there has been a build-up of the crisis since 2007, but when in September 2008 Lehman Brothers had filed for bankruptcy, institutions at risk could no longer finance themselves and had to sell assets at 'fire sale prices', and restrict lending, thus starting the true systematic banking crisis in Europe. In response to the drying up of liquidity, the European Central Bank (ECB) introduced the long-term refinancing operations through which liquidity was provided to banks at a fixed rate for one year. The problem however was not solved by the policy interest at a rate of zero. The relation to key market rates which had been broken down and impaired the transmission mechanism where liquidity and solvency problems have been difficult to disentangle. Reichlin (2013, p136) states that "these policies carried risks which showed when the debt crisis of 2011 exploded. The liquidity injection revealed to be a temporary relief for institutions which in fact faced solvency problems". In 2012, the horizon of refinancing by the ECB was extended for up to three years.

The strike of the subprime lending crisis, followed by the debt crisis, was particularly characterized by difficulty in selling and securitizing loans. The liquidity of banks dried up and many banks carried substantial losses in capital. Over 2008, the crisis had created so much unrest and uncertainty globally, that M&A transactions have dropped with 29.6% worldwide in just one year (Fiordelisi, 2009). The financial crisis had affected the financial system and banking sector to such extend that banks suffered from loss or even bankruptcy, and many sought additional capital or had to be nationalized by their respective governments. Results of abnormal returns of M&A's have also shown inconsistencies. A recent paper by Beltratti & Paladino (2013) studied European cross-border banking M&A's during the financial crisis on shareholder value from 2007 to 2010. They measured price of stock on market reactions to the announcements of M&A and to the completions of M&A's. In agreement to economic promising times, the announcements of M&A's did not represent significant abnormal returns.

In controversy however, from 2008, acquirers have shown to get significant positive returns around the announcement date. The returns at announcements are primarily clarified by characteristics of the acquiring bank. The returns gained upon completion of a merger or acquisitions depend on the transparency of the target firm and relates greatly to less volatility and risk associated with more transparent deals Asimakopoulos & Athanasoglou (2009).

The financial crisis had affected the financial system and banking sector to such extend that banks suffered from loss or even bankruptcy, and many sought additional capital or had to be nationalized by their respective governments. At the same time however, an explanation given for the abnormal returns from banking M&As is that banks with higher capital where able to take advantage of weaker competitors and therefore easily utilize the M&A opportunities (Berger & Bouwman, 2009).

Since the crisis of 2008, results of banking M&A abnormal returns have shown inconsistencies. A recent paper by Beltratti & Paladino (2013) studied European cross-border banking M&A's during the financial crisis on shareholder value from 2007 to 2010. The authors measured price of stock on market reactions to the announcements. They did so by calculating cumulative abnormal returns (CARs) computed over different event windows using a market index. In controversy to economic promising times however, the results show that acquirers realized significant positive abnormal returns (mean CAAR = 0.009097, SD = 0.039) for the window [-10, -5]; interpreted by the authors as information leakage related to insiders. CARs computed over different windows resulted positive and statistically significant at the 10% level for the windows [-10, +10] and [-10, +5]. Beltratti & Paladino argue that the positive returns may be coherent with a situation where acquisitions are partly motivated by exploiting opportunities on the part of stronger banks; this is in consonance with the theory from Berger & Bouwman who argue the utilization of M&A opportunities by acquirers with high-capital.

2.4 The role of capital in European banking

The financial sector differs from other industries, because banks are regulated and need to realize minimum requirements on the amount of capital held as a security against risk-taking events. Cornett et. al. (2003) argue that because regulators are accountable for safeguarding public confidence in the banking system as a whole, they want to give incentives to banks in order to maintain financial security. Capital standards are one way of providing these incentives. Given the ability of banks to use excess capital to fund risky investments (such as acquisitions), a capital standard is one way of providing an incentive to banks.

In a recent study on stock returns to US acquirers in the banking sector during the recent credit crisis, Berger & Bouwman (2013) argued that crises may represent opportunities for banks with excess capital. Particularly from the viewpoint of capital and liquidity, 'healthy' banks may have an opportunity to improve market share, and shop around to buy competitors at distressed prices during the crisis. The question if higher capital has an impact on banking performance is of high interest at the moment because of the consequences of the recent banking crisis, and also since the Basel Committee started implementing Basel III, a more comprehensive accord on capital requirements (Andersson & Nordenhager, 2013).

However, certain conflicting views exist on maintaining bank capital. Several recent proposals debate for more capital in banking due to the safety net provided (Kashyap, Rajan & Stein, 2008; Hart & Zingales, 2011), while bankers argue that holding more capital puts performance at risk and leads to less lending (Aiyar, Calomiris & Wieladek, 2012; Diamond & Rajan, 2011).

Even though the Basel accords are intended to be applied by internationally active banks only, the European Parliament adopted Basel II for all EU banks in 2005. The Basel II accord takes an internal ratings based approach to the amount of capital that needs to be held against a given exposure. In Basel I the capital requirement was a constant ratio of 8% while Basel II aims at a better alignment of capital requirements with the underlying banking risks, and consequently requires higher capital for riskier loans up to a 12% capital charge. In the US, Basel II was not implemented by the Federal Banking Agency until late 2007, also the US adopts only parts of the Basel II accord and applies these to the largest internationally active banks only.

To take significant steps in the direction of strengthening the banking sector, the latest Basel III agreement redefined capital to be truly loss-absorbing and set the minimum target for Tier 1 capital at 7% of risk-weighted assets[3]. This is an increase of an additional 2.5% in common equity to the required capital buffer (Demirguc-Kunt, Detragiache & Merrouche, 2013). A study by Miles et al. (2012) however, has shown that the optimal capital ratio is not likely to be below 15% in various scenarios. The new Basel III requirements will begin to be implemented in phases over the years 2013 to 2015[4]. To measure capital before crisis, Berger & Bouwman (2013) found that an average of each bank's capital ratio of the four quarters before the crisis are robust in their results and reduce impact of outliers. Also, beforehand banks do

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[3] Tier 1 capital is composed of common and preferred equity shares (a subset of total bank equity) (Corbae & D'Erasmo, 2013).

[4] For more information see BIS (2011) "Basel III: A global regulatory framework for more resilient banks and banking systems," pages 21-25.

not know a crisis will strike, and it is interesting to see if banks with higher capital ratios benefit from these in M&A during crises.

2.4.1 Competitive advantage from capital for bank performance during crises

Substantial economic costs which crises generate can be reduced by equity capital which functions as loss-absorbing. On the contrary to this benefit, there may be higher costs of intermediation of saving through the banking system; *"The cost of funding bank lending might rise as equity replaces debt and such costs can be expected to be reflected in a higher interest rate charged to those who borrow from banks. That in turn would tend to reduce the level of investment with potentially long lasting effects on the level of economic activity."* (Miles, Yang & Marcheggiano, 2012, p3).

Bank performance is not only measured by its solvency or loss-absorption ability, but also by one's ability to improve market share because of increase in bank capital. Opportunities for banks with higher equity capital during crises are presented by a study from Berger & Bouwman (2013) who studied bank capital and performance around crises in the United States. The authors argue that banks which maintain a higher capital have a greater buffer against the shocks of the crisis, and may therefore increase their competitive advantage over their lower-capital counterparts. In their third hypothesis Berger & Bouwman (2013) also predict that because of their competitive advantage, banks with higher pre-crisis capital are associated with gains in market share for medium and large banks during a crisis. The outcome of their research: *"For small and medium banks, the market-share effect is stronger when growth is organic, whereas for large banks the effect is stronger when growth is via M&As"* (Berger & Bouwman, 2013, p.149). Competitive advantage from capital during banking crises may be found because of the following reasons:

- Strong banks, in terms of capital and liquidity, have an opportunity to improve their market share and profitability during a crisis (Berger & Bouwman, 2008), and may shop around and buy competitors at distressed prices. However, in the recent crisis and in hindsight, it turns out banks where too optimistic about the future and should have kept larger reserves to be able to deal with economically harsh times, i.e. make sure to have some fat on their bones as some phrase it. In this thesis it will be interesting to see if European banks that did indeed kept reserve equity, are not only better able to hold their business together, but if they are the select group of banks with reserve cash at hand and the only ones to be in a position to do M&A, then theoretically they should also be able to buy targets at discounted prices, as the "law" of supply and demand. Marshall (1890)

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states: *"If demand decreases and supply remains unchanged, a surplus occurs, leading to a lower equilibrium price"*. Which means banks with high liquidity during the recent crisis should have been able to buy targets at discount prices because there was less competition in the race for a takeover. If this is true then regardless of the actual value of a target for the acquirer, a lower equilibrium price is to be expected while all the returns from conventional motives to pursue M&A; operational returns because of economies of scale, strategic returns, too-big-to-fail tactical returns, returns from increased market power and returns from geographical diversification, might not be exactly the same as before the crisis, however, any decrease is expected to be non-linear compared to the decrease in price of the target, as also pointed out by James and Wier (1987). The fact that only a limited amount of companies has a liquid position is due to a general lack of economic performance and thus low operational profits, and because of a general lack of trust a low valuation of assets.

- The other side of Marshall's hypothesis of supply and demand is just as well to be considered because during the crisis simultaneously with the decrease in the number of possible acquirers, supply did not remain unchanged; the number of potential targets during the crisis increased significantly. Acharya, Shin and Yorulmazer (2011) claim that the gains from acquiring assets at fire-sale prices during a crisis is one of the reasons explaining bank holdings of liquid assets in normal times. Acquisitions at times of crises may therefore imply positive abnormal returns as acquirers would be able to achieve portfolio diversification (Emmons et al. 2004), geographic diversification (Hughes et al. 1999), activity diversification Van Lelyveld and Knot (2009) and market power (Hankir et al., 2011) at low prices. The acquisition of banks by competitors needs to be approved by bank regulators. Such approval depends in part on the acquiring bank's capital. Banks with greater capital ratios are therefore better positioned to improve market share.

- Berger & Bouwman argue that during a crisis, the customers of a bank are likely to be more sensitive to the bank's capital in order to find security against bank default. This allows banks with greater capital to take away customers from other banks with less capital. Greater capital could as well increase the flexibility to make certain types of loans unavailable to banks with lower capital because of regulatory constraints.

2.4.2 The effect of capital on M&A performance

Mehran & Thakor (2011) studied a sample of 244 banks in the US between 1989 and 2007, and researched if bank capital affects bank value in M&A activity. The ratio of equity capital to assets of acquirers was on average (median) 9.1% (8.5%). The authors have shown (providing strong empirical support) that targets with lower capital ratios can be acquired for a lower price. The goodwill recorded in an acquisition increases in target capital. Hence, if capital to asset ratio of the target decreases, it is expected to have a lower price. As shown by a study from Pasiouras, Tanna & Gaganis (2011) and confirmed by Berger & Bouwman (2013), banks close to failure, are encouraged by the authorities to be taken over by well capitalized banks, and banks with greater capital are less attractive to potential buyers. Less capitalized banks however, are more attractive because it enables maximization of the merger performance gains relative to the costs of achieving these gains.

In the study from Berger & Bouwman, the authors measured market share as the percentage change of the banks average market share during a crisis, to the average market share over the eight quarters before the crisis. The regression coefficients for market share increase by capital ratio showed to be significant at the 1% level and where; 1.176%, 0.558% and 0.691% for respectively small, medium and large banks (N=189).

Cornett et. al. (2003) researched banking M&A's between 1988 and 1995 and studied the results from acquirer CARs around announcement [t = -1,+1]. The capital ratio was calculated based on book-values and taken a year prior to the initial merger announcement. The summary statistics are in line with other studies; mean = 7.45%, and standard deviation = 1.04%. The weighted-least-squares regression calculated capital ratio coefficients to stock price cumulative abnormal return using a market model. The results where for geographically diversifying banks and activity diversifying banks -0.053 (t-value = -0.81) and -0.047 (t-value = -0.78) respectively.

2.5 Hypotheses

Several theories suggest that capital enhances the ability of banks to acquire competitive counterparts. According to Berger & Bouwman (2013) this effect is strengthened during a period of banking crises due to the buffer to absorb earning shocks as to which capital functions. The theory of Berger & Bouwman has only been partially tested in the US by a measurement of market share increase by capital. This leaves doubt to whether similar effects can be achieved through the course of banking M&A which is a common strategy to increase bank performance. Beltratti & Palladino (2011) indicated that at the beginning of the recent sub-prime crisis of

2008, acquiring banks were able achieve positive abnormal returns around the announcement of a merger, pointing out that shareholders and investors anticipated increased bank performance through the course of scale economies, operating efficiency, increased synergy, reduction of risk and/or increased market power (Haynes & Thompson, 1998). These findings are controversial to earlier literature which indicated generally insignificant and negative abnormal returns around bank M&A announcements.

In current times where the European Committee is continuously opting to improve capital requirements as Basel II deemed to be insufficient, and additionally there seems to be an ongoing conflict of beliefs between researchers and bankers on the maintenance of adequate capital buffers, a clarifying research on the effect of capital on abnormal return around M&A announcement may give constructive results to illustrate arguments for the above conflicts in literature. Besides, the European banking environment shows to be much more heterogeneous than the US because the cultural, legal and economic differences are substantially different between EU member states. The gap in current literature allows for the formulation of the following research question:

"What is the effect of pre-crisis capital on stock abnormal return by merger and acquisition announcements in the Western European banking sector during the 2008 crisis?"

Through a prolonged period and improved definition of systematic banking crises, this study examines if there is abnormal return on stocks of the acquirer around the announcement, and whether or not a banks' pre-crisis capital has significant impact on the performance of a banks' merger or acquisition. These matters allow for the formulation of the following sub-questions which will be assessed during this study:

Q1: What is the announcement effect of merger and acquisitions in the Western European banking sector on stock prices during the 2008 crisis?

And

Q2: What is the effect of pre-crisis capital held on merger and acquisition performance in the Western European banking sector during the 2008 crisis?

The majority of research before the recent sub-prime and debt crises reported consistent insignificant and mostly negative abnormal return around merger announcements for acquiring banks. The returns at announcement are explained by Gottschalg & Zipser (2006) due to the competition for a limited number of attractive investment opportunities. An exogenous shock in demand for the target banks' securities leads to a significant short-term deviation of the market price for that security, hence, the price increased. However shareholders and investors

anticipate upon the acquisition price by taking into account synergy and efficiency opportunities that may result from the merger. With positive abnormal returns at completion of the merger, the overall return for acquirers is essentially zero. During the crisis however, Beltratti & Palladino (2011) found significant and positive abnormal returns, arguably a result of purchasing targets with distressed prices in such economic state as mentioned by the authors, and confirmed by Berger & Bouwman (2013) and Mehran & Thakor (2011). If during crises, banks with inadequate capital were unable to absorb the financial shocks, there are less acquiring banks on the market competing with each other over the same target. In addition, an increased number of banks become an attractive target due to the lack of liquidity and financial distress. Theoretically, the "law" of supply and demand by Marshall (1890) tells us that banks with higher equity capital during the recent crisis found themselves in a strong position to buy targets at discount prices because there was less competition in the race for a takeover. The hypothesis drawn from these arguments can be stated as follows:

> **Hypothesis 1:** *Western European banks achieve significant positive cumulative average abnormal return from stock price at M&A announcement during the 2008 crisis*
>
> **Null-hypothesis:** *Western European banking M&A announcements have no effect on western cumulative average abnormal return from stock during the 2008 crisis.*
>
> H_1: $\mu_{CAARt1,t2} > 0$
>
> H_0: $\mu_{CAARt1,t2} = 0$

Instead of solely focussing on stock reactions, this study also provides evidence regarding the factors that explain the abnormal returns. The role that capital plays in the positive abnormal returns can be hypothesised due to the opportunities of acquiring banks to buy targets at distressed prices. Banks close to failure are potentially attractive targets as argued by Mehran & Thakor (2011) because the target goodwill recorded in an acquisition decreases with lower capital ratios. Pasiouras, Tanna & Gaganis (2011) found that such banks are encouraged by the authorities to be taken over by well capitalized banks. This is attractive for acquirers because it enables maximization of the merger performance gains relative to the costs of achieving these gains. The relative heterogeneity of the European banking environment compared to the US increases the need to measure several other variables. The effect of capital on a banks' abnormal return around M&A announcement is thus hypothesised as follows:

Hypothesis 2: *Pre-crisis capital has a significant positive effect on cumulative abnormal return from stock price in western European banking M&A announcement during the 2008 crisis.*

Null-hypothesis: *Pre-crisis capital has no effect on cumulative abnormal return from stock price of western European banks at M&A announcement during the 2008 crisis.*

H_2: $\beta_{CAP} > 0$

H_0: $\beta_{CAP} = 0$

Presented in the above combination, this approach aims to provide reliable evidence on whether or not pre-crisis held capital increases performance of European banking M&A during the crisis of 2008, and the outcome will lead to a deeper insight of banking M&A announcements, its consequences to the acquirer, and the role equity capital plays during bank crises.

3. Methodology

3.1 Analysing abnormal return

According to Beitel & Schiereck (2001) there are generally three methodologies to study M&A's as dynamic events[5]. Dynamic efficiency studies (using econometric methodology the aim is to study if consolidation improves the efficiency of M&A banks as compared to the industry efficiency), operating performance studies (mainly based on mean difference tests from annual reports to determine changes in performance related ratios; from the stage before the deal to a 3 to 5 year period after), and event studies.

This paper adopts an event-study methodology because the focus is on value implications of banking M&A announcements, and this methodology will allow for directly determining the impact of M&A's on the value creation (or destruction) for shareholders. Stock price changes reflect value creation well due to supply and demand, and anticipated worth and growth of a companies' value. According to Fama (1970) the information implications of a stock split and dividend increases are fully reflected in the price of a share almost immediately after the announcement date. This study will study the value implications of M&A announcements by analyzing abnormal stock return (dependent variable) of acquirers during the 2008 crisis in the western European banking sector. A key assumption underlying the study of stock return is the theory of market efficiency. Accordingly, market stock-prices reflect all available information to a certain degree (the degree of market efficiency ranges from a strong to a weak form) (Fama & Malkiel, 1970). This study assumes at least a weak form of market efficiency, which means that current markets capture all information contained in past stock-price and volume data. Stock-price movement then is a good measurement to assess the changes on both a short term as a long term basis. Also, in various finance studies on both M&A as other topics, the stock prices are used as a measure (e.g. Alexandridis, Petmezas & Travos, 2010; Beltratti & Paladino, 2013; Campa & Hernando, 2004; Campa & Hernando, 2006; Chi, Sun, Young, 2011; Croci & Petmezas, 2010; De Long, 2011). The effect of confounding events is attempted to be minimized by removing those deals where the acquirer is involved in another M&A activity between [-90, +90][6]. Such events can affect the results of this study.

3.1.1 Event window and estimation period

Stock price reaction of the acquiring firms is measured around the announcement of an M&A. Several studies on financial firms have performed these same measurements to explain

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[5] I refer to this research as the study of dynamic events because I compare a time-window prior to the M&A to a stage thereafter; it is therefore not a static analysis.

[6] The number of days before (-90) or after (+90) the announcement, 0 being the announcement day.

the effect of an M&A announcement (e.g. Campa & Hernando, 2006; Scholtens & de Wit, 2004). The event is the public announcement of an M&A activity[7]. A cross-check using LexisNexis Academic software[8] confirms the dates given by Thompson One. Three cases however deviated by a few days from the actual announcement day, this is reported in Appendix Table 4. The date found in LexisNexis is used for the calculations of abnormal return.

Because in many circumstances the news spread gradually to the public I am more interested in a certain period around the event date ($t = 0$). This period is called the Event Window, and is defined as [$t1$, $t2$] (visualized in Figure 1). In my research, I observed 155 days as the estimation period of the stocks' returns, which are used for a correction on the returns in the event window. The estimation window runs from -201 days to -46 days prior to the event ([T1, T2] = [-201, -46]), and the event window lasts for 42 days including 10 days prior to the announcement date and 31 days afterwards ([$t1$, $t2$] = [-10, +31]). Each M&A deal should have its own estimation window and event window to avoid bias (Scholten & De Wit, 2004).

Figure 1 – Visualization of estimation window and event window
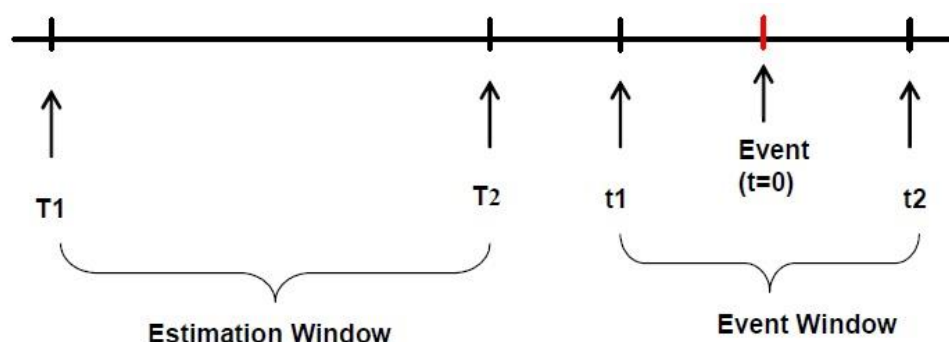
In similar studies, stock returns are calculated from a symmetric period around the announcement date (Hannan & Wolken, 1989; Asimakopoulos & Athanasoglou, 2009; Cyob-Ottone & Murgia, 2000; El-Khasawneh & Essadam), while sometimes the study is conducted over a asymmetric event window (Scholtens & Wit, 2004). Others make use of a combination of (a)symmetric event windows (Campa & Hernando, 2006; Beltratti & Palladino, 2011). To make inferences on the impact on stock price around the announcement of M&A's in a symmetric form, this study uses the most popular [-1, +1], [-5, +5] and [-10, +10] event windows to test direct impact of the announcement. Even though it is impossible to control for

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[7] Given by Thompson One Banker as the first day information of the M&A was made public and has reached the market.
[8] LexisNexis Academic is a database of 15000 newspapers word wide that go back to 1992. I checked all deals used in this study and confirmed the announcement dates to be correct for the greater part of the sample.

all confounding effects, the very short window [-1, +1] minimizes the risk of non-event spill-overs. Also I will study the event window prior to the announcement [-10, -5] to investigate the significant positive abnormal returns as found by Beltratti & Paladino (2013) and De Long & De Young (2007), displayed in Table 1. I add the [-10, 0] window to fully investigate possible leakage of information on the announcement as was found by Beltratti & Palladino. To measure post-announcement effect I use a shorter window [0, +5] that minimizes spill-over of non-events, but I also measure the [-3, +31] window. This is a relative long window exposed to confounding effects, however it may measure the announcement effect over a longer period and it follows the method of both Scholtens & De Wit, and Campa & Hernando. Even though some researchers don't mention to control for confounding events in the event window (De Long, 2001; Beltratti & Palladino, 2011), I will follow the method of Meznar et. al. (1994) and Beitel & Schiereck (2001) by limiting the confounding effects in the event window. The authors mention the challenge to eliminate the effects of another event that happens at the same time, making it difficult to ascertain the impact of one event on stock returns. Typical confounding events may be joint venture announcements, stock splits or fundamental changes, dividends, or earning declarations. One method to reduce these effects is reducing the event window size, the [-1, +1] window may fairly limit confounding effects. Another methods is collecting and analysing news on the bank during the event window. I do this by searching the LexisNexis database for confounding events on each acquiring bank of the sample for the month in which the announcement took place. The findings of nine cases are published in Appendix Table 4 and omitted from the sample.

3.1.2 Constructing abnormal returns

To assess the value implications of M&A's on the acquirer, most event studies rely on the calculation of abnormal returns (i.e. actual stock return minus benchmark return based on a model such as Mean Adjusted Model, Market Adjusted Model, Risk Adjusted Model, or a Portfolio Adjusted Model). I follow the Risk Adjusted Market Model based approach after Brown & Warner (1985) as they argue it is complete and reliable for short-term event studies. The market model approach is also widely used in banking M&A literature (Beitel & Schiereck, 2001; Beltratti & Palladino, 2013 and De Long, 2001)

The calculation of the market model will follow:

$$AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt}$$

In this formula AR_{it} represent the abnormal returns of company i at time t. R_{it} is the actual return on the stock of company i at time t. The actual return for one day is the change in

share price without dividends (*P*), divided by the closing share price the day before, the calculation is as follows:

$$R_{it} = \frac{P_1 - P_{t-1}}{P_{t-1}}$$

R_{mt} is the normal return on the stock calculated via a benchmark. To be consistent with literature, like Campa and Hernando (2004) and Ekkayokkaya et al. (2009), for normal returns (R_mt) a general market index is used (Morgan Stanley Capital International Europe Index, or MSCIE). This is a free float-adjusted market capitalization index that is designed to measure developed market equity performance in Europe[9]. I use an OLS-regression model to obtain the estimated parameters α_i and β_i by the regression of R_{it} on R_{mt} over the estimation window.

I choose country indices (MSCIE) for the market model returns because according to Murgia and Ottone (2000) constructing abnormal returns with an industry index may give bias to the effect of announcements[10]. The authors argue: *"(…) when a bank merger is announced bank stocks tend to rise, either because the increase of the market concentration improves profits of the largest players (e.g. Eckbo, 1983), or because financial analysts expect other peers to be more likely to be acquired. This implies that the sector index reaches a higher level, reducing excess returns."* (Murgia and Ottone, 2000, p.12).

With the parameters α_i and β_i given, the expected return can be calculated by $(\alpha_i - \beta_i R_{mt})$. Subsequently, these expected returns are subtracted from the actual return R_{it}. The result is the abnormal return (AR), of which the sum over a certain time-window AR_{it} gives the cumulative abnormal return for bank *i* (CAR*i*). By taking the average of AR across banks in an event day, I obtain the average abnormal return at day *t* (AAR*t*). By cumulating the periodic AAR's over a particular time interval (e.g. [-1, +1]) I obtain the cumulative average abnormal return for that event window (CAAR*t*). As a robustness check to the risk adjusted market model, I will also apply a market adjusted model for the calculation of benchmark returns, which is a popular and widely used model for M&A event studies. The formula used for the market adjusted model follows:

$$AR_{it} = R_{it} - R_{mt}$$

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[9] As of September 2002, the MSCI Europe Index consisted of the following 16 developed market country indices: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom (Retrieved from: http://www.msci.com/products/indices/tools/index.html#EUROPE) .
[10] Also, focusing on banks that do not engage in M&A regularly (or at all) may overweight the sample with mergers that were poorly implemented, as banks that have failed in previous mergers will be more reluctant to engage in them again, while successful banks will seek new and potentially bigger deals. This selection bias also holds for benchmarks which have been computed from an industry or portfolios sample, as it is difficult to compute a benchmark of non-acquiring banks in a rapidly consolidating consolidation (Houston et. al., 2001).

The robustness check via the market adjusted model avoids errors made associated with estimating the security betas in the market model. Because the market model estimates stock betas over a firm's estimation period, the security returns are typically linearly related to market returns. Since the market adjusted model does not require an estimation period, possible errors can be controlled for.

3.1.3 Significance of abnormal returns

With a known CAAR, a statistical test for significance of M&A abnormal returns to the acquirer's stock price can be performed. The null hypothesis (H_0) tested, is that the mean abnormal return from the sample for a given event window is equal to zero; meaning that it concerns an average effect to returns to shareholders, based on the market model. There is a broad range of literature on event study test statistics and its significance. In general, significance tests are grouped in parametric and non-parametric tests. The first assumes a normal distribution of individual firms, whereas the non-parametric test does not. Previous studies have commonly relied on a complementary non-parametric test to their original parametric test to verify that the findings are not biased due to outliers (Al-Khasawneh & Essaddam, 2011; Asimakopoulos & Athanasoglou, 2012; Beltratti & Paladino, 2011 Cybo-Ottone & Murgia, 2000; Campa & Hernando, 2006). Some scholars have further developed the tests to correct for the t-test's prediction error, such widely used 'scaled' test is developed by Patell (1976) and Boehmer et. al. (1991). This study relies on the classic t-test because of its value implications of comparison in the cross-section. It should be noted that even though this test has advantages from its simplicity, it has weaknesses by being prone to cross-sectional correlation and volatility changes.

The parametric one-sample *t*-test allows me to test whether the CAAR differs significantly from zero. The test statistic is the ratio of mean abnormal returns to its estimated standard deviation (i.e. from the time-series of mean abnormal returns). The test statistics via the one-sample t-test is calculated as follows:

$$t = \frac{\bar{x} - \mu 0}{\frac{s}{\sqrt{n}}}$$

Where $\bar{x}$ is the mean of all CAAR's over the event window, and $\mu 0$ the null-hypothesis. S is the standard deviation and *n* the number of sample banks whose abnormal returns are calculated of the event window. The degrees of freedom used are *n*-1. According to Brown (1985), this form of statistic is widely used in event studies of this kind.

The P-value (either computed by SPSS software, or found via the table for t-values by entering the degrees of freedom and test-statistic) will inform me about the conditional

probability of the results (De Veaux, Velleman, & Bock, 2009). That is; the probability of getting abnormal returns at least as unusual as the observed abnormal return, given that H0 is true (when the mean abnormal return equals zero). I measure the probability at the 1%, 5% and 10% significance levels, two-tailed because of the nature of the hypothesis. That is; the percentage chance of observing the statistical value given that the null-hypothesis is true. The significance levels define a threshold for the P-value, and show that a rare events has happened if the P-value falls below that point: It allows me to reject the null-hypothesis at that level of significance. In line with previous literature, I add a Wilcoxon signed-rank test to verify that the findings are not biased due to outliers. The Wilcoxon test is a nonparametric evaluation of paired differences and considers that both the sign and the magnitude of abnormal returns are important. The Wilcoxon test groups the abnormal returns in negative or positive abnormal returns, and ranks each observation. The test statistic W is calculated by the sum of ranks:

$$W = |\sum_{i=1}^{N_r}[sgn(x_{2,i} - x_{1,i}) \cdot R_i]$$

With W, the Z-score is calculated following: $z = \frac{W-0.5}{\sigma W}$

3.1.4 Analysis of different sub-samples

I will study the abnormal returns between several samples to gain further insight on determinants of the announcement effect. Several sub-samples I will compare in this study are:

- Different time-intervals for event windows to discover the effect of M&A announcements
- Bank to bank deals versus banks that diversify in activities
- Domestic M&A deals versus cross-border M&A's.

To control for the difference between the sub-samples, I will use a two-sample t-test, allowing me to test if the mean of the two paired sub-samples is significantly different from each other.

3.2 Regression analysis

To make an estimation on the effect of pre-crisis capital on stock price return, I will use an ordinary least squares (OLS) regression model. This method is frequently used in other event studies addressing the effect of individual variables on stock return (Al-Khasawneh & Essaddam, 2011; Beltratti & Paladino, 2011; Cybo-Ottone & Murgia, 2000; Houston et al., 2001). The bank's capital-ratio (CAP) before-crisis is measured as the ratio of a bank's equity-capital to gross total assets, averaged over the four quarters before the crisis. The ratio to gross total assets (a traditional measure of size that focuses on the banks on-balance-sheet activities)

gives a relevant position to compare this ratio with several counterparties. Bhattacharya & Thakor (1993) argue however a potential shortcoming of this measure which is the treatment of all assets identically, neglecting the qualitative asset transformation nature of a bank's activities. Kashyap, Rajan & Stein (2002) also argue that this ignores off-balance sheet activities. The alternative hypothesis expects a positive direction of CAP; the higher the pre-crisis capital ratio of the bank, the higher abnormal returns are expected.

3.2.1 Control variables

By integrating control variables into the OLS regression, the analysis will be able to make more accurate estimations on the relationship between capital and M&A performance. De Jong, Van der Poel, & Wolfswinkel (2007) argued that variables which influence acquirer announcement returns can be divided into basically two fragments; acquirer related characteristics and deal related characteristics. The following control variables are derived solely from literature and take into account both fragments of influence. Besides, the following variables had significant impact on abnormal returns in previous studies and are therefore included in this model[11]:

Return on Equity[12] (ROE) (Beccalli & Frantz, 2009; Asimakopoulos & Athanasoglou, 2012). Banks with a higher ROE as an indicator of financial strength and profitability are in a better position to exploit synergies arising from the acquisition.

Relative deal size [13] (RSIZE) (Campa & Hernando, 2006; Asimakopoulos & Athanasoglou, 2012). Through a large merger the acquirer may entail more benefits from cost reduction through synergy. However, the procedure is far more complex when the target is relatively large.

Size of acquiring bank[14] (SIZE), (Campa & Hernando, 2006). According to Berger & Bouwman (2013) the effect of capital differs by bank size.

Efficiency [15] (EFF) (Al-Khasawneh & Essaddam, 2011; Asimakopoulos & Athanasoglou, 2012; Beltratti & Paladino, 2011). Efficiency gives a proxy for effectively utilizing the banks' expenses in order to generate income. "An efficient bank can transfer its superior skills to another bank through a deal in an attempt for the overall entity to realize efficiency potentials" (Asimakopoulos & Athanasoglou, 2012, p19).

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[11] Acquirer characteristics are measured at the end of the year before the M&A announcement (Beltratti & Paladino, 2011)

[12] Mean of net income over the 12 months before the announcement divided by the mean shareholders' equity over the 12 months before the announcement (Beltratti & Stulz, 2011).

[13] Deal size is measured as the transaction value divided by the market value of acquirers' equity.

[14] Size is measured by the natural logarithm of the acquirers' total assets.

[15] Efficiency is measured as the ratio between expenditure and total revenue (beltratti & Paladino, 2011)

Domestic (DOM) (Asimakopoulos & Athanasoglou, 2009; Campa & Hernando, 2006; DeLong, 2011). This binary variable measures whether a bank performed a domestic (1) or cross-border (0) merger. Domestic deals provide better opportunities for synergy benefits.

Diversification (DIV). This binary variable controls for the difference in M&A's in terms of scope. Diversification (1) has showed positive abnormal return in previous studies while an M&A between banks (0) showed a negative market reaction.

A list of term definitions including all variables can also be found in Appendix A. The regression model is as follows:

$$AR = \alpha + \beta_{CAP} + \beta_{ROE} + \beta_{RSIZE} + \beta_{SIZE} + \beta_{EFF} + \beta_{DOM} + \beta_{SCOPE} + \varepsilon$$

To reduce the effect of possible spurious outliers and to limit extreme values, all numerical variables are trimmed at the one percent level. The multiple-regression test will be performed by using SPSS software and the outcome derived includes the coefficient and P-values. The coefficients of numerical variables (CAP, ROE, RSIZE, SIZE, EFF) will be presented in the form of standardized coefficients because the raw units are not well known in everyday usage. Standardized results represent what happens after all of the variables (predictors and outcome) have initially been converted into z-scores, and therefore give information in standard-deviation (SD) units. The findings will tell us for a one-SD increment on a predictor, the outcome variable (CAR) increases (or decreases) by some number of SD's corresponding to what the β coefficient is. Since the variables are converted to a common metric (SD), I can also compare the β coefficients in magnitude. For dummy variables, unstandardized coefficients are presented because in the case of dummies, the coefficient can then be interpreted as the response between categories (De Veaux, Velleman & Bock, 2009). The P-value gives the significance of probability for the coefficient of each determinant. The coefficient will be tested for statistical significance at the 1%, 5%, and 10% significance levels.

4. Data

4.1 Data sources

To answer hypothesis 1, I will obtain information on M&A deals by using Thompson One Banker. This software program allows me to select cases according to restrictions mentioned in the next paragraph. By retrieving SEDOL-codes from the acquiring companies, Datastream is used to obtain stock levels (from individual acquiring banks) over the event window and the MSCIE benchmark (to calculate the market return). To answer hypothesis 2, I use Compustat-Global to collect balance-sheet information, which are used to calculate the several control variables, and the independent variable for the OLS-regression model.

4.2 Data sample

Earlier studies on this subject have focused on the acquiring firm only (Moschieri & Campa, 2013), or both acquirer and target firm (Beitel & Schiereck, 2001), depending on the main research question. This study focuses on the acquiring firm because it is particularly interesting to study the controversial results Beltratti & Paladino (2013) have found in recent research in the acquirer stock-return around M&A announcement during a crisis. Besides, in most M&A's the target firm ceases to exist as an independent entity with its own stocks and becomes part of the acquiring firm. The data sample used for this study is restricted to the following criteria (see Appendix Table 1 for the formation process of the sample):

- The acquirer is classified as a registered and publicly listed European Bank headquartered in any of the western European countries[16].
- The target is a financial institution.
- The acquirer is not involved in yet another M&A transaction within the same quarter.
- Nor the acquirer or target is a government sponsored entity.
- The transaction is announced between October 1st, 2008, and December 31st, 2012. Classifying the period as a banking crisis[17].
- The transaction volume is above 7.5 million Euros *(Beltratti & Paladino, 2011)*.

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[16] ThompsonOne classified western European countries as: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom (i.e. EU-17 + Switzerland and Norway).

[17] As the refinancing operations of the ECB have been extended in 2012, but effects of this policy cannot be determined yet (Reichlin, 2013), the end of the sample period is defined at end of 2012, as the end of the banking crisis per country cannot be determined - at this point - without analyzing data, and, will lead to an exact sample period of 4.5 years.

4.3 Descriptive statistics

As can be seen in Table 2; over the period of October 1st 2008 to December 31st 2012, acquiring banks recorded 88 Announced M&A deals in the European financial sector with an average deal value of €247 million (Standard deviation = €369.4 million). From all deals, 63% (n=55) where of domestic nature versus 37% (n=33) cross-border deals. A greater ratio of domestic deals was also found in other literature (Asimakopoulos & Athanasoglou, 2009). Rather equally divided are banks that merged with other banks (46%, or 41 cases) versus diversifying banks (54%, or 47 cases). In appendix Table 2, the descriptive statistics of deal value per country are given.

Table 2 - Descriptive statistics of acquiring banks M&A deal value in million Euros (€)

	N	Mean	Median	Std. Deviation	Min.	Max.
Total	88	247.444	93.159	369.437	7.527	2,086.855

The sample size of 88 deals is sufficient for event studies as Brown & Warner (1985) showed that for samples of 50 and 20 securities, the empirical distribution of mean excess returns already seemed close to normal. Also various other event studies have used similar sample sizes (see Appendix Table 3). Larger samples however do more accurately detect the presence of abnormal performance because the probability of Type II errors increases in the process of testing for significance. However to avoid Type II errors, both parametric and non-parametric significance tests are applied which increases the power of the test.

Deals are fairly evenly distributed except for Italy (21) and Spain (17) which have vastly more deals, thus showing that the economic distress in these countries may very well have led to more take overs. A second point worth mentioning is that some countries, like for example the Netherlands are not represented even though they had large take overs in the banking sector during the crisis. These deals have been left out due to governmental involvement in these deals.

4.4 Descriptive statistics

To examine the effect of M&A announcements on stock price, the focus of this study is on cumulative average abnormal returns (CAARs) calculated via the Market Model. The CAARs are computed at different event windows, using the MSCI Europe index to compute market returns. Table 3 shows descriptive statistics of the CAARs from all banks on the announcement day (t_0) and other time-windows.

Table 3 - Descriptive statistics Cumulative Average Abnormal Return per event window (N=84)

Var.	Mean	Median	Std. Dev.	Min.	Max.
AAR at t_0	0.0072	0.0003	0.0669	-0.1264	0.5542
CAAR [-10, +10]	-0.0054	-0.0065	0.0057	-0.0149	0.0051
CAAR [-5, +5]	-0.0029	-0.0029	0.0041	-0.0108	0.0047
CAAR [-10, -5]	-0.0012	-0.0017	0.0033	-0.0055	0.0032
CAAR [-10, 0]	-0.0028	-0.0027	0.0062	-0.0146	0.0051
CAAR [-1, +1]	-0.0004	-0.0012	0.0037	-0.0036	0.0037
CAAR [0, +5]	0.0009	0.0002	0.0037	-0.0041	0.0072
CAAR [-3, +31]	0.0058	0.0065	0.0044	-0.0022	0.0155

From the descriptive statistics at the announcement day (t_0), it can be seen that the average abnormal return (AAR) is positive. Because the median (0.03%) is lower than the mean (0.72%, SD=6.69%), this sample is skewed to the right; this is also confirmed by a positive skew of 6.708. In this particular window (t_0), outliers have pulled the mean toward them, away from the median. In the analyses that follow in this study, outliers of single day abnormal returns will not be deleted because the CARs and CAARs are calculated by averages of the daily returns[18]. An outlier of stock price on a single day of the event window does not affect the normal distribution[19] of the CAR's.

The descriptive statistics of other event-windows show an overall negative result for cumulative average abnormal returns. At the [-3, +31] and [0, +5] window however, the result is positive, which is an indicator of positive market reaction to the announcement. A visualization of the abnormal return around announcement is given in Figure 2. This figure gives a complete overview of the CAAR over the [-10, +31] time window. It is noticeable that the abnormal return becomes positive the closer the window moves towards the announcement day. From the graph can be seen that two days before the announcement day, and 10 days after the announcement day, positive abnormal return turns the CAAR into an ascending line. Just for a short while however, because overall, a decline in abnormal return can be seen, before and a while after the announcement.

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[18] A face validity check has been performed but did not detect abnormal or extreme returns that seemed invalid. A check for confounding events in the event window has been performed and eliminated such cases.

[19] The distribution of CAR's is checked for a normal distribution and found to have a low skewness of -0.696 over the [-45, +45] event window. The relative small standard deviation of 0.2709 (N=84, Mean=-0.0387, Median=-0.0294) makes the bank sample form a symmetric unimodal distribution around the mean. The normal distribution of the CAR allows me to continue testing because it is an underlying assumption for parametric testing. According to Scholtens & De Wit (2004) the noise of stock returns tends to be cancelled out when returns are averaged out across a large number of banks (CAAR), it may therefore better distinguish the effect of the M&A announcement.

Figure 2 - Cumulative Average Abnormal Return [-10, +31] around announcement day (t_0)
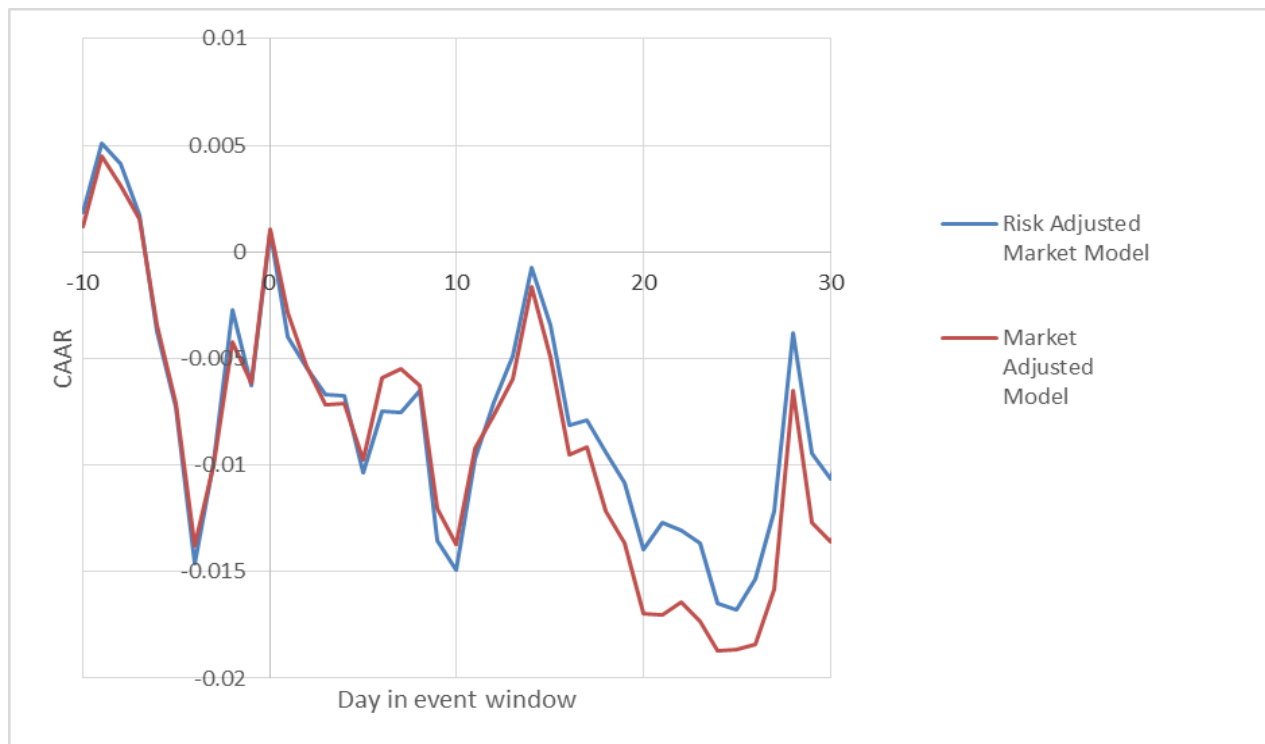
The second hypothesis concerns the effect of pre-crisis capital (CAP) on the abnormal returns. Before moving to the regression analysis, this sub-chapter will give information on the independent and control variables used to test the relation. The independent variable CAP is given by the descriptive statistics in Table 4. The mean of the independent variable, capital ratio (.0711, SD = .0567), indicates that the average bank acts considerably towards the Basel II capital requirements as the capital held is 7.11% based on an equity to capital calculation. Even though the calculation of Basel II capital adequacy is done via Tier 1 capital[20], necessity to distinguish for the purpose of this paper seems unnecessary. Valkanov & Kleimeier (2007) included both Tier 1 capital and total capital in calculations to their study on capital ratio, and found that the signs of the coefficients were the same in both cases. The results with Tier 1 capital were somewhat more reserved since coefficients in some cases were found to be insignificant.

The great difference of capital held between banks can be seen from the range between the minimum (0.0165) and maximum (0.3290) value. In the sub-sample descriptive statistics it can be seen that the capital held in domestic M&A's is slightly higher than in cross-border

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[20] Tier 1 capital is coore capital excluding preferred shares and non-controlling interest, and includes disclosed reserves (Le Leslé & Avramova, 2012)

mergers. Acquirers involved in diversifying activities however, have considerably more capital (8.14%) than bank-to-bank mergers (6.10%). An explanation could be the synergy, scale economies and cost-efficiency that is anticipated by the acquirer in a bank-to-bank merger and therefore less equity-capital is reserved to implement the merger completion process.

Several control variables will be included in the OLS-regression model. These variables where used, and had proven effect on abnormal return in previous studies. By inclusion, the measurement of the effect of capital on CAR's will be more accurate. In Table 4, the descriptive statistics of the control variables are given.

Table 4 – Descriptive statistics of the independent variable and control variables

Descriptive statistics for the independent variable, and all control variables, given by the number of cases (N), the mean and standard deviation in brackets. Two dummy variables give information on whether the M&A has been domestic or cross border, and whether or not it was a diversification activity or bank to bank merger. The variables are CAP (Capital ratio as equity capital to total assets), ROE (Return on equity), RSIZE (relative size of the merger as log of transaction value to the market value of acquirers' equity), SIZE (size of the acquirer measured by log of total assets), EFF (efficiency of the acquirer as expenditure to revenue).

Var.	N	Total Mean [Std. Dev.]	Median	Min.	Max.	Domestic (N=55) Mean [Std. Dev.]	Cross-border (N=33) Mean [Std. Dev.]	Bank-to bank (N=41) Mean [Std. Dev.]	Diversification (N=47) Mean [Std. Dev.]
Independent Variable									
CAP	87	0.0711 [0.0576]	0.0585	0.0165	0.3290	0.0730 [0.0459]	0.0674 [0.0759]	0.0610 [0.3278]	0.0814 [0.0740]
Control Variables									
ROE	88	0.0529 [0.1026]	0.0543	-0.6016	0.1806	0.0809 [0.3044]	0.0639 [0.0770]	0.0565 [0.1225]	0.0947 [0.3352]
RSIZE	74	1.4109 [0.9897]	1.2206	3.6937	0.1954	1.5786 [0.9613]	1.1614 [1.0235]	1.6843 [1.0373]	1.2111 [0.9210]
EFF	58	0.1869 [0.2444]	0.0964	-0.0627	1.0022	0.1221 [0.1114]	0.2854 [0.3446]	0.2128 [0.2856]	0.1592 [0.1922]
SIZE	88	11.7918 [1.8225]	11.7466	7.3178	14.5590	11.2932 [1.7317]	12.6833 [1.6258]	12.3079 [1.6237]	11.2287 [1.8776]

The descriptive statistics of the control variables in Table 4 show an average return on equity of 5.29%, with some banks showing extreme values of -60% or +18%. The relative size of the deal shows is more difficult to read due to the natural log transformation, but it shows that domestic and bank-to-bank deals are on average larger deals. The variable efficiency has an average capital expenditure to revenue ratio of 18.7% (SD=24.4%). In cross-border deals efficiency is much higher at 28% compared to domestic deals (12%). It could be that acquirers with a high efficiency are confident enough to apply this in cross-border deals, even though barriers exist in terms of national economic conditions, cultural and language differences, and in fiscal and legal systems. The natural log of acquirer size (with a mean of 11.79) shows that bigger banks (measured from total assets) are relatively more involved in cross-border and bank-to-bank deals.

A validity check of the cases and their variables occurred to sufficient after the top and bottom 1% of the variables have been trimmed to limit extreme values. Even though there is a high number of cases with a measurement of each variable, the variable EFF was measured for 58 cases only[21]. With a check for normal distribution and histogram plots, the four variables CAP, ROE, EFF, and SIZE passed face-valid and have a normal distribution, though with a slight positive skew. The variable RSIZE however did not pass the normality check and was substantially non-normal. I performed a log-transformation to normalize the data which is now reported in Table 4.

Table 5 shows correlation coefficients as they exist between the variables. In general the variables do not exhibit statistically significant correlation, except for the variable SIZE where the magnitude of coefficients is rather high. The size of the bank has a negative correlation with relative deal size -37%, ROE -24.6% and capital ratio -26%. The relation between size of banks and the relative deal size is rather straight forward because the capital available to larger banks brings opportunities to acquire counter-parts, but also because small banks come in larger numbers, and the price for small banks is lower than at the acquisition of a large bank. The relation between bank size and pre-crisis capital however is questionable, Goddard et. al. (2004) argued that the relation of bank size should be positive related to capital ratio's because scale economies increase profitability and allows to hold equity. Other researchers however suggest that only limited cost-savings can be achieved by increased size;

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[21] I did not delete the cases with missing EFF variables because a lot of data would be lost, however I did check for a pattern of missing variables. By separating EFF into groups of missing and non-missing variables, I used a t-test that determined the groups where not significantly different on other variables.

eventually leading to scale-inefficiencies. The number of observations taken from the variable EFF is rather low compared to other variables in this study. This lower N should be approached with caution in later finding of the effect of efficiency.

Table 5 – Pearson's correlation matrix
Pearson's correlation coefficient matrix showing correlation between variables under study; CAP (pre-crisis capital ratio), ROE (return on equity), RSIZE (relative deal size), EFF (bank efficiency), SIZE (acquirer size). * is significant at the 1% level (2-tailed). Number of observations is given in brackets [N].

Variables	CAP	ROE	RSIZE	EFF	SIZE
CAP	1				
	[87]				
ROE	-0.043	1			
	[82]	[88]			
RSIZE	0.142	0.151	1		
	[66]	[68]	[72]		
EFF	0.020	-0.006	-0.145	1	
	[53]	[56]	[40]	[58]	
SIZE	-0.261**	-0.246**	-0.371*	0.075	1
	[83]	[88]	[68]	[57]	[88]

5. Empirical Results

5.1 Hypothesis 1

In Table 6 the results are reported for one-sample t-tests of statistical significance, the table presents the cumulative average abnormal return (CAAR) associated with different event windows around the announcement period of bank mergers. In line with other literature in non-crises periods, acquirers realize negative abnormal returns over the various event windows, this is also what we have seen in Table 3 (descriptive statistics of CAAR's). The negative results however are tested statistically significant at the 1% and 5% level for windows [-10, +10] and [-5, +5] respectively. In the graph of figure 2 we saw a steep decline in CAAR just few days before announcement, which could mean than information leakage on the merger announcement has occurred and triggered shareholders and investors to anticipate on this. Also right after the announcement day a decline was observed in the same graph. This indicates that investors are sceptical about acquirers gaining from an acquisition. Koetter et al (2007) found that banking M&A is regularly the result of public sector intervention in order to prevent weaker banks from failure. If that would be the case, it is an explanation to find negative abnormal returns because of increased risk for acquirers that were forced to acquire the weak target due to pressure from regulators. Even though Beltratti & Palladino (2011) found statistically significant positive abnormal returns at the [-10, -5] event window (.0009), my results show to be negative and statistically insignificant in this window.

The CAAR for a month after the announcement [-3, +31] shows a positive abnormal return, and is tested to be statistically significant at the 1% level with the market model, but also by the non-parametric test and the control test using market adjusted returns. Scholtens & De Wit (2004) also measured positive abnormal return over the same time-window, but did not tested these statistically significant. Not reported in Table 6 is the return at announcement (t_0), even though the mean return at t_0 is positive (M=0.0072, SD=0.0669), it was not tested to be significant ($t(84)=0.991$, $p=0.325$).

To control for extreme values and a non-normal distribution, the non-parametric Wilcoxon sign-rank test is applied, and as a check for robustness to the results of the market model, the popular and widely used market adjusted model is applied as well, given in the second panel of Table 6. The market adjusted model and the Wilcoxon test confirmed significance at the same event-windows.

Table 6 – CAARs test for statistical significance
    This table shows the test statistics for the one-sample t-test per event-window around announcement (t_0). The non-parametric Wilcoxon signed-rank test is added to verify research findings. The Wilcoxon test is reported by its Z-statistic and denoted by the related statistical significance. Degrees of freedom = N-1. *Significance level 10%; **significance level 5%; ***significance level 1%.

	Risk Adjusted Market Model						
	CAAR [-10, +10]	CAAR [-5, +5]	CAAR [-10, 0]	CAAR [-10, -5]	CAAR [-1, +1]	CAAR [0, +5]	CAAR [-3, +31]
Mean	-0.0054	-0.0029	-0.0028	-0.0012	-0.0004	0.0009	0.0058
[Std. Dev.]	[0.0149]	[0.0041]	[0.0062]	[0.0033]	[0.0037]	[0.0037]	[0.0044]
t-test stat.	**-4.328*****	**-2.313****	-1.488	-0.904	-0.182	0.599	**7.732*****
Wilcoxon	**-3.285*****	**-2.045****	-1.245	-0.943	0.001	-0.524	**-4.815*****
	Market Adjusted Model						
Mean	-0.0052	-0.0031	-0.0030	-0.0001	0.0016	0.0009	0.0037
[Std. Dev.]	[0.0052]	[0.0039]	[0.0058]	[0.0044]	[0.0036]	0.0038	[0.0053]
t-test stat.	**-4.541*****	**-2.652****	-1.718	-0.022	0.777	0.601	**4.118*****
Wilcoxon	**-3.354*****	**-2.134****	-1.423	-0.105	-0.535	-0.105	**-3.407*****

The event windows [-10, +10] and [-5, +5] both show to be significant at the 1% and 5% level respectively. A visualization of these windows is given by the graph of the daily cumulative returns of the [-10, +10] window, and allow for better interpretation of M&A announcement effect in a shorter window, this is shown in Figure 3.

Figure 3 – Graph of cumulative average abnormal return at event window [-10, +10]
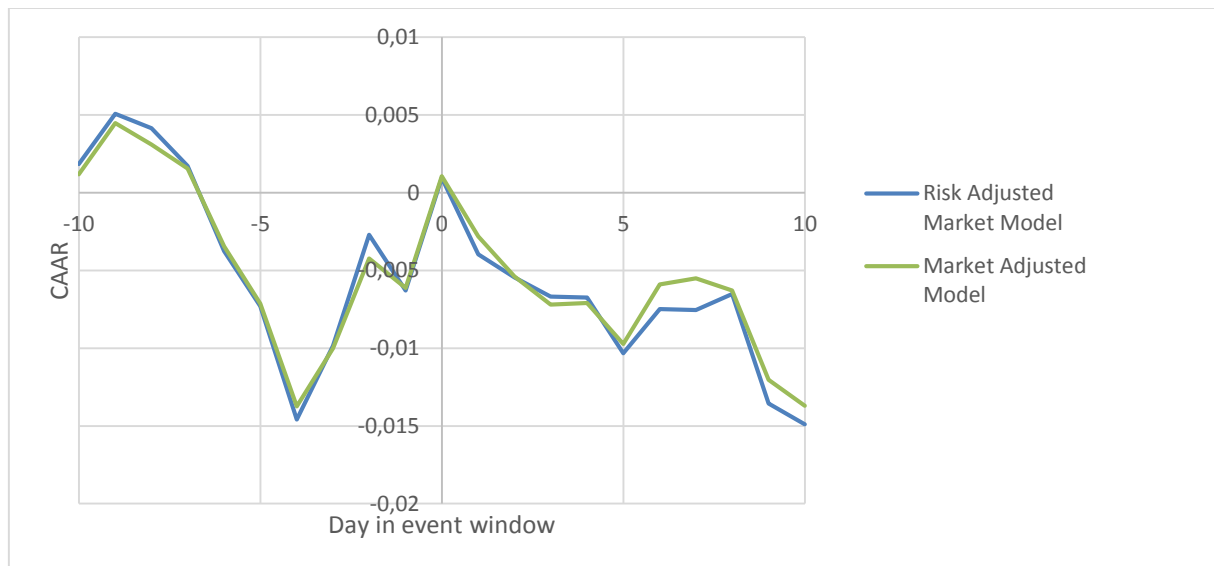
The graph in Figure 3 shows that from four days before the announcement, a possible information leakage resulted in positive effect to the abnormal returns. Skeptical or negative investor sentiment however kept abnormal returns to be negative until 10 days after the announcement, after which the magnitude of returns started to become increasingly positive. The positive CAAR about 10 days before the announcements could be interpreted as

information leakage and anticipation to the announcement. It is however a relatively longer event window and could be affected by confounding events.

I believe it is possible that because of substantial uncertainty investors may not fully or immediately react to announcements of M&A and will only be willing to provide a premium when a more thorough due diligence of the M&A is completed. With regard to uncertainty I estimate that opacity of assets in banking is relevant during the crisis because the opacity of assets in banking is generally accepted (Beltratti and Paladino 2011) and the risks involved with this are exaggerated and become obvious during a crisis. For example the crisis initiated by the vast decrease in value of mortgage-backed securities that where widely held by almost all banks. Flannery, Kwan and Nimalendran (2010) state the increase in opacity of assets in banking during a crisis in their research. Uncertainty around non-transparent assets causes information asymmetry and hinders valuation of the target. An acquisition always involves an extensive due diligence that makes clear what the value of the targets actually is but the announcement of the merger is also the pronouncement of the due diligence. Therefore investors are not yet willing to pay a premium but will wait until the due diligence is complete and that date lies behind the announcement date of the merger rather than immediately at t_0. Jones, Lee and Yeager (2011) discovered that a new valuation resulting from M&A's from 2000 until 2006 carry positive information for banks with more significant weight of opaque assets on their balance sheets. This underlines the risk premium that was paid for the opaqueness before the revaluation. This is a risk premium that needs to be paid up until completion of the due diligence. It explains why no significant returns were found immediately at announcement. Skepticism of investors that withholds the initial investment at M&A announcement could also be explained by the chance that a deal does not materialize in a reasonable time frame at times of financial distress, when information asymmetry and unexpected undesirable events could increase the probability of a termination of the transaction.

The results from my research indicate that M&A during a crisis is different from non-crisis M&A. Results from the most studies that have looked into banking in M&A in Europe, show that abnormal returns for acquirers in banking are negative or statistically insignificant (Scholtens & De Wit, 2004; Ferretti, 2000; Campa & Hernando, 2006). These authors' results are reported in Table 1. Even though this study also reports statistically significant positive abnormal returns for acquirers during a crisis just as Beltratti & Palladino (2013), the time-windows over which the significant positive returns are measured do not overlap (the time-

windows was [-10, -5] in the study from Beltratti & Palladino while I tested significant positive returns at the [-3, +31] window).

The results however do confirm the difference in M&A banking during a crisis and outside a crisis that Beltratti and Paladino (2013) found. These variances are remarkable because observed results for acquiring banks in Europe are also significantly different from several related studies for the North American bank M&A, which have documented a significant negative return for acquiring banks outside a crisis (Cornett et. al., 2003; De Long & De Young, 2007; Hagendorff, 2008). After the presentation of the above results and tests for statistical significance I can draw the following statistical conclusion:

Conclusion 1: I reject the null-hypothesis that M&A announcements have no statistically significant effect on western European banking stock price return during the 2008 crisis. There is sufficient evidence at the 1% and 5% significance level in several time windows [-10, +10], [-5, +5] that abnormal returns have been negative (respectively ($t_{(21)}$ = -4.328, p = 0.001), ($t_{(11)}$ = -2.313, p = 0.043). I accept H_1 only for the [-3, +31] event window at the 1% significance level, that western European banks achieve positive abnormal return from stock price at M&A announcement during the 2008 crisis because abnormal return is statistically significant positive ($t_{(35)}$ = 7.732, p = 0.001).

5.2 Hypothesis 2

The second hypothesis concerns the effect of pre-crisis capital on stock price return for western European banks at M&A announcement. In the preceding section, tests have shown that acquiring European banks demonstrate generally negative results for abnormal return before and around the announcement, and positive in the event window after announcement [-3, +31]. I expected the direction of capital ratio to be positive; the higher the capital ratio of the bank, the higher abnormal returns are expected. To make an estimation of the coefficient of the independent variable I use a simple linear regression. The independent variable, the bank's capital-ratio (CAP) before the crisis is measured as the ratio of a bank's equity-capital to gross total assets, averaged over the four quarters before the crisis. The dependent variable is the estimated cumulative abnormal return (CAR) of acquiring banks around the M&A announcement. CARs are the abnormal returns accumulated for each bank over a given event window. The calculation is therefore different than the CAAR which averaged the abnormal return for each day, and then accumulated the abnormal return for all banks together. To interpret the regression coefficients given in the following tests, Table 7 presents descriptive statistics of CARs at different time windows.

Table 7 – Cumulative Abnormal Return for different event windows.

This table presents descriptive statistics for the CAR_t following the market model for calculation of the market returns. N=84.

	Mean	Median	Std. Dev.
CAR [-10, +10]	-0.0149	-0.0100	0.1359
CAR [-5, +5]	-0.0066	-0.0061	0.1078
CAR [-10, -5]	-0.0073	-0.0053	0.0732
CAR [-10, 0]	0.0009	-0.0055	0.1348
CAR [-1, +1]	-0.0013	-0.0047	0.0611
CAR [0, +5]	-0.0041	-0.0019	0.0781
CAR [-3, +31]	0.0074	-0.0151	0.2167

First, Table 8 presents the effect of pre-crisis capital on the abnormal return of stock price around announcement for the event window [-3, +31] which tested statistically significant positive in the previous section of this study.

Table 8 – Simple Linear Regression: Pre-crisis capital on cumulative abnormal return at the [-3, +31] event window.

This table presents an estimate from the simple linear regression test explaining capital effect of acquiring banks on stock price abnormal return at the [-3, +31] time-windows around the announcement day (t_0) of an M&A. Capital is the bank's average of equity capital divided by total assets, measured 4-quarterly before the crisis. The regression shows standardized coefficients, indicated by ***, **, or *, whether the estimate is significant at the 1%, 5%, or 10% level, respectively.

Event window [-3, +31]	Standardized Coef.	N obs	F-statistic	t-value
CAP	0.039	75	0.114	0.337

Table 8 shows expected results as the pre-crisis capital seems to have a positive effect on the abnormal return of stock prices at [-3, +31] around the announcement day. However, not statistically significant linear dependence of the mean of CAR on CAP is detected. Also, the insignificance of the F-statistic indicates that this model only does not help me to understand the relationship sufficiently between capital and abnormal return. In Table 9 I perform a similar regression test to the other event windows in order to collect more evidence on the effect of capital on abnormal return.

Table 9 – Regression: Pre-crisis capital on cumulative abnormal return at different event windows.

This table presents estimates from linear regression tests explaining capital effect of acquiring banks on stock price abnormal return at several time-windows around the announcement day (t_0) of an M&A. Capital is the bank's average of equity capital divided by total assets, measured 4-quarterly before the crisis. The regressions show standardized coefficients, indicated by ***, **, or *, whether the estimate is significant at the 1%, 5%, or 10% level, respectively. T-values are in brackets.

Variables	-10, +10	-5, +5	-10, 0	-10, -5	-1, +1	0, +5
CAP	-0.007	0.009	0.002	0.0001	-0.043	0.029
	[-0.057]	[0.073]	[0.019]	[0.001]	[-0.368]	[0.248]
N obs	75	75	75	75	75	75
F-statistic	0.003	0.005	0.001	0.001	0.135	0.062

Table 9 shows a positive effect of pre-crisis capital on abnormal return around M&A announcement. The event window [-1, +1] measures a negative effect of pre-crisis capital on abnormal return, just as in the [-10, +10] window. At other event windows however, CAP positively affects abnormal return, as can be seen in the short period after the announcement [0, +5], capital has a positive effect and measured a standardized coefficient of 0.29%. It is however not measured significant so no interpretation can be made from this result. Due to the absence of any significant relation between pre-crisis capital and positive abnormal returns as concluded from the t-test statistic, I will continue to test the independent variable CAP with control variables to obtain increased accuracy in my results.

The results of the OLS-regressions with several control variables can be found in Table 10. In column 1, I first exclude the independent variable CAP and estimate the coefficients on various control variables instead. The result shows that no control variables have a statistically significant effect on abnormal returns at announcement in the [-3, +31] event window. Except for SIZE however, all variables are measured to have a positive relation. Column 2 presents the regression model of CAP to CAR and includes all the control variables tested in this study. In this model, CAP has a significant association with CAR at the 10% significance level. Also RSIZE is statistically significant at the 10% level. In column 3 and 4 I exclude the control variables that affected each other according to the Pearson correlation matrix. First I exclude SIZE as this correlated with the variables RSIZE and EFF. The association of CAP with CAR increases in column 3, and increased in positive significant association to the 5% level. The other variables remained fairly the same. The overall joint effect of the variables in the model of column 3 is statistically significant according to the F-statistic. In column 4 I exclude RSIZE and EFF in order to measure SIZE. In this column CAP decreased in its association to CAR and was tested insignificant. The fit of the model however (R^2) was reduced from about 0.30 to 0.05 because the R^2 is sensitive to the magnitude of the sample-size and the number of parameters (*p*) in small samples. Even though the *n* has increased in column 4 and 5, the model does not seem to fit the data very well. Column 5 and 6 include the dummy variables DOM and DIV. In column 5 CAP is only regressed with both dummies in the model. DOM has a positive association to CAP while DIV shows to be negative. In column 6 the control variables are added together with both dummies. SIZE is excluded because of its correlation to RSIZE and EFF. Column 6 shows a positive association of CAP (β=0.347) to CAR. Meaning that if the variable CAP increases by one standard deviation (5.76%), the association to CAR is a positive 0.347 standard deviation (21.6%) increase, hence a 7.5% increase in CAR given this sample in the [-

3, +31] event window. RSIZE remains to be statistically significant at the 10% level. Relative deal size is somewhat a proxy for the degree of market power which an acquirer may exert, and the continuing significant association of RSIZE with CAR suggests that the banks in my sample have benefitted from this.

Table 10 – Regression: CAR and CAP at [-3, +31] (robustness check 1)
This table reports ordinary least squares (OLS) regressions of the effect of pre-crisis capital and control variables on the cumulative abnormal returns (CAR) to acquirers over the [-3, +31] event window. Capital ratio (CAP) is the bank's average of equity capital divided by total assets, measured 4-quarterly before the crisis. ROE is the return on equity measured by net income divided by equity. EFF is efficiency, measured by expenses divided by total revenue. RSIZE is log of transaction value to the market value of acquirers' equity. SIZE is the natural log of acquirers' total assets. The DOM dummy is 1 if the M&A is to be of domestic nature and 0 if it will be cross-border. The dummy DIV is 1 if the nature of the acquisition is to diversify in activities, and 0 if it is a bank to bank acquisition. The regressions show coefficients, indicated by ***, **, or *, whether the estimate is significant at the 1%, 5%, or 10% level, respectively. T-values are in brackets, df = N-p

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	%	%	%	%	%	%
CAP		0.463*	0.349**	0.018	0.009	0.347
		[1.989]	[2.057]	[0.146]	[0.072]	[1.619]
ROE	0.043	0.148	0.087	0.108		0.090
	[0.225]	[0.761]	[0.501]	[0.843]		[0.493]
EFF	0.287	0.184	0.229			0.230
	[1.612]	[1.004]	[1.344]			[1.293]
RSIZE	0.273	0.403*	0.341*			0.342*
	[1.428]	[2.048]	[1.943]			[1.834]
SIZE	-0.190	0.199		-0.168		
	[-0.920]	[0.724]		[-1.272]		
DOM					0.032	0.005
					[0.055]	[0.138]
DIV					-0.038	0.023
					[0.053]	[0.104]
Constant	0.132	-0.865	-0.437**	0.229	0.009	-0.451**
	[0.357]	[-1.411]	[-2.673]	[1.126]	[0.136]	[-2.467]
R²	0.210	0.304	0.288	0.053	0.014	0.290
N obs	31	30	30	69	75	30
F-statistic	1.729	2.093	2.533*	1.207	0.330	1.566

To investigate if CAP is associated with CARs differently across several other time-windows around the announcement day, I exercise the OLS-regression model again from column 3 of Table 10. Table 11 shows the results of the regressions outcome.

Table 11 – Regression: CAR and CAP at different time-windows (robustness check 2)

This table presents estimates from linear regression tests explaining capital effect of acquiring banks on stock price abnormal return at several time-windows around the announcement day (0) of an M&A. Capital (CAP) is the bank's average of equity capital divided by total assets, measured 4-quarterly before the crisis. ROE is the return on equity measured by net income divided by equity. EFF is efficiency, measured by expenses divided by total revenue. RSIZE is log of transaction value to the market value of acquirers' equity. SIZE is the natural log of acquirers' total assets. The regressions show coefficients, indicated by ***, **, or *, whether the estimate is significant at the 1%, 5%, or 10% level, respectively. Standard errors are in brackets, df = N-p

Variables	-10, +10	-5, +5	-10, 0	-10, -5	-1, +1	0, +5
CAP	**0.429****	**0.425****	0.307	0.052	0.283	**0.349***
	[2.426]	[2.484]	[1.656]	[0.261]	[1.585]	[1.943]
ROE	-0.175	-0.243	-0.175	0.068	-0.023	-0.144
	[-0.962]	[-1.386]	[-0.921]	[0.333]	[-0.125]	[-0.781]
EFF	0.091	0.054	0.047	-0.022	0.041	0.003
	[0.512]	[0.313]	[0.252]	[-0.107]	[0.228]	[0.016]
RSIZE	0.181	**0.303***	0.228	-0.016	**0.389****	0.307
	[0.987]	[1.709]	[1.189]	[-0.078]	[2.108]	[1.651]
Constant	**-0.239****	**-0.208****	-0.190	-0.023	**-0.094***	**-0.118****
	[2.369]	[-2.518]	[-1.561]	[-0.357]	[-1.797]	[-2.273]
R^2	0.226	0.275	0.147	0.008	0.213	0.199
N obs	30	30	30	30	30	30
F-statistic	1.830	**2.372***	1.080	0.050	1.690	1.555

Table 11 shows the result of linear regression for four variables on the abnormal returns of M&A per event window. CAP has a positive association to CAR, as in Table 10. The effect of ROE is negative but insignificant in all time-windows (except [-10, -5], indicating that the shareholders of profitable banks where not confident during the crisis and did not anticipated positive effects upon completion of the merger. EFF has a positive insignificant effect, with a relatively lower coefficient. RSIZE has remained positive in all cases, and is significant at the 10% level in the [-5, +5] event-window, and at the 5% level in the [-1, +1] event window. Even though CAAR's are significantly negative at the 1% level in the [-10, +10] and [-5, +5] event-windows, the results from Table 11 give a clear indications that CAP has a significant positive association to abnormal return. I can see in this table the R^2 is low for all time windows (except at [-1, +1]. Interpretations from this model however should be approached with caution because of the low sample size (*n*=30).

If the hypothesis is true, banks with higher CAP yield a higher abnormal return and significant positive coefficients. Because as Berger & Bouwman argued; "*(…) crises may represent opportunities for strong banks. Particularly from the viewpoint of capital and liquidity, healthy banks may have an opportunity to improve market share, and shop around to buy competitors at distressed prices during the crisis*" (Beltratti & Palladino, 2013, p.4). One of the main findings of Berger and Bouwman (2013) is that medium and large banks with high pre-crisis capital ratios, have a higher survival rate and perform more acquisitions. From my

data it seems that better performance in that sense translates into banks with more capital to yield higher abnormal returns at M&A announcements. It could mean that acquirers where able to pay a lower premium for the target because these were sold at distressed prices.

Because the CAAR results showed to be statistically significant at the 1% level, whether it was negative or positive, I will continue to investigate if dummy variables where able to crystalize the results and clarify where the significant results come from. Significant positive CAAR's where found at the [-3, +31] event-window, and significant negative CAAR's at the [-10, +10], and [-5, +5] event-windows. Table 12 reports tests for the difference of the mean between control variables and the respective dummies DOM and DIV.

Table 12 – Significance test for difference of the mean – dummy variables DOM and DIV
Significant difference in the mean between the dummy variables DOM (domestic) and DIV (diversification). Significance is noted as *significant at 10%; **significant at 5%; ***significant at 1% level, equal variance not assumed. CAP is the bank's average of equity capital divided by total assets, measured 4-quarterly before the crisis. ROE is the return on equity measured by net income divided by equity. EFF is efficiency, measured by expenses divided by total revenue. RSIZE is the log of transaction value to the market value of acquirers' equity assets. SIZE is the natural log of acquirers' total assets.

	Domestic		Cross-border		Mean Diff.	Diversifying		Bank to bank		Mean Diff.
Variable	**Mean**	**N**	**Mean**	**N**		**Mean**	**N**	**Mean**	**N**	
CAP	0.0730	55	0.0674	30	0.0056	0.0610	47	0.0814	41	-0.0204
ROE	0.0809	53	0.0639	33	0.0171	0.0565	46	0.0947	39	-0.0382
EFF	0.1221	36	0.2854	24	**-0.1633**[**]	0.2128	30	0.1592	28	0.0536
RSIZE	0.3745	49	0.3173	23	0.0572	0.3316	34	0.3783	38	-0.0467
SIZE	11.2932	55	12.6833	33	**-1.3901**[***]	12.3079	47	11.2287	41	**1.0793**[***]

The table shows that the mean difference of EFF is significantly different at the 5% level between domestic and cross-border merger announcements, and SIZE at the 1% level, indicating that the association with CARs might be different as well. The difference in SIZE can be explained by competition rules for intra-European M&A. Since it is harder for large banks to get large M&A's approved, they are more likely to look outside of Europe for suitable targets. The same applies to the difference in banks that are involved in diversifying and bank to bank M&A; SIZE is significantly different (at the 1% level). Because of these significant differences, the dummy variables DOM and DIV are integrated for further regression over the event-windows that have resulted in significant positive CAAR's, which are the same event-windows that also indicated a positive association of CAP to CAR in the regression analysis. The results can be viewed in Table 13 which is the third and final robustness check that includes control variables over several event-windows in different sub-samples.

Table 13 – Regression: CAR and CAP at different time-windows with control variables (robustness check 3)

This table presents results from further robustness checks following the two dummy variables under this study. Panel A applies the dummy variable DOM which divides the sample into banks performing a domestic merger, and banks performing a cross-border merger. Panel B applies the dummy variable DIV, checking for diversifying and bank-to-bank mergers. The dummies are tested under the four different event-windows used throughout this study, and test the variable's effect on stock price cumulative abnormal return. Cells in the table represent estimated standardized coefficients, and t-values in brackets. Significance is denoted by***, **, and *, respectively 1%, 5% and 10% significant under two-tail probability (t-test, df=N-p). CAP is the bank's average of equity capital divided by total assets, measured 4-quarterly before the crisis. ROE is the return on equity measured by net income divided by equity. EFF is efficiency, measured by expenses divided by total revenue. RSIZE is the log of transaction value to the market value of acquirers' equity. SIZE is the natural log of acquirers' total assets.

Panel A: Robustness – Individual and control variables under domestic or cross-border mergers

	Domestic			Cross-border		
	-10, +10	**-5, +5**	**-3, +31**	**-10, +10**	**-5, +5**	**-3, +31**
CAP	0.242	0.265	0.360	**1.642***	0.101	0.535
	[0.942]	[1.027]	[1.468]	[2.545]	[0.089]	[0.317]
ROE	-0.279	-0.292	0.153	0.091	0.627	0.525
	[-1.058]	[-1.105]	[0.608]	[0.261]	[1.019]	[0.575]
EFF	0.068	0.024	0.226	-0.313	0.540	-0.394
	[0.283]	[0.102]	[0.989]	[-0.856]	[0.835]	[-0.411]
RSIZE	-0.070	0.239	0.427	**0.876***	0.465	0.071
	[-0.244]	[0.836]	[1.568]	[3.061]	[0.921]	[0.094]
SIZE	-0.314	-0.056	0.196	**1.142***	-0.180	1.121
	[-0.935]	[-0.166]	[0.611]	[2.478]	[-0.222]	[0.928]
Constant	0.225	-0.108	-0.963	-1.741*	-0.044	-1.718
	[0.455]	[-0.250]	[-1.179]	[-2.980]	[-0.070]	[-0.887]
R²	0.210	0.204	0.277	0.919	0.747	0.444
N obs	21	21	21	9	9	9
F-stat	0.795	0.770	1.151	**6.803***	1.773	0.478

Panel B: Robustness - Individual and control variables under diversifying or bank to bank mergers

	Diversifying			Bank to bank		
	-10, +10	**-5, +5**	**-3, +31**	**-10, +10**	**-5, +5**	**-3, +31**
CAP	0.132	0.512	0.383	0.881	0.526	0.197
	[0.338]	[1.311]	[1.302]	[1.449]	[0.874]	[0.321]
ROE	-0.488	-0.293	**-0.631****	-0.054	-0.284	0.078
	[-1.444]	[-0.863]	[-2.462]	[-0.137]	[-0.731]	[0.196]
EFF	0.444	0.425	**0.439***	-0.310	-0.081	0.312
	[1.547]	[1.477]	[2.020]	[-0.603]	[0.937]	[0.599]
RSIZE	-0.151	0.114	0.305	0.310	0.377	0.365
	[-0.476]	[0.357]	[1.268]	[1.030]	[1.264]	[1.201]
SIZE	-0.219	0.195	0.049	0.496	0.049	-0.209
	[-0.495]	[0.438]	[0.147]	[0.610]	[0.061]	[-0.255]
Constant	0.098	-0.167	-0.380	-1.054	-0.374	-0.041
	[0.245]	[-0.711]	[-0.442]	[-0.878]	[-0.351]	[-0.024]
R²	0.395	0.390	0.654	0.381	0.394	0.369
N obs	14	14	14	16	16	16
F-stat	1.047	1.024	**3.020***	1.233	1.299	1.172

In panel A domestic (N=21) versus cross-border (N=9) M&A announcements are analyzed via the OLS-regression model. The sample size is extremely low, especially for the cross-border model, of which the interpretations of the result should be approached with caution. It is noticeable that none of the variables in the model for domestic M&A announcements measured to be significantly associated to CAR. If not measured significant, the observations made of coefficients are not meaningful under the conditions of this study. In the cross-border sub-sample, significant results were found at the [-10, +10] event window. The variables CAP, RSIZE and SIZE all measured significantly positive at the 10% level. It should be noted that RSIZE and SIZE are correlated variables, and once again; the sample size of this model was a mere 9 cases. The probability of measuring a relatively high R^2 (0.919) as well as the F-statistic (6.803) is also due to the small sample size.

Panel B shows sub-samples divided into banks that diversify their activities through M&A ($n=14$) and bank to bank mergers ($n=16$). In both samples significance was only found in the [-3, +31] event window for diversifying merger announcements. ROE measured a statistically negative association to CAR of -0.631 at the 5% significance level. EFF was measured positively significant with a standardized coefficient of 0.439 at the 10% significance level. The significance of EFF confirms the theory from Hagendorff et. al. (2008) that banks are able to benefit from synergies and seems to be true diversifying acquisitions. The difference in the mean between diversifying and bank-to-bank mergers however did not measure a significant difference, which could mean that the significance measured in this regression is due to a Type II error. It should be noted that a larger sample size would give a better explanation of the correlation between variables. Correlation is after all subject to random error, and a small sample increases that error; deviating the estimate from its true value. After the presentation of the above results and tests for statistical significance I can draw the following statistical conclusion:

Conclusion 2: I reject the null-hypothesis that pre-crisis capital has no effect on the stock price abnormal return for western European banking M&A announcements during the 2008 crisis. There is enough evidence at the 10% and 5% significance level that in any of the event windows [-10, +10], [-5, +5], and [-3, +31] pre-crisis capital is positively associated with the abnormal returns of acquiring banks around M&A announcement. I do accept the alternative hypothesis 2 for the abnormal returns of M&A announcements during a crisis in the abovementioned event windows. The effect of capital is positively associated and statistically significant at the 5% level for the [-10, +10] and [-5, +5] event windows respectively ($t_{(30)} = 2.426, p < 0.05$), ($t_{(30)} = 2.484, p < 0.05$). At the [-3, +31] event

window, pre-crisis capital is measured to be significantly positive associated to abnormal return at the 5% level ($t_{(30)} = 2.057$, $p < 0.05$). The mean difference of pre-crisis capital was not measured to be statistically significant different between domestic and cross-border mergers, or between diversifying and bank-to-bank mergers.

6. Conclusion

This event study investigates the effect of pre-crisis equity-capital on abnormal return around M&A announcement for acquiring banks in Western Europe (EU-17 + Norway and Switzerland). To study abnormal return, the reaction of the publicly listed banks' stock price around the announcement date is estimated by the use of a Risk Adjusted Market Model. The effect of pre-crisis equity-capital on abnormal return around M&A announcement is tested among several control variables, and the standardized coefficients of these variables are estimated with a OLS-regression model. This study contributes to the literature because it cannot be assumed that the results from Berger and Bouwman (2013) also apply to Europe since Europe shows more heterogeneity than the US in its banking sector because of cultural, legal and economic differences. Besides, the recent crisis has changed the financial industry to such extend that banks were urged to rethink their original policies on strategy and capital structure (Flannery, 2010), in that matter this study tests the theory of Berger & Bouwman that in crisis-periods acquiring banks can buy targets at distressed prices, and verifies controversial result found by Beltratti & Palladino that acquiring banks obtain significant positive returns at M&A announcement. To do so, this study focusses on the pre-crisis capital ratio for acquiring banks at M&A announcement, and adopts an improved and prolonged timeframe of banking crises.

The aim of this study is to provide answers on whether or not acquirers gain abnormal stock returns at several event windows around announcement of an M&A in the European banking crisis that started in 2008. A deeper insight into the effect of pre-crisis capital on banking M&A's and its consequences to the acquirer is studied by regression analysis including various control variables. The statistical conclusions derived from this study however, are contingent on the use of particular event window specifications. Abnormal returns for acquiring banks are significantly positive at the [-3, +31] event window only, while two other windows show significant negative results. The regression analysis indicates that the pre-crisis capital held by acquirers has a significant positive association with abnormal return. Capital therefore partially determines abnormal returns for acquirers around the M&A announcement during a crisis. This confirms the difference in M&A announcements in the banking industry during a crisis that Beltratti and Paladino (2013) find.

The evidence of this study shows that M&A activity in the European banking sector during the financial crisis was indeed different. The skepticism of investors had negative results on abnormal returns around announcement, but acquisitions announcements retrieved delayed positive abnormal returns no longer than a month after the announcement. This result contributes to the controversy which exists among academics on the benefits of holding higher

capital. Bankers argue that holding more capital puts performance at risk and leads to less lending (Aiyar, Calomiris & Wieladek, 2012; Diamond & Rajan, 2011). The result of this study supports the theory of Kashyap, Rajan & Stein (2008), and Hart & Zingales (2011) by providing evidence that increased capital offers a safety net, but also allows to benefit from M&A's during a crisis. Because of uncertainty stockholders were hesitant to attach value to M&A up until completion of the deal and they were only willing to reward successful acquisitions with delayed abnormal returns as Beltratti and Paladino (2013) find. This is relevant for future research looking into broad time windows, including times of crises because it may distort observations of announcement and completion returns if looked at altogether. A possible explanation for the indifference of investors on the announcement date is the increased uncertainty in times of crises and the higher chance of unfortunate events that could prevent the merger from materializing. This would be consistent with a higher activity of merger arbitrageurs; an investment strategy providing insurance to target firm shareholders against deal failures. So far there has been no research into the activity of merger arbitrageurs in the banking industry during a crisis. For practitioners, this study is particularly interesting because it adds to the decision making of M&A's during crisis periods, as shareholder wealth creation is important for shareholders. The results also shed more light on the decision of the level of capital to be maintained by a given bank as the benefits from capital, and the performance at M&A announcement during a crisis are clearer.

This event-study is subordinate to several general limitations such as the assumption of efficient stock markets and assumption of the samples' normal distribution. With caution should be approached the results from the regression tests as the sub-samples of mean difference comparisons where rather small, resulting in outcome which is not as strong as the result with large samples. Also, with the use of the market model, the individual stock is linearly related to the market return. The market index used does not control for dividends and stock splits, phenomenon's which influence the stock price. Though there are share price series that control for dividends and splits that could increase the power of the result of this study, a value-weighted index is not incorporated in this study The scope of this paper is by no means an exhaustive review of recent literature on all consequences of M&A in banking and the best strategies to be pursued in order to come to a more stable and efficient banking industry. Given bank bailouts and other rescue packages that have been implemented post-crisis, a deeper understanding of the relationship between systemic stability and safety net subsidies is necessary. There is no doubt that since the crisis there have been calls to further regulate the banking sector. In order to help design the most appropriate regulatory blueprint, research

should further investigate the overall impact of financial sector efficiency and on the allocation of risks.

Finally, issues related to capital, liquidity, provisioning and fair value accounting are the cause of some banks to run into problems during the crisis and for others to take advantage of the situation and go on an M&A streak because their capital position allows it and targets are for sale at distressed prices. While this leads to positive AR for some banks one can argue if this result of cyclicality is desirable in the first place. If this is indeed a flaw in the free market mechanism that does more harm than good is undecided yet. Current and future research should continue to evaluate the effects of pro-cyclicality on the banking industry. Specifically, future research should illustrate ways in which regulation can be designed to make bank capital and provisioning less pro-cyclical. Research should also look into the inter-connections between capital, liquidity, performance and systemic risk. Last but not least, researchers should explore various issues in relation to fair value accounting including its potential effects in terms increased transparency and disclosure.

Because of uncertainty stockholders were hesitant to attach value to M&A up until completion of the deal and they were only willing to reward successful acquisitions with delayed abnormal returns as Beltratti and Paladino (2013) find. This is relevant for future research looking into broad time windows, including times of crises because it may distort observations of announcement and completion returns if looked at altogether. A possible explanation for the indifference of investors on the announcement date is the increased uncertainty in times of crises and the higher chance of unfortunate events that could prevent the merger from materializing. This would be consistent with a higher activity of merger arbitrageurs; an investment strategy providing insurance to target firm shareholders against deal failures. So far there has been no research into the activity of merger arbitrageurs in the banking industry during a crisis.

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Appendices

Definition of terms

ROE - Return on Equity. Net income divided by the shareholders' equity over the year prior the year of the deal (Beltratti & Stulz, 2011).

RSIZE - Relative deal size. The log of transaction value to the market value of acquirers' equity at the time of announcement (Asimakopoulos & Athanasoglou, 2012).

SIZE - Size of acquiring bank. The natural logarithm of the acquirers' total assets on the year prior the year of the deal (Berger & Bouwman, 2013).

EFF – Efficiency. The ratio of capital expenditure to total revenue on the year before the deal (beltratti & Paladino, 2011)

DOM – Domestic. Dummy variable that recoded mergers between countries into the binary variable that measures whether the acquiring bank performed a domestic (1) or cross-border (0) merger.

DIV – Diversification. This binary variable controls for the difference in M&A's in terms of scope. Diversification (1) when the target was other than a bank, and (0) if the acquisition was of a bank-to-bank nature.

CAR – Cumulative Abnormal Return. The abnormal return calculated by the actual return minus the market return via the MSCIE index, accumulated for a given bank over a certain event window.

AAR – Average Abnormal Return. The abnormal return calculated by the actual return minus the market return via the MSCIE index, averaged for all acquiring banks on a given day.

CAAR – Cumulative Average Abnormal Return. The sum of average abnormal return (AAR) over a certain event window.

Table 1. Summary of case criteria and sample advancement

Search Criteria

Request	Operator	Description	Hits
Database	Include	All Mergers & Acquisitions	n/a
Acquiror Mid Industry	Include	Banks	35863
Target Mid Industry	Include	Alternative Financial Investment Asset Management Banks Brokerage Credit Institutions Diversified Financials Insurance Other Financials	31143
Acquiror Nation Region	Include	Western Europe	7087
Acquiror Status	Include	Public	3915
Date Announced	Between	10/01/2008 to 12/31/2012	582
Deal Status	Include	Completed	307
Deal Value ($ Mil)	Between	10 to 99999	119
Greece and Cyprus	Exclude	Exluding Greece and Cyprus	111
Double M&A activity	Exclude	Activity in the quarter before or after the announcement [-90, +90]	109
Double cases	Exclude	Cases of activity on the same day with non-relating values	97
Confounding effects	Exclude	Cases with confounding events in the event window	88

Table 2. Summary statistics of deal value for acquiring cases per country

	Descriptive statistics for value of deal and acquiring country					
Acquirers' Nation	**N**	**Mean**	**Std. Deviation**	**Minimum**	**Maximum**	**Sum**
Belgium	1	13.000000	.	13.0000	13.0000	13.0000
Denmark	3	53.310333	41.2865804	18.0890	98.7450	159.9310
Finland	2	32.943000	6.9904576	28.0000	37.8860	65.8860
France	7	475.870571	383.1050016	66.4750	1037.7190	3331.0940
Germany	5	607.100600	605.7529432	51.5640	1300.0000	3035.5030
Iceland	1	340.979000	.	340.9790	340.9790	340.9790
Ireland-Rep	1	200.000000	.	200.0000	200.0000	200.0000
Italy	21	119.143048	154.1351483	10.1390	706.4000	2502.0040
Norway	7	47.721571	53.6147779	8.5800	160.0000	334.0510
Portugal	4	124.489750	78.5214363	39.8000	225.0000	497.9590
Spain	17	421.108020	463.6800576	12.0000	2086.8550	8060.1510
Sweden	5	64.282000	51.1071091	7.5270	121.0000	321.4100
Switzerland	8	261.797500	223.4252963	25.0000	716.1960	2094.3800
United Kingdom	6	136.452500	171.6427953	12.5780	479.8280	818.7150
Total	**88**	**247.443875**	**369.4373940**	**7.5270**	**2086.8550**	**21775.0610**
Deal value Domestic M&A	55	216.400339	275.3149619	8.5800	1204.8610	13065.0366
Deal value Cross-border M&A	33	304.461714	500.7774275	7.5270	2086.8550	8710.0244

Table 3. Summary of cases used in previous literature on event studies to analyze banking M&A.

Author(s)	Year of publication	World Region	Period under study	Number of M&A deals
Tourani-Rad & van Beek	1999	Europe	1989-1996	56
Cybo-Ottone & Murgia	2000	Europe	1987-1998	72
Beitel & Schiereck	2001	Europe	1985-1997	98
De Long	1999	US	1988-1995	280
Lepetit et al.	2004	Europe	1991-2001	180
Ismail & Davidson	2005	Europe	1987-1999	89
Campa & Hernando	2006	Europe	1998-2002	244
Schmautzer	2008	US & Europe	1985-2005	96
Ekkayokkaya et al.	2009	Europe	1990-2004	993
Beltratti & Paladino	2011	Europe	2007-2010	139
Berger & Bouwman	2013	US	2007-2009	189

Table 4. Cases cross-checked for announcement dates and confounding effects.

Thompson One Date announced	Acquirer bank	Target	LexisNexis Actual announcement date	Newspaper or journal found	Confounding event
12-18-2008	Alandsbanken Abp	Kaupthing Bank Sverige AB	12-22-2008	Associated Press International Dec. 22, 2008	None
02-25-2009	Credit Agricole SA	CACEIS Bank	02-27-2009	Banking Newslink Feb. 27 2009	None
03-22-2011	UniCredit SpA	Banca Lodi-Branches	03-21-2011	Global Banking News Mar. 21, 2011	None
12-18-2012	Bankia SA	Aseguradora Valenciana SA de	Correct	The Daily Telegraph (London) Dec. 29, 2012	Shares plunge after £15bn bail-out deal revealed
09-30-2011	CaixaBank SA	Aarhus Lokalbank A/S	Correct	SNL EU Financials Daily Oct. 13, 2011	CaixaBank downgraded by S&P to A from A+
02-25-2009	Credit Agricole SA	CACEIS Bank	Correct	Global Banking News March 4, 2009	Posted 4th-quarter loss of about EUR309m
10-20-2008	Deutsche Bank AG	Challenger Infrastructure Fund	Correct	The Asian Banker Journal Oct. 31, 2008	Deutsche Bank reports 3Q 2008 net income of EUR 414 million
08-17-2009	Commerzbank AG	Credit du Nord SA	Correct	ENP Newswire Aug. 11, 2009	Q2 closes with an operating result of minus EUR 201m; Gross revenues increase by 31% to EUR 3.1bn
02-04-2011	Julius Baer Group Ltd	Sparebanken Hardangen	Correct	Daily the Pak Banker Feb. 8, 2011	Announced net profit of $528m for 2010
04-29-2010	UBS AG	Grupo Financiero Santander	Correct	Global Banking News April 30, 2010	UBS buys Brazilian brokerage Link Investimentos for USD112m
02-18-2010	Societe Generale SA	Cassa dei Risparmi di Forli e	Correct	Banking and Credit News Feb. 19, 2010	2009 profit slips 66.3% Y/Y, poised for 2010 rebound
11-13-2008	Royal Bank of Scotland Group	Storebrand ASA	Correct	Global Banking News Nov. 14, 2008	RBS plans to cut 3,000 banking jobs