ERASMUS UNIVERSITY ROTTERDAM
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A shotgun wedding: The Impact of the Credit Suisse Takeover by UBS on the European and U.S. Banking Industries

Author: I.R. Bosman
Student number: 537565
Thesis supervisor: Dr. Ruben de Bliek
Second reader: Dr. Kan Ji
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ABSTRACT

This thesis explores the impact of Credit Suisse's emergency rescue by UBS, organized by the Swiss government, on the banking industries in Europe and the U.S. The stock market responses of 38 European banks and 30 U.S. banks following the announcement of the merger are analyzed. This thesis employs event study methodology to assess the short-term stock market returns. The findings reveal that the stock returns of the European and U.S. banks declined in reaction to the announcement, with European banks experiencing less severe declines compared to the significant decreases observed in U.S. banks. It was also found that U.S. banks exhibited higher abnormal stock market return volatility following the takeover. Additionally, the study did not find convincing evidence that a bank's size affects the extent to which it experiences cumulative abnormal returns. Using buy-and-hold abnormal return analysis, the results demonstrate that the acquisition had a lasting impact on the banking industries of both regions in the long term. In general, European banks benefited positively in the long term, whereas U.S. banks faced negative effects.

Keywords: Banking, Mergers & Acquisitions, Credit Suisse, Event study, Long-term performance

JEL Classification: G010, G140, G210, G400

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CHAPTER 1 Introduction

In March 2023, two well-known but different banks collapsed: Silicon Valley Bank (SVB) in the U.S. and Credit Suisse in Swiss. Despite being almost ten thousand kilometers apart, the banks collapsed within just five days of each other (Martins, 2024). In the financial world, Credit Suisse has a more powerful position than Silicon Valley Bank, which was considered a medium-sized bank. Credit Suisse has shown its systemic relevance in the past, as being named one of the top thirty banks essential to the global economic system (Financial Stability Board, 2022). Credit Suisse was therefore seen as one of the "too big to fail" institutions. However, in recent years, the bank found itself engaged in a number of scandals including a spying scandal and a case involving money laundering. On top of that, the bank also had serious financial problems for several years (Jayne et al., 2021).

Due to concerns that the inability to protect depositors could trigger a new international financial crisis, the Swiss government pushed through the acquisition of Credit Suisse by its biggest competitor UBS. The deal was completed for over $3.25 billion, which was a significantly lower amount than the market value of Credit Suisse. The takeover, which the Swiss government practically arranged, has been named a "shotgun wedding" in the media. Analysts described the transaction as chaotic and undesirable, yet inevitable given the situation (Dodd, 2023). Although several papers have been published on the contagion effects and the stock market's reaction to SVB's failure, papers on the impact of the collapse and takeover of Credit Suisse are few and far between. Martins (2023) examines how the collapses of SVB and Credit Suisse together affected the European banking industry. The author identifies significant declines in stock prices immediately following the bank failures, utilizing event study methodology with data from the stock returns of the 100 largest European listed banks and the STOXX Europe 600 index. According to his research, the banking crises damaged industry confidence and increased the risk of a global financial crisis. The study finds that the failure of Credit Suisse had a more detrimental impact than SVB because Credit Suisse had more regional and international connections. The collapse of Credit Suisse implied a greater danger of contagion than the bankruptcy of SVB.

Research by Goyal and Soni (2023) looks at the specific impact of the acquisition of Credit Suisse by UBS on the Indian banking and financial services industries. Through event study methodology, their research examines the responses of several financial market segments in India, including financial services firms and various banks operating in the public and private sectors. Cross-sectional regression is another tool the authors use in their study to determine whether there were bank-specific indicators of abnormal returns. The study by Goyal & Soni from 2023 stands out as the only paper specifically delving into the takeover of Credit Suisse by UBS and its impact on the financial market. This merger, noteworthy for being one of the largest mergers in the banking industry, offers valuable insights into how such significant takeovers can affect market behavior, investor confidence, and stability in the financial sector. Their paper highlights the repercussions in India's banking sector affecting both banks and financial service entities. On the contrary, investors' responses to UBS's acquisition of Credit Suisse caused European bank equities to see a favorable change in early market activity on March 21st, 2023, after the merger announcement. The European Stoxx 600 index increased by 2.2% shortly after the markets opened, with the banking sector observing a 1.1% growth (Kelly, 2023). The U.S. stock markets experienced an increase on the first trading day following the takeover news, probably because of the rescue of Credit Suisse. Several of the well-known stock indices in the U.S. experienced an increase, as there were gains of 0.89%, 0.39%, and 1.20% for the S&P 500, Nasdaq, and Dow Jones, respectively. Morgan Stanley saw a 1.2% gain in its share price on this day, however, several of the big banks in the U.S. saw little to no change (FD, 2023). Despite the significant market reactions in the U.S. following the failure and acquisition of Credit Suisse, the U.S. and European banking markets have not been examined in this context yet. Instead, the Indian banking market has received attention, even though it might not be the most obvious market to study in this context. This highlights a gap in the analysis of the more directly impacted markets. This event, marked by substantial interventions from regulatory bodies and central banks, represents a crucial moment in recent financial history with possible implications for broader banking industry dynamics. Therefore, exploring the effects of this emergency rescue on both European and US banking markets could provide valuable insights into how these interventions affect market behavior, investor sentiment, and stability in the system. This study aims to fill the gap in the literature by investigating the impact of Credit Suisse's collapse on the financial markets. The study focuses on the banking sectors in Europe and the U.S. to see whether there are significant differences in the market responses. Therefore, this study aims to answer the question:

How did the emergency rescue of Credit Suisse by UBS affect the European and U.S. banking industries?

To answer this question, this study uses an event study methodology and the market model, following the methodology by MacKinlay (1997). The European sample includes 38 banks in Europe with varying market capitalizations to assess the effects on the European banking industry. For the U.S. banking sector, the study will focus on a sample with the top 30 U.S. banks by market capitalization. Daily stock data and market index information are retrieved from Eikon Refinitiv. Daily stock data and market index information are retrieved from Eikon Refinitiv. The STOXX Europe 600 index serves as the reference market index for European banks and the S&P 500 Financial Sector index is used as the market benchmark for the U.S. banking industry. Since UBS's official confirmation of the takeover of Credit Suisse occurred on a Sunday (March 19th, 2023), the event day in the event study moves to the next trading day, which is March 20th, 2023.

It is beneficial to adjust the event windows in event studies, to effectively differentiate the impact of actual news from market speculations, which might influence the market. This study employs various event windows to ensure robustness. Following Martins (2023), the estimation window is set from [−140, −8]. Subsequently, further cross-sectional analysis aims to identify whether certain bank characteristics drive the observed changes in cumulative abnormal returns. The regression models for both the European and U.S. banking industries include various bank-specific variables, as suggested by Pandey et al. (2023). Additionally, the model for the European banking industry also includes country-specific variables. This study anticipates identifying abnormal stock price returns in the European and U.S. banking sectors following the news of the acquisition. These abnormal returns could reflect the market's evolving perceptions of systemic risks, reorganization effects, and changes in competition. Whether positive or negative, the nature of these returns will depend on the market's assessment of the acquisition's impact on industry stability and potential risks. This thesis aims to provide a definitive analysis of these outcomes.

The subsequent sections of this paper are structured as follows: section 2 marks the theoretical framework, reviews relevant literature and previous research, and lays the foundation for the remaining part of this thesis. Section 3, the Data section, explains the sample selection process and the data sources accompanied by descriptive statistics. In section 4, the methodology used in this paper is explained. Section 5 presents an in-depth analysis of the findings and incorporates robustness checks. Section 6 acknowledges the limitations of this thesis and gives suggestions for future research. Finally, the thesis concludes with Section 7.

CHAPTER 2 Theoretical Framework

The first subsection will cover the existing literature on the topic of banking failures. First, previous studies on the failures of other large banks will be reviewed, focusing on the broader context of bank failures, panics, and crises. The second subsection will discuss empirical research studies that analyze how the banking industry responds to bank failures and takeovers. This segment focuses on studies unrelated to Credit Suisse to provide a broader understanding of the dynamics of the banking industry. Finally, in the last subsection, the case of Credit Suisse will be discussed in detail. This section specifically investigates the case of Credit Suisse, examining their downfall and the eventual merger with UBS. The formulation of the research hypotheses, which are linked to the research question, marks the conclusion of this chapter.

2.1 Background: bank failures, panics, and crises

In this subsection, the concept of bank failures and their systemic impact will be introduced, noting the interconnected nature of the banking industries.

2.1.1 Historical analysis of banking crises

Over the past couple of years, a combination of economic globalization and technological innovation has brought the global financial markets closer together. The interconnectedness of the financial world has opened a lot of new opportunities and advantages. Businesses and investors have improved access to capital and a diverse range of investment options (Kose et al., 2009). However, the interconnectivity of the financial markets also introduces downsides. The market environment has become more complex, and the volume of foreign investment flows has increased, leading to potential risks and increased volatility. This has increased concerns about the possibility of financial contagion and the rise in systemic risks (Corbet and Goodell, 2022). Over time, several significant studies have investigated these events, offering insights into the causes, consequences, and management of such crises. Frydman and Xu give a historical analysis of banking crises in their paper of 2023. They point out common causes of banking crises and show how their effects change over time. From their research on previous banking crises, they highlight three key takeaways.

The first lesson they discover is that, in general, crises are triggered by leverage. According to their findings, financial systemic high leverage is a consistent indicator of future banking crises. Leverage accumulation raises financial fragility which increases the likelihood and severity of crises. According to empirical research, large leverage accumulations appear to increase the likelihood of financial crises by about 1.6 times. From 1800 forward, asset price bubbles and credit booms have preceded financial crises in both industrialized and emerging countries, according to research by Reinhart & Rogoff (2013). Financial systems often become increasingly speculative over time, creating bubbles that collapse and destabilize the economy (Minsky, 1986). The authors' second main argument concerns the negative effects on the actual economy. Banking crises have detrimental effects, including decreased innovation, employment, and production. These adverse consequences frequently have a large and extended duration. Countries with high debt levels before the crisis usually have delayed economic recovery (Bernanke, 1983). The article also mentions the connection between political instability and financial crises. Financial crises can lead to an increase in political extremism because of social unrest. They discover that far-right parties tend to gain 30% more votes on average in the aftermath of a financial crisis. (Funke, Schularick & Trebesch, 2016).

The third key takeaway of the paper by Frydman and Xu (2023) is that effective government interventions can reduce the negative impacts of banking crises. Historical evidence indicates that prompt and extensive actions, such as providing liquidity and easing monetary policy, can help stop panics and limit economic damage (Friedman & Schwartz, 1963; Bordo et al., 2001).

Sayek and Taskin (2014) study historical financial crises to provide insights into the current economic policy. This study compares historical crises that took place before 2007 with those that happened after 2007, using a propensity score matching approach. The authors evaluate these crises from three perspectives: their global context, the financial state of the impacted countries, and the already existing vulnerabilities within these countries before the emergence of the crises. This third and last aspect appears to be quite important for crises in peripheral eurozone countries. Their findings show that crises in countries like Greece, Ireland, Italy, Portugal, and Spain are comparable to previous crises in terms of pre-crisis domestic vulnerabilities. However, while each banking crisis is different and unique, there are enough similarities between crises such as the Japanese crisis that took place in the 1990s, the Nordic crisis in the early 1990s, and the Asian crises in 1996–1997. The importance of understanding common and specific aspects of financial crises is inevitable to successfully develop customized plans for recovery. Their key takeaway is that policymakers may create customized responses for the crises of today and in the future by learning from past crises.

2.1.2 “Contagion and panic” and “fundamentalist” approach

Financial literature distinguishes two main approaches of evaluating the effects of bank failures on the stock market: the "contagion and panic" approach and the "fundamentalist" approach (Martins, 2023). Financial instability may spread from one institution or country to another, as explained by the "contagion and panic" theory. This theory argues that when a bank fails, a domino effect of fear and panic across the financial system can be triggered. This can result in other bank failures and general economic instability. After a financial institution fails, investors and depositors may face a confidence crisis. The Diamond-Dybvig model (1983) provides a crucial theoretical framework for understanding this dynamic by demonstrating how banks are particularly sensitive to panics or "bank runs." In these scenarios, the fear that other depositors may withdraw their money might become a reality, resulting in simultaneous mass withdrawals.

On the other hand, the "fundamentalist" approach focuses on the underlying economic principles and banks' responsible decision-making. This method highlights that the financial health of banks is heavily influenced by their decisions regarding lending, investing, and risk management. Banks usually decide to cut back on lending and constrain credit availability in response to unfavorable economic conditions or negative shocks (Bernanke et al., 1991). These actions lead to a reduction in the quantity of deposits and loans available, which can exacerbate the economic downturn. The effects of restricted credit access extend beyond businesses to households as well (Bauer, 2016). Businesses may face difficulties securing financing for daily operations and growth opportunities, where individuals could be challenged in obtaining mortgages and personal loans, compounding the economic difficulties. As a result of their own decisions, banks can run the risk of intensifying the first shocks into something far more harmful, which can turn a bad shock into a bank run. This domino effect doesn't even require the banks to be in a bad condition (Calomiris, 2007). While the “contagion and panic” approach focuses more on behavioral dynamics, the “fundamentalist” approach examines the active decisions of banks and their effects on the broader economy. Together, these approaches provide crucial insights into how bank failures can impact the stock market.

The paper by Baron et al. (2021) questions the conventional belief that banking crises are primarily driven by panic among depositors and creditors. Instead, they examine the role of significant declines in bank equity and their impacts on economic stability. The authors provide a comprehensive market overview by analyzing a new dataset of bank equity returns spanning from 1870 to 2016 across 46 countries, which also includes non-financial stock indices, the authors provide a comprehensive market overview including non-financial stock indices.

The research reveals that even in the absence of typical panic in the markets, significant drops in bank equity can predict severe economic downturns, including observable declines in GDP and private-sector bank lending. This result contradicts the traditional view that panics are necessary for financial crises. Furthermore, the study shows that although panics intensify the negative consequences of bank equity declines, major economic consequences can still arise in the absence of panics. According to the authors, bank equity reductions can severely limit the banking industry's capacity to provide loans to consumers and businesses, ultimately reducing economic activity. Based on these findings, the authors advise policymakers to look beyond panic indications and consider significant declines in bank equity as early signals of potential financial crises and economic instability. They argue that increasing bank capital reserves could be an efficient way to mitigate the effects of these kinds of crises.

The choice to specifically focus on the impact of UBS's acquisition of Credit Suisse on the banking sectors in Europe and the United States was guided by fundamental theoretical models of financial contagion and bank runs. These models suggest that the banking sector experiences the initial and most profound impacts after a bank failure. According to Allen and Gale (2000), the consequences of a bank collapse spread faster and more intensely through the banking industry than through other sectors because of the highly interconnected nature of banks within the financial system.

This interconnectivity ensures that any disruption in one part of the system can lead to widespread repercussions across the entire banking industry. In addition to the interconnectedness of banks and firms leading to financial contagion through a "counterparty effect," Helwege & Zhang (2016) have also identified "information contagion" as another source of externalities. They discovered that during the Lehman Brothers bankruptcy, this form of contagion significantly contributed to the creation of spillover effects.

2.2 Empirical studies

2.2.1 Recent bank runs

This subsection will explore and evaluate the results of several empirical studies on noteworthy bank failures that do not include Credit Suisse.

The bankruptcy of Lehman Brothers during the 2008 financial crisis was the biggest banking failure in the financial history of the U.S. Johnson and Mamun (2012) looked at the immediate impact of the bank collapse and found that the day Lehman Brothers filed for bankruptcy, September 15th, 2008, was catastrophic for the U.S. financial sector. Their analysis showed that on this day, bank stocks decreased by 2.9%, while main dealers saw even steeper drops of 6% in their share prices. Their studies additionally indicated that larger financial institutions suffered more from the consequences of Lehman Brother's failure. The authors emphasize the significant systemic risks associated with the collapse of a large, interconnected entity.

Wiggins & Metrick (2014) explored the issue of financial contagion in the aftermath of the collapse and discovered that various markets and organizations experienced negative effects that were not directly related to their direct involvement with Lehman Brothers. Building further on this, Kim et al. (2015) found evidence of financial contagion that affected emerging Asian financial markets soon after Lehman Brothers' collapse. Additionally, Ceylan (2021) identified remarkable similarities in the dynamics of risk aversion in the French and U.S. financial markets following the downfall of Lehman Brothers.

The collapse of Silicon Valley Bank in March 2023 which has been mentioned before, serves as another striking example of a bank run in more recent memory. Just a few days before the Credit Suisse crisis, the previously 16th largest bank in the U.S. collapsed as a result of a bank run. In an extremely short period, SVB lost $42 billion in deposit outflows as fear took over the rational thinking of clients and investors. This study examines some studies that investigate SVB's collapse and its consequences on the global financial markets. Akhtaruzzaman et al. (2023) explored whether SVB's failure triggered an economic downturn that affected the G-7 countries, Brazil, China, South Africa, and India. They assessed the impacts across four distinct categories, including banks. They concluded that financial contagion from the bankruptcy was primarily confined to the banking sector, with minimal effects in other market sectors.

Yadav et al. (2023) investigated the impact of SVB's collapse on the top nine global equity indices using an event study methodology. Their findings indicate that the SVB failure can significantly affect global stock markets and cause cross-border ripple effects. They found that each stock exchange experienced a negative abnormal return, with the severity of these impacts varying among the exchanges.

Another study by Pandey et al. (2023) utilized an event study methodology as well to examine the impact of SVB's collapse. Their findings reveal widespread panic, resulting in significant negative returns across global markets. Developed markets, characterized by their close integration with the global economy, exhibited significantly higher abnormal volatility. The study also revealed that the impact of SVB's collapse varied by country, influenced by the development and stability of their banking systems.

2.2.2 European and U.S. Banking Industry

Alexandrou et al. (2011) found that financial contagion increases more and more as time goes by because of the economic and political integration process in Europe which has led to negative volatility spillovers among banks in the region. Paltalidis et al. (2015) examine systemic risk and financial contagion in the euro area banking system and identify three primary sources of systemic risk: interbank transactions, asset price fluctuations, and sovereign credit risk. These factors lead to both direct and indirect financial losses and can trigger cascades of defaults. Sovereign credit risk is identified as the most dominant contagion channel. The study finds that banks in southern Europe are more vulnerable to failures due to financial contagion.

The effects of financial contagion can extend beyond the borders of any single continent. Martins (2023) discovered that European banks experienced negative and statistically significant abnormal returns following the announcement of SVB's failure in California. Despite Diamond & Dybvig's (1983) model, which suggests that even solvent banks can fail during times of panic and stress, Martins' cross-sectional analysis indicated that banks with higher risk aversion, better capitalization, and more liquidity demonstrated greater resilience to the adverse effects of the studied bank failure.

Furthermore, Aharon et al. (2023) observed that the collapse of SVB had repercussions beyond the U.S. and European financial markets, extending its impact to Latin American, Middle Eastern, and African markets. Vo and Le (2023) highlighted the potential for SVB's bankruptcy to have consequences for other U.S. banks. Their study on the U.S. banking sector identified several factors that can increase the susceptibility of banks to fail, such as low interest rates, high GDP growth, (un)insured deposits, and the withdrawal of concentrated deposits.

2.3 The collapse of Credit Suisse and the subsequent acquisition by UBS

Turning to the Credit Suisse crisis, this subsection examines the underlying causes and potential consequences of the Credit Suisse Banking crisis. Particular emphasis will be placed on the dynamics of financial contagion within the interconnected European banking system, in which Credit Suisse operated as a central player. The dynamics of financial contagion within the European banking system in which Credit Suisse was a key player are highlighted and the consequences for the U.S. banking industry are explored. Furthermore, the potential consequences for the U.S. banking industry will be explored.

2.3.1 The downfall of Credit Suisse

Credit Suisse was founded in 1856 in Zürich under the name "Schweizerische Kreditanstalt" and was originally established to provide funding for the construction of Switzerland's rail network. In the course of its long history, Credit Suisse had grown to become the second-largest bank in Switzerland and an important player in the global wealth management industry. The bank had not experienced revenue growth in the last ten years of its existence. Credit Suisse reported a gross loss of 1.3 billion Swiss Francs in the fourth quarter of 2022, almost four times the losses from the same period in the year before (Credit Suisse Group AG, 2023). The bank had also lost billions of dollars as a result of various scandals, which severely damaged its reputation.

Credit Suisse ignored some painful lessons about bank risk management from past banking crises. One month after the bankruptcy of Lehman Brothers during the financial crisis of 2008, the Swiss government had to step in to save UBS from a collapse. UBS already was a large bank at the time and was highly active in U.S. investment banking with a sizeable amount of illiquid assets. The government established a stabilization fund that allowed UBS to transfer these risky assets and additionally provided a substantial loan. They did this to stabilize the bank and scale down its high-risk operations in the U.S. Instead of seeing this as a warning, Credit Suisse saw this situation as an example and continued its investment banking activities in the U.S. years later, confident of potential government support in a crisis. Despite various warning signs and ongoing capital strain because of significant depositor withdrawals (138 billion Swiss francs in the final quarter of 2022 against a total balance sheet of 531 billion Swiss francs), Credit Suisse's management maintained a facade of stability. They probably expected that state intervention would prevent them from collapsing (Rossi, 2023).

Credit Suisse already had a very low share price after the collapse of the Silicon Valley Bank. In the week before Credit Suisse got taken over, the Swiss Central Bank tried giving them a massive 50 billion Swiss liquidity backstop to stabilize the bank. But at this point, the crisis of confidence in Credit Suisse only worsened (Al Jazeera, 2023). The situation was exacerbated even more when the chair of the Saudi National Bank, Credit Suisse's largest investor, denied further support when asked any questions about additional investments. The statement from the Saudi National Bank came at a time when global markets were already in a state of increased anxiety, after U.S. regulators took over SVB after an abrupt withdrawal of $42 billion in deposits within one day. Credit Suisse was experiencing a similar scenario with daily outflows exceeding 10 billion Swiss Francs of its clients. A few months before, in October 2022, the bank had already lost 111 billion dollars caused by a social media rumor, that suggested that the bank was close to bankruptcy.

For years, there had been thoughts about merging the two biggest banks of Switzerland. Even before some of Credit Suisse's scandals and problems, there had been rumors about a potential merger between UBS and Credit Suisse. The merger was previously discussed, and Tidjane Thiam, the CEO of Credit Suisse from 2015 to 2020, described it as "the only merger in European banking that makes sense" (Morris et al., 2023). This would be the biggest merger among banks since the financial crisis of 2008. The Swiss Trinity, which consists of the Swiss Federal Council (FC), Swiss National Bank (SNB), and Swiss Financial Supervisory Authority (FINMA), arranged a joint intervention on March 19, 2023. They decided to step in together and forced a rescue merger between the struggling Credit Suisse and UBS. Under pressure to complete the merger as quickly as possible, the Swiss Trinity began to increase pressure on both sides of the takeover. Despite some initial reluctance at the beginning from UBS's side, the bank eventually agreed on a takeover deal. They agreed to buy Credit Suisse for 3 billion Swiss francs (around $3.25 billion) in UBS stock, an insignificant amount compared to what Credit Suisse had been worth. To ease the burden, UBS received considerable government assistance, including a liquidity line of 100 billion Swiss Francs from the Swiss National Bank to support the integration. Additionally, the government provided a guarantee to cover losses up to 9 billion Swiss Francs, with the condition that UBS would absorb the first 5 billion Swiss Francs of any losses themselves.

Despite this measure, tranquility was not fully reestablished in the financial markets. On the first trading day after the announcement all eyes were still on the banking industry on Monday, March as their stock values had dropped dramatically in reaction to SVB's collapse the previous week. In the U.S., Credit Suisse's acquirer UBS, increased by 3.3%, while shares of Credit Suisse dropped by 53% on Monday 20 March 2023. On this day, the prices of the major American banks were mostly stable, however Morgan Stanley showed a 1.2% increase (CNBC, 2023).

2.3.2 Consequences for the banking industry

As one of the top thirty globally systemically important banks, Credit Suisse's bankruptcy would significantly impact the whole financial system (Financial Stability Board, 2022). Nekhili et al. (2023) examine credit risk transmission across 15 major European banks around the collapse of Credit Suisse in March 2023 through a Tail-Event driven Network (TENET) model on weekly credit default swap data. The collapse of Credit Suisse led to a significant 61% increase in total extreme credit risk spillover which threatened overall financial stability in the European banking system.

Martins (2023) analyzed the impact of the collapses of SVB and Credit Suisse on European banks, revealing widespread negative responses in the stock market. The paper argues that the two collapses were not identical. SVB's collapse was particularly shocking given that the bank collapsed 48 hours after disclosing the sale of assets and was notable for funding nearly half of the U.S. venture-backed tech sector. Credit Suisse's problems were likely triggered by long-term mismanagement and scandals. The study primarily blamed panic, systemic contagion, and the uncertainty resulting from information asymmetry for the declines in the European stock market. Moreover, the study indicated that the negative consequences of these bank failures varied among institutions. Banks that retained better levels of profitability, operational efficiency, stronger risk management techniques, and higher liquidity were more able to withstand the negative consequences of these bank collapses.

As previously discussed, allowing Credit Suisse to fail was not a viable option in the eyes of the Swiss government. According to Financial Times (2023), authorities were deeply concerned that other European banks, due to their connections with Credit Suisse, would face difficulties as well. Swiss authorities indicated that a potential collapse of Credit Suisse could threaten the global financial system's stability. Consequently, the intervention by the Swiss Trinity was seen as a necessary measure that extended its responsibility beyond the Swiss borders. Following a period of instability within the American banking sector, the Swiss Credit Suisse required a takeover for stabilization. At the insistence of the Swiss authorities, the bank was acquired by its national competitor, UBS. An extremely powerful "monster bank" with considerable influence in Swiss as well as throughout the world has been established by the takeover of Credit Suisse by UBS. With a clear governmental guarantee from the Swiss National Bank and the Confederation, the institution may risk significant amounts of money on the wide financial markets (Rossi, 2023).

Research by Goyal & Soni (2023) looks at how UBS's acquisition of Credit Suisse affected India's banking and financial industries, especially how it affected stock prices in various market segments. The study indicates that the merger had a negative impact on India's banking industry. Particularly affected were public sector banks, which suffered from unfavorable opinions linked to inefficiency and ongoing financial difficulties. However, private sector banks, on the other hand, showed resilience by only experiencing negative cumulative average abnormal returns for a few days and then quickly generating positive average abnormal returns.

The transfer of market disruptions from one country or financial institution to another raises attention to the possibility of systemic risk and the mutual dependence of financial institutions (Forbes & Rigobon, 2002). Because of Credit Suisse's numerous relationships with other European banks, its downfall presented a big systemic danger. The Swiss government's decision to encourage UBS's acquisition of Credit Suisse was a stabilization measure designed to prevent market panic and restore investor confidence in the European banking system. This aligns with the concept suggesting that such measures might improve market perceptions (Bernanke, 1983). Investors develop future expectations based on all available information and change their portfolios accordingly (Lucas, 1972). The confirmation of the takeover most certainly caused investors to alter their expectations positively, anticipating lower systemic risk and greater stability in the European banking industry. Therefore, the first hypothesis is formed:

H1: The announcement of UBS's acquisition of Credit Suisse resulted in a positive market reaction within both the European and US banking sectors, as evidenced by significant increases in cumulative abnormal returns.

It is also intriguing to examine whether specific bank characteristics influence the extent to which banks experience abnormal stock returns following the announcements regarding the acquisition of Credit Suisse. Market capitalization is a good indicator of a bank's financial stability as it offers valuable insights into a bank's market value and its capacity to withstand financial shocks (Berger & Bouwman, 2013)

Because they typically have more extensive assets and more diversified operations, larger banks often show greater resilience to shocks in the market. In their three-factor model, Fama and French (1992) emphasized the impact of size, finding that smaller businesses typically have larger average returns, suggesting distinct responses to market shocks. Larger banks, however, frequently benefit from economies of scale and greater market power, which may ease the impact of bad news (Fama & French, 1993). Since bigger banks are considered "too big to fail," there is generally a perception that their risks of failure are lower. The chance of total bankruptcy decreases, according to Mishkin (2006), because larger financial organizations often have an implicit assurance of government support. When there are fluctuations in the markets, investors may expect government intervention to prevent a systemic collapse, which can lead to more steady abnormal returns. Based on empirical research, the way the market reacts to bank takeovers and collapses varies depending on the size of the institutions involved. According to Cornett et al. (2006), mergers between larger banks typically lead to more positive abnormal long-term stock returns, than mergers between smaller banks. This is probably because the market is more confident in the stability of larger banks and the probability of regulatory assistance. Larger banks often have more consistent abnormal returns after shocks in the market due to more diverse activities, increased market confidence, and implicit government guarantees. However, the findings by Johnson & Mamun (2012) suggest an alternative relationship between abnormal returns and the size of a financial institution. As detailed in section 2.2.1, the authors found that larger financial institutions were more severely impacted by the collapse from Lehman's collapse. This underscores the substantial systemic risks posed by the failure of a large, interconnected entity. Nevertheless, based on most evident theories, the following hypothesis is formulated:

H2: Larger banks experience more stable and less abnormal returns following the collapse and subsequent takeover of Credit Suisse by UBS.

Mergers and acquisitions are important transactions that may change the financial landscape and affect the long-term stock performance of both the companies directly involved and other competitors in the market. According to Jensen and Ruback (1983), mergers and acquisitions add value through synergies, improved efficiency, and market competition. The long-term consequences of such occurrences are frequently reflected in extended abnormal returns as markets must adapt to the new competitive dynamics. The long-term effects of such events often manifest as sustained abnormal returns, reflecting the market's adjustment to changed competitive dynamics. Building on this, Fama (1991) refines the efficient market hypothesis, suggesting that while stock prices generally assimilate all pertinent information very quickly, the ramifications of a major merger like that of Credit Suisse and UBS might require more time for full assimilation by the markets. This extended integration period can result in prolonged periods of abnormal returns as markets digest new information and realize potential synergies.

H3: The acquisition of Credit Suisse by UBS has a significant long-term impact on the abnormal stock returns of European and U.S. banks.

CHAPTER 3 Data

This section provides an overview of the used data and the descriptive statistics. To ensure a robust comparison, a distinction is made between the European and U.S. banking industries. For the cross-sectional analyses, the used control variables are explained and described.

3.1 Data collection

3.1.1 Banking stock data

To examine the impact of Credit Suisse's collapse and UBS's subsequent takeover on the banking sectors in Europe and the U.S., this study uses an event study methodology. All data is retrieved from Eikon Refinitiv. For the European sector, the study examines data from 38 notable banks across Europe. Rather than only including the largest banks, a varied group was chosen based on different market capitalizations to provide a comprehensive analysis of the second hypothesis, which investigates whether larger banks experienced less pronounced abnormal returns following the Credit Suisse acquisition. The selection criteria emphasized banks with complete data availability, particularly for the control variables required in the cross-sectional analyses. Banks from most Eastern European countries were excluded because of insufficient recent data. The European sample predominantly includes banks from Italy and the UK. In the American sector, 30 substantial banks were selected also with varying market capitalizations to assess the impact of bank size on the results. Notably, while most major banks are headquartered in the state of New York, the sample includes banks from 17 different states, ensuring a broad geographical representation.

Table 3.1 European Banks sample by country

Country	Banks per country
Austria	2
Belgium	1
Denmark	1
Finland	2
France	3
Germany	2
Italy	6
Ireland	2
Norway	1
Netherlands	3
Spain	4
Sweden	2
Switzerland	3
Turkey	1
United Kingdom	5

Table 3.2 U.S. Banks sample by state

State	Banks per state
Alabama	1
California	2
Connecticut	2
Illinois	1
Massachusetts	1
Michigan	1
Minnesota	2
New York	7
New Jersey	1
North Carolina	2
Ohio	3
Pennsylvania	1
Puerto Rico	1
Rhode Island	1
Texas	1
Tennessee	1
Virginia	1
Washington	1

Tables 1 and 2 provide information regarding the distribution of the banks included in the study from both the European and U.S. banking industries. Appendix A includes a more comprehensive table with information regarding the distribution of banks per country including the names of the banks. Stock return data for both European and U.S. banks are obtained from Eikon Refinitiv. This data covers the period from 140 trading days before the announcement event day, to March 29th, 2023 (7 trading days after the announcement event day). To assess the performance of banking equities in Europe and the U.S. with the market model, the STOXX Europe 600 index and the S&P 500 index were used as benchmarks, respectively. For added reliability, a robustness check using the MSCI World Index is performed.

Figures 3.1 - 3.3 show the performance of the STOXX Europe 600, S&P 500, and MSCI World indices around the official announcement of UBS's acquisition of Credit Suisse, with the event date highlighted by the red line at t=0 on the x-axis. Starting 8 days before the event date, the STOXX600 index decreased substantially. A slight peak was detected on March 14th, 2023 (day t-4). Following news of Credit Suisse's collapse, the STOXX600 index fluctuated, with noteworthy peaks and dips beginning at t-4, the day that the news of Credit Suisse's possible collapse came out. Following the formal announcement of the acquisition at t=0, the STOXX600 index showed a pattern of volatility, but with a general upward trend from t4, indicating a stabilization or favorable market reaction to the takeover.

Figure 3.2 shows that the S&P500 index experienced comparable movements around the time of the announcement of UBS's acquisition of Credit Suisse. The figure shows a significant decrease around t-8, which might be related to market speculations about the SVB collapse. On March 14th, 2023 (t-4) and March 16th (t-2), the index shows some minor increases. After the announcement day (t=0), the S&P500 index began to increase on March 22nd, 2023 (t+2), indicating that the market began to stabilize or respond positively to the news of the merger.

The MSCI index showed a similar pattern, with a substantial decline starting around t-8, likely due to broader issues in the banking sector, including the collapse of SVB. After the acquisition announcement at t=0, the MSCI index began to recover from day t+2 and onwards, similar to the S&P500 index. This suggests that the general financial market was stabilizing.

A comparative analysis of Figures 3.1, 3.2, and 3.3 shows notable similarities between the patterns in Figures 3.2 and 3.3. The S&P500 and MSCI World Index follow a similar pattern, especially in the period after the event date. Overall, all three indices share a similar pattern. The indices initially declined due to the banking crises but then slowly recovered after the announcement, highlighting how the markets adjusted and adapted to the significant events in the banking sector.

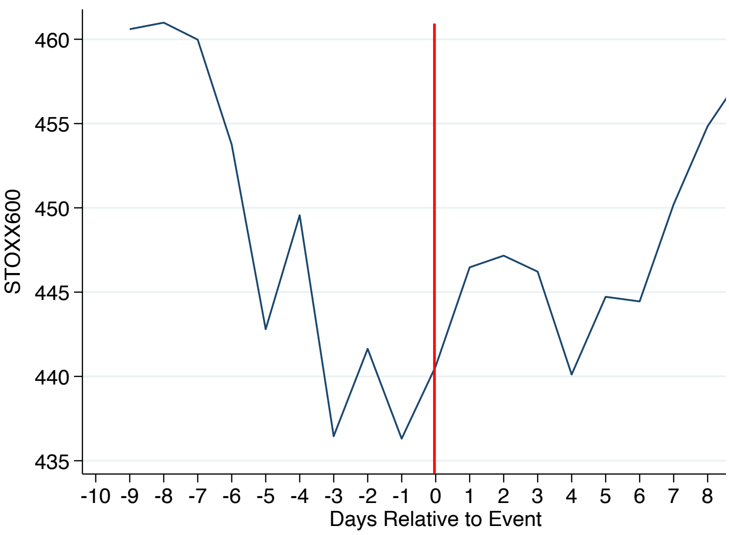

Figure 3.1. Fluctuations in the STOXX600 index surrounding the announcement of Credit Suisse's takeover by UBS.

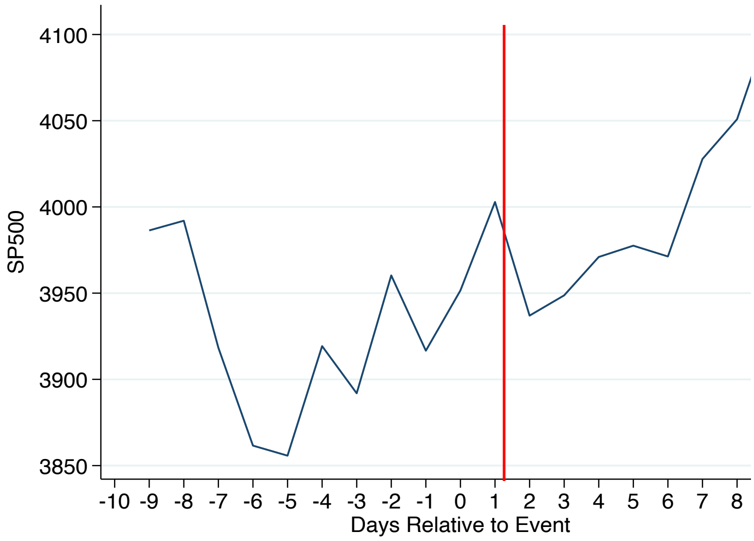

Figure 3.2. Fluctuations in the S&P500 index surrounding the announcement of Credit Suisse's takeover by UBS.

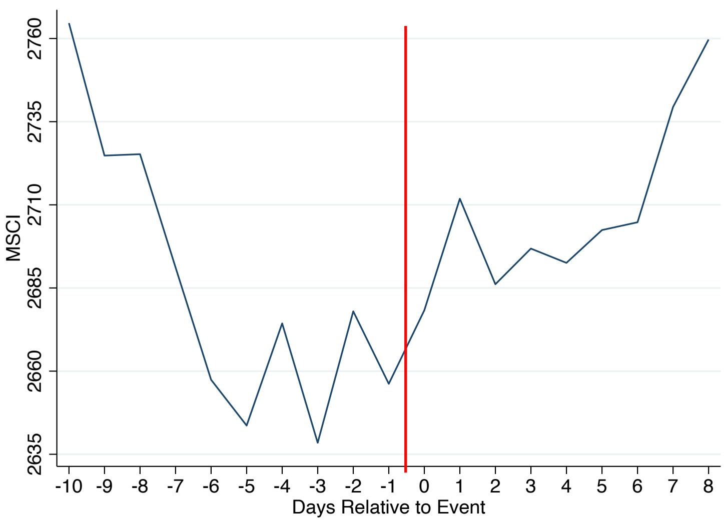

Figure 3.3. Fluctuations in the MSCI index surrounding the announcement of Credit Suisse's takeover by UBS.

Figure 3.4. Distribution of European banks in the sample

Note. The red dots represent banks located in Swiss or one of its neighboring countries. The black dots represent banks in other countries.

3.1.2 Control variables

For the cross-sectional analyses to examine the second hypothesis, control variables are used. A selection of the most relevant variables from Martins (2023) and Goyal and Soni (2023) are included in the regression of this study. In the study by Martins (2023) on the effects of the SVB and Credit Suisse collapses on the European banking market, he does not account for the geographical distance between the fallen or acquired bank and the bank on which the spread effect is being studied. In support of including a variable measuring geographical distance, Aharony and Swari (2024) found in their study on the information-based contagion effects of bank failures that the distance between the headquarters of solvent banks and those of failed banks plays a role in the extent of the contagion effects. They found that distance is negatively related to the magnitude of the contagion effect. Therefore, the cross-sectional regression analysis thus incorporates a proximity variable, represented by a dummy variable assigned a value of 1 for banks located in Swiss or countries neighboring Swiss. For the sample of European banks, this includes Italy, Austria, Germany, France, and Swiss itself.

Table 3.3 Variables with description

Variable	Symbol		Source
Size of bank	**SIZE**	Market capitalization in USD (natural logarithm)	Eikon Refinitiv
Liquidity Risk	**LIQ**	Liquid assets-to- Short-term Liabilities Ratio expressed as a percentage	Eikon Refinitiv
Equity Ratio	**EA**	Equity-to-Total Assets Ratio expressed as a percentage	Eikon Refinitiv
Net Interest Margin	**NIM**	Calculated as the ratio of net interest income to total assets	Eikon Refinitiv
Loan Ratio	**LA**	Loans-to-Total Assets Ratio expressed as a percentage	Eikon Refinitiv
Return on assets	**ROA**	Net income to total assets expressed as a percentage	Eikon Refinitiv
Proximity	**PRX**	Indicates whether a bank is located in Swiss or one of its neighboring countries.	Own input

The cross-sectional regressions aim to identify the primary drivers behind the observed changes in the cumulative abnormal returns. The regressions will use the cumulative abnormal stock returns of European and U.S. banks as the dependent variable, including the following variables:

Market capitalization (SIZE), which serves as an indicator of the size of a bank, is an essential control variable when determining cumulative abnormal returns (Boubaker et al., 2015). Larger banks usually have more resources available, in general have more influence in the market, and are more stable in comparison to smaller banks (Gržeta et al., 2023). These elements affect their stock performance and shape investor and market perceptions. Additionally, larger banks often maintain more diversified portfolios, which can mitigate risk and result in distinct CAR dynamics compared to smaller banks. Consequently, the size of a bank plays a crucial role in determining its response to market events and economic fluctuations, thereby influencing abnormal returns. The logarithm of market capitalization will be used in the regression to avoid bias resulting from the size of the analyzed banks and to address issues of data skewness and heteroscedasticity (Manning and Mullahy, 2001). This is also in line with the method of Boubaker et al. (2015), who use the natural logarithm of the market capitalization as a proxy for the size of a firm.

The liquidity coverage ratio (LIQ) is included in the regressions as well. Myers (1977) argues that higher liquidity levels can lower a firm's risk of financial distress, as a higher liquidity ratio typically gives an indication of a company's ability to meet short-term obligations. This usually has a positive impact on stock performance and can enhance investor confidence. Similarly, Bates et al. (2009) suggest that liquidity acts as a safeguard against adverse conditions. During crises, banks with higher liquidity are often perceived as more secure, which can affect their abnormal returns.

The equity-to-assets ratio (EA) serves as a proxy for the capitalization of banks. This ratio reflects the proportion of a bank's assets funded by equity and thus reflects its capital adequacy. A higher EA ratio indicates a larger capital buffer, enhancing the bank's ability to absorb losses and reduce risk. According to Shamki et al. (2016), a high level of capital makes banks comparatively safer during liquidation and less dependent on external financing. This can subsequently enhance profitability.

A bank's net interest margin (NIM) reflects the profitability from lending operations, which is an important indicator of a bank's financial stability and appeal to investors. Changes in interest rates can lead to differing responses among banks with various levels of net interest margins, affecting their abnormal returns. A higher net interest margin often indicates more efficient profit generation from assets, positively impacting stock performance. Taking this into account in the regression analyses helps to control for bank profitability, ensuring that fluctuations in CARs are not due to variations in interest margin efficiency.

The loans to assets ratio (LA) is used as a proxy of credit risk. This ratio indicates the percentage of a bank's assets that are allocated to loans, highlighting its exposure to credit risk. Muradoğlu and Sivaprasad (2018) suggest that a higher LA ratio may reflect a bank's emphasis on interest-generating assets, potentially enhancing profitability. However, investors might view banks with elevated LA ratios as riskier due to their increased exposure to credit risk, which can influence their stock performance and abnormal returns.

The return on assets (ROA) is incorporated as a proxy for the financial performance of banks, as it is anticipated to influence event-induced abnormal returns, thereby serving as an indicator of financial performance (Frankel and Lee, 1998). Given that abnormal returns typically signal the market's response to unforeseen news or events, a superior ROA suggests that a company is more flexible and better prepared to react favorably to these events. Furthermore, ROA is a good variable for assessing financial performance among banks, irrespective of their size or sector. Goyal and Soni (2023) additionally incorporate ROA in their cross-sectional regressions to examine the elements that cause abnormal returns.

Table 3.4 Descriptive Statistics European Banks

Variable	Obs	Mean	Min	Max	SD
SIZE	38	$21,445 mln	$1,150 mln	$63,400 mln	$19,150 mln
LIQ	38	16.8%	12.7%	29.1%	18.10%
EA	38	6.22%	3.81	9.4%	3,41%
NIM	38	1.59%	0.69%	2.43%	1.3%
LA	38	55.5%	42.5%	73.4%	18.9%
ROA	38	0.71%	0.16%	1.13%	0.27%

Table 3.5 Descriptive Statistics U.S. Banks

Variable	Obs	Mean	Min	Max	SD
SIZE	30	$82,895 mln	$4,360 mln	$560,214 mln	$120,983 mln
LIQ	30	23.7%	14.8%	42.3%	17.4%
EA	30	11.9%	4.98%	12.7%	6.45%
NIM	30	3.49%	1.24%	12.11%	2.23%
LA	30	61.4%	44.8%	68.9%	15.9%
ROA	30	1.33%	0.70%	3.00%	0.53%

When comparing the descriptive statistics of European and U.S. banks, distinct differences emerge. It is evident that U.S. banks generally have larger average market capitalizations. This discrepancy is reasonable given that the selection criteria for European banks emphasized data availability and geographic diversity across various European countries, whereas the U.S. sample comprised the 30 largest banks. Furthermore, U.S. banks exhibit a significantly higher net interest margin than European banks. Additionally, U.S. banks also have higher liquidity (23.7% vs. 16.8%) and equity-to-assets ratio (11.9% vs. 6.22%). Additionally, both the loans to assets ratio and return on assets are higher for U.S. banks, indicating greater profitability and efficiency.

CHAPTER 4 Method

4.1 Event study

The first part of this study follows an event study approach, a common and frequently used technique in finance to evaluate how specific events affect stock prices. An event study measures the impact of an event on a company's value using financial market data (MacKinlay, 1997). This methodology is based on the (already previously mentioned) efficient market hypothesis by Fama (1970), which states that information is immediately incorporated into stock prices. Therefore, this hypothesis suggests that any changes in a company's stock price around the time of an acquisition announcement reflect the market's perception of the benefits or drawbacks of the announcement. In this study, the event of interest is the announcement of the acquisition of Credit Suisse by UBS. According to Fama et al. (1970), the first three steps in employing an event study methodology include: (i) identifying the event, (ii) defining the event window and (iii) specifying the estimation window. The event date is set as March 20, 2023, following UBS's confirmation of the acquisition of Credit Suisse on March 19th, 2023. Since March 19 fell on a Sunday, the event date is shifted to the next trading day, which was March 20, 2023. This is in line with Hassan et al. (2022) who state that if the actual event date falls on a trading holiday or weekend, the event date should be moved to the next trading day. Choosing an appropriate event window is crucial in an event study, as it helps to isolate the impact of the event from other market speculation or unrelated news. In this study, using different event windows is particularly important since two significant announcements occurred within the same week. On March 15, 2023, the failure of Credit Suisse was announced, as analyzed by Martins (2023). A few days later, on March 19, 2023, it was officially announced that UBS would acquire Credit Suisse. Therefore, to capture the market's reaction accurately and ensure robust results, this study employs three different estimation windows.

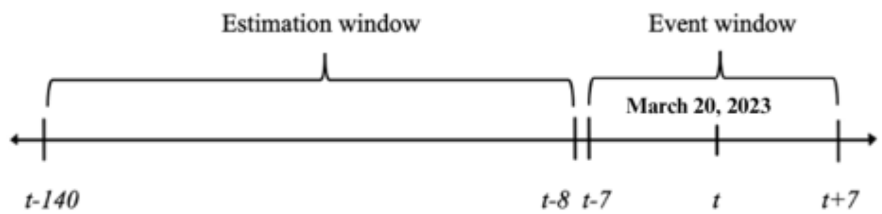

Figure 4.1 Event study timeline

The first and broadest event window spans 15 trading days [-7,7] as used by Goyal & Soni (2023) and Pandey et al. (2015). This window is important for capturing the full range of market reactions, including pre-announcement rumors and post-announcement reconsiderations. Given the substantial nature of the takeover, which is the largest bank merger since the 2008 financial crisis, market participants were probably speculating about the merger for a longer time already. The second event window covers 3 trading days, spanning from the day before to the day after the event, following the methodology by

Martins (2023). This window captures the immediate market reaction surrounding the event date. This window effectively isolates the direct impact of the announcement by limiting the influence of other market factors. The third event window covers a broader time frame [-3,3], which helps to capture market reactions that may include information leaks before the event and the market's interpretation afterward. This window is beneficial for capturing not only the immediate impact but also any potential anticipation or delayed response from the market, which often occurs with big events like a takeover. Using multiple event windows also serves as a robustness check. Including multiple event windows in an event study also serves as a robustness test. By employing different periods, this approach verifies the consistency and reliability of the results, ensuring that the observed effects persist across various periods around the event. In the second and third event windows, the days with the initial announcement of the collapse of Credit Suisse are excluded.

The duration of an estimation window in an event study can vary. The purpose of the estimation window is to estimate the normal relationship between the individual stock returns and the market returns, which allows for the calculation of abnormal returns during the event window. Typically, the estimation window spans between 100 and 250 trading days before the event. This period is advised to obtain a reliable estimation of the normal performance model parameters like the market model to ensure that these estimates are not affected by the event itself. MacKinlay (1997) advises that a standard estimation window should extend over 120 to 250 trading days before the event, while Brown and Warner (1985) recommend using an estimation window between 100 to 250 days to prevent event-related contamination. To comply with both recommendations, this study uses an estimation window ranging from [-140, -8] days relative to the event date, which is in line with the methodology used by Martins (2023).

Several variations of event studies can be employed to analyze the impact of an event on a firm's value. The market model assumes that a stock's return is related to the performance of a broader market index. A stock's expected return is based on its correlation with market movements. The expected return is calculated using the regression in equation (1).

$$R_{it} = \alpha_i + \beta_i * R_{mt} + \varepsilon_{it} \quad (1)$$

R_{it} represents the return on stock i at time t, α_i represents the intercept of the regression equation for stock i. β_i represents the regression slope for stock i, indicating the stock's sensitivity to the market. R_{mt} represents the return of the market index at time t (for European and U.S. banks, the STOXX Europe 600 index and S&P 500 are used respectively) and ε_{it} is the residual term which represents the portion of the stock's return that is not explained by market movements. While there are various methods available for conducting event studies, such as the constant mean return model or the market-adjusted model, the market model was chosen because of its efficiency and flexibility.

To ensure the robustness of the results using the Europe STOXX600 and S&P500 indices, an additional check is performed using the MSCI World Index. Including the same index as the market index for both the European and US Banking industries allows comparing the results obtained using the STOXX Europe 600 and S&P 500 indices. The MSCI World Index is used to calculate the average abnormal returns (AARs) and cumulative average abnormal returns (CAARs) of both markets following the same event study methodology. By using the MSCI World Index alongside the regional indices, this robustness check aims to verify whether market reactions remain consistent when considering a global market index.

The estimation window is used to estimate parameters α_i and β_i. After estimating the parameters using the estimation window, the abnormal return (AR) for stock *i* on day *t* can be computed, which represents the difference between the actual return of the stock and the expected return based on the market model. According to the event study methodology established by Brown and Warner (1985), abnormal returns are determined using equation 2.

$$AR_{it} = R_{it} - (\alpha_i + \beta_i * R_{mt}) \tag{2}$$

The average abnormal returns (AARs) of all banks are calculated using the following formula, where N represents the total number of companies:

$$AAR = \frac{1}{N} \sum_{i=1}^{N} AR_{it} \tag{3}$$

To assess the overall effect of the collapse and takeover of Credit Suisse across the event window, for every stock *i* CARs are calculated. The CARs are obtained by summing the abnormal returns for all the days within the event window as in formula 4, where (t_1, t_2) shows the event window.

$$CAR_{i,(t_1,t_2)} = \sum_{t=t_1}^{t_2} AR_t \tag{4}$$

The conventional event study methodology has been further developed by Fernandez-Perez et al. (2021) by including measurements of abnormal stock market return volatility (AVOLA) in addition to only considering stock market reactions in terms of cumulative abnormal stock returns (CAR). In their paper, the CAR is calculated for a country's stock market by aggregating the abnormal returns across a given event window and the AVOLA is derived from the standard deviation of these abnormal stock market returns within the same event window. This study investigates the AVOLA for both U.S. and European banks, motivated by the findings of Fernandez-Perez et al. (2021), which show that higher volatility is typically associated with larger stock market declines. To expand on the analysis, this study additionally looks at abnormal stock market return volatility (AVOLA), which is the standard deviation of the cumulative abnormal returns over the selected event windows as shown in equation 5. Calculated for each of the three event windows, the AVOLA offers information on the variability of returns, which may reflect risk factors related to the event or market uncertainty.

$$AVOLA_{i,(t_1,t_2)} = sd(CAR_{i,(t_1,t_2)}) \tag{5}$$

Finally, to calculate the cumulative average abnormal returns (CAARs), equation 6 is employed.

$$CAAR = \sum_{t=t_1}^{t_2} AAR_t \tag{6}$$

The statistical t-test from equation 7 is used to assess if the cumulative average abnormal returns (CAAR) deviate significantly from zero. The null hypothesis, according to which the CAAR is 0, is evaluated with this test.

$$t_{CAAR} = \frac{CAAR(t_{1,t_2})}{\sqrt{var(CAAR(t_{1,t_2}))}} \tag{7}$$

4.2 Cross-sectional analyses

To examine the second hypothesis, whether the size of a bank is associated with negative abnormal returns, OLS regressions including various control variables are used. To assess the influence of bank-specific characteristics on the variability of abnormal returns across different banks, Equation 8 is estimated using Ordinary Least Squares (OLS) for European banks.

$$CAR_{iw} = \beta_0 + \beta_1 \ln(SIZE_{iw}) + \beta_2 LIQ_{iw} + \beta_4 EA_{iw} + \beta_3 NIM_{iw} + \beta_5 LA_{iw} + \beta_6 ROA_{iw} + \beta_7 NBR_{iw} + \varepsilon_{iw} \tag{8}$$

For U.S. banks, Equation 9 is estimated with a slightly modified approach that excludes the "Neighbor" variable, as the sample of U.S. banks does not include any banks neighboring Switzerland.

$$CAR_{iw} = \beta_0 + \beta_1 \ln(SIZE_{iw}) + \beta_2 LIQ_{iw} + \beta_4 EA_{iw} + \beta_3 NIM_{iw} + \beta_5 LA_{iw} + \beta_6 ROA_{iw} + \varepsilon_{iw} \tag{9}$$

4.3 Buy-and-Hold Abnormal returns

While an event study offers many advantages, one drawback is its focus on the short-term economic impact of specific incidents. Event studies are designed for short-term analysis around the event window (Miller, 2023). The primary concerns are biases in test statistics used to detect abnormal returns over long periods. To assess whether the acquisition of Credit Suisse by UBS has had a long-term impact, the analysis needs to be extended beyond the event window. To test the third hypothesis, a different model is required. Barber and Lyon (1997) mention three different biases that can occur: new listing bias, rebalancing bias, and skewness bias. They identify that the buy-and-hold abnormal returns approach yields well-specified test statistics.

To evaluate the potential long-term effects of UBS's acquisition of Credit Suisse, a different model is required. To determine if the collapse of Credit Suisse is linked to abnormal returns in the European and U.S. banking industries over the long term and to examine if the short-term effect continues over a longer period, the buy-and-hold abnormal return (BHAR) approach is utilized. The buy-and-hold abnormal returns are calculated following equation 10. In this analysis, the buy-and-hold abnormal returns (BHAR) are calculated to extend the understanding of the long-term impacts of the UBS acquisition of Credit Suisse on the stock performance.

$$BHAR_{it} = \prod_{t=1}^{T}[1 + R_{it}] - \prod_{t=1}^{T}[1 + E(R_{it})] \tag{10}$$

The expected returns $E(R_{it})$ are determined using historical averages. The Buy-and-Hold Abnormal Returns (BHAR) analysis assumes that the expected returns equal the historical average returns over the event window. The analysis starts on the day of the announcement for the empirical analysis of 12 months.

The first part of the equation $\prod_{t=1}^{t}[1 + R_{it}]$ represents the cumulative return from stock *i* over period *T*. The second part of the equation $\prod_{t=1}^{T}[1 + E(R_{it})]$, which is subtracted, represents the cumulative expected return from stock *i* over period *T*. The corresponding parametric test statistic as proposed by Barber & Lyon (1997) is computed as follows:

$$t_{BHAR} = \frac{\overline{BHAR_{it}}}{\sigma(BHAR_{it})\sqrt{n}} \tag{11}$$

CHAPTER 5 Results

This section presents the results relevant to the first, second, and third hypotheses, aiming to answer the full research question. Each subsection details the findings for each specific hypothesis.

5.1 Event study results

In the first subsection, the event study results are obtained using the market model with regional indices: the STOXX600 for the European banking industry and the S&P500 for the U.S. banking industry. Tables 5.1, 5.2, and 5.3 have a similar structure for different event windows. The first four columns measure the AARs and CAARs and the corresponding t-CAARs for European banks using the regional index STOXX600 as the market index. Columns 5 through 8 measure the AARs and CAARs and the corresponding t-CAARs for U.S. banks using the S&P500 as the market index. In the last two columns, a two-sample t-test is used to determine whether the European and U.S. abnormal and cumulative abnormal returns are statistically significantly different from each other. The second subsection provides the results of the robustness check conducted using the MSCI World Index.

5.1.1 Event study results using regional indices

This subsection presents the findings from the event study analysis, which investigates the stock return behavior of European and U.S. banks around the announcement of the takeover of Credit Suisse by UBS. Table 5.1 provides an overview of the daily AARs, CAARs, and the t-statistics for the CAARs in the [-7:+7] event window for both European (N=38) and U.S. banks (N=30). Based on this event window [-7:+7], the results for both the European and U.S. banking industries reveal distinct market reactions. For European banks, the average abnormal returns were positive in the days leading up to the event, peaking at 0.0461 on t-7. On day t-3 (March 15th, 2023), which was the day of the announcement of Credit Suisse's failure, a smaller but still positive AAR is observed. In the days t-2 to t-1, slightly negative AARs are observed, which could suggest initial concerns after the announcement of the collapse. The CAAR decreases significantly, which indicates negative sentiment after the announcement of the failure of Credit Suisse. The observed changes in the AARs in the most recent days leading up to the official announcement of UBS's takeover (t-2 to t) could also be indicative of market behavior influenced by speculations. The reduction in the negativity of AARs on days t-2, t-1 and t could suggest that the market was reacting positively to the rumors of a potential takeover. In the days leading up to the official confirmation, there were widespread rumors in the news about a possible takeover. The CAARs are positive and significant from day t-5 to day t+3, mostly at a 10%-significance level. It could be likely that investors perceived the potential takeover as a stabilizing move for Credit Suisse, which would reduce panic and negativity in the broader European banking sector. On the event day t, the AAR is slightly negative, however the CAAR is still significantly positive. In the days after the event from t+1 to t+7, European banks show fluctuating AARs, slightly positive returns on day t+1 (0.0056) but in general negative returns. Consequently, the CAARs steadily declined and turned negative on day t+7.

The CAARs remained significant until t+4. This trend could potentially suggest that initially there was optimism in the market surrounding the takeover announcement, but eventually because of concerns about integration challenges or broader market impacts the positive sentiment gradually decreased.

In the U.S. banking industry, the days before the event day were characterized by consistent negative AARs, which were decreasing as the failure announcement of Credit Suisse was approaching (-0.2192 on day t-3). Subsequently, the CAAR followed a similar pattern, becoming increasingly negative. Unlike the European banks, there is no significant reduction in abnormal returns in the days before the announcement of the takeover, which does not give an indication of rumors about a takeover spreading in the U.S. Banking market. On the event day (t=0), U.S. banks still faced an AAR of -0.2421 and a CAAR of -1.5176. This could suggest that the official takeover announcement did little to relieve market concerns, maintaining a negative reaction in the U.S. banking industry. However, the CAAR on the event day is insignificant. The CAAR becomes significant one day after the announcement of the takeover by UBS (t+1) at a 10%-level with a value of -1.7127*. The negative t-statistics indicate persistent negative reactions. Maybe, this is caused by ongoing concerns about the implications of the takeover, due to fears of instability in the financial markets or concerns about competitive dynamics.

Table 5.2 shows the daily AARs, CAARs and the t-statistics for the CAARs in the [-1:+1] event window for both European (N=38) and U.S. banks (N=30). The provided results focus on a narrower window, specifically analyzing the stock performance of European and U.S. banks surrounding the official announcement of UBS's takeover of Credit Suisse on the event date. For the event window [-1:+1], the European and U.S. banks show different AARs and CAARs than in the [-7:+7] event window. For the European banking industry, on the day before the event (t-1), both the average abnormal return (AAR) and corresponding CAAR were -0.0031, the CAAR was not significant. On the event day (t), the AAR was -0.0081, resulting in a CAAR of -0.0112***, which is statistically significant at a 1% significance level. This is different compared to the CAAR on the event day in the [-7:+7] event window, which showed a positive and significant CAAR (0.1244**). This could mean that the announcement of the transaction was received negatively by the European banks, perhaps as a result of competitive concerns or the possibility of a problematic merger. The day after the event (t+1), the AAR turned positive at 0.0056, reducing the CAAR to -0.0056, nevertheless, this was not statistically significant.

For U.S. banks, on the day before the event (t-1), the AAR and CAAR were -0.2564 and the CAAR was insignificant. On the event day (t), the AAR was -0.2421, bringing the CAAR to -0.4985***, which is significant at the 1% level. On the day after the event (t+1), the AAR remained negative at -0.1952, further decreasing the CAAR to -0.6937***, also significant at the 1% level.

Table 5.1 Average Abnormal Returns (AARs), Cumulative Average Abnormal Returns (CAARs), and the t-statistics for the CAARs.

European Banks [-7:+7]				U.S. Banks [-7:+7]				Δ EU – U.S.	
Days	**AAR**	**CAAR**	**t-CAAR**	**Days**	**AAR**	**CAAR**	**t-CAAR**	**Δ AAR**	**Δ CAAR**
t-7	0,0461	0,0461	0,8186	t-7	-0,0762	-0,0762	-0,0746	0,1224***	0,1224***
t-6	0,0379	0,0840	1,4903	t-6	-0,0949	-0,1712	-0,1675	0,1328***	0,2552***
t-5	0,0260	0,1099*	1,9510	t-5	-0,2108	-0,3820	-0,3738	0,2368***	0,4919***
t-4	0,0211	0,1311**	2,3260	t-4	-0,2027	-0,5846	-0,5721	0,2238***	0,7157***
t-3	0,0087	0,1398**	2,4811	t-3	-0,2192	-0,8038	-0,7866	0,2279***	0,9437***
t-2	-0,0043	0,1356**	2,4055	t-2	-0,2152	-1,0190	-0,9972	0,2109***	1,1546***
t-1	-0,0031	0,1325**	2,3513	t-1	-0,2564	-1,2755	-1,2481	0,2534***	1,4080***
t	-0,0081	0,1244**	2,2077	t	-0,2421	-1,5176	-1,4850	0,2340***	1,6420***
t+1	0,0056	0,1299**	2,3065	t+1	-0,1952	-1,7127*	-1,6760	0,2007***	1,8427***
t+2	-0,0048	0,1252**	2,2210	t+2	-0,2317	-1,9444**	-1,9027	0,2269***	2,0696***
t+3	-0,0227	0,1025*	1,8180	t+3	-0,2638	-2,2082**	-2,1608	0,2410***	2,3106***
t+4	-0,0299	0,0725	1,2871	t+4	-0,2577	-2,4659**	-2,4130	0,2278***	2,5384***
t+5	-0,0400	0,0325	0,5766	t+5	-0,2387	-2,7046***	-2,6466	0,1987***	2,7371***
t+6	-0,0354	-0,0029	-0,0523	t+6	-0,2345	-2,9391***	-0,2876	0,1991***	2,9362***
t+7	-0,0400	-0,0430	-0,7628	t+7	-0,2309	-3,1700***	-3,1020	0,1908***	3,1270***

Notes. These metrics are measured daily within the event window spanning from 7 days before to 7 days after the announcement of the takeover of Credit Suisse by UBS ([-7:+7]). The data is provided for both European and U.S. banks, with the STOXX600 and S&P500 indices used as market indices for European and U.S. banks, respectively. At the 10%, 5%, and 1% significance levels, statistically significant CAAR values are denoted by *, **, and *** respectively. In the last two columns, a two-sample t-test is performed to determine whether the European and U.S. AARs and CAARs are statistically significantly different from each other.

Table 5.2 Average Abnormal Returns (AARs), Cumulative Average Abnormal Returns (CAARs), and the t-statistics for the CAARs.

European Banks [-1:+1]				U.S. Banks [-1:+1]				Δ EU – U.S.	
Days	**AAR**	**CAAR**	**t-CAAR**	**Days**	**AAR**	**CAAR**	**t-CAAR**	**Δ AAR**	**Δ CAAR**
t-1	-0,0031	-0,0031	-0,7396	t-1	-0,2564	-0,2564	-1,1708	0,2534***	0,2534***
t	-0,0081	-0,0112***	-2,6963	t	-0,2421	-0,4985***	-2,2759	0,2340***	0,4874***
t+1	0,0056	-0,0056	-1,3491	t+1	-0,1952	-0,6937***	-3,1669	0,2007***	0,6881***

Notes. These metrics are measured daily within the event window spanning from 1 day before to 1 day after the announcement of the takeover of Credit Suisse by UBS ([-1:+1]). The data is provided for both European and U.S. banks, with the STOXX600 and S&P500 indices used as market indices for European and U.S. banks, respectively. At the 10%, 5%, and 1% significance levels, statistically significant CAAR values are denoted by *, **, and *** respectively. In the last two columns, a two-sample t-test is performed to determine whether the European and U.S. AARs and CAARs are statistically significantly different from each other.

Table 5.3 Average Abnormal Returns (AARs), Cumulative Average Abnormal Returns (CAARs), and the t-statistics for the CAARs.

European Banks [-3:+3]				U.S. Banks [-3:+3]				Δ EU – U.S.	
Days	**AAR**	**CAAR**	**t-CAAR**	**Days**	**AAR**	**CAAR**	**t-CAAR**	**Δ AAR**	**Δ CAAR**
t-3	0,0087	0,0087	0,7180	t-3	-0,2192	-0,2192	-0,4368	0,2279***	0,2279***
t-2	-0,0043	0,0045	0,3684	t-2	-0,2152	-0,4344	-0,8656	0,2109***	0,4389***
t-1	-0,0031	0,0014	0,1172	t-1	-0,2564	-0,6908	-1,3767	0,6923***	0,2340***
t	-0,0081	-0,0067	-0,5472	t	-0,2421	-0,9329*	-1,8591	0,9263***	0,2007***
t+1	0,0056	-0,0011	-0,0898	t+1	-0,1952	-1,1281***	-2,2480	0,2007***	1,1270***
t+2	-0,0048	-0,0059	-0,4855	t+2	-0,2317	-1,3598***	-2,7097	0,2269***	1,3538***
t+3	-0,0227	-0,0286***	-2,3510	t+3	-0,2638	-1,6235***	-3,1669	0,2410***	1,5949***

Notes. These metrics are measured daily within the event window spanning from 3 days before to 3 days after the announcement of the takeover of Credit Suisse by UBS ([-3:+3]). The data is provided for both European and U.S. banks, with the STOXX600 and S&P500 indices used as market indices for European and U.S. banks, respectively. At the 10%, 5%, and 1% significance levels, statistically significant CAAR values are denoted by *, **, and *** respectively. In the last two columns, a two-sample t-test is performed to determine whether the European and U.S. AARs and CAARs are statistically significantly different from each other.

When comparing the market reactions of European and U.S. banks, the U.S. banks generally show larger negative AARs and CAARs in response to the takeover announcement which indicates negative spillover effects in the U.S. To conclude, the results from the [-1,1] event window indicate that both European and U.S. banks experienced negative abnormal returns surrounding the announcement, with U.S. banks showing a more pronounced negative reaction. The statistical significance of the CAARs suggests a strong market response to the event in both regions.

In Table 5.3 daily measurements of the AARs, CAARs and the t-statistics for the CAARs in the [-3,3] event window for European (N=38) and U.S. (N=30) are shown. For the European banks, it can be seen that the AARs and the CAARs start positive on day t-3 but become negative on day t-2. Probably after the markets incorporated the information regarding the announcement of the failure of Credit Suisse on March 14th, 2023. On day t+1, a slightly positive return is observed, which could indicate a relief about the takeover. However, the AARs on day t+2 and t+3 are negative and only the CAAR on day t+3 is significant (-0,0286***)

For the U.S. banks, all AARs and CAARs in the event window of [-3:+3] are negative. This reflects negative reactions concerning the announcement of both the Credit Suisse failure and the takeover. Starting from the event day (t) the CAARs become significant, starting at a 10%-level but eventually on a 1%-level. For the U.S. banking industry, the presented CAARs and AARs show strong negative returns before and on the event day and continuing post-event. Significant concerns about the stability of the financial sector and potential ripple effects from the Credit Suisse failure and subsequent takeover. Overall, the data indicates a more severe negative impact on U.S. banks compared to European banks, reflecting more concerns about systemic risks and market stability in the U.S. banking sector following the Credit Suisse event. The persistent negative returns and statistically significant CAARs highlight the market's concern about the takeover's broader implications.

The final two columns in Tables 5.1, 5.2, and 5.3 show similar and consistent results across all three event windows. From all three event windows, it can be observed that based on the two-sample t-test, the abnormal returns and cumulative abnormal returns of the European and US banks differ significantly.

5.1.2 Event study: robustness checks using the MSCI World Index

The MSCI World Index was used to verify the event study to confirm the validity of the findings. The purpose of this robustness test is to determine if implementing a global market index instead of local indices resulted in comparable reactions for the European and U.S. banking industries. Table 5.4 presents the daily AARs, CAARs, and the t-statistics for the CAARs in the [-7,7] event window for both European and U.S. banks using the MSCI World Index which performs as a robustness check for the results of Table 5.1. When using the local indices (STOXX600 for Europe and S&P500 for U.S.) for the [-7,7] event window, significant CAARs for European banks were observed in several days within the event window, particularly around the event date from 5 days before the announcement until three days after the announcement (t-5 until t+3). While a few positive CAARs were found using the STOXX600 market index, only positive and significant CAARs are observed in Table 5.4 when using the MSCI World Index, which is remarkable. This should be considered when interpreting the results of Table 5.1 for European banks.

For U.S. banks, the AARs and CAARs for the [-7:+7] event window for U.S. Banks are very similar in pattern and size when compared to the results obtained using the S&P500 index in Table 5.1. For example, the most negative AAR for U.S. banks is found on day t+3, which is not entirely surprising as the pattern of the S&P500 index and the MSCI index in Figures 3.2 and 3.3 are also very similar. The robustness check using the MSCI World Index supports the initial findings for the U.S. banks, with significant negative CAARs primarily after the announcement of the takeover. However, for the European banks, the results using the MSCI World Index as a robustness check [-7:+7] are not consistent using the STOXX600 Index, as the AARs and CAARs differ in size and sign.

Table 5.4 Average Abnormal Returns (AARs), Cumulative Average Abnormal Returns (CAARs), and the t-statistics for the CAARs.

European Banks [-7:+7]				**U.S. Banks [-7:+7]**			
Days	**AAR**	**CAAR**	**t-CAAR**	**Days**	**AAR**	**CAAR**	**t-CAAR**
t-7	0,1080	0,1080	1,4262	t-7	-0,0923	-0,0923	-0,0883
t-6	0,1005	0,2084***	2,7532	t-6	-0,1179	-0,2102	-0,2011
t-5	0,0579	0,2664***	3,5185	t-5	-0,2330	-0,4432	-0,4241
t-4	0,0581	0,3244***	4,2857	t-4	-0,2139	-0,6571	-0,6287
t-3	0,0191	0,3435***	4,5378	t-3	-0,2266	-0,8836	-0,8455
t-2	0,0009	0,3426***	4,5258	t-2	-0,2137	-1,0974	-1,0500
t-1	-0,0064	0,3362***	4,4415	t-1	-0,2621	-1,3595	-1,3007
t	-0,0094	0,3269***	4,3179	t	-0,2438	-1,6032	-1,5340
t+1	0,0047	0,3316***	4,3800	t+1	-0,1919	-1,7951	-1,7175
t+2	0,0154	0,3470***	4,5835	t+2	-0,2414	-2,0365	-1,9485
t+3	-0,0138	0,3331***	4,4011	t+3	-0,2736	-2,3100**	-2,2103
t+4	-0,0440	0,2891***	3,8194	t+4	-0,2580	-2,5680**	-2,4571
t+5	-0,0415	0,2477***	3,2715	t+5	-0,2405	-2,8085***	-2,6872
t+6	-0,0398	0,2079***	2,7460	t+6	-0,2394	-3,0479***	-2,9162
t+7	-0,0452	0,1626**	2,1485	t+7	-0,2292	-3,2771***	-3,1356

Note. These metrics are measured daily within the event window spanning from 7 days before to 7 days after the announcement of the takeover of Credit Suisse by UBS. The data is provided for both European and U.S. banks, using the MSCI World Index as the market index. At the 10%, 5%, and 1% significance levels, statistically significant CAAR values are denoted by *, **, and *** respectively. In the last two columns, a two-sample t-test is performed to determine whether the European and U.S. AARs and CAARs are statistically significantly different from each other.

Table 5.5 Average Abnormal Returns (AARs), Cumulative Average Abnormal Returns (CAARs), and the t-statistics for the CAARs.

European Banks [-1:+1]				U.S. Banks [-1:+1]			
Days	**AAR**	**CAAR**	**t-CAAR**	**Days**	**AAR**	**CAAR**	**t-CAAR**
t-1	-0,0064	-0,0064	-1,3653	t-1	-0,2621	-0,2621	-1,2004
t	-0,0094	-0,0157***	-3,3643	t	-0,2438	-0,5058**	-2,3169
t+1	0,0047	-0,0110**	-2,3592	t+1	-0,1919	-0,6977***	-3,1957

Note. These metrics are measured daily within the event window spanning from 1 day before to 1 day after the announcement of the takeover of Credit Suisse by UBS ([-1:+1]). The data is provided for both European and U.S. banks, using the MSCI World Index as the market index. At the 10%, 5%, and 1% significance levels, statistically significant CAAR values are denoted by *, **, and *** respectively. In the last two columns, a two-sample t-test is performed to determine whether the European and U.S. AARs and CAARs are statistically significantly different from each other.

Table 5.5 shows the daily AARs, CAARs, and the t-statistics for the CAARs in the [-1,1] event window for European and U.S. banks using the MSCI World Index which serves as a robustness check for the results of Table 5.2 using the regional indices. When comparing tables 5.2 and 5.5, for both European and U.S. banks, both tables show a negative AAR and CAAR around the event date (t). The CAARs are significant on the event day (t) using the STOXX600, S&P500, and the MSCI World indices. The robustness check confirms that the negative responses in the European and US markets to the takeover announcement of Credit Suisse by UBS are significant and persistent across both regional and global market indices.

Table 5.6 Average Abnormal Returns (AARs), Cumulative Average Abnormal Returns (CAARs), and the t-statistics for the CAARs.

European Banks [-3:+3]				U.S. Banks [-1:+1]			
Days	**AAR**	**CAAR**	**t-CAAR**	**Days**	**AAR**	**CAAR**	**t-CAAR**
t-3	0,0191	0,0191***	2,6125	t-3	-0,2266	-0,2266	-0,4451
t-2	-0,0009	0,0182**	2,4883	t-2	-0,2137	-0,4403	-0,8650
t-1	-0,0064	0,0118*	1,6139	t-1	-0,2621	-0,7024	-1,3799
t	-0,0094	0,0024	0,3338	t	-0,2438	-0,9461*	-1,8588
t+1	0,0047	0,0071	0,9775	t+1	-0,1919	-1,1380**	-2,2357
t+2	0,0154	0,0226***	3,0859	t+2	-0,2414	-1,3794***	-2,7100
t+3	-0,0138	0,0087	1,1958	t+3	-0,2736	-1,6529***	-3,2474

Note. These metrics are measured daily within the event window spanning from 3 days before to 3 days after the announcement of the takeover of Credit Suisse by UBS ([-3:+3]). At the 10%, 5%, and 1% significance levels, statistically significant CAAR values are denoted by *, **, and *** respectively. The data is provided for both European and U.S. banks, using the MSCI World Index as the market index.

Table 5.6 presents the daily AARs, CAARs, and t-statistics for the CAARs within the [-3,3] event window for European and U.S. banks. This analysis uses the MSCI World Index as a robustness check for the results reported in Table 5.3. The robustness check using the MSCI World Index confirms and, on certain days in the event window, amplifies the initial results obtained with the STOXX600 as for European banks, the check found additional significant CAARs, indicating a stronger market reaction for the European banking industry. For U.S. banks, the robustness check confirms the significant negative responses around the event date. Using the MSCI World Index as a global benchmark validates the initial findings.

5.1.3 Event study: Abnormal stock market return volatility in European banks

To generate robust findings, the AVOLAs are computed for several event windows, similar to the CARs for European and US banks. Tables 5.7 and 5.8 show that the abnormal stock market return volatility (AVOLA) of U.S. banks is higher than the AVOLA of European banks. For example, during the [-7:+7] event window, the mean AVOLA of U.S. banks is 6.7%, whereas that of European banks is 3.3%. This pattern holds for the shorter windows as well, as in the [-1:+1] event window, U.S. banks have a mean AVOLA of 3.1% and European banks of 1.6%. Similarly, for the [-3:+3] event window, a mean AVOLA of 3.5% is found for U.S. banks versus 1.9% for European banks

When evaluating the banks in the two samples independently for each event window, almost all U.S. banks exhibit higher abnormal stock market return volatility than European banks for the same event windows. The higher AVOLA values for U.S. Banks indicate that the U.S. banking market reacted more strongly to the takeover announcement. These findings are consistent with the findings for the CAR and AAR values, as the U.S. Banks also exhibited larger and more negative CAARs than the European banks.

Table 5.7 Abnormal stock market return volatility (AVOLA) in European banks

Country	Bank	$\mathbf{AVOLA}_{[-7:+7]}$	$\mathbf{AVOLA}_{[-1:+1]}$	$\mathbf{AVOLA}_{[-3:+3]}$
Austria	Raiffeisen	5,3%	0,5%	1,6%
	Erste Group	4,9%	1,1%	2,2%
Belgium	KBC Group	1,9%	0,4%	1,7%
Denmark	Danske Bank	2,5%	1,1%	2,0%
Finland	Aktia Bank	2,3%	1,1%	0,7%
	Nordea	3,3%	0,9%	1,3%
France	Crédit Agricole	2,4%	0,6%	1,5%
	Société Générale	8,8%	1,6%	1,7%
	BNP Paribas	4,0%	0,6%	1,0%
Germany	Deutsche Bank	6,5%	2,1%	5,4%
	Commerzbank,	5,0%	2,7%	3,5%
Italy	Mediobanca	1,8%	0,7%	0,9%
	BPER Banca	4,0%	0,7%	1,7%
	Intesa Sanpaolo	1,3%	0,9%	0,9%
	Banco BPM	3,4%	0,6%	2,2%
	UniCredit	1,6%	1,3%	0,9%
Ireland	Bank of Ireland	2,3%	2,6%	2,5%
	AIB Group	2,7%	3,0%	2,5%
Netherlands	Van Lanschot Kempen	1,5%	1,7%	1,5%
	ABN Amro	1,7%	1,2%	1,2%
	ING	5,0%	1,8%	2,0%
Norway	DNB	2,6%	0,7%	0,8%
Spain	Banco Bilbao	2,4%	1,5%	1,2%
	Banco de Sabadell	5,3%	1,5%	2,4%
	Banco Santander	1,9%	1,1%	0,9%
	CaixaBank	3,6%	2,8%	2,1%
Sweden	SEB	4,5%	1,0%	2,1%
	Swedbank	4,5%	0,3%	3,0%
Switzerland	Julius Baer	4,2%	3,4%	4,2%
	Banque Cantonale de Genève	0,9%	0,2%	0,8%
	Banque Cantonale Vaudoise	2,7%	4,2%	3,5%
Turkey	Türkiye İş Bankası	2,8%	4,1%	3,4%
United Kingdom	Standard Chartered	6,1%	2,6%	2,6%
	HSBC	2,1%	1,3%	1,6%
	Lloyds Banking Group	1,6%	1,3%	1,1%
	Barclays	4,7%	2,3%	1,8%
	NatWest Group	1,2%	2,6%	1,3%
Mean		3,3%	1,6%	1,9%

Note. The abnormal stock market return volatility across European banks over different event windows [-7:+7] (in column 3), [-1:+1] (in column 4) and [-3:+3] (in column 5). The AVOLA, represents the standard deviation of the abnormal stock market returns during the specified windows, reflecting how much the returns deviated from what was typically expected.

Table 5.8 Abnormal stock market return volatility (AVOLA) in U.S. banks

State	Bank	$AVOLA_{[-7:+7]}$	$AVOLA_{[-1:+1]}$	$AVOLA_{[-3:+3]}$
Alabama	Regions Financial Corporation	6,2%	2,2%	2,6%
California	Wells Fargo & Company	5,4%	1,0%	3,1%
	East West Bancorp, Inc.	7,8%	5,7%	4,7%
Connecticut	Synchrony Financial	6,8%	2,0%	2,2%
	Webster Financial Corporation	6,5%	4,6%	4,1%
Illinois	Wintrust Financial Corporation	5,8%	3,4%	4,3%
Massachusetts	State Street Corporation	6,0%	0,5%	1,9%
Michigan	Ally Financial Inc.	5,8%	5,6%	3,9%
Minnesota	U.S. Bancorp	8,5%	6,3%	4,4%
	Ameriprise Financial, Inc.	3,7%	1,5%	1,9%
New York	JPMorgan Chase & Co.	3,7%	0,3%	1,5%
	Citigroup Inc.	4,9%	1,2%	2,2%
	The Goldman Sachs Group, Inc.	3,8%	0,6%	1,5%
	Morgan Stanley	4,5%	0,5%	1,3%
	American Express Company	3,1%	0,5%	1,4%
	New York Community Bancorp	15,2%	6,9%	7,1%
	M&T Bank Corporation	6,0%	4,0%	6,2%
New Jersey	Valley National Bancorp	4,3%	2,1%	4,0%
North	Bank of America Corporation	4,7%	1,1%	3,0%
Carolina	Truist Financial Corporation	10,7%	5,7%	4,2%
Ohio	Fifth Third Bancorp	8,5%	4,8%	3,3%
	Huntington Bancshares Incorporated	9,6%	4,2%	2,7%
	KeyCorp	14,2%	6,1%	5,3%
Pennsylvania	PNC Financial Services Group, Inc.	4,7%	3,0%	3,0%
Puerto Rico	Popular Inc.	6,6%	4,2%	2,7%
Rhode Island	Citizens Financial Group, Inc.	6,9%	2,2%	3,7%
Texas	The Charles Schwab Corporation	8,5%	3,5%	5,8%
Tennessee	Pinnacle Financial Systems	5,9%	5,8%	5,2%
Virginia	Capital One Financial Corporation	4,8%	1,4%	2,3%
Washington	Columbia Banking System	8,1%	4,3%	4,9%
Mean		6,7%	3,1%	3,5%

Note. The abnormal stock market return volatility across U.S. banks over different event windows [-7:+7] (in column 3), [-1:+1] (in column 4) and [-3:+3] (in column 5). The AVOLA, represents the standard deviation of the abnormal stock market returns during the specified windows, reflecting how much the returns deviated from what was typically expected.

5.2 Cross-sectional analyses

The results from Table 5.7 and Table 5.8 show how the cumulative abnormal returns of the European and U.S. banks respectively are affected by different characteristics of banks. For the European banks, the ln(SIZE) coefficients range from -0.068 to -0.081 across different event windows, significant in columns 2, 3, 4, and 6 with negative coefficients. This indicates that larger banks tend to experience lower cumulative abnormal returns following the announcement of the takeover. The cross-sectional analyses for the US banking industry give negative coefficients for the natural logarithm of bank size ln(SIZE) which indicates a negative relationship with the cumulative abnormal returns across the different event windows, which is significant only for the [-3,3] event window. Similar to the European banking industry, these findings indicate that larger banks tend to experience lower cumulative abnormal returns in this period.

For the European banks, the coefficients regarding liquidity are positive with a value of 0.004 and are significant across all event windows, consistently significant at 1% level, which suggests that banks with higher liquidity experience higher cumulative abnormal returns. For the U.S. Banking industry, the liquidity (LIQ) exhibits positive coefficients, which is significant in the [1,1] event window. In line with the findings for European banks, this suggests that higher liquidity is associated with higher cumulative abnormal returns during these periods. For both the European and U.S. Banking markets, the equity ratio (EA) estimates are positive but not significant. This implies that there is no strong evidence that the equity ratio of banks has an impact on the cumulative abnormal returns.

The positive coefficients for the net interest margin (NIM) in the European banking industry indicate a potentially positive relationship with cumulative abnormal returns, however, none of the coefficients is statistically significant and though not conclusive. However, the estimates for the net interest margin in the U.S. banking show a positive relationship with cumulative abnormal returns and is significant in all three event windows.

The coefficients regarding the loan ratio (LA) are negative and significant across the event windows for European banks. This implies that banks with higher loan ratios are associated with lower cumulative abnormal returns, significant at 1%-level. For the US banks, negative coefficients are also found but insignificant. In Europe, the return on assets (ROA) gives positive and highly significant coefficients across all columns. For the US Banking industry, the return on assets (ROA) shows positive coefficients, with significance in the [-1,1] event window, which is similar to the European banks. More profitable firms are better in terms of cumulative abnormal returns during the event window. Lastly, the proximity coefficient (PRX) which is included in columns 4, 5, 6 shows positive coefficients, which would suggest that neighbor countries show larger cumulative abnormal returns, however these coefficients are all insignificant.

5.2.1 Cross-sectional analysis: robustness checks

To verify the robustness of the results, robust regressions (rreg) were conducted for both cross-sectional analyses. The outcomes of the robust regressions are detailed in Table B.1 for European banks and Table B.2 for the US banks in Appendix B. For the European banking industry, the robust regression industry shows that the estimates for ln(SIZE) remain negative but do not stay significant. The coefficient for liquidity (LIQ) remains positive and significant for the [-7,7] and [-3,3] event windows, however less significant than before. The estimates for the equity ratio (EA), the net interest margin (NIM) coefficients and proximity (PRX) remain positive and insignificant. The loan ratio (LA) coefficients stay negative and the return on assets (ROA) coefficients remain positive but both coefficients lose significance to some degree.

For the U.S. Banking industry, the robust regression results in Table B.2 in Appendix B show that the coefficients for ln(SIZE) are negative but not significant, which is consistent with the earlier findings of Table 5.8. The liquidity (LIQ) coefficients remain positive and significant in the [-1,1] event window. The equity-to-assets ratio (EA) and loan-to-assets ratio (LA) coefficients remain insignificant. The net interest margin (NIM) coefficients are consistently positive and significant in the [-3,3] event window, while the return on assets (ROA) coefficients are positive and significant in all event windows. However, the coefficients are very small. The results from the robust regression suggest that while some coefficients remain consistent, most of them vary, and their significance levels generally decrease. This indicates that the initial findings are somewhat sensitive to the model specifications and not very robust.

Table 5.9 Cross-sectional analyses for European Banking industry

VARIABLES	(1) CAR[-7:+7]	(2) CAR [-1:+1]	(3) CAR[-3:+3]	(4) CAR[-7:+7]	(5) CAR[-1:+1]	(6) CAR[-3:+3]
Ln(SIZE)	-0.081	-0.081***	-0.080**	-0.068*	-0.068	-0.068***
	(0.055)	(0.0239)	(0.035)	(0.027)	(0.053)	(0.023)
LIQ	0.004**	0.004***	0.004***	0.004***	0.004**	0.004***
	(0.002)	(0.000)	(0.001)	(0.001)	(0.002)	(0.001)
EA	0.025	0.025	2.539	0.018	0.018	0.018
	(0.050)	(0.022)	(3.234)	(0.023)	(0.050)	(0.022)
NIM	0.033	0.034	0.033	0.081	0.081	0.081
	(0.205)	(0.089)	(0.132)	(0.112)	(0.203)	(0.088)
LA	-0.043***	-0.043***	-0.091***	-0.044***	-0.0436***	-0.044***
	(0.013)	(0.005)	(0.801)	(0.003)	(0.013)	(0.005)
ROA	0.165***	0.165***	0.165***	0.166***	0.166***	0.166***
	(0.046)	(0.012)	(0.029)	(0.008)	(0.046)	(0.020)
PRX				0.128	0.128	0.128
				(0.065)	(0.105)	(0.045)
Constant	0.354	0.369	0.350	0.389	0.376	0.389
	(1.421)	(0.620)	(0.914)	(0.762)	(1.411)	(0.613)
Country Fixed Effects				YES	YES	YES
Observations	38	38	38	38	38	38
R-squared	0.533	0.532	0.541	0.545	0.545	0.545

Notes. This table shows the cross-sectional analyses estimates for the CARs of the three different event windows around the announcement of the takeover of Credit Suisse by UBS. The dependent variable is the European Banks CARs for event windows [-7:+7], [-1:+1] and [-3:+3] using the market model with STOXX600 as the market index. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5.10 Cross-sectional analyses for U.S. Banking industry

VARIABLES	(1) CAR [-7:+7]	(2) CAR [-1:+1]	(3) CAR [-3:+3]
Ln(SIZE)	-0.016	-0.020	-0.016*
	(0.002)	(0.002)	(0.002)
LIQ	0.018	0.011**	0.014
	(0.000)	(0.000)	(0.000271)
EA	0.039	0.085	0.060
	(0.007)	(0.008)	(0.008)
NIM	0.097*	0.030**	0.065*
	(0.016)	(0.015)	(0.015)
LA	-0.036	-0.041	-0.038
	(0.001)	(0.005)	(0.000)
ROA	0.001	0.0008*	0.001
	(0.000)	(0.000)	(0.000)
Constant	3.981	2.820	3.281
	(0.082)	(0.083)	(0.082)
Observations	30	30	30
R-squared	0.291	0.302	0.298

Notes. This table shows the cross-sectional analyses estimates for the CARs of the three different event windows around the announcement of the takeover of Credit Suisse by UBS. The dependent variable is the U.S. Banks CARs for event windows [-7:+7], [-1:+1] and [-3:+3] using the market model with S&P500 as the market index. Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

5.3 Buy and Hold Abnormal Returns Analysis

In this subsection, the results of the Buy-and-Hold Abnormal Returns (BHAR) model are shown to assess the long-term consequences of UBS's acquisition of Credit Suisse on the U.S. and European banking industries. Based on the approach of Barber and Lyon (1997), the BHAR-analysis uses cumulative actual returns and expected returns which are determined using historical averages, covering 12 months after the announcement of the takeover. Using historical market data, the cumulative abnormal returns for each stock were calculated and compared to the predicted return.

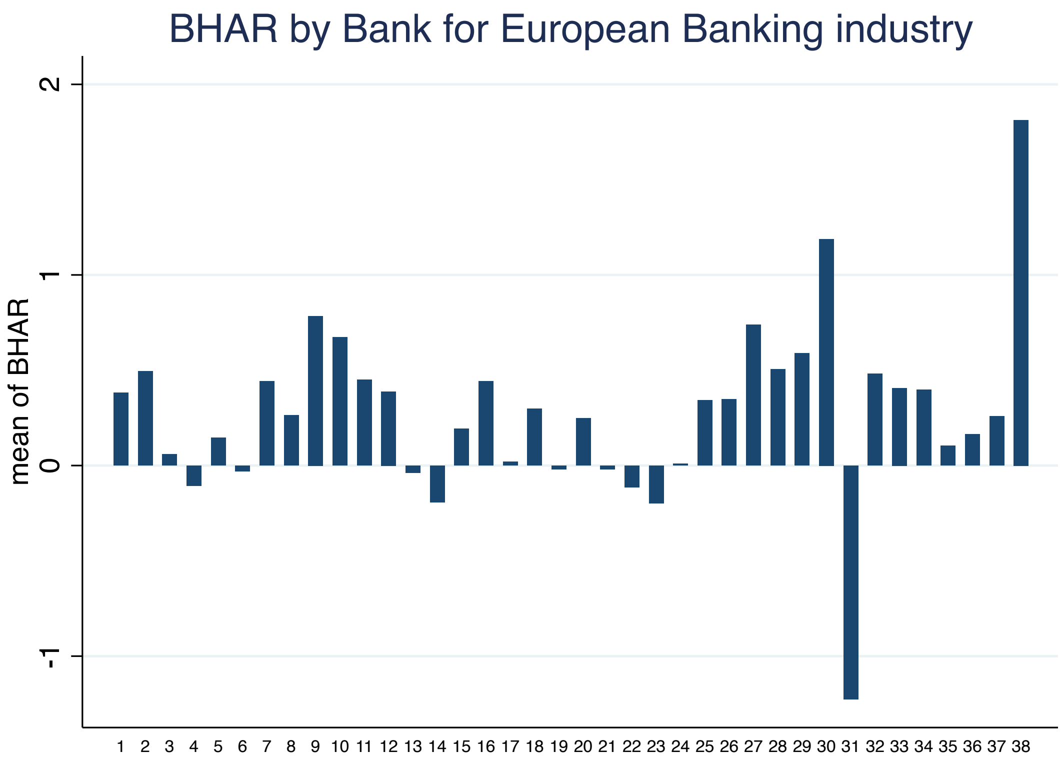

Figure 5.1: Distribution of Buy-and-Hold Abnormal Returns across European Banks using historical averages as Expected Returns.

The considerable variation in the stock returns among the 38 tested institutions in the European banking sector can be observed from Figure 5.1, which shows the broad range of Buy-and-Hold Abnormal Returns. The BHAR study reveals that Bank 31 behaved quite differently in contrast to the other banks. The Buy-and-Hold Abnormal Returns for this bank were substantially lower than those of the others. This outlier is linked to an important amount of missing data in the time that followed the announcement of the takeover. The outlier is eliminated from the computation of the mean BHAR across all banks to ensure the accuracy of the results. Bank-to-bank variations in BHAR values range from a little below -1.5 to slightly above 1.5. The broad spectrum of BHAR values across the banks, ranging from positive to negative, indicates a range of responses throughout the European banking industry to UBS's acquisition of Credit Suisse. Given that many banks are located close to the horizontal BHAR zero line, it is possible that the acquisition had no meaningful long-term effect on the stock returns of these banks.

This neutral effect implies that, despite the acquisition's importance, its impacts in the long term may have been localized in a few banks rather than having an impact on the European banking industry as a whole.

The buy-and-hold abnormal returns (BHAR) for the European banking stocks were, on average, about 32.2%, according to the coefficient for the intercept for European banks, which is 0.322 as can be observed from Table 5.11. This implies that within the observed time, there was a significant positive abnormal return on average for the European Banking industry. The positive BHAR could suggest that the European market reacted positively to UBS's acquisition of Credit Suisse, maybe seeing it as a sign of strengthened financial health for UBS and a boost in investor confidence. Moreover, this positive reaction might have led investors to see the banking sector as more stable and profitable following the merger, spreading a sense of optimism about other banks in Europe.

The t-BHAR of 3.818 for the European banks implies that the mean Buy-and-Hold Abnormal Return (BHAR) in the banking sector in Europe significantly differs from zero and is positive. Specifically, since the t-value is positive with a magnitude of >1.96, it indicates that the average BHAR is significantly different from zero. This result points to a positive impact on the stock returns of the European banks in the long term.

Figure 5.2 shows the variation in the stock returns among the 30 analyzed banks in the U.S. banking industry. Similar to the European banking market, some banks cluster around the zero BHAR line, which suggests a minimal long-term impact from the acquisition. This could suggest that the acquisition may not have had a significant long-term effect on their stock returns. However, most banks show substantial negative deviations. The BHAR values of the banks in the U.S. range from -0.5 to 0.4. There are also a few banks that have a positive BHAR value in the long term. As can be seen in Table 5.11, the negative mean BHAR for the US banking industry suggests a generally negative response to UBS's acquisition of Credit Suisse. The negative mean BHAR value of -14% implies that, on average, U.S. banks experienced a decrease in their stock performance relative to what was expected. This drop can be the result of negative market perceptions that are experienced because of the merger. Concerns about the merger's impact on the entire industry are reflected in the significant negative response. There may be fears in the US market that the takeover may result in unfair competition or problems with the merger of the two large banks, which might harm the banking industry in general.

Table 5.11 Average BHAR for European and U.S. Banking industries

Market	BHAR	t-BHAR	Event window
Europe	0.322	3.818	12 months
U.S.	-0.140	-4.219	12 months

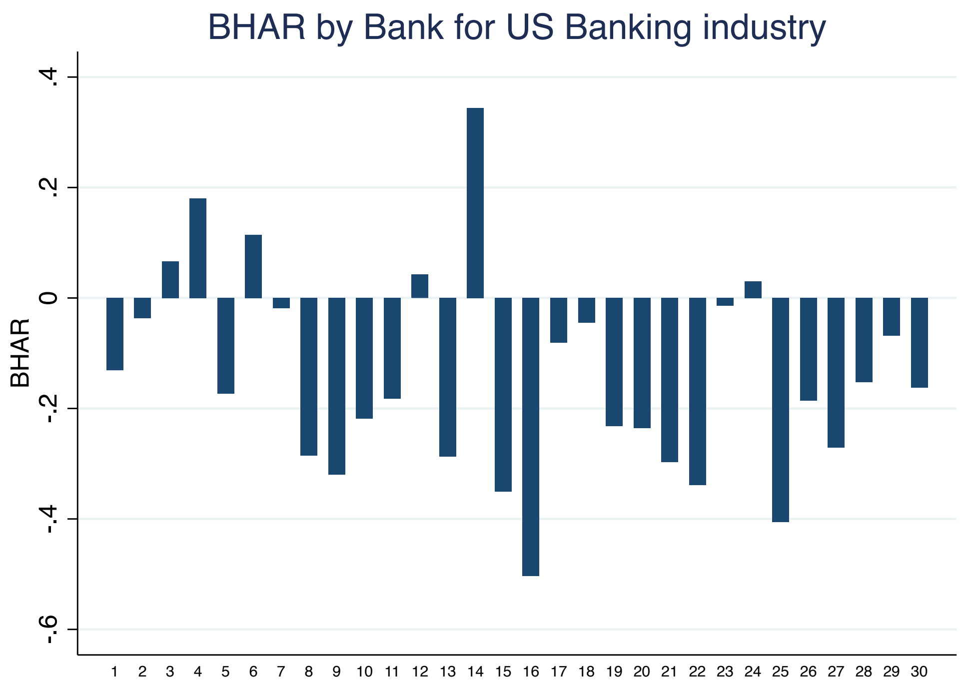

Figure 5.2. Distribution of Buy-and-Hold Abnormal Returns across US Banks using historical averages as expected returns.

The t-BHAR of -4.219 suggests that the mean Buy-and-Hold Abnormal Return (BHAR) in the U.S. Banking industry is significantly different from zero. The negative t-value again highlights a negative impact on the stock returns of the U.S. banks in the sample.

5.4 Discussion of results

In the [-7:+7] event window, the days before the announcement of the takeover (t-7 to t-1), European banks generally exhibited positive AARs and CAARs that were mostly positive and statistically significant, especially from t-4 onwards. This could indicate that the investors in European banks were relatively optimistic or less affected by negative rumors. One possible explanation is that rumors about the acquisition of Credit Suisse by UBS were perceived positively by the European banking industry, leading to significantly positive AARs on certain days. Initially, these results seem to align with the findings of Goyal & Soni (2023), who also found positive CAARs for the financial services sector in India after the acquisition of Credit Suisse. It should be noted that the CAARs they found were insignificant for all days of their event window ([-7:+7]).

Contrarily, for the same event window ([-7:+7]) other results were found for U.S. Banks. All CAARs in the event window are negative and in the days after the announcement (t+1) the CAARs become significant thus these findings are not in line with the first hypothesis, which expects positive CAARs. For sectors other than financial services, such as public banks and private banks, Goyal & Soni (2023) find negative CAARs as well, however again not statistically significant. In the context of the U.S. banking industry, it is important to consider that the negative stock returns of banks, particularly in the days leading up to the event date, are also likely related to the collapse of SVB on March 10, 2023. Previous event studies, such as those by Kabir and Winters (2023) and Naveed et al. (2023), have shown that U.S. bank stocks exhibited negative abnormal returns associated with the downfall of SVB, which can be explained by the fact that bank failures harm the confidence of market participants in the stability of the banking system. Therefore, there could be a chance of contamination from the Silicon Valley bank crisis particularly in the US, given that this event window is quite large.

The results of Table 5.2 and 5.3 are quite similar, which show some negative significant cumulative abnormal returns. While the results for the event windows [-1,1] and [-3,3] for European banks are consistent, the AARs and CAARs for the event window [-7,7] are somewhat divergent. It is possible that the AARs and CAARs for the [-7,7] event window are more positive because this event window covers a relatively longer period. Across all three event windows for the U.S. banking industry, the U.S. banks faced significantly negative CAARs, with some days showing significance at the 1% level. In the days leading up to the event (t-7 to t-1), none of the CAARs were significant for the U.S. banks. On the event day (t) and in the days following, U.S. banks continued to experience significant negative AARs, leading to further declines in CAARs, which became significant on the event day for the [-1,1] and [-3,3] event windows. These findings are consistent with the results of Pandey et al. (2023b), who examined the impact of the SVB collapse on global equity markets and found a significant negative effect on stock markets worldwide.

From all three event windows ([-7,7], [-1,1], and [-3,3]), a consistent pattern is observed: European banks generally showed less negative CAARs, while U.S. banks showed larger significant declines in CAARs. Leading up to and following the announcement of the takeover, European banks showed relatively fewer negative abnormal returns, suggesting a more resilient market response compared to the U.S. banking industry which experienced substantial negative abnormal returns. These findings underscore the influence of regional market conditions on market reactions and investor sentiment. The pronounced negative responses in the U.S. banking sector could be exacerbated by other banking failures that happened around the same time, unlike the more stable reaction seen in European banks. The last two columns of Tables 5.1, 5.2, and 5.3 confirm that the AARs and CAARs between the EU and the US are statistically significantly different.

The findings for this part of the study are largely in line with the results presented by Martins (2023, 2024). Martins' papers observed a negative and statistically significant stock price reaction around the announcement of the SVB and CS failures for the three time intervals in both the U.S. and Europe, with a stronger negative response in the US, indicating negative market sentiment towards these events. Although Martins examined the announcement of the failure of these banks and not of the takeover, his conclusions likely apply here as well. The results partially align with the first hypothesis for European banks, which showed some positive market reactions before the event and maintained positive CAARs in some instances. On the other hand, a lot of significant negative (cumulative) average abnormal returns are found either. However, for U.S. banks, the results completely contradict the hypothesis as the U.S. banking industry only experienced significant negative CAARs. These results are essentially consistent when comparing two different papers by Martins (2023, 2024). For both markets, Martins finds negative cumulative abnormal returns, with the US banking market experiencing cumulative abnormal returns with a larger magnitude.

The higher volatility observed in the U.S. banking industry may indicate that U.S. banks' stock returns are more vulnerable to the news compared to those of European banks. The broader fluctuations may be attributed to different market dynamics. The shorter event windows ([-1:+1] and [-3:+3)] typically exhibit less volatility in both the U.S. and Europe, indicating that the immediate response to events may not be as severe as the response observed over a longer event window. The U.S. banks exhibit a higher average AVOLA in both the shorter and longer event windows than Europe (1.57%), confirming the assumption that US markets are more sensitive.

The results for the second part of the analysis, the cross-sectional regressions partially align with the second hypothesis, which states that larger banks generally experience more stable and less abnormal returns following the collapse and subsequent takeover of Credit Suisse by UBS. According to the second hypothesis, larger banks generally are expected to have more consistent and normal returns following Credit Suisse's failure and UBS's subsequent acquisition of the bank. This hypothesis is partially supported by the findings of the cross-sectional regressions, in the second part of this study. For both European and U.S. banks, all ln(SIZE) coefficients are negative and some of them are significant, which supports the hypothesis that larger banks experience less abnormal returns, indicating more stability. The negative coefficients for ln(SIZE) contradict the findings of both Martins (2023) and Goyal & Soni (2023) who found a positive coefficient for market capitalization, indicating that higher market capitalization of banks had a positive relationship with CARs during the specified event window. The negative coefficient does align with the findings of Johnson & Mamun (2012), who found that larger banks were impacted more negatively after the collapse of Lehman Brothers in 2008. However, the significance of the ln(SIZE) coefficient diminishes when performing the robust regression as a robustness check, which highlights the sensitivity of the results.

Secondly, liquidity (LIQ) appears to play an important role in mitigating the negative impacts of the takeover announcement which is consistent with the theory by Bates et al. (2009) that liquidity can serve as a safeguard when facing adverse conditions. These findings also align with those of Martins et al. (2023), who found that greater liquidity typically helps reduce the negative effects resulting from a bank's collapse. The equity ratio (EA) does not show a significant impact on the cumulative abnormal returns in either European or U.S. Banking sectors. Contrarily, Martins does find significant and positive coefficients for the equity-to-assets ratio at a 1%-level. The net interest margin (NIM) exhibits a potential positive relation with the cumulative abnormal returns in both regions, but the significance varies. While the coefficients for European banks are not statistically significant, the U.S. banks show a significant positive relationship in all event windows. However, again, performing the robust regression as a robustness check decreases the significance of the NIM coefficients for U.S. banks. Additionally, the loan ratio (LA) is found to have a negative and significant impact on cumulative abnormal returns for European banks, indicating that higher loan ratios are associated with lower cumulative abnormal returns. Considering that investors might see banks with high loan ratios as more hazardous because of their greater exposure to credit risk, this is the opposite of what was anticipated. Although the U.S. banks also have negative coefficients, these are not statistically significant. Lastly, the return on assets (ROA) is consistently positive and significant across all event windows for European banks and significant in the [-1:+1] event window for U.S. banks. This suggests that higher ROA's are associated with higher cumulative abnormal returns, this is consistent with the findings of Goyal & Soni (2023).

The results of the buy-and-hold abnormal returns suggest that the acquisition of Credit Suisse by UBS had a significant long-term impact on the abnormal stock returns of both European and U.S. banks, although in opposite directions. According to the results, on average the European banking sector experienced a significant positive impact, indicating that the acquisition can be interpreted as a sign of better financial health for UBS and more investor confidence. On the other hand, according to the buy-and-hold abnormal returns for the U.S., this banking sector experienced a significant negative impact. This could be because of concerns about increased risk and potential challenges associated with the merger. In conclusion, the third hypothesis, which states that the acquisition of Credit Suisse by UBS had a significant long-term impact on the abnormal stock returns of European and U.S. banks is supported by the findings. The analysis shows that the acquisition had a substantial impact on both European and U.S. banks, with positive effects in the European banking sector and negative effects in the U.S. banking sector.

CHAPTER 6 Limitations

One of the strengths of this study is that it provides new empirical insights into how the U.S. and European banking sectors perceived the news of Credit Suisse's acquisition by UBS. This research is the first to specifically focus on more than one market in the context of this event by using a compound dataset including data on the banking sectors from both Europe and the U.S. By conducting a cross-market analysis, this study offers a more comprehensive understanding of the event's impact compared to studies that only focus on one single market. This approach allows for the detection of differences in how each market responded to the news.

Although the event study using the market model is a widely recognized and respected approach, established by MacKinlay in 1997, the methodology employed in this paper presents some limitations. Event studies require a precise definition of the estimation window and the event window to accurately isolate the measured effects. An event study works best if no other relevant events that could potentially influence the returns occurred in the days before and after the event date. This study faced some challenges at this point because of rumors in the financial markets about Credit Suisse’s financial stability, potential government support and possible takeovers before the actual announcement of the event took place. These rumors likely influenced investor behavior and stock returns before the official announcement.

Additionally, the timing of the Credit Suisse announcement closely followed significant disruptions in the U.S. banking sector, because of the collapse of SVB and later the less well-known Signature Bank. These events caused some additional volatility in the banking market, which makes it complicated to isolate the effects attributable solely to the UBS acquisition of Credit Suisse. Previous research indicated that the failure of SVB affected the stock returns of other U.S. banks during that period. The finding that U.S. banks generally experienced more significant abnormal returns around the announcement of the takeover could likely come from the already existing instability in the U.S. banking market at the time.

Another limitation is that the cross-sectional analyses of section 5.2 could suffer from omitted variable bias, a common issue in OLS regressions. This means that important explanatory variables may have been excluded from the regression models, which could lead to biased and inconsistent parameter estimates. When the robust regressions were performed for the robustness check, some of the coefficients did not stay significant.

A possible recommendation for future research would be to explore alternative methodologies other than event studies that may be better suited to examine the effects of bank failures or acquisitions as these types of events deal with leakage of information before the official event date. A potential suggestion could be the adoption of the GARCH model (Generalized Autoregressive Conditional Heteroskedasticity), as these models are better able to analyze volatility dynamics.

Another possible suggestion for future research could be to expand the scope of the analysis by including other markets beyond the banking industry to provide a more comprehensive view of the systemic impacts of the takeover. For example, Yousef and Goodell (2023) examined the abnormal returns across different market sectors in the U.S. following the implosion of Silicon Valley Bank. They found significant negative abnormal returns, not only in the financial sector but also in the materials and real estate sectors. This underscores the importance of considering the broader market implications of such events. Future research could also examine the spillover effects on various market sectors, such as bond or derivatives markets, which could reveal changes in investor confidence and market dynamics. Another option could be to study foreign exchange markets by analyzing whether the collapse and takeover of Credit Suisse affected currency exchange rates which could lead to shifts in international capital flows and the stability of currencies.

In summary, while this study offers valuable insights into the Credit Suisse failure and subsequent acquisition by UBS, there are some methodological limitations regarding the assumptions of the event study methodology, the timing of the announcement relative to other events in the banking sector and the cross-sectional analyses. Future research could explore alternative methodologies and expand the scope of the analysis to provide a more comprehensive understanding of other market sectors.

CHAPTER 7 Conclusion

This research provides essential empirical insights into how the European and U.S. banking sectors reacted to UBS's acquisition of Credit Suisse, representing the first study to analyze the effects of this event across both markets. By employing a comprehensive dataset covering banking data from both Europe and the U.S., the study aimed to address the question: *"How did the emergency rescue of Credit Suisse by UBS affect the European and U.S. banking industries?"*

Using the market model methodology developed by MacKinlay in 1997, an event study was used. The European sample consisted of 38 banks with diverse market capitalizations, whereas the U.S. sample consisted of the top 30 banks by market capitalization. Data for daily stock performances and market indices were retrieved from Eikon Refinitiv with the STOXX Europe 600 and the S&P 500 Financial Sector as the respective market indices for European and U.S. banks. As an additional robustness check, the MSCI World Index was used for both markets. Across various event windows, a consistent pattern was observed: both European and U.S. banks displayed significant negative cumulative abnormal returns following the acquisition announcement. Notably, the extent of negative returns differed across both banking industries, as European banks were facing less severe negative cumulative abnormal returns compared to the U.S. banking sector. Additionally, it was also found that banks in the U.S. experienced higher abnormal stock market return volatility than European banks. These findings align with two studies by Martins (2023, 2024) who investigated the impact of the SVB and Credit Suisse failure on the European and U.S. banking industries in two separate studies. In both the European and the U.S. markets, Martins reports negative cumulative abnormal returns. When comparing both studies, more pronounced negative returns are observed in the U.S. banking market. In the context of the U.S. financial markets, this trend of substantial declines may also have been influenced by the collapse of Silicon Valley Bank on March 10th, 2023. The original hypothesis suggesting that UBS's acquisition announcement would lead to a positive market response, as indicated by significant increases in cumulative abnormal returns in both banking sectors, was rejected.

Further investigations explored how specific bank characteristics influenced the variability of cumulative abnormal returns through OLS regressions applied to both European and U.S. banks. This second hypothesis was also rejected, as the data revealed that larger banks did not necessarily experience more stable or less abnormal returns post-acquisition. Initial findings showed a negative coefficient for banks market capitalizations, but later robustness checks failed to confirm these coefficients as reliable.

Moreover, the research examined the long-term effects of the merger announcement and the actual merger of Credit Suisse into UBS on the banking markets in Europe and America. The third hypothesis, which stated that the acquisition had a considerable long-term impact on the abnormal stock returns of banks in both regions, was confirmed. The findings indicated significant long-term impacts, with positive outcomes observed in the European banking sector and negative outcomes in the U.S. sector. Given the internationalization and the interconnectedness of the banking sector, particularly in recent years, it was crucial to examine the effects of the largest bank mergers since the financial crisis of 2008 on other banks in connected markets.

The findings of this paper highlight the need for robust risk management systems. Financial institutions should be prepared to deal with big changes in the (banking) industry. The significant effects emphasize the need for quick and effective regulatory responses to big mergers and acquisitions in the banking sector to keep the financial system as stable as possible. The negative effects seen in both the European and even more so in the U.S. markets highlight the need for countries to work together.

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APPENDIX A Description of Banks per country/state with codes

Table A.1 Names of European Banks in sample including names with code

Country	Bank	Code
Austria	Raiffeisen	1
	Erste Group	2
Belgium	KBC Group	3
Denmark	Danske Bank	9
Finland	Aktia Bank	14
	Nordea	15
France	Crédit Agricole	16
	Société Générale	17
	BNP Paribas	18
Germany	Deutsche Bank	7
	Commerzbank,	8
Italy	Mediobanca	26
	BPER Banca	27
	Intesa Sanpaolo	28
	Banco BPM	29
	UniCredit	30
	Banca Monte dei Paschi di Siena	31
Ireland	Bank of Ireland	24
	AIB Group	25
Netherlands	Van Lanschot Kempen	32
	ABN Amro	33
	ING	34
Norway	DNB	35
Spain	Banco Bilbao	10
	Banco de Sabadell	11
	Banco Santander	12
	CaixaBank	13
Sweden	Skandinavika Enskilda Banken (SEB)	36
	Swedbank	37
Switzerland	Julius Baer	4
	Banque Cantonale de Genève	5
	Banque Cantonale Vaudoise	6
Turkey	Türkiye İş Bankası	38
United Kingdom	Standard Chartered	19
	HSBC	20
	Lloyds Banking Group	21
	Barclays	22
	NatWest Group	23

Note. This table shows the European banks that have been studied per country, with codes used for the buy-and-hold abnormal returns in Figure 5.1

Table A.2 Names of U.S. banks in sample including names with code

State	Bank	Code
Alabama	Regions Financial Corporation	21
California	Wells Fargo & Company	29
	East West Bancorp, Inc.	10
Connecticut	Synchrony Financial	24
	Webster Financial Corporation	28
Illinois	Wintrust Financial Corporation	30
Massachusetts	State Street Corporation	23
Michigan	Ally Financial Inc.	2
Minnesota	U.S. Bancorp	26
	Ameriprise Financial, Inc.	4
New York	JPMorgan Chase & Co.	14
	Citigroup Inc.	7
	The Goldman Sachs Group, Inc.	12
	Morgan Stanley	17
	American Express Company	3
	New York Community Bancorp, Inc.	18
	M&T Bank Corporation	16
New Jersey	Valley National Bancorp	27
North Carolina	Bank of America Corporation	5
	Truist Financial Corporation	25
Ohio	Fifth Third Bancorp	11
	Huntington Bancshares Incorporated	13
	KeyCorp	15
Pennsylvania	PNC Financial Services Group, Inc.	19
Puerto Rico	Popular Inc.	1
Rhode Island	Citizens Financial Group, Inc.	8
Texas	The Charles Schwab Corporation	22
Tennessee	Pinnacle Financial Systems	20
Virginia	Capital One Financial Corporation	6
Washington	Columbia Banking System	9

Note. This table shows the US banks that have been studied per state, with codes used for the buy-and-hold abnormal returns in Figure 5.2.

APPENDIX B Robustness checks using robust regressions

Tabel B.1 Robustness checks rreg OLS regressions European Banking industry

VARIABLES	CAR [-7:+7]	CAR [-1:+1]	CAR [-3:+3]
Ln(SIZE)	-0.082	-0.073	-0.072
	(0.027)	(0.053)	(0.023)
LIQ	0.006*	0.006	0.007*
	(0.001)	(0.002)	(0.001)
EA	0.023	0.024	0.023
	(0.000)	(0.001)	(0.000)
NIM	0.090	0.092	0.089
	(0.112)	(0.203)	(0.088)
LA	-0.052*	-0.056*	-0.054*
	(0.000)	(0.000)	(0.001)
ROA	0.002*	0.002*	0.001*
	(0.001)	(0.001)	(0.000)
PRX	0.091	0.089	0.091
	(0.000)	(0.001)	(0.001)
Constant	1.239	1.166	1.236
	(0.762)	(1.411)	(0.613)
Country Fixed Effects	YES	YES	YES
Observations	38	38	38
R-squared	0.325	0.331	0.326

Notes. This table shows the robust regression (rreg) cross-sectional analyses estimates for the CARs of the three different event windows around the announcement of the takeover of Credit Suisse by UBS. The dependent variable is the European Banks CARs for event windows [-7:+7], [-1:+1] and [-3:+3] using the market model with STOXX600 as the market index. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Tabel B.2 Robustness checks OLS regressions US. Banking industry

VARIABLES	CAR [-7:7]	CAR [-1:1]	CAR [-3:3]
Ln(SIZE)	-0.037	-0.036	-0.034
	(0.000)	(0.000)	(0.001)
LIQ	0.022	0.015*	0.017
	(0.000)	(0.000)	(0.000)
EA	0.009	0.015	0.050
	(0.001)	(0.000)	(0.000)
NIM	0.150	0.173	0.165*
	(0.001)	(0.001)	(0.001)
LA	-0.034	-0.044	-0.038
	(0.000)	(0.003)	(0.000)
ROA	0.000*	0.001*	0.000*
	(0.000)	(0.001)	(0.000)
Constant	5.215	3.853	4.367
	(0.006)	(0.083)	(0.082)
Observations	30	30	30
R-squared	0.221	0.246	0.234

Notes. This table shows the robust regression (rreg) cross-sectional analyses estimates for the CARs of the three different event windows around the announcement of the takeover of Credit Suisse by UBS. The dependent variable is the U.S. Banks CARs for event windows [-7,7], [-1,1] and [-3,3] using the market model with S&P500 as the market index. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1