Banking Contagion of Credit Suisse: Analysis of European banks' share prices

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Abstract

This study seeks to comprehensively investigate the immediate market response to the insolvency of Credit Suisse within the European banking sector. Utilizing the event study methodology with the market model, the study analyses the event's impact on share prices of Banks listed in Europe, employing daily closing prices as the dataset. Additionally, two cross-sectional regression analyses are conducted to explore factors that may drive abnormal returns. The empirical findings of this research reveal a significant negative impact on stock prices following the occurrence of this banking collapse event. The general devaluation observed in this sector is attributed to various factors such as systemic contagion, panic-driven market behaviour, information asymmetries and the resurgence of uncertainty. Furthermore, these reactions are additionally influenced by specific bank characteristics, such as size and profitability. Additionally, the study investigates country-specific variables for a potential linkage. However, no definitive conclusion can be drawn from this analysis.

Abstract (Portuguese version)

Esta pesquisa visa investigar de forma abrangente a resposta imediata do mercado à insolvência do Credit Suisse no setor bancário europeu. Utilizando a metodologia de estudo de evento com o modelo de mercado, o estudo analisa o impacto do evento nos preços das ações dos bancos listados na Europa, utilizando os preços de fechamento diários como conjunto de dados. Além disso, são realizadas duas análises de regressão seccional para explorar fatores que podem influenciar retornos anormais. Os resultados empíricos desta pesquisa revelam um impacto significativamente negativo nos preços das ações após a ocorrência deste evento de colapso bancário. A desvalorização geral observada neste setor é atribuída a diversos fatores, como contágio sistêmico, comportamento de mercado movido pelo pânico, assimetrias de informação e o ressurgimento da incerteza. Além disso, essas reações são influenciadas adicionalmente por características específicas dos bancos, como tamanho e lucratividade. Adicionalmente, o estudo investiga variáveis específicas do país para uma possível ligação. No entanto, nenhuma conclusão definitiva pode ser tirada desta análise.

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1 Introduction

"I believe that banking institutions are more dangerous […] than standing armies." This quote from Thomas Jefferson (1809) explains quite well the importance of the banking system and its potential impact on the broader economy. Thus, the banking sector is a crucial part of the global economy and any major bank failure can have widespread consequences (Horwitz, 1975; Mahate, 1994; Helwege and Zhang, 2016). The collapse of one bank is not an isolated event but can trigger a chain reaction that spills over into the financial markets and affects not only the entire banking sector, but the whole economy (Allen and Gale, 2000).

As historical events show, a financial crisis can have lasting consequences. For example, the effects of the 2008/2009 financial crisis led to the collapse of banks and many countries are still struggling with high levels of debt today. This financial burden has in turn led to resources being diverted from other important tasks. In addition, the crisis has shaken public confidence in banks and this trust is crucial to their functioning as the emergence of mistrust and the possibility of a bank run can pose major challenges for institutions (Schneider, 2023).

In March 2023, the collapse of two banks – Silicon Valley Bank and Credit Suisse - shook the markets and captured the attention of investors and analysts alike (Barron, 2023). On March 10th, Silicon Valley Bank collapsed, the second largest bankruptcy since the financial crisis. With total assets of 209 billion dollars, Silicon Valley Bank was one of the 20 largest American commercial banks at the end of 2022 (Barron, 2023). Five days later, the Swiss authorities intervened at Credit Suisse Bank after several years of scandals and mismanagement had led to billions in losses. Credit Suisse is one of the largest asset managers in the world and one of 30 global systemically important banks whose collapse could affect the entire financial system (Smith, 2023). The occurrence of bank failures can have a significant impact on global equity markets, leading to disruptions in the financial system and affecting investor confidence (Johnson and Mamun, 2012). Numerous studies have examined the repercussions of bank failures on share prices. Certain empirical research has focused specifically on the collapse of Lehman Bank, highlighting the central role of uncertainty, information asymmetry and systemic contagion in reducing the market value of other banks (Johnson and Mamun, 2012).

Given this context, this study aims to examine the failure of Credit Suisse and its effect on the share prices of other banks listed in Europe. Under the assumption of market efficiency, where all publicly available information is reflected in share prices, investors are expected to react to unexpected information, which should be reflected in European bank market prices. In addition, for a further comprehensive analysis and a differentiated understanding of the results of the event studies, various bank- and country-specific characteristics were analysed to identify factors that amplify abnormal returns.

Nevertheless, there is a lack of research in the existing literature that specifically addresses the impact of Credit Suisse's failure on banking sector equities. While recent academic research has tended to focus on the impact of the Russia-Ukraine crisis and the collapse of Silicon Valley Bank on the financial markets, there is a noticeable gap in literature for the analysis of the impact of the Credit Suisse failure. However, recent studies use the event study methodology to analyse the influence of the Silicon Valley Bank collapse on global equity indices (Yadav et al., 2023; Pandey et al., 2023; Choi, 2023).

This study differs from previous studies by extending the empirical investigation to another systemically important institution within the banking sector - Credit Suisse - and by focusing on listed banks rather than using market indices, which allows for an analysis of bank-specific characteristics as valued by the market. The choice of the banking sector as the object of study is deliberate as it is consistent with the prevailing theoretical models of financial contagion and bank runs, which assume that the banking sector is the first and most affected sector after a bank failure (Allen and Gale, 2000). By applying an event study methodology on listed banks in Europe, this study finds a remarkable negative and statistically significant share price reaction that coincides with the announcement of the insolvency of Credit Suisse and its subsequent acquisition by UBS. In addition, this research provides important insights into the bank-specific characteristics that prove to be influential factors in the announcement of systemic bank failures in the banking sector.

The remaining paper is organized as follows: Section 2 explains the background of the study, including a literature review and an explanation of the event. Section 3 describes the methodology employed and the data used in this study. Section 4 deals with the presentation and discussion of the empirical results. Lastly, section 5 serves as a conclusion, summarising the implications and identifying future research directions.

2 Literature review

2.1 The failure of Credit Suisse Bank

Before its collapse, Credit Suisse was a systemically important bank, as it was part of the 30 banks worldwide that the Financial Stability Board - an international supervisory body - classifies as "too big to fail". These financial institutions are labelled as such due to the potentially devastating repercussions their insolvency could inflict upon the global economy as a whole (Luttmer, 2023).

Credit Suisse’s struggle to stay afloat already started several years ago with clients migrating their money due to a loss of trust in the bank. Numerous high-profile scandals exposed the bank's serious shortcomings, for example the failure to take action against client money laundering activities which resulted in billions of dollars in losses from the liquidation of the US hedge fund Archegos Capital Management (Larsen, 2023). Another example is the decision to use client funds to invest in the fraudulent financial firm Greenhill Capital and the bank's failed "tuna bond" project to finance a tuna fishing and marine safety project in Mozambique (Larsen, 2023). Consequently, Credit Suisse faced ongoing problems in recent years, characterised by unfavourable press coverage and financial losses, which was also reflected in a strong fluctuation in the value of its shares. The aim to keep the bank's existence intensified at the beginning of March 2023 when Credit Suisse was forced to delay the publication of its annual report after the US Securities and Exchange Commission raised questions about its cash flow statements going back three years (Smith, 2023). The next day Silicon Valley Bank collapsed, which had a significant impact on the share price of Credit Suisse, which fell by 30%, even though it seems that there was no systemic connection between those two institutions (Larsen, 2023). Credit Suisse released its belated report on the subsequent Tuesday, acknowledging the discovery of "material weaknesses" in the financial reporting processes for both 2021 and 2022. However, the report also affirmed the accuracy of the previously disclosed financial statements (Ray, 2023). Thus, the market reacted to this statement with a drop in the Bank’s share price by more than 5% on the same day (Walker, 2023). The negative development of the share price continued the next day when the Saudi National Bank - Credit Suisse’s largest shareholder with a 10-percent stake - announced that it would no longer support the bank financially. As a result, Credit Suisse's share price decreased by 24% in one single day, leading to a massive outflow of cash deposits from the accounts of Credit Suisse, the non-renewal of maturing term deposits and the reduction of credit limits for numerous trading counterparties (Meredith et al., 2023). However, on the same day, Credit Suisse announced its intention to secure up to CHF 50 billion in credit from the Swiss National Bank through a covered credit facility and a short-term liquidity facility. Furthermore, the Swiss National Bank not only lent money to the bank but also ensured that Credit Suisse was stable and would proceed with its banking business as usual (Lee, 2023). Consequently, the share price of the Credit Suisse recovered and experienced a significant upswing of 20%. However, this was not enough to prevent the outflow of funds, as customers continued to abscond the bank: An estimated USD 35bn was withdrawn in just three days (Larsen, 2023).

On March 20, Swiss regulatory authorities intervened by organising a rescue led by the larger Swiss bank UBS. In a transaction valued at $3.25bn, UBS took over Credit Suisse and absorbed $5.4bn in losses resulting from the liquidation of Credit Suisse's high-risk assets, including its derivatives contracts (Reid, 2023). The Swiss National Bank stated this takeover was a solution to secure financial stability and protect the Swiss economy (SNB, 2023).

This acquisition makes UBS the fourth largest bank in the world with assets under management totalling $5tn and 120,000 employees. To strengthen the Swiss banking system and protect the economy from a potential financial crisis, the merged entity is supported by the state and the central bank with over CHF 260 billion (USD 280 billion), which is equivalent to about one-third of Switzerland's total gross domestic product (Larsen, 2023).

2.2 Contagion Effects in the Banking System

Contagion effects within the banking sector are a key aspect of financial dynamics and reflect the interconnectedness and interdependence inherent in modern global economies. Moreover, the impact of such effects can pose significant risks to the economy given that banks play a crucial role in the operation of the financial system (Gobat, 2017).

The term “contagion” refers to the transmission of an impact or disruption from one firm to another. This phenomenon is often a domino-like chain reaction, where an effect or shock of one firm spills over to interconnected firms, creating a broader and interrelated pattern of influence across the affected economic landscape (Kaufman, 1994). Contagion effects result from the heterogeneous character of a bank's assets. Since these assets possess different characteristics, it can be costly for depositors to closely monitor them. In times of financial distress for a bank, depositors may prefer withdrawing their funds from the entire banking system instead of investigating whether the issues faced by one bank are widespread among others. As a result, the failure of a single bank can rapidly and significantly affect other banks (Kanas, 2005). Contagion effects can arise from unpredictable shocks that cause depositors to withdraw their funds, even in the absence of any fundamental change in the perspective of a bank. The beliefs of depositors regarding a specific bank's capability to fulfil its obligations can influence their expectations about the overall condition of the banking sector (Diamond and Dybvig, 1983).

In his paper “A Critical Review of contagion risk in banking” Hasman describes two explanations for the rationality of contagion: Informational and Linkage reasons. Considering the first approach for a contagion explanation, the negative information leading to a crisis in one institution also indicates unfavourable information about other institutions. This perspective emphasises the interconnectedness of core values between institutions and underlines the Bayesian learning process of rational actors (Chen, 1999). Moreover, Banks are non-transparent institutions, making it easy to believe information about other banks based on information about a single bank. Additionally, a crisis in one market prompts investors to reassess the risks related to investing in other markets, regardless of whether actual connections exist between these markets or institutions. This could lead to significant changes in asset prices, thereby potentially exerting a negative impact on the balance sheet of banks and overall stability within the banking system (Hasman, 2008). According to Chang and Velasco (2000), the trust of creditors is the most important value for a bank. If investors lose their confidence and trust, they will demand an immediate payment on their existing loans. In this case, the bank is forced to liquidate its investments prematurely and at a substantial loss.
The second approach to explaining contagion effects is the interconnectedness among financial institutions, which may arise from either portfolio linkages or balance sheet connections. In the age of globalisation, banks are closely interconnected through various channels, such as interbank lending, financial markets and shared economic exposures. When one institution is hit by a crisis or adverse event, it can quickly spread through these interconnected channels, affecting others (Upper and Worms, 2004). Thus, interbank linkages bring a risk of contagion. Referring to the views of Allen and Gale (2000), the structure of interbank markets and the pattern of financial linkages play a critical role in determining the extent and speed of contagion. As banks are interconnected through multiple channels, there are many potential pathways for the transmission of shocks. For example, interbank lending is an important link where distress in one bank can cause other banks to be reluctant to lend, creating a lending shortage that may affect the entire financial system (Hasman, 2023).

In the event of a financial shock, a bank tries to address its liquidity requirements by utilizing its deposits with other banks before liquidating its long-term assets. This strategy is based on the assumption that the premature liquidation of non-current assets is associated with significant costs, which may require the abandonment of otherwise profitable real investment projects or the interruption of long-term credit relationships. Instead of the premature liquidation of long-term assets in response to a liquidity shock, banks withdraw their deposits from other banks, thus spreading the liquidity shortfall across the financial system. Additionally, discussions on interbank linkages highlight the significance of "counterparty risk." When banks engage in financial transactions with one another, they become exposed to the risk that their counterparties may encounter financial difficulties. This aspect is particularly relevant in the context of contagion risk, as the distress of one bank may raise concerns about the financial soundness of its interconnected counterparties (Upper and Worms, 2004).

Banking contagion, arising from the assumption that if one bank is in trouble, other banks must also face difficulties, has been extensively explored in recent literature. Event studies using abnormal returns provide a strong methodology for analysing the impact of certain events on financial markets and therefore are widely used in financial research. The financial literature emphasises that bank failures can have a significant impact on both the banking sector and global share markets, causing disruption in the financial system and affecting depositor and investor confidence. Empirical studies, particularly those focussing on the Lehman failure, have highlighted the central role of uncertainty, information asymmetry and systemic contagion in the decline in the market value of other banks.

Johnson and Mamun (2012) identify various significant dates during the last months of Lehman Brothers' existence and examined the wealth effects encountered by shareholders of shares in other financial institutions. The authors find that after the collapse of Lehman Brothers, banks, primary dealers and brokerage firms were faced with significant negative repercussions. This led to a market panic that resulted in a significant sell-off in the share market and immense negative abnormal returns.

Hellwege and Zhang (2016) examine distressed financial firms and find that external spillover effects can arise through the contagion of counterparties as well as through information contagion. Furthermore, they also conclude that contagion effects are more pronounced for riskier companies and for larger and more complex exposures. Nevertheless, counterparty risks are low, particularly for banks that are subject to the diversification rules and generally do not lead to a cascade of defaults. However, information contagion exhibits greater strength among competitors operating in similar geographic regions and within the same industry. The contagion effect of information is most pronounced in samples with distressed companies, indicating that investors are aware of the information long before a bankruptcy event.

After Silicon Valley Bank collapsed, some researchers focused on studying this event and its impact on equity indices and share prices (Pandey et al., 2023; Yadav et al., 2023; Azimli, 2023). All studies consistently demonstrate a significant negative impact on market indices following the collapse of Silicon Valley Bank.

So far, there are only two papers that additionally investigate the failure of Credit Suisse and its impact on share prices. In his article, Martin (2023) analyses the short-term market reaction to the bankruptcy of Silicon Valley Bank and Credit Suisse in the European banking sector. He shows that equities reacted significantly negatively to these two bank failures. The author explains the general loss of value in the sector through systemic contagion, panic, information asymmetries and uncertainty returns. In addition, he analyses bank-specific characteristics and finds that liquidity, interest margin, risk aversion, operational efficiency and institutional ownership amplify these reactions. The other paper is by Goyal and Soni (2023) who analyse the impact of the acquisition of Credit Suisse by UBS on the Indian banking and financial services sector. Their empirical results indicate that the event had a heterogeneous impact on the share prices of Indian banks and financial services companies. In their study, they categorise banks into the public sector, the private sector, the entire banking sector and financial services companies. They find that the public sector, the entire Indian banking sector and financial services companies experienced significant negative impacts on selected days within the event window. In contrast, the Indian private sector banks proved to be relatively resilient and showed minimal impact. Additionally, the study also found that the Cumulative Abnormal Returns (CARs) were significantly affected by certain variables such as return on assets, working capital and market capitalisation.

3 Framework

Firstly, this chapter presents the underlying hypothesis of the study. Furthermore, it points out the data used as well as information about the source of data and a definition of the used variables. Additionally, this section describes the different methodologies of this research.

3.1 Hypothesis

This paper aims to analyse the reaction of bank share prices to the failure of a similar institution. The underlying assumption is that there is a correlation within the financial sector that leads to a potential decline in the market value of other banks due to the phenomenon of bank contagion. Based on the examination of the literature and the aim of this paper, the following hypotheses are formulated:

Null Hypothesis (H0): The failure of Credit Suisse did not have a statistically significant impact on the share prices of banks listed in Europe.
Alternative Hypothesis (H1): The failure of Credit Suisse had a statistically significant impact on the share prices of banks listed in Europe.

3.2 Data

The data used to perform the event analysis is on a daily frequency and is taken from Thomson Reuters Refinitiv Eikon. The data set consists of European banks' stock prices, the market returns' proxy as well as bank- and country-specific information. In this study, the STOXX Europe 600 Banks is used as the benchmark index. In cases where certain data points were not available, the annual financial statements of the respective bank were used as an alternative data source. The obtained dataset contained 134 banks from 21 countries. However, because of missing data, the final set is reduced to 112 banks from 20 different countries. A list with all banks included in the data set, can be found in Appendix 1. Table 1 shows the allocation of banks by country. As a result, Switzerland is the country most represented with 18 banks. To minimise possible distortions in the results due to currency risks (Irresberger et al., 2015), all accounting data is collected and presented in US dollars.

For the cross-sectional analysis, 4 bank-specific variables are used: Size, Profitability, Institutional Ownership and Leverage. The bank-specific variables are calculated from Q1 2023 accounting figures and were also obtained from the Thomson Reuters Refinitiv Eikon database. Table 2 presents a definition of the bank- and country-specific variables used for both cross-sectional analyses. The data for the country-specific analysis are taken from the World Bank database.

Table 1: Distribution of Banks by country

Country	#	Country	#
Austria	4	Netherlands	2
Belgium	2	Portugal	1
Croatia	1	Slovenia	1
Cyprus	2	Spain	6
France	16	Sweden	6
Germany	4	Estonia	2
Greece	6	Finland	5
Ireland	3	Lithuania	1
Italy	16	Switzerland	18
Malta	1	UK	15

This table presents the distribution of European listed banks by country. # denotes the number of listed banks by country.

3.3 Methodology

This section describes the research methodology used in the study, which includes both the event and the two cross-sectional analyses. The event analysis allows an investigation of the impact of the event on the share prices of European listed banks, while the cross-sectional analyses help to explore the intrinsic factors contributing to CARs. The analysis includes an assessment of both bank-specific and country-specific factors.

3.3.1 Event Study Methodology

In numerous recent studies, the event study methodology has been used to analyse the impact of various events on different financial markets. More specifically, the application of this methodology allows the assessment of the existence of abnormal effects on stock prices related to an unexpected event. It analyses whether returns deviate from what would be considered rational returns or theoretically derived appropriate returns which are normally based on a specific model. Given the limitations associated with analysing each event and the corresponding stock price individually, the focus is on quantifying the average and cumulative average abnormal returns (CAARs) of the stocks in the sample during the event. This approach aims to identify an overall effect (Khotari and Warner, 2006).

No standardised procedure exists for conducting an event study, but McKinley (1997) has introduced an approach that has since become widely adopted as a foundational Framework:

Firstly, it is essential to select the specific event of interest and the corresponding time period (event window) in which the returns are to be analysed. Secondly, a selection of companies is made and additionally criteria are defined to facilitate the inclusion of certain companies. Thirdly, the formulation and calculation of normal and abnormal returns (ARs) for each individual event is essential. Various models such as the market model or the Fama-French three-factor model can be used to calculate normal returns. Once the normal returns model is chosen, the definition of the estimation window becomes crucial. This window represents the time frame in which the parameters of the model are estimated. Normally, the estimation window precedes the event window to prevent the event from influencing the normal return model estimates. This is the fourth step. Subsequently, the ARs and CARs within the event window can be determined. The fifth step is to outline the testing framework for ARs and CARs, including defining the null hypothesis and determining methods for aggregating the ARs. Various parametric and non-parametric tests can be used to assess the statistical significance of ARs. However, the effectiveness of the test statistics depends on the characteristics of the data and deviations from the characteristics specified in the statistical theory may affect the reliability of the test statistics.

As in many other studies, the underlying event analysis follows the method of Brown and Warner (1985). The abnormal return results from the difference between the observed return of share i on day t and the expected normal return generated by the market model. The mathematical formula is expressed as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{1}$$

Where R_{it} denotes the return of security i at time t, Rm_t represents the market index on day t, and ε_{it} denotes the zero-mean disturbance term. αi, βi are the market model's parameters.

With the estimated market model parameters, it is possible to quantify and analyse abnormal returns. The abnormal return (AR_{it}) for a specific day 't' and a given stock 'i' within the sample is calculated by using the following equation:

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

where AR is the abnormal return, r is the actual return, and R is the calculated normal return. The normal return is calculated in the step before.

To measure the cumulative impact of the event over the entire event window and to fully assess the effect of the event, the CARs are calculated for a particular sample stock i. This calculation involves summing up the abnormal returns for all days within the event period. The mathematical expression for calculating the CARs is as follows:

$$CAR_i = AR_{it_1} + \cdots + AR_{it_2} = \sum_{t=t_1}^{t_2} AR_{it} \tag{3}$$

Assuming that the ARs are independent and identically distributed, the calculation of the equally weighted average abnormal return (AAR) over a period of one day for a sample of N companies is as follows:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \tag{4}$$

The equation for the cumulative abnormal return (CAAR) over a period of multiple days (t1, t2) for a sample of N firms is as follows:

$$CAAR_{t1,t2} = \sum_{t=t1}^{t2} AAR_t \tag{5}$$

According to MacKinley "It is typical for the estimation window and the event window not to overlap" (1997). Hence, t represents the event day, with an estimation window of 200 days from t-207 to t-8 and an event window of 11 days from t-5 (March 6, 2023) to t+5 (March 22, 2023), including the event day. The bank failure announcement is designated as t = 0. The actual event date is considered to be the 15th of March, as that was the date with the last negative announcements regarding Credit Suisse. Appendix 2 reports a summary of the events linked to Credit Suisse to better understand the dynamics of the contagion.

To test the statistical significance of each bank's abnormal return at every point in time, the ordinary t-test is used. For multiple-day periods, under the null hypothesis that assumes there is no event effect, the test is asymptotically distributed N(0,1) and is defined as:

$$t = \frac{AAR_t}{\left({\sigma^2}_{AAR_t}\right)^{0.5}} \tag{6}$$

where σ^2 is the variance of CAARs, estimated as:

$${\sigma^2}_{AAR_t} = \frac{1}{N^2}\sum_{i=1}^{N} \sigma^2_{AR_i} \tag{7}$$

3.3.2 Cross-sectional analyses

Furthermore, two different cross-sectional analyses were carried out to investigate the potential influence of various characteristics on the observed CAR. The aim is to identify the primary determinants that contribute to the observed changes in CARs of this analysis. Existing literature shows that some company- and country-specific variables influence event-induced abnormal returns (Martins et al. 2023; Pandey et al. 2023; La Porta et al. 2013).
For the first regression Size, Profitability, Institutional Ownership and Leverage are chosen as independent firm-specific variables.

Bank size is considered a standard bank-specific control variable and includes dimensions that may influence the bank's market power and financial performance. Titman and Wessels (1988) argue that larger firms tend to have more efficient business diversification practices and thus are less vulnerable to bankruptcy. However, Johnson and Mamun (2012) found that after the collapse of Lehman Brothers, there were significant fluctuations in share prices, especially for large banks.

Furthermore, Profitability is taken into consideration as a variable that can influence abnormal returns. As explained by Kang and Stulz (1997), the profitability of a firm is valued by investors because robust profitability indicators are seen as a reflection of efficient management. Therefore, it can be assumed that the negative impact on the share price of a highly profitable bank will be comparatively small.

Another independent variable is the Institutional Ownership. This variable characterises the proportion of the company held by institutional investors. This is a crucial aspect as institutional investors, who tend to be better informed, are less prone to impulsive and thoughtless actions than other market participants (La Porta et al. 2002).

The last independent variable is the bank's leverage. As investors often take a company's leverage ratio into account when analysing the company's risk tolerance, this factor can have an impact on investor perception and subsequently on the share price (Bhandari, 1988).

The following equation represents the first regression model:

$$CAAR_{iw} = \alpha + \beta_1 \, SIZE_{iw} + \beta_2 \, NIM_{iw} + \beta_3 \, INSTOWN_{iw} + \beta_4 \, LEV_{iw} \tag{8}$$

Here, β represents the coefficient associated with various factors, i stands for the firm, and w represents different event windows.

The second regression model follows the approach of La Porta et al. (2013). In their publication, the authors investigate the impact of securities laws on the development of the stock market. They find variables that can have an impact on stock market performance. The present analysis considers two of those independent variables: Market-Cap-to-GDP and the natural logarithm of GDP per capita. Additionally, the Z-Score is added as a third independent variable for this regression model (Pandey et al., 2023).

La Porta et al. (2013) include stock-market-to-GDP in their analysis as it is a key measure of stock market development. It reflects the breadth of the market as reflected by several listed companies and their valuation and therefore developed financial markets are reflected by a higher stock-market-capitalization-to-GDP (La Porta et al., 2013). Additionally, this variable is of great interest, as better investor protection is theoretically associated with both a higher number of listed companies and a higher valuation of capital (Shleifer and Wolfenzon, 2002). Thus, it is expected that countries with a higher stock-market-to-GDP ratio will experience less abnormal returns.

GDP per capita is often used as a measure of a country's economic development (Burger, 2019). A higher GDP per capita indicates a more developed and advanced economy with greater production and consumption capacities (Pandey et al., 2023). Economic development is often associated with capital deepening. In addition, wealthier countries may have higher overall institution quality, including better property rights and a stronger rule of law. Such attributes may be correlated with improved financial development, irrespective of the precise provisions of the laws (North, 1981). Consequently, a nation exhibiting a high GDP per capita is anticipated to encounter lower abnormal returns.

The last independent variable in this analysis is the Bank Z-Score. It computes the probability of default of a country's commercial banking system and thus serves as an indicator of the stability of the banking sector (Boyd and Runkle, 1993). Hence, a country with a high Z-score is perceived as a country with a stable banking sector, which leads to the expectation of lower abnormal returns.

Table 2: Description of Variables

Variable	Notation	Measure
Size	SIZE	Market capitalization in USD (natural logarithm)
Profitability	NIM	Net interest margin (in %), defined as net interest income divided by total assets
Institutional Ownership	INSTOWN	Percentage of stock that is in possession of institutional investors (%)
Leverage	LEV	Leverage ratio, defined as total debt divided by total equity
Stock Market Development	SMD	Market capitalization to GDP
Economic Development	ED	GDP per capita in USD (natural logarithm)
Stability of Banking Sector	ZS	Z-Score of banking sector

This table presents the definitions and notation of explanatory variables of Eq. (8) and Eq. (9).

The following equation represents the second regression model:

$$CAAR_{cw} = \alpha + \beta_1\, SMD_{cw} + \beta_2\, ED_{cw} + \beta_3\, ZS_{cw} \tag{9}$$

Here, β represents the coefficient associated with various factors, c stands for the country, and w represents different event windows.

4 Results

This chapter presents and discusses the results of both the event and the cross-sectional analyses.

4.1 Event study results

Figure 1 illustrates the trend of CAAR over the entire event window, spanning from five trading days before the event to five trading days after the event for the entire dataset. Even without going into the specific results of the event study, it is evident that the uncertainties in the financial landscape associated with the demise of the two banks had a negative impact on share prices. The chart provides a strong indication that the average returns of the sample in the five days before the event were significantly below expectations and showed considerable volatility.

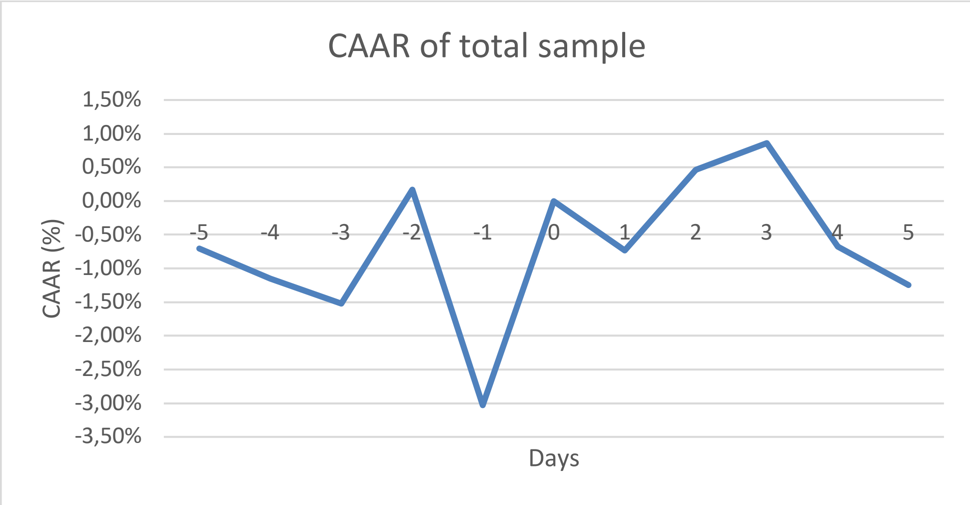

Figure 1: Cumulative Average Abnormal Returns of the total sample over the total event period

The results of the event study are presented in Table 3, outlining the results for each country for each day within the event window (t-5 to t+5). In Addition, Table 4 provides a breakdown of the results across various event windows, which include periods both preceding and following the event, as well as the overall event window.

Table 3 presents daily CAAR for each country along with their t-statistics throughout the event window based on the market model. While the results don't reveal statistically significant returns for the total sample on the event date, Greece stands out with significant negative abnormal returns. Conversely, Switzerland and Sweden exhibit positive abnormal returns, reaching significance at a 1% level. These nations experience notable increases in share prices, with AARs of 2.77% and 1.45%, respectively.

The days preceding the event show negative abnormal returns, particularly on t-3, where the results exhibit strong significance. The highest decline is recorded in Spain with a loss of -8.63%. Considering all banks in the sample, statistically significant negative abnormal returns can be observed for every day in the 5-day window before the event, except for t-2. The analysis shows that the market reacted strongly to this news with a CAAR of -1.53% on t-3 and -3.03% on t-1.

On the day after the event (t+1), nearly every country reports negative CAAR, except Estonia, Finland, Lithuania and the UK. The total sample records abnormal returns of -3,03%, which are significant at a 1% level. The days following the event (t+2, t+3) are characterised by positive, statistically significant abnormal returns. On t+4, t+5 the total sample again realises significant negative abnormal returns.

Table 3: Event study results daily:

Date	t-5	t-4	t-3	t-2	t-1	t	t+1	t+2	t+3	t+4	t+5
Austria	-0,010	-0,0183**	-0,0217**	0,005	-0,0412***	-0,005	-0,008	0,001	0,0175***	-0,007	-0,006
	(0,2679)	(0,0382)	(0,0218)	(0,6591)	(0,0000)	(0,6886)	(0,3618)	(0,9422)	(0,0467)	(0,4682)	(0,4694)
Belgium	-0,020	-0,021	-0,027	0,000	-0,021	-0,005	-0,020	0,006	0,007	-0,009	-0,011
	(0,2484)	(0,2347)	(0,1506)	(0,9877)	(0,2442)	(0,8251)	(0,2424)	(0,7329)	(0,6892)	(0,6162)	(0,5048)
Croatia	-0,002	-0,008	-0,006	-0,009	0,000	-0,002	-0,010	-0,001	-0,009	0,014	-0,0241*
	(0,8529)	(0,5305)	(0,6528)	(0,5698)	(0,9953)	(0,8942)	(0,4449)	(0,9295)	(0,4822)	(0,3251)	(0,069)
Cyprus	-0,013	-0,004	-0,0459***	-0,012	-0,016	-0,025	-0,019	-0,022	0,018	-0,0293*	-0,0499***
	(0,3338)	(0,7829)	(0,0023)	(0,4649)	(0,2511)	(0,1737)	(0,1713)	(0,1166)	(0,1875)	(0,0514)	(0,0004)
France	-0,005	-0,0106***	-0,0226***	0,0092**	-0,0383***	-0,006	-0,002	0,000	0,0083**	-0,007*	-0,002
	(0,2073)	(0,0042)	(0,0000)	(0,0381)	(0,0000)	(0,1894)	(0,5286)	(0,9348)	(0,0239)	(0,0772)	(0,6658)
Germany	-0,002	-0,0314***	-0,0634***	0,0197*	-0,0564***	-0,016	-0,0163*	-0,002	0,0419***	-0,0314***	-0,0259***
	(0,859)	(0,0006)	(0,0000)	(0,0679)	(0,0000)	(0,1781)	(0,0658)	(0,8114)	(0,0000)	(0,0015)	(0,0041)
Greece	-0,028	-0,0528***	0,022	-0,010	-0,019	-0,0454*	-0,019	0,005	-0,0752***	-0,015	-0,0452***
	(0,1157)	(0,0034)	(0,2391)	(0,6437)	(0,2873)	(0,0508)	(0,2051)	(0,7458)	(0,0000)	(0,3716)	(0,0034)
Ireland	-0,0322***	-0,0325***	-0,0637***	0,0333**	-0,0546***	0,011	-0,0325***	0,0328***	0,0454***	-0,012	-0,0318***
	(0,0052)	(0,0055)	(0,0000)	(0,017)	(0,0000)	(0,4613)	(0,0049)	(0,0063)	(0,0001)	(0,3181)	(0,006)
Italy	0,002	-0,005	0,004	-0,0132***	-0,0072*	-0,002	0,000	0,000	0,0085**	0,000	-0,0077*
	(0,6346)	(0,2294)	(0,3648)	(0,0083)	(0,0871)	(0,7577)	(0,934)	(0,9699)	(0,0398)	(0,9626)	(0,0592)
Malta	-0,033	0,011	-0,008	-0,011	0,035	-0,004	-0,002	0,002	-0,003	0,005	0,000
	(0,2995)	(0,7266)	(0,8135)	(0,7805)	(0,291)	(0,9334)	(0,9468)	(0,9607)	(0,9278)	(0,8829)	(0,9917)
Netherlands	-0,016	-0,0413***	-0,0576***	0,012	-0,1015***	0,013	-0,0261**	-0,001	0,0449***	-0,006	-0,0266**
	(0,2176)	(0,0019)	(0,0000)	(0,4591)	(0,0000)	(0,4598)	(0,0444)	(0,9485)	(0,0007)	(0,6525)	(0,0407)
Portugal	-0,007	-0,0377***	-0,086***	0,0305*	-0,0996***	0,0304*	-0,0385***	0,0286**	0,0502***	-0,001	-0,0297**
	(0,6021)	(0,0045)	(0,0000)	(0,0535)	(0,0000)	(0,075)	(0,0034)	(0,0348)	(0,0002)	(0,9432)	(0,0228)
Slovenia	-0,004	-0,005	0,000	0,009	-0,009	0,018	-0,019	0,014	-0,0479***	0,004	-0,007
	(0,7981)	(0,7301)	(0,9873)	(0,6294)	(0,5497)	(0,3643)	(0,2017)	(0,3607)	(0,0016)	(0,7874)	(0,6383)
Spain	-0,0129*	-0,0383***	-0,0863***	0,0296***	-0,0793***	-0,004	-0,032***	0,019**	0,0514***	-0,0206***	-0,0304***
	(0,078)	(0,0000)	(0,0000)	(0,0012)	(0,0000)	(0,7039)	(0,0000)	(0,0139)	(0,0000)	(0,0107)	(0,0000)
Sweden	-0,012	-0,0385***	-0,005	0,000	-0,0433***	0,0145***	-0,0233**	0,012	0,0186*	-0,015	-0,0239**
	(0,2089)	(0,0001)	(0,1087)	(0,8926)	(0,0000)	(0,0002)	(0,0144)	(0,233)	(0,052)	(0,1333)	(0,0123)
Estonia	0,004	-0,002	-0,0232*	0,0431***	-0,0408***	0,017	0,002	0,004	0,007	-0,007	-0,003
	(0,6609)	(0,8129)	(0,0968)	(0,007)	(0,0027)	(0,316)	(0,8827)	(0,7935)	(0,5928)	(0,6127)	(0,7997)
Finland	-0,0199***	-0,022***	0,004	-0,0564***	0,008	0,005	0,005	0,0385***	0,010	-0,0171***	-0,0287***
	(0,0064)	(0,003)	(0,6459)	(0,0000)	(0,2771)	(0,5957)	(0,469)	(0,0000)	(0,1767)	(0,0304)	(0,0001)
Lithuania	-0,0473***	0,0309**	-0,0545***	0,002	0,009	-0,019	0,009	-0,003	-0,005	-0,019	0,004
	(0,001)	(0,0314)	(0,0004)	(0,9025)	(0,5476)	(0,302)	(0,5424)	(0,8277)	(0,7393)	(0,2133)	(0,7604)
Switzerland	0,003	0,0061**	0,001	0,01***	-0,0472***	0,0277***	-0,002	0,0064*	0,0155***	-0,002	-0,003
	(0,2527)	(0,043)	(0,7377)	(0,0059)	(0,0000)	(0,0000)	(0,5039)	(0,0396)	(0,0000)	(0,4772)	(0,3232)
UK	-0,009*	0,0136**	0,0166***	0,011*	-0,004	0,008	0,005	0,005	-0,0147***	-0,014**	0,003
	(0,0975)	(0,0147)	(0,005)	(0,0911)	(0,4541)	(0,2441)	(0,3357)	(0,4193)	(0,0081)	(0,0183)	(0,5867)
Total	-0,007***	-0,0115***	-0,0152***	0,002	-0,0303***	0,000	-0,0073***	0,0046***	0,0086***	-0,0068***	-0,0125***
	(0,0001)	(0,0000)	(0,0000)	(0,4215)	(0,0000)	(0,9822)	(0,0000)	(0,0132)	(0,0000)	(0,0005)	(0,0000)

This table presents the event study results for the CAARs around the Credit Suisse downfall announcement to European listed banks on a daily basis. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. t-values are reported in parentheses.

In addition, an examination across various countries reveals that news contagion had different effects within different markets. Belgium, Croatia and Malta do not show any significant abnormal returns during the event window. This may be attributed to the fact that the banking sectors in these countries only have limited exposure to Credit Suisse, which minimises the impact of the event. Furthermore, it is noteworthy that the abnormal returns observed in the UK are only marginally significant and differ from the behaviour observed in the other countries from the sample. This may be due to a different law in the UK. In contrary to e.g. Spain, Italy, Germany or France, the UK possesses a common law. La Porta et al. (1998) document that countries with a common law have stronger rights of shareholders and creditors in general. Additionally, common law countries have a protective power on credits (Danisman et al., 2020). That may be the reason, why the UK does not show the same pattern of stock price behaviour as banks in other nations. However, in every other country, there is a significantly negative CAAR observed on at least one day within the three days prior to the event. As in the total sample, it should be noted that in the periods t+2 and t+3, a positive reaction can be observed in most of the countries. The statistical significance of these positive abnormal returns is evident in most countries. Nevertheless, almost every country shows negative abnormal returns on t+4 and t+5.

Table 4 offers CAARs for each country across different event windows. The total sample shows a CAAR of -5.86% for the entire event window. This result is statistically significant at a 1% level. Moreover, in this analysed window nearly every country shows negative abnormal returns, of which most are statistically significant. Greece shows the highest CAAR with -29.66%, followed by Cyprus and the Netherlands with -21.82% and -20.74%, respectively. Those abnormal returns are statistically significant at a 1% level. However, it is important to notice that over the entire considered period, Switzerland realises positive CAARs of 2.77%, which are statistically significant for an alpha of 1%. Furthermore, the (-2,2) window yields less significant results than the (-5,5) window.

The pre-event window demonstrates statistically significant negative CAARs at a significance level of at least 10%, except for five countries (Croatia, Malta, Slovenia, Estonia and the UK). Furthermore, the average of all CAARs in all countries is -7.13%. The post-event window (1,5) also realises negative returns for all nations in total. The CAARs of -1.66% are statistically significant at a 1% level. However, it is noteworthy that in this window more nations realise positive abnormal returns rather than negative. However, Greece shows very strong statistically significant negative CAARs of -16.39%.

Table 4: Event study results for different time windows

Date	CAAR(-5,5)	CAAR(-2,2)	CAAR(1,5)	CAAR(-5,-1)	CAAR(0,0)
Austria	-0,0937***	-0,0485**	-0,003	-0,0864***	-0,005
	(0,0056)	(0,0431)	(0,8871)	(0,0001)	(0,6886)
Belgium	-0,1212***	-0,040	-0,028	-0,0882***	-0,005
	(0,0673)	(0,3944)	(0,4782)	(0,041)	(0,8252)
Croatia	-0,059	-0,023	-0,031	-0,026	-0,002
	(0,2401)	(0,5273)	(0,3108)	(0,4216)	(0,8942)
Cyprus	-0,2182***	-0,0943**	-0,1022***	-0,0913***	-0,025
	(0,0001)	(0,0131)	(0,0015)	(0,0084)	(0,1737)
France	-0,0761***	-0,038***	-0,003	-0,067***	-0,006
	(0,0000)	(0,0002)	(0,7347)	(0,0000)	(0,1895)
Germany	-0,1828***	-0,071***	-0,034*	-0,1331***	-0,016
	(0,0000)	(0,0041)	(0,0958)	(0,0000)	(0,1781)
Greece	-0,2966***	-0,0856*	-0,1639***	-0,0873**	-0,0454*
	(0,0000)	(0,0756)	(0,0001)	(0,0469)	(0,0508)
Ireland	-0,1371***	-0,010	0,002	-0,1497***	0,011
	(0,0021)	(0,7485)	(0,9509)	(0,0000)	(0,4613)
Italy	-0,021	-0,0223**	0,000	-0,0196*	-0,002
	(0,1819)	(0,0467)	(0,9665)	(0,0551)	(0,7577)
Malta	-0,008	0,020	0,001	-0,006	-0,004
	(0,9477)	(0,8184)	(0,985)	(0,941)	(0,9335)
Netherlands	-0,2074***	-0,1044***	-0,015	-0,2049***	0,013
	(0,0001)	(0,0037)	(0,6108)	(0,0000)	(0,4598)
Portugal	-0,1597***	-0,049	0,010	-0,1997***	0,0305*
	(0,0016)	(0,1699)	(0,7475)	(0,0000)	(0,0751)
Slovenia	-0,047	0,012	-0,055	-0,010	0,018
	(0,3999)	(0,7591)	(0,1028)	(0,7934)	(0,3644)
Spain	-0,2039***	-0,0665***	-0,013	-0,1875***	-0,004
	(0,0000)	(0,0012)	(0,4463)	(0,0000)	(0,7039)
Sweden	-0,1332***	-0,028	-0,033	-0,1176***	0,017
	(0,0004)	(0,2844)	(0,1346)	(0,0000)	(0,1747)
Estonia	0,000	0,025	0,002	-0,019	0,017
	(0,9972)	(0,4814)	(0,9464)	(0,5489)	(0,316)
Finland	-0,0741***	0,000	0,008	-0,0868***	0,005
	(0,0081)	(0,9868)	(0,6411)	(0,0000)	(0,5958)
Lithuania	-0,0934***	-0,003	-0,014	-0,0601*	-0,019
	-0,084	(0,9385)	(0,6602)	(0,0871)	(0,3021)
Switzerland	0,0277***	0,016	-0,005	0,0147**	-0,0265***
	(0,0000)	(0,1659)	(0,5373)	(0,0336)	(0,0006)
UK	0,008	0,020	0,0249*	-0,016	0,0282**
	(0,2441)	(0,3299)	(0,0936)	(0,2)	(0,0391)
Total	-0,0586***	-0,0127***	-0,0516***	-0,0166***	0,0096***
	(0,0000)	(0,0091)	(0,0000)	(0,0001)	(0,0001)

This table presents the event study results for the CAARs around the Credit Suisse downfall announcement to European listed banks for 5 different time windows *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. t-values are reported in parentheses.

The results indicate that the time window before the event is particularly characterised by negative abnormal returns reflecting a period of negative news impacting the financial world, including the Silicon Valley Bank failure and revelations about Credit Suisse's anomalies in financial reports. Hence, it is expected that negative abnormal returns occur within the sample.

The two time frames around the event [(-5,5); (-2,2)] reveal a market reaction over a longer period. It is important to note that it is difficult to define a single day as an event day, suggesting that a wider time window needs to be considered for a comprehensive assessment of the long-term impact of the event on the share prices of the affected banks.

To summarise, the empirical results show that the challenges faced by Credit Suisse and its takeover by UBS had different effects on the share prices of companies in the European financial sector. While negative abnormal returns were predominantly observed during the dissemination of negative news about Credit Suisse, positive abnormal returns were observed after the announcement of the takeover by UBS. The extent of negative returns exceeded those of positive returns. The negative reaction of the stock market can be explained by the fact that the failure of banks can undermine the confidence of market participants in the solidity of the banking system, which can ultimately lead to depositors withdrawing their deposits and the panic and financial contagion spreading to other market participants in a domino effect (Kaufman, 1994). With those results, it is possible to say that the failure of Credit Suisse had a statistically significant impact on European banks and therefore H0 is rejected.

4.2 Cross-sectional analysis

Following the previous literature, the two cross-sectional analyses examine different variables to investigate the dynamics of event induced CAARs. These analyses are conducted in different event windows covering both pre- and post-event periods, i.e. (0, 0), (-5, +5), (-2, +2), (1, 5) and (-5, -1).

Table 5 shows results for the first cross-sectional analysis for each observed window, including t-statistics in parentheses for every observation and the adjusted R-square and F-statistics for each window. The time frame specifically analysing the event day shows a low R-squared. Based on this observation, it is advisable not to draw any final conclusions from this result. The remaining periods show positive R-squares larger than 13%, which indicates that the model effectively explains the fluctuations in the dependent variable.

The variable "Size" shows a statistically significant negative coefficient for the pre-event window (-5,-1). This goes in line with previous studies, which found that after a financial institution failed, larger banks were affected more than smaller ones (Johnson and Mamun, 2012). Thus, from the analysis of the variable “Size” it can be concluded that there is a negative influence on returns in the pre-event days. However, no statistically significant impact can be observed in any of the other windows. The coefficient associated with the variable “Profitability” is positive and statistically significant for three of the observed time windows, i.e. (-5,5), (-2,2), (1,5). Thus, it can be concluded that there is a positive correlation between bank profitability and abnormal returns. These results are in line with the literature, as Kang and Stulz (1997) found that investors generally favour companies with high profitability as they see this as an indicator of efficient management. could be found for the relationship between leverage and returns (Goyal and Soni, 2023).

Table 5: Bank-specific analysis results

			CAAR		
Variables	(0, 0)	(-5, +5)	(-2, +2)	(+1, +5)	(-5, -1)
SIZE	0.001	-0,005	-0,0014	0,005	-0,012**
	(0.443)	(0.459)	(0.670)	(0.158)	(0.017)
NIM	0.1348	2,5581***	1,247***	2,2264***	0.159
	(0.487)	(0.000)	(0.000)	(0.000)	(0.743)
INSTOWN	-0,009	-0,089	-0,015	-0,047	-0,032
	(0.532)	(0.107)	(0.560)	(0.091)	(0.396)
LEV	0,001	0.0064	0.0025	0.003	0.002
	(0.338)	(0.091)	(0.171)	(0.115)	(0.360)
Constant	-0,009	-0,068	-0,020	-0,044	0.009
	(0.594)	(0.535)	(0.507)	(0.034)	(0.826)
R Square	0.0210	0.2240	0.1612	0.3548	0.1320
F-statistics	0.8258	0.0001	0.0021	0.000	0.0066
# Obs.	112	112	112	112	112

This table presents the cross-sectional results for the CAARs around the Credit Suisse downfall announcement to European listed banks. The dependent variables are the banks' CAARs for five different time windows, calculated using the market model (MM). *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. t-values are reported in parentheses. # Obs. denotes the number of observations used in the estimation.

The variable “Institutional Ownership” shows a negative coefficient, which is not statistically significant for every observed period. This result differs from the existing literature, which has found a statistically significant impact of institutional ownership on returns (Boehmer and Kelley, 2009). However, this inconsistency can be explained by the fact that in the case of Credit Suisse, institutional investors may not have perceived an immediate threat, which led to a lack of reaction on their part. As for the proxy for bank leverage (debt-equity-ratio), the analysis shows a positive coefficient, but it does not reach statistical significance. This is partly consistent with the existing literature, in which some authors assume an impact of leverage on abnormal returns. Even in more recent work which analyse the impact of the Credit Suisse bankruptcy on equity markets, no statistical significance

Table 6 presents the results of the second cross-sectional analysis, which aims to identify country-specific variables that have an impact on abnormal returns.

The first variable analysed is "GDP per capita". Based on existing literature, it is assumed that a higher GDP per capita is associated with a lower incidence of negative abnormal returns. A high GDP per capita serves as an indicator for wealthier countries characterised by a higher overall institutional quality, which is reflected in improved property rights and respect for the rule of law. In this analysis, the coefficient for the variable "GDP per Capita" is consistently positive, except for the period covering only the event date (0,0). However, there is no statistical significance and consequently, no influence of GDP on share prices can be identified.

Table 6: Country-specific analysis results

	CAAR				
Variables	(0, 0)	(-5, +5)	(-2, +2)	(+1, +5)	(-5, -1)
SMD	0.006	-0,007	-0,018	-0,003	-0,010
	(0.536)	(0.901)	(0.471)	(0.894)	(0.809)
ED	0.010	0.035	0.019	0.034	-0,009
	(0.378)	(0.558)	(0.444)	(0.204)	(0.844)
ZS	0.018	0.026	o.oo7	0.101	-0,092
	(0.757)	(0.929)	(0.957)	(0.44)	(0.685)
Constant	-0,114	-0,478	-0,225	-0,398	0.033
	(0.336)	(0.438)	(0.414)	(0.150)	(0.943)
R Square	0.1845	0.03	0.0475	0.2106	0.042
F-statistics	1,210	0,165	0.27	1,420	0,230
# Obs.	112	112	112	112	112

This table presents the cross-sectional results for the CAARs around the Credit Suisse downfall announcement to European listed banks. The dependent variables are the banks' CAARs for five different time windows, calculated using the market model (MM). *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. t-values are reported in parentheses. # Obs. denotes the number of observations used in the estimation.

Concerning the proxy for the stability of the banking sector (Z-Score), the results show no evidence that there is any influence. In contrast to the remaining periods, the pre-event window exhibits a negative coefficient, though lacking statistical significance across all time windows. This differs from the existing literature, which assumes a positive influence of the Z-score on share prices (Pandey et al., 2023). The variable "Stock Market Development" shows the existence of a non-statistically significant effect of a developed financial market on the stock market returns. The literature states that a high stock-market-capitalization-to-GDP is theoretically associated with both a higher number of listed companies and a higher valuation of capital and therefore may have a positive impact on stock market returns.

5 Conclusion

The paper intends to explore the impact of the failure of Credit Suisse with the following acquisition by UBS on the banking sector in Europe. To this end, a comprehensive event study was conducted to assess the impact of a bank collapse on the share market performance of other financial institutions. In addition, to identify possible determinants of the achieved abnormal returns, two different cross-sectional regression models were conducted, one for bank-specific variables and one for country-specific.

The results of the study show that European listed banks experienced negative and statistically significant abnormal returns around the announcement date of the failure of Credit Suisse Bank. The event study results for the entire sample show a statistically significant negative market reaction during both the pre-event and post-event windows. This may be explained by investors' uncertainty and lack of confidence in response to adverse information, as well as the potential for systemic contagion leading to eventual panic among depositors and investors. Additionally, the failure of the Silicon Valley Bank contributes to a faster and more significant negative return in the days before Credit Suisse's failure. The results of this study also show that the agreement of UBS to acquire Credit Suisse had a positive impact on share prices. Thus, it is plausible to say that investors react to any news in the financial market.

The first cross-sectional analysis of CARs indicates that the size of the bank, measured by its market capitalisation, may have a negative impact on its abnormal returns. This would conclude that larger banks experience relatively smaller unexpected fluctuations in share prices. However, this observation is only significant in the pre-event period and therefore cannot be applied to the entire event window. Additionally, the study finds that a bank's profitability has a statistically significant positive impact on abnormal returns. In contrast, institutional ownership and leverage do not show any significant contribution to abnormal returns. The results of the second cross-sectional analysis display no country-specific variable, which may have an influence on share prices in the banking sector.

However, overall, the results seem to confirm that investors react to both positive and negative news, confirming a banking contagion. These results are consistent with previous studies that emphasize the contagion effects of insolvencies of large financial institutions (Diamond and Dybvig, 1983; Upper and Worms, 2004; Hasman, 2008). The observed statistically significant abnormal returns emphasise the importance of considering systemic risks and interdependencies within the banking sector. As financial markets continue to evolve and face new challenges, the implications of this research are important for policymakers, market participants and academics alike. The findings presented here highlight the need for vigilant risk management strategies and a nuanced understanding of the broader economic implications arising from the failure of major financial institutions.

The study encounters limitations, particularly in defining the day of the event, as the process of Credit Suisse's failure lasted several days. In addition, the collapse of another bank in the days immediately before the event had already disrupted the market, raising the possibility of a confounding effect. In addition, the small R-squared values in the country-specific analysis indicate that the model is not able to explain a significant part of the variation in the dependent variable. Moreover, the analysis used STOXX Europe 600 as a proxy for the market. This index only includes banks listed in EU and therefore excludes financial institutions in Switzerland and the UK. Thus, these results should be considered with caution.

Future research should consider extending the analysis beyond the European market to the global financial landscape. Given Credit Suisse's status as one of the largest banks in the world, such an extension would allow for a more comprehensive understanding of its impact on the global financial market. Furthermore, it is advisable to investigate alternative statistical tests to determine significance, as the current use of the t-test provides only a limited perspective. Diversifying the statistical approaches used would improve the robustness of the results. Additionally, future research should consider other country-specific variables for a better understanding and a more robust reasoning. On top of that, future analyses could use other models as a basis for the event study. For example, the Fama-French Three Factor Model could be used instead.

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Appendix

Appendix 1: Details of sample

Bank	Country	Bank	Country
Aareal Bank AG	Germany	Credit Agricole SA	France
ABN Amro Bank NV	Netherlands	Credito Emiliano SpA	Italy
Addiko Bank AG	Austria	Deutsche Bank AG	Germany
Aib Group PLC	Ireland	Deutsche Pfandbriefbank AG	Germany
Aktia Bank Abp	Finland	EFG International AG	Switzerland
Alandsbanken Abp	Finland	Erste Group Bank AG	Austria
Alisa Pankki Oyj	Finland	Eurobank Ergasias Services and Holdings SA	Greece
Alpha Services and Holdings SA	Greece	FinecoBank Banca Fineco SpA	Italy
Arbuthnot Banking Group PLC	UK	Graubuendner Kantonalbank	Switzerland
Attica Bank SA	Greece	Hellenic Bank PCL	Cyprus
Banca Generali SpA	Italy	HSBC Holdings PLC	UK
Banca IFIS SpA	Italy	illimity Bank SpA	Italy
Banca Mediolanum SpA	Italy	ING Groep NV	Netherlands
Banca Popolare Di Sondrio SpA	Italy	Intesa Sanpaolo SpA	Italy
Banca Profilo SpA	Italy	Julius Baer Gruppe AG	Switzerland
Banca Sistema SpA	Italy	Kbc Groep NV	Belgium
Banco Bilbao Vizcaya Argentaria SA	Spain	LHV Group AS	Estonia
Banco BPM SpA	Italy	Liechtensteinische Landesbank AG	Switzerland
Banco Comercial Portugues SA	Portugal	Lloyds Banking Group PLC	UK
Banco de Sabadell SA	Spain	Luzerner Kantonalbank AG	Switzerland
Banco di Desio e della Brianza SpA	Italy	Mediobanca Banca di Credito Finanziario SpA	Italy
Banco Santander SA	Spain	Metro Bank Holdings PLC	UK
Bank of Cyprus Holdings PLC	Cyprus	National Bank of Greece SA	Greece
Bank of Georgia Group PLC	UK	National Westminster Bank PLC	UK
Bank of Greece	Greece	Nationale Bank Van Belgie NV	Belgium
Bank of Ireland Group PLC	Ireland	NatWest Group PLC	UK
Bank of Valletta PLC	Malta	Nordea Bank Abp	Finland
Bankinter SA	Spain	Nordnet AB	Sweden
Banque Cantonale de Geneve	Switzerland	Norion Bank AB	Sweden
Banque Cantonale du Valais	Switzerland	Nova Ljubljanska Banka dd Ljubljana	Slovenia
Banque Cantonale Vaudoise	Switzerland	Oberbank AG	Austria
Barclays PLC	UK	Oma Saastopankki Oyj	Finland
Basellandschaftliche Kantonalbank	Switzerland	OSB Group PLC	UK
Basler Kantonalbank	Switzerland	Permanent TSB Group Holdings PLC	Ireland
Berner Kantonalbank AG	Switzerland	Piraeus Financial Holdings SA	Greece
BMonte dei Paschi di Siena SpA	Italy	Raiffeisen Bank International AG	Austria
BNP Paribas SA	France	Schweizerische Nationalbank	Switzerland
Bper Banca SpA	Italy	Secure Trust Bank PLC	UK
Bristol & West PLC	UK	Siauliu Bankas AB	Lithuania
Caixabank SA	Spain	Skandinaviska Enskilda Banken AB	Sweden
Cembra Money Bank AG	Switzerland	Societe Generale SA	France
Close Brothers Group PLC	UK	St Galler Kantonalbank AG	Switzerland
Commerzbank AG	Germany	Standard Chartered PLC	UK
Coop Pank AS	Estonia	Svenska Handelsbanken AB	Sweden
Cr Credit Agricole Mutuel Loire Hte Loir	France	Swedbank AB	Sweden
CRCAM Atlantique Ven	France	TBC Bank Group PLC	UK
CRCAM Brie Picardie	France	TF Bank AB	Sweden
CRCAM d'Ille-et-Vilaine	France	Thurgauer Kantonalbank	Switzerland
CRCAM de Normandie Seine SC	France	Unicaja Banco SA	Spain
CRCAM du Languedoc	France	UniCredit SpA	Italy
CRCAM Nord France	France	Valiant Holding AG	Switzerland
CRCAM Paris Idf	France	Viel et Compagnie SA	France
CRCAM Sud Rhone Alpes	France	Virgin Money UK PLC	UK
CRCAM Toulouse	France	VP Bank AG	Switzerland
Credit Agricole Alpes Provence	France	Zagrebacka Banka dd	Croatia
Credit Agricole du Morbihan SC	France	Zuger Kantonalbank	Switzerland

This table presents a list of all banks included in the sample.

Appendix 2: Table of events

Date	Event
2021	Bankruptcy of several investement funds that Credit Suisse was involved in
2022-09-28	The resignation of two senior executives from Credit Suisse was followed by an increase in the company's CDS spreads
2023-03-10	Collapse of Silicon Valley Bank
2023-03-14	Credit Suisse's Publication of financial report, identifyinf "material weaknesses"
2023-03-15	Saudi National Bank announces that it will not increase the Capital of Credit Suisse
2023-03-17	UBS agrees to acquire Credit Suisse
2023-03-19	Completion of acquisition process

This table provides an overview of the most important events to be considered in connection with the downturn of Credit Suisse (Source: Kraus and Some, 2023)