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THE MARKET'S REACTION TO THE BASEL IV ANNOUNCEMENT

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Abstract

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Stricter capital requirement for banks is one of the key measures to make the banking system more resilient and eventually counteract financial crises. Established by the Basel Committee on Banking Supervision (BCBS) since 1988, the Basel Accords are a series of regulatory acts of bank capital requirements. These accords, which require banks to keep a certain level and quality of capital, have become both recognized and criticized. However, BCBS continues to increase requirements on capital. In 2016 and 2017, the strictest version of the accords were announced through the establishment of Basel IV. While investigating the market movements triggered by Basel IV, this study examines the void of how stricter capital requirements impact banking performance with an event study methodology. The findings demonstrate a minor negative effect on banking performance during the announcement of Basel IV. However, the results do not yield any statistical significance, a result that could very well be an indication of the opaqueness of the capital requirement or simply because the market did already internalize the effects of Basel IV before the announcement.

Keywords: Capital Requirements, Basel, Banking Performance, Event Study

JEL Classifications: G14, G21, G28, G32

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Contents

List of Tables

List of Figures

1 Introduction

The repercussions of the 2008 financial crisis highlighted the importance of maintaining financial stability and the long-term negative spillover effects of banking crisis on the real economy. A key player in the maintenance of financial stability is the Basel Committee on Banking Supervision (BCBS), a non-supranational committee mandated to strengthen international banking practices and financial systemic stability. Since 1975, BCBS has continuously fulfilled its mandate by introducing several international regulatory frameworks. Its most notable work is the Basel Accords, which mainly emphasize quality and quantity of adequate capital, *i.e.*, capital requirements. In theory, capital requirements lower the probability of default in the banking sector by allowing the banks to absorb losses more efficiently while remaining balance-sheet solvent. Hence, better capitalized banks contribute to systemic stability. However, by endorsing this theory, the Basel Accords have become both acknowledged and criticized. Parallel to its development, the impact of the Basel Accords has continuously been revised, and findings show both supporting and contradicting evidence for capital requirements to counteract systemic vulnerabilities. Based on the wide amount of contradicting research, the topic of capital requirements has become profoundly opinionated, and literature has expanded into supporting either higher or lower capital requirements.

There is extensive evidence in favor of the hypothesis that higher capital requirements strengthens financial stability. For example, several studies find evidence to support that low levels of capital, and low levels of quality capital, are predeceasing several of the severest financial crises and economic downturns in history.[1] With lower levels of (quality) capital banks are less able to withstand financial shocks, and have less ability to extend credit. Moreover, by keeping more capital banks signal solvency making depositors, creditors and other counterparts less likely to panic and materialize their deposits and investments (Beltratti and Stulz, 2012; Coates, 2014). Another common argument relates to subsidization of systemically important banks with bailout schemes during financial shocks. If banks keep more capital they have more skin in the game and are less likely to take on excessive risk, hence, preventing the moral hazard issue inherent

[1] *E.g.* the Great Depression (Bernanke, 1983), the Japanese banking crisis in the 1990s (Peek and Rosengren, 2000), the Russian default in 1998 (Schnabl, 2012) and the financial crisis of 2007-2009 (Chodorow-Reich, 2014; Paravisini *et al.*, 2014)

in the too big to fail debate (Van Der Weide and Zhang, 2019). Finally, rooted in the Modigliani and Miller (1958) theorem, several authors argue that keeping more capital is not necessarily costly for banks as they should be able to attract less costly funding when better capitalized (Admati and Hellwig, 2013; Van Der Weide and Zhang, 2019).

For the many arguments, and ample evidence, in favor of stricter capital requirements for banks there is an equal number counterarguments and contradictory findings. For example, Gorton (2012) shows that there are in fact financial crises where the banking sector did not suffer from low levels of capitalization. In addition, with respect to investor influence, Bouwman, Kim and Shin (2018) show that informed investors with knowledge of highly capitalized banks in reality did not act on this information. Instead, the investors followed a pattern of "surprised investors", meaning that investors with knowledge of the banking sector's capital structure still mispriced the highly capitalized banks, and, did not act on this information during bad times. Relatedly, Van Der Weide and Zhang (2019) find that investors possess inadequate information to judge the solvency of the banking sector, and therefore, investors might run for any reason, leading to harmful and contagious effects. Finally, there is a persistent argument among bankers that keeping equity as regulatory capital is expensive. Due to numerous assumptions by Modigliani and Miller (1958) and their supporters, critics claim that the true climate of banking is not accurately described. Instead, in a non-idealized climate[2], keeping equity at a high level introduces significant economic costs (*e.g.* Elliott, 2013; Miles, Yang and Marcheggiano, 2013). Hence, capital requirements are argued to be unreasonably expensive and inefficient to function as a financial stabilizer. The same argument has also been supported in findings that capital requirements negatively affect loan growth (*e.g.* La Porta *et al.*, 1997; Van den Heuvel 2008; Elliott, 2013), which however also has been contradicted (Miles, Yang and Marcheggiano, 2013; Deli and Hasan, 2017).

Despite the ongoing debate, BCBS have continuously increased capital requirements since 1988, and, in 2016 and 2017, BCBS announced its new accord Basel IV. Basel IV will strengthen the capital requirements even further, demanding the banking sector to keep higher levels of capital than ever before (European Banking Authority [EBA], 2017). How-

[2]By including *e.g.* the tax-effect on debt payments, the jurisdictional protection of equity capital, and the inefficiency of raising equity capital.

ever, despite the ever-increasing literature on bank capital requirements, studies reliant on market data remain scarce. This study therefore aims to address this gap in the literature by analyzing the market movements, and hence, the impact on banking performance, triggered by the announcement of Basel IV. In so doing, this study joins the debate on capital requirement utility by investigating how higher capital requirements are received on an aggregated scale.

The findings of this study indicate a minor negative impact on banking performance during the Basel IV announcement. However, these results do not obtain statistical significance. It is therefore not possible to determine whether the Basel IV announcement is an impacting factor on banking performance at the time of its release. The findings are similar to Bouwman, Kim and Shin (2018), which is one of the few recent studies on market reaction to new regulations in banking. Due to the insignificant results, this study discuss if the results refers to methodological errors or if there are more systematic issues associated with market-based studies of the banking industry. The main conclusions relates to this latter discussion. First, it might be possible that the lack of statistical significance stems from the opaqueness of the capital requirement, *i.e.* the Basel Accords' complexity, which makes it difficult for the market to understand the Basel IV impact the immediate days after its release. Second, the chosen methodology and data is argued to be suboptimal for this study. Therefore, changing it might yield different results. At last, investors with insider information, or even the market itself, could potentially already have internalized the effects of Basel IV before the announcement. Hence, the future impact of Basel IV could already have been incorporated in the stock prices before the days of the event, which could explain the insignificant results.

The remainder of the thesis is organized as follows. First, the Purpose together with the Research Questions and Delimitations are outlined, followed by an introduction to the different Basel Accords in the section Regulatory Context. The Literature Review introduces earlier research on banking performance in regard to capital requirements, and the Methodology together with the section Data outlines the event study methodology and sample selection of this study. Lastly, Results and Analysis together with the Conclusion present the complete findings of the study.

1.1 Purpose

By examining market data, this study aims to measure how higher capital requirements, represented by Basel IV, impact banking performance. To accomplish this aim, this study first measures the aggregated effect on banking performance incurred by Basel IV, and second isolates the effect in an in-sample analysis in order to explain the impact. The impact of Basel IV on banking performance is captured through an event study examining the market movements triggered by BCBS's announcement of the new regulatory framework Basel IV.

Studies on Basel IV are very scarce, which is also true for event studies on market behavior regarding all of the previous Basel Accords. Thereby, this study contributes to the research on capital requirements by joining the debate through an unexplored quantitative strand of methodology focusing on banking performance. Thus, our research questions are defined as follows:

1.2 Research Questions

How does the announcement of Basel IV impact the performance of the banking sector?

How does the announcement of Basel IV impact the performance of different banks?

1.3 Delimitations

This section will briefly discuss the delimitations of the study. First, considering the nature of the Basel Accords, this study will exclusively examine how the announcement of Basel IV impacts the performance of the banking sector. Performance is measured through the return on stock prices, and the sampled banks are publicly traded banks. Second, considering the wide range of the Basel Accords, this study only considers the aspect of capital requirements in order to narrow the scope of the study. Last, the findings of this thesis are limited to the chosen time period of 1^{st} of January 2015 to 31^{st} of December 2018. The second research question will be answered through the use of different portfolios based on the characteristic of (i) size, (ii) profitability and (iii) business model. Hence, the result is limited to the chosen variables reflecting the characteristics in this study.

2 Regulatory Context

Before proceeding to the Literature Review, the Basel Accords will be presented to illustrate some of the key differences that is introduced in Basel IV, which could have an impact on the market value of banks.

2.1 Basel I, Basel II and Basel III

The first Basel Accord, Basel I, was introduced in 1988. It introduced a standardized approach of capital measurement system based on a weighted risk approach, which requires internationally active banks to keep minimum levels of capital (BIS, 2019; BCBS, 1988). This measurement system is built on (1) the quality of capital and (2) assessing the amount of minimum capital in relation to credit risk (BCBS, 1988). Further, Basel I introduced a capital ratio of 8%, which demands the banks to keep minimum 8% of their risk weighted assets (RWAs)[3] as regulatory capital. This capital ratio has remained through all of the Basel Accords. Basel I was revised in 2006 with the establishment of Basel II, which, in short, introduced more risk-sensitive requirements together with the internal-based (IRB) approaches to calculate minimum capital levels (BCBS, 2006). A fast and advanced amendment of Basel II was made in regard to the financial crisis, and the new version, Basel II.5, was announced in 2007 (BCBS, 2010). However, shortly after the establishment of Basel II.5, BCBS realized that a more extensive revision of Basel II was needed. In an attempt to increase the capital requirements even further, BCBS introduced Basel III in 2010 with two major changes. First, BCBS wanted to (1) increase the demand on banks to keep more core capital as equity capital, but also to sharpen the definition of what kind of equity capital the banks would be allowed to keep as core capital. Second, BCBS introduced a (2) measurement of regulatory capital regarding liquidity risk in addition to credit risk, market risk and operational risk (Hull, 2018; BCBS, 2010). However, even though continuous assessments and revisions of the Basel Accords had been made, substantial weaknesses in the international financial systems still remained even after Basel III (IMF, 2019). Therefore, BCBS also revised Basel III.[4]

[3]The RWAs are calculated as a fraction of the face value of the banks' liabilities. The different fractions are defined risk weights (RWs). The amount of RWA depend on what kind of item it is, as well as on which kind of method the bank is using to calculate the RWAs. Please see any of the regulatory texts for further details on the capital requirement equations.

[4]For more detailed information on all of the previous accords, please see the references for the full regulatory texts on Basel I, Basel II and Basel III.

2.2 Basel IV

In Basel III, the use of the IRB approaches of calculating regulatory capital granted the banks to keep less capital in contrast to the standardized methods introduced in the earlier accords (Elliot, Hedqvist, Nordström and Silén, 2019; Hull, 2018; BCBS, 2017; Resti, 2016). The banks had started to exploit this opportunity to keep lower levels of capital, which resulted in large variations in the banks' methods of calculating regulatory capital. Therefore, BCBS expressed the need to revise Basel III in order to restore credibility in the banking sector as well as in the different models of calculating RWAs (BCBS, 2017). The new amended version of Basel III was first announced on the 24^{th} March 2016, and then established on the 7^{th} December 2017. The revision is by BCBS referred to as "The Finalised Basel III Reforms". Henceforth, however, this study will refer to the new accord as Basel IV.

First, the Basel IV reform complements Basel III by: (1) correcting the earlier calculations of RWAs, (2) enhancing the robustness of the standardized approaches and (3) constraining the use of foundation-based IRB (FIRB) and advanced IRB (AIRB) approaches[5]. In order to execute these aims, new standards on how to calculate the IRB-models, along with new assigned risk weights (RWs) to calculate the RWAs in the standardized approach were introduced. Several areas where the IRB-approaches were allowed to be used, were now also completely abolished. Therefore, with the establishment of Basel IV, banks using any of the FIRB-approaches in these areas now need to revert to the standardized RW approaches instead (BCBS, 2017). Further, the RWs in the standardized models were also made to be more risk sensitive in Basel IV, and the use of external ratings were now not as important as in the previous Basel Accords (Elliot *et al.*, 2019). Second, Basel IV introduced output floors for the IRB-models in order to keep the banks from exploiting the models to minimize their regulatory capital. Together with the first amendments of the IRB-models, Basel IV now made it impossible for the banks using the IRB-approaches to fall below 72.5% of regulatory capital calculated from the standardized approach. Hence, banks using the IRB-approaches to a large extent which exploited the opportunity to keep

[5]These two approaches were firstly introduced in Basel II and has since then been revised continuously. Both the FIRB and AIRB approaches are built on advanced calculations, which grants the banks themselves to calculate several parameters to calculate the minimum capital requirements. However, banks using the AIRB approach have a greater freedom in calculating their own estimates of risk (BCBS, 2006). Please see the complete Basel IV accord in the references for more details on these approaches.

lower amount of regulatory capital, will now be forced to increase their capital levels. Also, the previous models of calculating operational risk in Basel III were now completely abolished and replaced by a standardized method of capital requirements (Elliot *et al.*, 2019; BCBS, 2017). Changes to the calculations of credit risks, market risks, operational risks as well as credit value adjustment (CVA)-risks[6] were added to the finalized reforms of Basel IV. For example, regarding credit risk, the banks using IRB-models and, hence, the banks calculating their own capital requirements, now have to subject to "input floors" in order to ensure minimum capital levels. Banks also need to become more transparent in their specification of calculations to their individual calculations. Further, it is not only for market risk, but all of the mentioned risk calculations have been constrained in their use of IRB-models (Phua, 2019).

Even though the capital ratio of $\geq 8\%$ still remained unchanged in Basel IV, BCBS introduced higher capital requirement through its heavy regulatory amendments. Basel IV is supposed to be implemented at the latest in 2027, but there are already several impact and assessment reports circulating on how Basel IV might impact the banking sector. For example, according to the Cumulative Impact Assessment conducted by the European Banking Authority (EBA) (2017), Basel IV will, in weighted average terms, increase the minimum capital requirements by 12.9% for European banks. Further, by only investigating the impact of changed credit risk, EBA (2017) find that the amendments of the IRB and standardized approaches alone will increase the required minimum capital in total Tier 1[7] with 4.3% and 1% respectively. The Basel IV reform can therefore be expected to increase the regulatory capital for the banking sector with a larger amount than ever before.

[6]Basel III introduced counterparty credit risk to its capital calculations. This regulatory demand forces the banks to calculate an amount of CVA, which is the expected loss due to counterparty default. Since it is possible for the CVA to change over time, now the banks are also expected to keep regulatory capital for CVA-risk (Hull, 2018). Please see the complete Basel III and Basel IV accord for more detailed information on CVA-risk.

[7]Tier 1 refers to the core capital in capital requirements, *i.e.*, the high quality capital. Please see any of the regulatory Basel texts in the references for more details on Tier 1 capital.

3 Literature Review

Despite not approaching any consensus, there is still one line of research which has been scarce in literature regarding capital requirements. This line of research refers to quantitative studies on market data. Modigliani and Miller (1963) introduced the relationship between bank capital and banking performance by mathematically finding that higher capital requirements lead to lower performance through the expression of Return on Equity (ROE). This negative relationship between equity capital and banking performance is also supported by Besanko and Kanatas (1996) who found falling stock prices as a response to forced recapitalization through higher capital requirements. Hence, banks with a defiance of capital when new capital requirements are introduced, face falling stock prices. Using an agency-model to examine this relationship, Besanko and Kanatas (1996) also found that the impact incurred on the banks through capital requirements are linked to the observable characteristics of size and ownership structure.

Equity capital adversely affecting banking performance and value has however been contradicted in previous findings. By examining how bank capital impacts the bank value in an acquisition's context, Mehran and Thakor (2011) found that equity capital has a positive impact on bank value. Controlling for ROE, Return on Asset (ROA), market capitalization and geographical location for both acquirer and target, Mehran and Thakor (2011) found that regardless how value is measured, value is increasing with higher equity capital in the cross section, shown through the finalization of the acquisition process. Bouwman, Kim and Shin (2018) also found evidence for such a relationship. By using three different trading strategies and controlling for the size of the banks by their amount of equity capital, Bouwman, Kim and Shin (2018) found that highly capitalized banks outperform banks with low levels of capital. Hence, banks with higher levels of capital face higher valued stock prices. However, this is only found to be true during bad times, no statistical significance was obtained during normal times.

In terms of the new characteristics of Basel IV and the earlier findings on capital requirements, what impact on banking performance can be expected from Basel IV? This question is both challenging and important, considering the extensive changes on earlier regulation, as well as the contradicting findings presented. Combining the new elements

of Basel IV together with earlier findings, might however provide with some possible indicators. For example, since Basel IV established the usage of standardized RW approaches to replace a larger extent of FIRB, the banking sector will certainly see an increase in their equity bank capital (EBA, 2017). The more risk sensitive RWs, the input floors and the increased transparency, also underline this change. In the light of Modigliani and Miller (1963), Basel IV will therefore theoretically confront the banking sector with a decrease in ROE. Considering ROE is one of the main performance indicators used in financial valuation, the theoretical future decrease of ROE might propose a signaling value to the market, affecting the stock prices of the banking sector negatively.[8] However, beyond the signaling value stemming from a future decrease of ROE, earlier research showing evidence on capital requirements hurting the economy (*e.g.* Gorton, 2012; Elliott, 2013; Miles, Yang and Marcheggiano, 2013; Van Der Weide and Zhang, 2019) as well as the contradicting evidence showing capital requirements ability to provide financial stability (*e.g.* Beltratti and Stulz, 2012; Chodorow-Reich, 2014; Paravisini *et al.*, 2014; Van Der Weide and Zhang, 2019) and better performance (Mehran and Thakor, 2011; Bouwman, Kim and Shin, 2018) might also have a similar signaling effect on future performance.

The impact on ROE, as well as the impact on performance, can however be expected to play out differently over the banking sector. Since the lesser use of FIRB will impact the smaller banks more heavily (*e.g.* BCBS, 2006; Hull, 2018), different sizes of banks, and different bank business models, as estimated by both Besanko and Kanatas (1996) and Bouwman, Kim and Shin (2018), can be expected to be impacted differently. Further, another effect possibly incurred by Basel IV applies on geographical aspects, since BCBS does not claim a supranational status (BIS, 2018). Hence, relying on the member countries to implement the regulations in accordance with their own rules and procedures might therefore prompt contrasting levels of implementation.

Hence, as discussed above, earlier proved characteristics together with the newly established elements of Basel IV might provide new findings on how higher capital requirements impact banking performance. New research on banking performance supplement earlier findings on the legitimacy of capital requirements, since it shows how capital requirements

[8]Please see Myers and Majluf (1984) on the reverse causality story generated by the pecking order argument.

are valued by the market. However, market data also have the potential to contribute through its assessment on an aggregated scale. Arguably, assuming an efficient market, the judgement of the market supplement the inference on capital requirements by showing an important intersection, meaning, the judgement of the market has the ability to show which signaling value is the strongest. Considering the large void in research on banking performance, no consensus in earlier research on capital requirements, and the striking importance of measures on financial stability, investigating market data in regard to new capital requirements seems highly relevant.

4 Methodology

To investigate the possible impact Basel IV might have on banking performance, this thesis employs an event study on how banks' share prices react to the announcement of Basel IV. The main focus is therefore put on analyzing the cumulative abnormal return (CAR), which is conducted in two separate parts. The first part analyzes the aggregated stock market's reaction on the announcement of Basel IV within the global banking sector, and the second part aims to isolate the potential effect by using a number of portfolios created by different categories. The same methodology is used to test the two separate parts. The statistical software used in this master thesis project is Stata.

4.1 The History of Event Studies

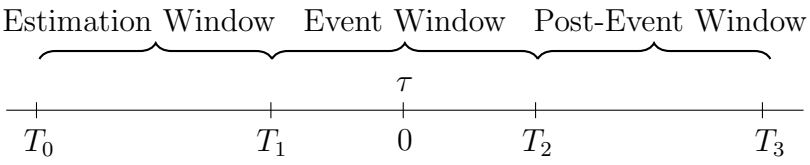
In the end of the 1960s, the cornerstones for the event study methodology used today was introduced by Ball and Brown (1968), and Fama *et al.* (1969). After the introduction of these studies, the methodology for event studies has only encountered minor changes (Binder, 1998). The event study methodology is commonly used in both finance and accounting research and is conducted in order to evaluate the effects on the value of firms from an economic event (MacKinlay, 1997). MacKinlay (1997) describes the event study methodology as useful since possible effects from an event will directly be incorporated in the security prices, given the assumption that financial markets are efficient.

4.2 The Design of the Event Study

An event study typically consists of three time periods; an estimation window, an event window and a post-event window, which is illustrated in Figure 1. $\tau = 0$ is the event date, which in this study represents the announcement of Basel IV. The announcement of Basel IV consists of two dates. The first event date is the 24^{th} of March 2016, which represents the day when BCBS published the first draft of Basel IV. The second event date is the 7^{th} of December 2017, which represents the release of the complete and final Basel IV. Therefore, each security has two event dates, where the aggregated effect from those dates are analyzed. The event window is defined as $L_2 = T_2 - T_1$, and abnormal returns are calculated using this period of time. In order to isolate the reaction on the stock market from the announcement of the implementation of Basel IV, the length of the event window

in this study is set to be 3 days, *i.e.* a 3-day window [-1;1] immediately surrounding the event date (τ). Even though the event occurs on a single day, it is common to set the event window to be larger than one day. This makes it possible to capture the price effects that happen after the closing of the stock exchange on the announcement days (MacKinlay, 1997). Lastly, the length of the estimation window is defined as $L_1 = T_1 - T_0$, where it is common that the estimation window and the event window do not overlap. The estimation window is used for estimating the parameters for the market model, which will be described in more detail later in this section. The estimation window in this thesis is set to be 250 days prior to the event window, as in line with MacKinlay (1997). Lastly, a post-event window can be defined in order to analyze the effects further. This thesis does however not apply a post-event window.

Figure 1: Timeline Event Study



Furthermore, by following the event study methodology described by MacKinlay (1997), the length of an observation interval is specified. The observation interval used in this study is one day, and thus the collected data contains daily stock returns.

4.3 The Procedure of the Event Study

The methodology for this event study is based on the market model advocated by Brown and Warner (1980, 1985). The authors conclude that the market model is a suitable model for event studies as the model operates well and is powerful under various conditions. The methodology for the event study in the paper by MacKinlay (1997) is also founded in the market model. The market model is a statistical model which is used for calculating the normal return of a given security by relating the return of any given security to the return of the market portfolio (MacKinlay, 1997). For a given security i, the market model looks as follows:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \epsilon_{i,t} \tag{1}$$

$$E(\epsilon_{i,t} = 0) \qquad var(\epsilon_{i,t}) = \sigma^2_{\epsilon_i}$$

where $R_{i,t}$ represents the return for security i under period t while $R_{m,t}$ is the return for the market portfolio, represented by S&P500 Index in this thesis, under period t. $\epsilon_{i,t}$ is the zero mean disturbance term, *i.e.* the error term. Lastly, OLS regression will be used to estimate the parameters α_i, β_i and $\sigma^2_{\epsilon_i}$ of the market model for security i. As mentioned before, the estimation window is used for estimating the market model parameters. Next, expected returns are calculated using formula (16)

$$\hat{R}_{i,\tau} = \hat{\alpha}_i + \hat{\beta}_i R_{m,\tau}. \tag{2}$$

Given the calculated expected returns, abnormal returns are calculated for security i by taking the difference between the actual return, $R_{i,t}$, and the expected return, $\hat{R}_{i,t}$,

$$AR_{i,\tau} = R_{i,\tau} - \hat{\alpha}_i - \hat{\beta}_i R_{m,\tau} \tag{3}$$

where the event window is used when calculating the abnormal return. Further, the abnormal returns are aggregated in order to draw a general conclusion for the event considered in this study, *i.e.* the announcement of the regulatory framework Basel IV. The formula used for aggregating the abnormal returns for the individual security i for any interval (τ_1, τ_2) is

$$CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i,\tau}. \tag{4}$$

$\widehat{CAR_i}$ is the cumulative abnormal return (CAR) for each individual security from τ_1 to τ_2 where $T_1 < \tau_1 \leq \tau_2 \leq T_2$. According to MacKinlay (1997), the abnormal return observations should be aggregated not only through time, but across observations as well. In order to aggregate the CARs across securities, the following formula is used

$$\overline{CAR}(\tau_1, \tau_2) = \frac{1}{N} \sum_{i=1}^{N} \widehat{CAR}_i(\tau_1, \tau_2) \tag{5}$$

Lastly, in order to test if the Basel IV announcement has a significant impact on the stock returns, the null hypothesis is derived by using the z-value represented by the parameter θ. The formula for testing if the CAR significantly differs from zero is:

$$\theta_1 = \frac{\overline{CAR}(\tau_1, \tau_2)}{var(\overline{CAR}(\tau_1, \tau_2))^{1/2}} \sim N(0,1) \tag{6}$$

where the variance is defined as

$$var(\overline{CAR}(\tau_1, \tau_2)) = \frac{1}{N^2} \sum_{i=1}^{N} \sigma_i^2(\tau_1, \tau_2). \tag{7}$$

If the null hypothesis that the $\overline{AR}s$, and hence, $\overline{CAR}$, is equal to zero is rejected, it can be concluded that the announcement of Basel IV has a statistically significant impact on banking performance. Hence, if the z-test obtains significant results, the conclusion can be drawn that the announcement of Basel IV had an impact on the stock prices of the sampled banks during the time of the chosen event window. To reject the null hypothesis that the $\overline{AR}$s are equal to zero, the z-value has to lie outside of the critical regions of the test; z = ± 2,575 for α 1%; z = ± 1,96 for α 5%; and z = ± 1,645 for α 10% (McWilliams, Siegel and Teoh, 1999).

5 Data

In order to provide further insight of the chosen methodology, this section outlines the sample selection process together with the characteristics of the chosen variables and created portfolios.

5.1 Sample

The sample is collected from Bloomberg Terminal using different criteria. The requirements chosen are (i) no geographical delimitation, (ii) publicly traded banks and (iii) available data from 1^{st} of January 2015 to 31^{st} of December 2018. The specified timeline is chosen in order to construct a viable event-study design, as described by MacKinlay (1997), and to perform proper robustness tests, which will be further described in later sections. Using the criteria led to the final sample of 914 banks. The scope of this thesis does not cover country-specific differences, but the geographical distribution is presented in Table 10 in Appendix A for further clarification. Of 914 banks, 429 banks are from the US, making it the largest geographical group.

The daily stock return data of the sample is collected from Bloomberg Terminal using the adjusted stock price return for each trading day. The choice of using daily stock returns is in accordance with the findings of Morse (1984), who found that daily stock prices is preferable in event studies since it produce stronger statistics for abnormal returns. It is also based on MacKinlay's (1997) methodology of observation interval.

5.2 Variables

In order to conduct the in-sample analysis, additional variables beyond daily stock return are collected. Since the changes introduced by Basel IV might impact banks differently, variables representing size, profitability and business model of the banks are sampled. There are several theories on how to measure size of firms from different sectors, namely organizational, technological and institutional theories (Kumar, Rajan and Zingales, 1999). This study does not cover the scope of these theories but will however refer to them to motivate the chosen in-sample variable of size. Based on the organizational and technological theory, quantity of physical assets can be exerted to represent

the size and character of a firm. It has therefore become common to use sales and total assets as a measure of size as a characteristic of a firm (Kumar, Rajan and Zingales, 1999). Since this study examines the banking sector, Total Assets is therefore sampled to represent a size characteristic. Further variables capturing other characteristics of the banks are also collected. First, ROA, as a simple measure of profitability is collected on a daily basis for the total sample. Second, a ratio representing the business model of the banks is sampled. As with the size of firms, there are also many suggested ways on how to categorize the banking sector in different business models based on financial statements. One suggestion is the Net Interest Income (NII) and Net Banking Income (NBI) ratio (Roengpitya, Tarashev and Tsatsaronis, 2014), which is sampled for this study. In short, this ratio determines whether a specific bank is an investment oriented, universal or lending oriented bank based on the bank's amount of net interest income in relation to its net banking income. Classifying the banking sector in such a way has however also been criticized, since the banking sector has evolved broad characteristics and non-clearly separable business models (Mergaerts and Vander Vennet, 2016).

Hence, three variables representing (i) size, (ii) profitability and (iii) business model of the banks are sampled. The choice of isolating the effect on different kind of characteristics is in line with, and inspired by, the study of Bouwman, Kim and Shin (2018), who used capitalization as a measure of size to isolate the effect of higher capital requirements on banking performance. Lastly, the S&P 500 Index is sampled to represent the market index. An overview of all the collected variables can be seen in Table 1.

Smaller corrections are applied to the data set, to make the data more usable in the study, and the first correction is missing values. The choice of strategy for managing missing values is discretionary and missing values can be handled by using various methods. This thesis employs a method where the missing values are replaced by that variable's mean value. Another aspect to consider when cleaning the data are outliers. Outliers can have a large effect on the future analysis and therefore, it is of high importance to adjust the data for outliers. In this study, the data set is adjusted so the 1% highest and 1% lowest values, *i.e.* the extreme values, for each variable is replaced by the next value counting inwards from the extremes.

Table 1: Definition of Variables

Name of Variable	Definition
Dependent Variables	
Daily Stock Return	Last stock return each trading day. Dividend adjusted.
In-Sample Variables	
Total Assets	Total assets reported in MUSD.
Return on Assets (ROA)	Net Income / Total Assets.
(NII/NBI)	(Net Interest Income/Net Banking Income)
Proxy Variable	
Market Index	S&P 500 Index

Table 2 presents the summary statistics for all of the collected variables. As seen on the large standard deviation and large difference between the median and mean, Total Assets is positively skewed. Hence, the sample covers a wide range of different sizes of banks, but it also shows that it is skewed towards smaller banks. However, it should be noted that the smallest banks are excluded per definition since they are not public. This Further, the range between the max and min values of (NII/NBI) also show that the sample cover different business models of banks. However, independently of bank size and business model, the profitability measure ROA does not have a skewed distribution.

Table 2: Summary Statistics

Variable	N	max	min	mean	median	sd
Dependent Variables						
Daily Stock Return[a]	953302	8.05	-8.06	0.03	0.00	2.11
In-Sample Variables						
Total Assets[e]	953302	2097800.00	184.68	97430.83	8381.00	298957.60
ROA[b]	953302	3.67	-1.60	0.94	0.93	0.72
(NII/NBI)[c]	953302	158.06	8.54	83.90	85.39	0.31
Proxy Variable						
S&P500[d]	953302	2.12	-2.70	0.03	0.04	0.82

[abcd] Values in percent. [e] Values in MUSD.

5.2.1 Portfolios

In order to conduct the chosen methodology, and to properly conduct the in-sample analysis, in-sample portfolios are created. The basic concept of creating different portfolios stems from the methodological aim of isolating the effect and answering the second research question, since it enables an in-sample analysis rather than an aggregated analysis. Constructing portfolios enables analyzing stock performance between the different categorized banks during the event. Hence, it makes it possible to examine how banks within the different categories perform during the announcement dates of Basel IV. First, the portfolios are created based on different categories. These categories are the independent in-sample variables sampled for characteristics; Total Assets, ROA and (NII/NBI). The Total Asset and ROA portfolios are divided into two portfolios for each category. For both categories, the separation is made at the median of the variables. Hence, one portfolio contains 50% of the values, which are the lowest values, and the other portfolio 50% of the other half of the values, *i.e.*, the largest values of the variable. The (NII/NBI) portfolio is divided into three different portfolios in order to separate the investment oriented, universal and lending oriented banks. The portfolio of the investment-oriented banks contains the (NII/NBI) values of <60%, the portfolio of the universal banks contains the (NII/NBI) values between 60% and 80%, and the third portfolio of the lending-oriented banks contains the (NII/NBI) values >80%. This sectioning yields seven different portfolios, which are presented in Table 3.

Table 3: Definition of Portfolios

Portfolio Category	Definition
Low Total Assets	50% of the smallest values of Total Assets
High Total Assets	50% of the largest values of Total Assets
Low ROA	50% of the smallest values of ROA
High ROA	50% of the largest values of ROA
Low NII/NBI	Ratio $< 60\%$; investment-oriented banks
Middle NII/NBI	Ratio between 60-80%; universal banks
High NII/NBI	Ratio $> 80\%$; lending-oriented banks

6 Results and Analysis

This section provides an overview of the results. Firstly, the aggregated result is outlined, which answers the first research question; "*How does the announcement of Basel IV impact the performance of the banking sector?*". Secondly, the in-sample result is presented, which answers the second research question; "*How does the announcement of Basel IV impact the performance of different banks?*". All of the results presented in this section are found using a $[-1; 1]$ 3-day event window and 250-day estimation window.

6.1 Research Question 1

The aggregated banking performance, measured by $\overline{CAR}$, of the complete sample during the event window is presented in Table 4. The result shows a minor negative effect on banking performance during the time of event by -0.9%. However, as can be seen in Table 4, the result cannot be statistically supported. Further, while the estimation of CAR is relatively large, and given that there is no mistake in the estimation (all codes have been double-checked and t-tests have also been performed with similar results), the insignificant results may stem from a non-normal distribution of CAR. The banking industry is characterised by extremely unbalanced distribution of total assets, returns, *etc.*, and by a few very large systemically significant banks, which could contribute to non-normality of data and potentially drive the insignificance of our results.

Table 4: $\overline{CAR}$ of the Sample with 250 Days Estimation Window

Event Window	$\overline{CAR}$ (%)	z-value
$[-1; 1]$	-0.9001 (0.1689)	-0.102

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

In Table 5, the $\overline{AR}$s of the sample are presented for each day during the event window. $\overline{CAR}$ for one day is $\overline{AR}$, and $\overline{AR}$ will therefore be stated throughout this paper when the results for one day are reported. The $\overline{AR}$ shows a minor negative effect on each day, with the largest negative impact on banking performance on the event days, showing a decrease of -0.3464% for the aggregated sample. This effect can also be seen in Figure 2. However,

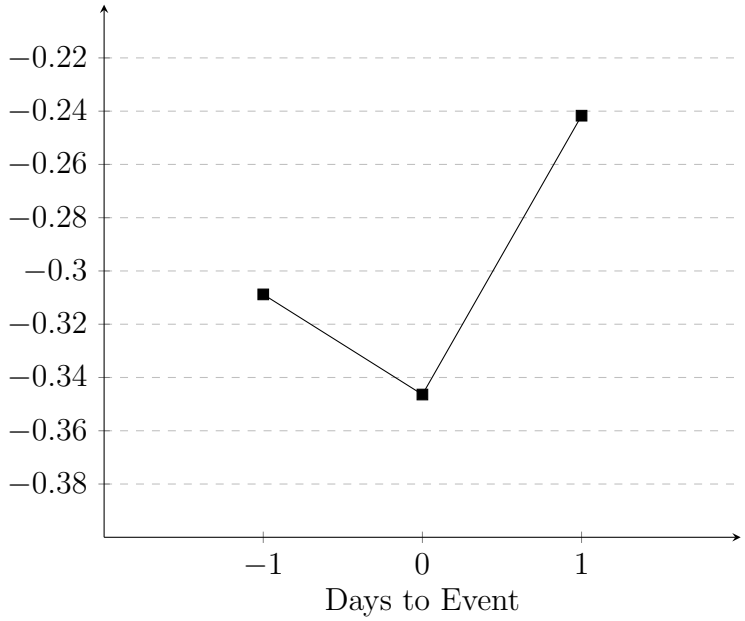
these findings also do not obtain any statistical significance. Thus, the aggregated results are not able to answer how the announcement of Basel IV impacts the performance of the banking sector, where banking performance is measured in abnormal returns. These results are in line with the efficient market hypothesis (Fama, 1970), which states that no abnormal returns can be obtained since all stocks are correctly priced with all available information incorporated in the stock price.

Table 5: $\overline{AR}$ of the Sample with 250 Days Estimation Window

Days to Event	$\overline{AR}$ (%)	z-value
(-1)	-0.3088 (0.0663)	-0.089
(0)	-0.3464 (0.0682)	-0.097
$(+1)$	-0.2417 (0.0666)	-0.070

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Figure 2: $\overline{AR}$ of the Sample with 250 Days Estimation Window



6.2 Research Question 2

The portfolio specific banking performance, measured by $\overline{CAR}$, is presented in Table 6. The result shows a minor negative effect over the chosen event window. The largest effect is captured in the High Total Assets portfolio, showing a decrease of -1.6348%. The smallest effect is obtained by the Low Total Assets portfolio, showing -0.2294%. The second largest effect is captured by the Low ROA portfolio of -1.5002%, and the second smallest effect is obtained by the High ROA portfolio with a decrease of -0.6702%. For the different portfolios of (NII/NBI), the universal banks show the largest negative effect of -1.1243%, followed by the investment banks of -0.8126% and lastly the lending-oriented banks of -0.7819%. As with the above presented results, none of the values in Table 6 obtain any statistical significance.

Table 6: $\overline{CAR}$ of the Portfolios with 250 Days Estimation Window

Portfolio	Event Window	$\overline{CAR}$	z-value
Low Total Assets	$[-1;1]$	-0.2294 (0.2322)	-0.026
High Total Assets	$[-1;1]$	-1.6348 (0.2468)	-0.182
Low ROA	$[-1;1]$	-1.5002 (0.2342)	-0.176
High ROA	$[-1;1]$	-0.6702 (0.2393)	-0.074
Low (NNI/NBI)	$[-1;1]$	-0.8126 (0.2284)	-0.111
Middle (NNI/NBI)	$[-1;1]$	-1.1243 (0.1247)	-0.221
High (NNI/NBI)	$[-1;1]$	-0.7819 (0.1431)	-0.078

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Similar to the $\overline{CAR}$ results are the portfolio $\overline{AR}$ results. These results are presented in Table 7 to Table 9. The largest negative impact is found in the High Total Asset portfolio on the event day with a decrease of -0.6890%. The smallest negative effect is captured by the Low Total Asset portfolio the day after the event, with a decrease of -0.0009%. The $\overline{AR}$s over the event window are depicted in Figure 3. Once again, no statistical signifi-

cance is reached for any of the portfolios, over any given day in the chosen event window. Consequently, the in-sample findings cannot answer the second research question about how the announcement of Basel IV impacts the performance of different banks. The portfolios were created in order to analyze how banks categorized after a low amount of Total Assets, a high amount Total Assets, a low ROA, a high ROA and low, middle and high levels of NNI/NBI performed. However, as no statistical significance was reached for any of the portfolios' results, this analysis cannot be conducted.

Lastly, since the results did not obtain statistical significance, the results can neither support nor reject the legitimacy of capital requirements. Hence, the discussion about the research questions cannot be further developed from these results, instead, the possible explanations for the insignificant results will be discussed in the section General Discussion.

Figure 3: $\overline{AR}$ of the Portfolios with 250 Days Estimation Window

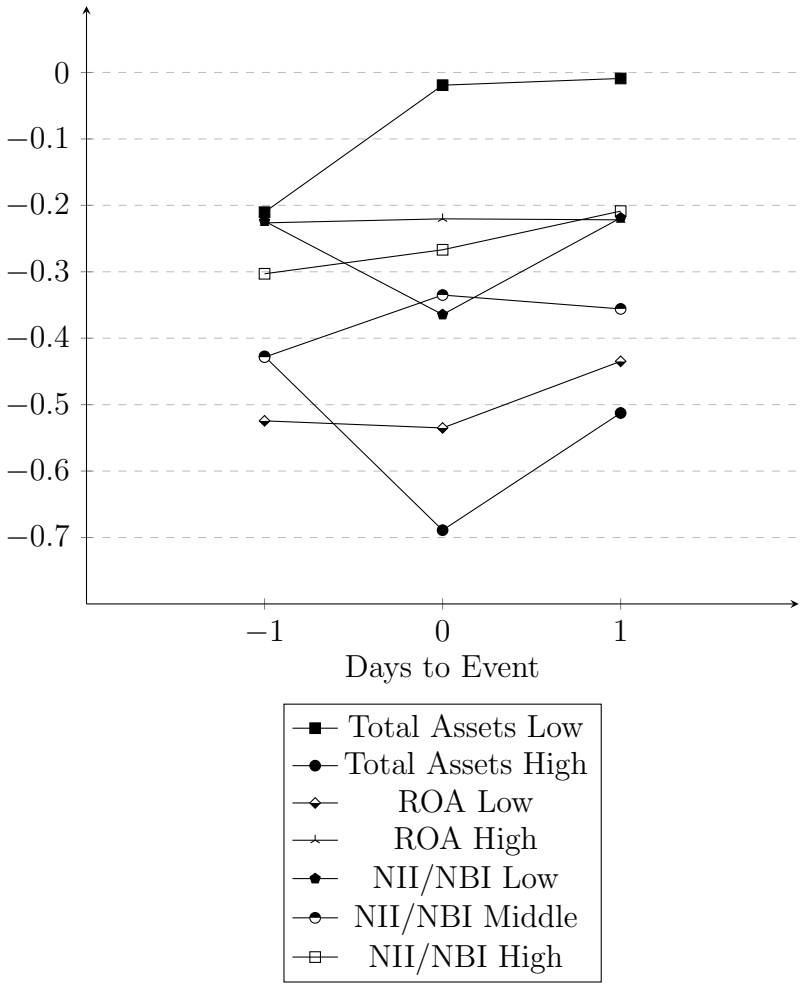


Table 7: $\overline{AR}$ of the Total Assets Portfolios with 250 Days Estimation Window

	Low Total Assets		*High Total Assets*	
Days to Event	$\overline{AR}$(%)	z-value	$\overline{AR}$(%)	z-value
(-1)	-0.2103 (0.0972)	-0.056	-0.4273 (0.0918)	-0.127
(0)	-0.0191 (0.0931)	-0.006	-0.6890 (0.0995)	-0.193
(+1)	-0.0009 (0.0923)	-0.001	-0.5126 (0.0970)	-0.146

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 8: $\overline{AR}$ of the ROA Portfolios with 250 Days Estimation Window

	Low ROA		*High ROA*	
Days to Event	$\overline{AR}$(%)	z-value	$\overline{AR}$(%)	z-value
(-1)	-0.5244 (0.0913)	-0.151	-0.2264 (0.0957)	-0.049
(0)	-0.5351 (0.0978)	-0.154	-0.2203 (0.0939)	-0.052
(+1)	-0.4348 (0.0958)	-0.120	-0.2218 (0.0928)	-0.048

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 9: $\overline{AR}$ of the (NII/NBI) Portfolios with 250 Days Estimation Window

	Low (NII/NBI)		*Middle (NII/NBI)*		*High (NII/NBI)*	
Days to Event	$\overline{AR}$(%)	z-value	$\overline{AR}$(%)	z-value	$\overline{AR}$(%)	z-value
(-1)	-0.2238 (0.1485)	-0.077	-0.4285 (0.0918)	-0.210	-0.3030 (0.0972)	-0.075
(0)	-0.3644 (0.1722)	-0.133	-0.3350 (0.0982)	-0.156	-0.2669 (0.0988)	-0.066
(+1)	-0.2189 (0.1636)	-0.077	-0.3559 (0.0955)	-0.149	-0.2087 (0.0986)	-0.051

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

6.3 Robustness Tests

The robustness methodology used in this study is based on the alteration of both the estimation window and event window. To investigate if an alteration to the chosen event methodology increases the accuracy of the sampled returns, several robustness tests are therefore conducted. First, alterations of the estimation window are made by decreasing the baseline estimation window from 250 days to 200, 150 and 100 days. Secondly, the event window is increased from the baseline window of $[-1; +1]$ 3 days to $[-2; +2]$ 5 days and $[-5; +5]$ 11 days when using 250, 200, 150 and 100 day estimation windows. The choice of increasing the event window to these specific intervals is based on that event windows typically range from 1 to 11 days (Holler, 2014). The tables showing the results of these tests are presented in Appendix B.

Since the sample contains a majority of American banks, further robustness tests were made. Under the Dodd-Frank Act's Collins Amendment, a federal American law, the American banks are already subjected to regulation similar to the Basel Accords. Even though the American banks do face stricter rules by, *e.g.*, the increased usage of internal models established by Basel IV, the already established constraints by the Dodd-Frank Act impose similar restrictions. Implementing Basel IV on those terms would therefore not have a great effect on the American banking sector, and an implementation of Basel IV might therefore not be fully conducted in the US (Durante, 2016). The choice was therefore made to also conduct all of the above-mentioned robustness tests on the sample when excluding the American banks. The tables showing the results of these tests are presented in Appendix C.

Changing the estimation window did not change our aggregated baseline result. This was true when including and excluding the American banks. The level of significance was the same for the sample $\overline{CAR}$ over 250, 200, 150 and 100 days when using the baseline $[-1; +1]$ 3-day event window. The only concept changed by altering the estimation window, was the magnitude of the sample $\overline{CAR}$. This was also true when changing the baseline event window over all of the estimation windows, also when including and excluding American banks.

Changing the estimation window did not change our in-sample baseline result. This was also true when including and excluding American banks. The level of significance was the same for the in-sample, *i.e.*, portfolio $\overline{CARs}$, over 250, 200, 150 and 100 days when using the baseline $[-1;+1]$ 3-day event window. Only the magnitude of the portfolio $\overline{CARs}$ changed. Altering the event window over all of the estimation windows did also not change the level of significance level of the in-sample results, which also was true when including and excluding American banks. Regarding the minor changes resulting from the robustness checks, the choice was made to not change the methodology.

It is also relevant to discuss some limitations to the method of choice. It would have been preferable to include control variables both in the main study, as well as in the robustness tests, controlling for special events or other characteristics altering the effect on stock prices outside the scope of the Basel IV announcement, as *e.g.*, a variable representing country. Also, considering the skewness of *e.g.* Total Assets, dividing the portfolios into quintiles might have been a better method considering the larger amount of smaller banks in the dataset. Further, the choice of using the S&P 500 Index as a market proxy could also have been altered, especially since the choice was made to exclude the American banks in half of the robustness tests. In the main methodology, it was however logical to use the S&P 500 Index, considering that the largest amount of banks were of American origin. One potential change could be to use a market proxy for each country in the sample.

6.4 General Discussion

Since all of the results are insignificant in both the main study and robustness tests, it is in place to discuss how this came to be. This section will therefore present a general discussion on this matter and draw possible parallels to the choice of methodology and previous research.

First, it might be possible that the lack of statistical significance stems from the opaqueness of the capital requirements, *i.e.* the Basel Accords' complexity. For example, the more risk sensitive RWs and the new calculation methods for risks are some of the complex factors introduced by the new regulatory framework. Basel IV is a highly complicated,

and large regulative text. It claims competency in law as well as economics, mathematics and finance to truly understand its full scope. Even though knowledge of the previous Basel Accords certainly simplifies the understanding of Basel IV, the new accord still manages to challenge the capital requirement-knowledge of the market. Hence, claiming to understand the impact Basel IV will incur on the banking sector the immediate days surrounding its release, might be too strong of a claim. Investigating how Basel IV impact banking performance in the immediate days surrounding the event might therefore be a problematic approach. This line of reasoning is related to the findings of Van Der Weide and Zhang (2019), who found that investors have too little information and knowledge of capital structure to actually judge the solvency of the banking sector. Hence, it might be the case that Basel IV is too complex to yield an impact in the immediate days after its announcement.

Based on the above discussion, changing the current methodology to a long-term examination might instead yield statistical significance. By then letting the market learn about Basel IV through discussions, exchange of knowledge (*e.g.* through the several platforms established by BCBS) (BIS, 2019) and research, possible effects might occur since it might cause the market to react. Since Basel IV will be fully implemented in 2027 (BCBS, 2017), the impact on banking performance might be capturable when the regulatory framework is fully implemented. However, in contrast to this discussion, statistical insignificance was also found by Bouwman, Kim and Shin (2018), who examined banking performance between higher and lower capitalized banks - during a longer period. Bouwman, Kim and Shin (2018) found that high capitalized banks outperformed low capitalized banks during bad timed. No significance was found during normal times. The reason behind this result, as discussed by Bouwman, Kim and Shin (2018), was that investors might suffer from a "look-ahead bias" during bad times. This is an interesting approach which at least needs to be mentioned, since the effect on banking practices in regard to higher capital requirements is most important during bad times, considering it is what the Basel Accords is designed to shield the banking sector from. Hence, impacts during normal times, as this study investigates, simply might not yield any significant results.

The idea that the insignificant results stem from the choice of examining the immediate

days surrounding the event, and hence, might change in the long-term, is also questionable in terms of signaling value (Myers and Majluf, 1984). If there is signaling value in earlier research on the Basel Accords, the market should have considered this during the event window, independently on the level of Basel IV complexity. Hence, once again, claiming that investigating a longer time period could change the results might be an incorrect assumption. Discussing alternate changes to the methodology might therefore be in place. Another suggestion to the source of insignificance could be the choice of sample. Even though this was partly corrected for in the robustness tests when excluding the American banks, a complete alteration of the sample might yield other results completely, since obtaining insignificant results could stem from that some of the banks' performance are impacted by the Basel IV announcement, while some are not. One suggestion could therefore be to investigate a specific group of banks, as *e.g.* the Global Systemically Important Banks (GSIB's) or use such a group as a control group for this study. Even though the business model classification used in this study through the (NII/NBI) ratio has been defined by Bank of International Settlements (BIS) (Roengpitya, Tarashev and Tsatsaronis, 2014), it has also been criticized (Mergaerts and Vander Vennet, 2016). Changing the choice of (NII/NBI), or even changing the sample, to control for the business model variance, could possibly yield significant results. Furthermore, since this study investigates stock prices and hence, publicly traded banks, smaller banks are excluded per definition since they are not public. This could also have been corrected for by including non-public banks.

Lastly, obtaining insignificant results could also be a statement and result in itself. For example, the insignificant results could stem from that investors with insider information, or even the market itself, did already internalize the effects of Basel IV before the announcement. Therefore, the future impact of Basel IV could already have been incorporated in the stock prices before the days of the event, which could explain the insignificant results. However, studies can always be further perfected, and, as discussed, this study's insignificant result could possibly stem from no effect or large variances in the data. These results should therefore be acknowledged instead of discarded and inspire future research to alter studies like this in search for further answers.

7 Conclusion

Since 1988, BCBS has established the Basel Accords which aims to strengthen international banking practices and financial systemic stability. These accords have been diversely received amongst researchers, academics and bankers, who both support and criticize the design and theory behind them. Despite the ongoing debate reaching no consensus on the legitimacy on higher capital requirements, BCBS announced its new accord Basel IV in 2016 and 2017. In an attempt to contribute to the debate evolving around the Basel Accords and higher capital requirements, this study examines how the announcement of Basel IV was received on an aggregated scale by the market.

By applying a quantitative event study methodology on market data, the findings indicate a minor negative impact on banking performance, which however does not reach statistical significance. It is therefore not possible to determine how the announcement of Basel IV impacts the performance of the banking sector. Furthermore, the findings from the study cannot answer the second research question about how the announcement of Basel IV impacts the performance of different banks, due to lack of statistical significance in the results. Since the study yields insignificant results, it is not possible to support neither critics nor supporters to higher capital requirements. The main conclusions from the study are related to the discussion about the insignificant results. First, it might be possible that the lack of statistical significance stems from the opaqueness of the capital requirement, *i.e.* the Basel Accords' complexity, which makes it difficult for the market to understand the Basel IV impact the immediate days after its release. Second, the chosen methodology and data is argued to be suboptimal for this study. Therefore, changing it might yield different results. At last, investors with insider information, or even the market itself, could potentially already have internalized the effects of Basel IV before the announcement. Hence, the future impact of Basel IV could already have been incorporated in the stock prices before the days of the event, which could explain the insignificant results.

All readers should be aware of that the findings of this study are limited to the chosen methodology and collected data. We do however believe that these results could contribute to further research. A suggestion for further research is alterations to the methodology, as

e.g. longer time period and change of sample to yield significant results. The regulations on capital requirements in the banking sector are eminent in order to sustain financial stability and hence, it is of high importance to continue to contribute to this area of research. However, since the Basel IV regulatory framework will be fully implemented first in 2027 (BCBS, 2017), interesting further research could be to investigate the banking performance when this date is reached, since the effect could possibly be captured then.

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Appendix A - Supplementary Material

Table 10: Geographical Distribution of Sample (Frequency)

AE	9	ID	31	PK	1
AT	6	IE	3	PL	9
AU	7	IL	9	PR	3
BB	1	IN	31	PS	3
BD	24	IT	16	PT	1
BE	2	JO	11	QA	5
BH	2	JP	14	RU	6
BR	8	KE	9	SA	7
BS	2	KR	7	SE	3
BW	2	KW	4	SG	3
CA	9	KZ	4	SK	2
CH	10	LB	2	TG	1
CL	6	LI	1	TH	10
CN	19	LK	8	TR	7
CO	6	MA	2	TT	1
CY	2	MT	1	TW	17
CZ	1	MW	1	TZ	2
DE	3	MX	3	UA	1
DK	17	MY	8	UG	2
ES	6	NA	1	US	429
FI	3	NG	10	VN	1
FR	4	NL	1	ZA	7
GB	6	NO	19	ZM	1
GE	2	OM	6		
GL	1	PA	4		
GR	5	PE	2		
HK	7	PG	1		
HU	1	PH	12		

Appendix B: Robustness Tests; Including US

Table 11: $\overline{CAR}$ of the Sample

Event Window	Estimation Window	$\overline{CAR}$ (%)	z-value
$[-1;1]$	250	-0.9001 (0.0975)	-0.102
$[-2;2]$	250	-1.2200 (0.1102)	-0.095
$[-5;5]$	250	0.9376 (0.1183)	0.046
$[-1;1]$	200	-0.8623 (0.0978)	-0.098
$[-2;2]$	200	-1.1534 (0.1109)	-0.089
$[-5;5]$	200	1.1227 (0.1202)	0.053
$[-1;1]$	150	-0.8953 (0.0981)	-0.101
$[-2;2]$	150	-1.240 (0.1110)	-0.096
$[-5;5]$	150	1.100 (0.1206)	0.053
$[-1;1]$	100	-0.8725 (0.0979)	-0.099
$[-2;2]$	100	-1.1768 (0.1107)	-0.091
$[-5;5]$	100	1.2269 (0.1200)	0.059

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 12: $\overline{AR}$ of the Sample with 250 Days Estimation Window

Days to Event	$\overline{AR}$ (%)	z-value
(-5)	1.0213 (0.0824)	0.238
(-4)	0.3922 (0.0738)	0.102
(-3)	0.0047 (0.070)	0.001
(-2)	-0.0192 (0.0612)	-0.006
(-1)	-0.3088 (0.0663)	-0.089
(0)	-0.3464 (0.0682)	-0.097
(+1)	-0.2417 (0.0666)	-0.070
(+2)	-0.2950 (0.0696)	-0.081
(+3)	-0.0816 (0.0677)	-0.023
(+4)	0.5841 (0.0749)	0.150
(+5)	0.2285 (0.0717)	0.061

* Significant at the 10% level; ** Significant at the 5% level;*** Significant at the 1% level.

Table 13: $\overline{CAR}$ of the Total Asset Portfolios

Portfolio	Event Window	Estimation Window	$\overline{CAR}$	z-value
Low Total Assets	$[-1;1]$	250	-0.2294 (0.1340)	-0.026
	$[-2;2]$	250	-0.4349 (0.1497)	-0.034
	$[-5;5]$	250	1.3754 (0.1614)	0.070
	$[-1;1]$	200	-0.1697 (0.1351)	-0.019
	$[-2;2]$	200	-0.3393 (0.1520)	-0.027
	$[-5;5]$	200	1.5861 (0.1674)	0.078
	$[-1;1]$	150	-0.2294 (0.1339)	-0.026
	$[-2;2]$	150	-0.4519 (0.1504)	-0.036
	$[-5;5]$	150	1.5053 (0.1685)	0.073
	$[-1;1]$	100	-0.2179 (0.1310)	-0.025
	$[-2;2]$	100	-0.3971 (0.1480)	-0.032
	$[-5;5]$	100	1.5694 (0.1637)	0.077
High Total Assets	$[-1;1]$	250	-1.6348 (0.1423)	-0.182
	$[-2;2]$	250	-2.1093 (0.1639)	-0.158
	$[-5;5]$	250	0.3415 (0.1787)	0.016
	$[-1;1]$	200	-1.6295 (0.1401)	-0.183
	$[-2;2]$	200	-2.1100 (0.1615)	-0.159
	$[-5;5]$	200	0.4049 (0.1763)	0.019
	$[-1;1]$	150	-1.6487 (0.1395)	-0.185
	$[-2;2]$	150	-2.1944 (0.1604)	-0.165
	$[-5;5]$	150	0.4318 (0.1732)	0.020
	$[-1;1]$	100	-1.6194 (0.1364)	-0.183
	$[-2;2]$	100	-2.1097 (0.1571)	-0.160
	$[-5;5]$	100	0.6471 (0.1716)	0.030

* Significant at the 10% level; ** Significant at the 5% level;*** Significant at the 1% level.

Table 14: $\overline{CAR}$ of the ROA Portfolios

Portfolio	Event Window	Estimation Window	$\overline{CAR}$	z-value
Low ROA	$[-1;1]$	250	-1.5002 (0.1351)	-0.176
	$[-2;2]$	250	-2.0936 (0.1568)	-0.162
	$[-5;5]$	250	-0.7764 (0.1734)	-0.037
	$[-1;1]$	200	-1.4548 (0.3424)	-0.172
	$[-2;2]$	200	-2.0331 (0.1529)	-0.159
	$[-5;5]$	200	-0.7140 (0.1680)	-0.034
	$[-1;1]$	150	-1.4358 (0.1266)	-0.172
	$[-2;2]$	150	-2.0301 (0.1458)	-0.162
	$[-5;5]$	150	-0.5859 (0.1580)	-0.028
	$[-1;1]$	100	-1.3203 (0.1245)	-0.157
	$[-2;2]$	100	-1.8250 (0.1422)	-0.145
	$[-5;5]$	100	-0.1571 (0.1552)	0-008
High ROA	$[-1;1]$	250	-0.6702 (0.1381)	-0.074
	$[-2;2]$	250	-0.8129 (0.1559)	-0.061
	$[-5;5]$	250	1.6822 (0.1689)	0.080
	$[-1;1]$	200	-0.6921 (0.1354)	-0.077
	$[-2;2]$	200	-0.8129 (0.1531)	-0.061
	$[-5;5]$	200	1.7096 (0.1678)	0.080
	$[-1;1]$	150	-0.7686 (0.1285)	-0.086
	$[-2;2]$	150	-0.9802 (0.1441)	-0.075
	$[-5;5]$	150	1.4133 (0.1579)	0.067
	$[-1;1]$	100	-0.6722 (0.1255)	-0.075
	$[-2;2]$	100	-0.8221 (0.1403)	-0.063
	$[-5;5]$	100	1.7142 (0.1556)	0.080

* Significant at the 10% level; ** Significant at the 5% level;*** Significant at the 1% level.

Table 15: $\overline{CAR}$ of the (NII/NBI) Portfolios

Portfolio	Event Window	Estimation Window	$\overline{CAR}$	z-value
Low (NII/NBI)	$[-1;1]$	250	-0.8126 (0.2284)	-0.111
	$[-2;2]$	250	-1.0445 (0.2246)	-0.108
	$[-5;5]$	250	0.5221 (0.2763)	0.029
	$[-1;1]$	200	-0.7291 (0.2249)	-0.099
	$[-2;2]$	200	-0.8763 (0.2201)	-0.091
	$[-5;5]$	200	1.1901 (0.2720)	0.068
	$[-1;1]$	150	-0.6430 (0.1980)	-0.092
	$[-2;2]$	150	-0.8569 (0.1919)	-0.096
	$[-5;5]$	150	1.0119 (0.2246)	0.064
	$[-1;1]$	100	-0.4290 (0.2181)	-0.057
	$[-2;2]$	100	-0.5332 (0.2210)	-0.055
	$[-5;5]$	100	1.5001 (0.2304)	0.097
Middle (NII/NBI)	$[-1;1]$	250	-1.1243 (0.1247)	-0.221
	$[-2;2]$	250	-1.5355 (0.1223)	-0.237
	$[-5;5]$	250	0.3323 (0.1333)	0.032
	$[-1;1]$	200	-1.1254 (0.1224)	-0.221
	$[-2;2]$	200	-1.5073 (0.1220)	-0.231
	$[-5;5]$	200	0.3992 (0.1264)	0.040
	$[-1;1]$	150	-1.0694 (0.1200)	-0.207
	$[-2;2]$	150	-1.4522 (0.1232)	-0.213
	$[-5;5]$	150	0.4593 (0.1209)	0.045
	$[-1;1]$	100	-1.0406 (0.1201)	-0.195
	$[-2;2]$	100	-1.4324 (0.1244)	-0.203
	$[-5;5]$	100	0.3519 (0.1241)	0.033
High (NII/NBI)	$[-1;1]$	250	-0.7819 (0.1431)	-0.078
	$[-2;2]$	250	-1.1358 (0.1568)	-0.08
	$[-5;5]$	250	0.8456 (0.1884)	0.034
	$[-1;1]$	200	-0.7974 (0.1397)	-0.080
	$[-2;2]$	200	-1.1383 (0.1623)	-0.076
	$[-5;5]$	200	0.7063 (0.1807)	0.029
	$[-1;1]$	150	-0.8901 (0.1307)	-0.090
	$[-2;2]$	150	-1.2876 (0.1508)	-0.087
	$[-5;5]$	150	0.7066 (0.1696)	0.029
	$[-1;1]$	100	-0.8585 (0.1235)	-0.089
	$[-2;2]$	100	-1.2289 (0.1421)	-0.085
	$[-5;5]$	100	0.8038 (0.1611)	0.033

* Significant at the 10% level; ** Significant at the 5% level;*** Significant at the 1% level.

Table 16: $\overline{AR}$ of the Total Assets Portfolios with 250 Days Estimation Window

	Low Total Assets		*High Total Assets*	
Days to Event	$\overline{AR}$(%)	z-value	$\overline{AR}$(%)	z-value
(-5)	0.7614 (0.1104)	0.181	1.2119 (0.1246)	0.274
(-4)	0.3688 (0.1049)	0.091	0.4175 (0.1064)	0.108
(-3)	0.0060 (0.1013)	-0.002	0.0767 (0.1020)	0.019
(-2)	-0.0866 (0.0897)	-0.025	0.01361 (0.0854)	0.007
(-1)	-0.2103 (0.0972)	-0.056	-0.4273 (0.0918)	-0.127
(0)	-0.0191 (0.0931)	-0.006	-0.6890 (0.0995)	-0.193
(+1)	0.0009 (0.0923)	-0.001	-0.5126 (0.0970)	-0.146
(+2)	-0.1154 (0.0970)	-0.036	-0.4791 (0.1023)	-0.131
(+3)	0.0825 (0.0962)	0.020	-0.2698 (0.0958)	-0.078
(+4)	0.3302 (0.0977)	0.091	0.8340 (0.1158)	0.201
(+5)	0.2579 (0.0987)	0.069	0.1842 (0.1045)	0.051

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 17: $\overline{AR}$ of the ROA Portfolios with 250 Days Estimation Window

	Low ROA		*High ROA*	
Days to Event	$\overline{AR}$(%)	z-value	$\overline{AR}$(%)	z-value
(-5)	0.7673 (0.1223)	0.177	0.8735 (0.1240)	0.219
(-4)	0.3224 (0.1059)	0.085	0.5094 (0.1036)	0.140
(-3)	-0.1233 (0.1043)	-0.033	0.1994 (0.0990)	0.066
(-2)	-0.1904 (0.0909)	-0.050	0.0894 (0.0877)	0.046
(-1)	-0.5244 (0.0913)	-0.151	-0.2264 (0.0957)	-0.049
(0)	-0.5351 (0.0978)	-0.154	-0.2203 (0.0939)	-0.052
(+1)	-0.4348 (0.0958)	-0.120	-0.2218 (0.0928)	-0.048
(+2)	-0.3921 (0.1029)	-0.106	-0.2305 (0.0969)	-0.056
(+3)	-0.1730 (0.1007)	-0.047	0.0012 (0.0903)	-0.005
(+4)	0.4064 (0.1032)	0.110	0.5461 (0.1137)	0.138
(+5)	0.0744 (0.1007)	0.017	0.3934 (0.1049)	0.110

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 18: $\overline{AR}$ of the (NII/NBI) Portfolios with 250 Days Estimation Window

	Low (NII/NBI)		*Middle (NII/NBI)*		*High (NII/NBI)*	
Days to Event	$\overline{AR}$(%)	z-value	$\overline{AR}$(%)	z-value	$\overline{AR}$(%)	z-value
(-5)	0.7046 (0.2233)	0.2139	0.8404 (0.1498)	0.254	0.7652 (0.1161)	0.1687
(-4)	0.2056 (0.1783)	0.054	0.3096 (0.1050)	0.131	0.4645 (0.1073)	0.1084
(-3)	0.1551 (0.1729)	0.048	-0.1050 (0.1024)	-0.072	-0.0262 (0.0994)	-0.004
(-2)	0.1953 (0.1755)	0.078	-1.3599 (0.0880)	-0.063	-0.0400 (0.0892)	-0.013
(-1)	-0.2238 (0.1485)	-0.077	-0.4285 (0.0918)	-0.210	-0.3030 (0.0972)	-0.075
(0)	-0.3644 (0.1722)	-0.133	-0.3350 (0.0982)	-0.156	-0.2669 (0.0988)	-0.066
(+1)	-0.2189 (0.1636)	-0.077	-0.3559 (0.0955)	-0.149	-0.2087 (0.0986)	-0.051
(+2)	-0.4206 (0.1828)	-0.149	-0.2658 (0.1104)	-0.092	-0.312 (0.1004)	-0.075
(+3)	-0.1460 (0.1560)	-0.049	0.2211 (0.1110)	0.082	-0.1301 (0.0925)	-0.033
(+4)	0.2471 (0.1877)	0.074	0.4516 (0.1191)	0.129	0.5965 (0.1032)	0.146
(+5)	0.6054 (0.1758)	0.223	0.1644 (0.1060)	0.061	0.1908 (0.1029)	0.050

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Appendix C: Robustness Tests; Excluding US

Table 19: $\overline{CAR}$ of the Sample, Excluding US

Event Window	Estimation Window	$\overline{CAR}$ (%)	z-value
$[-1;1]$	250	-1.4657 (0.1328)	-0.168
$[-2;2]$	250	-1.9069 (0.1447)	-0.156
$[-5;5]$	250	1.3774 (0.1462)	0.075
$[-1;1]$	200	-1.4409 (0.1334)	-0.165
$[-2;2]$	200	-1.8556 (0.1459)	-0.150
$[-5;5]$	200	1.6076 (0.1484)	0.086
$[-1;1]$	150	-1.5193 (0.1340)	-0.173
$[-2;2]$	150	-2.0382 (0.1465)	-0.164
$[-5;5]$	150	1.5004 (0.1498)	0.080
$[-1;1]$	100	-1.5330 (0.1351)	-0.173
$[-2;2]$	100	-2.0031 (0.1472)	-0.161
$[-5;5]$	100	1.5654 (0.1497)	0.083

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 20: $\overline{AR}$ of the Sample with 250 day Estimation Window, Excluding US

Days to Event	$\overline{AR}$ (%)	z-value
(-5)	1.4574 (0.1197)	0.322
(-4)	0.2869 (0.0926)	0.082
(-3)	0.0283 (0.0874)	0.009
(-2)	0.0204 (0.0775)	0.007
(-1)	-0.2916 (0.0858)	-0.090
(0)	-0.6845 (0.0938)	-0.193
(+1)	-0.4841 (0.0913)	-0.140
(+2)	-0.4522 (0.0995)	-0.120
(+3)	-0.0236 (0.0886)	-0.007
(+4)	0.8938 (0.1081)	0.219
(+5)	0.6599 (0.0923)	0.1891

* Significant at the 10% level; ** Significant at the 5% level;*** Significant at the 1% level.

Table 21: $\overline{CAR}$ of the Total Asset Portfolios, Excluding US

Portfolio	Event Window	Estimation Window	$\overline{CAR}$	z-value
Low Total Assets	$[-1;1]$	250	-0.3165 (0.2044)	-0.033
	$[-2;2]$	250	-0.4956 (0.2272)	-0.035
	$[-5;5]$	250	2.5512 (0.2427)	0.116
	$[-1;1]$	200	-0.2945 (0.2055)	-0.030
	$[-2;2]$	200	-0.4545 (0.2298)	-0.032
	$[-5;5]$	200	2.7392 (0.2477)	0.122
	$[-1;1]$	150	-0.3654 (0.2035)	-0.037
	$[-2;2]$	150	-0.6009 (0.2270)	-0.043
	$[-5;5]$	150	2.6012 (0.2479)	0.116
	$[-1;1]$	100	-0.4103 (0.2021)	-0.042
	$[-2;2]$	100	-0.6371 (0.2245)	-0.046
	$[-5;5]$	100	2.4952 (0.2434)	0.112
High Total Assets	$[-1;1]$	250	-2.6225 (0.1537)	-0.369
	$[-2;2]$	250	-3.3541 (0.1631)	-0.343
	$[-5;5]$	250	0.0716 (0.156)	0.005
	$[-1;1]$	200	-2.5810 (0.1532)	-0.363
	$[-2;2]$	200	-3.2715 (0.1632)	-0.334
	$[-5;5]$	200	0.3543 (0.1542)	0.026
	$[-1;1]$	150	-2.6186 (0.1544)	-0.363
	$[-2;2]$	150	-3.4164 (0.1651)	-0.342
	$[-5;5]$	150	0.3565 (0.1545)	0.026
	$[-1;1]$	100	-2.6092 (0.1579)	-0.353
	$[-2;2]$	100	-3.3171 (0.1686)	-0.325
	$[-5;5]$	100	0.5322 (0.1580)	0.038

* Significant at the 10% level; ** Significant at the 5% level;*** Significant at the 1% level.

Table 22: $\overline{CAR}$ of the ROA Portfolios, Excluding US

Portfolio	Event Window	Estimation Window	$\overline{CAR}$	z-value
Low ROA	$[-1;1]$	250	-2.2151 (0.1777)	-0.280
	$[-2;2]$	250	-2.8682 (0.1918)	-0.256
	$[-5;5]$	250	-0.3055 (0.1989)	-0.018
	$[-1;1]$	200	-2.1310 (0.1742)	-0.271
	$[-2;2]$	200	-2.7420 (0.1871)	-0.247
	$[-5;5]$	200	-0.0936 (0.1896)	-0.006
	$[-1;1]$	150	-2.1025 (0.1708)	-0.264
	$[-2;2]$	150	-2.7341 (0.1831)	-0.243
	$[-5;5]$	150	0.0511 (0.1858)	0.003
	$[-1;1]$	100	-1.9656 (0.1707)	-0.241
	$[-2;2]$	100	-2.4837 (0.1817)	-0.216
	$[-5;5]$	100	0.5144 (0.1853)	0.029
High ROA	$[-1;1]$	250	-0.8493 (0.1916)	-0.093
	$[-2;2]$	250	-1.0534 (0.2123)	-0.080
	$[-5;5]$	250	2.4126 (0.2136)	0.123
	$[-1;1]$	200	-0.8453 (0.1905)	-0.092
	$[-2;2]$	200	-1.0132 (0.2119)	-0.076
	$[-5;5]$	200	2.6057 (0.2166)	0.129
	$[-1;1]$	150	-1.0156 (0.1799)	-0.112
	$[-2;2]$	150	-1.3073 (0.1991)	-0.100
	$[-5;5]$	150	2.1983 (0.2057)	0.111
	$[-1;1]$	100	-0.9238 (0.1747)	-0.102
	$[-2;2]$	100	-1.1661 (0.1910)	-0.091
	$[-5;5]$	100	2.3665 (0.1912)	0.125

* Significant at the 10% level; ** Significant at the 5% level;*** Significant at the 1% level.

Table 23: $\overline{CAR}$ of the (NII/NBI) Portfolios, Excluding US

Portfolio	Event Window	Estimation Window	$\overline{CAR}$	z-value
Low (NII/NBI)	$[-1;1]$	250	-1.2838 (0.2494)	-0.179
	$[-2;2]$	250	-1.7098 (0.2578)	-0.179
	$[-5;5]$	250	-0.2629 (0.3077)	-0.015
	$[-1;1]$	200	-1.1910 (0.2426)	-0.168
	$[-2;2]$	200	-1.5257 (0.2497)	-0.162
	$[-5;5]$	200	0.5319 (0.2971)	0.032
	$[-1;1]$	150	-0.9419 (0.2169)	-0.137
	$[-2;2]$	150	-1.2641 (0.2227)	-0.139
	$[-5;5]$	150	0.8314 (0.2499)	0.054
	$[-1;1]$	100	-0.4922 (0.2402)	-0.068
	$[-2;2]$	100	-0.5586 (0.2501)	-0.060
	$[-5;5]$	100	1.8591 (0.2514)	0.126
Middle (NII/NBI)	$[-1;1]$	250	-1.2695 (0.2098)	-0.204
	$[-2;2]$	250	-1.3645 (0.2062)	-0.170
	$[-5;5]$	250	1.2551 (0.2120)	0.104
	$[-1;1]$	200	-1.2881 (0.2011)	-0.208
	$[-2;2]$	200	-1.3669 (0.2021)	-0.169
	$[-5;5]$	200	1.3141 (0.1971)	0.111
	$[-1;1]$	150	-1.1972 (0.1960)	-0.189
	$[-2;2]$	150	-1.3475 (0.2018)	-0.159
	$[-5;5]$	150	1.4730 (0.1855)	0.124
	$[-1;1]$	100	-1.1552 (0.1884)	-0.178
	$[-2;2]$	100	-1.3705 (0.1964)	-0.157
	$[-5;5]$	100	1.0867 (0.1903)	0.085
High (NII/NBI)	$[-1;1]$	250	-1.4673 (0.2026)	-0.154
	$[-2;2]$	250	-2.0398 (0.2212)	-0.151
	$[-5;5]$	250	1.543 (0.2372)	0.074
	$[-1;1]$	200	-1.4632 (0.1965)	-0.153
	$[-2;2]$	200	-1.9891 (0.2152)	-0.146
	$[-5;5]$	200	1.3853 (0.2267)	0.065
	$[-1;1]$	150	-1.6488 (0.1809)	-0.173
	$[-2;2]$	150	-2.2781 (0.1965)	-0.170
	$[-5;5]$	150	0.9764 (0.2105)	0.046
	$[-1;1]$	100	-1.5897 (0.1712)	-0.169
	$[-2;2]$	100	-2.183 (0.1838)	-0.166
	$[-5;5]$	100	1.0642 (0.1966)	0.051

* Significant at the 10% level; ** Significant at the 5% level;*** Significant at the 1% level.

Table 24: $\overline{AR}$ of Total Assets Portfolios with 250 Days Estimation Window, Excluding US

	Low Total Assets		*High Total Assets*	
Days to Event	$\overline{AR}$(%)	z-value	$\overline{AR}$(%)	z-value
(-5)	1.1971 (0.1713)	0.2530	1.6432 (0.1668)	0.369
(-4)	0.1371 (0.1330)	0.038	0.4531 (0.1267)	0.131
(-3)	0.1466 (0.1300)	0.040	-0.0252 (0.1195)	-0.008
(-2)	0.0631 (0.1283)	0.017	-0.0761 (0.0847)	-0.030
(-1)	-0.0131 (0.1373)	0.000	-0.5820 (0.0972)	-0.215
(0)	-0.1572 (0.1398)	-0.044	-1.1985 (0.1172)	-0.393
(+1)	-0.1464 (0.1366)	-0.037	-0.8307 (0.1148)	-0.285
(+2)	-0.2421 (0.1426)	-0.064	-0.6360 (0.1368)	-0.1876
(+3)	0.0617 (0.1356)	0.022	-0.1290 (0.1107)	-0.0423
(+4)	0.5345 (0.1598)	0.127	1.2271 (0.1438)	0.325
(+5)	0.9528 (0.1370)	0.259	0.3687 (0.1183)	0.118

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 25: $\overline{AR}$ of the ROA Portfolios with 250 Days Estimation Window, Excluding US

	Low ROA		*High ROA*	
Days to Event	$\overline{AR}$(%)	z-value	$\overline{AR}$(%)	z-value
(-5)	1.2118 (0.1704)	0.277	1.3359 (0.1776)	0.298
(-4)	0.3361 (0.1345)	0.096	0.3892 (0.1349)	0.111
(-3)	-0.1683 (0.1316)	-0.046	0.2338 (0.1285)	0.080
(-2)	-0.1192 (0.1084)	-0.042	0.1498 (0.1171)	0.069
(-1)	-0.6418 (0.1095)	-0.217	-0.1207 (0.1328)	-0.015
(0)	-0.9188 (0.1319)	-0.282	-0.4050 (0.1348)	-0.098
(+1)	-0.6465 (0.1279)	-0.197	-0.3198 (0.1311)	-0.075
(+2)	-0.5186 (0.1423)	-0.141	-0.3526 (0.1358)	-0.090
(+3)	-0.1168 (0.1367)	-0.028	0.0510 (0.1128)	0.025
(+4)	0.7346 (0.1535)	0.182	0.7426 (0.1575)	0.184
(+5)	0.5933 (0.1387)	0.156	0.7016 (0.1285)	0.205

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 26: $\overline{AR}$ of the (NII/NBI) Portfolios with 250 Days Estimation Window, Excluding US

	Low (NII/NBI)		*Middle (NII/NBI)*		*High (NII/NBI)*	
Days to Event	$\overline{AR}$(%)	z-value	$\overline{AR}$(%)	z-value	$\overline{AR}$(%)	z-value
(-5)	0.7131 (0.2674)	0.221	1.2955 (0.2161)	0.372	1.4061 (0.1733)	0.314
(-4)	0.0780 (0.1967)	0.008	0.0899 (0.1396)	0.023	0.5104 (0.1398)	0.144
(-3)	0.0579 (0.1939)	0.014	-0.1838 (0.1543)	-0.088	-0.0482 (0.1225)	-0.007
(-2)	0.0791 (0.2036)	0.035	0.0521 (0.1378)	0.031	0.0084 (0.1155)	-0.008
(-1)	-0.3673 (0.1746)	-0.137	-0.3825 (0.1503)	-0.1684	-0.3568 (0.1310)	-0.104
(0)	-0.5602 (0.1.912)	-0.213	-0.5438 (0.1633)	-0.231	-0.6415 (0.1451)	-0.175
(+1)	-0.350 (0.1803)	-0.132	-0.3366 (0.1442)	-0.144	-0.4610 (0.1449)	-0.130
(+2)	-0.4954 (0.1938)	-0.196	-0.1345 (0.1700)	-0.025	-0.5732 (0.1548)	-0.143
(+3)	-0.0587 (0.1507)	-0.042	0.2331 (0.1505)	0.107	-0.1071 (0.1302)	-0.027
(+4)	0.2956 (0.2168)	0.104	0.6115 (0.1845)	0.180	0.9842 (0.1548)	0.244
(+5)	0.6424 (0.2070)	0.234	0.5292 (0.1427)	0.225	0.6528 (0.1404)	0.193

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.