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ABSTRACT

This paper evaluates the impact of postcrisis financial risk regulation introduced through Basel II.5, Basel III, and Basel IV on European Union (EU) and United States (U.S.) bank shareholders and creditors. Specifically, an event study is used to analyze 15 market events, 26 credit events, and 13 liquidity events. This approach allows for an assessment of the impact on profitability and risk, providing a basis for deriving the effectiveness of these regulations in reducing risks for the public sector and taxpayers. Significant negative stock market reactions by EU banks in response to market and credit risk regulations are observed. In contrast, U.S. banks exhibit no clear significant stock market reactions, largely due to the Dodd-Frank Act and especially more lenient regulatory implementation. EU creditors responded to credit risk regulation with significantly rising credit default swap (CDS) spreads, signaling higher risks due to diminished bailout expectations. The cross-sectional analysis highlights the importance of bank- and country-specific factors in explaining heterogeneous reactions. The results suggest that the Basel reforms have successfully shifted risks from taxpayers back to shareholders and reduced moral hazard among creditors. However, the significant differences between the EU and U.S. market reactions raise concerns about the establishment of a level playing field, underscoring the need for more consistent implementation across jurisdictions.

1. Introduction

Significant Basel reforms were introduced in response to the 2007 United States (U.S.) subprime crisis, which escalated into a global financial crisis (GFC) and the Lehman Brothers bankruptcy in 2008. The crisis spread rapidly through interconnected global financial markets, with Europe being especially affected due to high levels of exposure to U.S. subprime assets. The public sector was forced to intervene with unprecedented injections of liquidity, capital assistance, and guarantees, which placed taxpayers at significant risk of substantial losses (Basel Committee on Banking Supervision, 2011). Examples include the Emergency Economic Stabilization Act of 2008 and the American Recovery and Reinvestment Act of 2009 in the U.S., while in the European Union (EU), the European Economic Recovery Plan was adopted in 2008. Despite various interventions, the consequences for both the financial system and the real economy were so severe that a global recession, the so-called Great Recession, followed. A key cause of the crisis was identified as insufficient regulation of the financial system, to which the Basel Committee on Banking Supervision (BCBS) responded with a comprehensive revision. The objective was to increase the resilience of the global financial system, prevent future crises, and avoid further reliance on taxpayer funds (Basel Committee on Banking Supervision, 2011).

To achieve these objectives, the BCBS significantly strengthened the regulation of financial risks – namely, market, credit, and liquidity risk – through the Basel II.5, Basel III, and Basel IV accords, whereby the liquidity risk was addressed globally for the first time.[1] This enforcement involves far-reaching changes to proprietary trading, lending, the term structure, funding, and asset selection, raising questions about the implications for banks. As the regulatory framework for all three types

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[1] Officially, Basel IV is designated as the finalization of the Basel III reforms. However, it is commonly referred to as Basel IV by bank representatives. To better distinguish the Basel Accords, this paper employs the term Basel IV.

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of risk has been fully announced, it is now possible to quantify the overall effect, which is crucial for understanding the actual impact of the regulation. Although the BCBS conducted various scenario analyses and impact studies to assess the hypothetical impact, it is useful to examine market reactions. This approach allows an investigation independent of any assumptions because markets price new information with at least semistrong information efficiency (Fama, 1970). Because regulatory initiatives have a prospective impact on a bank's profitability as well as its risk, the effects can be captured by an event study, which is the empirical foundation of this paper.

Despite the significance of the Basel reforms, there is surprisingly limited literature assessing the effectiveness of these policy responses post-GFC. To the author's knowledge, only two papers address market reactions to Basel's financial risk regulation. The impact of liquidity regulation on banks is analyzed for European samples by Bruno et al. (2018) and Simion et al. (2024). The first paper focuses on stocks and reveals that shareholders reacted negatively. However, when liquidity announcements made alongside other Basel III measures are excluded, the effect is only weakly significant. The second paper examines the impact on creditors, and the authors suggest that default risk has increased. Although liquidity announcements have already been examined for Europe, the U.S. market is missing in both analyses. Furthermore, the first paper includes only events up to January 2013, while the second liquidity ratio, the net stable funding ratio (NSFR), was subsequently published. Therefore, liquidity regulation is also included in the analysis.

This paper complements previous studies by analyzing the important aspects of market and credit risk regulation, which allows for a thorough examination of the significant changes in proprietary trading and the core activity of banks, namely, lending. The analysis involves both EU and U.S. bank stocks and credit default swaps (CDSs), which has the advantage of examining the position of both bank owners and creditors. Therefore, whether the intended effect of risk reduction succeeds can be investigated. The sample selection is based on the fact that both U.S. and EU banks were particularly affected by the crisis, making it plausible to study the regulatory impact in these jurisdictions. In addition to the importance of both financial markets, sufficiently long time series of CDSs are available. Focusing on EU banks rather than all European banks ensures a consistent regulatory environment. This focus allows for an analysis of whether differences in reactions between EU and U.S. banks arise from varying implementation practices. The BCBS mandates and monitors the application of its rules for 'internationally active banks'. However, this term is not precisely defined, giving national authorities some discretion (Basel Committee on Banking Supervision, 2012). This lack of precision has led to significant differences in implementation between the EU and U.S., as, for example, liquidity rules and certain capital requirements are applied only to the largest U.S. banks.

This paper makes contributions in three key areas. First, the analysis of stock and CDS market reactions enables an assessment of how the extensive post-GFC regulation of the three financial risks impacts banks' profitability and risk. Additionally, it demonstrates that bank-specific and country-specific factors account for heterogeneous responses. Second, the inclusion of both EU and U.S. banks allows for an examination of differences due to divergent regulatory implementations across jurisdictions. Third, from a policy perspective, it allows for an evaluation of the BCBS's effectiveness in achieving its objectives of reducing risk for the public sector and taxpayers. The empirical design and results are briefly presented. Using event study methodology, the overall effects of EU and U.S. stock and CDS market reactions to carefully selected 15 market events, 26 credit events and 13 liquidity events by the BCBS and their significance are computed for both equally weighted and market-weighted portfolios. Next, a cross-sectional analysis is conducted to identify bank- and country-specific drivers of the potentially heterogeneous market reactions, as it cannot be assumed that all banks reacted similarly to the regulation.

Regarding aggregated market responses, market risk regulation leads to a distinct negative and significant EU stock market reaction from −11.82% for the equally weighted portfolio up to −20.16% for the market-weighted response, implying a wealth loss for shareholders. In contrast, U.S. bank stocks show no significant reaction. These differences can be attributed to the stricter EU implementation as well as to the fact that small regional U.S. banks are part of the sample that generally do not engage in proprietary trading. A further explanation is the unchanged risk-return profile of U.S. banks under the Basel regulation, largely due to the existing Volcker Rule, which restricts trading for U.S. institutions. Neither U.S. nor EU bank creditors react at all. Significant differences also exist in terms of credit risk regulation. A clearly negative and significant EU stock market reaction is observed, with aggregated responses of −20.08% for the equally weighted reaction up to −40.91% for the market-weighted reaction. Although the U.S. reaction is negative as well, with market-weighted reactions up to −27.41%, significance cannot be clearly proven here. The reason is that, in the EU, the credit risk framework applies uniformly to all banks, whereas in the U.S., small bank holding companies (SBHCs) are exempt, and only larger institutions face specific requirements. U.S. and EU creditors perceive higher risks and react with rising CDS spreads, with only the EU reaction being significant. The equally weighted portfolio achieves a value of 35.19%, while the market-weighted response is stronger with 40.33%. Increased EU CDS spreads suggest that creditors are bearing greater risk because of the reduced likelihood of bailouts induced by regulation. An explanation for the insignificance of U.S. creditors is provided by Schäfer et al. (2016), who show rising CDS spreads following the introduction of the Dodd-Frank Act, attributing it to a reduction in bailout probability. This observation implies that the Basel credit risk framework has no additional impact. Liquidity regulation has no impact on EU and U.S. shareholders and EU creditors, whereas the U.S. CDS reaction cannot be analyzed due to confounding events.[2] The lack of a U.S. reaction may be attributed to the fact that U.S. liquidity rules apply exclusively to large banks, as well as the stronger liquidity position of these institutions during and after the GFC (Dietrich et al., 2014; European Banking Authority, 2012). While (Bruno et al., 2018) report a significant negative shareholder reaction, this paper finds no effect. However, the aggregated market reaction is comparable in magnitude. This finding suggests that the six additional events examined in this paper may be considered noise events with limited capital market significance, indicating that the relevance of events diminishes over time. While CDS spreads increased similarly as in the study by Simion et al. (2024), no significance was found here, likely due to methodological differences and a reduced sample size. Additionally, the authors include Swiss and Norwegian banks that are not part of the EU. Finally, significance in their analysis is only observed in the (0;0) window, with similar results for the (−1;+1) window, which is also utilized in this paper.

In addition to aggregated market reactions, cross-sectional analysis demonstrates the importance of bank- and country-specific characteristics for individual reactions. Concerning market risk regulation, a bank's capitalization lowers CDS spreads in both the U.S. and the EU. Furthermore, increased market risk and classification as a global systemically important bank (G-SIB) lead to higher CDS spreads in the U.S. In contrast, G-SIBs reduce U.S. returns, whereas elevated market risk and a bank' being located in Greece, Italy, Ireland, Portugal or Spain (GIIPS) result in reduced returns for EU shareholders. Regarding credit risk, there is a positive but decreasing effect of a bank's capitalization on U.S. stock market reactions, while risk costs negatively affect returns. Additionally, banks subject to regulation show lower returns than SBHCs do. U.S. creditors respond to risk costs with higher CDS spreads. In the EU, the feedback loop between sovereign and

[2] This limitation also applies to the cross-sectional analysis of U.S. CDS spreads.

bank credit risk in GIIPS banks positively influences shareholders and reduces CDS spreads. Bank capitalization and risk costs also exert a negative effect. With regard to liquidity risk, more liquid balance sheets and higher charter values reduce EU CDS spreads, suggesting greater resilience to liquidity shocks. Conversely, the feedback loop raises creditor risk by worsening funding conditions. In the EU stock market, the feedback loop reduces returns, which also holds for reduced funding mismatches. In the U.S. stock market, large banks subject to full liquidity requirements experience decreasing returns, reflecting a one-sided penalty and competitive disadvantage. The results remain robust across various tests, including the application of different models for estimating abnormal returns and CDS spread changes, the use of alternative benchmark indices, and a thorough analysis of potential confounding events.

In addition to the purely economic assessment from the perspective of shareholders and creditors, the results can be framed within the context of the BCBS's objectives. To evaluate whether regulation serves the public interest, two strands of literature can be identified, whereby a market reaction can be expected in both cases but with different signs. The public interest theory developed by Needham (1983) postulates that the regulator acts in the public interest as a social planner who maximizes overall welfare—in this case, at the expense of the banks. This role is particularly relevant against the backdrop of the GFC, during which governments used taxpayers' money to bail out banks. The BCBS has emphasized the importance of preventing such a scenario. Of course, a banking system in which banks adequately perform their transformational functions serves the public interest (Bruno et al., 2018). The capture theory developed by Stigler (1971) argues the opposite. Here, regulated industries influence the regulator by lobbying to gain privileges. Indeed, such tendencies can also be observed in the regulatory process of the banking industry with the occasional significant weakening of regulatory proposals (see Table A.9, Table A.10, Table A.11).

Regardless of the risk type, there is no significant positive stock market reaction that supports the capture theory of Stigler (1971), neither in the EU nor in the U.S. Although the banking industry's lobbying has weakened regulatory proposals, the absence of a positive stock market reaction, coupled with the overall tightening of regulation, aligns with the public interest theory proposed by Needham (1983). During the GFC, bank risks were transferred to the public sector. The negative stock market reactions suggest a reversal of this process, with a welfare transfer from bank shareholders back to taxpayers through the reallocation of risk. This mechanism appears to be more pronounced in the EU, likely due to the stricter initial implementation of the regulations. In contrast, the U.S. reactions may also have been tempered by the earlier introduction of the Dodd-Frank Act in 2010, as well as the fact that the U.S. stock sample includes many small regional banks, which are generally less affected by the related regulations. The CDS market reactions show that the success of regulation in achieving risk reduction remains uncertain. This uncertainty arises from the absence of significant and decreasing CDS spreads. This finding does not inherently imply that the intended risk reduction has been unsuccessful, nor does it suggest that regulation inadvertently amplifies a bank's default risk. From a creditor's perspective, regulation generates two opposing dynamics. On the one hand, there is the sought-after risk reduction leading to lower CDS spreads. On the other hand, reduced expectations of creditor bailouts increase CDS spreads (Pancotto et al., 2020; Sarin & Summers, 2016; Schäfer et al., 2016). In this context, the latter factor takes precedence in the eyes of creditors, which is reinforced by the fact that the CDS portfolios exclusively encompass major banks.

Given these findings, it can be concluded that the objectives of the BCBS have been largely achieved through the revision of financial risk regulation. The risks borne by taxpayers during the GFC were transferred back to shareholders, while the regulation also contributed to mitigating moral hazard among bank creditors by reducing bailout expectations. However, the significant differences in actual implementation, as evidenced by the divergent responses in the U.S. and the EU, raise doubts about whether a truly level regulatory playing field has been established. A key policy implication is the need to enforce more consistent implementation across BCBS member states.

This paper contributes to the broad literature on the market evaluation of bank regulation, which has a long tradition in the U.S. and is driven largely by deregulatory measures (Allen & Wilhelm, 1988; Bhargava & Fraser, 1998; Brook et al., 1998; Carow & Heron, 1998; Cornett & Tehranian, 1989, 1990; Dann & James, 1982; James, 1983; Mamun et al., 2004; Slovin et al., 1990; Yildirim et al., 2006). In addition to the papers mentioned by Bruno et al. (2018) and Simion et al. (2024), the closest connection in terms of content is with the papers that examine the impact of Basel I on stocks (Cooper et al., 1991; Eyssell & Arshadi, 1990; Lu et al., 1999; Wagster, 1996). The bottom line is that shareholders in various countries react negatively, there are redistribution effects favoring smaller banks, and Basel I is unable to establish a level playing field. The present paper also relates to more recent literature that analyzes regulatory changes post-GFC, with an increasing use of CDSs due to the growing availability of CDS data (Horváth & Huizinga, 2015; Moenninghoff et al., 2015; Pancotto et al., 2020; Schäfer et al., 2016).

The paper is structured as follows: Section 2 outlines the key changes introduced by Basel II.5, Basel III, and Basel IVregarding the regulatory treatment of market, credit, and liquidity risks. It also describes the event selection and evaluation process and presents the actual implementation in the U.S. and EU. Section 3 discusses hypotheses related to both aggregated and heterogeneous market reactions. Section 4 details the data, event study design, block bootstrap significance test, cross-sectional analysis, and approach to handling confounding events. Section 5 presents the results and discussion. Section 6 addresses additional robustness checks and limitations. Section 7 concludes the paper.

2. Regulatory background and event dates

2.1. Regulation of financial risks from Basel II.5 to Basel IV

The regulation of the three financial risks changed considerably in the wake of the 2007 GFC. Basel II.5 can be understood as the BCBS's immediate crisis response, addressing banks' market risk and, to an extent, their trading books' capitalization, risk management and disclosure requirements. The market risk framework that was valid until the GFC in 2007 was the 1996 Amendment that was intended to supplement Basel I, which until 1996, covered only credit risk. During the crisis, it became apparent that core aspects of the framework are inadequate and, in some cases, set incorrect incentives for banks. For example, credit-dependent instruments were preferentially held in the banking book because of lower capital requirements. As the risk of such instruments is not captured by the existing value at risk (VaR) framework of the trading book and to mitigate the incentive for arbitrage between the trading book and the banking book, an additional incremental risk charge (IRC) must be calculated for unsecuritized credit positions, which includes default and migration risk. Since the VaR framework for quantifying trading book capital is determined on the basis of the previous year's period, it is not surprising that even at the beginning of the crisis, the calculated capital was insufficient to absorb losses. To adjust regulatory capital for a crisis scenario, banks are required to additionally calculate a stressed VaR calibrated on a one-year stress period, which at least doubles the capital requirements. For securitizations, the capital charges of the banking book apply. These changes were implemented by December 31, 2011.

The BCBS had previously explained that these changes focus only on the most pressing issues and that a systematic revision of the entire framework is still pending—the fundamental review of the trading book (FRTB). In May 2012, the first consultative document on the FRTB was published; it was finalized after further consultative documents and standards in 2019, with the rules enforced beginning January 1, 2022. The FRTB includes further measures to reduce regulatory arbitrage and changes to the previous VaR framework to an expected shortfall (ES) framework to account for tail risk. Furthermore, the models of both the standardized approach and the internal models are calibrated for a stress period, and that the newly developed standardized approach are ensured to be a credible fallback of the internal model. A brief description and assessment of the market events are provided in Table A.9.

The regulatory treatment of credit risk has also undergone significant tightening. Two capital buffers above the regulatory minimum capital have been implemented. The capital conservation buffer serves to accrue additional capital in good times, which may be utilized during periods of stress. In addition, to prevent procyclicality, national supervisors may require a countercyclical capital buffer to be built up when there are signs of a credit bubble. Due to significant losses on resecuritizations during the GFC, the risk weights under both the standardized approach and internal ratings-based approach (IRBA) increased, as was the case for credit risk exposures resulting from derivatives, repos and securities financing transactions. While under Basel II, bank exposures to central counterparties were not subject to capital requirements, under Basel III, a risk weight of 2% is set. To encourage more derivatives settlement via central counterparties, the BCBS has implemented margin requirements for noncentrally cleared derivatives to reflect the generally higher inherent risk. Having already tightened the capital requirements for resecuritizations, the framework for securitizations is also being strengthened. The standardized approach to securitizations has been tightened, and with regard to the IRBA, the calculated capital requirements may not fall below a floor in relation to the standardized approach.

The standardized approach for credit risk will be revised to be more risk sensitive and more closely aligned with the IRBA. Furthermore, the mechanistic reliance on external ratings for borrower assessment and risk weighting is restricted. Thus, external ratings may be applied only to banks and corporate exposures. Similarly, the use of the advanced and foundational IRBA is also restricted. The advanced IRBA may no longer be utilized for credit exposures for banks, other financial firms, and large corporations. Neither IRBA may be employed for equities. The output floor of both IRBAs is now set to the higher of IRBA risk-weighted assets (RWAs) or 72.5% of the RWAs of the standardized approach. In Table A.10, a brief description and assessment of credit events is given.

While credit and market risk were covered by regulations before the GFC, liquidity regulation is a unique feature of Basel III and can be considered a consequence of the crisis that demonstrated its significance. Due to a lack of confidence, the interbank market came to a standstill, the issuance of new debt became difficult, and banks were forced to sell assets to generate liquidity, which caused their prices to fall and led to write-downs and thus contagion among other market participants. This finding illustrates that liquidity risk is closely linked to credit and market risks. In addition to two quantitative metrics (Pillar 1), supervisory monitoring (Pillar 2) and disclosure and market discipline (Pillar 3) were also tightened, as were the other two financial risks. In temporary terms, short-term and structural liquidity is ensured with the liquidity coverage ratio (LCR) and NSFR under Pillar 1. A brief description and assessment of the liquidity events are provided in Table A.11. The event identification process is described in the next section.

2.2. Event identification and classification

The use of event studies to evaluate the information content of events dates back to Fama et al. (1969) and has long been applied to regulatory events. As Lamdin (2001) discusses in detail, there are issues regarding the use of this method for regulatory changes that must be addressed. A major concern is the exact definition of the event period because ongoing debates may leak information or market participants can anticipate events (Binder, 1985). Such uncertainty in the event window reduces the power of tests to reject the null hypothesis of no effect (Lamdin, 2001). Therefore, all event days refer exclusively to official BCBS announcements involving consultative documents, standards, sound practices and guidelines for the relevant market, capital or liquidity risk regulation and thus cover initiatives related to Basel II.5, Basel III and Basel IV. This approach ensures that only true information and no rumors or debates influence the calculations to prevent noise. All publications are filtered to reflect the topics of the market, credit and liquidity risk from the beginning of the GFC in 2007 to December 2019.[3] The end of the search period is chosen to allow all relevant changes in regulation to be taken into account and so that the COVID-19 pandemic starting in 2020 does not affect the results. Furthermore, all press releases are reviewed to ensure no significant information is missing in the analysis, which would reduce the power of the tests.[4] All events are evaluated in terms of their information content and their implications for the capital market, including whether they tighten or weaken the existing regulatory framework. Note that the evaluation of each event depends on the prior event since the former announcement can be changed, i.e., tightened or weakened. Events that simply redescribe changes that have already been announced are removed to prevent noise. If an announcement occurred on a weekend, the first available trading day is used as the event date.

Because events corresponding to the market, credit and liquidity regulation are partly announced simultaneously, establishing a causal effect of the specific regulatory announcement type might be misleading. Therefore, analogous to Bruno et al. (2018), tests are performed for the three types of regulation that exclude events that coincide simultaneously with regulatory announcements of the two other types. These tests are referred to as market-only events, credit-only events and liquidity-only events. Although the definition of regulatory capital equally determines the market reaction for credit and market price risk, events that affect only the composition of regulatory capital are removed for this reason.

To further mitigate the influence of noise via nonsignificant events, the information content of all events is investigated via media analysis. Using LexisNexis, international media (Wall Street Journal, Wall Street Journal Europe, Financial Times, International Herald Tribune, International New York Times, American Banker, and The Guardian) are checked to ensure that the events convey new information to the market.[5] To reduce concerns about capital market anticipations, the media analysis is amplified in the week prior to each event. All market, credit and liquidity events and their descriptions can be found in Appendix A.

2.3. U.S. and EU implementation of the Basel accords

The BCBS requires its regulations to apply to 'internationally active banks'. However, this term is not precisely defined, allowing national authorities some discretion (Basel Committee on Banking Supervision, 2012). Although the BCBS monitors the transposition of its rules into domestic law through the Regulatory Consistency Assessment Program (RCAP), it ensures alignment with minimum regulatory standards only. Market participants may anticipate the extent to which national authorities will implement regulations based on past decisions. For example, under Basel II, only the advanced approach was mandatory for 'core banks' in the U.S., while other institutions continued to be regulated exclusively under Basel I. In 2011, only 17 large banks exceeded the regulatory limits based on total assets and on-balance sheet foreign

[3] See https://www.bis.org/bcbs/publications.htm.

[4] See https://www.bis.org/press/pressrels.htm.

[5] Several keywords are used to evaluate international press coverage of the BCBS announcements; see Table B.12.

exposure (Basel Committee on Banking Supervision, 2012). In the EU, Basel II was implemented consistently for all institutions (Dierick et al., 2005). The actual implementation of regulations in different jurisdictions does not directly influence market reactions to BCBS announcements, as implementation typically occurs later. However, the example of Basel II demonstrates that banks might anticipate inconsistent future implementation in the EU and the U.S. Therefore, a brief overview of the regulatory institutions and frameworks in both the U.S. and the EU are provided. This overview is followed by an explanation of the implementation of Basel II.5, Basel III, and Basel IV within these jurisdictions. This institutional background then serves as a foundation for deriving hypotheses at both the aggregate and cross-sectional levels for each jurisdiction.

In the U.S., banks can be chartered at either the federal or state level. State-chartered banks are supervised by both federal and state regulators. Consequently, every bank in the U.S. is supervised by one of the federal banking authorities: the Office of the Comptroller of the Currency (OCC), the Federal Deposit Insurance Corporation (FDIC), or the Federal Reserve Board (FRB), collectively referred to as U.S. agencies (Basel Committee on Banking Supervision, 2014c). The legal form of a bank, its membership in the Federal Reserve System, and whether it is chartered at the federal or state level determine which of the three U.S. agencies supervises it. In addition to supervision, U.S. agencies are responsible for implementing banking regulations. In the EU, banking regulation is enacted through regulations and directives from the European Parliament and the Council. Directives must be written into national law by member states, while regulations are directly applicable in the context of EU law. Since 2014, the European Central Bank (ECB) has been responsible for supervising significant institutions under the single supervisory mechanism (SSM), while other banks continue to be supervised by national authorities.

Regarding Basel II.5 and its changes to the market risk framework, notable jurisdictional differences exist. In the U.S., the rules apply only to institutions with trading activity (assets and liabilities) that either constitutes ≥ 10% of quarter-end total assets or exceeds ≥ $1 billion (bn.) (Office of the Comptroller of the Currency, Treasury and Board of Governors of the Federal Reserve System, 2013). In the EU, the framework was implemented through the Capital Requirements Directive (CRD) III (Directive (EU) 2010/76) and the Capital Requirements Regulation (CRR) (Regulation (EU) 575/2013). Generally, the rules apply without limits to all trading book positions of an institution in accordance with Art. 4 (86) CRR. However, institutions whose on- and off-balance sheet trading book volume is typically less than 5% of the total assets and €15 million (mio.) and never exceeds 6% of total assets and €20 mio. are granted relief in the risk calculation according to Art. 94 CRR. Thus, the application in the EU is more restrictive. A further crucial difference is that the Dodd-Frank Act in the U.S. removes the requirement to use credit ratings when assessing the creditworthiness of securities, a provision that also affects credit risk regulation.

The market risk framework was subsequently refined by the FRTB with Basel IV. In the U.S., the proposed rules were released in 2023. They are mandatory for banks with total assets of ≥ $100 bn. (regardless of trading activities), their subsidiary depository institutions and banks with a four-quarter average of trading assets plus trading liabilities ≥ $5 bn. or ≥ 10% of total assets (Office of the Comptroller of the Currency, Treasury and Board of Governors of the Federal Reserve System and Federal Deposit Insurance Corporation, 2023). In the EU, the FRTB standards for reporting purposes were implemented with CRR II (Regulation (EU) 2019/876) and CRD V (Directive (EU) 2019/878), while the final rules for the own funds requirements were published in 2024 with the CRR III (Regulation (EU) 2024/1623) and the CRD VI (Directive (EU) 2024/1619). A derogation for small trading book business is granted if the on- and off-balance sheet trading book business is ≤ 5% of the institution's total assets and ≤ €50 mio., according to Art. 94 CRR II and CRR III. Similarly to Basel II.5, the application scope of the FRTB is stricter in the EU than in the U.S. The application of the FRTB rules in the EU has been postponed by the Commission until January 1, 2026. This postponement was justified with the intention of not jeopardizing a level playing field because the U.S. implementation is still pending.

Credit risk, which is addressed by Basel III and IV, is treated differently in the U.S. and the EU. The final U.S. Basel III credit risk framework was released in 2013 and applies to all banks, except for bank holding companies subject to the Board's SBHC Policy Statement (total assets ≤ $ 500 mio.). Some rules, such as the countercyclical capital buffer or the mandatory calculation of capital requirements using internal approaches, apply only to advanced approaches of banks (≥ $250 bn. total assets or ≥ $10 bn. in total consolidated on-balance sheet foreign exposure) and subsidiary depository institutions (Office of the Comptroller of the Currency, Treasury and Board of Governors of the Federal Reserve System, 2013). However, following a general consultation, the U.S. agencies created a comprehensive framework in 2019 for the application of capital and liquidity rules for large banks, and the rules for credit risk were adapted to this framework (Office of the Comptroller of the Currency, Treasury and Board of Governors of the Federal Reserve System and Federal Deposit Insurance Corporation, 2019). They are based on four risk-based categories determined by the risk profile to define tailored requirements that increase in stringency on the basis of size- and risk-based indicators (cross-jurisdictional activity, weighted short-term wholesale funding, nonbank assets, and off-balance sheet exposures). Table 1 outlines the characteristics of Category I–IV banks and their additional credit risk requirements, which also apply to their depository subsidiaries. Banks outside these categories follow the general Basel III credit risk rules. Only institutions subject to the Board's SBHC Policy Statement remain exempt from the rules.[6] In the EU, the Basel III credit rules were implemented in 2013 through the CRR and CRD IV (Directive (EU) 2013/36), applying to all banks, which reflects a stricter and more comprehensive approach to their enforcement.

As with the FRTB, there are U.S. proposals from 2023 for the changes to the credit risk framework under Basel IV, which only affect large banks with total assets of ≥ $100 bn. that are assigned to one of the four categories (Office of the Comptroller of the Currency, Treasury and Board of Governors of the Federal Reserve System and Federal Deposit Insurance Corporation, 2023).[7] The internal credit risk models will be abolished, requiring banks to calculate capital using both a new standardized approach (expanded risk-based) and the existing standardized approach, with the more conservative result being applied. Consequently, banks in Categories I-IV will follow the same credit risk rules. Additionally, banks in Categories III and IV should recognize elements of accumulated other comprehensive income (AOCI) in regulatory capital, and the countercyclical capital buffer will also apply to Category IV banks. In contrast, Basel IV was already adopted in the EU in 2024 with CRR III and CRD VI, and these regulations will take effect on January 1, 2025. In contrast to the U.S., regulations in the EU generally affect all banks, including the new standardized approach to credit risk. While internal models for credit risk have not been entirely eliminated in the EU, their requirements and application scope are being tightened.

Significant jurisdictional differences also exist in the implementation of the liquidity regulation introduced with Basel III. In the U.S., the agencies published final LCR requirements in October 2014, which took effect in January 2015. Initially, the LCR applied in full only to internationally active banking organizations and their consolidated subsidiaries with assets of ≥ $10 bn. A bank is considered to be

[6] The threshold for consolidated assets has been raised twice and has been set to ≤ $3 bn. since 2018, as specified in section 207 of the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA).

[7] The changes to credit risk regulation are not included in Table 1, as they are still proposals.

Table 1
U.S. Implementation of credit risk capital requirements and liquidity rules.

Category	Description	LCR	NSFR	Credit Risk
I	G-SIBs and their depository institution subsidiaries	full requirement	full requirement	-G-SIB surcharge -calculate both the advanced and standardized approach -recognize accumulated other comprehensive income (AOCI) in capital - expand the capital conservation buffer by the amount of the countercyclical capital buffer, if applicable
II	≥ \$700 bn. in total consolidated assets; or ≥ \$75 bn. in cross-jurisdictional activity; do not meet the criteria for Category I	full requirement	full requirement	-same as Category I banks without G-SIB surcharge
III	≥ \$250 bn. in total consolidated assets; or ≥ \$75 bn. in weighted short-term wholesale funding, nonbank assets or off-balance sheet exposure; do not meet the criteria for Category I or II	- full requirement, if ≥ \$75 bn. in average weighted short-term wholesale funding - otherwise reduced LCR of 85%	- full requirement, if ≥ \$75 bn. in average weighted short-term wholesale funding - otherwise reduced NSFR of 85%	-countercyclical capital buffer -opt out of the requirement to recognize AOCI in capital
IV	≥ \$100 bn. in total consolidated assets; do not meet the criteria for Category I, II or III	- reduced LCR of 70%, if ≥ \$50 bn. average weighted short-term wholesale funding - otherwise no requirement	- reduced NSFR of 70%, if ≥ \$50 bn. in average weighted short-term wholesale funding - otherwise no requirement	-generally risk-based capital requirements as banks with ≤ \$100 bn.

internationally active if the consolidated assets are ≥ \$250 bn. or if the balance sheet foreign exposure is ≥ \$10 bn. (Basel II threshold). The less strict, so-called modified LCR of 70%, must be complied with by banks that are not internationally active and have ≥ \$50 bn. in total assets (Office of the Comptroller of the Currency, Department of the Treasury and Board of Governors of the Federal Reserve System and Federal Deposit Insurance Corporation, 2014). Consistent with the application scope of the LCR, a proposal to implement the NSFR was published in 2016 (Office of the Comptroller of the Currency, Department of the Treasury and Board of Governors of the Federal Reserve System and Federal Deposit Insurance Corporation, 2016). The liquidity rules were then adapted to the framework based on the risk-based Categories I-IV, and the final NSFR rules were published in 2021 (Office of the Comptroller of the Currency, Department of the Treasury and Board of Governors of the Federal Reserve System and Federal Deposit Insurance Corporation, 2021). They are displayed in Table 1, and the requirements of parent companies subject to Categories I-III also apply to their depository institution subsidiaries with total consolidated assets of ≥ \$10 bn. Banks that do not meet the criteria are not subject to the LCR and NSFR. In the EU, the LCR was introduced in 2015 and fully applies to all banks in accordance with the CRR, indicating that the requirements in the EU are considerably more stringent. The NSFR was codified in the CRR and fully implemented with CRR II in 2019, becoming a standard in 2021. Generally, the NSFR applies to all EU banks; however, national authorities may permit small and non-complex institutions to adopt a simplified approach (Basel Committee on Banking Supervision, 2022). However, the threshold is restrictive and subject to various criteria, e.g., total assets must be on average ≤ \$5 bn. in the last four years.[8] Similar to the LCR, the application scope of the NSFR is broader in the EU than in the U.S., where only the largest institutions need to comply.

In summary, the cross-jurisdictional comparison highlights notable differences in actual implementation. The regulatory scope within the EU is both broader and more stringent across all agreements and for each of the three types of risk. These discrepancies in implementation between the U.S. and the EU lay the foundation for discussing aggregated market reactions and developing the cross-sectional hypotheses.

3. Aggregated market reactions and hypotheses for cross-sectional analysis

The next section discusses overall market reactions and potential differences between U.S. and EU banks, followed by an analysis of the factors driving potentially heterogeneous responses among banks. To avoid confusion, the terms *negative* and *positive* are used to describe the *direction* of market reactions, although the interpretations differ between stocks and CDSs. A negative stock market reaction indicates a loss for shareholders, whereas it reflects a decrease in CDS spreads, signaling reduced risk for creditors, and vice versa. Both stock and CDS markets may respond positively or negatively to the three financial risks, depending on how creditors and shareholders assess the trade-offs of regulation.

Different implementations in the U.S. and the EU may lead to varied market reactions. The actual implementation in jurisdictions can shape expectations, both ex ante through preceding political discussions and proposals and ex post. One example is Basel III, implemented in the U.S. and the EU in 2013. The 26 credit events considered in this paper span from 2008 to 2019. It is plausible that market participants adjust their expectations in response to BCBS events, such as when pre-2013 negotiations in the U.S. suggested that stricter rules will apply only to large banks. Ex post, these expectations may influence reactions to subsequent BCBS announcements, as similar regulatory implementations are anticipated across jurisdictions. Another example is Basel II, which applied to all EU banks but only to large U.S. banks, thus potentially influencing anticipations for future BCBS accords.

In addition to the overall reaction of markets, the cross-sectional analysis highlights whether certain bank- and jurisdictional-specific variables have a positive or negative effect on stock and CDS market reactions, as it cannot be assumed that all banks react uniformly to regulation.

[8] See Art. 4 (1) No. 145 CRR II.

3.1. Market risk

Before potential differences in jurisdictional responses are examined, several key considerations regarding aggregated reactions are outlined. Standard financial theory posits that better capitalized banks with less leverage face lower equity volatility, leading to lower expected returns on debt and stock due to reduced risk (Sarin & Summers, 2016). From this neoclassical perspective, restricted risk-taking reduces future profits. Additionally, equity is costlier than debt due to the tax deductibility of interest, reducing profitability (Moenninghoff et al., 2015). Furthermore, implementing regulation incurs operational costs and requires resources, thereby reducing the funds available for dividend payments. However, arguments for positive stock market reactions exist. Empirical evidence shows that increasing equity can boost bank profitability, especially during crises (Berger & Bouwman, 2013). In addition, Laeven et al. (2016) show that systemic risk decreases with higher capital. If shareholders perceive reduced crisis risks and costs from prudent risk limitations (Barth & Miller, 2018; Basel Committee on Banking Supervision, 2019; Miles et al., 2013), they might respond positively.

Similar arguments apply to the CDS market. The neoclassical view suggests that lower leverage triggers a negative CDS market reaction. Lower spillover risks and greater banking system resilience are also likely to have a negative impact. Conversely, positive CDS market reactions are plausible as well. Sarin and Summers (2016) find higher CDS spreads in the U.S. post-GFC, linked to lower bailout expectations. Similarly, Schäfer et al. (2016) observe increased spreads following financial reforms, especially the Volcker Rule in the U.S., and attribute this finding to reduced bailout expectations. Creditors may view implicit government bailout guarantees in the EU and the U.S. as weakened due to higher capital requirements and the introduction of bail-in debt and resolution frameworks.

The Basel II.5 framework is implemented more restrictively in the EU, where it applies to all institutions; only thresholds for simplified capital requirement calculations exist. In contrast, U.S. regulations apply only to banks with a trading volume of ≥ 10% of total assets or ≥ $1 bn. The market events analyzed (see Table A.9) span 2007 to 2019, with Basel II.5 implemented in 2013 in both the U.S. and EU. The discussions and proposals leading up to 2013 and beyond influence expectations. For post-2013 events, particularly those related to the FRTB, market participants might anticipate less stringent implementation in the U.S. Notably, while the regulation is already law in the EU, the U.S. has only proposed implementation so far, with a narrower application scope in the EU, similar to Basel II.5.

In addition to the less stringent implementation, the U.S. banking market's structure is characterized by numerous small regional banks that are publicly listed but do not engage in proprietary trading, which may contribute to a U.S. stock market reaction that is milder compared to that of the EU. In contrast, relatively larger banks are listed in the EU and are more likely to engage in trading. Furthermore, the Volcker Rule, enacted as part of the Dodd-Frank Act in 2010, has imposed stringent restrictions on proprietary trading for U.S. banks.[9] Consequently, the risk-return profile of U.S. banks could remain largely unchanged by the Basel' market risk framework, leading to reduced pressure to adhere to these rules. Although a similar CDS reaction is expected in both jurisdictions, as CDSs are generally traded by larger institutions subject to the market risk framework, the Volcker Rule could lead to a less pronounced U.S. reaction.

In the next step, hypotheses for the cross-sectional analysis are developed for U.S. and EU banks. Since both returns and CDS spread changes are closely linked by risk, the same variables are used to explain the heterogeneity in banks' reactions, where applicable. First, the bank-specific variables are operationalized to ensure that they are consistent for U.S. and EU banks before the jurisdictional-specific variables are presented.

The Tier 1 ratio (TIER1_RAT) is the ratio of Tier 1 capital to total RWAs and serves as a proxy for capitalization. A higher ratio indicates a lower probability of default (PD), which is expected to negatively impact the CDS market reaction. In contrast, a positive effect on the stock market is anticipated, as banks with higher TIER1_RAT require less additional capital, lowering compliance costs. However, beyond a certain level, the cost of raising additional capital may outweigh its benefits, making the positive effect ultimately negative. Therefore, a quadratic term is included in the stock market estimations to capture this nonlinear relationship.

$H1_{US,EU,m}$: *Capitalization has a positive but decreasing impact on the stock market reaction and a negative impact on the CDS market reaction.*

Banks' market risk is proxied for the U.S. portfolio by the ratio of derivatives to total assets, DER_ASSET. In contrast, consistent with Fiordelisi and Molyneux (2010) and due to limited data availability, the EU sample uses the more generic ratio of marketable security investments to total assets, SEC_ASSET. It is assumed that higher market risk negatively impacts stock market reactions, as future profitability is expected to decline when banks are forced to assume less risk. To meet requirements, banks with a higher market risk must either raise additional capital or restructure their portfolios. If a bank has significant market risk exposure, it suggests that management relies on generating profits from riskier securities, meaning that its business model is undermined by regulation. In contrast, a positive impact is expected in the CDS market, as these banks continue to face elevated risks.

$H2_{US,EU,m}$: *Market risk has a negative impact on the stock market reaction and a positive impact on the CDS market.*

In response to the GFC, the Financial Stability Board (FSB) issued a list of G-SIBs in 2011 that are required to hold additional capital and that are subject to stronger supervision. This list is updated annually with new additions and deletions. A dummy variable, which is 1 for G-SIBs and 0 otherwise, is used.[10] Since G-SIBs must still hold additional capital, shareholders could negatively react to the general tightening of market risk regulation. Furthermore, it is conceivable that G-SIBs engage in more proprietary trading, which could provoke a negative reaction from shareholders. Regarding the CDS market, the risk of G-SIBs is a priori higher, suggesting a positive impact.

$H3_{US,EU,m}$: *G-SIBs have a negative impact on the stock market reaction and a positive impact on the CDS market.*

In the next step, jurisdictional hypotheses are developed based on differences in the implementation and banking system structures. Considering Europe reveals that peripheral GIIPS countries in particular are affected by the sovereign debt crisis. Acharya et al. (2014) provide evidence for a two-way feedback loop between sovereign risk and bank credit risk, demonstrating that a stressed banking sector leads to government bailouts, which increases sovereign credit risk. This outcome, in turn, weakens the banking system because the value of government guarantees and government bonds implicitly decreases. Because domestic bonds capture the majority of banks' sovereign exposure, GIIPS banks are particularly affected (Gennaioli et al., 2018). Thus, they have a higher credit risk than banks outside GIIPS, which implies higher refinancing costs and a higher PD. This condition could also affect the response to market risk regulation because more capital is needed. The

[9] In 2017, U.S. President Trump initiated a review of the Dodd-Frank Act. On May 24, 2018, EGRRCPA was signed into law. This act raised the threshold for banks considered systemically important from $50 bn. to $250 bn., reducing the regulatory burden for many mid-sized institutions, including stress test requirements. Smaller banks with assets of $10 bn. or less were granted further relief and exempted from the Volcker Rule.

[10] In general, G-SIBs are classified into different buckets. No distinction is made in the context of this work. For consistency, the identified G-SIBs in 2011 are classified as G-SIBs prior to 2011.

EU sample is split with the dummy variable GIIPS, which is 1 if the bank is located in a GIIPS country and 0 otherwise. To examine the feedback loop, the interaction between GIIPS and the sovereign debt crisis (SOV_DEBT) is analyzed, focusing on the interactions between 2010 and mid-2013 (Hobelsberger et al., 2022; Ricci, 2015). A negative impact on the stock market is predicted, whereas a positive impact on the CDS market is assumed because of the higher risk of banks located in GIIPS.

H4$_{EU,m}$: *The feedback loop has a negative impact on the stock market reaction and a positive impact on the CDS market reaction.*

Beyond the feedback loop, several factors suggest differing responses between GIIPS banks and non-GIIPS banks. One argument is rooted in fire sales, as the sale of sovereign bonds is identified as a major driver of systemic risk (Greenwood et al., 2015). Because GIIPS banks hold riskier sovereign bonds and are riskier a priori, they could try to sell their sovereign exposure in a crisis, which could be exacerbated by market risk regulation, thus increasing their PD. Furthermore, GIIPS banks may find it difficult to find counterparties for derivatives due to their sovereign exposure. The discussion starting in 2015 on the abolition of the preferential treatment of sovereign exposures in the banking and trading books could also contribute to a tightening of the market reaction of GIIPS banks (Basel Committee on Banking Supervision, 2017).[11]

Unfortunately, due to unavailable granular data on trading assets and liabilities, a plausible approximation of whether a U.S. bank is subject to the market risk framework and the formulation of a specific hypothesis cannot be carried out.

3.2. Credit risk

As the regulatory treatment of market and credit risk is comparable due to higher capital ratios for RWAs, the arguments for aggregated market reactions from the previous section are referenced. Basel III credit risk rules apply to all U.S. banks, except for SBHCs.[12] Some requirements are mandatory only for large banks, with the definition evolving over time. Since 2019, these banks are generally those with total assets of ≥ \$250 bn. (see Table 1). Basel IV changes in the U.S. are still in the proposal stage and exclusively target large banks. In contrast, the EU applies the Basel III credit risk framework to all banks without exception, and Basel IV has already been implemented.

It is assumed that EU banks have a stronger stock market reaction due to the stricter implementation without exceptions or size thresholds, and partly because Basel IV, which will be mandatory only for large U.S. banks, has not yet been implemented in the U.S. Although the implementation of CRR III and CRD VI in the EU and the U.S. proposal fall outside the credit events period (2008–2019), market expectations shaped by previous divergent implementations and negotiations in these regions can still influence reactions to BCBS announcements. A similar response in the CDS market is expected, comparable to market risk regulation discussions, as CDSs typically cover the largest banks, which are treated similarly in both the U.S. and the EU. However, the U.S. faces delays in implementing Basel IV, which could be anticipated.

The determinants of market responses are somewhat similar for market and credit risk as the regulatory treatment is partially consistent, which is why some hypotheses are the same. The influence of capitalization is assumed to be analogous to that of market risk regulation.

H1$_{US,EU,c}$: *Capitalization has a positive but decreasing impact on the stock market reaction and a negative impact on the CDS market reaction.*

The ratio of total loans to total assets (LOAN_ASSET) serves as a proxy for credit risk. Banks that face higher credit risk are required to secure additional capital, leading to increased costs. Additionally, new regulations can impose restrictions on risk-taking, which can curtail future profits. Consequently, a negative impact on the stock market is anticipated. Conversely, in the CDS market, a positive impact is expected, reflecting the heightened credit risk in comparison to other banks.

H2$_{US,EU,c}$: *Credit risk has a negative impact on the stock market reaction and a positive impact on the CDS market.*

Another aspect of credit risk regulation involves the cost of risk, measured by the ratio of loan loss provisions to total loans (PROV_LOAN) (Brissimis et al., 2008). These costs are expected to rise due to regulation, likely leading to a negative effect on stock market reactions and a positive effect on CDS market reactions.

H3$_{US,EU,c}$: *Credit risk costs have a negative impact on the stock market reaction and a positive impact on the CDS market reaction.*

Similar to market risk, the influence of banks as G-SIBs is analyzed for credit risk, with the expected direction of impact being consistent.

H4$_{US,EU,c}$: *G-SIBs have a negative impact on the stock market reaction and a positive impact on the CDS market.*

Alongside the bank-specific hypotheses, the jurisdictional hypotheses are examined in the next step. As in the analysis of EU market risk determinants, the mechanism of the feedback loop is tested.

H5$_{EU,c}$: *The feedback loop has a negative impact on the stock market reaction and a positive impact on the CDS market reaction.*

U.S. credit risk rules are not binding for SBHCs. To capture differences in market reactions between SBHCs and affected institutions, a dummy variable AFF_BANK_c is constructed that is 0 for SBHCs and 1 otherwise. The size-based regulatory thresholds determining when a bank holding company is exempt from regulation have changed over time, leading to the following specification: a bank holding company is classified as SBHC if its total assets are ≤ \$500 mio. prior to October 23, 2013 (the day before a bill of Public Law 113–250 was introduced in the House, which raises the threshold to ≤ \$1 bn.), ≤ \$1 bn. between October 23, 2013 and November 15, 2017 (the day before a bill of Public Law 115–174 (EGRRCPA) was introduced in the Senate that raised the threshold to ≤ \$3 bn.), and ≤ \$3 bn. on November 16, 2017.[13] Because CDSs are available for large banks only, the hypothesis cannot be tested for creditors.

H5$_{US,c}$: *AFF_BANK_c negatively impacts stock market reactions.*

3.3. Liquidity risk

In terms of aggregated market reactions to liquidity risk, the considerations and arguments differ from those related to market and credit risk. Unlike the latter, liquidity risk is not regulated through capital requirements but rather by mandating that banks hold a higher proportion of liquid assets and avoid structural funding mismatches. A negative stock market reaction is plausible, as banks prioritize profit maximization when selecting assets and funding, which is hindered by liquidity regulation (Bruno et al., 2018). This situation creates opportunity costs, as banks must hold lower-yielding assets, such as government bonds, rather than more profitable loans or securities to meet liquidity requirements. In addition, liquidity introduces moral hazard to management (Jensen, 1986).

Nevertheless, there are arguments suggesting a positive stock market reaction. The GFC highlighted the severe impact of liquidity risk,

[11] Ultimately, these considerations were not realized. Only disclosure requirements for sovereign exposures were implemented, which are mandatory only when required by national supervisors.

[12] The number of these holding companies supervised by U.S. agencies on December 31, 2012, was substantial, totaling 3802 (Office of the Comptroller of the Currency, Treasury and Board of Governors of the Federal Reserve System, 2013).

[13] Exemptions apply exclusively to holding companies, not to banks. SBHCs are approximated with a size-based threshold, as described above. In addition to these thresholds, bank holding companies must meet additional qualitative criteria, which, however, cannot be properly mapped with the available data.

including systemic risk and spillover effects, which the LCR and NSFR aimed to address (Basel Committee on Banking Supervision, 2013, 2014a). Additionally, global standards offer convergence benefits (Bruno et al., 2018).

The previous arguments are relevant for CDSs as well, and a negative market reaction can be expected if liquidity regulation mitigates the risks of excessive profit maximization. This expectation holds if the regulatory goals of reducing systemic risk due to liquidity shortages and spillover effects are met. Conversely, a positive CDS market reaction is also conceivable. Myers and Rajan (1998) analyze the 'dark side' of liquidity. Their model shows that higher liquidity limits a firm's ability to commit to strategies that protect creditors. Another argument concerns reduced bailout expectations.

Although the scope of the LCR and NSFR has evolved over time, both metrics have always been intended for the largest U.S. banks. In contrast, the EU applies both metrics to all banks. Consequently, the stock market reaction in the EU is expected to be stronger than that in the U.S., where the rules are not relevant to shareholders of smaller banks. A weaker reaction is further supported by the better liquidity situation of U.S. banks during and after the GFC compared with their EU competitors (Dietrich et al., 2014; European Banking Authority, 2012). Since large U.S. banks are subject to liquidity requirements and CDSs are available primarily for these banks, a comparable CDS market reaction in both jurisdictions is assumed, albeit possibly somewhat weaker due to the better liquidity situation of U.S. institutions. Building on Bruno et al. (2018) and Simion et al. (2024), cross-sectional hypotheses are developed, and since they examine the economic rationale of regulation, the LCR and NSFR are first addressed, which aim to ensure a bank's short-term liquidity and prevent structural funding mismatches. As shown in Table A.11, the liquidity events span from 2008 to 2017. The LCR was introduced in 2015, followed by the NSFR in 2018 (Basel Committee on Banking Supervision, 2014b, 2015). Hence, neither ratio is reported by banks for all liquidity events. Furthermore, since the necessary data for calculating the ratios were not yet published in earlier balance sheets, plausible approximations must be used across all events for consistency (Bruno et al., 2018). Due to the significantly divergent jurisdictional implementation, the hypotheses for the U.S. and the EU are formulated separately, starting with the EU.

The variable LCR_PROXY represents the ratio of liquid assets to demand deposits and short-term funding. Banks with more liquid assets are better positioned to meet LCR requirements, reducing the pressure to restructure their assets. Therefore, a higher LCR_PROXY should positively affect stock market reactions and negatively impact CDS market reactions.

H1$_{EU,l}$: *Banks with more liquid balance sheets have a positive impact on the stock market reaction and a negative impact on the CDS market.*

The NSFR conceptually aligns with the "golden rule of banking" by limiting maturity transformation. This situation arises if the stability and long-term nature of the liabilities are sufficient to cover the outflows of assets. As outlined in Art. 26 (Basel Committee on Banking Supervision, 2014a), regulatory capital is eligible as available stable funding at 100%, which also applies to demand deposits of retail and small business customers in a range of 90% to 95%. Banks relying heavily on short-term wholesale funding may struggle to meet these requirements, as their situations are considered less stable. Compliance is also challenging for banks with minimal regulatory capital, forcing them to raise additional equity and restructure their funding. The variable NSFR_PROXY is defined as the ratio of the sum of total equity, long-term funding and customer deposits to total assets. A higher ratio indicates a smaller funding mismatch, which is expected to positively impact the stock market and negatively affect the CDS market. The reason is that banks with smaller mismatches face lower liquidity risk and reduced compliance costs.

H2$_{EU,l}$: *A lower funding mismatch has a positive impact on the stock market reaction and a negative impact on the CDS market.*

The charter value of a bank can be defined as the value that would be foregone due to insolvency and includes, e.g., reputation, monopoly rents or economies of scale (Acharya, 1996). Since those values cannot be sold if a bank is insolvent, banks with higher charter values have a lower incentive to risk failure (Keeley, 1990). Ratnovski (2009) examines the relationship between banks' liquidity decisions and their charter values and finds a positive correlation. This result implies that banks protect their charter values by maintaining adequate liquidity (Bruno et al., 2018). Since banks base their liquidity on the likelihood of a bailout (generate short-term bailout rents with low liquidity level vs. preserve the charter value with high liquidity and long-term rents) and liquidity regulation reduces this probability, banks with higher charter values will choose higher liquidity (Bruno et al., 2018). Charter values should have a positive impact on the stock market reaction and a negative impact on the CDS market reaction because the PD decreases with higher levels of liquidity. The ratio of customer deposits to total assets (DEP_ASSET) is the proxy for a bank's charter value (Goyal, 2005; Keeley, 1990).

H3$_{EU,l}$: *A higher charter value has a positive impact on the stock market reaction and a negative impact on the CDS market reaction.*

Regarding the EU sample, as in the previous sections, the feedback loop between sovereign credit risk and banks' credit risk is assumed to negatively impact the stock market reaction while positively affecting the CDS market. This expectation is due to higher refinancing costs and a higher PD.

H4$_{EU,l}$: *The feedback loop has a negative impact on the stock market reaction and a positive impact on the CDS market reaction.*

In contrast to the EU, U.S. liquidity rules were always intended only for large banks. To capture this design, two dummy variables are constructed following Sundaresan and Xiao (2024): MOD_AFF_l is set to 1 for all banks with total assets ≥ $50 bn. and < $250 bn. (banks subject to less stringent liquidity requirements), and 0 otherwise, and FULL_AFF_l is set to 1 for banks with total assets ≥ $250 bn., and 0 otherwise (banks that must meet the full requirements). Since the liquidity events under consideration extend until 2017, this categorization is plausible, as the tailoring of capital and liquidity rules, with adjusted requirements for banks, was discussed and implemented at a later stage. Because the LCR and NSFR apply only to large banks, MOD_AFF_l and FULL_AFF_l are interacted with LCR_PROXY and NSFR_PROXY. Both positive and negative coefficients are conceivable. A positive effect could be explained analogously to the previous arguments regarding the impact on the EU stock market, as higher compliance results in lower costs to the regulatory requirements. Conversely, a negative effect is conceivable because U.S. banks had higher liquidity levels, making affected U.S. banks less willing to adjust their assets (LCR) and funding (NSFR). Another argument for a negative effect is that U.S. implementation penalizes large banks, while institutions not subject to the rules (which represent the majority) gain a competitive advantage.

H1_A$_{US,l,stock}$: *Affected banks have a positive impact on the stock market reaction with more liquid balance sheets and a lower funding mismatch.*

H1_B$_{US,l,stock}$: *Affected banks have a negative impact on the stock market reaction with more liquid balance sheets and a lower funding mismatch.*

Similar to the cross-sectional analysis of credit regulation, the impact of the affected banks on the CDS portfolio cannot be assessed, as it includes exclusively large banks. Therefore, the effect of the LCR and NSFR is examined without an interaction term. A negative impact on CDS spreads is assumed due to the increased resilience to liquidity shocks and funding risks.

H1$_{US,l,CDS}$: *Banks with more liquid balance sheets have a negative impact on the CDS market reaction.*

H2$_{US,l,CDS}$: *A lower funding mismatch has a negative impact on the CDS market reaction.*

Additionally, the mechanism of the charter value is examined analogously to the EU estimation for both stock and CDS markets.

H2$_{US,l,stock}$: *A higher charter value has a positive impact on the stock market reaction.*

H3$_{US,l,CDS}$: *A higher charter value has a negative impact on the CDS market reaction.*

Table 2
Number of included banks per regulatory category and financial instrument.

Type	EU		U.S.	
	Stocks	CDS spreads	Stocks	CDS spreads
Market risk	66	20	220	8
Credit risk	72	27	218	8
Liquidity risk	72	18	222	8

This table presents the number of included banks for each regulatory category and financial instrument in the EU and the U.S. after applying the liquidity criteria.

4. Methodology

4.1. Data

All data used in this paper are sourced from Refinitiv Eikon and Bloomberg. To capture capital market reactions, daily closing prices of stocks and end-of-day CDS mid-spreads, written on senior unsecured debt, are gathered for all available EU and U.S. banks.[14] To illustrate the effects on debt, it is also possible to use bonds. Nevertheless, using CDS spreads is recommended for several reasons, e.g., Bessembinder et al. (2009), Ericsson et al. (2009), Longstaff et al. (2005). CDSs with a five-year maturity are the most widely traded and most liquid, which is why they are used. To generate reliable samples, in line with Simion et al. (2024), only banks' stocks that meet both of the following criteria are considered: (1) returns must be available every day in the event window, and (2) the sum of unavailable observations and zero returns must not exceed 50% of the estimation window. A bank's CDS spread changes are considered only if (1) they are available in the event window each day, and (2) unavailable observations do not exceed 50% of the estimation window.[15] The criterion for inclusion in the portfolio is weakened for CDSs because zero changes in CDS spreads are not problematic in the estimation window. A zero change in stock returns suggests nontrading, with CDSs being available only on a day when a new contract has been closed. A zero change in CDS spreads therefore does not imply nontrading but rather that the risk has not changed from the creditor's perspective. In a further step, insolvent and nationalized banks are removed. After the banks that fulfill the above requirements are identified for each event, an intersection is formed for each regulatory category to generate balanced panels of bank returns and CDS spread changes. This step leads to a significant reduction in the sample size, but with an unbalanced panel, the aggregation of portfolio returns and CDS spread changes could not be properly performed. The results of the selection process are provided in Table 2.

4.2. Event study design

To examine the capital market reactions, an event study approach is employed. Following the methodological literature, e.g., Brown and Warner (1985), MacKinlay (1997), abnormal returns $AR_{i,t}$ are calculated using the market model (Sharpe, 1963).[16] $AR_{i,t}$ is the abnormal return of bank i at time t in the event window and is calculated as follows:

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_{1,i} R_{m,t}), \tag{1}$$

where $R_{i,t}$ is the actual return of bank i at time t and $R_{m,t}$ is the market index return. The subtrahend corresponds to the expected returns with parameters calculated in the estimation window using ordinary least squares (OLS). Supranational and broad stock indices are less subject to bias than national indices because of the reduced correlation of financial and nonfinancial firms within a specific country and the correlation of banks in different countries (Ongena et al., 2003). Therefore, the effect of bank regulation should be less visible because the influence of banks is lower due to the wide diversification and more constituents. Thus, the abnormal effect due to regulatory announcements can be determined in a more isolated way. Given these considerations, the MSCI World index is used. To avoid making the results contingent on the choice of index, the analyses are additionally carried out for the EU with the MSCI Europe index and for the U.S. with the MSCI USA index.

In contrast, the literature provides evidence that many factors, mainly macroeconomic factors (Collin-Dufresne et al., 2001; Ericsson et al., 2009), provide explanatory power for CDS spreads. Therefore, consistent with prior research (Couaillier & Henricot, 2023), the factor model proposed by Andres et al. (2021) is used to estimate abnormal CDS spread changes $\Delta AS_{i,t}$ for bank i at time t in the event window

$$\Delta AS_{i,t} = \Delta S_{i,t} - (\hat{\alpha}_i + \hat{\beta}_{1,i}\Delta S_{index,t} + \hat{\beta}_{2,i} Level_t + \hat{\beta}_{3,i} Slope_t + \hat{\beta}_{4,i}\Delta Vola_t). \tag{2}$$

The minuend $\Delta S_{i,t}$ corresponds to the actual CDS spread change of bank i at time t. The subtrahend reflects the calculation of the expected CDS spreads of bank i at time t, whereby the parameters are estimated in the estimation window using OLS. The change in the CDS market index is $\Delta S_{index,t}$.[17] Unfortunately, there is no global CDS index. Hence, the iTraxx Europe 5-years index is selected for the EU CDS market, and the iTraxx CDX IG 5-years index is selected for the U.S. CDS market.[18] $Level_t$ is the level of the risk-free interest rate (proxied by the 5-year interest rate swap rate with reference to the 3M Euribor in Europe and the 5-year interest rate swap rate with reference to the 3M Libor in the U.S.). $Slope_t$ is the slope of the risk-free interest rate (proxied by the difference in the 10- and 2-year swap rate with the above specification in Europe and the U.S.). $\Delta Vola_t$ is the daily change in the equity implied volatility (proxied by the VSTOXX in Europe and the VIX in the U.S., respectively). Considering events over several years and potential parameter instability, a dedicated 150-day estimation window is used for each event. A trade-off exists in selecting an appropriate estimation window: as the period lengthens, the model parameter accuracy improves, but so does the probability of parameter changes and overlapping events. Given that events coincide with the GFC and the European sovereign debt crisis, a 150-day estimation window preceding each event is used to ensure a balance between statistical accuracy and bias avoidance in β_i.

To further account for such a bias, market-adjusted abnormal returns $MAR_{i,t}$ and CDS spread changes $\Delta MAS_{i,t}$ (Andres et al., 2021; Fuller et al., 2002) are computed directly in the event window as the difference between bank's i return $R_{i,t}$ and the return $R_{m,t}$ of a market

[14] The EU sample consists of banks from Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, and the United Kingdom (UK). The countries of origin in the EU portfolios vary depending on the type of regulation and for stocks and CDSs. The UK left the EU on January 31, 2020; however, all events examined in this paper occurred prior to this date.

[15] Returns and CDS spread changes are computed as logarithmic differences of stock prices and CDS spreads, respectively.

[16] The market model is not extended with further regressors to form a multifactor model, as they provide only marginal additional explanatory power (MacKinlay, 1997).

[17] For reasons of robustness, $\Delta AS_{i,t}$ are additionally calculated using the standard single-index model as follows: $\Delta AS_{i,t} = \Delta S_{i,t} - (\hat{\alpha}_i + \hat{\beta}_{1,i}\Delta S_{index,t})$.

[18] Since both indices have missing values, the last observation carried forward method is used to fill data gaps for up to five missing observations before calculating the index returns.

index as well as between the bank's CDS spread change $\Delta S_{i,t}$ and the CDS spread change of the CDS index $\Delta S_{index,t}$

$$MAR_{i,t} = R_{i,t} - R_{m,t}, \quad (3)$$

$$\Delta MAS_{i,t} = \Delta S_{i,t} - \Delta S_{index,t}. \quad (4)$$

Although no estimation window is required and only the first liquidity criterion of Section 4.1 is binding, the same banks are considered for reasons of comparability. Confounding events in the event window are more concerning as they directly bias the calculation of the abnormal effect. Since this problem increases with a larger event window, the latter is limited to three days ranging from t_{-1} to t_{+1} and centered on the event date t_0. Moreover, short event windows with daily data enhance significance test power, reducing the probability of a type II error (Schäfer et al., 2016). In the event window, the corresponding cumulative abnormal returns $CAR_{i,t}$, cumulative market adjusted returns $CMAR_{i,t}$, cumulative abnormal CDS spread changes $\Delta CAS_{i,t}$ and cumulative market adjusted CDS spread changes $\Delta CMAS_{i,t}$ are calculated for each bank as follows:

$$CAR_{i,t} = \sum_{i=t_{-1}}^{t_{+1}} AR_{i,t}, \quad (5)$$

$$CMAR_{i,t} = \sum_{i=t_{-1}}^{t_{+1}} MAR_{i,t}, \quad (6)$$

$$\Delta CAS_{i,t} = \sum_{i=t_{-1}}^{t_{+1}} AS_{i,t}, \quad (7)$$

$$\Delta CMAS_{i,t} = \sum_{i=t_{-1}}^{t_{+1}} MAS_{i,t}. \quad (8)$$

4.3. Aggregated market reactions and block bootstrap significance test

The starting point of the calculation of aggregated market reactions and their significance with respect to the three types of regulation are $CAR_{i,t,x}$, $CMAR_{i,t,x}$, $\Delta CAS_{i,t,x}$ and $\Delta CMAS_{i,t,x}$, with $x \in \{m, c, l\}$ (m = market risk, c = credit risk and l = liquidity risk). To avoid redundancies, the additional procedure is explained on the basis of $CAR_{i,t,x}$, beginning with calculating the overall effects. For each event and separately for each type of regulation, the average cumulative abnormal return $\overline{CAR}_{x,e}$ is calculated based on equally and market-weighted portfolios. The latter method assigns more weight to larger banks, and the $CAR_{i,t,x}$ are weighted with their proportional market value in the portfolio as of the last trading day of the previous quarter (Armstrong et al., 2010).[19] Events that weaken regulation compared with the initial proposal are multiplied by -1 because it is not appropriate to aggregate the untreated $\overline{CAR}_{x,e}$ over several events (Armstrong et al., 2010). According to the type of regulation, $\sum \overline{CAR}_x$ is calculated as the sum of the $\overline{CAR}_{x,e}$ over all events to capture the total effect of market, credit and liquidity regulation.

Because the number of events is never greater than 26, significance cannot be reliably evaluated using common tests. Therefore, following Armstrong et al. (2010), block bootstrap simulations are employed, which is explained using market risk regulation and the EU stock market as an example.

All days within the range of t_{-2} to t_{+2} to the actual events are excluded from the simulation of nonevent days. This step ensures that only nonevent trading days are considered with corresponding nonevent windows that do not overlap with the actual event windows.[20]

Therefore, the simulated data fit the distribution under the null hypothesis that no market risk regulation occurs. Because return distributions are often nonstationary (Bey, 1983; Hsu, 1984), 15 nonevent days are randomly drawn such that they mimic the year-by-year distribution of market events (Armstrong et al., 2010) and that the nonevent windows do not overlap. Thus, one nonevent day is drawn from 2007, one nonevent day is drawn from 2008, two nonevent days are drawn from 2009, etc.; see Table A.9. For each simulated nonevent day, the $\overline{CAR}_{m,e}$ are computed based on equally weighted and market-weighted portfolios. Then, the assumed pattern regarding the tightening and weakening of regulation is applied to nonevents. This simulation of 15 nonevents is repeated 1000 times. The sum of the $\overline{CAR}_{m,e}$ over all 15 nonevents is computed for each of the 1000 simulations to form 1000 nonevent $\sum \overline{CAR}_m$. This procedure does not rely on any distributional assumptions, and a two-sided test is performed because the direction of the expected reactions is unclear; see Section 3. For this purpose, p values are calculated according to the number of cases for which the actual event $\sum \overline{CAR}_m$ is larger or smaller than the 1000 nonevent $\sum \overline{CAR}_m$.

The bootstrap procedure of the market-only events is analogously performed. Only the pattern of the annual distribution changes, and the number of events decreases from 15 to eleven.

To statistically rule out anticipation effects by information leakage and to prevent the results from being driven by overall short-run market trends near the event days, following Bruno et al. (2018), placebo events are constructed five trading days before the actual events and tested for significance.

4.4. Cross-sectional analysis

In a further step, which bank- and country-specific characteristics explain the variation in EU and U.S. market responses are analyzed. The models are explained using $CAR_{i,t}$ and $\Delta CAS_{i,t}$, with the regressions analogously computed using $CMAR_{i,t}$ and $\Delta CMAS_{i,t}$ as dependent variables. According to the type of regulation, $CAR_{i,t}$ and $\Delta CAS_{i,t}$ are regressed on a vector of bank- ($\mathbf{BANK}_{i,t}$) and country-specific ($\mathbf{COUNTRY}_{i,t}$) variables, where the variables depend on the type of regulation and the jurisdiction, which is why the regressions are separately run for each financial risk and separately for EU and U.S. banks (see Section 3).[21] The most recent available accounting data before each event is presented in United States dollar (USD) and euros, respectively, meaning either quarterly or annual figures. The vector $\mathbf{CONTROL}_{i,t}$ includes the control variables, leading to the following models:

$$CAR_{i,t} = \alpha_r + \beta_r' \mathbf{BANK}_{i,t} + \gamma_r' \mathbf{COUNTRY}_{i,t} + \delta_r' \mathbf{CONTROL}_{i,t} + \epsilon_{i,t,r}, \quad (9)$$

$$\Delta CAS_{i,t} = \alpha_s + \beta_s' \mathbf{BANK}_{i,t} + \gamma_s' \mathbf{COUNTRY}_{i,t} + \delta_s' \mathbf{CONTROL}_{i,t} + \epsilon_{i,t,s}. \quad (10)$$

$\mathbf{CONTROL}_{i,t}$ includes the level of profitability (measured as the return on assets (ROA)) and the level of cost efficiency (measured by the cost-to-income ratio (COST_INC)); see Fiordelisi and Molyneux (2010). Furthermore, the natural logarithm of total assets is included to control for the size (SIZE). To capture the impact of regulation over time, the sample period is divided into four subperiods. Following Aït-Sahalia et al. (2012) and Ricci (2015), the first period is labeled the "subprime crisis" and ranges from 01/06/2007 to 09/14/2008, the day before the Lehman Brothers declared bankruptcy. The second period is referred to as the "global financial crisis" and ranges from 09/15/2008 to 05/01/2010, which is the day before the start of the European

[19] For the EU samples, the market values in the respective national currency are first converted into euros.

[20] Since a three-day nonevent window is constructed from the simulated nonevent days, t_{-2} and t_{+2} of the actual events need to be excluded. If t_{-2} (t_{+2}) were drawn, then the constructed nonevent window would contain t_{-1} (t_{+1}) and thus overlap with the actual event window.

[21] Analyzing the cross-sectional determinants of abnormal returns and CDS spread changes using a 2-stage approach is common in the finance literature: e.g., Bruno et al. (2018), Carboni et al. (2017), Moenninghoff et al. (2015), Pancotto et al. (2020), Simion et al. (2024).

sovereign debt crisis with a 110 bn. bailout package for Greece. The third period starts on 05/02/2010 and ends on 06/30/2013, which is labeled the "sovereign debt crisis" (Hobelsberger et al., 2022; Ricci, 2015). The last period is labeled "ex post crisis" and ranges from 07/01/2013 to the last event. Dummies of these periods are included as controls in the U.S. estimates, while in the EU estimates, the sovereign debt crisis is interacted with GIIPS as an explanatory variable. Because events for the three financial risks were announced at different times, not all periods occur for all regulatory categories. To avoid perfect multicollinearity, one period is always dropped.

Again, dependent variables are multiplied by −1 if the event is associated with a reduction in regulatory intensity. The absence of multicollinearity is checked using variance inflation factors (VIFs).[22] Equations are estimated using random effects with clustered standard errors at the bank level because time-invariant variables (GIIPS) are included in EU estimations. Descriptive statistics of independent variables are provided in Table C.13.

4.5. Handling confounding events

In any event study, two crucial considerations are event selection and avoiding bank-specific confounding events in the event window, as both can introduce bias. The former problem is mitigated through careful event selection (see Section 2.2). Regarding the latter problem, all event windows are checked for bank-specific news with LexisNexis.[23] During many events, bank-specific news occur that affect both the aggregated market reactions and the cross-sectional analysis.

To validate the results of the cross-sectional analysis, the regressions are recomputed, omitting banks in each event with confounding news. The results do not change the conclusions and can be provided upon request. The impact on aggregated market reactions is difficult to account for because balanced stock and CDS portfolios are constructed. This fact implies that a bank would no longer be part of the portfolio even if it is missing only in one event due to bank-specific news (because the intersection of banks is formed over all events), which leads to a significant reduction in sample size, especially for a higher number of events. Bank-specific confounding events are likely to play a minor role in the calculation of overall effects, given that messages randomly occur and the sample is sufficiently large. Against this background, the results for stock markets should be sufficiently robust. However, for CDS markets, due to smaller samples, especially for U.S. portfolios with eight banks, and the higher responsiveness of professional creditors, it is important to pay close attention to whether the overall effect could be biased. Due to higher sensitivity, outliers are more likely, which, combined with a smaller sample over which the effect is averaged, introduces a higher risk that the overall effect is biased. Close attention is given to this issue when discussing CDS market reactions.

5. Discussion

5.1. Overall market reactions and cross-sectional analysis

For the stock market analysis, results based on the MSCI World index are used. Only when significant deviations occur are the MSCI Europe and MSCI USA indices considered as proxies for the stock market portfolio (see Appendix D). The EU CDS market reaction is measured using the iTraxx Europe 5-year index, while the iTraxx CDX IG 5-year index is used for the U.S. market. Results from the single-index model are presented only if notable differences arise (see Appendix D).[24]

5.1.1. Market risk

The EU stock market responds negatively, with equally weighted portfolios experiencing an overall effect of −0.1476 ($\sum \overline{CMAR}_{m\_ew}$) and −0.1182 ($\sum \overline{CAR}_{m\_ew}$), both significant at the 5% and 10% levels. The market-weighted reactions, $\sum \overline{CMAR}_{m\_ew}$ at −0.2016 and $\sum \overline{CAR}_{m\_ew}$ at −0.1693, are significant at the 5% level. Larger banks, which are more likely to engage in proprietary trading, may explain these stronger reactions.[25] When market events announced alongside credit and liquidity events (events 3, 4, 8, and 13) are excluded, no values are significant. This finding likely stems from the excluded events' importance, as they were announced at the outset of market risk regulation, during a time when the upcoming rules were anxiously awaited. Moreover, they introduced significant changes, drawing considerable media attention. Events 3 and 4 introduced adjustments to capital requirements for incremental risk in the trading book, along with a new stressed VaR measure that effectively doubles the capital requirements. In contrast, credit events 2 and 3, which coincided with market events 3 and 4, had a lower impact on credit risk regulation, as resecuritizations were merely assigned higher risk weights. To substantiate this finding, the market reaction is recalculated using the four excluded market events (3, 4, 8, and 13). Distinct negative reactions of −0.0944 ($\sum \overline{CMAR}_{m\_ew}$), −0.0879 ($\sum \overline{CAR}_{m\_ew}$), −0.1665 ($\sum \overline{CMAR}_{m\_mw}$), and −0.1681 ($\sum \overline{CAR}_{m\_mw}$) are observed. The equally weighted reactions are significant at the 5% level, while the market-weighted ones are significant at the 1% level. Event 3 largely drives the overall effect, where the BCBS published proposals for the IRC and a stressed VaR. Given this impact, the BCBS should carefully consider market conditions and financial stability when making such announcements. The conclusion is that EU bank shareholders are facing wealth losses.

In contrast, U.S. reactions are insignificant, indicating that shareholders are less affected. The differences in stock market reactions between the U.S. and the EU can be attributed to the EU's stricter implementation of regulations. Additionally, small regional banks in the U.S., which typically do not engage in proprietary trading, are often publicly listed and included in the sample, whereas larger banks in the EU tend to be capital market-oriented. This difference is reflected in the significantly larger market capitalization in the EU compared with the U.S., which could also account for the positive reactions observed in the equally weighted U.S. portfolio, while the market-weighted reactions remain negative.[26] Another explanation is that the risk-return profile of U.S. banks has not changed due to Basel regulations, primarily because of the existing Volcker Rule.

The EU CDS reaction is consistently negative for all market and market-only events, none of which is significant. However, examining the placebo events reveals positive abnormal CDS spread changes of 0.4644 ($\sum \overline{\Delta CMAS}_{m\_ew}$), 0.4149 ($\sum \overline{\Delta CAS}_{m\_ew}$), 0.5742 ($\sum \overline{\Delta CMAS}_{m\_mw}$), and 0.5635 ($\sum \overline{\Delta CAS}_{m\_mw}$). Among these, $\sum \overline{\Delta CAS}_{m\_ew}$ is significant at the 5% level, while the other three values are significant at the 1% level. The analysis of market-only placebo events confirms these findings. These values are driven mainly by placebo event 12. Further analysis reveals that a report from Commerzbank, which indicated its restructuring plan is much less costly

[22] Calculated VIFs indicate the absence of multicollinearity. The results can be provided upon request.

[23] Following Bruno et al. (2018), the following keywords are utilized: dividends, earnings, CEO, losses, write-downs, restatement, downgrade, rating, fraud, annual report, manipulate, inspection, restructuring, M&A, merger, acquisition, stock split, dilution, fired, restructuring, issue, and takeover.

[24] The number of banks in the EU CDS portfolio is lower in terms of market-weighted reactions because IKB Deutsche Industriebank AG, Coöperatieve Rabobank U.A., and Bayerische Landesbank are not publicly traded companies: $m = 19$, $c = 25$, and $l = 16$.

[25] Effect size and significance are more pronounced for calculations with the MSCI Europe index.

[26] To substantiate this finding, the mean and median market capitalizations are calculated for each of the 15 events. The average mean market capitalization is approximately USD 18.1 bn. for the EU sample and USD 6.2 bn. for the U.S. sample. The disparity is even more pronounced when examining the average median values, with the EU at USD 12.7 bn. and the U.S. at approximately USD 339 mio.

than expected, has positively impacted the creditors of the banks in the sample by reducing contagion risk. This positive impact is reflected in the decreasing CDS spread changes at the individual bank level. However, since event 12 is associated with reduced regulatory intensity, the values are multiplied by −1, leading to positive abnormal CDS spread changes.

The U.S. CDS market reaction is generally negative but insignificant. While stock market reactions differ, CDS responses are similar in both regions, likely because CDS portfolios are dominated by large banks with similar market risk frameworks. From a creditor's perspective, the lack of reaction may stem from the balancing effects of risk reduction and diminished bailout expectations. The U.S. response may also be linked to the Volcker Rule, as Schäfer et al. (2016) show increased CDS spreads following its introduction, implying that additional BCBS regulations have a relatively limited impact.

The cross-sectional results show that a bank's capitalization has no effect on stock market reactions in the EU or U.S. However, a higher TIER1_RAT significantly reduces CDS spreads in both regions. This finding implies that better-capitalized banks are viewed as less risky by creditors, which is in line with $H1_{US,EU,m}$.

A bank's market risk, tested in $H2_{US,EU,m}$, is proxied in the EU by the ratio of marketable securities to total assets (SEC_ASSET). One coefficient for the stock market reaction is negative and significant at the 5% level. However, two coefficients become significant at the 1% and 5% levels when the MSCI Europe index is used, supporting Hypothesis 2, as higher market risk for EU banks negatively impacts stock market reactions. The lack of significant coefficients for the market-only event estimates aligns with the findings for aggregated market-only reactions, which are insignificant due to the exclusion of key events 3 and 4. In contrast, the EU CDS market is generally unaffected by SEC_ASSET. The ratio of derivatives to total assets (DER_ASSET) serves as a proxy in the U.S. sample. The coefficient remains insignificant across all stock market estimates, aligning with the insignificant aggregated U.S. market reactions. The U.S. CDS market reactions, however, are positively influenced, with both coefficients for all market events being significant at the 1% level. This finding supports Hypothesis 2, meaning that banks with higher market risk are perceived as riskier by creditors. Compared with stock estimates, the significant impact on CDS can be attributed to the fact that the CDS portfolio consists exclusively of large banks, which are more likely to hold derivatives.[27] The insignificance of the market-only events can be related to the importance of the excluded events 3 and 4.

$H3_{US,EU,m}$ examines the classification of a bank as a G-SIB. For EU banks, the coefficient is insignificant across all estimates for both stock and CDS markets. The results of the U.S. regressions, however, align with the expected mechanism. There is a negative effect on stock market reactions, which is significant at the 1% and 5% levels for all market events, and a positive effect on the CDS market, which is significant at the 5% level for all market events (estimate (5)) and at the 1% level for market-only events. In the U.S., classification as a G-SIB reflects higher trading activity.

Regarding the EU, the feedback loop discussed in $H4_{EU,m}$ proves irrelevant for shareholders and creditors, as all the coefficients of GIIPS∗SOV_DEBT are insignificant. This irrelevance may stem from the mechanism's focus on credit risk and funding conditions, making its role in market risk negligible. However, the coefficients of GIIPS are negative and highly significant in the stock market estimates but can only be interpreted as conditional on SOV_DEBT=0 due to the interaction term. To assess the overall GIIPS impact, the regressions are re-estimated without the interaction term. The coefficients in all estimations are negative and significant at the 1% level, suggesting that GIIPS banks in particular drive the negative stock market reaction.[28]

5.1.2. Credit risk

The EU stock market reaction is clearly negative. For the equally weighted portfolio, the overall effects are −0.2335 ($\sum \overline{CMAR}_{c\_ew}$) and −0.2008 ($\sum \overline{CAR}_{c\_ew}$), significant at the 1% and 5% levels, respectively. The market-weighted portfolio shows a stronger negative impact of −0.4091 ($\sum \overline{CMAR}_{c\_mw}$) and −0.3491 ($\sum \overline{CAR}_{c\_mw}$), with both values significant at the 1% level. Excluding credit events announced with liquidity and market events—events 2, 3, 5, 7, 9, 19, 20, and 25—leaves 18 credit-only events. The credit-only analysis confirms the initial results, with $\sum \overline{CMAR}_{c\_mw}$ at −0.1595 significant at the 10% level. The results are more pronounced with the MSCI Europe index as the stock market proxy, where both market-weighted responses (−0.1717 $\sum \overline{CMAR}_{c\_mw}$, −0.1449 $\sum \overline{CAR}_{c\_mw}$) are significant at the 5% level. Overall, this indicates a decline in shareholder value for EU banks, especially larger banks.

The U.S. reaction follows a similar trend but is less pronounced. While equally weighted responses are insignificant, market-weighted portfolios show clearer effects, with −0.2560 ($\sum \overline{CMAR}_{c\_mw}$) and −0.2741 ($\sum \overline{CAR}_{c\_mw}$), significant at the 10% and 5% levels, respectively. The credit-only analysis confirms consistent negative results, though none are significant. While shareholders of larger banks appear to experience significant wealth loss, all credit-only events are insignificant. The influence of the eight excluded credit events (2, 3, 5, 7, 9, 19, 20, and 25) is therefore examined, revealing that only $\sum \overline{CAR}_{c\_mw}$, with a value of −0.1757, is significant at the 5% level when the MSCI USA index is used for calculation. Given the insignificance of credit-only events and limited significance of excluded events, the case for a significantly negative U.S. stock market reaction is weak.

Similar to market risk, the responses of U.S. and EU stock markets differ, reflecting divergent implementation of regulations and the structure of their banking systems. In the EU, the uniform implementation across banks results in consistently negative reactions for both equally and market-weighted portfolios, with the effect being more pronounced for the latter. In the U.S., the variation in effect size and significance suggests a limited impact on smaller banks. This may be due, in part, to Basel II applying only to large banks, so that expectations for a similar implementation arise for Basel III. Furthermore, the Basel III credit risk framework was adjusted by U.S. agencies so that certain rules apply only to banks with total assets of ≥ $250 bn., and SBHCs are entirely exempt. The changes to credit risk under Basel IV shall also apply only to large banks in Categories I-IV.

Creditors of EU banks react with an increased risk perception. Positive abnormal CDS spread changes of 0.2501 ($\sum \overline{\Delta CMAS}_{c\_ew}$), 0.3519 ($\sum \overline{\Delta CAS}_{c\_ew}$), 0.3194 ($\sum \overline{\Delta CMAS}_{c\_mw}$), and 0.4033 ($\sum \overline{\Delta CAS}_{c\_mw}$) are observed. The third value is significant at the 10% level, whereby the second and last values are significant at the 5% level. The credit-only analysis supports the direction of the effect, but the effect size is reduced, with no significant values. To further analyze market reactions, the CDS market response for the eight omitted events (events 2, 3, 5, 7, 9, 19, 20 and 25) is calculated. These lead to positive reactions of 0.2483 $\sum \overline{\Delta CMAS}_{c\_ew}$, 0.2587 $\sum \overline{\Delta CAS}_{c\_ew}$, 0.2917 $\sum \overline{\Delta CMAS}_{c\_mw}$, and 0.3006 $\sum \overline{\Delta CAS}_{c\_mw}$, all significant at the 5% level. These events explain much of the market reaction, which clarifies why the credit-only events lack significance. While these credit events coincide with market and liquidity regulation, EU CDS markets show no significant response to such regulations, suggesting the observed effects are due to credit regulation. Creditors respond with increasing CDS spreads, as they perceive a reduced likelihood of a bailout. All four values of the U.S. CDS market reaction are positive and even larger than those

[27] Descriptive statistics in Table C.13 show that there is a high dispersion of the variable DER_ASSET because certain large banks (e.g., Morgan Stanley, Goldman Sachs) hold a multiple of derivatives to total assets. Unreported analyses expectedly show a significantly higher level of DER_ASSET for banks in the U.S. CDS portfolio.

[28] The results are available upon request.

Table 3
Market reactions to announcements regarding market risk regulation.

	$\sum \overline{CMAR}_{m\_ew}$	$\sum \overline{CAR}_{m\_ew}$	$\sum \overline{CMAR}_{m\_mw}$	$\sum \overline{CAR}_{m\_mw}$
Panel A: EU				
Actual Events				
Sum (all events)	−0.1476**	−0.1182*	−0.2016**	−0.1693**
p value (all events)	0.025	0.077	0.012	0.028
Sum (market-only events)	−0.0532	−0.0303	−0.0352	−0.0012
p value (market-only events)	0.372	0.585	0.595	0.986
Placebo Events				
Sum (all events)	−0.0219	−0.0034	0.0086	0.0417
p value (all events)	0.763	0.959	0.911	0.582
Sum (market-only events)	−0.0613	−0.0340	−0.0605	−0.0329
p value (market-only events)	0.298	0.537	0.366	0.602
Panel B: U.S.				
Actual Events				
Sum (all events)	0.0671	0.0733	−0.0358	−0.0711
p value (all events)	0.261	0.236	0.719	0.469
Sum (market-only events)	0.0526	0.0688	0.0741	0.0616
p value (market-only events)	0.263	0.151	0.269	0.344
Placebo Events				
Sum (all events)	0.0044	0.0318	0.0339	0.0672
p value (all events)	0.955	0.625	0.731	0.495
Sum (market-only events)	0.0268	0.0464	0.1029	0.0905
p value (market-only events)	0.567	0.330	0.138	0.177
	$\sum \overline{\Delta CMAS}_{m\_ew}$	$\sum \overline{\Delta CAS}_{m\_ew}$	$\sum \overline{\Delta CMAS}_{m\_mw}$	$\sum \overline{\Delta CAS}_{m\_mw}$
Panel A: EU				
Actual Events				
Sum (all events)	0.0029	−0.0444	−0.0133	−0.0106
p value (all events)	0.984	0.797	0.948	0.951
Sum (market-only events)	−0.1437	−0.1792	−0.197	−0.1973
p value (market-only events)	0.292	0.243	0.188	0.249
Placebo Events				
Sum (all events)	0.4644***	0.4149**	0.5742***	0.5635***
p value (all events)	0.002	0.024	0.000	0.003
Sum (market-only events)	0.3478**	0.3126*	0.4277***	0.4018**
p value (market-only events)	0.016	0.051	0.004	0.025
Panel B: U.S.				
Actual Events				
Sum (all events)	−0.1224	−0.1593	−0.1353	−0.2006
p value (all events)	0.513	0.433	0.493	0.376
Sum (market-only events)	−0.0693	−0.1117	−0.0892	−0.1395
p value (market-only events)	0.607	0.466	0.541	0.409
Placebo Events				
Sum (all events)	0.3013	0.2453	0.3401	0.2993
p value (all events)	0.134	0.236	0.107	0.183
Sum (market-only events)	0.1468	0.0348	0.1557	0.0364
p value (market-only events)	0.337	0.824	0.324	0.830

This table presents aggregated EU and U.S. stock and CDS market reactions to 15 regulatory announcements of market risk by the BCBS. Cumulative abnormal returns $CAR_{i,t}$, cumulative market-adjusted returns $CMAR_{i,t}$, cumulative abnormal CDS spread changes $\Delta CAS_{i,t}$ and cumulative market-adjusted CDS spread changes $\Delta CMAS_{i,t}$ are calculated according to Eq. (1)–Eq. (8). The MSCI World index is employed as a proxy for the stock market portfolio. The iTraxx Europe 5-years and iTraxx CDX IG 5-years indices are selected as proxies for the EU and U.S. CDS market portfolios, respectively. For each of the 15 market events (m), the average values $\overline{CAR}_m$, $\overline{CMAR}_m$, $\overline{\Delta CAS}_m$, $\overline{\Delta CMAS}_m$ are computed based on equally weighted (ew) and market-weighted (mw) portfolios. These values are multiplied by −1 if the event is associated with a reduction in regulatory intensity. The stock market reaction is reported as the sum of cumulative average abnormal returns $\sum \overline{CAR}_m$ and the sum of cumulative average market-adjusted returns $\sum \overline{CMAR}_m$ over 15 events. The CDS market reaction is reported as the sum of cumulative average abnormal CDS spread changes $\sum \overline{\Delta CAS}_m$ and the sum of cumulative average market-adjusted CDS spread changes $\sum \overline{\Delta CMAS}_m$ over 15 events. In addition, aggregated market reactions are calculated for market-only events; i.e., four market events that are announced simultaneously with credit and liquidity events are excluded (events 3, 4, 8, and 13). Abnormal stock and CDS market reactions are computed for placebo events five trading days prior to the actual events to assess potential information leakage and market anticipation. All values are tested for significance using a block bootstrap significance test (see Section 4.3). p values are computed based on a two-sided significance test: *p<0.1; **p<0.05; ***p<0.01.

of the EU, though none are statistically significant. Similar to market risk, the Dodd-Frank Act can be cited as an explanation for the lack of significance. In addition to the Volcker Rule, Schäfer et al. (2016) provide evidence of increased CDS spreads due to the Dodd-Frank Act. They attribute this rise to reduced bailout expectations, driven by enhanced prudential regulation and improved resolution procedures.[29] Additionally, the non-bailout of Lehman Brothers in 2008 may have already diminished expectations for future bailouts.

The first hypothesis focuses on bank capitalization. For U.S. banks, the expected positive but diminishing effect of TIER1_RAT on stock market reactions is clear. Three coefficients are significant at the 5% level and one is significant at the 10% level, which holds for the squared term's coefficients. The initially positive impact is attributed to greater regulatory compliance. However, beyond a certain threshold, the capital costs outweigh these benefits, with turnaround values of around 20%. Interestingly, this mechanism cannot be observed among EU shareholders, and the lack of response cannot be attributed to large differences in TIER1_RAT levels across jurisdictions (see Table C.13). An explanation for the U.S. effect is that only the advanced Basel II approaches were mandatory only for large banks (e.g. 17 banks in

[29] See Title II–Orderly Liquidation Authority of the Dodd-Frank Act for measures designed to prevent bailouts.

Table 4
Determinants of stock and CDS market reactions to market risk regulation.

	Stock Market				*CDS Market*			
	Market Events		*Market-Only*		*Market Events*		*Market-Only*	
	CAR (1)	CMAR (2)	CAR (3)	CMAR (4)	ΔCAS (5)	$\Delta CMAS$ (6)	ΔCAS (7)	$\Delta CMAS$ (8)
Panel A: EU								
TIER1_RAT	−0.019	0.059	−0.160	0.076	−0.654**	−0.381	−0.932***	−0.646*
	(0.129)	(0.124)	(0.163)	(0.136)	(0.264)	(0.269)	(0.327)	(0.362)
TIER1_RAT^2	0.075	−0.114	0.512	−0.138				
	(0.248)	(0.259)	(0.428)	(0.373)				
SEC_ASSET	−0.041**	−0.028	−0.009	0.007	−0.018	−0.010	0.037	0.075
	(0.018)	(0.018)	(0.017)	(0.017)	(0.049)	(0.064)	(0.054)	(0.073)
G_SIB	0.003	0.003	0.004	0.007	0.010	−0.015	0.007	−0.022
	(0.013)	(0.011)	(0.006)	(0.006)	(0.032)	(0.020)	(0.040)	(0.024)
GIIPS	−0.014**	−0.015***	−0.025***	−0.022***	−0.011	−0.005	−0.029	−0.015
	(0.006)	(0.006)	(0.005)	(0.005)	(0.019)	(0.018)	(0.023)	(0.020)
SOV_DEBT	0.003	−0.006	0.001	−0.008*	0.020**	0.001	0.006	−0.012
	(0.005)	(0.005)	(0.004)	(0.005)	(0.009)	(0.014)	(0.013)	(0.017)
GIIPS*SOV_DEBT	−0.009	−0.007	0.002	0.001	−0.011	−0.006	−0.004	0.001
	(0.007)	(0.007)	(0.007)	(0.007)	(0.012)	(0.019)	(0.014)	(0.019)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	826	826	565	565	268	268	183	183
R^2	0.059	0.061	0.025	0.031	0.257	0.187	0.131	0.055
Panel B: US								
TIER1_RAT	−0.061	−0.067	0.015	0.005	−1.158***	−0.203	−1.055***	0.215
	(0.065)	(0.062)	(0.067)	(0.063)	(0.232)	(0.193)	(0.377)	(0.346)
TIER1_RAT^2	0.091	0.120	−0.071	−0.052				
	(0.163)	(0.155)	(0.164)	(0.149)				
DER_ASSET	0.0002	0.0002	0.00002	−0.00005	0.001***	0.0005***	0.0003	−0.0002
	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0003)	(0.0002)	(0.0004)	(0.0004)
G_SIB	−0.013***	−0.011**	−0.004	−0.001	0.110**	0.041	0.224***	0.110***
	(0.005)	(0.005)	(0.004)	(0.005)	(0.056)	(0.032)	(0.045)	(0.034)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,919	2,919	1,985	1,985	116	116	77	77
R^2	0.043	0.026	0.053	0.062	0.601	0.420	0.424	0.326

This table presents the variables explaining heterogeneous reactions in cumulative abnormal returns (CAR), cumulative market-adjusted returns (CMAR), cumulative abnormal CDS spread changes ΔCAS and cumulative market-adjusted CDS spread changes $\Delta CMAS$ for 15 market events by the BCBS. These values are calculated according to Eq. (1) – Eq. (8). Dependent variables are multiplied by −1 if the event is associated with a reduction in regulatory intensity. The MSCI World index is used as proxy for the stock market portfolio. The iTraxx Europe 5-years and the iTraxx CDX IG 5-years indices are used as proxies for the EU and U.S. CDS market portfolios, respectively. For so-called market-only events, market events are excluded (events 3, 4, 8, 13) if they are announced simultaneously with credit and liquidity events. The bank-specific variables are TIER1_RAT, SEC_ASSET, DER_ASSET and G_SIB. TIER1_RAT is the ratio of Tier 1 capital to total risk-weighted assets. SEC_ASSET is the ratio of marketable security investments to total assets. DER_ASSET is ratio of derivatives to total assets. G_SIB is a dummy variable that is 1 for global systemically important banks and 0 otherwise. The country-specific variable is GIIPS. GIIPS is a dummy variable that is 1 for EU banks located in Greece, Italy, Ireland, Portugal or Spain and 0 otherwise. SOV_DEBT is a dummy variable that is 1 for the sovereign debt crisis (05/02/2010-06/30/2013) and 0 otherwise. The control variables are SIZE, COST_INC, ROA and dummies for the subprime crisis (01/06/2007-09/14/2008) and the global financial crisis (09/15/2008-05/01/2010) for EU portfolios, while U.S. portfolios also include the sovereign debt crisis dummy. SIZE is the natural logarithm of total assets. COST_INC is the cost-to-income ratio. ROA is the return on assets. Regressions are estimated using random effects with clustered standard errors at bank level reported in parentheses. Note *p<0.1; **p<0.05; ***p<0.01.

2011), meaning the majority of U.S. banks remained regulated under Basel I. Moreover, even banks subject to Basel II continued reporting capital ratios according to Basel I during the parallel run (Basel Committee on Banking Supervision, 2012). In contrast, Basel II was mandatory for EU banks, helping them become familiar with the regulatory framework and better understand the implications of Basel III. This prior experience allowed them to be more prepared in advance, potentially leading to more consistent effects from the new regulation. Meanwhile, the uncertainty surrounding actual capital requirements for U.S. banks that were newly regulated under Basel III may have reassured shareholders of banks with higher capital reserves. Regarding the U.S. CDS market, no effect can be demonstrated. The influence on EU creditors is initially ambiguous, because the coefficient in estimation (5) is negative and significant at the 1% level for all credit events, whereas the coefficient in estimation (8) is positive and significant at the 5% level for credit-only events. To further investigate this, the regressions where the endogenous variable was calculated using the single-index model are considered. This analysis reveals a negative coefficient that is significant at the 10% level. Overall, there is at least some support for a negative influence of TIER1_RAT on the EU CDS market reaction.

According to $H2_{US,EU,c}$, bank's credit risk is modeled as the ratio of total loans to total assets (LOAN_ASSET). There is no impact for either the EU or U.S. shareholders and creditors. This suggests that the credit risk itself does not explain variations in market responses. Consistent with $H3_{US,EU,c}$, the costs of credit risk are approximated with provisions for loan loss to total loans (PROV_LOAN). For the EU stock market, there is no impact. One coefficient in the U.S. stock market estimates for credit-only events is negative and significant at the 10% level. This finding holds for the credit-only estimates where the

Table 5
Market reactions to announcements regarding credit risk regulation.

	$\sum \overline{CMAR}_{c\_ew}$	$\sum \overline{CAR}_{c\_ew}$	$\sum \overline{CMAR}_{c\_mw}$	$\sum \overline{CAR}_{c\_mw}$
Panel A: EU				
Actual Events				
Sum (all events)	−0.2335***	−0.2008**	−0.4091***	−0.3491***
p value (all events)	0.007	0.019	0.000	0.001
Sum (credit-only events)	−0.0804	−0.0676	−0.1595*	−0.1225
p value (credit-only events)	0.268	0.354	0.075	0.137
Placebo Events				
Sum (all events)	0.0663	0.0560	0.0675	0.0361
p value (all events)	0.450	0.538	0.531	0.727
Sum (credit-only events)	0.0460	0.0294	0.0096	−0.0401
p value (credit-only events)	0.535	0.680	0.911	0.598
Panel B: U.S.				
Actual Events				
Sum (all events)	−0.0353	−0.0705	−0.2560*	−0.2741**
p value (all events)	0.632	0.368	0.087	0.047
Sum (credit-only events)	−0.0404	−0.0708	−0.1402	−0.1439
p value (credit-only events)	0.521	0.222	0.153	0.132
Placebo Events				
Sum (all events)	0.0405	0.0773	−0.0152	0.0252
p value (all events)	0.587	0.320	0.909	0.870
Sum (credit-only events)	0.0019	0.0250	−0.0340	−0.0489
p value (credit-only events)	0.976	0.693	0.702	0.581
	$\sum \overline{\Delta CMAS}_{c\_ew}$	$\sum \overline{\Delta CAS}_{c\_ew}$	$\sum \overline{\Delta CMAS}_{c\_mw}$	$\sum \overline{\Delta CAS}_{c\_mw}$
Panel A: EU				
Actual Events				
Sum (all events)	0.2501	0.3519**	0.3194*	0.4033**
p value (all events)	0.120	0.043	0.067	0.048
Sum (credit-only events)	0.0019	0.0932	0.0277	0.1028
p value (credit-only events)	0.986	0.493	0.838	0.513
Placebo Events				
Sum (all events)	0.1890	0.2097	0.1661	0.1897
p value (all events)	0.249	0.238	0.348	0.349
Sum (credit-only events)	0.1547	0.0679	0.1475	0.0702
p value (credit-only events)	0.207	0.621	0.294	0.644
Panel B: U.S.				
Actual Events				
Sum (all events)	0.2814	0.3706	0.3473	0.4164
p value (all events)	0.267	0.202	0.191	0.184
Sum (credit-only events)	0.1525	0.1999	0.1847	0.2289
p value (credit-only events)	0.408	0.369	0.350	0.319
Placebo Events				
Sum (all events)	0.2383	0.4041	0.3504	0.5002
p value (all events)	0.328	0.160	0.188	0.101
Sum (credit-only events)	0.2205	0.2685	0.2779	0.3301
p value (credit-only events)	0.249	0.227	0.169	0.159

This table presents aggregated EU and U.S. stock and CDS market reactions to 26 regulatory announcements of credit risk by the BCBS. Cumulative abnormal returns $CAR_{i,t}$, cumulative market-adjusted returns $CMAR_{i,t}$, cumulative abnormal CDS spread changes $\Delta CAS_{i,t}$ and cumulative market-adjusted CDS spread changes $\Delta CMAS_{i,t}$ are calculated according to Eq. (1)–Eq. (8). The MSCI World index is selected as a proxy for the stock market portfolio. The iTraxx Europe 5-years and iTraxx CDX IG 5-years indices are employed as proxies for the EU and U.S. CDS market portfolios, respectively. For each of the 26 credit events (c), average values $\overline{CAR}_c$, $\overline{CMAR}_c$, $\overline{\Delta CAS}_c$, $\overline{\Delta CMAS}_c$ are computed based on equally weighted (ew) and market-weighted (mw) portfolios. These values are multiplied by −1 if the event is associated with a reduction in regulatory intensity. The stock market reaction is reported as the sum of cumulative average abnormal returns $\sum \overline{CAR}_c$ and the sum of cumulative average market-adjusted returns $\sum \overline{CMAR}_c$ over 26 events. The CDS market reaction is reported as the sum of cumulative average abnormal CDS spread changes $\sum \overline{\Delta CAS}_c$ and the sum of cumulative average market-adjusted CDS spread changes $\sum \overline{\Delta CMAS}_c$ over 26 events. In addition, aggregated market reactions are calculated for credit-only events; i.e., eight credit events that are announced simultaneously with market and liquidity events are excluded (events 2, 3, 5, 7, 9, 19, 20, and 25). Abnormal stock and CDS market reactions are computed for placebo events five trading days prior to the actual events to assess potential information leakage and market anticipation. All values are tested for significance using a block bootstrap significance test (see Section 4.3). *p* values are computed based on a two-sided significance test: *p<0.1; **p<0.05; ***p<0.01.

dependent variable is calculated using the MSCI USA, with coefficients being significant at the 5% and 10% levels, respectively. The negative impact of higher risk costs in the U.S. can again be explained by the regulatory changes affecting large parts of the U.S. banking landscape as a result of Basel III. PROV_LOAN has a negative effect on EU CDS spreads, with the coefficient in estimate (7) for credit-only events being significant at the 5% level. In the estimates where the endogenous variable is calculated with the single-index model, the coefficients are also negative and significant at the 10% and 5% levels, respectively. In contrast, the coefficients in all four estimates of the U.S. CDS market reaction are consistently positive and significant. This opposing effect is likely due to differences in accounting standards. Banks in the EU CDS portfolio adhere to International Financial Reporting Standards (IFRS), while those in the U.S. sample follow United States Generally Accepted Accounting Principles (US-GAAP). Under US-GAAP, loan write-downs are strictly based on incurred losses, whereas IFRS allows for a more forward-looking approach to risk assessment. Creditors of EU banks reward a more precise and cautious risk assessment, while loan write-downs at U.S. banks come as a negative surprise. The classification of a bank as a G-SIB discussed in $H4_{US,EU,c}$ does not explain stock or CDS market reactions in either the EU or the U.S. Regarding the jurisdictional hypotheses, there is a highly significant and positive effect of the feedback loop on shareholders, with all four coefficients in the estimates being significant at the 1% level. In contrast, the CDS market estimates show negative and significant coefficients for estimates (5) and (7) at the 5% and 10% levels. This contradicts the hypothesized mechanism of $H5_{EU,c}$. Besides creditors, shareholders of GIIPS banks may view regulation as desirable if it helps contain the excessive risks associated with these banks. With regard to $H5_{US,c}$ and the distinction between SBHCs and institutions affected by the U.S. credit risk framework in general, there is a negative effect in line with the hypothesis. The coefficient of AFF_BANK_c in estimates (2) and (4) is at the 1% and 10% level significant, respectively. Both coefficients are significant at the 1% level in the estimations where the market reaction is calculated with the MSCI USA index.

5.1.3. Liquidity risk

Regarding liquidity regulation, both the EU stock market (−0.0659 $\sum\overline{CMAR}_{l\_ew}$, −0.0301 $\sum\overline{CAR}_{l\_ew}$, −0.0858 $\sum\overline{CMAR}_{l\_mw}$, −0.0471 $\sum\overline{CAR}_{l\_mw}$) and U.S. stock market (0.0236 $\sum\overline{CMAR}_{l\_ew}$, 0.0279 $\sum\overline{CAR}_{l\_ew}$, 0.0801 $\sum\overline{CMAR}_{l\_mw}$, 0.0944 $\sum\overline{CAR}_{l\_mw}$) show no significant reaction, which holds for liquidity-only events (events 4, 5, 6 and 11 are removed). While the EU reaction is negative, the U.S. reaction is positive. The EU stock market reaction is not significant, but its direction aligns with the findings of Bruno et al. (2018). Although their study includes only seven events due to the timing of publication, the inclusion of six additional events in this analysis confirms the consistency of the effect's direction. This finding suggests that the following six events can be considered noise, which is explained by the fact that a habituation effect occurs in the market, causing the informational impact of regulatory events to decrease over time. The difference in sign between EU and U.S. reactions may be explained by the less strict U.S. implementation (it applies only to large banks) and their comparatively better liquidity position. Most U.S. banks in the sample are not subject to these regulations, and the institutions that are covered face less pressure to restructure their assets and funding to comply with the new rules.

Analogous to the stock market, the creditors of EU banks exhibit an insignificant response. The observed reactions are positive and as follows: 0.2106 $\sum\overline{\Delta CMAS}_{l\_ew}$, 0.1080 $\sum\overline{\Delta CAS}_{l\_ew}$, 0.1289 $\sum\overline{\Delta CMAS}_{l\_mw}$, and 0.0283 $\sum\overline{\Delta CAS}_{l\_mw}$. Similar to the findings of Simion et al. (2024), CDS spreads have risen, though unlike their results, no significance was found. Several factors may explain this. On the one hand, there are methodological differences, as this paper calculates the aggregated overall effect and uses a bootstrap simulation to calculate significance. This requires the use of a balanced panel to sum the average abnormal market reactions, significantly reducing the sample size. Additionally, due to the focus on EU banks, Swiss banks are not included in the analysis. Notably, significance is evident only for the (0,0) window in the study of Simion et al. (2024), and their result for the (−1;+1) window is similar to the findings in this paper.

The U.S. CDS market displays a markedly positive and significant response, reflecting heightened perceived credit risk: 0.4532 ($\sum\overline{\Delta CMAS}_{l\_ew}$), 0.3444 ($\sum\overline{\Delta CAS}_{l\_ew}$), 0.1311 ($\sum\overline{\Delta CMAS}_{l\_mw}$), and 0.1132 ($\sum\overline{\Delta CAS}_{l\_mw}$). Among these, the first and last values are significant at the 5% level, while the third is significant at the 1% level. A similar pattern emerges when analyzing liquidity-only events, though significance is found only in $\sum\overline{\Delta CMAS}_{l\_mw}$, which records a value of 0.0878, significant at the 5% level. The analysis of individual events shows that the rise in U.S. CDS spreads is mainly driven by events 3 and 4. Event 3, following the Lehman Brothers collapse, saw hedge funds withdraw nearly one-third of their assets from Morgan Stanley, as reported by the Financial Times on September 25, 2008. Shortly after, on September 29, 2008, Morgan Stanley received a \$9 bn. investment from Mitsubishi UFJ, and news broke of Citigroup's takeover of Wachovia. Though not an official event date, these factors likely influenced the reaction of the U.S. stock market. Morgan Stanley's CDS spread increases were notably high at 0.8162 ΔCAS and 0.8755 $\Delta CMAS$, creating a significant bias in event 3 as the effect is averaged over only eight banks. During event 4 on December 17, 2009, Morgan Stanley announced a \$2.2 bn. quarterly loss, further boosting CDS spreads. Therefore, the positive U.S. reactions are not attributable to liquidity risk regulation itself. Rules are comparable for EU and U.S. banks, as the U.S. portfolio includes only large banks, making the LCR and NSFR binding. Both portfolios show rising CDS spreads, but the larger effect and significance in the U.S. portfolio is due to confounding events. The results of the cross-sectional analysis for U.S. CDSs are therefore not presented, as confounding events drive the reaction.

In the first step, the determinants of the EU responses are discussed. The assumed influence of LCR_PROXY, according to $H1_{EU,l}$, is evident in the CDS market, as all coefficients are negative and significant at the 1% level. From a creditor's perspective, a more liquid balance sheet leads to greater resilience against liquidity shocks, which aligns with the findings of Simion et al. (2024). Contrary to Bruno et al. (2018), no effect can be observed in the stock market, likely due to the decreasing relevance of the six additional events examined in this paper.

Regarding $H2_{EU,l}$, NSFR_PROXY negatively affects the stock market with the coefficients being significant at the 10% level for liquidity-only events. Contrary to the expectation, a lower funding mismatch (expressed by higher NSFR_PROXY) has a negative effect on a bank's stock market reaction, which is consistent with the results of Bruno et al. (2018). Analogously, pecking-order theory serves as an explanation (Myers & Majluf, 1984), because NSFR_PROXY contains equity, so capital costs increase as the funding mismatch decreases. Because well-capitalized banks with a lower funding mismatch face lower liquidity risk anyway, they may be less willing to bear the additional costs of adjusting assets and liabilities (Bruno et al., 2018). The smaller effect size in comparison and the lower significance can again be attributed to the little relevance of the additional six events in this paper. The significant influence of NSFR_PROXY compared to LCR_PROXY may be due to the fact that compliance with the NSFR is more costly from a shareholder's perspective. For the CDS market, NSFR_PROXY has no explanatory power. This may be due to the fact that cost considerations of pecking-order theory are less relevant from a creditor's perspective than the resilience against liquidity shocks, which can directly lead to insolvency.

The charter value of a bank explained in $H3_{EU,l}$ and proxied by DEP_ASSET, shows no effect on stock markets, while two coefficients in the CDS market estimations are significant at the 10% level. However, the coefficient in estimation (5) is negative, whereas in estimation (8) it is positive. To verify these findings, additionally the regressions are considered where the dependent variable is calculated with the single-index model. In this case, the coefficient is negative and significant at the 5% level in the regression that includes all liquidity events, providing some support for $H3_{EU,l}$ by suggesting that higher liquidity preserves a bank's charter value, thereby reducing CDS spreads.

Regarding the jurisdictional hypotheses, the assumed feedback loop effect, consistent with $H4_{EU,l}$, is evident. In the stock market estimates, all coefficients for GIIPS∗SOV_DEBT are negative and significant at the 1% level. In the CDS market, both coefficients are positive for liquidity-only events and significant at the 1% level. From a shareholder's perspective, the feedback loop increases compliance costs associated with liquidity ratios, while from a creditor's perspective, it heightens funding risk.

Regarding the U.S. determinants, the impact of the LCR and NSFR is analyzed for banks that must fully comply with the liquidity rules (FULL_AFF_l) and those that that are permitted to calculate modified metrics (MOD_AFF_l), while banks that are not affected constitute the reference category. The coefficients of the interaction terms of banks required to fully comply FULL_AFF_l∗LCR_PROXY and FULL_AFF_l∗NSFR_PROXY are distinct negative and highly significant, both for all events and liquidity-only events. This is consistent with $H1\_B_{US,l,stock}$ and implies that the application of liquidity rules solely to large banks amounts to a one-sided sanction, thereby providing smaller banks

Table 6
Determinants of stock and CDS market reactions to credit risk regulation.

	Stock Market				*CDS Market*			
	Credit Events		*Credit-Only*		*Credit Events*		*Credit-Only*	
	CAR	CMAR	CAR	CMAR	ΔCAS	$\Delta CMAS$	ΔCAS	$\Delta CMAS$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: EU								
TIER1_RAT	−0.010	0.006	−0.129	−0.106	−0.329***	−0.001	−0.103	0.225**
	(0.092)	(0.085)	(0.104)	(0.092)	(0.087)	(0.095)	(0.084)	(0.103)
TIER1_RAT^2	−0.092	−0.119	0.154	0.056				
	(0.257)	(0.235)	(0.281)	(0.294)				
LOAN_ASSET	−0.022	−0.016	−0.024	−0.032	0.044*	0.011	−0.002	−0.022
	(0.016)	(0.014)	(0.019)	(0.022)	(0.023)	(0.025)	(0.023)	(0.027)
PROV_LOAN	0.107	0.046	−0.021	−0.041	−0.533	−0.017	−0.941**	−0.028
	(0.151)	(0.158)	(0.160)	(0.208)	(0.362)	(0.314)	(0.379)	(0.324)
G_SIB	−0.009	−0.009	−0.008	−0.010	0.005	−0.001	−0.004	−0.007
	(0.007)	(0.007)	(0.007)	(0.009)	(0.014)	(0.011)	(0.007)	(0.007)
GIIPS	−0.008*	−0.012**	−0.009	−0.011*	0.008	0.020**	0.017**	0.023**
	(0.004)	(0.004)	(0.006)	(0.007)	(0.009)	(0.009)	(0.008)	(0.009)
SOV_DEBT	−0.005**	−0.008***	−0.004*	−0.006***	0.019***	0.024***	0.017**	0.025***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.006)	(0.005)	(0.007)	(0.005)
GIIPS*SOV_DEBT	0.014***	0.015***	0.020***	0.020***	−0.022**	−0.011	−0.017*	−0.009
	(0.005)	(0.005)	(0.007)	(0.007)	(0.009)	(0.008)	(0.009)	(0.009)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,510	1,510	1,067	1,067	632	632	444	444
R^2	0.018	0.014	0.018	0.012	0.112	0.101	0.097	0.065
Panel B: US								
TIER1_RAT	0.128**	0.115**	0.102*	0.115**	0.082	0.301	0.365	0.268
	(0.050)	(0.046)	(0.053)	(0.054)	(0.254)	(0.259)	(0.319)	(0.283)
TIER1_RAT^2	−0.303**	−0.270**	−0.244*	−0.290**				
	(0.127)	(0.111)	(0.138)	(0.138)				
LOAN_ASSET	−0.004	−0.004	−0.002	−0.003	−0.058	−0.018	0.025	−0.028
	(0.006)	(0.004)	(0.008)	(0.008)	(0.092)	(0.035)	(0.069)	(0.048)
PROV_LOAN	−0.002	−0.010	−0.214*	−0.126	0.942**	0.414*	1.037***	0.578**
	(0.085)	(0.076)	(0.117)	(0.121)	(0.367)	(0.250)	(0.326)	(0.240)
G_SIB	−0.007**	−0.004	0.001	0.004	0.065	0.004	0.056	−0.024
	(0.004)	(0.003)	(0.004)	(0.004)	(0.047)	(0.018)	(0.039)	(0.022)
AFF_BANK_c	−0.002	−0.005***	0.002	−0.003*				
	(0.002)	(0.002)	(0.002)	(0.002)				
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,388	5,388	3,732	3,732	207	207	143	143
R^2	0.032	0.021	0.131	0.076	0.171	0.093	0.159	0.135

This table presents the variables explaining heterogeneous reactions in cumulative abnormal returns (CAR), cumulative market-adjusted returns (CMAR), cumulative abnormal CDS spread changes ΔCAS and cumulative market-adjusted CDS spread changes $\Delta CMAS$ for 26 credit events by the BCBS. These values are calculated according to Eq. (1)–Eq. (8). Dependent variables are multiplied by −1 if the event is associated with a reduction in regulatory intensity. The MSCI World index is used as proxy for the stock market portfolio. The iTraxx Europe 5-years and the iTraxx CDX IG 5-years indices are used as proxies for the EU and U.S. CDS market portfolios, respectively. For so-called credit-only events, credit events are excluded (events 2, 3, 5, 7, 9, 19, 20, 25) if they are announced simultaneously with market and liquidity events. The bank-specific variables are TIER1_RAT, LOAN_ASSET, PROV_LOAN and G_SIB. TIER1_RAT is the ratio of Tier 1 capital to total risk-weighted assets. LOAN_ASSET is the ratio of total loans to total assets. PROV_LOAN is the ratio of loan-loss provisions to total loans. G_SIB is a dummy variable that is 1 for global systemically important banks and 0 otherwise. The country-specific variables are GIIPS and AFF_BANK_c. GIIPS is a dummy variable that is 1 for EU banks located in Greece, Italy, Ireland, Portugal or Spain and 0 otherwise. AFF_BANK_c is a dummy variable that is 1 for U.S. banks that are not subject to the Board's SBHC Policy Statement and 0 otherwise. SOV_DEBT is a dummy variable that is 1 for the sovereign debt crisis (05/02/2010-06/30/2013) and 0 otherwise. The control variables are SIZE, COST_INC, ROA and a dummy for the global financial crisis (09/15/2008-05/01/2010) for EU portfolios, while U.S. portfolios also include the sovereign debt crisis dummy. SIZE is the natural logarithm of total assets. COST_INC is the cost-to-income ratio. ROA is the return on assets. Regressions are estimated using random effects with clustered standard errors at bank level reported in parentheses. Note *p<0.1; **p<0.05; ***p<0.01.

with a competitive advantage. Regarding the interaction term with NSFR_PROXY, an additional argument again relates to the pecking-order theory. However, no significance is observed in the interactions of banks that are subject to the modified rules. The weakening of the liquidity rules for such banks also gives them a competitive advantage over the banks that must comply fully, which explains the insignificance of the interaction terms. Analogous to EU stock market reactions, the charter value of a bank described in H2$_{US,l,stock}$ has no significant impact on U.S. shareholders.

6. Further robustness and limitations

In the main chapter, abnormal stock and CDS market reactions are calculated using different models and indices to avoid dependency on exogenous decisions. Nevertheless, the results could be biased because

Table 7
Market reactions to announcements regarding liquidity risk regulation.

	$\sum \overline{CMAR}_{l\_ew}$	$\sum \overline{CAR}_{l\_ew}$	$\sum \overline{CMAR}_{l\_mw}$	$\sum \overline{CAR}_{l\_mw}$
Panel A: EU				
Actual Events				
Sum (all events)	−0.0659	−0.0301	−0.0858	−0.0471
p value (all events)	0.314	0.610	0.283	0.510
Sum (liquidity-only events)	−0.0085	0.0076	0.0153	0.0174
p value (liquidity-only events)	0.896	0.897	0.830	0.789
Placebo Events				
Sum (all events)	−0.0658	−0.0583	−0.0306	−0.0504
p value (all events)	0.314	0.337	0.716	0.487
Sum (liquidity-only events)	−0.0677	−0.0600	−0.0439	−0.0540
p value (liquidity-only events)	0.238	0.280	0.500	0.391
Panel B: U.S.				
Actual Events				
Sum (all events)	0.0236	0.0279	0.0801	0.0944
p value (all events)	0.712	0.683	0.458	0.396
Sum (liquidity-only events)	−0.0025	−0.0016	0.0764	0.0675
p value (liquidity-only events)	0.962	0.986	0.374	0.425
Placebo Events				
Sum (all events)	0.0415	0.0547	0.1444	0.1030
p value (all events)	0.509	0.408	0.224	0.353
Sum (liquidity-only events)	0.0175	0.0190	0.0549	0.0122
p value (liquidity-only events)	0.722	0.732	0.516	0.903
	$\sum \overline{\Delta CMAS}_{l\_ew}$	$\sum \overline{\Delta CAS}_{l\_ew}$	$\sum \overline{\Delta CMAS}_{l\_mw}$	$\sum \overline{\Delta CAS}_{l\_mw}$
Panel A: EU				
Actual Events				
Sum (all events)	0.2106	0.1080	0.1289	0.0283
p value (all events)	0.178	0.575	0.441	0.890
Sum (liquidity-only events)	0.0735	−0.056	0.0002	−0.1047
p value (liquidity-only events)	0.576	0.726	1.000	0.538
Placebo Events				
Sum (all events)	0.1062	0.0540	0.0537	0.0243
p value (all events)	0.484	0.757	0.768	0.899
Sum (liquidity-only events)	0.0885	0.0138	0.0404	−0.0132
p value (liquidity-only events)	0.498	0.931	0.752	0.946
Panel B: U.S.				
Actual Events				
Sum (all events)	0.4532**	0.3444	0.1311***	0.1132**
p value (all events)	0.022	0.119	0.004	0.023
Sum (liquidity-only events)	0.2856	0.1198	0.0878**	0.0624
p value (liquidity-only events)	0.196	0.489	0.042	0.127
Placebo Events				
Sum (all events)	0.0853	−0.1173	−0.0261	−0.0625
p value (all events)	0.603	0.564	0.460	0.136
Sum (liquidity-only events)	0.1689	−0.0337	−0.0054	−0.0379
p value (liquidity-only events)	0.240	0.827	0.852	0.288

This table presents aggregated EU and U.S. stock and CDS market reactions to 13 regulatory announcements of liquidity risk by the BCBS. Cumulative abnormal returns $CAR_{i,t}$, cumulative market-adjusted returns $CMAR_{i,t}$, cumulative abnormal CDS spread changes $\Delta CAS_{i,t}$ and cumulative market-adjusted CDS spread changes $\Delta CMAS_{i,t}$ are calculated according to Eq. (1) – Eq. (8). The MSCI World index is selected as a proxy for the stock market portfolio. The iTraxx Europe 5-years and iTraxx CDX IG 5-years indices are employed as proxies for the EU and U.S. CDS market portfolios, respectively. For each of the 13 liquidity events (l), average values $\overline{CAR}_l$, $\overline{CMAR}_l$, $\overline{\Delta CAS}_l$, $\overline{\Delta CMAS}_l$ are computed based on equally weighted (ew) and market-weighted (mw) portfolios. These values are multiplied by −1 if the event is associated with a reduction in regulatory intensity. The stock market reaction is reported as the sum of cumulative average abnormal returns $\sum \overline{CAR}_l$ and the sum of cumulative average market-adjusted returns $\sum \overline{CMAR}_l$ over 13 events. The CDS market reaction is reported as the sum of cumulative average abnormal CDS spread changes $\sum \overline{\Delta CAS}_l$ and the sum of cumulative average market-adjusted CDS spread changes $\sum \overline{\Delta CMAS}_l$ over 13 events. In addition, aggregated market reactions are calculated for liquidity-only events; i.e., four liquidity events that are announced simultaneously with market and credit events are excluded (events 4, 5, 6, and 11). Abnormal stock and CDS market reactions are computed for placebo events five trading days prior to the actual events to assess potential information leakage and market anticipation. All values are tested for significance using a block bootstrap significance test (see Section 4.3). *p* values are computed based on a two-sided significance test: *p<0.1; **p<0.05; ***p<0.01.

of event-induced volatility as well as cross-sectional and serial correlation (Hippert & Uhde, 2021). To account for volatility clustering and autoregressive heteroscedasticity in the time series of returns and CDS spread changes, abnormal stock and CDS market reactions are recalculated using a generalized autoregressive conditional heteroscedasticity (GARCH) model (Farruggio et al., 2013). Hence, Eq. (1), Eq. (2) and the CDS single-index model are estimated using a GARCH(1,1) model, revealing that signs and effect sizes of aggregated stock and CDS market reactions remain comparable in most cases. Then the cross-sectional regressions are recalculated with dependent variables calculated with the GARCH(1,1) model. The conclusions remain consistent in most cases.[30] The analysis of CDS market reactions is limited because it focuses solely on major banks in the U.S. and Europe. Therefore, conclusions regarding increased risk due to regulation are specifically applicable to major banks, which are more likely than smaller banks to be rescued. Furthermore, a challenge emerges within the U.S. context, given the small sample size, as this category consists of only eight banks. In the interpretation of the results, careful consideration is given to the potential influence of confounding events on the observed market reactions.

[30] Analyses can be provided upon request.

Table 8
Determinants of stock and CDS market reactions to liquidity risk regulation.

	Stock Market				*CDS Market*			
	Liquidity Events		*Liquidity-Only*		*Liquidity Events*		*Liquidity-Only*	
	CAR (1)	CMAR (2)	CAR (3)	CMAR (4)	ΔCAS (5)	$\Delta CMAS$ (6)	ΔCAS (7)	$\Delta CMAS$ (8)
Panel A: EU								
LCR_PROXY	0.0001	−0.0004	−0.002	−0.002	−0.037***	−0.028***	−0.034***	−0.035***
	(0.001)	(0.001)	(0.004)	(0.004)	(0.009)	(0.008)	(0.010)	(0.010)
NSFR_PROXY	−0.013	−0.009	−0.040*	−0.034*	0.061	−0.012	0.032	−0.039
	(0.011)	(0.012)	(0.022)	(0.020)	(0.053)	(0.053)	(0.040)	(0.034)
DEP_ASSET	−0.021	−0.025	−0.005	−0.002	−0.102*	−0.027	0.030	0.060*
	(0.014)	(0.016)	(0.023)	(0.022)	(0.053)	(0.042)	(0.052)	(0.033)
GIIPS	0.007**	0.005	0.011*	0.011*	−0.015**	0.002	−0.032***	−0.015
	(0.004)	(0.004)	(0.006)	(0.006)	(0.007)	(0.008)	(0.008)	(0.010)
SOV_DEBT	−0.024***	−0.024***	−0.026***	−0.026***	0.060***	0.042***	0.030***	0.025***
	(0.005)	(0.005)	(0.007)	(0.007)	(0.009)	(0.008)	(0.007)	(0.008)
GIIPS∗SOV_DEBT	−0.025***	−0.026***	−0.049***	−0.048***	−0.009	−0.002	0.045***	0.033***
	(0.008)	(0.008)	(0.013)	(0.012)	(0.013)	(0.013)	(0.009)	(0.011)
Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	702	702	480	480	177	177	118	118
R^2	0.097	0.095	0.134	0.132	0.338	0.348	0.326	0.422
Panel B: US								
MOD_AFF_l	−0.119	−0.139	−0.116	−0.174				
	(0.125)	(0.128)	(0.140)	(0.147)				
FULL_AFF_l	0.127***	0.138***	0.236***	0.239***				
	(0.038)	(0.040)	(0.066)	(0.072)				
LCR_PROXY	−0.001	0.0002	0.001	0.002				
	(0.003)	(0.003)	(0.003)	(0.003)				
NSFR_PROXY	−0.028	−0.039*	−0.038	−0.043*				
	(0.022)	(0.022)	(0.025)	(0.025)				
DEP_ASSET	0.003	0.003	−0.008	−0.003				
	(0.017)	(0.017)	(0.019)	(0.020)				
MOD_AFF_l∗LCR_PROXY	−0.022	−0.037	−0.017	−0.028				
	(0.021)	(0.025)	(0.029)	(0.034)				
FULL_AFF_l∗LCR_PROXY	−0.042***	−0.041***	−0.040***	−0.038***				
	(0.007)	(0.007)	(0.010)	(0.010)				
MOD_AFF_l∗NSFR_PROXY	0.133	0.160	0.134	0.197				
	(0.135)	(0.139)	(0.154)	(0.162)				
FULL_AFF_l∗NSFR_PROXY	−0.134***	−0.145***	−0.252***	−0.262***				
	(0.046)	(0.048)	(0.079)	(0.085)				
Control	Yes	Yes	Yes	Yes				
Observations	2,629	2,629	1,818	1,818				
R^2	0.051	0.056	0.064	0.070				

This table presents the variables explaining heterogeneous reactions in cumulative abnormal returns (CAR), cumulative market-adjusted returns (CMAR), cumulative abnormal CDS spread changes ΔCAS and cumulative market-adjusted CDS spread changes $\Delta CMAS$ for 13 liquidity events by the BCBS. These values are calculated according to Eq. (1)–Eq. (8). Dependent variables are multiplied by −1 if the event is associated with a reduction in regulatory intensity. The MSCI World index is used as proxy for the stock market portfolio. The iTraxx Europe 5-years and the iTraxx CDX IG 5-years indices are used as proxies for the EU and U.S. CDS market portfolios, respectively. For so-called liquidity-only events, liquidity events are excluded (events 4, 5, 6, 11) if they are announced simultaneously with market and credit events. The bank-specific variables are LCR_PROXY, NSFR_PROXY and DEP_ASSET. LCR_PROXY is a proxy for a bank's liquidity coverage ratio (LCR). NSFR_PROXY is a proxy for a bank's net stable funding ratio (NSFR). DEP_ASSET is the ratio of customer deposits to total assets. The country-specific variables are GIIPS, MOD_AFF_l and FULL_AFF_l. GIIPS is a dummy variable that is 1 for EU banks located in Greece, Italy, Ireland, Portugal or Spain and 0 otherwise. MOD_AFF_l is a dummy variable that is 1 for U.S. banks that are subject to modified liquidity metrics and 0 otherwise. FULL_AFF_l is a dummy variable that is 1 for U.S. banks that are subject to full liquidity metrics and 0 otherwise. SOV_DEBT is a dummy variable that is 1 for the sovereign debt crisis (05/02/2010-06/30/2013) and 0 otherwise. The control variables are SIZE, COST_INC, ROA and dummies for the subprime crisis (01/06/2007-09/14/2008) and the global financial crisis (09/15/2008-05/01/2010) for EU portfolios, while U.S. portfolios also include the sovereign debt crisis dummy. SIZE is the natural logarithm of total assets. COST_INC is the cost-to-income ratio. ROA is the return on assets. Regressions are estimated using random effects with clustered standard errors at bank level reported in parentheses. Note *p<0.1; **p<0.05; ***p<0.01.

The CDS market is opaque and illiquidity has increased in recent years, which can lead to rising CDS spreads (International Swaps and Derivatives Association, 2023). Paddrik and Tompaidis (2019) show that post-GFC regulation increased the costs of holding inventory for dealers, thereby increasing illiquidity. Although this problem is mitigated in this analysis by applying liquidity criteria to the CDS portfolios, the majority of market makers and dealers are themselves banks (European Securities and Markets Authority, 2023). Because regulation increases costs for banks, ceteris paribus, inventory costs also increase, thereby increasing CDS market illiquidity. This could imply that the observed increased CDS spreads following the regulatory announcements do not stem from an increase in risk but rather from the regulation-induced rise in illiquidity. If this increase is attributed to heightened illiquidity, then the CDS spreads of all companies, not just banks, would rise. The EU CDS market reaction to credit risk regulation is the only significant one. To assess whether this reaction is caused by an increase in risk or heightened illiquidity, a CDS portfolio consisting of 27 non-financial companies is constructed, mimicking the countries of origin of the banks.[31] The results suggest that the banks' CDSs have risen due to an increase in risk, because no CDS market reaction of the non-financial portfolio is positive and significant.[32]

The main section already addresses bank-specific confounding events. However, a key difference between U.S. and EU banks is that since 2014, the ECB has supervised large Eurozone banks as part of the SSM. In this study, to ensure that EU reactions are not influenced by the introduction of the SSM, following Fiordelisi et al. (2017), 25 significant events are identified. None of the three-day windows for market, credit, and liquidity regulations overlap with these events, ruling out SSM-related biases in the results.

7. Conclusion

With the full release of the BCBS's regulatory frameworks for market, credit, and liquidity risk through Basel II.5, Basel III, and Basel IV, market reactions can be studied to understand the real-world impact of regulation on shareholders and creditors, which is essential for evaluating its effectiveness. This paper picks up here using event study methodology to quantify the collective impact of 15 market events, 26 credit events, and 13 liquidity events for EU and U.S. bank stocks and CDSs. The findings significantly contribute to the literature on financial regulation post-GFC. First, the findings demonstrate that regulation of financial risks leads to notable market reactions from shareholders and creditors, indicating changes in profitability and risk, whereby bank- and country-specific factors explain individual responses. Second, significant differences in market reactions between the EU and the U.S. – largely attributable to varying implementation practices – raise questions about the establishment of a true level playing field. Finally, the reactions can be discussed in the context of whether the regulatory objectives of reducing risk for the public sector have been achieved.

The analysis reveals significant negative stock market reactions for EU banks in response to market and credit risk regulation. This stands in contrast to U.S. banks, which exhibit insignificant reactions to market risk and a less stringent response to credit risk. The stricter application of Basel regulations in the EU, coupled with the Volcker Rule and exemptions or relief for smaller banks in the U.S., account for much of this discrepancy. Creditors in both the EU and U.S. show no reaction to market risk regulation. However, credit risk regulation triggers a significant rise in EU CDS spreads, indicating that creditors perceive higher risks due to diminished bailout expectations. In contrast, U.S. creditors respond with increased but insignificant CDS spreads, likely because the Dodd-Frank Act had already lowered bailout expectations prior to the Basel reforms. Liquidity regulation shows no significant impact on shareholders and creditors in both the EU and U.S. The absence of a U.S. market reaction may stem from U.S. liquidity rules applying only to large banks, which had stronger liquidity positions during and post-GFC compared to EU banks. While earlier studies find a negative EU shareholder response, this paper detects no effect, suggesting that the additional events examined here have limited market relevance. Although CDS spreads increased similarly to previous findings, no statistical significance is observed, likely due to methodological differences and sample variations.

Importantly, the cross-sectional analysis demonstrates that bank- and country-specific factors play a crucial role in heterogeneous responses to regulation, highlighting the complexity of regulatory impacts across different banking institutions and jurisdictions. Regarding market risk regulation, a bank's capitalization reduces CDS spreads in both the U.S. and the EU. Additionally, higher market risk and a bank's classification as a G-SIB increase U.S. CDS spreads. Conversely, U.S. stock market reactions are negatively influenced by G-SIBs, while higher market risk and a bank's location in GIIPS reduce returns for EU shareholders. Regarding credit risk regulation, there is a positive but diminishing effect of a bank's capitalization on U.S. stock market reactions, while higher risk costs have a negative impact. Additionally, banks that are subject to regulation show lower returns compared to SBHCs. U.S. creditors respond to increased risk costs with higher CDS spreads. In the EU, the feedback loop positively influences shareholders and reduces CDS spreads. Bank capitalization and risk costs also exert a negative impact. Regarding liquidity risk, a negative impact of more liquid balance sheets and charter values on EU CDSs is observed, indicating greater resilience to liquidity shocks. In contrast, the feedback loop increases creditor risk. For the EU stock market, a negative effect of the feedback loop is evident, which similarly applies to reduced funding mismatches. In the U.S. stock market, a negative effect is found for large banks subject to full liquidity requirements, indicating a one-sided penalty and competitive disadvantage.

Overall, the findings suggest that the Basel reforms post-GFC have successfully transferred risks from taxpayers back to shareholders and reduced moral hazard among creditors, indicated by the negative stock market reactions and increased CDS spreads, which is consistent with the public interest theory by Needham (1983). The effect is more pronounced in the EU than in the U.S., which is due to the previously introduced Dodd-Frank Act and the stricter implementations of regulations in the EU. However, the evident differences in implementation raise concerns about the establishment of a level playing field. Consequently, a critical policy implication emerges: there is a need for more consistent regulatory enforcement across BCBS member states.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author used ChatGPT in order to improve language and readability. After using this tool/service, the author reviewed and edited the content as needed and takes full responsibility for the content of the publication.

Declaration of competing interest

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Event description

See Tables A.9–A.11.

Appendix B. Keywords for checking international media coverage

See Table B.12.

Appendix C. Descriptive statistics

See Table C.13.

[31] CDS illiquidity is more severe for non-financial firms, hindering the creation of a liquid portfolio covering all 26 credit events. Eaton Corporation has been headquartered in Ireland only since 2012.

[32] Results can be provided upon request. The conclusions do not change when the CDS market reaction is calculated using the single-index model.

Table A.9
Market events and predicted impact on regulation.

Event	Type and Name	Impact	Short Description
1 October 12, 2007	**Consultative**: Guidelines for Computing Capital for Incremental Default Risk in the Trading Book	Tightened	Stricter guidelines for calculating incremental default risk charge (IDRC) for trading book positions.
2 July 22, 2008	**Press release**: Computing Capital for Incremental Risk in the Trading Book **Consultative**: Guidelines for Computing Capital for Incremental Risk in the Trading Book[a] **Consultative**: Proposed revisions to the Basel II market risk framework	Tightened	IDRC is to be replaced by IRC, which takes into account not only default risk of credit-dependent instruments in the trading book but also losses due to changes in credit ratings, credit spreads and liquidity. The capital requirements for these instruments in particular is to be increased in order to prevent regulatory arbitrage between the banking and the trading book.
3 January 16, 2009	**Consultative**: Guidelines for computing capital for incremental risk in the trading book Consultative: Revisions to the Basel II market risk framework	Tightened	IRC includes default risk and migration risk and has to be calculated for unsecuritized credit products. For securitized instruments, the capital requirements of the banking book have to be applied. The capital framework of the trading book is supplemented by a VaR based on a one-year historical stress period. This at least doubles regulatory capital. Furthermore, the BCBS proposes to remove the 4% preferential treatment of specific risks of liquid and diversified equity portfolios so that 8% would be required.
4 July 13, 2009	**Standards**: Guidelines for computing capital for incremental risk in the trading book **Standards**: Revisions to the Basel II market risk framework	Tightened	Rules are adopted as standards without significant changes. Although the capital requirements of the banking book apply to securitized products, banks may calculate a comprehensive risk measure (CRM) for so-called correlation trading activities with the permission of the supervisory authority. This framework would replace the IRC and specific risk charge for those portfolios, but it would be subject to strict requirements, stress tests and a floor given by the banking book capital requirement.
5 June 18, 2010	**Press release**: Adjustments to the Basel II market risk framework announced by the Basel Committee	Weakened	BCBS grants nine-month extension to implement rules adopted in July 2009. Furthermore, net long and short positions of non-correlation trading securitization positions can be offset during the subsequent two-year transition period after the implementation of the market risk framework on December 31, 2011. The floor for the correlation trading securitization positions is set to 8% of the standard method.
6 May 3, 2012	**Consultative**: The fundamental review of the trading book	Tightened	BCBS proposes a more strict boundary between the banking and the trading book to reduce regulatory arbitrage. VaR models shall be replaced by expected shortfall models that incorporate tail risk. A revised standard approach should be constructed that is risk sensitive and a credible fallback for internal models. The calculation of the standard approach should be mandatory if it is necessary as a floor or surcharge for internal models. In the internal model, the possibility of taking diversification into account is to be reduced, with hedging and diversification being more closely aligned in both approaches. Consistent with the stressed VaR approach from Basel II.5, a revised framework in both the internal models-based and the standardized approach should be calibrated on a period of significant financial stress.
7 Otober 31, 2013	**Consultative**: Fundamental review of the trading book: A revised market risk framework	Tightened	The points raised in the first consultation paper have now been elaborated in more detail and incorporated into a draft text for the new market risk framework.
8 December 19, 2014	**Consultative**: Fundamental review of the trading book: outstanding issues	Weakened	Development for a treatment of internal risk transfers from the banking to the trading book. There are simplifications for the standard approach, which, in addition to the cash-flow-based approach, also includes a sensitivity-based. Furthermore, revisions to the internal models approach with varying liquidity horizons facilitate implementation, which is easier for banks to implement due to internal systems.
9 June 8, 2015	**Consultative**: Interest rate risk in the banking book	Tightened	BCBS proposes two potential options for dealing with interest rate risk in the banking book to ensure that banks have enough capital to address losses due to an interest rate increase, especially in times of very low interest rates. The first option involves a minimum Pillar 1 capital requirement, whereas the second proposal involves a quantitative disclosure against the background of Pillar 2.
10 January 14, 2016	**Standards**: Minimum capital requirements for the trading book	Weakened	New market risk framework comes into force on January 1, 2019.

(*continued on next page*)

Table A.9 (*continued*).

Event	Type and Name	Impact	Short Description
11 April 21, 2016	**Standards**: Interest rate risk in the banking book	Weakened	BCBS decides against capital requirements for interest rate risk in the banking book. Only disclosure requirements and management guidelines will be tightened.
12 June 29, 2017	**Consultative**: Simplified alternative to the standardized approach to market risk capital requirements	Weakened	BCBS proposes a simplified standardized approach for smaller banks that significantly lowers operational hurdles. Furthermore, under this approach, vega and curvature risk do not have to be backed by capital. The calculation is simplified and comes with reduced risk factor granularity correlation scenarios. As an alternative, the BCBS proposes to use a modified version of the Basel II.5 standardized approach.
13 December 7, 2017	**Press release**: Governors and Heads of Supervision finalize Basel III reforms	Weakened	Implementation of the market risk framework is postponed by three years to January 1, 2022.
14 March 22, 2018	**Consultative**: Revisions to the minimum capital requirements for market risk	Weakened	BCBS proposes refinements to the standardized approach, including less conservative consideration of liquid foreign exchange (FX) pairs and correlation scenarios and changes to non-linear instruments. Furthermore, BCBS proposes to reduce the risk weights for the general interest rate risk class by 20%–40%, and equity and FX risk classes by 25-50%. As an alternative to the standardized approach for small banks, the Basel II.5 standardized approach with a more conservative calibration is proposed.
15 January 14, 2019	**Standard**: Minimum capital requirements for market risk	Tightened	The market risk framework was adopted without significant changes. Compared to Basel II.5, a weighted average increase of 22% in market risk capital is estimated.

This table provides information on 15 announcements regarding market risk regulation by the BCBS. It includes an assessment of whether each announcement will tighten or weaken regulation, along with a brief description.

[a] The BCBS information concerning the publication date differs between July 22, 2008 and July 23, 2008. July 22, 2008 is defined as event day with the corresponding press release.

Table A.10
Credit events and predicted impact on regulation.

Event	Type and Name	Impact	Short Description
1 November 17, 2008	**Press release:** Nout Wellink: The Importance of Banking Supervision in Financial Stability	Tightened	The BCBS proposes to increase regulatory capital for credit risk and the quality of Tier 1. A capital buffer is proposed that banks need to build up in "good times" and that can be drawn in periods of stress.
2 January 16, 2009	**Consultative:** Proposed enhancements to the Basel II framework	Tightened	The BCBS proposes higher capital requirements for resecuritizations in the banking book.
3 July 13, 2009	**Standards:** Enhancements to the Basel II framework	Tightened	Higher risk weights for resecuritizations are suggested. These regulations are supplemented by stricter risk management and stronger disclosure requirements.
4 September 7, 2009	**Press release:** Comprehensive response to the global banking crisis	Tightened	The Group of Central Bank Governors and Heads of Supervision reach agreement. The introduction of a framework for countercyclical capital buffers is planned. Tier 1 capital shall include predominantly common shares and retained earnings.
5 December 17, 2009	**Consultative:** Strengthening the resilience of the banking sector	Tightened	Tier 1 capital predominantly includes common equity and retained earnings, which could hit EU banks that use hybrid capital particularly hard, since hybrid capital will be phased out completely. Furthermore, the BCBS proposes to strengthen capital requirements for counterparty credit risk exposures resulting from derivatives, repos and securities financing transactions. A capital conservation buffer shall force banks to build up Tier 1 capital that can be drawn in periods of stress. The countercyclical capital buffer shall dampen procyclicality and will likely be implemented at the jurisdiction level, if necessary.
6 July 16, 2010	**Consultative:** Countercyclical capital buffer proposal	Tightened	In normal times, the buffer is set at zero. If the national regulator detects signs of a credit bubble, it can force banks to comply with the buffer within twelve months. Tier 1 capital must be used.
7 July 26, 2010	**Press release**: The Group of Governors and Heads of Supervision reach broad agreement on Basel Committee capital and liquidity reform package	Weakened	An annex to the press release is published. Minority stakes in bank subsidiaries qualify as regulatory capital. Banks are allowed to include holdings in unconsolidated financial institutions, mortgage servicing rights and deferred tax assets up to 10% of the common equity component of tier one capital.

(*continued on next page*)

Table A.10 (*continued*).

Event	Type and Name	Impact	Short Description
8 September 13, 2010	**Press release:** Group of Governors and Heads of Supervision announces higher global minimum capital standards[a]	Weakened	The capital adequacy rules will not be introduced until 2013, and there is with a generous transition period until 2019. The capital conservation buffer will be phased in only from 2016. Furthermore, it is unclear when and how the countercyclical capital buffer will be introduced. Capital instruments that no longer qualify as regulatory capital are phased out over ten years starting in 2013.
9 December 16, 2010	**Standards:** Basel III: A global regulatory framework for more resilient banks and banking systems	Tightened	Proposed rules are adopted as standards without significant changes. Countercyclical capital buffer is to be met with CET1 and set between 0 and 2.5% by national authorities, depending on excessive credit growth. It is phased in with the capital conservation buffer.
10 November 2, 2011	**Consultative:** Capitalisation of bank exposures to central counterparties[b]	Tightened	There is only relief for smaller banks that clear through larger banks. The BCBS does not change the original proposal for a two percent risk weighting of exposures to central counterparties, which, according to the banks, counteracts the BCBS' desire for central clearing.
11 July 6, 2012	**Consultative:** Margin requirements for non-centrally-cleared derivatives	Tightened	Issued draft proposes margin requirements and a framework for non-centrally derivatives to promote the use of central counterparties.
12 July 25, 2012	**Standards:** Capital requirements for bank exposures to central counterparties	Tightened	The former proposal is reaffirmed as standard. Furthermore, banks can choose between a simplified and a risk sensitive approach to determine their capital required for exposures to default funds.
13 December 18, 2012	**Consultative:** Revisions to the Basel Securitization Framework	Tightened	After resecuritizations were already given a higher risk weight in the standard of July 13, 2009, the securitization framework is now being completely revised. The risk weight floor for internal models will initially be raised from 7% to 20%. Both internal and standard approaches are to be revised so that they are more closely aligned. Furthermore, reliance on external ratings is to be reduced.
14 February 15, 2013	**Consultative:** Margin requirements for non-centrally cleared derivatives	Weakened	The initial draft is eased, since a universal initial margin threshold of €50 mio. is now proposed. Furthermore, after a transition phase (depending on the notional amount of non-centrally cleared derivatives), the rules do not have to be applied by everyone until 2019. Contrary to the previous proposal, the BCBS is seeking market participants' advice on whether financial firms should be permitted to reuse collateral that has been used as margin.
15 June 28, 2013	**Consultative:** Capital requirements for bank exposures to central counterparties	Tightened	The BCBS argues that an interim standard was implemented and that it needs an overhaul.
16 September 2, 2013	**Standards:** Margin requirements for non-centrally cleared derivatives	Weakened	The standard introduced excludes foreign exchange derivatives from initial margin requirements.Furthermore, subject to strict requirements, a unique re-hypothecation of initial margin collateral is permitted
17 December 19, 2013	**Consultative:** Revisions to the securitization framework	Weakened	The hierarchy of the securitization framework is designed similar to that of the credit risk one and therefore simplified to the initial proposal, which results in substantial reductions in capital. The risk-weight floor for the internal ratings based approach is set to 15%, instead of 20% from the previous proposal.
18 April 10, 2014	**Standards:** Capital requirements for bank exposures to central counterparties - final standard	Tightened	There is a new approach to determining capital requirements for bank exposures to qualifying central counterparties as well as a limit on the capital requirement compared to non-qualifying central counterparties. The standard will become mandatory as of January 01, 2017.
19 December 11, 2014	**Standards:** Revisions to the securitization framework	Tightened	The prior proposal is finalized as standard without significant changes. The securitization framework will be implemented in January 2018.
20 December 22, 2014	**Consultative:** Revisions to the standardized approach for credit risk	Tightened	The draft proposes to reduce banks' reliance on external ratings and thus to tighten their own risk management with respect to the standardized approach for credit risk.
21 March 18, 2015	**Standards:** Margin requirements for non-centrally cleared derivatives	Weakened	The beginning of the four-year phase-in period is postponed from December 1, 2015 to September 1, 2016.
22 December 10, 2015	**Consultative:** Revisions to the Standardized Approach for credit risk	Weakened	The complete ban on the use of external ratings is rescinded. They can still be used for exposures to companies and banks, although the mechanistic nature shall be mitigated.
23 March 24, 2016	**Consultative:** Reducing variation in credit risk-weighted assets - constraints on the use of internal model approaches	Tightened	The use of the advanced and foundation IRBA is to be prohibited for credit exposures to banks, other financial companies as well as large companies (total assets > €50 bn.) and equities. Furthermore, a minimum input floor for the IRBA parameters is given. The BCBS proposes an output floor of the IRB approaches calibrated in the range of 60% to 90% in relation to the standardized approach.

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Table A.10 (*continued*).

Event	Type and Name	Impact	Short Description
24 July 11, 2016	**Standards:** Revisions to the securitization framework	Weakened	Compared to the November 2015 consultation paper, the risk weights of simple, transparent and comparable (STC) securitizations are lowered and the risk floor for senior exposures has been reduced from 15% to 10%.
25 December 7, 2017	**Standards:** Basel III: Finalising post-crisis reforms	Weakened	Contrary to the previous consultative document, the foundation IRBA may be used for exposures to banks, large and medium-sized enterprises and other financial companies. The previously discussed capital output floor for the IRB approaches lied in the range of 60% to 90% and is now set to the higher of IRBA RWAs or 72.5% of the RWAs under the standardized approach. A transitional agreement for the output floor is agreed so that it is obligatory on January 1, 2027. The risk weights under the standardized approach have also been weakened compared with the consultation paper. The revised standardized and the IRB approaches will not be implemented before January 1, 2022.
26 July 23, 2019	**Standards:** Margin requirements for non-centrally cleared derivatives	Weakened	The last implementation phase for institutions with the lowest threshold (notional derivative amount of more than €8 bn.) is delayed by one year.

This table provides information on 26 announcements regarding credit risk regulation by the BCBS. It includes an assessment of whether each announcement will tighten or weaken regulation, along with a brief description.

[a] The publication is dated Sunday, September 12, 2010 and the next trading day is set as the event day.

[b] An initial consultation paper dated December 20, 2010 is excluded because its event window would overlap with the event window of event 9.

Table A.11
Liquidity events and predicted impact on regulation.

Event	Type and Name	Impact	Short Description
1 February 21, 2008	**Sound practices**: Liquidity Risk: Management and Supervisory Challenges	Tightened	Summary of the main findings of a BCBS working group on liquidity risk, assessing how banks address and manage it; these findings also take into account the GFC.
2 June 17, 2008	**Consultative**: Principles for Sound Liquidity Risk Management and Supervision	Tightened	BCBS proposes stronger liquidity risk management framework for banks and enhanced supervisory oversight. This consultative paper is a substantial revision of guidelines from 2000.
3 September 25, 2008	**Guidelines**: Principles for Sound Liquidity Risk Management and Supervision	Tightened	The final version of the previous consultation paper is published without significant changes.
4 December 17, 2009	**Consultative**: International framework for liquidity risk measurement, standards and monitoring	Tightened	The BCBS proposes two new liquidity metrics, the LCR and the NSFR. While the former metric aims to ensure that banks have sufficient high quality liquid assets (HQLA) over a 30-day period under stress, the goal of the NSFR is to ensure stable funding of long-term and illiquid assets over a one-year period.
5 July 26, 2010	**Press release**: The Group of Governors and Heads of Supervision reach broad agreement on Basel Committee capital and liquidity reform package	Weakened	An annex to the press release is published and both liquidity metrics are alleviated. For the LCR, run-off factors of retail and small and medium-sized enterprise (SME) deposits are reduced. The definition of HQLA is relaxed, which now also qualifies certain high-quality corporate bonds, for example. Retail and SME deposits receive a higher available stable funding (ASF) factor, with the required stable funding (RSF) factor for residential mortgages being reduced. Furthermore, the BCBS announces that some refinements to both metrics might be possible.
6 December 16, 2010	**Standards**: Basel III: International framework for liquidity risk measurement, standards and monitoring	Tightened	The BCBS publishes the Basel III rules text and results of a quantitative impact study (QIS). Furthermore, the final standards for liquidity management are published, no significant changes have been made compared to the annex of July 26, 2010.
7 January 07, 2013	**Standards**: Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools	Weakened	Final standard of the LCR is issued by the BCBS, with the metric being phased in from January 1, 2015 (60%) until January 1, 2019 (100%). The scope of assets that can be used as HQLA is expanded. Furthermore, some inflow and outflow rates are recalibrated (see Annex 2 *Complete set of agreed changes to the formulation of the Liquidity Coverage Ratio published in December 2010* for concrete changes).
8 July 19, 2013	**Consultative**: Liquidity coverage ratio disclosure standards	Tightened	The BCBS proposes disclosure requirements for the LCR.
9 January 13, 2014[a]	**Standards**: Liquidity coverage ratio disclosure standards **Consultative**: Basel III: the Net stable funding ratio	Weakened	The BCBS issues the standard for the LCR disclosure requirements. In the second document, the BCBS relaxes the NSFR with respect to a broader recognition and higher ASF factor for deposits while increasing consistency with the LCR. In addition, cliff effects in the measurement of ASF and RSF shall be mitigated.

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Table A.11 (*continued*).

Event	Type and Name	Impact	Short Description
10 October 31, 2014	**Standards**: Basel III: the net stable funding ratio	Tightened	The standard of the NSFR is finalized. BCBS makes only minor changes to the RSF. The standard will be implemented as of January 01, 2018.
11 December 9, 2014	**Consultative**: Net stable funding ratio disclosure standards	Tightened	For reasons of market discipline and transparency, the BCBS proposes that banks need to disclose their NSFR according to a given template.
12 June 22, 2015	**Standards**: Net stable funding ratio disclosure standards	Tightened	The BCBS is introducing the disclosure requirements for the NSFR as a standard in parallel with the introduction of the BCBS on January 01, 2018.
13 October 6, 2017	**Standards**: Implementation of net stable funding ratio and treatment of derivative liabilities	Weakened	The BCBS allows countries to lower the RSF factor for derivative liabilities from 20% to as low as 5%. In this respect, countries have discretion in setting a floor, which should simplify the implementation of the NSFR as of January 01, 2018.

This table provides information on 13 announcements regarding liquidity risk regulation by the BCBS. It includes an assessment of whether each announcement will tighten or weaken regulation, along with a brief description.

[a] The event date is set to January 13, 2014, because both announcements are made on Sunday January 12, 2014.

Table B.12
Keywords for evaluating international media coverage.

Market Risk	Credit Risk	Liquidity Risk
bank regulation	bank regulation	bank regulation
BIS	BIS	BIS
Bank for International Settlements	Bank for International Settlements	Bank for International Settlements
BCBS	BCBS	BCBS
Basel Committee	Basel Committee	Basel Committee
Basel Committee on Banking Supervision	Basel Committee on Banking Supervision	Basel Committee on Banking Supervision
banking supervision	Basel III	Basel III
Basel IV	Basel 3	Basel 3
Basel 4	banking supervision	banking supervision
Basel 2.5	Basel IV	liquidity risk
Basel II.5	Basel 4	liquidity coverage ratio
capital requirements	capital requirements	LCR
Tier 1	Tier 1	net stable funding ratio
additional Tier 1	additional Tier 1	NSFR
Tier 2	Tier 2	liquidity regulation
Incremental default risk	capital conservation buffer	high quality liquid assets
IRC	countercyclical buffer	HQLA
market risk	counterparty credit risk	available stable funding
trading book	central counterparties	ASF
incremental risk charge	credit risk	required stable funding
IRC	securitization framework	RSF
market framework	mortgage insurance	
internal model	standardized approach	
fundamental review of the trading book	margin requirements	
FRTB	internal ratings based approach	
standardized approach	IRBA	
interest rate risk		

This table presents the keywords used to evaluate international media coverage for regulatory announcements of the BCBS for 15 market, 26 credit and 13 liquidity events using LexisNexis.

Table C.13
Descriptive statistics of independent variables of the entire dataset.

	M	25%	50%	75%	SD
Panel A: EU					
TIER1_RAT	0.143	0.112	0.136	0.168	0.049
TIER1_RAT^2	0.023	0.013	0.019	0.028	0.018
SEC_ASSET	0.176	0.072	0.146	0.231	0.152
G_SIB	0.162	0	0	0	0.369
LOAN_ASSET	0.561	0.468	0.601	0.684	0.181
PROV_LOAN	0.010	0.002	0.006	0.013	0.030
LCR_PROXY	0.465	0.158	0.285	0.496	0.706
NSFR_PROXY	0.734	0.632	0.754	0.871	0.178
DEP_ASSET	0.529	0.387	0.536	0.671	0.194
GIIPS	0.312	0	0	1	0.464
SIZE	10.763	8.999	11.017	12.712	2.459
COST_INC	0.670	0.514	0.612	0.722	9.266
ROA	0.005	0.002	0.005	0.009	0.015

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Table C.13 (*continued*).

	M	25%	50%	75%	SD
Panel B: U.S.					
TIER1_RAT	0.134	0.111	0.127	0.147	0.041
TIER1_RAT^2	0.020	0.012	0.016	0.022	0.018
DER_ASSET	0.875	0.0003	0.022	0.112	5.255
G_SIB	0.026	0	0	0	0.159
LOAN_ASSET	0.673	0.613	0.695	0.758	0.129
PROV_LOAN	0.006	0.001	0.002	0.006	0.010
AFF_BANK_c	0.930	1	1	1	0.250
LCR_PROXY	0.349	0.118	0.214	0.400	0.527
NSFR_PROXY	0.945	0.933	0.966	0.985	0.069
DEP_ASSET	0.761	0.722	0.787	0.830	0.107
MOD_AFF_l	0.050	0	0	0	0.230
FULL_AFF_l	0.040	0	0	0	0.190
SIZE	8.600	7.249	8.324	9.486	1.782
COST_INC	0.627	0.546	0.615	0.688	0.334
ROA	0.009	0.007	0.010	0.012	0.009

This table presents descriptive statistics of the independent variables for the entire data set for EU and U.S. banks. TIER1_RAT is the ratio of Tier 1 capital to total risk-weighted assets. SEC_ASSET is the ratio of marketable security investments to total assets. G_SIB is a dummy variable that is 1 for global systemically important banks and 0 otherwise. LOAN_ASSET is the ratio of total loans to total assets. PROV_LOAN is the ratio of loan-loss provisions to total loans. LCR_PROXY is a proxy for a bank's LCR. NSFR_PROXY is a proxy for a bank's NSFR. DEP_ASSET is the ratio of customer deposits to total assets. GIIPS is a dummy variable that is 1 for banks located in Greece, Italy, Ireland, Portugal or Spain and 0 otherwise. DER_ASSET is ratio of derivatives to total assets. AFF_BANK_c is a dummy variable that is 1 for U.S. banks that are not subject to the Board's SBHC Policy Statement and 0 otherwise. MOD_AFF_l is a dummy variable that is 1 for U.S. banks that are subject to modified liquidity metrics and 0 otherwise. FULL_AFF_l is a dummy variable that is 1 for U.S. banks that are subject to full liquidity metrics and 0 otherwise. SIZE is the natural logarithm of total assets. COST_INC is the cost-to-income ratio. ROA is the return on assets. More precise descriptive statistics of the dependent variables used in the regressions for market, credit, and liquidity risk for the stock and CDS markets can be provided upon request, as can for the time dummy variables (subprime crisis, global financial crisis, sovereign debt crisis, ex post crisis).

Table D.14
Market reactions to announcements regarding market risk regulation.

	$\sum \overline{CMAR}_{m\_ew}$	$\sum \overline{CAR}_{m\_ew}$	$\sum \overline{CMAR}_{m\_mw}$	$\sum \overline{CAR}_{m\_mw}$
Panel A: EU				
Actual Events				
Sum (all events)	−0.1442**	−0.1387**	−0.1982***	−0.1970***
p value (all events)	0.016	0.020	0.005	0.003
Sum (market-only events)	−0.0736	−0.0659	−0.0556	−0.0484
p value (market-only events)	0.124	0.146	0.313	0.330
Placebo Events				
Sum (all events)	−0.0298	−0.0296	0.0007	0.0102
p value (all events)	0.606	0.595	0.994	0.881
Sum (market-only events)	−0.0254	−0.0271	−0.0246	−0.0266
p value (market-only events)	0.586	0.551	0.665	0.590
Panel B: U.S.				
Actual Events				
Sum (all events)	0.0258	0.0473	−0.0770	−0.1169
p value (all events)	0.641	0.419	0.454	0.208
Sum (market-only events)	0.0237	0.0571	0.0452	0.0441
p value (market-only events)	0.587	0.192	0.461	0.436
Placebo Events				
Sum (all events)	−0.0294	0.0167	0.0002	0.0394
p value (all events)	0.593	0.750	0.998	0.658
Sum (market- only events)	−0.0186	0.0211	0.0574	0.0522
p value (market-only events)	0.666	0.608	0.342	0.343
		$\sum \overline{\Delta CAS}_{m\_ew}$		$\sum \overline{\Delta CAS}_{m\_mw}$
Panel A: EU				
Actual Events				
Sum (all events)		−0.0578		−0.0506
p value (all events)		0.712		0.776
Sum (market-only events)		−0.1923		−0.2303
p value (market-only events)		0.187		0.154
Placebo Events				
Sum (all events)		0.3487**		0.4805**
p value (all events)		0.046		0.015
Sum (market- only events)		0.2691*		0.3542**
p value (market-only events)		0.066		0.032

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Table D.14 (*continued*).

	$\sum \overline{CMAR}_{m\_ew}$	$\sum \overline{CAR}_{m\_ew}$	$\sum \overline{CMAR}_{m\_mw}$	$\sum \overline{CAR}_{m\_mw}$
Panel B: U.S.				
Actual Events				
Sum (all events)		−0.1896		−0.2043
p value (all events)		0.332		0.328
Sum (market-only events)		−0.1398		−0.1586
p value (market-only events)		0.353		0.326
Placebo Events				
Sum (all events)		0.1876		0.2291
p value (all events)		0.337		0.280
Sum (market-only events)		0.0348		0.0417
p value (market-only events)		0.817		0.780

This table is analogous to Table 3. The only difference is that the MSCI Europe and MSCI USA indices were used as proxies for the stock market portfolio, and the abnormal CDS spread changes were calculated using the single-index model.

Table D.15
Determinants of stock and CDS market reactions to market risk regulation.

	Stock Market				*CDS Market*	
	Market Events		*Market-Only*		*Market Events*	*Market-Only*
	CAR	CMAR	CAR	CMAR	ΔCAS	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: EU						
TIER1_RAT	−0.052	0.047	−0.213	0.046	−0.652**	−0.940***
	(0.125)	(0.121)	(0.148)	(0.124)	(0.257)	(0.321)
TIER1_RAT^2	0.089	−0.126	0.606	−0.046		
	(0.248)	(0.255)	(0.404)	(0.345)		
SEC_ASSET	−0.043***	−0.034**	−0.017	−0.007	0.017	0.089*
	(0.017)	(0.017)	(0.016)	(0.016)	(0.049)	(0.051)
G_SIB	0.003	0.003	0.003	0.005	−0.013	−0.019
	(0.012)	(0.010)	(0.006)	(0.006)	(0.020)	(0.025)
GIIPS	−0.015***	−0.015***	−0.026***	−0.021***	−0.005	−0.026
	(0.005)	(0.005)	(0.005)	(0.004)	(0.015)	(0.020)
SOV_DEBT	0.004	−0.005	0.003	−0.004	0.013	−0.001
	(0.005)	(0.005)	(0.004)	(0.005)	(0.010)	(0.013)
GIIPS∗SOV_DEBT	−0.009	−0.007	0.003	0.001	−0.015	−0.006
	(0.007)	(0.007)	(0.007)	(0.007)	(0.011)	(0.012)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	826	826	565	565	268	183
R^2	0.045	0.046	0.033	0.024	0.233	0.138
Panel B: US						
TIER1_RAT	−0.066	−0.055	0.002	0.003	−0.687***	−0.461
	(0.066)	(0.061)	(0.067)	(0.062)	(0.185)	(0.377)
TIER1_RAT^2	0.114	0.105	−0.021	−0.033		
	(0.162)	(0.153)	(0.161)	(0.145)		
DER_ASSET	0.0001	0.0001	−0.00002	−0.0001	0.001***	0.0002
	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0002)	(0.0004)
G_SIB	−0.011**	−0.011**	−0.004	−0.0005	0.091*	0.185***
	(0.006)	(0.005)	(0.006)	(0.005)	(0.053)	(0.050)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,919	2,919	1,985	1,985	116	77
R^2	0.071	0.051	0.037	0.034	0.583	0.448

This table is analogous to Table 4. The only difference is that the MSCI Europe and MSCI USA indices were used as proxies for the stock market portfolio, and the abnormal CDS spread changes were calculated using the single-index model.

Table D.16
Market reactions to announcements regarding credit risk regulation.

	$\sum \overline{CMAR}_{c\_ew}$	$\sum \overline{CAR}_{c\_ew}$	$\sum \overline{CMAR}_{c\_mw}$	$\sum \overline{CAR}_{c\_mw}$
Panel A: EU				
Actual Events				
Sum (all events)	−0.2465***	−0.2334***	−0.4221***	−0.3899***
p value (all events)	0.001	0.005	0.000	0.000
Sum (credit-only events)	−0.0926	−0.085	−0.1717**	−0.1449**
p value (credit-only events)	0.146	0.183	0.027	0.029
Placebo Events				
Sum (all events)	0.0127	0.0264	0.0139	−0.0054
p value (all events)	0.864	0.736	0.900	0.951
Sum (credit-only events)	0.0283	0.0324	−0.0081	−0.0401
p value (credit-only events)	0.645	0.592	0.919	0.546
Panel B: U.S.				
Actual Events				
Sum (all events)	−0.0519	−0.0757	−0.2726*	−0.2851**
p value (all events)	0.439	0.264	0.056	0.023
Sum (credit-only events)	−0.0249	−0.0488	−0.1246	−0.1094
p value (credit-only events)	0.633	0.352	0.163	0.180
Placebo Events				
Sum (all events)	0.0463	0.0748	−0.0094	0.0247
p value (all events)	0.475	0.268	0.937	0.842
Sum (credit-only events)	0.0121	0.0324	−0.0238	−0.0286
p value (credit-only events)	0.809	0.547	0.770	0.697
		$\sum \overline{\Delta CAS}_{c\_ew}$		$\sum \overline{\Delta CAS}_{c\_mw}$
Panel A: EU				
Actual Events				
Sum (all events)		0.3171**		0.3757**
p value (all events)		0.046		0.040
Sum (credit-only events)		0.0798		0.0882
p value (credit-only events)		0.548		0.535
Placebo Events				
Sum (all events)		0.1478		0.1204
p value (all events)		0.370		0.514
Sum (credit-only events)		0.0727		0.072
p value (credit-only events)		0.580		0.614
Panel B: U.S.				
Actual Events				
Sum (all events)		0.4071		0.4627
p value (all events)		0.130		0.100
Sum (credit-only events)		0.2569		0.2858
p value (credit-only events)		0.205		0.185
Placebo Events				
Sum (all events)		0.2942		0.3984
p value (all events)		0.247		0.158
Sum (credit-only events)		0.1999		0.2569
p value (credit-only events)		0.310		0.228

This table is analogous to Table 5. The only difference is that the MSCI Europe and MSCI USA indices were used as proxies for the stock market portfolio, and the abnormal CDS spread changes were calculated using the single-index model.

Table D.17
Determinant of stock and cds market reactions to credit risk regulation.

	Stock Market				*CDS Market*	
	Credit Events		*Credit-Only*		*Credit Events*	*Credit-Only*
	CAR	CMAR	CAR	CMAR	ΔCAS	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: EU						
TIER1_RAT	0.074	0.069	−0.024	−0.014	−0.143*	0.101
	(0.093)	(0.085)	(0.100)	(0.092)	(0.083)	(0.081)
TIER1_RAT^2	−0.249	−0.253	−0.037	−0.121		
	(0.264)	(0.235)	(0.274)	(0.289)		
LOAN_ASSET	−0.025	−0.017	−0.019	−0.032	0.037	0.002
	(0.018)	(0.014)	(0.016)	(0.022)	(0.023)	(0.027)
PROV_LOAN	0.085	0.054	0.045	0.010	−0.586*	−0.858**
	(0.152)	(0.153)	(0.154)	(0.206)	(0.335)	(0.359)

(*continued on next page*)

Table D.17 (*continued*).

	Stock Market				*CDS Market*	
	Credit Events		*Credit-Only*		*Credit Events*	*Credit-Only*
	CAR	CMAR	CAR	CMAR	ΔCAS	
	(1)	(2)	(3)	(4)	(5)	(6)
G_SIB	−0.010	−0.009	−0.008	−0.009	0.007	−0.0004
	(0.008)	(0.008)	(0.006)	(0.008)	(0.015)	(0.009)
GIIPS	−0.007	−0.011**	−0.008	−0.011*	0.016*	0.022***
	(0.005)	(0.004)	(0.006)	(0.006)	(0.008)	(0.008)
SOV_DEBT	−0.008***	−0.010***	−0.006**	−0.008***	0.018***	0.016***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.005)	(0.006)
GIIPS∗SOV_DEBT	0.014***	0.015***	0.019***	0.020***	−0.020**	−0.016**
	(0.005)	(0.005)	(0.007)	(0.007)	(0.008)	(0.008)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,510	1,510	1,067	1,067	632	444
R^2	0.027	0.020	0.029	0.017	0.055	0.031
Panel B: US						
TIER1_RAT	0.089*	0.089**	0.092*	0.106**	−0.018	−0.008
	(0.048)	(0.044)	(0.051)	(0.052)	(0.209)	(0.294)
TIER1_RAT^2	−0.220*	−0.216**	−0.219*	−0.267**		
	(0.121)	(0.107)	(0.132)	(0.131)		
LOAN_ASSET	−0.001	−0.001	−0.001	0.001	−0.029	0.013
	(0.006)	(0.004)	(0.007)	(0.008)	(0.051)	(0.024)
PROV_LOAN	−0.079	−0.085	−0.229**	−0.198*	0.357	0.420**
	(0.083)	(0.077)	(0.108)	(0.116)	(0.274)	(0.183)
G_SIB	−0.006*	−0.004	−0.0002	0.003	0.031	0.031
	(0.004)	(0.003)	(0.004)	(0.004)	(0.033)	(0.021)
AFF_BANK_c	−0.003	−0.007***	0.001	−0.005***		
	(0.002)	(0.002)	(0.002)	(0.002)		
Control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,388	5,388	3,732	3,732	207	143
R^2	0.023	0.017	0.052	0.025	0.103	0.129

This table is analogous to Table 6. The only difference is that the MSCI Europe and MSCI USA indices were used as proxies for the stock market portfolio, and the abnormal CDS spread changes were calculated using the single-index model.

Table D.18
Market reactions to announcements regarding liquidity risk regulation.

	$\sum \overline{CMAR}_{l\_ew}$	$\sum \overline{CAR}_{l\_ew}$	$\sum \overline{CMAR}_{l\_mw}$	$\sum \overline{CAR}_{l\_mw}$
Panel A: EU				
Actual Events				
Sum (all events)	−0.0761	−0.0483	−0.0961	−0.0683
p value (all events)	0.169	0.350	0.168	0.259
Sum (liquidity-only events)	−0.0152	0.0041	0.0086	0.0151
p value (liquidity-only events)	0.751	0.932	0.868	0.745
Placebo Events				
Sum (all events)	−0.0304	−0.0352	0.0047	−0.0203
p value (all events)	0.566	0.493	0.932	0.756
Sum (liquidity-only events)	−0.0140	−0.0162	0.0098	0.0022
p value (liquidity-only events)	0.772	0.733	0.852	0.961
Panel B: U.S.				
Actual Events				
Sum (all events)	−0.0075	0.0002	0.0490	0.0491
p value (all events)	0.880	0.997	0.617	0.592
Sum (liquidity-only events)	−0.0163	−0.0122	0.0626	0.0467
p value (liquidity-only events)	0.684	0.765	0.414	0.494
Placebo Events				
Sum (all events)	0.0282	0.0477	0.1310	0.1049
p value (all events)	0.603	0.377	0.223	0.265
Sum (liquidity-only events)	0.0188	0.0253	0.0546	0.0358
p value (liquidity-only events)	0.650	0.564	0.465	0.607

(*continued on next page*)

Table D.18 (*continued*).

	$\sum \overline{CMAR}_{l\_ew}$	$\sum \overline{CAR}_{l\_ew}$	$\sum \overline{CMAR}_{l\_mw}$	$\sum \overline{CAR}_{l\_mw}$
		$\sum \overline{\Delta CAS}_{l\_ew}$		$\sum \overline{\Delta CAS}_{l\_mw}$
Panel A: EU				
Actual Events				
Sum (all events)		0.1566		0.0865
p value (all events)		0.346		0.650
Sum (liquidity-only events)		−0.0002		−0.0500
p value (liquidity-only events)		0.999		0.737
Placebo Events				
Sum (all events)		0.0950		0.0466
p value (all events)		0.578		0.815
Sum (liquidity-only events)		0.0711		0.0251
p value (liquidity-only events)		0.602		0.863
Panel B: U.S.				
Actual Events				
Sum (all events)		0.4139*		0.1256***
p value (all events)		0.051		0.007
Sum (liquidity-only events)		0.1952		0.0745*
p value (liquidity-only events)		0.196		0.068
Placebo Events				
Sum (all events)		−0.0298		−0.0476
p value (all events)		0.833		0.217
Sum (liquidity-only events)		0.0638		−0.0226
p value (liquidity-only events)		0.609		0.425

This table is analogous to Table 7. The only difference is that the MSCI Europe and MSCI USA indices were used as proxies for the stock market portfolio, and the abnormal CDS spread changes were calculated using the single-index model.

Table D.19

Determinants of stock and CDS market reactions to liquidity risk regulation.

	Stock Market				*CDS Market*	
	Liquidity Events		*Liquidity-Only*		*Liquidity Events*	*Liquidity-Only*
	CAR	CMAR	CAR	CMAR	ΔCAS	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: EU						
LCR_PROXY	−0.0002	0.0001	−0.001	−0.001	−0.037***	−0.037***
	(0.001)	(0.001)	(0.004)	(0.003)	(0.010)	(0.011)
NSFR_PROXY	−0.012	−0.016	−0.032	−0.033*	0.040	0.006
	(0.012)	(0.013)	(0.021)	(0.017)	(0.047)	(0.035)
DEP_ASSET	−0.022	−0.024	−0.013	−0.004	−0.089**	0.040
	(0.015)	(0.017)	(0.022)	(0.019)	(0.041)	(0.049)
GIIPS	0.006	0.005	0.008	0.011**	−0.008	−0.023***
	(0.003)	(0.004)	(0.006)	(0.006)	(0.007)	(0.008)
SOV_DEBT	−0.025***	−0.023***	−0.024***	−0.021***	0.053***	0.030***
	(0.005)	(0.005)	(0.007)	(0.007)	(0.008)	(0.007)
GIIPS∗SOV_DEBT	−0.025***	−0.026***	−0.046***	−0.047***	−0.008	0.041***
	(0.008)	(0.008)	(0.012)	(0.012)	(0.012)	(0.010)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	702	702	480	480	177	118
R^2	0.107	0.095	0.124	0.115	0.326	0.379
Panel B: US						
MOD_AFF_l	−0.151	−0.147	−0.145	−0.173		
	(0.119)	(0.123)	(0.136)	(0.142)		
FULL_AFF_l	0.093**	0.126***	0.198***	0.228***		
	(0.041)	(0.041)	(0.065)	(0.072)		
LCR_PROXY	−0.00004	0.0004	0.001	0.002		
	(0.003)	(0.002)	(0.003)	(0.003)		
NSFR_PROXY	−0.014	−0.028	−0.021	−0.033		
	(0.022)	(0.021)	(0.026)	(0.025)		
DEP_ASSET	0.005	0.006	−0.014	−0.006		
	(0.017)	(0.017)	(0.020)	(0.019)		

(*continued on next page*)

Table D.19 (*continued*).

	Stock Market				*CDS Market*	
	Liquidity Events		*Liquidity-Only*		*Liquidity Events*	*Liquidity-Only*
	CAR	CMAR	CAR	CMAR	ΔCAS	
	(1)	(2)	(3)	(4)	(5)	(6)
MOD_AFF_l∗LCR_PROXY	−0.025	−0.040*	−0.023	−0.035		
	(0.022)	(0.024)	(0.028)	(0.032)		
FULL_AFF_l∗LCR_PROXY	−0.034***	−0.040***	−0.034***	−0.039***		
	(0.007)	(0.007)	(0.009)	(0.009)		
MOD_AFF_l∗NSFR_PROXY	0.165	0.165	0.164	0.195		
	(0.128)	(0.133)	(0.149)	(0.156)		
FULL_AFF_l∗NSFR_PROXY	−0.099**	−0.136***	−0.214***	−0.253***		
	(0.049)	(0.048)	(0.077)	(0.085)		
Control	Yes	Yes	Yes	Yes		
Observations	2,629	2,629	1,818	1,818		
R^2	0.028	0.032	0.085	0.067		

This table is analogous to Table 8. The only difference is that the MSCI Europe and MSCI USA indices were used as proxies for the stock market portfolio, and the abnormal CDS spread changes were calculated using the single-index model.

Appendix D. Market reactions using other supranational indices

See Tables D.14–D.19.

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