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"Three Essays on Political Risk in Financial Institutions"

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* Da completare solo nel caso di convenzione in essere

Declaration

I hereby declare that, the contents and organization of this dissertation constitute my own original work and does not compromise in any way the rights of third parties, including those relating to the security of personal data.

Mehdi Janbaz, October 2022

Abstract

Political risk in financial institutions received more and more relevance over the past two decades. Today, political risk is a growing concern for the banking system and is constantly identified as a significant and very likely risk that banks must monitor. Especially after the events of 2016, the contributions in this direction have grown increasingly. Partly due these facts, the drawback of political considerations in banks, the signs of an increase in political risk in politically developed countries, the inconsistencies in the field, and the need to fill some important gaps have led me to focus on political risk in financial institutions.

Although the concept of political risk manifested in finance and economics texts as early as the 1960s (see, e.g., Usher, 1965), the conceptualization of political risk was not introduced into the literature until 1970 (see, e.g., Nehrt, 1970; Robock, 1971; Root, 1972; Aliber, 1975; Kobrin 1979). They defined political risk in terms of its characteristics, primarily government interventions and action, political and institutional environment, and political instability. They also distinguished between political risk and political instability, explaining it as a broader concept than is commonly perceived. However, the perception of the nonstandard concept of political risk and its theoretical boundaries as drawn in the literature of the 1970s is still somewhat fuzzy and differs from one framework to another. The literature on the impact of various forms of political risk on financial institutions has mainly emerged after 1985. This dissertation will take a step toward understanding political risk as it is actually defined, measured, and evaluated in the context of the banking system and in the banking literature.

Political risk, considered mainly as a country-level risk affecting banks' operations and valuations, especially in emerging markets (see, e.g., Erb et al., 1996), is less postulated in the context of a developed market. Evidence on the impact of political risk on financial institutions

in economically and politically developed countries is more than sparse. This is mainly because political risk is imprecisely considered and measured as the quality of the political and regulatory environment, political uncertainty, expropriation risk, or even explicit political interference in some aspects, while government, policy, and regulatory interventions can also be considered as political risk. Under this definition, political risk is not necessarily lower in developed countries, especially in light of the various protracted crises and the increased need for policy decisions, policy interventions, bailouts, and explicit support. Moreover, recent political events such as the war in Ukraine and Brexit in the midst of a politically developed region have heightened concerns about political risk. However, the cyclical impact of systematic political events such as the U.S. primaries, particularly with respect to opportunistic behavior by politicians and political considerations related to banking and financial intermediation, is widely viewed and studied as an important facet of political risk that is not limited to emerging markets.

The goal of this dissertation is to theoretically and empirically explore the underdeveloped and, due to its interdisciplinary nature, neglected or insufficiently identified field of political risk in financial institutions. I begin this with a meta-synthesis review to integrate the current incoherent studies into a clear, detailed, and articulated framework. I then empirically address some novel questions about the impact of government and central bank intervention on bank stability and the sovereign-bank nexus, focusing on developed markets rather than emerging markets.

In the first chapter, I aim to synthesizes the disjointed literature on political risk in banks to paint a detailed picture of the field in the past and a way forward. I attempt to clarify the ambiguous and multidisciplinary notion of political risk as it is used in the banking literature,

but also provide an appraisal of political risk in banking and highlight the main research streams, the thematic background and building blocks, and some influential aspects of the field. Finally, we develop a conceptual framework and a future agenda that shed light on further developments in the field. In general, as a first review of political risk in banking, this study shows how financial institutions are affected by political risk in different forms and in terms of underlying theories.

Using a combination of qualitative and quantitative methods, including multilevel bibliometrics and content analysis, I conducted a meta-synthesis of all studies that have examined the impact of political risk on banks over a 35-year period. First, I identified the keywords covering different characteristics of political risk. Using sixty keywords on political risk in conjunction with general keywords on banking, I search for all relevant articles in the Web of Science Core Collection and then exclude the irrelevant articles after reading at least the abstracts twice. The final sample contains 303 English-language articles (300) and reviews (3) published in ISI WOK journals from 1985 to 2019.

I analyze the sample primarily using two complementary methods, co-citation mapping and historiography, to uncover the structure of this field and its trends over time. I also analyzed the field in terms of journals, authors, and keywords. The main contributions of this study are the identification and synthesis review of research streams, thematic structure, influential studies, and the development of an agenda for future studies. I also examined measures of political risk to determine how political risk is actually measured and to answer the question of why measuring political risk is challenging.

The results point to four important research directions in the literature, including political considerations in bank lending and their consequences, the impact of government and

regulatory interventions on bank risk-taking behavior, the impact of the political and institutional environment on bank development and performance, and economic models related to political risk in banking. Finally, this study drawn up the boundaries and frontiers of political risk in banks by developing a theoretical framework and proposing fourteen research questions for future studies.

The second chapter goes beyond the limits of political risk and addresses the unintended consequences of monetary policy interventions on the unravelling of sovereign-bank nexus. The main thrust of the literature on the interconnectedness of bank and sovereign risks, the so-called sovereign-bank nexus or diabolic loop, supports the phenomenon that risks flow in both directions, leading to a two-way feedback loop between bank and sovereign. The diabolic loop is directly related to banks' exposure to domestic sovereign bonds, and this excessive holding of domestic sovereign bonds can be explained by various overlapping motives, spanning from credit exposure and risk shifting to moral suasion, carry trade, and liquidity management. The sovereign-bank nexus through the liquidity management channel has not yet been explored.

The objective of this study is to provide empirical evidence on the sovereign-bank nexus through the liquidity management channel. I hypothesize that aggregate liquidity pressures in the banking sector increase funding liquidity risk and induce banks to buy and hold domestic sovereign bonds for liquidity management purposes because sovereign bonds are considered safe and liquid securities and are a common source of liquidity for banks.

I also postulate that ECB interventions in the form of non-standard policy measures and the asset purchase programme (APP) reinforce the mechanisms that lead to a diabolical loop by lowering the cost of funding and making government bonds a more attractive investment option for banks. In other words, these monetary policy interventions provide banks with an

indirect incentive to use their reserves for collateral trading and balance sheet management through government bonds.

Most of the existing literature focuses on the relationship between bank credit risk and sovereign credit risk, while this study focuses on the nexus between banking sector liquidity risk and sovereign credit default swap (CDS) spreads. This liquidity risk measure is a novel disentangled liquidity risk measure derived from the EURIBOR-OIS spread. The Euribor-OIS indicates both the liquidity and counterparty risk of the banking sector. During the period of study, the counterparty risk component is generally more volatile, with the exception of the Covid 19 breakout. To decompose the components, I construct a new measure of counterparty risk by using the first principal components of CDS spreads of seventeen banks that are dealers in the CDS market. Then, I simply remove the effects of the new counterparty risk measure from EURIBOR-OIS by orthogonalization (Gramme-Schmidt procedure).

The sample covers 22 European economies, including 13 euro area countries, for the period from July 2012 to January 2021. Using a dynamic panel data set with a two-step system GMM estimator robust to autocorrelation and heteroskedasticity (HAC), I find that an increase in liquidity risk in the banking sector leads to lower sovereign creditworthiness. Liquidity pressures in the banking sector motivate banks to buy domestic government bonds, consistent with the "flight to liquidity" phenomenon. In the long run, this over-exposure to sovereign bonds leads to a diabolical cycle and increases the probability of sovereign defaults. Moreover, I find evidence that ECB intervention through the announcement and implementation of APP reinforces the sovereign-bank nexus, consistent with the collateral trading channel and liquidity management. This results is robust as for the public sector purchase programme (PSPP).

The third chapter addresses the paradoxical effects of political institutions on banking stability when deposit insurance is in place. The presence and generosity of a deposit insurance system can create disincentives for bank risk-taking. The extent to which deposit insurance motivates banks to be more risk-taking depends on the quality of the institutional and political environment. I posit that a politically developed system with lower political risk is able to mitigate these negative incentives, while political development itself creates incentives for higher risk-taking by increasing the expectation of government support and exacerbating the moral hazard problem.

The sample includes 705 listed banks from 70 countries with different income levels over a period from January 2007 to December 2021. Using a robust instrumental variable estimator, I examine how the policy environment and banks' business model affect the relationship between the deposit insurance system and banks' risk-taking. Using a range of accounting-based and systemic risk measures, I find that the presence of a deposit insurance system is associated with higher bank risk. Although deposit insurance provides incentives for excessive risk-taking, the presence and generosity of the deposit insurance system overall help reduce the probability of a banking crisis.

The results also suggest that banks with a more sustainable business model that benefits from higher equity relative to debt, higher deposits relative to liabilities, more loan loss provisions relative to total loans, and better income diversification are more likely to be stable. However, such a business model may amplify the negative effects of explicit support on bank stability by reducing market discipline through increased complexity. This result is robust to both the presence and generosity of the deposit insurance system.

Finally, I find evidence of the negative impact of policy developments on bank stability. The results show that banks in a more politically developed system, identified with lower political risk, are more prone to excessive risk-taking, consistent with the phenomenon that such a political environment raises banks' expectations of government support and triggers the moral hazard problem. This positive relationship between political developments and bank risk could be due to the increase in competition in the credit market. Using the political risk characteristics instead of the composite index, the results are constant for the majority of the components. Interestingly, I also find that political developments significantly mitigate the negative incentives induced by deposit insurance. The results are robust after a battery of robustness tests.

Contents

Chapter 1

Political Risk in Banks: A Review and Agenda

Political Risk in Banks: A Review and Agenda

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Abstract

Although political risk in banking has received much more attention in recent years, there is no review that synthesizes these incoherent studies and provides a comprehensive image of the field in the past, present, and future. This paper is a meta-synthesis literature review on political risk in banks over a 35-year period from 1985 to 2019. We summarize the studies on political risk in banks in terms of the underlying theories to highlight the research streams, trends, and thematic structure of the field. By applying bibliometric and content analyses, we identified four main clusters in the literature: (1) political interference in bank lending and its consequences, (2) effects of government and regulatory interventions on bank risk-taking, (3) effects of the institutional and political environment on banking development and performance, and (4) economic models related to political risk in banks. Finally, this study poses 14 questions for future research.

Keywords: Political Risk, Banking, Government Intervention, Political Instability, Political Environment.

JEL Codes: G15, G21, G28, G32

1. Introduction

Before the presence of Covid-19 pandemic especially during 2016 and 2020, political risk was one of the main sources of uncertainty and a growing concern of banks. Major central banks (US and EU) have explicitly expressed concerns about the critical influence of political and geopolitical instability on financial institutions[1]. At ECB, political risk factors were identified in terms of probability and impact on banks, with geopolitical uncertainties representing one of the most likely risks in 2017-2019 and becoming the most prominent banking risk driver for banks in Europe in 2020, ahead of the Covid 19 pandemic. Similarly, the FED considers geopolitical risks and major US political events as the most probable source of shocks on banks.

According to the World Bank's definition, political risk is considered the prospect of disruption and impairment in an organization caused by uncertainties emanating not only from politicians, institutions, governments, and events, but also from internal groups and radical activities (World Investment and Political Risk 2011, World Bank). In general, "political risk is defined as the risk that government activities, faulty governors, and a poor legal and institutional environment will negatively affect investment value" (Bekaert et al., 2014, p.3).

In spite of political risk being considered a critical factor in the corporate sector (e.g., Faccio, 2006; Khwaja and Mian, 2005; Shleifer and Vishny, 1994), the sovereign sector (e.g., Bekaert et al., 2016; Henisz, 2000), and in financial markets (e.g., Stiglitz, 1993), the impact on banks has received less attention both theoretically and empirically. However, contributions in this direction have accumulated in recent years, with a remarkable growth in both breadth and depth (e.g., Bitar et al., 2017; Koetter and Popov, 2021).

[1] See for instance annual reports on supervision and financial stability reports published by both the ECB and the FED from 2017 to 2020.

This study is motivated by the need for a comprehensive systematic review to synthesize all of the incoherent literature on political risk in banking in terms of underlying theories and concepts in order to contribute with research directions for future studies that fill both the empirical and theoretical gaps and define and measure the forms of political risk that affect banking systems. As far as we know, therefore, we propose the first meta-synthesis literature review of political risk in banking.

Our contribution to the literature is primarily to highlight the leading research streams and provide a synthesis review of the field in terms of the identified clusters, as well as to identify the most influential studies, trends, constructs, and thematic structure of political risk in banking. We also review the main measurement methods and key indicators adopted so far to investigate political risk in the banking sector. Finally, we provide an agenda for future studies by providing a theoretical framework and identifying leading research questions on political risk in banks.

We also contribute to Jiménez and Bjorvatn (2018), which provides a bibliometric review of political risk in general. The impact of political risk on the banking sector is not addressed in this review, while our study focuses on political risk in the banking sector to adequately fill this gap. Using a only one keyword for systematic sample collection compared to 60 in this study, Jiménez and Bjorvatn (2018) analyzed the literature on political risk using historiography or citation mapping, which examines only the links between articles in the primary collection, while we focused on co-citation mapping to identify research streams that allow for a more in-depth analysis of the field by considering the link between primary collection and secondary collection. However, we also use historiography to identify and track research themes and trends over time.

We review 303 articles published in ISI WOK journals during 1985- 2019 as the primary or local collection and 9,334 cited references as the secondary or global collection. We apply multilevel bibliometric analysis based on the document, author, journal, and keywords, in addition to content analysis. Overall, this study provides a broad and detailed picture of political risk in banking, its past and suggestions for its future growth.

To synthesis the literature on political risk in banking, we need to create a taxonomy of political risk by reviewing the classic and influential studies on political risk. We are then in a position to conduct this research and develop a theoretical framework in terms of a generally accepted conceptualization and classification. Political risk can be classified differently contingent on the adopted definition (Fitzpatrick, 1983). Political risk is primarily characterized by government intervention (Aliber, 1975; Kobrin, 1979), political instability related to political events (Root, 1972), and the political and institutional environment (Nehrt, 1970; Robock, 1971). Bekaert et al. (2014) also refer to government actions, government policy instability, and the soundness of the legal environment as three different forms of political risk.

The remainder of our review study is organized as follows. In Section 2, we present our sample and methodology. In Section 3, we explain our results and address them separately. Section 4 contains a brief discussion of our main findings. Finally, Section 5 provides our concluding remarks.

2. Method

2.1. Sample selection process

Consistently with the aims of this paper, we follow a meta-synthesis literature review using a multilevel bibliometric analysis and a qualitative content analysis (Figure 1).

Insert Figure 1 about here

First, we identify the influential and classic studies of political risk using *HistCite* software or by reviewing the reference lists of other leading works. After carefully reviewing these prominent reviews and articles on political risk, we extract the conceptual terms from the texts. We used a broader range of keywords to cover all aspects of political risk. In Table 1, we list 60 keywords assigned to the three categories of political risk or general concepts. Using general terms reduces the likelihood of overlooking an influential study.

Insert Table 1 about here

Second, we search these keywords in combination with "banking", "banks" and "financial institutions" in the ISI Web of Sciences database, resulting in a raw sample of articles. Third, we rely only on articles and reviews published in ISI-WOK journals from 1985 to 2019. We set 1985 as starting point because of absence of any relevant article published before 1985. We also decided to exclude the most recent relevant publications (2020 and 2021) due to lack of enough time to be cited by subsequent papers and therefore this could underscore the results or lead to a bias in bibliometrics analysis. We also excluded contributions that are not written in English.

Finally, we refine the sample by excluding articles whose content did not fit the aims of this paper. This required us to have each article carefully reviewed twice by two people: In most cases, the abstract was sufficient for exclusion, but in some cases it was necessary to review the entire article. Following the exclusion and inclusion procedure, we obtained a primary sample of 303 articles[2]. The cited references of the 303 studies in our primary collection are 9,334 studies that are considered our secondary collection.

[2] Due to the extensive number of references, the full list of analyzed papers is not included but remains available upon request.

To furtherly ensure that our process does not exclude influential studies, we also search within citations of influential articles. We do not find any new dominant articles outside our sample: our extended set of keywords proves sufficient to ensure comprehensive coverage of the field.

By recording the number of unique outcomes for each keyword, we find that only 33 of them are meaningful in the context of financial institutions. By comparing results for each keyword, Institutional Quality, Government Interventions, Election, Political Risk, Political Stability, and Regulatory Quality are respectively the most fitting keywords of political risk with respect to the banking sector. Referring to the macropolitical risk framework of Alon and Martin (1998), we can say that studies on political risk in banks focus mainly on the governmental aspect, compared to the economic and social dimensions.

2.2. Research design

Using a combination of qualitative and quantitative methods, we have constructed a meta-synthesis literature review of political risk in banks. We combine bibliometric methods such as co-citation analysis (Hassan et al., 2020; Zupic and Čater, 2015), historiography (Garfield, 2009), citation analysis (De Bellis, 2009), and co-occurrence (Leung et al., 2017). We also use qualitative content analysis (Bahoo et al., 2021; Hassan et al., 2020) to integrate quantitative findings.

First, we use the *Bibliometrix R* package (Aria and Cuccurullo, 2017) for descriptive analysis, keywords evolution, and illustrations. We conduct the citation and co-citation analyses of documents, authors, and journals, as well as the co-occurrence of author keywords using *VOSviewer,* and perform the historiography using *Clarivate Analytics' HistCite.*

Second, we review the literature in our primary collection using a content analysis to identify key gaps and set an agenda for future research. We focus primarily on the future direction of influential studies and track their citations to see if there is a proposed direction that has not yet been addressed. Then we try to develop those research questions in addition to our own findings and suggestions. We also reviewed several recent publications (2020-2021) on the identified gaps to provide an indication of timeliness and update the latest contribution to the research direction.

The focus of this study is on document analysis through co-citation analysis of documents and historiography based on local citation score. These two approaches complement each other perfectly (Vogel et al., 2020). The focal point of document co-citation is co-cited references or articles in the secondary collection that are co-cited in articles in the primary collection, while historiography looks at the association between only articles in the primary collection. Historiography indicates the way documents in the primary collection cite other documents in the primary collection.

Document co-citation indicates the proximity and interconnection of different subfields and is therefore often used to identify the major clusters and building blocks of a field. In contrast, the historiography approach illustrates the trend and progress of key research topics over time. Consistent with this statement, we use document co-citation to identify the leading streams and subfields of political risk in banks, and use historiography to detect the major research topics of the field and to illuminate the progress of research themes over time.

Interpreting the results of these two bibliometric analyses using content analysis helps us to extract all the necessary information to achieve the research objectives. We also use content

analysis to track the growth of articles and keywords in respect to clusters or thematic categories.

Accordingly to Garfield et al. (2009) and Van Eck and Waltman (2013), we use the following bibliometrics in the remainder of our paper. Total Global Citation (TGC) or Global Citation Score (GCS) symbolizes the overall amount of citations of an article by other documents present in the Core Collection of WOS. Total Local Citation (TLC) or Local Citation Score (LCS) signifies the amount of citations of cited documents within the collection. Total Link Strength (TLS) indicates the overall strength of a co-citation link. Finally, Links is the total number of links an article has with other articles.

3. Results

3.1 Summary statistics

The 303 papers included in our sample show a total quantity of cited references of 9,334. Only 3 contributions are literature reviews, supporting our motivation for a comprehensive bibliometric assessment of this research field. Figure 2 illustrates the evolution of annual publications and citations. We find that papers grew significantly in the last decade, with three major upward breaks (in 2009, in 2013 and in 2016).

Insert Figure 2 about here

3.2 Source analysis

Our sample is composed of contributions appearing in 140 different journals. Co-citation networks allow the mapping of 50 major journals across four different research clusters. Figure 3 depicts the co-citation network of sources between these leading journals where the size of circles represents the weight of each source, and the lines mark the strongest co-citation links

between journals. A closer proximity between two journals is associated to a higher relatedness in terms of co-citation links.

Insert Figure 3 about here

Table 2 reports the main sources ranked by citations and the Total Link Strength with the latter being a standard weight attributes which captures the total strength of the links of a source with other sources. To discover the conceptual structure tied to each cluster of journals, our content analysis on all relevant articles published in the key journals within each cluster reveals how each cluster describes a research area that could be identified by key terms or concepts (Table 2).

Insert Table 2 about here

3.3 Author analysis

3.3.1 Most cited authors

Our sample of research papers lists 605 different authors, of which 58 authored single-name contributions, with the average number of authors per document being 2.26. Figure 6 illustrates the most local cited authors.

Insert Figure 4 about here

3.3.2 Co-citation of authors

The co-citation of authors illustrates the mapping of 40 leading authors. This analysis reveals how research fields lead to groups of different authors, as well as the connection strength of citations. Figure 5 depicts the co-citation network of top co-cited authors.

Rafael La Porta, Thorsten Beck, and Ross Levine emerge as the main authors of the blue cluster, which focused on the impact of the legal environment, regulatory restrictions, and government intervention on bank lending and banking sector development.

In the red cluster, Asli Demirguc-Kunt, Allen N. Berger, Luc Laeven, and James R. Barth focused on the impact of banking regulation, governance, institutional environment, and regulatory intervention on bank performance and stability.

The green cluster, which includes Serdar Dinç, Andrei Shleifer, Paola Sapienza, Stijn Claessens, and Mara Faccio, focuses mainly on government interference, political connection, and bank lending.

Manuel Arellano, Richard Blundell, Alex Cukierman, and Daniel Kaufmann in the yellow cluster worked on prominent political risk measurement methods and frameworks, political risk indicators, and advanced econometrics and modeling approaches.

Insert Figure 5 about here

3.4 Article analysis

3.4.1 Most cited articles

The total citations of a research is considered a measure of the research's influence. Figure 6 shows the most influential articles in terms of total citations of a study by subsequent studies in our sample (local citations) and by all subsequent studies in the WoS Core Collection (global citations). Based on the both citation scores, prominent studies of La Porta et al. (2002), Demirguc-Kunt and Detragiache (2002), Sapienza (2004), and Dinç (2005) are the most influential studies on political risk in banks.

Insert Figure 6 about here

3.4.2 Co-citation of articles

As defined by Small (1973), co-citation analysis explores the link between articles in secondary collection and primary collection, co-cited references or articles in the secondary collection that are co-cited in articles in the primary collection. Document co-citation analysis reveals the proximity and interconnection of distinct subfields. Thus, it applied to identify the leading research streams or major clusters of the field.

We applied this perspective on the top 49 references (out of 9,334 total citations) after excluding those with less than 14 citations. We have reached the best setting for co-citation analysis by trial and error. Based on the co-citation mapping (Figure 7), all the most co-cited references are dispersed within four clusters.

Insert Figure 7 about here

Following a precise review of the dominant references and the connections within each cluster, we find a way to describe each of them and the key streams of research. Table 3 reports the most co-cited references within each cluster together with the TLCs, TLSs, and links. In particular content analysis on the topics, links, and link strength of articles in each cluster disclose the common characteristics of that cluster (Table 3).

Insert Table 3 about here

3.4.2.1 Synthesis review of clusters

Cluster 1 (red): Government interventions in banks regarding the political theory of state ownership

Government interventions in banks are mainly discussed in the subject of government ownership. This part of literature illustrates the adverse consequences of state ownership on

productivity and development (La Porta et al., 2002), bank performance (Micco et al., 2007), and lending (Dinc, 2005; Sapienza, 2004) through the political view of state ownership. According to this viewpoint, the control of government or politicians over banks has the aim of delivering financial support and other benefits to allies, who support them in political events or in other ways depending on the target of politicians (Shleifer and Vishny, 1994). La Porta (2002) shows the prevalence of government ownership mostly in the less developed countries and those with lower government effectiveness and higher political interference.

Following La Porta (2002), the adverse consequences of state ownership on banks supported by the political theory of state ownership are shown for bank lending in Sapienza (2004) and Dinc (2005). The negative consequences of government ownership and interventionism behavior intensified in election years (Dinc, 2005), also due to the political ties of bank directors at the time of election (Sapienza, 2004). In addition, SOBs ask for a lower interest rate than private banks. This rate dropped even further due to political connections that show government ownership of banks is politically driven (Sapienza, 2004). Political connection and elections are two reasons that explain the higher probability of political interference by providing incentives for politicians and governors (Faccio et al., 2006). The political connection is predominantly noticeable in the context of bank lending. Although political connection facilitates access to credit, it also increases the level of default (Khwaja and Mian, 2005). The political connection also increases exposure to political corruption (Faccio, 2006).

Ownership is a key driver of bank productivity (Demirguc-kunt and Huizinga, 1999). The underperformance of government banks compared to private banks is pronounced in election years (Micco et al., 2007), which is consistent with the political view of government ownership. Micco et al. (2007) complement the findings of Dinc (2005) about the importance of political

events in increasing the unfavorable effects of state ownership and political interference in banks.

Cluster 2 (green): How do the legal and institutional environment affect the development of banking and financial intermediation, taking into account institutional theory and the theory of law and finance?

The underlying theories of cross-country differences in financial and banking development explain the way that legal and institutional environment hinder or facilitate the operations. This cluster contains two subsets, a part of the literature that explains the impact of the legal environment on the nexus between banking development and economic development using the theory of law and finance (Beck et al., 2003; La Porta et al., 1998, La Porta et al., 1997) and part of the literature that discusses the nexus between banking development and economic development using differences in institutional environment and institutional theories (Acemoglu et al., 2001; La porta et al., 1999; Mauro, 1995; Qian and Strahan, 2007).

The development of financial intermediaries as a crucial determining factor of long-term economic growth (King and Levine, 1993; Rajan and Zingales, 1998) has been frequently employed in empirical studies to predict the subsequent economic growth mainly proxied by GDP growth (Beck et al., 2000; Levine et al., 2000). The development of financial intermediaries decreases the cost of capital and credit constraints that accelerate growth (Rajan and Zingales, 1998). The positive linkage between banking development and economic development (Levine et al., 2000; Levine and Zervos, 1998) vary in different countries in terms of the legal origin (Beck et al., 2003; La Porta et al., 1998, La Porta et al., 1997) and institutional characteristics or government qualities (Acemoglu et al., 2001; La porta et al., 1999).

Regulatory restrictions on banks' operations increase the cost of financial intermediation (Demirguc-kunt et al., 2004). Legal origin determines creditor rights (Djankov et al., 2007), and strengthened creditor rights speed up the growth (Levine et al., 2000). As noted in the influential work of La Porta et al. (1997), the country-specific level of investor protection is positively related to the volume of the capital market, which is a driver of economic performance (Levine and Zervos, 1998). Furthermore, economic performance is affected by the institutional environment (Acemoglu et al., 2001). Corruption is a consequence of a poor institutional environment that hampers development by limiting investment (Mauro, 1995). Generally, a sound country's governance limits interventionism behavior (La porta et al., 1999). This is a key point that links this cluster to the others related to government interventions.

Cluster 3 (blue): The influence of government and regulatory interventions on bank stability with respect to the moral hazard problem and competition-stability trade-off

The way in which banking stability is affected by regulation is described by different perspectives regarding the stability-competition trade-off. Although some refer to the impact of bank supervision and regulation, the focus of this cluster is on excessive risk taking due to regulatory and government intervention (Dam and Koetter, 2012; Duchin and Sosyura, 2014).

Keeley (1990) emphasizes that deposit insurance reduces the dominant force of regulation in alleviating the competition-stability trade-off, and that increased competition due to the lack of monopolistic control lowers the bank's charter value, which induces banks to hold less capital relative to assets and take further risks. Despite the impact of regulation on risk-taking, bank stability is also affected by bank supervision. Banks that are more heavily supervised are more likely to take more risks (Laeven and Levine, 2009). When there is a deposit insurance system, bank owners are more likely to switch to riskier securities (Keeley, 1990). Along the

same lines, Barth et al. (2004) examined the effects of a broad set of governance and regulatory factors. Using the deposit insurance measure of Demirgueç-Kunt and Detragiache (2002), Barth et al. (2004) reported that the probability of a banking crisis is positively associated with both moral hazard and state ownership. Large government banks are less probable to experience the moral hazard problem (Dam and Koetter, 2012). The positive association between deposit insurance and crisis is strengthened when guarantees are provided by the government and in countries with inferior regulatory and institutional environments (Demirgueç-Kunt and Detragiache, 2002).

In contrast, some studies point to the competition-fragility trade-off. They argue that higher competition leads to higher creditworthiness by lowering lending rates and consequently promoting stability (Boyd and De Nicolò, 2005). Moreover, banks in countries with sounder regulatory environments that promote competition are expected to be more stable (Beck et al., 2006), which is inconsistent with the negative effects of competition on a bank's vulnerability (Keeley, 1990). Capital injections into banks based on TARP and CPP may not lead to higher risk-taking. For example, interventions in CEO compensation provide a disincentive to accept government guarantees for quite a number of banks (Bayazitova and Shivdasani, 2012). Moreover, the accessibility of bailouts increases with political connectivity (Duchin and Sosyura, 2014; Duchin and Sosyura, 2012).

The influential study by Barth et al. (2004) linked this cluster to the previous clusters by expanding the scope of the study to include state ownership, ensuing La Porta et al. (2002), and by including the role of the legal environment in banking development, following La Porta et al. (1998).

Cluster 4 (yellow): Measurement methods and econometric approaches

The last cluster is concentrated on measurement methods. Arellano and Bond (1991) proposed a dynamic difference panel estimator that has been used in a variety of studies within the collection such as Levine et al. (2000). Subsequently, Arellano and Bond (1991) formed a system GMM panel estimator that was further expanded by Blundell and Bond (1997) through Monte Carlo simulations.

A subordinate part of the cluster relates to measurement methods and indicators of political risk. In order not to overlook this important part of the literature and to overcome its limitations, we broaden our stance by providing an overview of political risk management in the banking literature.

Political risk has been measured through different approaches: macroeconomic measures (Baker et al., 2016; Hassan et al., 2019), perceptual measures (Kaufmann et al., 2003), their combination (Henisz and Zelner, 1999), and conventional measures (Rodrik, 1999).

Conventional measures are problematic since they do not cover economic implications; nonetheless they are the main reference for measuring political instability (Baker et al., 2016; Hassan et al., 2019; Pastor and Veronesi, 2012, 2013).

According to Brunetti and Weder (1998), policy uncertainty refers to unpredictability and inconsistency caused by changes in government policy and institutional structure. Although aggregate government economic policy uncertainty (EPU) indicates both economic and policy uncertainty, this indicator is often used in banking studies as a leading indicator of political uncertainty. EPU is a macroeconomic news-based index based on newspapers, expiring tax bills, and analyst conflicts (see, e.g., Baker et al., 2016). According to Baker et al. (2016), EPU

increases during election periods. Elections have also been considered as an alternative proxy for the EPU (Ashraf and Shen, 2019).

The institutional quality index (Kaufmann et al., 2003; Kraay et al., 2010) is based on a large set of factors quantifying perceptions on the quality of governance from different organizational sources and surveys, aggregated in six components. The repetitive nature of perceptual measures represents its main limitation.

Henisz and Zelner (1999) propose that a combination of macroeconomic and perceptual measures is the appropriate method of measurement if the country-specific political system has been considered as a control.

Bekaert et al. (2014) proposed political risk spreads, a new market-based measure extracted from sovereign yield spreads. Using the political risk rating (ICRG), they extract the fraction of sovereign spreads attributable to political risk. The spreads indicate the country-specific probability of an adverse political event. A key advantage of this method is that it solves the problem of double counting systematic risk.

Recently, Hassan et al. (2019) constructed an index of firm-level political risk using the percentage of quarterly earnings conference calls in which political risk was addressed. They showed that political risk is less predictable at the firm level than in the sovereign sector.

We summarize the leading measurement methods in Table 1.

Insert Table 4 about here

3.4.2.2 Influential studies of clusters

According to the co-citation analysis, La Porta et al. (1998), La Porta et al. (2002), Barth et al. (2004), Sapienza (2004) and Dinc (2005) are the top five references in terms of total link

strength (TLS) and total local citations (TLC). Below, we briefly review the most influential studies in each cluster.

In the first cluster, the articles developed the impact of government interventions and actions as the first category of political risk on the banking system by focusing on state ownership.

La Porta et al. (2002) is the most influential study that makes government ownership a trend in the banking literature. Using an extensive cross-country dataset of large banks from ninety-two countries, La Porta et al. (2002) show that state ownership of banks is widespread in the 1990s and is more common in countries with lower income and financial development, lower property rights protection, less effective governance, and higher interventionism. Moreover, they show that government control of banks in 1970 slowed financial and economic development, consistent with the political view of government ownership. Bank overhead relative to total assets, commercial bank assets relative to total bank assets, bank soundness, net interest spread, credit accessibility, and the value of banks' private loans relative to GDP are key indicators of financial development in this study.

To measure the impact of government intervention on banks, they used a number of indicators, including the bank openness index, the democracy index, the political rights index, the likelihood of government price control, the extent of business regulation, the black market premium, government consumption expenditure as a share of GDP, government subsidies, the marginal government tax rate, and economic freedom.

Although this article has focused primarily on government intervention and the political theory of state ownership, the effects of the legal and institutional environment and political instability have also been considered. This holistic approach highlights the phenomenon that the various forms of political risk in banks are interrelated and mutually reinforcing.

Sapienza (2004) is another notable study that concentrates on the impact of state ownership on bank lending of 85 Italian banks between 1991 and 1995. The results show that SOBs set a lower interest rate than private banks. SOBs are also more likely to lend to larger firms and to those located in the south of Italy. The study also examines how the political connections of directors and top managers of SOBs affect their lending behavior in times of elections. Sapienza (2004) indicates that the political influence of the party associated with the bank has a negative impact on the interest rate charged, which is consistent with the political theory of state ownership. The study mainly emphasizes the perspective that the government's control over the bank has the objective of providing political patronage.

Similarly, Dinç (2005) examines how banks' lending behavior is affected by political influences on SOBs, especially in emerging markets. To do so, he uses data from 462 banks, including 163 SOBs, in 43 countries from 1994 to 2000. The sample shows that state ownership is more prevalent in emerging markets. The study examines the impact of politically motivated actions by SOBs on lending in the context of political events, as elections trigger opportunistic behavior by politicians to use state-owned banks for political patronage. To achieve a higher degree of precision, we also account for cross-country institutional differences and the previously identified gap between private and state bank productivity. The results show that SOBs are more prone to lend in election years than private banks.

Khwaja and Mian (2005) is another influential study that looks at the fact that state-owned banks grant political favors in lending. They test this hypothesis in a different way using loan-level data from 1996 to 2002. They highlight that banks lend 45% more to politically connected firms and that such behavior occurs only among SOBs. In other words, political lending increases when the party associated with the firms is in power. The study provides empirical

evidence for the political view of state ownership. It also argues that the presence of a political preference in lending leads to political corruption.

In the second cluster, we identified several influential articles on the impact of the political, institutional, and legal environment as the third classical category of political risk on the banking and financial development, and some of these papers are noteworthy.

La Porta et al. (1998) is a key seminal work in this area, proposing a theory of law and finance and constructing a composite index of creditor rights. It examines the origins and qualities of legal systems protecting creditors and investors in 49 countries. When legal systems originate in common law rather than civil law, the country is more responsible for protecting creditors' rights. This study also assesses the legal enforcement quality based on five components, including corruption, rule of law, effectiveness of the legal system, risk of contract rejection by the government, and expropriation risk. They point out that the level of law enforcement varies from country to country, depending on the origin of the legal system. Finally, they confirm previous evidence from the literature documenting the negative impact of a poor legal environment and weak protection of investor and creditors' rights on financial development, but note that this is not an insurmountable obstacle and that there are exceptions such as France, which is one of the high-income countries.

In the same vein, La Porta et al. (1997) examine the inconsistancy in the quality of the legal environment across countries and their impact on capital markets. They explore the effects of the legal environment on specific forms of external finance such as stock market capitalization and total bank credit to the private sector (both as a percentage of GNP) for 49 countries in 1994. The results suggest that countries with a sounder legal environment or better protection of investors' rights, characterized in particular by a higher degree of rule of law and better law

enforcement, have larger stock and debt markets. In contrast, countries with French civil law, which provide inadequate protection of investor and creditor rights, tend to have smaller debt and equity markets than common law countries.

Qian and Strahan (2007) argue in an extensive study that the institutional and legal environment differs across countries and how it affects bank credit. They examine how creditor rights protection affects ownership and loan terms. They focused on loans made during 1994-2003 in 43 countries. The results show that greater protection of creditor rights leads to greater concentration of ownership of bank loans, lower interest rates, longer loan maturities, and greater participation of foreign banks. Moreover, greater protection of creditor rights in developed countries (with the exception of the U.S.) is associated with higher government ownership and lower government ownership in emerging markets.

The third cluster discusses banks' risk-taking behavior and the theories that explain this behavior in response to government intervention, expected government support, deposit insurance, bank regulation, and government ownership.

Demirgueç-Kunt and Detragiache (2002) is the leading article examining the impact of deposit insurance on bank stability using data from 61 economies from 1980 to 1997. Using a logit probability model to measure banking crises, they found that banking crises are more likely in countries with a deposit insurance system and that this positive relationship is strengthened in a weak institutional environment or in the presence of interest rate deregulation. They examined deposit insurance by its design features, including the presence of unlimited explicit coverage, foreign currency deposit coverage, interbank deposit coverage, and no coinsurance in addition to the explicit coverage limit. All of these features significantly increase the probability of a crisis. They also developed a composite index of moral hazard

through principal component analysis based on deposit insurance characteristics and found that moral hazard is less probable in a sound institutional environment. They also argue that the negative consequences of deposit protection are likely to be amplified when the system is operated by the government, when it is funded, and when it is open to depositors.

An influential and multidimensional study in this area, Barth et al. (2004) document the influence of banking regulation and supervision on risk-taking, crises, development, and performance indicators of banks in 107 countries. The data are mainly from 1999 and were obtained through a survey they conducted and funded by the World Bank. Interestingly, they use a wide range of regulatory and supervisory factors, such as regulatory restrictions on banking activities, severity of capital constraints, banking system openness and barriers to entry, political and legal independence of supervision, supervisory intervention, regulatory intervention, explicit deposit insurance schemes, moral hazard, and state ownership.

They discuss the impact of regulatory constraints on banking activities using several theoretical explanations, including openness to a wider range of activities due to higher risk-taking as a result of moral hazard, the agency problem, higher supervisory costs due to increased bank complexity, deteriorating competition from large financial conglomerates, and "too big to discipline." Although the results show that non-performing loans (NPL) are positively affected by government ownership and adversely affected by the severity of capital constraints, NPL is not affected by regulatory constraints. The results also show that higher regulatory constraints and interventions in bank operations increase the likelihood of a banking crisis. Moreover, crises occur more often in banks with less stringent capital constraints.

Barth et al. (2004) observed that moral hazard increases the probability of a banking crisis occurring, which attenuated with higher political openness and rule of law. The study finds no

evidence that government ownership significantly affects bank stability, performance, or development, especially after controlling for other regulatory factors, while government banks are more corrupt. Moreover, they provide evidence of a negative link between bank stability and deposit coverage excellence, which is consistent with the findings of Demirgueç-Kunt and Detragiache (2002). They emphasized that deposit coverage intensifies the moral hazard problem and the lottery behavior of banks.

Finally, Laeven and Levine (2009) is an important research that focuses on the underlying principles that explain risk-taking behavior regarding country-specific bank regulation and ownership structure. Using a sample of 251 private listed banks with large assets in 46 countries over the period 1996-2001, they found that bank risk-taking increases with increasing shareholder control in bank governance. This is consistent with the theoretical explanation that managers who hold equity tend to take more risk than those who do not. In addition, they argue that dominant bank owners with better cash flow rights are more prone to be engaged in excessive risks.

They also point out that banks with minimum capital requirements, higher regulatory restrictions, and deposit coverage are more likely to take risks. Their results suggest that bank regulation moderates the impact of bank ownership on risk taking and that ignoring ownership structure in the link between bank regulation and stability may lead to inaccurate results. Moreover, they reveal that deposit insurance, regulatory restrictions on banking activities, and stringent capital regulation mitigate the tendency of larger owners to be more risk-taking.

The fourth cluster refers to seminal methodological and econometric studies, as well as those related to political risk measures, whose mainly described in section 2 and table 1.

The JF and JFE each have 3 influential studies in the top 10 articles. Overall, JFE, JF, AER, QJE, JBF, and RFS are the leading journals in this field with 12, 6, 6, 5, 4, and 4 influential articles, respectively, among the top 49 most cited references.

3.5 Historiography and research themes

The method of historiography allows us to make a complementary analysis of the field in terms of thematic structure and trends by focusing on the primary collection. This method is based on the way documents in the primary collection cite other documents in the primary collection.

For this purpose, we perform historiography in the form of Local Citation Scores (LCS) using HistCite software. The historiography shows the most influential studies in our sample with a Local Citation Score greater than 40 (Figure 8). To detect research themes, we examined the topics of all nodes and their interrelationships.

Insert Figure 8 about here

According to the historiography, we identified eight major research themes on political risk in the banking sector (Figure 8).

La Porta et al. (2012) show that more government ownership in the banking sector leads to a slowdown in the development of the banking and financial sector, which is consistent with the political theory of government ownership. Following this study, Sapienza (2004), Dinc (2005), and Micco and Panizza (2006) examined the destructive effects of state ownership on bank lending, which are mitigated by the influence of elections. Subsequently, Micco et al. (2007), Cornett et al. (2010), and Shen and Lin (2012) also studied the destructive effects of political interference on government-owned banks, but on performance rather than lending. In contrast to the first and second themes, the impact of government intervention on risk-taking

is usually argued through moral hazard. Unjustified risk-taking in response to expected government support and interventions associated with moral hazard is the third line of research in this area (Brown and Dinc, 2005; Dam and Koetter, 2012; Duchin and Sosyura, 2014).

The fourth theme relates to the impact of political instability through elections or political transitions on bank performance (Cole, 2009; Baum et al., 2010; Jackowicz et al., 2013; Ghosh, 2016). This topic is mostly studied in the context of the political theory of state ownership and following the dominant studies of the first and second topics. It can be noted that variables related to political instability, such as elections, are mainly used as moderators alongside variables related to government interventions or the political environment.

The other four themes relate to the influence of various features of institutional and legal environment on the banking system. The influence of regulatory and institutional environment on bank and economic performance (Levine, 1998; Andrianova et al., 2008; Park, 2012) is the oldest line of research of political risk in banking (5th theme). The negative consequences of a fragile institutional environment on bank productivity (Barth et al., 2004; Lensink et al., 2008; Haw et al., 2010; Barth et al., 2013), bank stability (Gonzalez, 2005; Fang et al., 2014; Ashraf, 2017) and lending (Beck et al., 2006; Qian and Strahan, 2007; Barth et al., 2009) are considered as other trending topics in this field.

Taking a holistic view, we decode the historiography in terms of the three classical categories of political risk (Table 2). According to the mapping, we found that components of the political, institutional, and legal environment as the third category with 19 nodes and variables related to government interventions as the first with 17 nodes are the most important aspects of political risk studied in relation to the banking system. The subcomponents of

political risk characterized as the second category, mainly known as political instability, are less used as predictors in banking studies (4 nodes).

To expose the trends of the three major thematic categories of political risk in banks, we have extracted the annual production of each through content analysis (Figure 9).

Insert Figure 9 about here

The evolution of political risk categories in banking shows that the political and institutional environment is the most developed category of political risk in banking in recent years. Although the influence of political instability on financial institutions has become increasingly popular in recent years, when one speaks of political risk in banking, one is likely to refer to characteristics of political risk that relate to the first and third categories.

3.6 Keyword analysis

Co-occurrence and co-citation are two complementary analyses (Leung et al., 2017). Following this approach, we conduct a co-occurrence network of author keywords with at least six occurrences that illustrates the top 25 keywords out of 698 author keywords. In terms of the terminology, there are four clusters throughout the existing body of literature.

The green cluster refers to the bailout-crisis nexus and impact of economic policy uncertainty (EPU) on lending. The relationship between political connection and bank governance and the effects of the institutional environment on banks are related to the yellow cluster. In the blue cluster, the effects of the institutional environment on economic growth and banking crises is the fitting topic. Lastly, the effects of institutional soundness on bank stability, corruption-banking development nexus, and the link between central bank stability and banking development are the main links in the red cluster (Figure 10).

Insert Figure 10 about here

After clusters are identified, we check the annual progress of related keywords across time. For this purpose, we generate the annual frequency of keywords by using the R package and search the key terms of each cluster within keywords. Then, we create an annual aggregate index for each stream and compare them across time (Figure 11).

Insert Figure 11 about here

According to the keyword growth, we reveal that the cluster on the effects of the legal and regulatory environment on economic growth and banking crises (blue) is less trendy in the recent years compared to others. The one on the influence of EPU and Political Risk on banking is the leading stream (green), with significant growth since 2014, when Baker et al. (2016) proposed a measure for EPU.

To reveal which specific keywords are trendy, we check how leading keywords evolve across time. Figure 12 shows that Political Risk, Economy Policy Uncertainty, Islamic Banks, Bank Stability, and Institutional Quality are the leading keywords related to political risk in banking. Regarding both frequency and trend, EPU and Institutional Quality emerge from other keywords.

Insert Figure 12 about here

3.7 Future research agenda

By reviewing the literature and listing relevant publications over time, as well as content analysis of suggestions for future research in the primary collection especially the influential studies, it is possible to identify gaps in the literature and a possible agenda for future studies. We also reviewed several recent publications (2020-2021) on the identified gaps to provide an indication of timeliness and the latest contribution to the research direction. The results are summarized in Table 5.

Insert Table 5 about here

3.7.1 Political considerations in state-owned banks (SOBs)

Government interference in banks' operations is mainly discussed in the context of government ownership and under three perspectives.

Firstly, participation or ownership of government in the banking system and other enterprises are inevitable as development is not attainable by the private sector in less advanced countries or those with inferior institutional soundness (e.g., Stiglitz, 1993). This development or social perspective argues that control of the government over banks speeds up financial development and economic growth (e.g., Andrianova et al., 2008). Secondly, government power on banks and firms may aim at delivering benefits to allies by acquiring credit and resources. Political theory of state ownership posits that government ownership limits the banking system development (e.g., Beck and Levine, 2002; La Porta et al., 2002), lending (Dinc, 2005; Sapienza 2004), performance and efficiency (e.g., Cornett et al., 2010; Micco et al., 2007), and stability (Brown and Dinç, 2005; Iannotta et al., 2013). Thirdly, seeing government ownership as a double-edged phenomenon, it may have deleterious consequences such as corruption (Hart et al., 1997).

Political influence on bank lending is a prominent issue in emerging markets (Dinç, 2005) and even in developed countries (Sapienza, 2004). This line of research is again proving to be a challenging topic in banking research (Koetter and Popov, 2021; Kumar, 2020). Government ownership, political interference, political connections, and political events are the building blocks of this line of research. Government ownership is very common and substantial in low-income countries (La Porta et al., 2002). The control of elite politicians and political parties

over SOBs is more attractive and less problematic than for other state-owned enterprises (see Dinç, 2005; Rajan and Zingales, 2003).

The political view assumes that state ownership leads to lobbying behavior, abandonment of regulatory and budgetary constraints, lopsided resource allocation, and deterioration of financial productivity as politicians seek to influence financial institutions to pursue their political objectives (Shleifer and Vishny 1994). Some of the most influential studies in this area find evidence for the political theory of state ownership (Dinç, 2005; La Porta et al., 2002; Sapienza, 2004).

Dinç (2005) pointed out that determining the total cost of political pressure on SOBs in emerging economies would be an important future direction. To date, this gap has not really been explored. Although the real costs of political interference in bank lending have been studied for the manufacturing sector in Brazil (Carvalho, 2014) and the agricultural sector in India (Kumar, 2020), the total costs of these distortions in bank lending have not yet been studied for state-owned or even private banks. These government interventions in banks can lead to lower bank development (La Porta et al., 2002), weaker bank performance and efficiency (Micco et al., 2007), and higher operational risks (Iannotta et al., 2013).

3.7.2 Political cycle lending

Political pressures on bank lending behavior are likely to intensify before and during election years or because of the bank's political connections.

Do state political parties use their power to grant bank loans to state government in election years? Are these state interventions mitigated when the party in power is not the dominant force? When the political party in power is not powerful, politicians are more likely to put the

brakes on policy interventions in a tense political contest. The second question coincides with one raised by Brown and Dinç (2005) that points to the future.

To support the value of this research question, we also refer to a recent influential study. Koetter and Popov (2021) studied the politically motivated savings banks lending to German state governments. These banks, which were established to strengthen economic development in their regions, can be influenced by political party changes in elections. As Koetter and Popov (2021) suggest, one could also examine how government-induced lending evolves with election cycles for savings banks in other European economies, notably Spain (Cajas), Italy (Casse di Risparmio), and Norway (Sparebank).

Another issue that future studies could address concerns the phenomenon that political cycle lending and its consequences are more pronounced in SOBs than in their private counterparts. Cyclical lending is not limited to SOBs. Evidence of cyclical lending in state-owned banks is documented, but the comparison between state-owned and private banks is rarely studied. Baum et al. (2010) show that Turkish banks' lending and performance are strongly influenced by general election cycles in Turkey, but fail to demonstrate a significant difference between state-owned banks' lending and that of other counterparties in the political cycle. Micco et al. (2007) document that political cycles cause a meaningful difference in performance between private and government counterparties.

Do SOBs change their lending behavior in the context of a local or regional political event such as an election relative to local private banks? Depending on a range of factors such as macroeconomic characteristics, political and institutional development, CBI, bank supervision and governance, political connections with state politicians, and political conflicts between national and state politicians, various scenarios could be considered to test this hypothesis.

3.7.3 Political connections and banks loan defaults

First, one might ask whether state banks with politically connected CEOs have worse credit quality and solvency than state banks with non-political CEOs. The vulnerability of SOBs to crises is highly related to state banks' credit standards, which are primarily influenced by CEOs (Sapienza, 2004). Politically tied chief executives may exploit the authority to soften lending standards to extend credit to their allies and facilitate political corruption. In addition, excessive risk-taking by a bank's CEO can lead to excessive lending behavior (Acharya and Naqvi, 2012). Chen et al. (2018) suggest that SOBs with a political CEO perform worse during the GFC, while this is not true for banks with non-politically connected CEOs. Politically connected SOBs are more prone to sacrifice credit quality for political considerations (Chen et al., 2018). Boateng et al. (2019) also suggest that the positive association between a bank CEO's political connection and credit risk is likely to be strengthened for SOBs. Moreover, political corruption due to political connections increases information asymmetry, which affects bank lending and efficiency.

Second, the scenario that financial institutions with greater political ties are less vulnerable to government loan defaults compared to other banks in emerging markets is also an important direction for future study. The ultimate goal of politicians is to rise in the political system, and this goal is tied to the power and financial performance of their allies. Therefore, selective loan defaults to banks with large political affiliations could be very costly and destructive to their development. Moreover, politically associated banks are expected to generate more deposits than non-politically tied banks (Nys et al., 2015), which reduces the probability of default. Hung et al. (2017) highlight that Chinese banks with a politically linked chief executives face a lower probability of default and a higher creditworthiness. For recent work in this direction, see Gao et al. (2021). Using data on sub-sovereign debt in China, Gao et al. (2021) document

that less politically influential banks have a higher probability of being selected in the event of a selective government loan default. Therefore, the real cost of a nonpolitical bank in a highly corrupt country or in a less politically and institutionally developed environment would be substantial.

3.7.4 Political ascendancy, bank risk exposure, and bank governance

This hypothesis that the rise of politicians up the political ladder and the associated pressure on banks lead to higher risk, especially when local politicians hold the chairmanship or a seat on the board of the bank, can be tested for several developing countries. Wang et al. (2019) suggest that promotional pressure from local Chinese politicians increases bank risk by increasing poor-quality lending and reducing liquidity, especially for local commercial banks and when active politicians rule as bank governors. Investigating the nexus between political ascendancy and risk through the profitability channel, especially in countries with less diversified banking income, would be another contribution to the relevant literature.

The pressure that political sponsorship exerts on banks is likely to increase risk-taking by weakening competition in terms of competition- fragility view. The effect of bank competition on controlling corruption control is mitigated by the increase in information asymmetry (Barth et al., 2009). Thus, the effects of political sponsorship on risk exposure could be reconsidered by increasing information asymmetry and the agency problem. In addition, the lobbying behavior of a bank's CEO may reinforce the link between political sponsorship and risk, as lobbying behavior may increase the bank's lottery behavior, especially through the agency cost problem.

3.7.5 Political instability and banking stability

Robock (1971) distinguishes between political instability and political risk. He states that political instability, such as a regime change that alters the business environment, is political risk. Although the impact of systematic political instability, especially electoral instability, on bank failure is rarely studied (e.g., Liu and Ngo, 2014), the literature seems to say too little about how different forms of political instability affect bank risk, credit growth, and liquidity creation.

Despite political instability triggered by global and multinational political events such as Brexit and Trump's victory, political instability can also be measured under the headings of different events such as national and state elections, political transition, revolution, war, and referendum. Political instability is described as a channel that explains how the economy is affected by politics (Julio and Yook, 2012). Increasing political uncertainty poses risks and increases borrower monitoring, which provides an incentive for banks to slow loan growth (Bordo et al., 2016). Ghosh (2016) finds that the Arab Spring is reducing the stability and productivity of both commercial and Islamic banks in the MENA.

The negative impact of political instability on banking stability are amplified in times of endogenous risk crises by a higher probability of default, greater reliance on politics and government intervention, a higher expectation of bailouts, and moral hazard, while endogenous shocks can mitigate the destructive effects of political instability on bank stability as banks opt for hedging and flight to quality. Moreover, an institutional environment may establish a motivational system to decrease political uncertainty and boost effectiveness (North, 1991).

Banks in countries with less independent central banks and greater government involvement are more vulnerable to the risk of national or regional political instability. Greater central bank

political independence can lead to greater financial and banking stability (Klomp and De Haan, 2009). Politically independent central banks face fewer political restrictions and can more effectively prevent and combat a crisis. An independent central bank alleviate the adverse effects of political instability on banking stability. The underperformance of SOBs, especially before and during elections because they charge lower interest rates (Jackowicz et al., 2013; Micco et al., 2007; Shen and Lin, 2012), is a threat to banking stability. In countries where banks are often state-owned, the negative impact of political instability on banking stability seems to be exacerbated by increasing political patronage and corruption.

In a recent work in this direction, Cheng et al. (2021) reveal that instability due to the change of city governors reduces the creditworthiness of Chinese banks as the lending of city banks increases. Investigating whether the link between political uncertainty and credit risk is mediated by credit growth and liquidity would be another future research direction.

3.7.6 Moral hazard problem of government support

The unintended consequences of government capital injections are a growing concern for financial institutions. Government guarantees, intended to restore stability and confidence to banks, can adversely affect the stability and lead to excessive risk-taking through the moral hazard problem (Dam and Koetter, 2012; Duchin and Sosyura, 2014). How can a bailout system mitigate the unintended effects of government support on bank stability? Do the volume of capital injections and the quality of the bailout mechanism matter? This unintended effect could be modified by considering some assumptions such as bailout mechanism (Hryckiewicz 2014), bank size (Dam and Koetter, 2012), political institutions (Ashraf, 2017), political connections (Duchin and Sosyura, 2014), and during elections (Iannotta et al., 2013).

A sound political environment reduces information asymmetries and the risk of expropriation, leading to greater bank stability. In contrast, sound political institutions can lead to less stability by increasing competition and raising banks' expectations of government support in times of crisis. Ashraf (2017) provides evidence to support this assumption that political institutions soundness induce banks to take more risks, especially in countries with deposit insurance schemes. However, this study does not distinguish whether this positive effect is explained by the moral hazard problem or a competition-stability trade-off.

Distinguishing the channels explaining the impact of political institutions on bank stability through mediation analysis would be a good contribution to this issue. We could then examine whether the moral hazard problem of government bailouts and excessive bank risk-taking is amplified in a weak political environment. Is this unique effect amplified in countries that are fully protected by deposit guarantee? As Demirgueç-Kunt and Detragiache (2002) have found, the positive effects of deposit protection on banking crises are likely to be amplified when the quality of political institutions is low.

Now may be a good time to support the point raised by Black and Hazelwood (2013) as a future research question. Are capital injections efficient enough in times of crisis, given the possibility of a negative effect? Allen et al. (2015) critique the view that government support leads to additional risk-taking and moral hazard. They provide a new theoretical framework by considering both the direct and indirect effects of government support on different types of banking crises, which allows for a better assessment of the trade-off between restoring stability and the moral hazard of government support.

3.7.7 Political environment and interventionist behavior of government and regulations

Any change in the political and institutional environment that leads to a change in the business environment is a political risk (Robock, 1971). According to the theory of financial intermediation, bank development is related to the soundness of the political environment, especially political stability (Aggarwal and Goodell, 2009).

As Micco et al. (2007) stated, finding the circumstances that the adverse effects of government intervention in lending and political corruption are negligible compared to their positive aspects for banking and economic development is an important argument for future studies. This optimal condition could be rooted in the soundness of the policy and institutional framework. Government interventionist behavior tends to be lower in countries with sound governance and institutional frameworks (La porta et al., 1999). Do policy and institutional developments actually reduce the adverse effects of government ownership on bank risk due to state control? Chen et al. (2018) show that political interference in SOBs does not lead to SOB failure in countries with sound governance and institutional quality and low corruption.

Despite government intervention, the adverse effects of banking supervision and regulation on stability might be mitigated by the soundness of political institutions. A banking crisis is more likely in countries with higher regulatory constraints (Barth et al., 2004). Regulatory constraints raise the financial intermediation cost (Demirguc-Kunt et al., 2004). Bermpei et al. (2018) find weak evidence that the adverse effects of bank supervision on bank stability are moderated by institutional quality. The downside of the relationship between regulation and stability appear to be stronger in environments with lower corruption control, lower political stability, and lower regulatory quality.

Do ideological and political characteristics of the political party in power particularly influence bank lending and credit spreads? Are there more constraints on government intervention in a democratic regime than in an autocratic or communist system? Since democracies are likely to increase information transparency (Hollyer et al., 2011), a democratically developed system is more likely to limit bank lending corruption. The role of ideology in political interference in banks is suggested as a future direction by Brown and Dinç (2005). In a recent article, Delis et al. (2020) document that the cost of credit is significantly affected by democratization. Consistent with political risk frameworks, lack of democratic accountability or democracy is considered a characteristic of the political environment and a subcategory of political risk.

3.7.8 Bank-level political risk measurement and bank stock return volatility

Most of the developed measures of political risk and political uncertainty are country-specific measures (Baker et al., 2016; Kaufmann et al., 2003). Recently, Hasan et al. (2019) proposed a simple and interesting measure of political risk at the firm level. Following Hasan et al. (2019), future studies can use textual analysis and computational linguistics (pattern-based sequence classification) to develop news-based bank-level measures for different banks and central banks. First, they can carefully develop the political risk keywords used in this study or those proposed by Bekaert et al. (2014) by adding some more general keywords that can be expected in bank communications. Second, they need to collect all the texts of the press conference and the bank CEO's speeches in a timely manner. Finally, they can check the frequency of keyword matches in the texts and use them to create a time series-based index. This quantifies the political risk of bank i at time j based on the frequency with which the bank's communications reflect the key political concepts. This will help subsequent studies and

policymakers better measure their bank's political risk, or the bank's perception of political risk, and quantify the cost of political risk to bank performance and stability.

In the case of significant political uncertainty in developed countries related to a presidential election or even a non-systematic event such as a war, perceptions of real political risk and its impact on stock returns, stock volatility, asset valuations, and the cost of capital could be very different across sectors. In this situation, a bank is more likely to consider and respond to political risk as perceived in central bank communications than to use country-specific or global political risk assessments.

By using a bank-level measure of political risk, future studies will be in a better stance to revisit an important, long-unanswered research question, the so-called sign paradox of political risk (Perotti and van Oijen, 2001), and provide a novel explanation for why higher political risk in a developed market leads to lower bank stock returns? Or provide evidence of a parabolic relationship between bank-level political risk and bank stock returns in developed markets.

In general, the literature on the impact of political risk and political uncertainty on asset volatility, asset valuation, and bank systematic risk is more than sparse. Political risk is likely to drive stock volatility and valuation because political risk is a component of systematic risk (Bekaert et al., 2014; Perotti and van Oijen, 2001). An increase in political risk is likely to increase bank stock volatility and valuation because of an increase in the bank's cost of equity, which is the discount factor in the firm valuation model. Pastor and Veronesi (2012) also emphasize that political changes leading to an economic crisis lead to higher stock volatility.

4. Discussion

The adverse effects of social actions, government activities, and policies on investments and operations are referred to as political risk (Simon, 1982). The ambiguous concept of political risk is generally limited to the dark side of government and political interference in business operations (Aliber, 1975). As Fitzpatrick (1983) and Kobrin (1979) have noted, the concept of political risk can be defined in terms of government intervention, event-driven political instability, and the political environment. In a broader definition, political risk is defined not only as "undesirable consequences of government intervention" (Fitzpatrick, 1983, p. 249) and "manifestations of a political nature" (Fitzpatrick, 1983, p. 250), but also comprises "restrictions on doing business and changes in the business environment due to changes in the political environment" (Kobrin, 1979, p. 68).

Although the above definitions highlight the main criteria of political risk, the concept of political risk has become much broader in recent years. Given this multidimensional nature of political risk, we refer to it in this paper as any impairment, restriction, or disruption of banking operations due to opportunistic behavior by politicians and governors through government involvement, political instability due to political events and transitions, or unsound legal, institutional, and policy frameworks. In short, any change in the political environment, the consequences of political instability, or government actions and interventions that adversely affect banks can be defined as political risk for banks.

Using a meta-synthesis literature review based on a combination of bibliometric analysis and content analysis, we studied the literature on political risk in banks from different aspects and in terms of the underlying theories and frameworks. The focus of our study is to identify and review the main streams of political risk in banks by document co-citation mapping.

However, we also used historiography or citation mapping to capture the main research themes in the field and the evolution of the topic over time.

The results show four main streams in the literature and eight trending research topics in the field. Leading streams include political considerations in bank lending and their negative impact on bank performance, the impact of government and regulatory intervention on bank risk-taking, the impact of the institutional and political environment on bank development and performance, and economic models and measurement methods related to political risk in banks.

This study also highlights the influential aspects of the field, such as the leading studies and authors. Finally, we developed a theoretical framework that shows the dispersion of the literature on political risk in banking and set an agenda for future research with fourteen research questions. The future agenda shows that the field is evolving mainly toward the first and third clusters and by focusing on emerging markets.

Political risk in banks is mainly studied from the perspective of how banks are affected by political and government interventions or changes in the political and institutional environment, especially during and before periods of systematic political events, while the literature on the direct impact of political instability on financial institutions is more than scarce. Interestingly, indicators of the policy environment and government intervention are rarely used together in banking research. Our results highlight how little political risk factors are studied in the banking literature compared to other financial literature.

5. Conclusions

The significant and recent advances in the field of political risk in financial institutions and the growing concern about political risk in financial systems, which has not abated even during the Covid 19 pandemic, have led us to undertake the first comprehensive review of political

risk in banks using bibliometrics and content analysis. In this meta-synthesis literature review, we consider all disjointed studies to provide a coherent and detailed image of the field. Our findings provide a pathway for future developments in research streams, trends, and themes, as well as a comprehensive and structured source of references for scholars interested in the field.

We provide a multilevel bibliometric analysis based on 60 keywords on political risk in conjunction with keywords on banking, complemented by a content analysis of political risk in banking covering 303 publications in ISI WOK journals over a period from 1985 to 2019, to provide suggestions for future research. We review articles primarily using two complementary methods, co-citation mapping and historiography, to uncover the structure of this field and its trends over time. We also analyzed the field in terms of journals, authors, and keywords.

We have identified four research clusters. The first refers to the influence of political interference on bank lending, particularly in the context of political cycles through the political theory of state ownership (Dinc, 2005; La Porta et al., 2002; Sapienza, 2004). The second group addresses how the policy environment affects banking and the role of financial institutions as financial intermediaries, considering institutional theory (Barth et al., 2004; Lensink et al., 2008) and law and finance theory (La Porta et al., 1998). The third group addresses the impact of government and regulatory intervention, bank supervision, and deposit insurance on bank risk-taking through moral hazard (Ashraf, 2017; Dam and Koetter, 2012), the competition-stability trade-off (Keeley, 1990), the competition-fragility trade-off (Boyd and De Nicolò, 2005), or government ownership (Iannotta et al., 2013). Finally, a fourth area relates to econometrics and political risk measurement. We also set an agenda for future research in this area by identifying and discussing fourteen research gaps.

As a direction for future bibliometric or systematic reviews, we should elucidate the lack of a review of the impact of political events on financial institutions. Such a survey could address the question of how the response of banks to political risk associated with non-systematic political events such as wars or the actions of elite politicians differs from the political risk triggered by systematic political events such as elections.

The concept of political risk in banks is somewhere puzzling that should be problematic for future studies. This is precisely the point that illuminates the importance of the contributions, especially the development of a conceptual framework for political risk in banks that could also be relevant for policymakers.

The main limitations of this study relate to the non-universal scope of the ISI WOK database. Although articles are the most common way to disseminate research results nowadays, there are also books, book chapters, etc. Besides, another limitation is that we focused on publications in English. Although this is what most review articles do for logistic reasons, we have to acknowledge that there might also be interesting contributions published in other languages. A third limitation of our study lies in the temporal coverage that we were able to analyze. Although broad, covering from 1985 to 2019, publications after this year could not be included and therefore it would be interesting for future studies to extend our analysis and examine the directions in which the field is evolving.

References

Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. *American Economic Review*, 91, 1369-1401.

Acharya, V., & Naqvi, H. (2012). The seeds of a crisis: A theory of bank liquidity and risk taking over the business cycle. *Journal of Financial Economics* , *106* (2), 349-366.

Aggarwal, R., & Goodell, J. W. (2009). Markets and institutions in financial intermediation: National characteristics as determinants. *Journal of Banking & Finance*, *33*(10), 1770-1780.

Aliber, R. Z. (1975). Exchange risk, political risk, and investor demand for external currency deposits. *Journal of Money, Credit and Banking*, 7, 161-179.

Allen, F., Carletti, E., Goldstein, I., & Leonello, A. (2015). Moral hazard and government guarantees in the banking industry. *Journal of Financial Regulation* , *1* (1), 30-50.

Alon, I., & Martin, M. A. (1998). Political Risk Assessment1. *Multinational Business Review*.

Andrianova, S., Demetriades, P., & Shortland, A. (2008). Government ownership of banks, institutions, and financial development. *Journal of Development Economics*, 85, 218-252.

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11, 959-975.

Ashraf, B. N. (2017). Political institutions and bank risk-taking behavior. *Journal of Financial Stability*, 29, 13-35.

Ashraf, B. N., & Shen, Y. (2019). Economic policy uncertainty and banks' loan pricing. *Journal of Financial Stability*, 44, 100695.

Bahoo, S., Alon, I., & Floreani, J. (2021). Corruption in economics: a bibliometric analysis and research agenda. *Applied Economics Letters*, *28*(7), 565-578.

Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *The Quarterly Journal of Economics*, 131, 1593-1636.

Barth, JR, Caprio Jr, G., & Levine, R. (2004). Bank regulation and supervision: what works best ?. *Journal of Financial intermediation* , *13* (2), 205-248.

Barth, J. R., Lin, C., Lin, P., & Song, F. M. (2009). Corruption in bank lending to firms: Cross-country micro evidence on the beneficial role of competition and information sharing. *Journal of Financial Economics*, 91, 361-388.

Barth, J. R., Lin, C., Ma, Y., Seade, J., & Song, F. M. (2013). Do bank regulation, supervision and monitoring enhance or impede bank efficiency?. *Journal of Banking & Finance*, 37, 2879-2892.

Baum, C. F., Caglayan, M., & Talavera, O. (2010). Parliamentary election cycles and the Turkish banking sector. *Journal of Banking & Finance*, 34, 2709-2719.

Bayazitova, D., & Shivdasani, A. (2012). Assessing tarp. *The Review of Financial Studies*, 25, 377-407.

Beck, T., & Levine, R. (2002). Industry growth and capital allocation:: does having a market-or bank-based system matter?. *Journal of Financial Economics*, 64, 147-180.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2003). Law, endowments, and finance. *Journal of Financial Economics*, 70, 137-181.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2006). Bank concentration, competition, and crises: First results. *Journal of Banking & Finance*, 30, 1581-1603.

Beck, T., Levine, R., & Loayza, N. (2000). Finance and the Sources of Growth. *Journal of Financial Economics*, 58, 261-300.

Bekaert, G., Harvey, C. R., Lundblad, C. T., & Siegel, S. (2016). Political risk and international valuation. *Journal of Corporate Finance*, *37*, 1-23.

Bekaert, G., Harvey, C. R, Lundblad, CT, & Siegel, S. (2014). Political risk spreads. *Journal of International Business Studies* , 45, 471-493.

Bermpei, T., Kalyvas, A., & Nguyen, T. C. (2018). Does institutional quality condition the effect of bank regulations and supervision on bank stability? Evidence from emerging and developing economies. *International Review of Financial Analysis*, *59*, 255-275.

Bitar, M., Hassan, M. K., & Walker, T. (2017). Political systems and the financial soundness of Islamic banks. *Journal of Financial Stability*, *31*, 18-44.

Black, L. K., & Hazelwood, L. N. (2013). The effect of TARP on bank risk-taking. *Journal of Financial Stability*, *9*(4), 790-803.

Boateng, A., Liu, Y., & Brahma, S. (2019). Politically connected boards, ownership structure and credit risk: Evidence from Chinese commercial banks. *Research in International Business and Finance*, *47*, 162-173.

Bordo, M. D., Duca, J. V., & Koch, C. (2016). Economic policy uncertainty and the credit channel: Aggregate and bank level US evidence over several decades. *Journal of Financial Stability*, *26*, 90-106.

Boyd, J. H., & De Nicolo, G. (2005). The theory of bank risk taking and competition revisited. *The Journal of Finance*, 60, 1329-1343.

Brown, C. O., & Dinc, I. S. (2005). The politics of bank failures: Evidence from emerging markets. *The Quarterly Journal of Economics*, 120, 1413-1444.

Carvalho, D. (2014). The real effects of government-owned banks: Evidence from an emerging market. *The Journal of Finance*, *69*(2), 577-609.

Chen, H. K., Liao, Y. C., Lin, C. Y., & Yen, J. F. (2018). The effect of the political connections of government bank CEOs on bank performance during the financial crisis. *Journal of Financial Stability*, 36, 130-143.

Cheng, M., Guo, P., Jin, J. Y., & Geng, H. (2021). Political uncertainty and city bank lending in China: Evidence from city government official changes. *Emerging Markets Review*, 100802.

Cole, S. (2009). Financial development, bank ownership, and growth: or, does quantity imply quality?. *The Review of Economics and Statistics*, 91, 33-51.

Cornett, M. M., Guo, L., Khaksari, S., & Tehranian, H. (2010). The impact of state ownership on performance differences in privately-owned versus state-owned banks: An international comparison. *Journal of Financial Intermediation*, 19, 74-94.

Dam, L., & Koetter, M. (2012). Bank bailouts and moral hazard: Evidence from Germany. *The Review of Financial Studies*, 25, 2343-2380.

De Bellis, N. (2009). *Bibliometrics and citation analysis: from the science citation index to cybermetrics*. Scarecrow press.

Delis, M. D., Hasan, I., & Ongena, S. (2020). Democracy and credit. *Journal of Financial Economics*, *136*(2), 571-596.

Demirgüç-Kunt, A., & Detragiache, E. (2002). Does deposit insurance increase banking system stability? An empirical investigation. *Journal of Monetary Economics*, 49, 1373-1406.

Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: some international evidence. *The World Bank Economic Review*, 13, 379-408.

Demirgüç-Kunt, A., Laeven, L., & Levine, R. (2004). Regulations, Market Structure, Institutions, and the Cost of Financial Intermediation. *Journal of Money, Credit and Banking*, 3, 593-622.

Dinç, I. S. (2005). Politicians and banks: Political influences on government-owned banks in emerging markets. *Journal of Financial Economics*, 77, 453-479.

Djankov, S., McLiesh, C., & Shleifer, A. (2007). Private credit in 129 countries. *Journal of Financial Economics*, 84, 299-329.

Duchin, R., & Sosyura, D. (2012). The politics of government investment. *Journal of Financial Economics*, 106, 24-48.

Duchin, R., & Sosyura, D. (2014). Safer ratios, riskier portfolios: Banks′ response to government aid. *Journal of Financial Economics*, 113, 1-28.

Faccio, M. (2006). Politically connected firms. *American Economic Review*, 96, 369-386.

Faccio, M., Masulis, R. W., & McConnell, J. J. (2006). Political connections and corporate bailouts. *The Journal of Finance*, 61, 2597-2635.

Fang, Y., Hasan, I., & Marton, K. (2014). Institutional development and bank stability: Evidence from transition countries. *Journal of Banking & Finance*, 39, 160-176.

Fitzpatrick, M. (1983). The definition and assessment of political risk in international business: A review of the literature. *Academy of Management Review*, 8, 249-254.

Gao, H., Ru, H., & Tang, DY (2021). Subnational debt of China: The politics-finance nexus. *Journal of Financial Economics*.

Garfield, E. (2009). From the science of science to Scientometrics visualizing the history of science with HistCite software. *Journal of Informetrics*, 3, 173-179.

Ghosh, S. (2016). Political transition and bank performance: how important was the Arab Spring?. *Journal of Comparative Economics*, 44, 372-382.

Gonzalez, F. (2005). Bank regulation and risk-taking incentives: An international comparison of bank risk. *Journal of Banking & Finance*, 29, 1153-1184.

Hart, O., Shleifer, A., & Vishny, R. W. (1997). The proper scope of government: theory and an application to prisons. *The Quarterly Journal of Economics*, 112, 1127-1161.

Hassan, M. K., Paltrinieri, A., Dreassi, A., Khan, A., & Bahoo, S. (2020). A bibliometric review of takaful literature. *International Review of Economics & Finance*, 69, 389-405.

Hassan, T. A., Hollander, S., van Lent, L., & Tahoun, A. (2019). Firm-level political risk: Measurement and effects. *The Quarterly Journal of Economics*, 134, 2135-2202.

Haw, I. M., Ho, S. S., Hu, B., & Wu, D. (2010). Concentrated control, institutions, and banking sector: An international study. *Journal of Banking & Finance*, 34, 485-497.

Henisz, W. J. (2000). The institutional environment for economic growth. *Economics & Politics*, 12, 1-31.

Henisz, W. J., & Zelner, B. A. (1999). Political risk and infrastructure investment. *The Wharton School, University of Pennsylvania*.

Hollyer, JR, Rosendorff, BP, & Vreeland, JR (2011). Democracy and transparency. *The Journal of Politics* , *73* (4), 1191-1205.

Hryckiewicz, A. (2014). What do we know about the impact of government interventions in the banking sector? An assessment of various bailout programs on bank behavior. *Journal of Banking & Finance*, *46*, 246-265.

Hung, C. H. D., Jiang, Y., Liu, F. H., Tu, H., & Wang, S. (2017). Bank political connections and performance in China. *Journal of Financial Stability*, *32*, 57-69.

Iannotta, G., Nocera, G., & Sironi, A. (2013). The impact of government ownership on bank risk. *Journal of Financial Intermediation*, 22, 152-176.

Jackowicz, K., Kowalewski, O., & Kozłowski, Ł. (2013). The influence of political factors on commercial banks in Central European countries. *Journal of Financial Stability*, 9, 759-777.

Jiménez, A., & Bjorvatn, T. (2018). The building blocks of political risk research: A bibliometric co-citation analysis. *International Journal of Emerging Markets*, 13, 631-652.

Julio, B., & Yook, Y. (2012). Political uncertainty and corporate investment cycles. *The Journal of Finance*, *67*(1), 45-83.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2003). *Governance matters III: Governance indicators for 1996–2002*. The World Bank.

Keeley, M. C. (1990). Deposit insurance, risk, and market power in banking. *The American Economic Review*, 80, 1183-1200.

Khwaja, A. I., & Mian, A. (2005). Do lenders favor politically connected firms? Rent provision in an emerging financial market. *The Quarterly Journal of Economics*, 120, 1371-1411.

King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, 108, 717-737.

Klomp, J., & De Haan, J. (2009). Central bank independence and financial instability. *Journal of Financial Stability*, *5*(4), 321-338.

Kobrin, S. J. (1979). Political risk: A review and reconsideration. *Journal of International Business Studies*, 10, 67-80.

Koetter, M., & Popov, A. (2021). Political cycles in bank lending to the government. *The Review of Financial Studies*, *34*(6), 3138-3180.

Kraay, A., Kaufmann, D., & Mastruzzi, M. (2010). *The worldwide governance indicators: methodology and analytical issues*. The World Bank.

Kumar, N. (2020). Political interference and crowding out in bank lending. *Journal of Financial Intermediation*, 43, 100815.

La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). Government ownership of banks. *The Journal of Finance*, 57, 265-301.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1999). The quality of government. *The Journal of Law, Economics, and Organization*, 15, 222-279.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. *The Journal of Finance*, 52, 1131-1150.

Laeven, L., & Levine, R. (2009). Bank governance, regulation and risk taking. *Journal of Financial Economics*, 9, 259-275.

Lensink, R., Meesters, A., & Naaborg, I. (2008). Bank efficiency and foreign ownership: Do good institutions matter?. *Journal of Banking & Finance*, 32, 834-844.

Leung, X. Y., Sun, J., & Bai, B. (2017). Bibliometrics of social media research: A co-citation and co-word analysis. *International Journal of Hospitality Management*, 66, 35-45.

Levine, R. (1998). The legal environment, banks, and long-run economic growth. *Journal of Money, Credit and Banking*, 596-613.

Levine, R., & Barth, J. (2001). *Bank regulation and supervision: what works best?*. The World Bank.

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, 46, 31-77.

Levine, R., & Zervos, S. (1998). Stock markets, banks, and economic growth. *American economic review* , 537-558.

Liu, W. M., & Ngo, P. T. (2014). Elections, political competition and bank failure. *Journal of Financial Economics*, 112, 251-268.

Mauro, P. (1995). Corruption and growth. *The Quarterly Journal of Economics*, 110, 681-712.

Micco, A., & Panizza, U. (2006). Bank ownership and lending behavior. *Economics Letters*, 93, 248-254.

Micco, A., Panizza, U., & Yanez, M. (2007). Bank ownership and performance. Does politics matter?. *Journal of Banking & Finance*, 31, 219-241.

Nehrt, L. C. (1970). The political environment for foreign investment. *NY: Praeger Pub*.

North, D. C. (1991). Institutions. *Journal of Economic Perspectives*, *5*, 97-112.

Nys, E., Tarazi, A., & Trinugroho, I. (2015). Political connections, bank deposits, and formal deposit insurance. *Journal of financial stability*, *19*, 83-104.

Park, J. (2012). Corruption, soundness of the banking sector, and economic growth: A cross-country study. *Journal of International Money and Finance*, 31, 907-929.

Pástor, Ľ., & Veronesi, P. (2013). Political uncertainty and risk premia. *Journal of financial Economics*, *110*(3), 520-545.

Pastor, L., & Veronesi, P. (2012). Uncertainty about government policy and stock prices. *The Journal of Finance*, 67, 1219-1264.

Perotti, EC, & Van Oijen, P. (2001). Privatization, political risk and stock market development in emerging economies. *Journal of International Money and Finance* , *20* (1), 43-69.

Porta, R. L., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy*, 106, 1113-1155.

Qian, J., & Strahan, P. E. (2007). How laws and institutions shape financial contracts: The case of bank loans. *The Journal of Finance*, 62, 2803-2834.

Rajan, R. G., & Zingales, L. (2003). The great reversals: the politics of financial development in the twentieth century. *Journal of Financial Economics*, 69, 5-50.

Rajan, R., & Zingales, L. (1998). Financial development and growth. *American Economic Review*, 88, 559-586.

Robock, S. H. (1971). Political risk-identification and assessment. *Columbia Journal of World Business*, 6, 6-20.

Rodrik, D. (1999). Where did all the growth go? External shocks, social conflict, and growth collapses. *Journal of Economic Growth*, 4, 385-412.

Root, F. R. (1972). Analyzing political risks in international business. *The Multinational Enterprise in Transition*, 354-365.

Sapienza, P. (2004). The effects of government ownership on bank lending. *Journal of Financial Economics*, 72, 357-384.

Shen, C. H., & Lin, C. Y. (2012). Why government banks underperform: A political interference view. *Journal of Financial Intermediation*, 21, 181-202.

Shleifer, A., & Vishny, R. W. (1994). Politicians and firms. *The Quarterly Journal of Economics*, 109, 995-1025.

Simon, J. D. (1982). Political risk assessment-past trends and future-prospects. *Columbia Journal of World Business*, 17, 62-71.

Small, H. (1973). Co-citation in the scientific literature: A new measure of the relationship between two documents. *Journal of the American Society for Information Science*, 24, 265-269.

Stiglitz, J. E. (1993). The role of the state in financial markets. *The World Bank Economic Review*, 7(suppl_1), 19-52.

Van Eck, N. J., & Waltman, L. (2013). VOSviewer manual. *Leiden: Univeristeit Leiden*, *1*(1), 1-53.

Wang, L., Menkhoff, L., Schröder, M., & Xu, X. (2019). Politicians' promotion incentives and bank risk exposure in China. *Journal of Banking & Finance*, 99, 63-94.

Zupic, I., & Čater, T. (2015). Bibliometric methods in management and organization. *Organizational Research Methods*, 18, 429-472.

Tables

Table 1. Political risk keywords

This table summarizes the political risk keywords used for our systematic search. The classification is consistent with the literature (categories I, II and III), as well as the general terms listed in the first column. Each of the political risk keywords was searched individually in conjunction with banking keywords (Banking or Banks or "Financial Institutions").

General Terms	I: Government Interventions and Actions	II: Political Instability Caused by Events or Acts	III: Political and Institutional Environment
• Political Risk • Politics • Politicians • Political Factors • Political System	• Government Interventions/ Interference • Political Interference • Government Support • State Aid • Capital Injections • Government Grants • Political Connection • Political Influence • Political Power • Government Regulation • Regulatory Interventions • Central Bank Independence/CBI • TARP • Expropriation	• Political Instability • Political Transition/ Change • Election • Political Events/ Systemic Events • War/ Civil War • Revolution/Coup • Political Cycles • Elite Politics/ Elite Politicians • Party Politics • Brexit • Democratic Changes • Political Turmoil • Direct Violence • Terrorism • Civil Disturbance • Breach of Contract • Adverse Regulatory Change • Convertibility Constraints • Discriminatory Taxation • Restrictions on Remittance of Profit • Non-honoring of Sovereign Financial Obligations	• Political Environment • Political Institutions • Institutional Environment • Regulatory Environment • Regulatory Restrictions • Institutional Quality • Rule of Law • Creditor Rights/ Investor Rights Protection • Institutional Uncertainty • Policy Uncertainty • Democratic Accountability • Bureaucracy Quality • Regulatory Quality • Regulatory Change • Political Stability • Government Stability • Democracy • Political Corruption/ Corruption • Economic Policy Uncertainty/EPU • Public Sector Competition

Table 2. Conceptual structure tied to each cluster of leading journals

This table maps key journals by total link strength and citations within each cluster identified in the co-citation analysis of journals. The latest column summarizes the most relevant concepts referring to each cluster.

Clusters	Major Journals	TLS	Citations	Most Relevant Concepts
Red	*American Economic Review (AER)*	385	416	Political Connection, Legal and Institutional Environment, Financial Development, Banking Development, Regulatory Uncertainty, Regulatory Restrictions, Deregulation, Bank Lending, and Corruption
	Quarterly Journal of Economics (QJE)	303	327	
	Journal of Political Economy (JPE)	193	202	
	Journal of Monetary Economics (JME)	181	190	
Green	*Journal of Banking and Finance (JBF)*	796	1012	Political Interference, Bank Risk-taking, Bank Performance, Crisis, Bank Systematic Stability, Bank Default Risk, Credit Risk, Bank Credit, Capital Flows, Central Bank Independence, Institutional Quality, Economy Policy Uncertainty, Political Connection, Regulatory Interventions, and Political Monetary Cycles
	Journal of Financial Stability (JFS)	176	191	
	Journal of International Money and Finance (JIMF)	128	135	
Blue	*Journal of Financial Economics (JFE)*	720	853	Government and Regulatory Interventions, Government Ownership, Bank Lending, Bank Risk-taking, Moral Hazard, Financial Intermediary Development, Legal Environment, Deposit Insurance, and Political Connection
	Journal of Finance (JF)	634	729	
	Review of Financial Studies (RFS)	216	230	
Yellow	*Journal of Financial Intermediation (JFI)*	259	275	Bank Regulation, Bank Supervision, Competition, Government Ownership, Performance, Bank Systematic Risk, Liquidity Creation, and Regulatory Interventions
	Journal of Money, Credit and Banking (JMCB)	275	296	

Table 3. Clusters, local citations, links, and references

This table provides the outcomes of the co-citation analysis of references divided by clusters, in terms of total local citations (TLC), total local scores (TLS) and links. Red is identified by "the impact of political-driven government interventions, government ownership, and political connection on bank lending and performance mainly through political theory of state-ownership". Green represents "how legal and institutional environment affect the banking and financial development considering institutional theory and the theory of law and finance?". Blue is defined by "the impact of the government and regulatory interventions, bank regulations, bank supervision, and deposit insurance on excessive bank risk-taking behavior through moral hazard". Yellow focuses on "major

measurement methods and frameworks of political risk, advanced econometrics methods, and modeling approaches".

Cluster	Most Co-cited References	TLC	TLS	Links
Red		**378**	**371**	**577**
	Bonin et al., 2005, j bank finance	15	12	30
	Brown & Dinc, 2005, q j econ	17	17	32
	Demirguc-kunt & Huizinga, 1999, world bank econ rev	15	14	32
	Dinc is, 2005, j financ econ	41	41	45
	Faccio m, 2006, am econ rev	19	19	37
	Faccio et al., 2006, j financ	19	19	34
	Fisman r, 2001, am econ rev	20	20	33
	Goldman et al., 2009, rev financ stud	14	14	30
	Johnson & Mitton, 2003, j financ econ	16	16	28
	Khwaja & Mian, 2005, q j econ	39	39	45
	La Porta et al., 2002, j finance	49	49	46
	Micco et al., 2007, j bank finance	23	23	42
	Petersen ma, 2009, rev financ stud	14	13	30
	Sapienza p, 2004, j financ econ	41	41	45
	Shleifer & Vishny, 1994, q j econ	22	21	38
	Stigler gj, 1971, bell j econ	14	13	30
Green		**355**	**348**	**573**
	Acemoglu et al., 2001, am econ rev	15	15	33
	Beck et al., 2000, j financ econ	20	19	33
	Beck et al., 2003, j financ econ	16	16	35
	Beck et al., 2006, j bank finance	18	17	36
	Demirguc-kunt et al., 2004, j money credit bank	19	19	33
	Djankov et al., 2007, j financ econ	26	25	39
	King & Levine, 1993, q j econ	21	21	33
	La Porta et al., 1998, j polit econ	54	52	43
	La Porta et al., 1999, j law econ organ	19	19	39
	La Porta et al., 1997, j finance	41	40	43
	Levine & Zervos, 1998, am econ rev	17	17	30
	Levine et al., 2000, j monetary econ	21	21	28
	Mauro p, 1995, q j econ	14	13	30
	Qian & Strahan, 2007, j finance	17	17	41
	Rajan & Zingales, 1998, am econ rev	23	23	37
	Rajan & Zingales, 2003, j financ econ	14	14	40
Blue		**282**	**259**	**503**
	Barth et al., 2004, j financ intermed	43	42	47
	Bayazitova & Shivdasani, 2012, rev financ stud	16	15	26
	Beck et al., 2006, j bank finance	14	14	41
	Boyd & De nicolo, 2005, j finance	15	14	37
	Dam & Koetter, 2012, rev financ stud	17	17	37
	Demirguc-kunt & Detragiache, 2002, j monetary econ	28	26	48
	Demirguc-kunt & Huizinga, 2010, j financ econ	14	13	38
	Diamond & Dybvig, 1983, j polit econ	18	14	33
	Duchin & Sosyura, 2012, j financ econ	15	15	28
	Duchin & Sosyura, 2014, j financ econ	14	14	20
	Houston et al., 2010, j financ econ	18	18	34
	Keeley, 1990, am econ rev	23	21	42
	Laeven & Levine, 2009, j financ econ	31	27	45
	Merton, 1974, j finance	16	9	27
Yellow		**94**	**94**	**123**
	Arellano & Bond, 1991, rev econ stud	36	36	39
	Arellano & Bover, 1995, j econometrics	27	27	41
	Blundell & Bond, 1998, j econometrics	31	31	43

Table 4. Leading measures of political risk in banking studies

This table highlights the leading measures of political risk in banking studies, together with their indicators or components, a brief description, the source and the main references.

Framework	Components	Description	Source
Institutional Quality	(1) Control of Corruption, (2) Rule of Law, (3) Political Stability, (4) Governance Effectiveness, (5) Regulatory Quality, and (6) Voice and Accountability	The Worldwide Governance Indicators (WGI) reports aggregate and individual governance indicators for over 200 countries and territories over the period 1996–2018, for six dimensions of governance.	World Bank – WGI Daniel Kaufmann and Aart Kraay Kaufmann et al., 2007; Kaufmann et al., 2005; Kaufmann et al., 2003; Kaufmann et al., 1999; Kraay et al., 2010
Political Risk Rating	(1) Government Stability 12p, (2) Socioeconomic Conditions 12p, (3) Investment Profile 12p, (4) Internal Conflict 12p, (5) External Conflict 12p, (6) Corruption 6p, (7) Military in Politics 6p, (8) Religious Tensions 6p, (9) Law and Order 6p, (10) Ethnic Tensions 6p, (11) Democratic Accountability 6p, and (12) Bureaucracy Quality 4p	ICRG produces monthly ratings for 140 countries and for another 26 countries on an annual basis under a different title. The Political Risk Rating includes 12 weighted variables covering both political and social attributes. The composite scores, which range from zero to 100, are then divided into categories from very low risk (80-100 points) to very high risk (0-49.9 points).	PRS Group – ICRG
The Political Constraint Index	(1) The number of independent veto points over policy outcomes (2) The distribution of preferences of the actors that inhabit them	POLCON is an objective and comprehensive measure of institutional commitment based on positive political theory. It uses a quantitative model to capture the competition part of the definition of democracy (competition and participation).	Witold Henisz Henisz, 2000
Political Risk Spreads	(1) Government Actions, (2) Company-Specific Risks, and (3) Country-Specific Risks	Political Risk Spreads is a market- and news-based measure of political risk, which is the yield spread between a country's U.S. dollar debt and a corresponding U.S. bond. Variations in these sovereign bond yield spreads are explained by global economic conditions, country-specific economic factors, the liquidity of the country's bonds, and political risk. Finally, they extract the fraction of the sovereign bond spread attributable to political risk using political risk scores. The measure derives the probability of an adverse political event for a country.	Geert Bekaert, Campbell R. Harvey, Christian T. Lundblad, and Stephan Siegel Bekaert et al., 2014
EPU	1st component quantifies newspaper coverage based on search results from 10 major newspapers, 2nd component reflects the number of provisions of the federal tax code that will expire in the coming years, and 3rd component uses disagreement among economic forecasters as an indicator of uncertainty based on the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters	The economic policy uncertainty (EPU) index is based on the frequency of newspaper coverage frequency. EPU is based on an index of three types of underlying components. The EPU website provides data for 26 countries on a monthly basis. The data series cover the period from January 1997 to the present.	Economic Policy Uncertainty Index Scott R. Baker, Nick Bloom, and Steven J. Davis Baker et al.,2016; Baker et al., 2015; Baker et al., 2013

Table 5. Suggestions for future research

This table contains our suggestions for future research arising from the content analysis of our primary collection, focusing on the influential studies.

No.	Proposed Future Research Questions	Main References
1	How to quantify the total cost of political pressure on state-owned banks in emerging markets?	Dinç (2005)
2	Do state political parties use their power to provide bank credit to state government during election cycles? Are these state interventions mitigated when the party in power is not the dominant power?	Brown and Dinç (2005), Koetter and Popov (2021)
3	Are political cycle lending and its consequences more pronounced in state-owned banks than in their private counterparts?	Baum et al. (2010)
4	Whether state-owned banks with politically connected CEOs had poorer credit quality and solvency during the Covid 19 crisis than state-owned banks with non-political CEOs?	Chen et al. (2018), Boateng et al. (2019)
5	Are banks with stronger political connections less at risk of a selective loan default by government compared to banks with fewer political connections?	Hung et al. (2017), Gao et al. (2021)
6	Does pressure on banks from political promotion of local politicians increase bank risk, especially when local politicians sit on the bank's board? Do the lobbying behavior of a bank's CEO, increasing information asymmetry, and the problem of agency costs strengthen the link between political advancement and bank risk?	Wang et al. (2019), Barth et al. (2009)
7	Is the link between national or regional political instability and the risk faced by banks likely to be stronger in countries with higher levels of sovereign exposure and lower levels of CBI?	Klomp and De Haan (2009)
8	Is the link between political instability and bank credit risk mediated by credit growth and liquidity? How do endogenous shocks mitigate the negative effects of political instability on bank stability? Higher exposure to political risk vs. more hedging and flight to quality.	Cheng et al. (2021)
9	How can a bailout system mitigate the unintended effects of government support on bank stability? What is the role of the size of the capital injections and the quality of the bailout mechanism?	Ashraf (2017), Hryckiewicz (2014)
10	Does the soundness of political institutions lead to excessive risk-taking by exacerbating the moral hazard problem, especially in countries with deposit insurance schemes? How can we distinguish whether this positive effect is explained by the moral hazard problem or by a competition-stability trade-off?	Ashraf (2017), Demirgueç-Kunt and Detragiache (2002), Allen et al. (2015)
11	Are capital injections efficient enough in times of crisis, given the possibility of a negative effect?	Black and Hazelwood (2013)
12	Under what circumstances are the negative effects of government intervention in bank lending and political corruption negligible compared to their positive aspects for banking and economic development? Do political developments actually mitigate the negative effects of state ownership on banking risk due to state control?	Micco et al. (2007), Chen et al. (2018), La porta et al. (1999), Bermpei et al. (2018)
13	Do ideological and political characteristics of the political party in power significantly influence bank lending and credit spreads? Do the political frameworks of autocratic or communist regimes increase political corruption in bank lending relative to democracies by placing fewer restrictions on politically motivated government intervention or providing less information transparency?	Brown and Dinç (2005), Delis et al. (2020)
14	How does bank communication reflect political risk? Can bank-level political risk provide a novel explanation for the political risk sign paradox and the lower returns on bank stocks in response to higher political risk in a developed market? Does the increase in bank-level political risk increase the volatility of bank stocks and the likelihood of a systemic banking crisis by increasing the bank's cost of equity?	Hasan et al. (2019), Perotti and van Oijen (2001), Bekaert et al. (2014), Pastor and Veronesi (2012)

Figures

Figure 1. Data collection and analysis processes

This figure illustrates the process of data collection, the methodological approaches and the flow of the analysis followed in this paper.

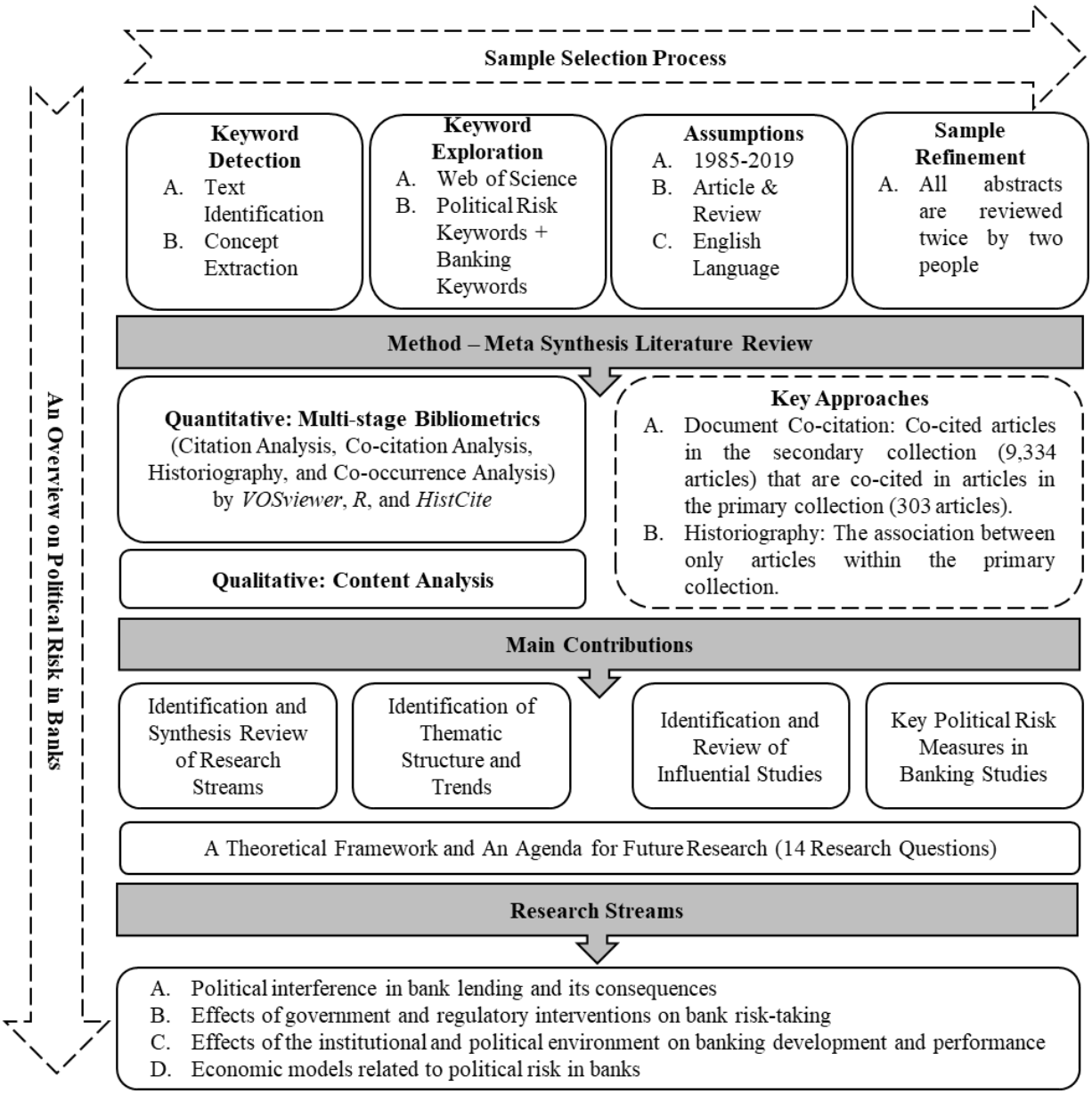


Figure 2. Annual scientific production and total citations

This figure illustrates the trend in annual publications and total citations per year in our sample for the period 1985-2019.

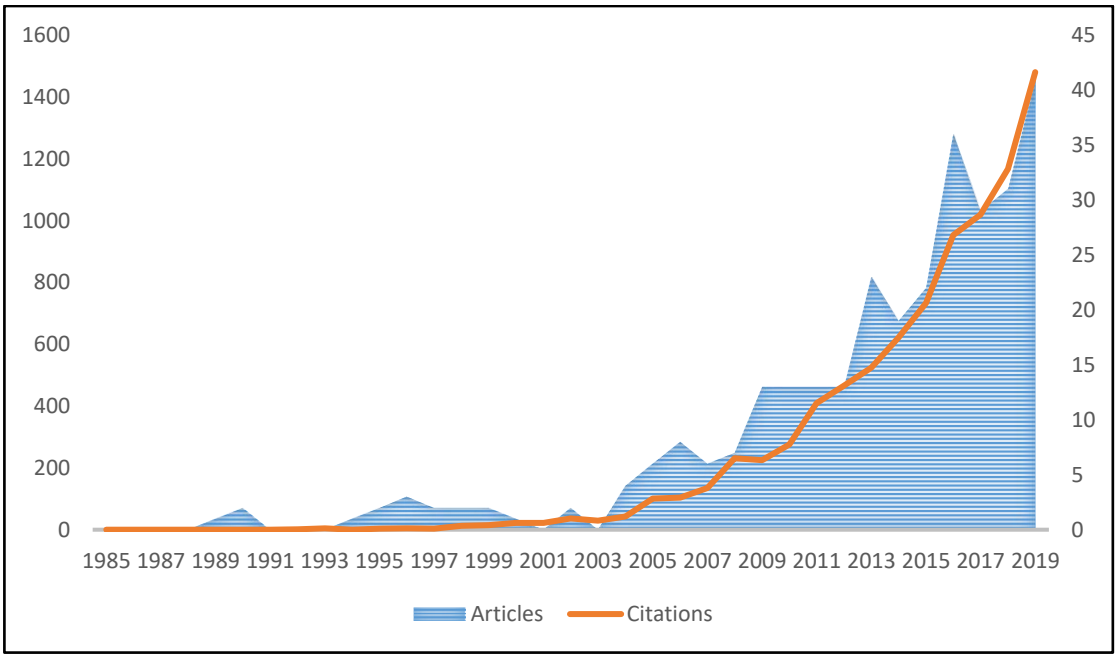


Figure 3. Co-citation network of journals

This figure shows co citation network of sources for the 50 leading journals in the field. The top journals are clustered into four groups in terms of their circulation area. The analysis checks how many times a pair of journals has been cited together in subsequent studies, hence showing journals' proximity (Table 4).

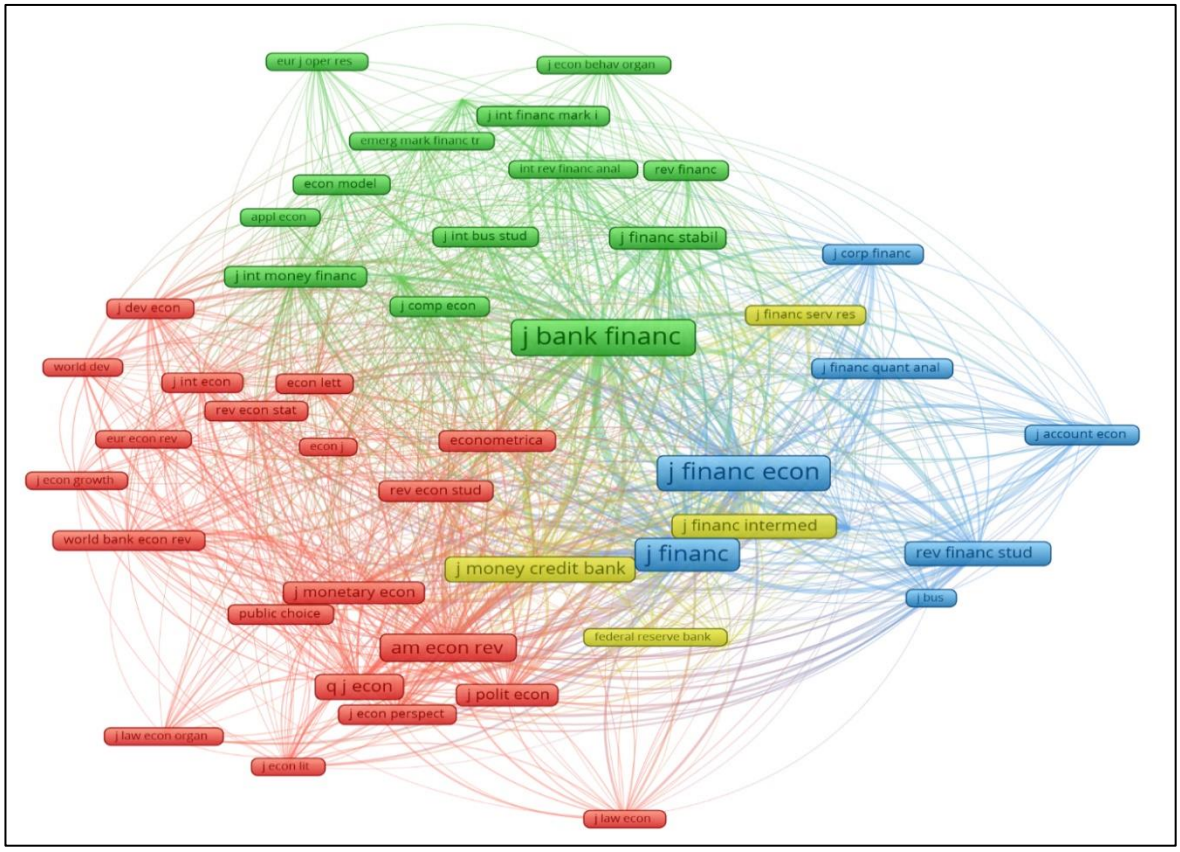


Figure 4. Most local cited authors

This figure shows the leading authors by both the number of publications and their local citations.

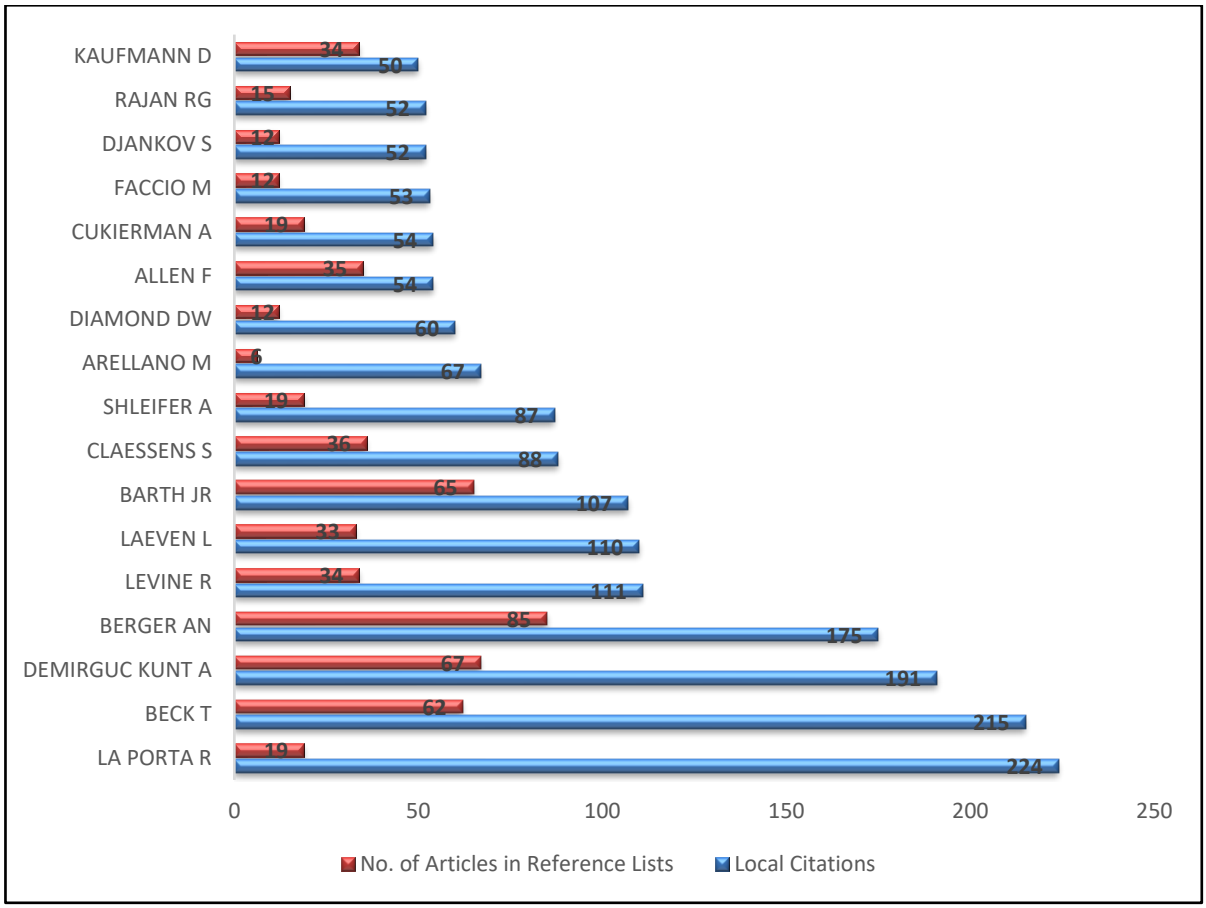


Figure 5. Co-citation network of top co-cited authors

This figure shows the co-citation network of prominent authors in the field, grouped into four clusters. The blue cluster refers to the impact of the legal environment, regulatory restrictions, and government intervention on banking development. The red cluster focuses on the impact of banking regulation, supervision, and the institutional environment on bank performance and stability. The green cluster refers to government interference, political connections, and bank lending. Finally, the yellow cluster points to the main methodologies and frameworks for measuring political risk and advanced econometric approaches.

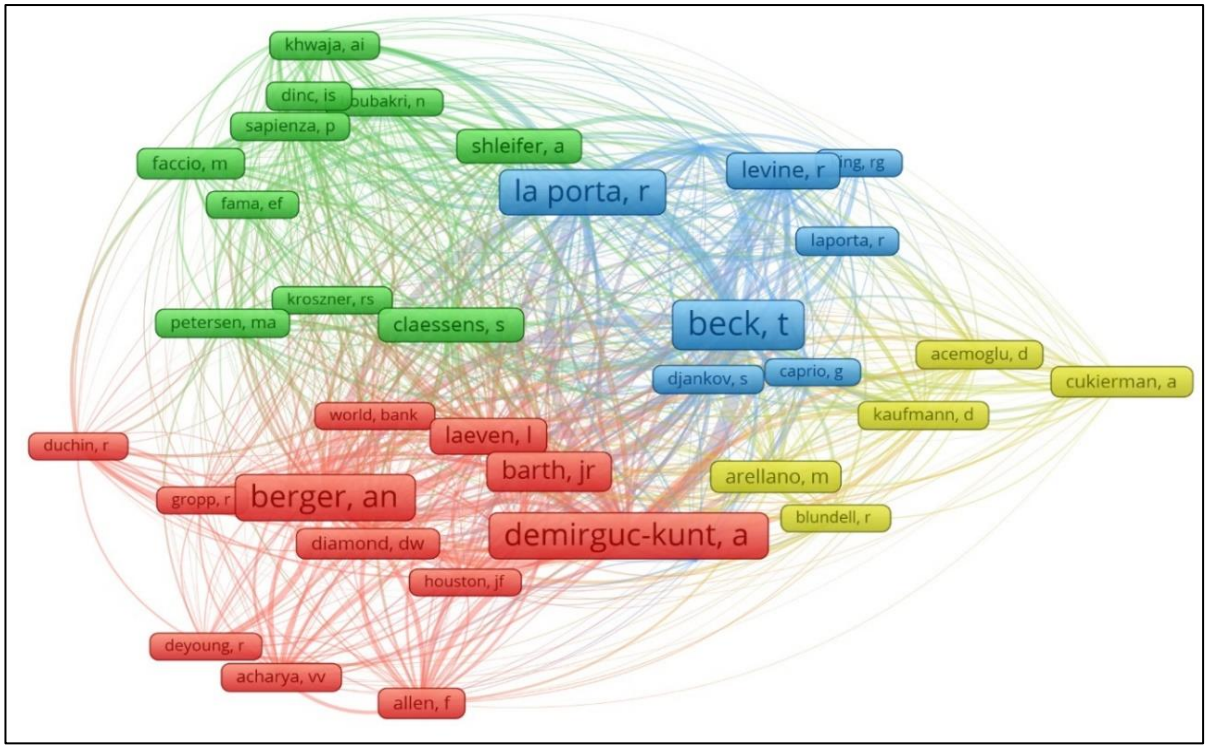
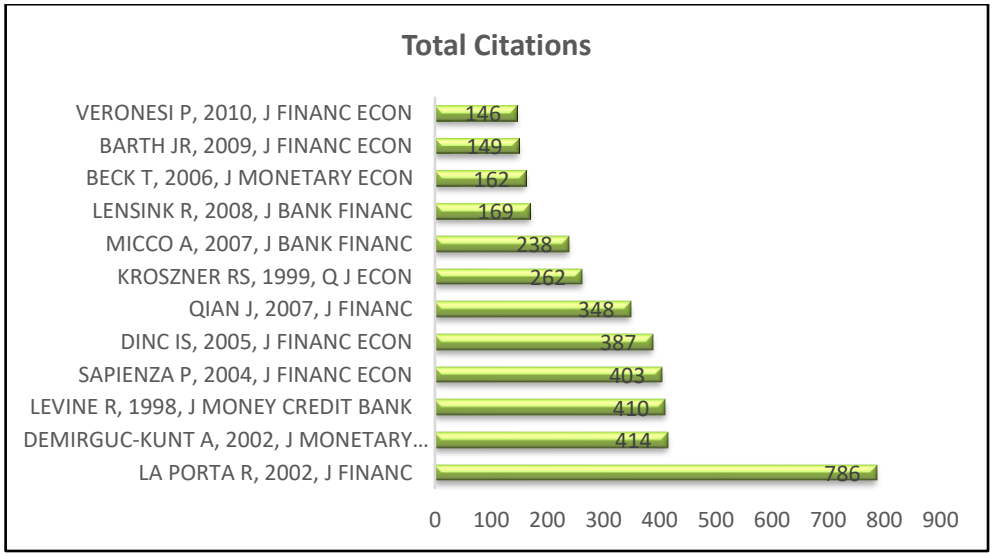


Figure 6. Leading articles by total and local citations

This figure shows the most popular articles in terms of total and local citations. Local citation indicates the number of times an article is cited within our sample, while total citation indicates the total number of times an article is cited by other articles that exist in the Core Collection of WOS.



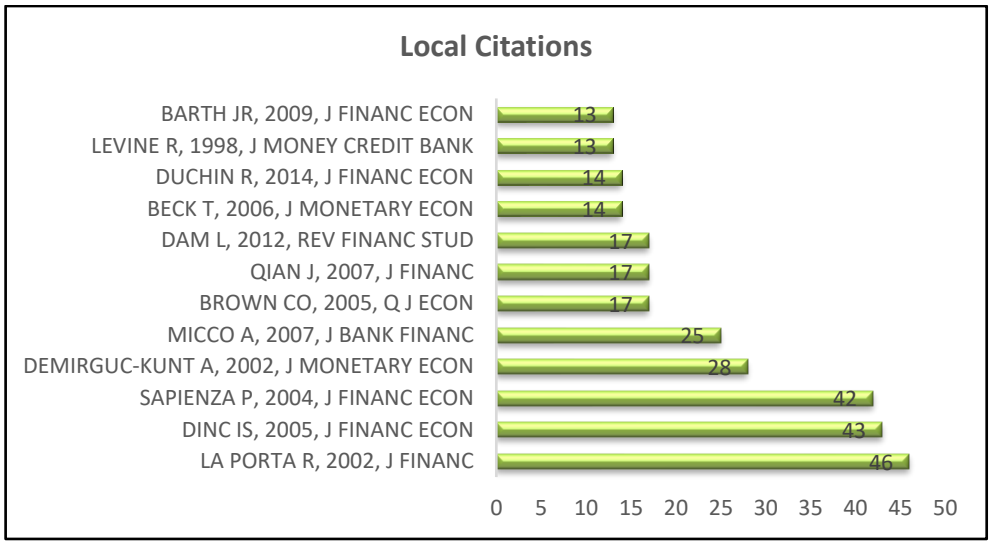


Figure 7. Co-citation network of articles

This figure shows co-citation mapping of the most influential references and divided into four major streams. The red cluster refers to the impact of politically motivated government interventions, state ownership, and political connections on bank lending and performance. The green cluster highlights how the legal and institutional environment affects banking and financial development. The blue cluster highlights the impact of government and regulatory interventions, bank regulation and supervision, and deposit insurance on bank risk-taking. The yellow cluster refers to the main measurement methods for political risk and advanced econometric methods.

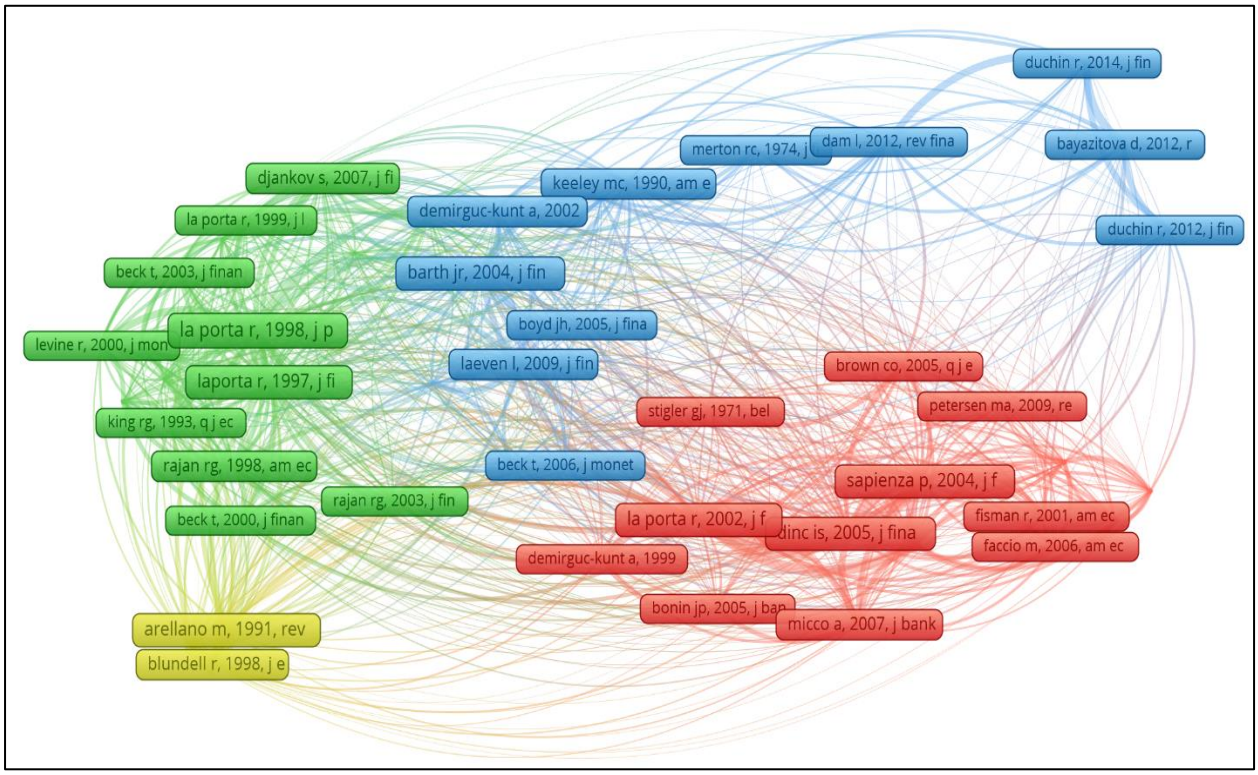


Figure 8. Historiograph: research themes, links, and trends

This figure provides the historiography, based on papers with a local citation score greater than 40 and using HistCite software. It allows the detection of major research themes through a content analysis on nodes and links across topics, together with their trend across time.

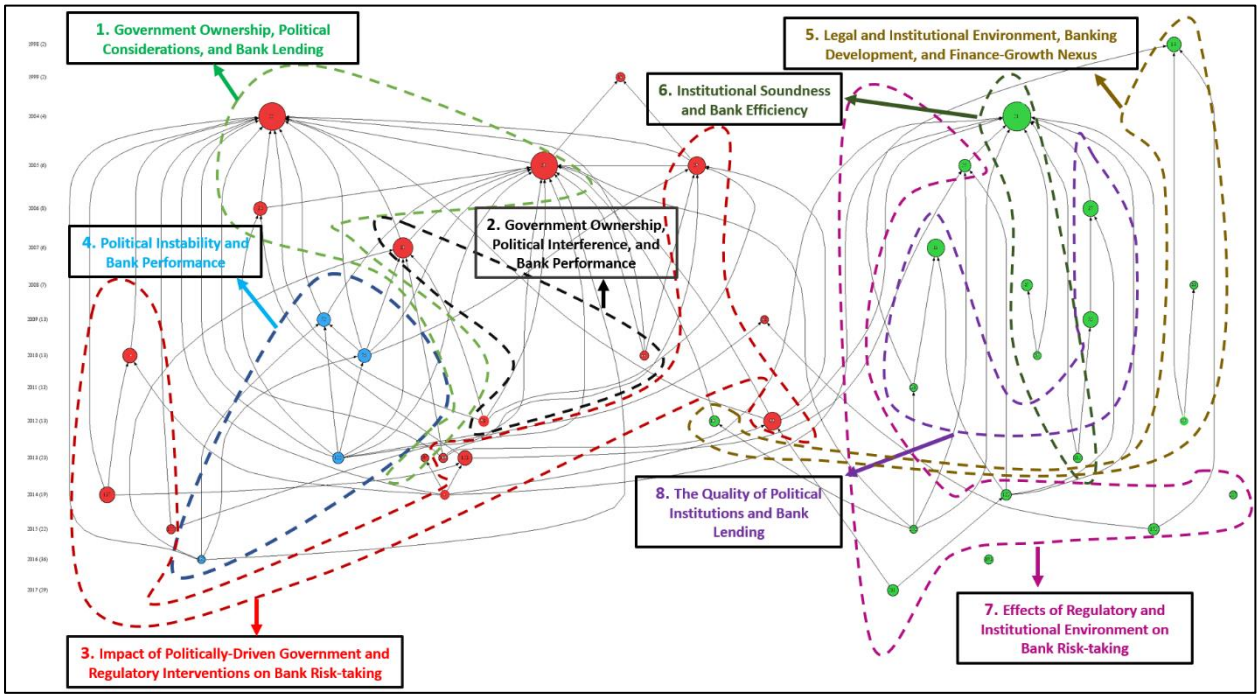


Figure 9. Trends in research themes by cluster

This figure shows thematic trends in the banking literature on political risk categories, including government interventions (red), political and institutional environment (green), and political instability (blue), as well as the total number (black). Data on annual production of each category were extracted through content analysis.

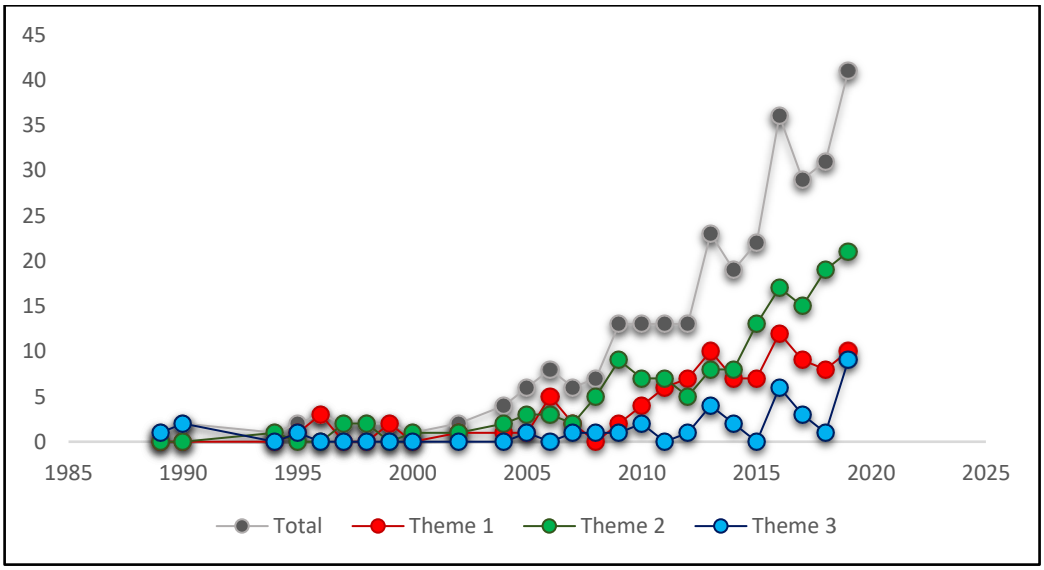


Figure 10. Co-occurrence network of most frequent keywords

This figure shows the co-occurrence network of the 25 most frequent keywords. The proximity of the key terms in each cluster implies the cluster focus.

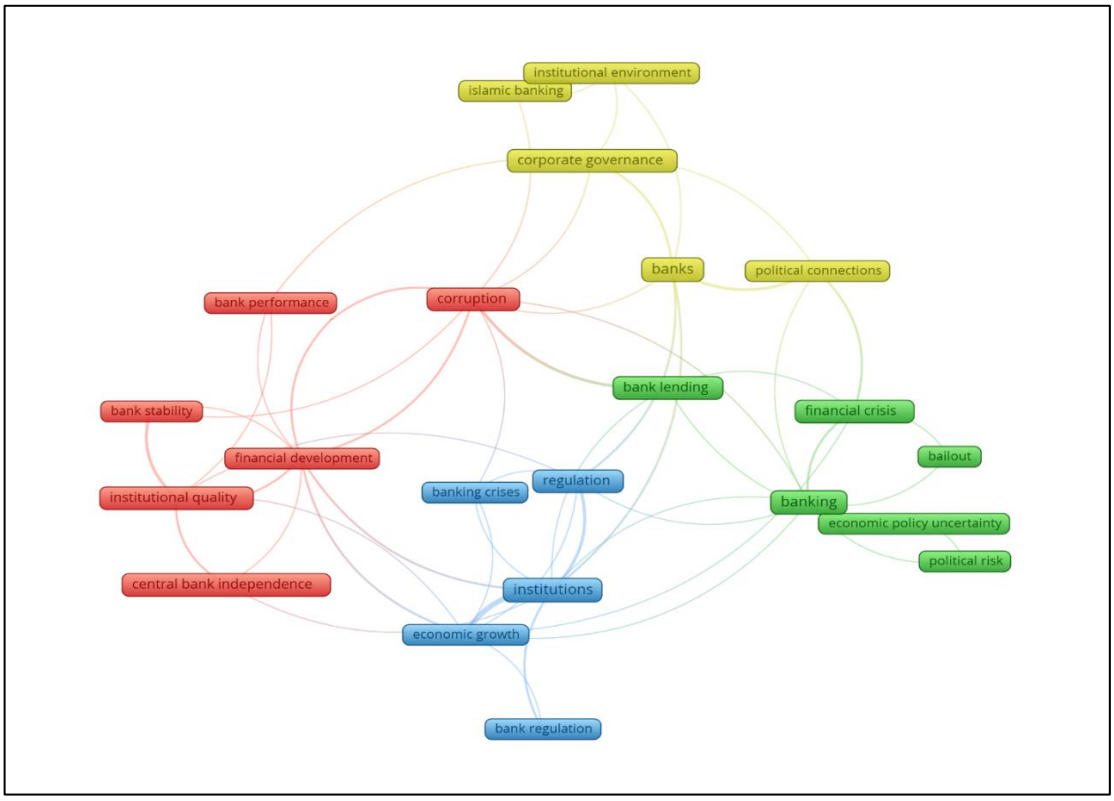


Figure 11. Evolution of co-occurrence clusters

This figure illustrates the growth of co-occurrence clusters. We compute an annual aggregate index for each co-occurrence cluster by extracting the annual frequency of keywords in each cluster. The colors refer to the color of the clusters in the co-occurrence network (Figure 13).

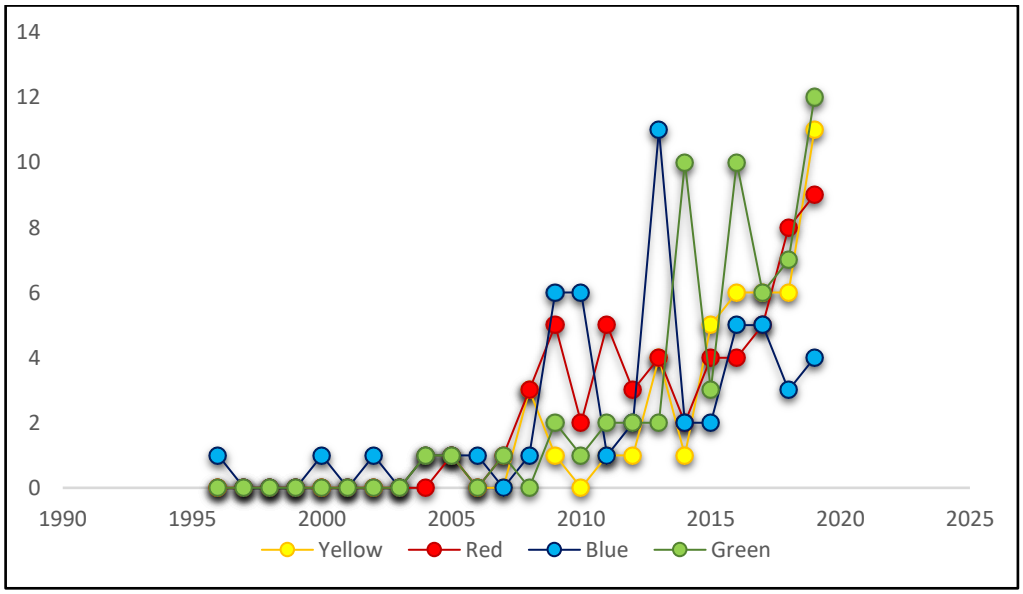
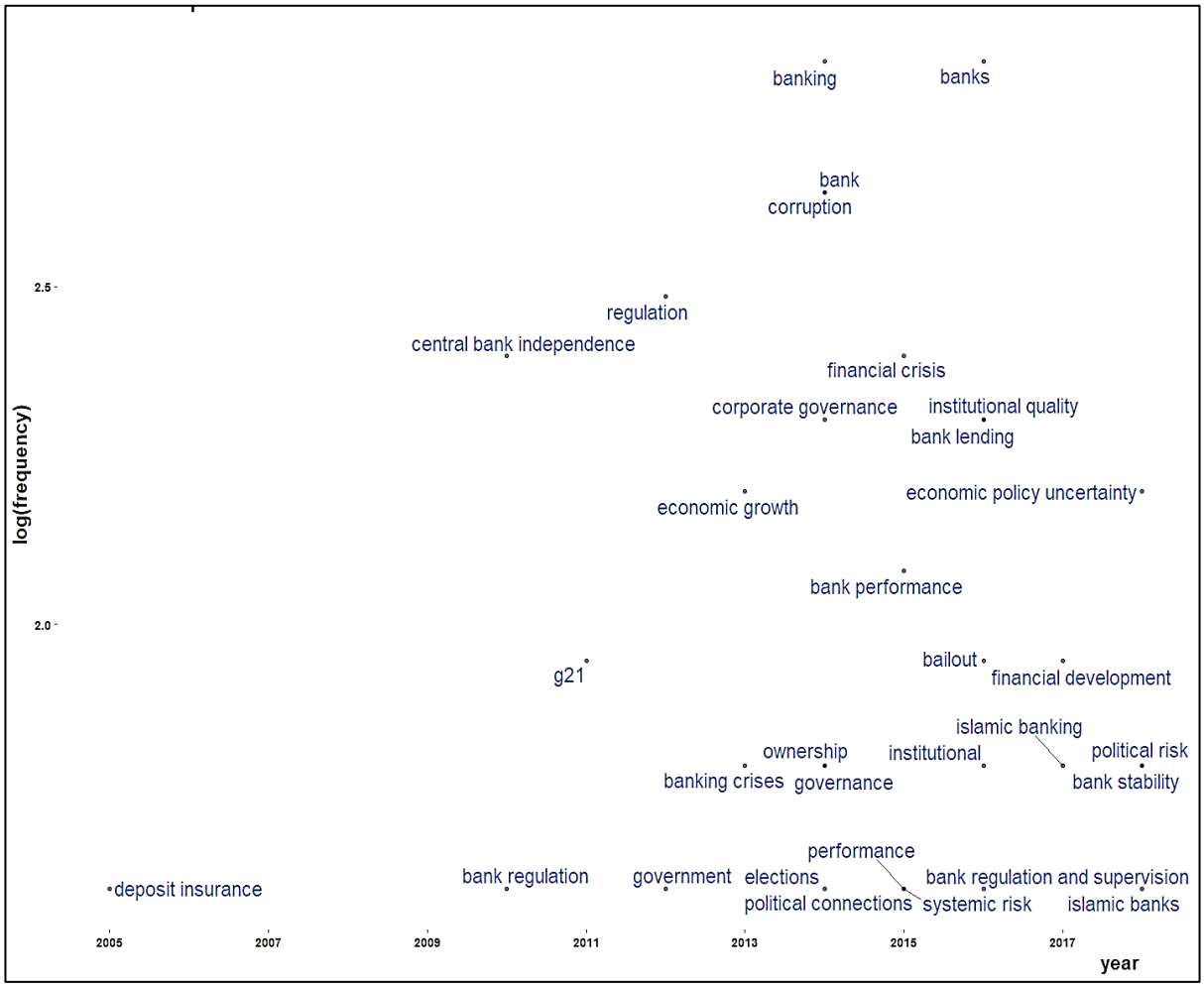


Figure 12. Keyword trend

This figure shows how keywords evolved across time. The horizontal axis shows the timespan and the vertical axis is the rate of occurrence.



Chapter 2

Liquidity Pressure, Policy Interventions, and Sovereign-Bank Diabolic Loop

Liquidity Pressure, Policy Interventions, and Sovereign-Bank Diabolic Loop

Mehdi Janbaz, M. Kabir Hassan, Josanco Floreani, Alberto Dreassi

Abstract

We study the sovereign-bank nexus through the liquidity channel. Using a sample of 22 European economies during 2012-2021, we find that an increase in banking liquidity pressures leads to a significant widening of SCDS spreads as banks are encouraged to purchase sovereign bonds for liquidity management purposes, consistent with the "flight to liquidity" phenomenon. This excessive exposure increases the probability of sovereign default in the long run by reducing the sovereign debt sustainability and evoking a diabolic loop scenario. The results also suggest that ECB intervention can reinforce the feedback loop by lowering funding costs and triggering collateral trading.

Keywords: Sovereign-Bank Nexus, Liquidity Pressure, ECB Intervention, Flight to Liquidity, Diabolic Loop.

JEL Classification: E58; G20; G21; H63

1. Introduction

"Sovereign default risk increases both implicitly and explicitly as the banking crisis flares up" (Reinhart and Rogoff, 2011, p.41). The foremost direction of the literature on the interconnectedness of sovereign and bank risks, the so-called diabolic loop or sovereign-bank nexus, supports the phenomenon that risks flow in both directions and can lead to a two-way feedback loop between bank and sovereign risks (Acharya and Steffen, 2015; Acharya et al., 2014; Bolton and Jeanne, 2011; Fratzscher and Rieth, 2019). As Brunnermeier et al. (2011) argue, European banks' endless speculation on their solvency by holding excessive sovereign bonds not only does not protect them from default, but this large exposure to sovereign leads to a twin crisis and increases the probability of sovereign default.

In general, the theoretical and empirical literature on the sovereign-bank nexus through the liquidity management channel is too silent and inconclusive. Risk shifting (Alter and Schüler, 2012), credit exposure (Broner et al., 2014), government guarantees (Acharya et al., 2014), carry trade (Acharya and Steffen, 2015), moral suasion (Ongena et al., 2019), collateral trade (Crosignani et al., 2020), and liquidity management are the main overlapping motives for banks' excessive exposure to domestic sovereign debt.

Based on this theoretical background, our study contributes to the literature on the sovereign-bank nexus in two ways (Acharya et al., 2014; Brunnermeier et al., 2016; Leonello, 2018; Fratzscher and Rieth, 2019):

First, we provide empirical evidence of the sovereign-bank diabolic loop through the liquidity management channel using a novel disentangled indicator of liquidity risk in the banking sector derived from the EURIBOR-OIS spread. Most of the existing literature on the sovereign-bank nexus focuses on the link between bank credit risk and sovereign credit risk

(see Fiordelisi et al., 2020; Fratzscher and Rieth, 2019), perhaps reflecting the opacity of bank solvency during the European debt crisis, while we focus on the link between banking sector liquidity risk and sovereign credit risk to study the liquidity management channel. To distinguish from these studies and to be sure that credit risk does not play a role in examining the liquidity channel, we remove the effect of credit risk by controlling for orthogonal counterparty credit risk.

We hypothesize that aggregate liquidity pressures in the banking sector increase funding liquidity risk and induce banks to buy and hold domestic government bonds for liquidity management purposes, consistent with the "flight to liquidity" phenomenon. This is because government bonds are widely considered as a source of liquidity for banks (Brutti, F., 2011; Nakaso, 2013). Gennaioli et al. (2014) point out that local banks are heavily exposed to domestic government bonds to accumulate liquidity as a reserve for future investment, as the government is very likely to repay once investment returns are very high.

In the short run, this over-exposure to sovereign bonds by mean of liquidity management or balance sheet management should increase economic prosperity and sovereign creditworthiness, but in the long run it increases the likelihood of sovereign default by reducing the sustainability of sovereign debt and creating a feedback loop.

Second, our work draws on the literature on the effects of ECB intervention on the sovereign-bank nexus (see Bechtel et al., 2021; Crosignani et al., 2020; Fratzscher and Rieth, 2019). We add to this literature by finding evidence that ECB interventions under the non-standard measures, in particular the asset purchase program (APP), reinforce the sovereign-bank diabolic cycle through collateral trading and the liquidity management channel.

Using dynamic panel data analysis with a two-step system GMM estimator robust to autocorrelation and heteroskedasticity (HAC) for a cross-country panel of 22 European countries over a period from 2012 to 2021, we examine the sovereign-bank nexus through the liquidity management channel. Regarding the impact of policy interventions on the sovereign-bank nexus, we focus only on the 13 euro area countries in our sample.

The remainder of the paper is organized as follows: Section 2 presents a literature review and hypothesis development; Section 3 presents the data and model used to estimate sovereign credit default swap (SCDS) spreads in Europe; Section 4 presents the empirical results and discusses the main findings. Finally, Section 5 presents our conclusions.

2. Literature Review

2.1 The crux of the doomsday scenario

In the shadow of the European sovereign debt crisis, there is a large literature demonstrating a strong co-movement between banking sector risk and sovereign risk (Breckenfelder and Schwaab, 2018; Dungey et al., 2021; Fiordelisi et al., 2020; Fratzscher and Rieth, 2019), as well as incentives for extensive sovereign bond holding by banks (Podstawski and Velinov, 2018). This large exposure of banks to domestic sovereign bonds reinforces the interconnectedness of bank and sovereign risks, especially when sovereign bond prices are high (Ongena et al., 2019).

According to Podstawski and Velinov (2018), contagion from the sovereign to the bank can be discussed through a number of channels, such as the portfolio channel or the direct exposure channel (De Bruyckere et al., 2013), the collateral channel (Kaminsky et al., 2003), and the guarantee channel (Brown and Dinç, 2011). On the other hand, bank-to-sovereign

contagion can be explained by some channels such as the credit supply channel (Palmén, 2020) and implicit bailout guarantees (Alter and Schüler, 2012).

The literature on the interconnectedness of sovereign and bank risk (see Altavilla et al., 2017; Battistini et al., 2014; De Bruyckere et al., 2013), particularly those that have found evidence of the sovereign-bank nexus (Acharya et al., 2014; Brunnermeier et al., 2011; Leonello, 2018; Fratzscher and Rieth, 2019), shed light on a third trend, referred to as the diabolic loop scenario or sovereign-bank two-way feedback loop. Excessive holding of domestic sovereign bonds by European banks, fueled by speculation on solvency, increases the likelihood of sovereign default and thus a banking crisis (Brunnermeier et al., 2011). As Gennaioli et al. (2014) point out, the adverse effects of sovereign defaults on financial institutions are particularly pronounced for banks holding more sovereign bonds and for banks operating in a more developed market.

The sovereign-bank diabolic loop is directly related to banks' exposure to domestic sovereign debt, and this excessive holding of sovereign debt could be related to various overlapping motives, spanning from credit exposure (Brunnermeier et al., 2016) and risk-shifting (Alter and Schüler, 2012) to moral suasion (Ongena et al., 2019), carry trade (Acharya and Steffen, 2015), and liquidity management. Figure 1 provides an overview of the core of the sovereign-bank nexus.

Insert Figure 1 about here

Banks use government securities for balance sheet management, including liquidity management, by buying government bonds to trade as collateral or to hold as a source of liquidity. Through the liquidity management channel, banks purchase government bonds with the aim of using them as collateral (Gennaioli et al., 2014). Since banks use sovereign bonds as collateral in refinancing operations, a sovereign default can increase banks' liquidity risk

(Buschmann and Schmaltz, 2017). As Crosignani et al. (2020) found, a decline in the cost of sovereign debt induces banks that hold too much liquidity due to costly external funding to use their reserves to purchase sovereign bonds and use them as collateral in refinancing operations, consistent with the collateral trading hypothesis.

The liquidity channel is one of the main motives for banks' exposure to sovereign bonds, which is less explored both theoretically and empirically. We add to the literature on the core of the sovereign-bank nexus through banks' over- exposure to sovereign bonds by providing evidence on the liquidity management channel. We believe that the intervention of ECB generates a worse-case scenario and reinforces the mechanisms that lead to a diabolic loop, in particular by triggering banks' collateral trading behavior.

2.2 Hypothesis development

Hypothesis 1: *The increase of banking sector liquidity risk leads to an increase in sovereign credit risk.*

To investigate the sovereign-bank nexus through the liquidity channel, we examine the impact of a novel liquidity risk indicator derived from EURIBOR-OIS on SCDS spreads. Any change in the spread between 3-month LIBOR and 3-month OIS can alter the money market, credit supply, and the effectiveness of monetary policy (Taylor and Williams, 2009). This spread can be described as the sum of credit risk premia and liquidity premia (Bank of England, 2007). This measure only indicates liquidity pressures in the banking sector and interbank markets.

Assuming that government bonds are relatively liquid assets (Brutti, F., 2011; Nakaso, 2013), we hypothesize that liquidity pressures in the banking sector constrain funding liquidity, and the increase in funding liquidity risk causes banks to flee to more liquid assets by buying

domestic government bonds for liquidity management, consistent with the "flight to liquidity" phenomenon.

Government bonds are mainly seen as quite liquid securities (Correa and Sapriza, 2014) and as a source of liquidity for financial institutions (Holmström and Tirole, 1993). Domestic banks view government bonds as very attractive assets to comply with their liquidity obligations. The logic behind the provision of liquidity by the government and liquidity management using government bonds is outlined by Holmström and Tirole (1998). Given the safe status, relatively low volatility, and high market activity of government bonds, as well as their advantages as active diversifiers for portfolios that limit the overlap effects of volatile assets, these bonds are recognized as liquid assets and a true standard for pricing (Nakaso, 2013). Gennaioli et al. (2014) point out that local banks are heavily exposed to domestic government bonds to accumulate liquidity as a reserve for future investment, as the government is very likely to repay once investment returns are very high. Moreover, sovereign default is less likely and very costly in more developed countries than in less developed countries (Gennaioli et al., 2014).

The use of government bonds for liquidity management increases the government's wealth and creditworthiness in the short run, but in the long run, over-exposure to government bonds negatively affects the sustainability of the government's debt and consequently increases the likelihood of a sovereign default by creating a diabolic scenario.

Hypothesis 2: *ECB liquidity injections reinforce the sovereign-bank diabolic loop and so increase the probability of sovereign default.*

Central bank liquidity injections for banks are mainly via sovereign debt (Dell'Ariccia et al., 2018), and the fact that banks are highly prone to sovereign debt is due to the importance

of sovereign debt for central bank liquidity injections (Battistini et al., 2014; Gennaioli et al., 2014).

We hypothesize that ECB interventions intensify the sovereign-bank nexus through the liquidity management channel, as ECB liquidity injections reinforce the mechanisms that lead to the doomsday scenario. Liquidity injections lower funding costs and make government bonds more attractive to banks relative to other investment and funding options. Thus, these interventions motivate banks to use their accumulated reserves to buy government bonds and use them as collateral in refinancing operations. Crosignani et al. (2020) also argue that ECB liquidity injections make government bonds more appealing for banks and trigger collateral trading. This collateral trading behavior is likely to be exacerbated if banks hold too much liquidity. Holding liquidity is a normal market response by banks when the cost of external funding is high. Severe liquidity shocks in interbank markets may also cause banks to hold liquidity.

The size of monetary policy measures plays a crucial role in balancing risks in the banking and sovereign sectors. A large injection of liquidity negatively affects the sustainability of government debt, reduces the creditworthiness of the government, and consequently increases the risk of the banking sector. This leads to a doomsday scenario, as banks get themselves into trouble by buying sovereign debt.

In this context, we refer to the EU bail-in regulation and the asset purchase programme (APP) of ECB, which is a component of non-standard policy measures. Fiordelisi et al. (2014) highlight that, compared to the standard measures, the non-standard measures are not able to restore the interbank market (3M LIBOR-OIS spread) and ensure the performance of financial intermediation.

There is a body of evidence that monetary policy actions contribute significantly to reducing SCDS spreads (Moessner and de Haan, 2021) and weakening the bank-sovereign nexus (Bechtel et al., 2021). Fiordelisi et al. (2020) find that the announcement of the recent bail-in programme reduces co-movement between sovereign and bank credit default swaps (CDS). In a related study, Bechtel et al. (2021) find evidence that the Public Sector Purchase Programme (PSPP), as a component of APP, significantly weakens the sovereign-bank nexus through the credit risk channel by reducing the stock of sovereign bonds, increasing excess liquidity, and raising the price of sovereign bonds.

In contrast, some argue that monetary policy actions increase bank and sovereign risk (Lewis and Roth, 2019; Moessner, 2018) and strengthen the sovereign-bank nexus (Crosignani et al., 2020; Fratzscher and Rieth, 2019). As Crosignani et al. (2020) document, ECB liquidity injection through the 2011 three-year long-term refinancing operations (LTROs) strengthened the sovereign-bank nexus in Portugal during the sovereign debt crisis by creating an incentive to purchase local sovereign debt that was associated with a decline in the cost of public debt. Fratzscher and Rieth (2019) also examined the impact of some non-standard monetary policy measures from ECB on the SCDS of euro area countries and found limited and mixed evidence that ECB interventions can shift risks from the banking sector to the government sector. As Fratzscher and Rieth (2019) point out, OMTs, SMPs, and LTROs with a maturity of 6-12 months have a negative effect on SCDS, and LTROs with a maturity of 3 years have a positive effect. de Haan et al. (2021) also found that the announcement of unconditional LTROs leads to higher holdings of domestic government bonds by banks.

The ECB LTRO provide funding to local banks in peripheral euro area countries to increase banks' exposure to their domestic sovereign bonds (Acharya and Steffen, 2015). From

this viewpoint, banks use liquidity from ECB to increase their portfolio of government bonds rather than providing liquidity to the banking sector.

Along these lines, Lewis and Roth (2019) have noted some evidence of drawbacks and unintended consequences of ECB' APP on the stability of banks and financial systems, in particular an increase in liquidity and market risk. Moessner (2018) also shows that the announcement of ECB' APP leads to an expansion of SCDS in Germany.

Therefore, it is likely that ECB 's interventions reinforce the mechanisms that lead to a diabolic loop and increase the probability of sovereign default, as liquidity injections lower funding costs and trigger bank collateral trading behavior.

3. Data and method

3.1 Sample

We consider a sample of twenty-two European countries, consisting of 21 EU countries in addition to Norway over a period from July 2012 to January 2021 in two panels, one for the entire sample and one for eurozone countries only. The data for the period before July 2012 contain a large number of missing values. Therefore, we could not include data for the main period of the European sovereign debt crisis. Our sample includes Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden. All these countries are members of the European Economic Area (EEA).

3.2 Variables

Table 1 provides a complete list of variables, descriptions of the measures, and the corresponding sources, while Table 2 describes the main characteristics of our data.

Insert Tabel 1 about here

Insert Tabel 2 about here

3.2.1 Dependent variable

Sovereign credit default swap (SCDS) spreads measure sovereign credit risk (Blommestein et al., 2016) and market-assessed sovereign debt risk (Aizenman et al., 2013). Following Ang and Longstaff (2013), we rely on SCDS spreads instead of sovereign bond spreads because they are a better measure of sovereign credit risk. In this empirical study, the dependent variable is the percentage change in 5-year senior USD-dominated SCDS spreads for each country. Five-year senior CDS are considered by market participants to be the most representative and most traded maturity in terms of liquidity (Antón et al., 2018; Cottrell et al., 2021). We use USD-dominated SCDS as used in previous studies of SCDS for the euro area (Antón et al., 2018). Following Longstaff et al. (2011), we also rely on monthly data. Figure 2 shows the heterogeneity of SCDS spreads across European countries in our sample.

Insert Figure 2 about here

3.2.2. Independent variable

The independent variable is a novel decoded indicator of banking sector liquidity risk derived from the EURIBOR-OIS spread for euro area countries and the corresponding values for non-euro area countries. The difference between the 3-month EURIBOR (interbank rate) and the 3-month OIS (risk-free rate) is used as the EURIBOR-OIS spread. EURIBOR-OIS is the difference between an interest rate with some built-in credit risk and an interest rate that is virtually risk-free. Without transaction costs and credit risk, the interbank rate is equal to the OIS. Thus, the widening of the spread is an indication of the potential risks in the banking sector.

EURIBOR-OIS or LIBOR-OIS spread represents the marginal cost of funding for financial institutions (Klingler and Syrstad, 2021), interbank risk premia (Heider et al., 2015), counterparty risk in the banking sector (Gorton and Metrick, 2012), liquidity constraints in the banking sector (Cottrell et al., 2021), and both liquidity risk and counterparty risk in the interbank market and the banking sector (Schwarz, 2019). Dubecq et al. (2016) explain that the decline in interbank spreads in 2012-2013 is related to the decline in the liquidity component, while Taylor and Williams (2009) say that counterparty risk is the main component of the LIBOR-OIS spread. Schwarz (2019) finds that one-third of the LIBOR-OIS spread is associated with liquidity risk.

To extract the liquidity component from the EURIBOR-OIS and generate the decoded indicator, we adopt a two-step approach. First, we follow the method used by Arce et al. (2013) and Antón et al. (2018) to construct a measure of counterparty risk by performing PCA on the CDS of primary dealer banks in the CDS market. The first principal component of the CDS of these seventeen banks would be the counterparty risk indicator (CPR). Due to their liquidity and popularity, we rely on USD-denominated 5-year CDS. The first principal component explains about 83% of the total variance. Table 3 and Figure 3 show the result of the PCA analysis. Second, we remove the effects of this counterparty risk measure from the EURIBOR-OIS spread using orthogonalization and a modified Gram-Schmidt procedure (Golub and Van Loan, 2013).

Insert Tabel 3 about here

Insert Figure 3 about here

Orthogonalization is about finding a set of orthogonal vectors spanning a given subspace. In other words, orthogonalization is used to make two variables mathematically independent. A simple Gram-Schmidt procedure is applied to generate the orthogonal vectors of the two

variables x1 (CPR) and x2 (EURIBOR-OIS). Since these two variables are highly correlated, the modified Gram-Schmidt procedure for orthogonal vectors is used instead of the classical procedure. The orthogonal variables of ox1 (CPRO) are calculated by removing the constant from x1, and the orthogonal variable of ox2 (LRO) is generated by removing the effects of the constant and of x1 from x2.The shortened procedure is shown below:

(a) LIBOIS = f (LR, CPR)

(b) CPRO = CPR – r

(c) LRO = f (LR, CPR) – CPR – r

where, *LR* and *CPR* represent the liquidity and credit components of EURIBOR-OIS (*LIBOIS*). *CPR* is the new counterparty risk indicator derived from PCA analysis. Accordingly, *CPRO* and *LRO* are orthogonal variables of *CPR* and *LIBOIS* with respect to *CPR*.

The orthogonal EURIBOR-OIS based on the CPR indicates the liquidity risk component or the orthogonal liquidity risk (LRO), since the impact of the counterparty risk component is excluded from the spread. According to the results (Table 4), orthogonalized liquidity risk is completely independent of orthogonal counterparty risk. The new unbundled liquidity risk is strongly correlated with EURIBOR-OIS, while the correlation of orthogonal counterparty risk with EURIBOR-OIS is not very significant.

Insert Tabel 4 about here

3.2.3 Moderators

Central bank intervention can have a negative impact on bank risk or lead to risk transfer from banks to sovereigns. We study this phenomenon by focusing on the effects of non-standard policy interventions by ECB, in particular by APP. The ECB's APP, which includes the targeted LTRO announced and implemented in October 2014 to address the challenge of low HICP inflation.

We examine the impact of the Eurosystem APP, including the asset-backed securities purchase programme (ABSPP) (since November 2014), the public sector purchase programme (PSPP) (since March 2015), and the corporate sector purchase programme (CSPP) (since June 2016), on the dynamics of SCDS. The percentage change in net purchases per month is used as a measure of the three programmes at APP. We also add a dummy variable for the period of the bail-in regime starting in November 2014.

3.2.4 Covariates

Orthogonal counterparty credit risk (CPRO) is controlled to block the credit risk channel. We also control for the impact of a number of important determinants of sovereign credit risk. Given the literature on the large impact of national indices on CDS (Collin-Dufresne et al., 2001; Longstaff et al., 2011), we control for country-specific market exposure of SCDS using country-specific total market returns and volatility in our study. Following Longstaff et al. (2011), we use the net dividend-based total return index instead of the national stock market return as an indicator of SCDS's market exposure because dividend dynamics contain important information about market functioning. In addition, following Collin-Dufresne et al. (2001), we also control for the effects of the slope of each country's yield curve.

The measure of sovereign debt explains cross-country differences in sovereign credit risk (Augustin et al., 2020). Given the importance of sovereign debt and fiscal space for sovereign stability and creditworthiness (Aizenman et al., 2013; Chernov et al., 2020), we control for country-specific total debt as a percentage of GDP. Exchange rate volatility, or euro/USD exchange rate uncertainty, is another control variable in this study, as documented by Fontana and Scheicher (2016). It is well known that CDS market liquidity and asymmetric information represented by the bid-ask spread affect SCDS pricing (Antón et al., 2018). Moreover, a

significant part of sovereign credit spreads is due to a liquidity premium (Passadore and Xu, 2020).

The degree of political uncertainty plays a crucial role in shifting risks from the banking sector to sovereigns (Bales, 2021). We focus on Davis' (2016) Global Economic Policy Uncertainty (GEPU) index to control for the impact of global policy uncertainty on SCDS. The GEPU index is a monthly news-based index that contains the GDP-weighted average of the country-specific EPU indices of 21 leading economies, including eight European countries. Each national index was constructed based on the frequency of simultaneous occurrence of the three terms economy, politics, and uncertainty in local newspapers.

The severe collapse of the oil market in April 2020 due to the outbreak of Covid-19 and the failure of the negotiations of OPEC and its impact on the price increase of SCDS makes it necessary to control the impact on the crude oil market. Following Asli Demirguc-Kunt et al. (2021), who used oil price instead of oil price yield as a measure of banks' oil exposure, we used monthly Brent crude oil prices.

We constructed a dummy variable to control for the impact of the Covid-19 crisis on EEA countries' CDS. Although the first waves of Covid-19 were observed in late 2019, Covid-19 becomes a global pandemic in March 2020. Therefore, we consider March 2020 as the beginning of the Covid-19 crisis in our analysis. Finally, we use GDP growth as a popular macroeconomic driver of CDS (Heinz and Sun, 2014) to control for the effects of country-specific macroeconomic characteristics in our analysis.

3.3. Empirical model

In this study, we use a reduced-form model specification in the form of a dynamic panel model (Levine et al., 2000) in which endogenous variables are defined as a function of lagged

endogenous variables and exogenous variables. We examine the impact of the unbundled liquidity risk on SCDS spreads (H1) using the following equation:

$$SCDS_{it} = \alpha_0 + \delta\ SCDS_{it-1} + \beta_1\ LRO_{it} + \beta_2\ CPRO_{it} + \sum_{k=1}^{k} \beta_{3+k}\ C_{itk} + \gamma_i + \theta_t + u_{it} \quad (1)$$

where *SCDSi,t* denotes the percentage changes in sovereign credit default swap spreads of country *i* at time *t*, $SCDS_{it-1}$ is the lagged dependent variable, LRO_{it} denotes the banking sector liquidity risk of country *i* at time *t*, $CPRO_{it}$ is the orthogonalized counterparty risk that is uncorrelated with LRO_{it}, *Ci,t,k* is a vector of control variables including GEPU, crude oil price, total market return, Euro-USD volatility, public debt to GDP ratio, bid-ask spread, slope of yield curve, GDP growth, and Covid-19 dummy, γi denotes the country fixed effect and θt refers to the time fixed effect, and *uit* is the error term.

To examine the impact of the non-standard measures of ECB on the relationship between banking sector liquidity risk and the SCDS (H2), we estimate equation 2 four times for four different programmes. We test the effects of the three measures announced in the ECB APP, including the ABSPP, the CSPP, and the PSPP, on the relationship between banking sector liquidity risk and SCDS. In addition, we test this hypothesis once with a dummy variable covering the entire period of liquidity injections starting in November 2014.

$$SCDS_{it} = \alpha_0 + \delta\ SCDS_{it-1} + \beta_1\ LRO_{it} + \beta_2\ CPRO_{it} + \beta_3\ ECB_{it} + \beta_4\ LRO * ECB_{it} + \sum_{k=1}^{k} \beta_{5+k}\ C_{itk} + \gamma_i + \theta_t + u_{it} \quad (2)$$

where, ECB_{it} is the non-standard measures announced by ECB for 2014-2021.

We analyze the first equation twice separately, once for the entire sample and another time for the euro area countries in the sample, while the second equation refers only to the euro area countries.

To address the econometric concerns of this study, in particular the endogeneity problem, the dynamic nature of the sovereign-bank nexus, the use of dummies, and time-invariant

variables, we use a system Generalized Method of Moment (GMM) estimator developed by Blundell and Bond (1998). Our GMM estimator is robust to autocorrelation and heteroskedasticity (HAC). To test the authenticity of the two-step system GMM estimator, we examine three key assumptions as described in Roodman (2009). In addition, numerous instruments relative to sample size undermine specification tests by increasing standard errors and coefficient biases (Roodman, 2009). Following Levine et al. (2000), we used two approaches of curtailing and collapsing to address the problem of too many instruments. When the number of observations is not large enough, we use the one-step system GMM in estimation, which is more efficient than the two-step sys- GMM for moderately small panels.

To check the specifications, we use a three-step procedure. First, we perform the Levin-Lin-Chu (LLC) and Hadri LM stationary unit root tests (see Hadri, 2000) to verify that all panels are stationary. This allows us to include fixed effects in the models. Second, we estimate the models using a two-step system GMM estimator. Third, we check the validity of the system GMM estimator by performing some specification tests, including the Hanson or Sargan test for overidentifying restrictions, the difference-in-Hanson test, and the Arellano-Bond test (AB).

The first lagged SCDS and the EURIBOR-OIS are the endogenous variables. To find appropriate instruments for the endogenous variables, we rely on the theoretical expectations. In the literature, volatility is the main driver of the LIBOR-OIS spread (Cui et al., 2016). Therefore, we used country-specific market volatility and time dummies as instruments in the model specifications.

4. Empirical results

4.1 Summary statistics

This section provides summary statistics for all the main variables in this study, except for the dummy variables. (Table 2).

The dramatic jump in interest rate spreads such as the 3M EURIBOR-OIS spread at the onset of the Covid 19 pandemic (Figure 4) is reminiscent of the dramatic and prolonged escalation of the LIBOR-OIS spread during the GFC, particularly on August 7, 2007, as reported by Taylor and Williams (2009). The LIBOR-OIS spread, considered a "black swan," exhibited asymmetric behavior during the financial crisis (Olson et al., 2012). The increase in the EURIBOR-OIS spread could be due to the increase in the probability of default associated with credit risk or the impact of market liquidity, as argued by Schwarz (2019).

Taylor and Williams (2009) find that the remarkable jumps in LIBOR-OIS spreads at the beginning of the GFC are due to an increase in counterparty risk. In contrast, Gefang et al. (2011) show that the dynamics of the LIBOR-OIS spread during the GFC period (2007-2009) are mainly due to liquidity risk and that the liquidity component of LIBOR-OIS is more volatile than the credit risk component. Schwarz (2019) also highlights that the LIBOR-OIS spread is mainly derived from the liquidity component. In short, liquidity risk is the main driving component of LIBOR-OIS, especially in the short run, while counterparty credit risk determines LIBOR-OIS in the long run (Gefang et al., 2011).

Insert Figure 4 about here

As Figure 4 shows, the counterparty risk component of the EURIBOR-OIS spread is much more volatile over time than the liquidity risk component, except during the Covid 19 pandemic. During the onset of the Covid 19 crisis, the liquidity component is more volatile than the credit risk component.

4.2 Dynamic panel data analysis

4.2.1 Sovereign-bank nexus through liquidity channel

In this section, we present the empirical results aimed at answering the research questions by testing the equations with a system GMM approach.

Insert Table 5 about here

Table 5 shows that a one-unit change in the liquidity risk (LRO) of the banking sector has a positive effect on the SCDS spreads of European countries, leading to an increase of 2.7%, while this effect increases to 6.3% in the euro area. The results confirm the significant positive association between LRO and SCDS spreads in both panels, which is consistent with theory.

In the sovereign credit risk literature, there are several pieces of evidence that SCDS are exposed to exchange rate volatility (Fontana and Scheicher, 2016), market yield (Longstaff et al., 2011), slope of yield curve (Augustin, 2018), and liquidity in the SCDS market (Arce et al., 2013). Our results not only confirm this exposure for CDSs of euro area countries, but also show that SCDSs are significantly affected by economic policy uncertainty and crude oil market dynamics.

4.2.2 ECB liquidity injections and sovereign-bank nexus

Table 6 illustrates the results in terms of the moderating effect of ECB policy measures on the relationship between the disentangled banking sector liquidity risk and SCDS. The first column refers to a dummy variable reflecting the main bail-in period starting in November 2014. Columns 2 to 4 refer to the effects of the three components of the APP.

Insert Table 6 about here

Regarding the impact of the ECB non-standard policy measure on sovereign credit risk, results vary for different measures. Fratzscher and Rieth (2019) also report different results for

different programs. The results (Table 6) show that the announcement and implementation of APP, in particular the PSPP and the CSPP, led to a significant expansion of SCDS in the euro area by 2.3% and 13.6%, respectively, which is consistent with Moessner (2018) who finds the same for Germany's SCDS in response to the announcement of APP.

Using a dummy variable for the period of ECB liquidity injections, we also show that these monetary policy interventions generally led to an increase in sovereign credit risk and a shift of risk from the banking sector to the sovereign sector, consistent with Fratzscher and Rieth (2019).

Table 6 also shows that ECB liquidity injections by all three components of APP (PSPP, CSPP, ABSPP) strengthen the link between banking sector liquidity risk and sovereign credit risk. However, the results in the first column show that quantitative easing measures have generally been able to break the sovereign-bank nexus.

Given the direct impact of policy actions on SCDS spreads and the moderating effect of these measures on the sovereign-bank nexus, we can conclude that ECB interventions at APP using the PSPP and CSPP increase the probability of sovereign default by strengthening the sovereign-bank nexus.

Tables 5 and 6 present the full results of the system GMM estimation and specification tests for the developed hypotheses. The specification tests confirm that all models are correctly specified in terms of instrument validity and endogeneity.

4.3 Robustness tests

To confirm the result of this empirical study, we perform a robustness test using a different but consistent econometric method. We robust our result on the use of instrumental variables

(IV) through a "two-stage least squares" (2SLS) estimation, which is a common econometric method in financial studies (e.g., Antón et al., 2018).

To deal with correlations between independent variables and error terms, we use a reduced form IV (robust for first stage regression). In the first stage, we estimate an OLS for all exogenous variables and instruments. In the second stage, we estimate only the independent variables without instruments.

The accuracy of the IV estimator is the subject of some specification tests. First, we need to test the validity of the instruments using the first-stage F-test. Then we use the endogeneity test to show that the variables are exogenous. Finally, we show that the instrument set is valid by the overidentifying restriction test.

Insert Table 7 about here

Table 7 shows the results for the first specification with the same set of variables as in table 5, but with a different econometric approach. Consistent with previous results, banking sector liquidity risk is significantly associated with the SCDS spread. In both panels, a one-unit change in liquidity risk leads to a 3.4% change in SCDS. Thus, we find robust empirical evidence that liquidity pressures in the banking sector lead to a significant decline in the sovereign creditworthiness of both European and euro area countries.

Insert Table 8 about here

The results of Table 8 help us confirm the previous results regarding the second hypothesis. Our earlier evidence of a substantial expansion of SCDS in response to the CSPP and the PSPP is now limited to the PSPP. The introduction of the PSPP increases the price of SCDS by 2% by triggering a two-way feedback loop.

However, the dummy still shows a positive sign, implying that quantitative easing has worsened the creditworthiness of euro area countries by 5.9%. On the other hand, our earlier finding that all three components of APP have a positive impact on the sovereign-bank nexus is no longer significant for the CSPP. These results show that the implementation of ABSPP and PSPP strengthens the sovereign-bank nexus.

So, we confirm only the second hypothesis for PSPP. In other words, we can say that this study provides robust empirical evidence that ECB liquidity injections through PSPP reinforce the sovereign-bank nexus through the liquidity channel and consequently increase sovereign credit risk.

4.4 Discussion

The creditworthiness of sovereigns is significantly affected by bank stress (Böhm and Eichler, 2020). Banking stress can also lead to deteriorating conditions for sovereigns through sovereign debt outflows (Reinhart and Rogoff, 2011). We add to the extensive literature on the link between sovereign defaults and banking crises (Altavilla et al., 2017; Breckenfelder and Schwaab, 2018; Dungey et al., 2021; Fiordelisi et al., 2020; Sosa-Padilla, 2018), particularly those that find evidence of a sovereign-bank nexus (Acharya and Steffen, 2015; Acharya et al., 2014; Bolton and Jeanne, 2011; Crosignani et al., 2020; Fratzscher and Rieth, 2019; Leonello, 2018) by providing empirical evidence on the liquidity management channel, including liquidity holding through the holding of domestic government bonds and collateral trading using reserves, especially in response to ECB liquidity injections under the PSPP and CSPP.

First, we construct an unbundled liquidity risk indicator extracted from EURIBOR-OIS to study the sovereign-bank nexus through the liquidity channel. By controlling for orthogonalized counterparty risk, we prevent the credit exposure channel from affecting our

analysis of the liquidity channel, which distinguishes this study from previous studies of the credit risk channel. Our results show that liquidity shocks in the banking sector significantly increase sovereign credit risk. Liquidity stress in the banking sector and interbank market may provide an incentive for banks to hold liquidity, especially because sovereign bonds are known to be liquid and safe assets, investing in these bonds is beneficial for banks, and sovereign defaults are less likely in European countries (see, e.g., Gennaioli et al., 2014). Therefore, buying government bonds for liquidity management purposes is a normal response to liquidity shocks, leading to over-exposure to sovereign bonds and triggering a twin crisis in the long run.

Second, we hypothesize that ECB liquidity injections from APP reinforce the mechanism that leads to a sovereign-bank diabolic loop, increasing the probability of sovereign default. The estimation of the second specification for three components of APP and a dummy variable covering the period of liquidity injections shows limited but robust evidence that the interventions of ECB not only increase the credit risk of euro area countries, but also exacerbate the link between banking sector liquidity risk and sovereign credit risk in the euro area. This implies that policy interventions increase the probability of sovereign default by reinforcing the sovereign-bank nexus and triggering a diabolic loop scenario. Fratzscher and Rieth (2019) also provided limited evidence that LTROs not only partially strengthened the link between bank credit risk and sovereign credit risk, but also led to an increase in sovereign credit risk in the euro area at some point.

The announcement and implementation of the PSPP and CSPP makes government bonds more alluring to banks relative to other investment options by lowering funding costs, which encourages banks to use their reserves to purchase government bonds and trade collateral, consistent with the liquidity management channel. This evidence of the spontaneous effects of ECB interventions on the sovereign-bank nexus and sovereign creditworthiness may raise the

argument that the success of monetary policy actions depends on the extent to which the market is liquid and solvent, as well as on the size of liquidity injections.

Our results on the moderating effect of the intervention of ECB on the relationship between banking sector liquidity and sovereign credit risk are consistent with the results of Crosignani et al. (2020) in the case of the 2011 LTRO and the results of Fratzscher and Rieth (2019) on the 3-year LTRO. Crosignani et al. (2020) also provide evidence for the doomsday scenario for the sovereign-bank nexus as a result of the large liquidity injections from ECB through the collateral trading hypothesis. As Crosignani et al. (2020) show, Portuguese banks significantly increased their holdings of short-term domestic government bonds following the wake of the 3-year LTRO. Contrastingly, this result is at odds with Bechtel et al. (2021), who find that the PSPP weakens the sovereign-bank nexus, and Fratzscher and Rieth (2019) for Outright Monetary Transactions (OMT) and Securities Market Programme (SMP). Fiordelisi et al. (2020) also find evidence in favor of the positive role of ECB intervention in loosening the sovereign-bank nexus.

As we discussed earlier, the results on sovereign credit spread widening in response to non-standard policy announcements are consistent with Moessner's (2018) results for APP in Germany. As Moessner (2018) argues, the widening of term premia for German bonds following the implementation of APP may be related to a reversal of the flight to safety of German sovereign bonds. Fratzscher and Rieth (2019) find mixed evidence: OMT led to a tightening of SCDS, while the 3-year LTRO increased the price of SCDS. Lemke and Werner's (2020) argument that the decline in German government bond yields occurred in response to the PSPP through a portfolio rebalancing channel supports the notion of the unforeseen effects of this policy measure on the shift of risk from banks to sovereigns.

In summary, we argue that while the diabolic loop is mainly due to the opportunistic and risk-taking behavior of banks that take advantage of the most attractive investment opportunities, even if this means speculating on solvency, balance sheet management, in particular liquidity management using sovereign bonds, should also be considered as a cause of excessive exposure to sovereigns. Unintentionally, the interventions of ECB may reinforce this game and provide an implicit incentive for banks to profit from their accumulated liquidity through collateral trading. The presence of a doomsday scenario for the bank-sovereign nexus in response to ECB interventions sheds light on the unintended consequences of ECB non-standard policy actions on sovereign creditworthiness and the unraveling of the nexus between the banking sector and sovereigns.

5. Conclusion

The study contributes in some aspects to the literature on the sovereign-bank feedback loop (Acharya and Steffen, 2015; Acharya et al., 2014; Crosignani et al., 2020; Fratzscher and Rieth, 2019; Leonello, 2018). This study provides the first empirical evidence of the sovereign-bank nexus through the liquidity management channel. We also seek to show that ECB liquidity injections reinforce the mechanisms that lead to a diabolic loop and consequently increase the probability of sovereign failures.

Using a novel indicator of banking sector liquidity risk derived from EURIBOR-OIS, we examine the sovereign-bank feedback loop through the liquidity management channel. In this scenario, the over-exposure to domestic sovereign bonds occurs through holding liquidity and collateral, which is considered as the liquidity management channel. To distinguish from previous studies of the sovereign-bank nexus, which mainly examine the interconnectedness between bank credit risk and sovereign credit risk, the effects of orthogonal counterparty risk are controlled for.

Using a cross-country sample covering 22 European economies from July 2012 to January 2020 and applying a two-step system GMM estimator robust to autocorrelation and heteroskedasticity (HAC), we find that liquidity pressures in the banking sector lead to a significant widening of SCDS spreads. These shocks increase funding liquidity risk and may therefore provide an incentive for banks to hold excessive amounts of domestic sovereign bonds by mean of liquidity management, consistent with the phenomenon of flight to liquidity, especially when these bonds are viewed as a source of liquidity.

We also find robust evidence that ECB liquidity injections through the PSPP lead to a substantial expansion of SCDS by creating a diabolic loop scenario. The liquidity injections lower funding costs and increase the relative demand for government bonds, which in turn triggers banks' collateral trading behavior. In other words, the interventions provide an implicit incentive for banks to spend their reserves and buy government bonds to use as collateral in refinancing operations, consistent with the liquidity management channel.

This liquidity management through collateral trading or liquidity holding by banks leads to over-exposure to sovereign bonds, which triggers a double crisis and reduces the creditworthiness of the sovereign in the long run as the sustainability of sovereign debt declines.

As for future studies, the decomposition of sovereign credit spreads could answer the question of whether or not bank liquidity risk actually affects the credit component of sovereign credit spreads. Also, the heterogeneity of SCDS prices across euro area countries may affect the economic interpretation of the results and necessitates clustering based on SCDS prices or a simple split into a core and a peripheral sample for the euro area. The main policy implications of this study lie in the critical role of market-wide liquidity risk, or banking sector liquidity risk,

as a driver of sovereign debt credit risk and in the way in which policies that initially appear to be effective eventually become a problem for the system as a whole.

References:

Acharya, V., Drechsler, I., & Schnabl, P. (2014). A pyrrhic victory? Bank bailouts and sovereign credit risk. *The Journal of Finance*, *69*(6), 2689-2739.

Acharya, V. V., & Steffen, S. (2015). The "greatest" carry trade ever? Understanding eurozone bank risks. *Journal of Financial Economics*, *115*(2), 215-236.

Aizenman, J., Hutchison, M., & Jinjarak, Y. (2013). What is the risk of European sovereign debt defaults? Fiscal space, CDS spreads and market pricing of risk. *Journal of International Money and Finance*, *34*, 37-59.

Altavilla, C., Pagano, M., & Simonelli, S. (2017). Bank exposures and sovereign stress transmission. *Review of Finance*, *21*(6), 2103-2139.

Alter, A., & Schüler, Y. S. (2012). Credit spread interdependencies of European states and banks during the financial crisis. *Journal of Banking & Finance*, *36*(12), 3444-3468.

Ang, A., and Longstaff, F.A. (2013). "Systemic Sovereign Credit Risk: Lessons from the US and Europe". *Journal of Monetary Economics 60(5)*, 493-510.

Antón, M., Mayordomo, S., & Rodríguez-Moreno, M. (2018). Dealing with dealers: Sovereign CDS comovements. *Journal of Banking and Finance*, *90*, 96-112.

Arce, O., Mayordomo, S., & Peña, J. I. (2013). Credit-risk valuation in the sovereign CDS and bonds markets: Evidence from the euro area crisis. *Journal of International Money and Finance*, *35*, 124-145.

Augustin, P. (2018). The term structure of CDS spreads and sovereign credit risk. *Journal of Monetary Economics*, *96*, 53-76.

Augustin, P., Chernov, M., & Song, D. (2020). Sovereign credit risk and exchange rates: Evidence from CDS quanto spreads. *Journal of Financial Economics*, *137*(1), 129-151.

Bales, S. (2021). Policy uncertainty and the sovereign-bank nexus: A time-frequency analysis using wavelet transformation. *Finance Research Letters*, 102038.

Bank of England, 2007. Markets and operations, Quarterly Bulletin, 490-510.

Battistini, N., Pagano, M., & Simonelli, S. (2014). Systemic risk, sovereign yields and bank exposures in the euro crisis. *Economic Policy*, *29*(78), 203-251.

Bechtel, A., Eisenschmidt, J., Ranaldo, A., & Veghazy, A. V. (2021). Quantitative easing and the safe asset illusion. *Available at SSRN 3864112*.

Blommestein, H., Eijffinger, S., & Qian, Z. (2016). Regime-dependent determinants of Euro area sovereign CDS spreads. *Journal of Financial Stability*, *22*, 10-21.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of econometrics*, *87*(1), 115-143.

Böhm, H., & Eichler, S. (2020). Avoiding the fall into the loop: Isolating the transmission of bank-to-sovereign distress in the Euro Area. *Journal of Financial Stability* , *51* , 100763.

Bolton, P., & Jeanne, O. (2011). Sovereign default risk and bank fragility in financially integrated economies. *IMF Economic Review*, *59*(2), 162-194.

Breckenfelder, J., & Schwaab, B. (2018). Bank to sovereign risk spillovers across borders: Evidence from the ECB's Comprehensive Assessment. *Journal of Empirical Finance*, *49*, 247-262.

Broner, F., Erce, A., Martin, A., & Ventura, J. (2014). Sovereign debt markets in turbulent times: Creditor discrimination and crowding-out effects. *Journal of Monetary Economics*, *61*, 114-142.

Brown, C. O., & Dinç, I. S. (2011). Too many to fail? Evidence of regulatory forbearance when the banking sector is weak. *The Review of Financial Studies*, *24*(4), 1378-1405.

Brunnermeier, M. K., Garicano, L., Lane, P. R., Pagano, M., Reis, R., Santos, T., ... & Vayanos, D. (2016). The sovereign-bank diabolic loop and ESBies. *American Economic Review*, *106*(5), 508-12.

Brunnermeier, M., Garicano, L., Lane, P. R., Pagano, M., Reis, R., Santos, T., ... & Vayanos, D. (2011). European safe bonds (ESBies). *Euro-nomics. com*, *26*.

Brutti, F. (2011). Sovereign defaults and liquidity crises. *Journal of International Economics*, *84*(1), 65-72.

Buschmann, C., & Schmaltz, C. (2017). Sovereign collateral as a trojan horse: Why do we need an LCR+. *Journal of Financial Stability*, *33*, 311-330.

Chernov, M., Schmid, L., & Schneider, A. (2020). A macrofinance view of US Sovereign CDS premiums. *The Journal of Finance*, *75*(5), 2809-2844.

Collin-Dufresne, P., Goldstein, R.S. and Spencer, J.M. (2001). "The Determinants of Credit Spread Changes". *Journal of Finance 56*, 2177-208.

Correa, R., Lee, KH, Sapriza, H., & Suarez, GA (2014). Sovereign credit risk, banks' government support, and bank stock returns around the world. *Journal of Money, Credit and Banking* , *46* (s1), 93-121.

Cottrell, S., Yu, X., Delpachitra, S., & Ma, Y. (2021). What Determines Wholesale Funding Cost of the Global Systemically Important Banks ?. *Journal of Banking and Finance* , 106197.

Crosignani, M., Faria-e-Castro, M., & Fonseca, L. (2020). The (unintended?) consequences of the largest liquidity injection ever. *Journal of Monetary Economics*, *112*, 97-112.

Cui, J., In, F., & Maharaj, E. A. (2016). What drives the LIBOR–ois spread? evidence from five major currency LIBOR–ois spreads. *International Review of Economics & Finance, 45*, 358-375.

Davis, S. J. (2016). *An index of global economic policy uncertainty* (No. w22740). National Bureau of Economic Research.

De Bruyckere, V., Gerhardt, M., Schepens, G., & Vander Vennet, R. (2013). Bank/sovereign risk spillovers in the European debt crisis. *Journal of Banking and Finance*, *37*(12), 4793-4809.

de Haan, L., Holton, S., & van den End, J. W. (2021). The impact of central bank liquidity support on banks' sovereign exposures. *Applied Economics*, *53*(15), 1788-1806.

Dell'Ariccia, MG, Ferreira, C., Jenkinson, N., Laeven, ML, Martin, A., Minoiu, MC, & Popov, A. (2018). Managing the sovereign-bank nexus.

Demirguc-Kunt, A., Pedraza, A., & Ruiz-Ortega, C. (2021). Banking sector performance during the covid-19 crisis. *Journal of Banking and Finance*, 106305.

Dubecq, S., Monfort, A., Renne, JP, & Roussellet, G. (2016). Credit and liquidity in interbank rates: A quadratic approach. *Journal of Banking and Finance* , *68* , 29-46.

Dungey, M., Flavin, T., & Sheenan, L. (2021). Banks and sovereigns: did adversity bring them closer?. *The European Journal of Finance*, 1-26.

Fiordelisi, F., Galloppo, G., & Ricci, O. (2014). The effect of monetary policy interventions on interbank markets, equity indices and G-SIFIs during financial crisis. *Journal of Financial Stability*, *11*, 49-61.

Fiordelisi, F., Girardone, C., Minnucci, F., & Ricci, O. (2020). On the nexus between sovereign risk and banking crises. *Journal of Corporate Finance*, *65*, 101717.

Fontana, A. and Scheicher, M. (2016). "An Analysis of Euro Area Sovereign CDS and Their Relation with Government Bonds". *Journal of Banking and Finance 62*, 126–140.

Fratzscher, M., & Rieth, M. (2019). Monetary policy, bank bailouts and the sovereign-bank risk nexus in the euro area. *Review of Finance*, *23*(4), 745-775.

Gefang, D., Koop, G., & Potter, S. M. (2011). Understanding liquidity and credit risks in the financial crisis. *Journal of Empirical Finance*, *18*(5), 903-914.

Gennaioli, N., Martin, A., & Rossi, S. (2014). Sovereign default, domestic banks, and financial institutions. *The Journal of Finance*, *69*(2), 819-866.

Golub, G. H., & Van Loan, C. F. (2013). *Matrix computations*. JHU press.

Gorton, G., & Metrick, A. (2012). Securitized banking and the run on repo. *Journal of Financial economics* , *104* (3), 425-451.

Hadri, K. (2000). Testing for stationarity in heterogeneous panel data. *The Econometrics Journal*, *3*(2), 148-161.

Heider, F., Hoerova, M., & Holthausen, C. (2015). Liquidity hoarding and interbank market rates: The role of counterparty risk. *Journal of Financial Economics*, *118*(2), 336-354.

Heinz, M. F. F., & Sun, M. Y. (2014). *Sovereign CDS spreads in Europe: The role of global risk aversion, economic fundamentals, liquidity, and spillovers*. International Monetary Fund.

Holmström, B., & Tirole, J. (1993). Market liquidity and performance monitoring. *Journal of Political economy*, *101*(4), 678-709.

Holmström, B., & Tirole, J. (1998). Private and public supply of liquidity. *Journal of political Economy*, *106*(1), 1-40.

Kaminsky, G. L., Reinhart, C. M., & Vegh, C. A. (2003). The unholy trinity of financial contagion. *Journal of economic perspectives*, *17*(4), 51-74.

Klingler, S., & Syrstad, O. (2021). Life after LIBOR. *Journal of Financial Economics*.

Leonello, A. (2018). Government guarantees and the two-way feedback between banking and sovereign debt crises. *Journal of Financial Economics*, *130*(3), 592-619.

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of monetary Economics*, *46*(1), 31-77.

Lewis, V., & Roth, M. (2019). The financial market effects of the ECB's asset purchase programs. *Journal of Financial Stability*, *43*, 40-52.

Longstaff, F. A., Pan, J., Pedersen, L. H., & Singleton, K. J. (2011). How sovereign is sovereign credit risk?. *American Economic Journal: Macroeconomics*, *3*(2), 75-103.

Moessner, R. (2018). Effects of asset purchases and financial stability measures on term premia in the euro area. *Applied Economics*, *50*(43), 4617-4631.

Moessner, R., & de Haan, J. (2021). Effects of monetary policy announcements on term premia in the euro area during the COVID-19 pandemic. *Finance Research Letters* , 102055.

Nakaso, H. (2013). Financial markets without a risk-free sovereign. *BIS Paper*, (72n).

Olson, E., Miller, S., & Wohar, M. E. (2012). "Black Swans" before the "Black Swan" evidence from international LIBOR–OIS spreads. *Journal of International Money and Finance*, *31*(6), 1339-1357.

Ongena, S., Popov, A., & Van Horen, N. (2019). The invisible hand of the government: Moral suasion during the European sovereign debt crisis. *American Economic Journal: Macroeconomics*, *11*(4), 346-79.

Palmén, O. (2020). Sovereign default risk and credit supply: Evidence from the euro area. *Journal of International Money and Finance*, *109*, 102257.

Passadore, J., & Xu, Y. (2022). Illiquidity in sovereign debt markets. *Journal of International Economics*, *137*, 103618.

Podstawski, M., & Velinov, A. (2018). The state dependent impact of bank exposure on sovereign risk. *Journal of Banking and Finance*, *88*, 63-75.

Reinhart, C. M., & Rogoff, K. S. (2011). From financial crash to debt crisis. *American Economic Review*, *101*(5), 1676-1706.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The stata journal*, *9*(1), 86-136.

Schwarz, K. (2019). Mind the gap: Disentangling credit and liquidity in risk spreads. *Review of Finance*, *23*(3), 557-597.

Sosa-Padilla, C. (2018). Sovereign defaults and banking crises. *Journal of Monetary Economics*, *99*, 88-105.

Taylor, J. B., & Williams, J. C. (2009). A black swan in the money market. *American Economic Journal: Macroeconomics*, *1*(1), 58-83.

Tables:

Table 1. Main Variables, Measures, and Sources

Variable	Description	Source
SCDS	Percentage change in 5-yr senior USD-dominated sovereign CDS spreads of country i	Bloomberg & Own Calc
LIBOIS	The difference of 3-M EURIBOR and 3-M OIS for euro area countries, and the difference of the country-specific 3-M interbank offered rate and 3-M risk free rate (OIS) for non-euro area countries	Bloomberg & Own Calc
CPR	The counterparty risk of banking sector proxied by using the first principal component of the CDS spreads of the main 17 banks that act as dealers in the CDS market	Bloomberg & Own Calc
LRO	The liquidity component of LIBOR-OIS is extracted from LIBOR-OIS using a twostep method. First we generate a new and independent indicator of counterparty risk (see CPR). Then we remove the effect of this counterparty risk measure from LIBOR-OIS by using the orthogonalization. The outcome is the market illiquidity or liquidity risk of banking sector.	Bloomberg & Own Calc
CPRO	The orthogonalized counterparty risk that has no correlation with LRO.	Bloomberg & Own Calc
OIL	The percentage change in the price of Crude Oil BFO M1 Europe FOB $/BBl (Europe Brent Spot Price)	Bloomberg & Own Calc
FXvol	The 3M volatility index of Euro-USD for euro area and 3M volatility index of local currency to USD for other European countries	Bloomberg
PDebt	The total amount of sovereign debt of a country to its GDP	Bloomberg
Tret	The total return index based on net dividends of country i	Bloomberg
Slope	The difference between 10-yr overnight indexed swap (OIS) and 3-M OIS of a country	Bloomberg & Own Calc
GDPG	The monthly growth of the GDP of country i	Bloomberg
Bid-Ask	The spread between the Bid and Ask prices of SCDS of country i that indicates market illiquidity in the sovereign CDS market.	Bloomberg & Own Calc
GEPU	The news-based global economic policy uncertainty index based on 21 countries	EPU Web (Davis, 2016)
MV	The 3-M volatility of the prices of the main national index of country i	Bloomberg & Own Calc
OVX	The US CBOE Crude Oil Volatility Index	Bloomberg
Covid-19	A dummy takes the value of one for the period from March 2020 to January 2021 and zero otherwise	Own Calc
Bail-in	A dummy takes the value of one for the period from November 2014 to January 2021 and zero otherwise	Own Calc
ABSPP	The percentage change of monthly net purchases under the ABSPP of ECB's APP	ECB & Own Calc
CSPP	The percentage change of monthly net purchases under the CSPP of ECB's APP	ECB & Own Calc
PSPP	The percentage change of monthly net purchases under the PSPP of ECB's APP	ECB & Own Calc

Table 2. Summary statistics.

This table contains the number of observations, the mean, the standard deviation, and the minimum and maximum values of the variables.

Variable	Obs.	Mean	Std. Dev.	Min	Max
SCDS	2,266	-0.0095507	0.0878471	-0.5187288	1.177215
LIBOIS	2,266	0.0541906	0.2445334	-1.88	1.3
CPR	2,266	4.76E-08	3.743276	-4.741671	14.42304
LRO	2,266	-6.22E-10	1.000221	-5.970869	3.859234
CPRO	2,266	-9.31E-10	1.000221	-2.19745	4.503839
GEPU	2,266	183.1033	75.16766	86.16971	429.459
OIL	2,266	0.002044	0.1177679	-0.5707717	0.5455696
TRet	2,266	6877.165	8599.819	4.52	46082.82
Fxvol	2,266	4.568934	4.013339	0.0087582	13.9
Pdebt	2,266	67.83147	30.06962	16.3	133
BidAsk	2,266	10.74949	10.40839	0.5	50
Slope	2,266	1.042256	1.204174	-3.2655	6.7205
GDPG	2,266	1.802696	3.160479	-18.1	25.23
OVX	2,266	36.24728	19.21386	15.61	170.55
MV	2,266	16.60393	7.329136	5.14	57.07
ABSPP	975	-0.2963176	4.83736	-26.77778	17.21429
PSPP	923	-0.6769528	2.976014	-21.74212	1.640093
CSPP	728	0.5405571	4.975694	-3.055762	36.21384
PEPP	143	0.471723	1.663894	-0.3038643	5.692955

Table 3. Counterparty risk measurement using PCA analysis

The table shows the result of the PCA analysis, including the eigenvalue per component and the share each component has in the data, as well as the list of banks and the mean of the CDS spreads.

Components	Eigenvalue	Proportion	SE-Prop	Bias
Comp1	14.0432	0.8320	0.0215	0.0290
Comp2	0.9262	0.0604	0.0106	0.0231
Comp3	0.6565	0.0386	0.0069	0.0000
Comp4	0.4680	0.0275	0.0049	-0.0193
Comp5	0.1950	0.0115	0.0021	0.0042
Comp6	0.1606	0.0094	0.0017	-0.0101
Comp7	0.1054	0.0062	0.0011	-0.0035
Comp8	0.0846	0.0050	0.0009	-0.0084
Comp9	0.0476	0.0028	0.0005	-0.0022
Comp10	0.0375	0.0022	0.0004	-0.0038
Comp11	0.0262	0.0015	0.0003	-0.0029
Comp12	0.0152	0.0009	0.0002	-0.0010
Comp13	0.0126	0.0007	0.0001	-0.0019
Comp14	0.0084	0.0005	0.0001	-0.0010
Comp15	0.0066	0.0004	0.0001	-0.0012
Comp16	0.0033	0.0002	0.0000	-0.0004
Comp17	0.0028	0.0002	0.0000	-0.0006

Banks	Mean
AXPRS	41.7979
BOFA	75.2486
BARCLAY	83.1282
LCLSA	77.6736
CRDSUI	83.4411
GS	92.1669
HSBC	59.5637
ING	62.8902
ISPIM	146.5587
JPMCC	62.8209
MS	91.1676
RBSPLC	99.5703
SOCGEN	82.2677
STANLNHCO	94.3564
UBSAG	55.3081
UCGIM	162.2250
WELLFARGO	55.3541

Table 4. Orthogonalized components

LIBOIS, CPRO and LRO represent EURIBOR-OIS, orthogonal counterparty risk and orthogonal liquidity risk, respectively.

Orthogonalization procedure using EURIBOR-OIS

Source	SS	DF	MS		No. Obs	103
Model	0.0673	1	0.0673		F(1, 101)	19.82
Residual	0.3429	101	0.0034		Prob > F	0.0000
Total	0.4102	102	0.0040		Adj R2	0.1558
					Root MSE	0.0483

CPR	Coef.	Std. Err.	t	P > | t |	[95% Conf.	Interval]
LIBOIS	0.0068	0.0015	4.45	0.0000	0.0038	0.0099
cons	0.0484	0.0057	8.44	0.0000	0.0371	0.0599

Correlation Matrix

	LIBOIS	CPRO	LRO
LIBOIS	1.0000		
CPRO	0.4050	1.0000	
LRO	0.9143	0.0000	1.0000

Table 5. LIBOR-OIS, Market Illiquidity, and SCDSs

This table presents the results of dynamic panel data analysis using the two-step system GMM estimator (Blundell and Bond, 1998) based on the first equation. The table contains two panels: Panel A for all 22 European countries in our data set and Panel B for the 13 euro area countries in our sample. The dependent variable is the percentage change in 5-year senior USD-denominated credit default swap (CDS) spreads for each country. The independent variable is the disentangled liquidity risk (LRO). We also included orthogonalized counterparty risk (CPRO), which is uncorrelated with liquidity risk (LRO). To check the authenticity of the two-step system GMM estimator, we performed some specification tests, in particular the Hansen test for overidentifying restrictions and the test for second-order serial correlation using the m2 statistic of Arellano and Bond (1991). The null hypothesis of the Hansen test states that the instruments are not correlated with the residuals and that they are valid instruments. A Hansen p-value greater than 10% means that we accept the null hypothesis and all instruments are valid. The null hypothesis of AR (2) is that the errors in the first difference regression have no first order serial correlation (P-value > 5% or 10%). Standard errors are given in parentheses. $***p < 0.01$, $**p < 0.05$, $*p < 0.10$.

Variables	Panel A	Panel B
L1. SCDS	0.581	-1.319 **
	[0.375]	[0.544]
LRO	0.027 **	0.063 **
	[0.011]	[0.032]
CPRO	0.061	-0.133 *
	[0.041]	[0.075]
GEPU	0.002 **	-0.003 ***
	[0.001]	[0.001]
OIL	-0.271 ***	-0.020
	[0.092]	[0.534]
Tret	6.720	-0.000
	[0.000]	[0.000]
FXvol	-0.005	-0.066 ***
	[0.014]	[0.018]
PDebt	-0.018	0.014
	[0.014]	[0.014]
BidAsk	-0.040	0.058
	[0.027]	[0.052]
Slope	-0.422 *	-0.410
	[0.228]	[0.250]
GDPG	-0.050 **	0.29
	[0.021]	[0.034]
Covid-19	-1.093 *	0.365
	[0.567]	[0.331]
Constant	1.969	0.385
	[1.358]	[0.277]
Model fit		
Time fixed effects	Yes	Yes
N	2244	1326
K (Countries)	22	13
AR(2)-*p*	[0.532]	[0.136]
Hansen-*p*	[0.946]	[0.295]

Table 6. ECB's Interventions, Market Illiquidity, and SCDSs (EA)

This table presents the results of dynamic panel data analysis using the two-step system GMM estimator for large panels or the one-step system GMM estimator for moderately small panels (Blundell and Bond, 1998) based on the second equation. The model is estimated using monthly data from 13 euro area countries over a period from 2012 to 2021. The dependent variable is the percentage change in each country's 5-year senior USD-dominated CDS spread. The independent variable is the disentangled liquidity risk component extracted from EURIBOR-OIS. We test specification 2 four times with different policy measures. Bailin is a dummy variable for the period of liquidity injections (1: Nov 2014 to Jan 2021, 0: otherwise). The percentage change in monthly purchases under the APP (ABSPP, PSPP, and CSPP) is the main indicators of nonstandard policy measures from ECB. The covariates and instruments are the same as for the other specifications. As for the specification tests, the Hansen test for overidentifying restrictions ($p > 0.10$) and the test for second-order serial correlation ($p > 0.10$) are performed. Standard errors are given in parentheses. $***p < 0.01$, $**p < 0.05$, $*p < 0.10$.

	Bailin	APP		
Variables	Dummy	ABSPP	PSPP	CSPP
L1. SCDS	-1.024 *	0.105	0.123	0.699 *
	[0.494]	[0.520]	[0.077]	[0.360]
LRO	0.348 **	0.060 *	0.055 *	0.080
	[0.129]	[0.034]	[0.027]	[0.079]
CPRO	0.072	0.109 *	0.068 *	0.081
	[0.099]	[0.053]	[0.037]	[0.145]
GEPU	0.002 *	0.000	-0.001 **	-0.001
	[0.001]	[0.000]	[0.000]	[0.002]
OIL	-0.057	0.011	0.093	0.053
	[0.140]	[0.052]	[0.054]	[0.277]
TRet	-0.000 **	0.000	6.500	0.000
	[0.000]	[0.000]	[7.450]	[0.000]
FXvol	-0.050	-0.021	-0.029 **	-0.045 *
	[0.042]	[0.013]	[0.013]	[0.021]
PDebt	0.064	-0.005	-0.001	0.003
	[0.040]	[0.005]	[0.002]	[0.012]
BidAsk	0.018	-0.037	-0.012	-0.032
	[0.019]	[0.053]	[0.009]	[0.031]
Slope	0.882 **	0.031	-0.091 **	0.093
	[0.350]	[0.049]	[0.036]	[0.095]
GDPG	-0.025	-0.007	-0.012	-0.025
	[0.018]	[0.011]	[0.007]	[0.017]
Covid-19	0.327	-0.003	-0.097*	0.141
	[0.208]	[0.043]	[0.046]	[0.171]
Bail-in	1.126 **			
	[0472]			
LRO * Bailin	-0.329 ***			
	[0.106]			
ABSPP		-0.002 *		
		[0.001]		
LRO * ABSPP		0.005 **		
		[0.002]		
PSPP			0.023 **	
			[0.011]	
LRO * PSPP			0.040 **	
			[0.018]	
CSPP				0.136 **
				[0.060]
LRO * CSPP				0.235 **
				[0.100]
PEPP				
LRO * PEPP				
Constant	-6.070	0.857	0.647 **	0.427
	[3.475]	[0.660]	[0.255]	[1.371]
Model fit				
Time fixed effect	Yes	Yes	Yes	Yes
N	1326	962	910	715
K (Countries)	13	13	13	13
AR(2)-*p*	[0.405]	[0.279]	[0.158]	[0.117]
Hansen/Sargan-*p*	[0.456]	[0.684]	[0.841]	[0.109]

Table 7. LIBOR-OIS, Market Illiquidity, and SCDSs: Instrumental Variable

This table presents the results of instrumental variable estimation (IV) using two-stage least squares regression (2SLS) based on the first equation. The DV, IDV, and controls are the same as in Table 5. To test the validity of the instruments, we use the first-stage F-test. For a single instrument study, the F-value should be above 10 as benchmark. Then we use the endogeneity test to show that the variables are exogenous (P value > 0.05). Since the number of instruments is equal to the number of endogenous variables, there is no overidentification problem. Standard errors are given in parentheses. $***p < 0.01$, $**p < 0.05$, $*p < 0.10$.

Variables	Panel A	Panel B
LRO	0.034 *** [0.012]	0.034 ** [0.015]
CPRO	-0.018 *** [0.003]	-0.013 *** [0.004]
GEPU	0.000 *** [0.000]	0.000 ** [0.000]
OIL	-0.069 ** [0.030]	-0.093 ** [0.046]
TRet	2.260 [2.350]	5.320 [4.340]
FXvol	-0.001 * [0.000]	-0.004 ** [0.002]
PDebt	-0.000 [0.000]	-0.000 [0.000]
BidAsk	-0.000 [0.000]	0.000 [0.000]
Slope	0.001 [0.002]	-0.015 [0.010]
GDPG	0.001 [0.001]	0.001 [0.001]
Covid-19	0.009 [0.011]	0.025 [0.020]
Constant	-0.034 *** [0.011]	0.001 [0.021]
Model fit		
Time fixed effect	Yes	Yes
N	2266	1339
K (Countries)	22	13
First-Stage F	80.88***	321***
Adj R-squared	0.12	0.41

Table 8. ECB's Interventions, Market Illiquidity, and SCDSs (EA): Instrumental Variable

This table presents the results of IV estimation using two-stage least squares regression (2SLS) based on the second equation. The DV, IDV, moderators, and controls are the same as in Table 6. To check the validity of the instruments, we use the first-stage F test. For a single instrument study, the F value should be more than 10, which is a guideline value. Then we use the endogeneity test to show that the variables are exogenous (P value > 0.05). Since the number of instruments is equal to the number of endogenous variables, there is no overidentification problem. Standard errors are given in parentheses. ∗∗∗ p < 0.01, ∗∗ p < 0.05, ∗ p < 0.10.

	Bailin		APP	
Variables	Dummy	ABSPP	PSPP	CSPP
LRO	-0.072 ***	-0.008	0.003	0.048 ***
	[0.020]	[0.009]	[0.006]	[0.017]
CPRO	-0.001	0.008	0.011	0.041 ***
	[0.005]	[0.009]	[0.007]	[0.010]
GEPU	-0.000 ***	0.000	-0.000	-0.000 ***
	[0.000]	[0.000]	[0.000]	[0.000]
OIL	-0.052	-0.052	-0.012	-0.061
	[0.054]	[0.032]	[0.023]	[0.053]
TRet	1.72	6.700	1.070	1.850
	[3.120]	[2.570]	[2.590]	[3.060]
FXvol	-0.013 ***	0.004	-0.001	-0.021 ***
	[0.002]	[0.003]	[0.002]	[0.006]
PDebt	-0.000	-1.040	0.000	1.530
	[0.000]	[0.000]	[0.000]	[0.000]
BidAsk	-0.000	0.000	0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]
Slope	0.024 **	-0.016 *	-0.003	0.050 **
	[0.011]	[0.009]	[0.007]	[0.021]
GDPG	0.000	0.001	0.001	-0.000
	[0.001]	[0.001]	[0.001]	[0.001]
Covid-19	0.046 **	-0.014	-0.004	0.103 **
	[0.021]	[0.014]	[0.011]	[0.046]
Bail-in	0.059 ***			
	[0.019]			
LRO * Bailin	0.101 ***			
	[0.020]			
ABSPP		0.001		
		[0.001]		
LRO * ABSPP		0.004 **		
		[0.002]		
PSPP			0.020 **	
			[0.010]	
LRO * PSPP			0.039 **	
			[0.019]	
CSPP				0.016
				[0.010]
LRO * CSPP				0.029
				[0.019]
PEPP				
LRO * PEPP				
Constant	0.073 ***	-0.034 ***	0.021	0.192 ***
	[0.022]	[0.041]	[0.031]	[0.061]
Model fit				
Time fixed effect	Yes	Yes	Yes	Yes
N	1339	975	923	728
K (Countries)	13	13	13	13
First-Stage F	160.74 ***	112.99***	274.18***	194.59***
Adj R -squared	0.93	0.74	0.83	0.88

Figures:

Figure 3. The core of the sovereign-bank nexus

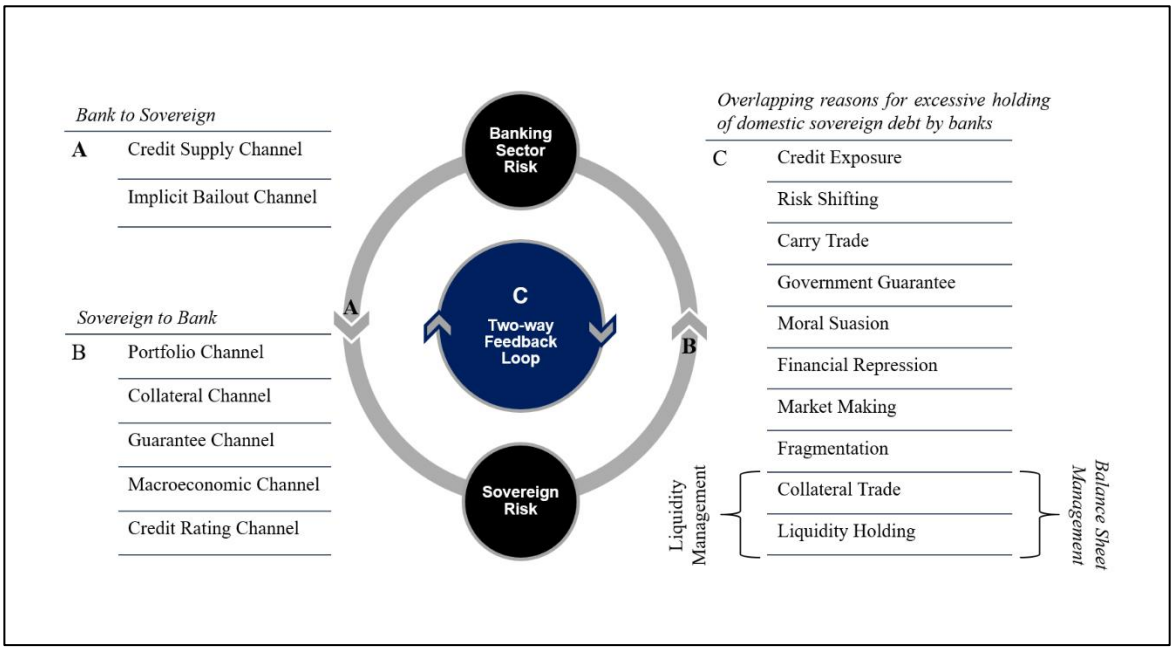


Figure 2. CDS spread of European countries during 2012-2021

The figure shows the average price of sovereign credit default swaps (SCDS) of the 22 European countries and the overall index for the entire sample (22 countries) and the euro area countries (13 countries) over the period from mid-2012 to early 2021.

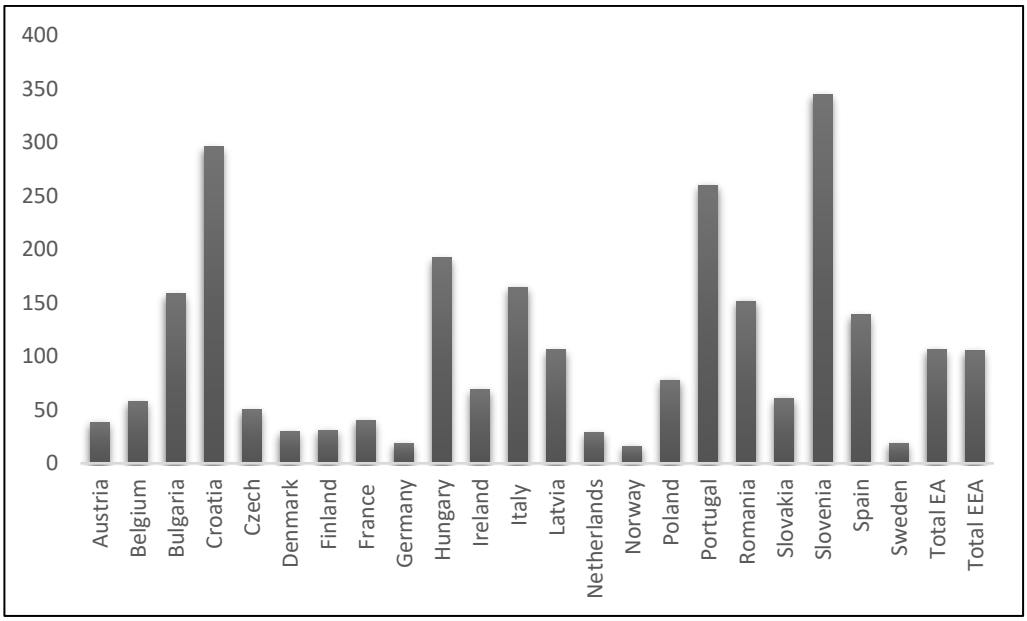
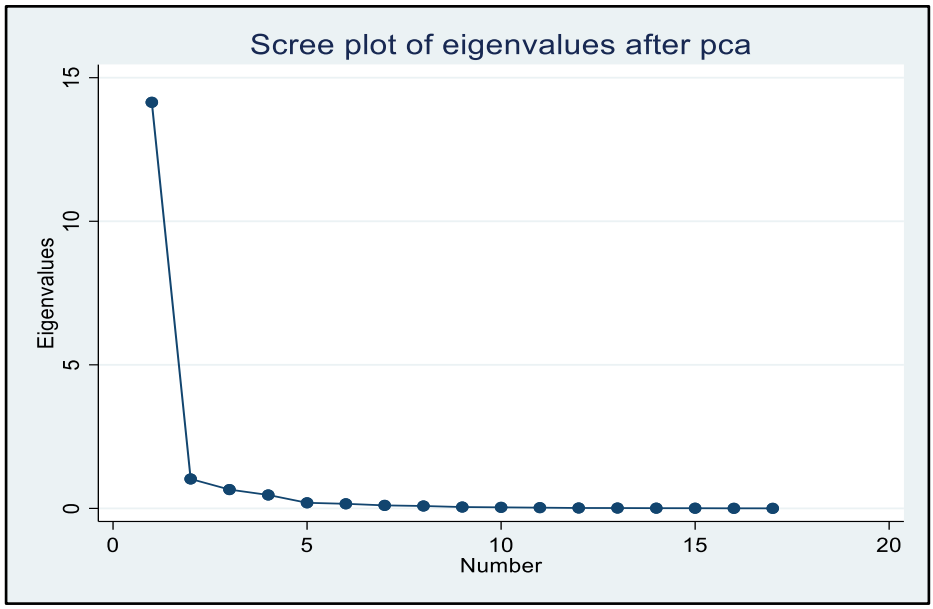


Figure 3. Scree plot and component loading for PCA

The table shows the result of the PCA analysis. The scree plot indicates that the first component can stand alone when the data are plotted. The component loading shows the connection between the principal components and the original values.



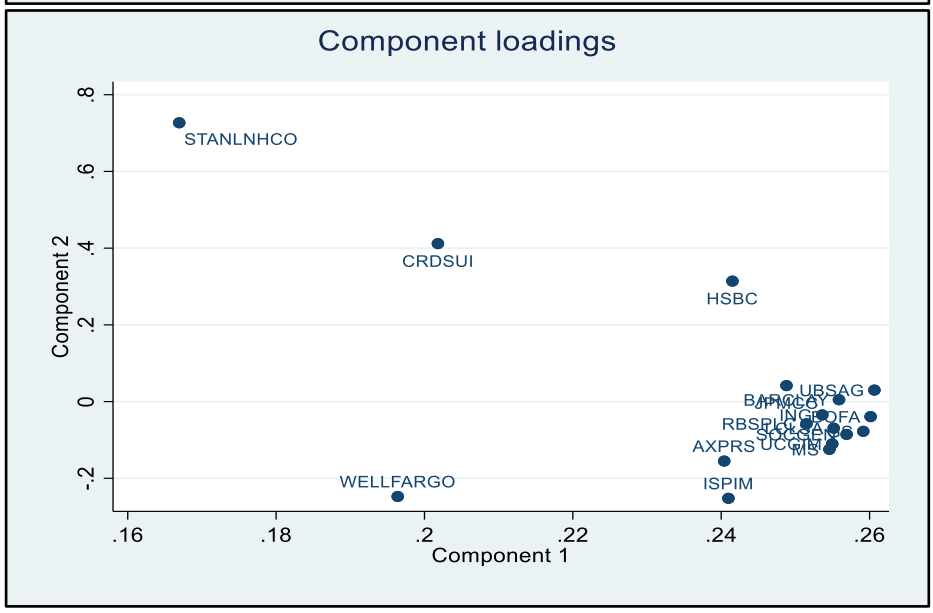
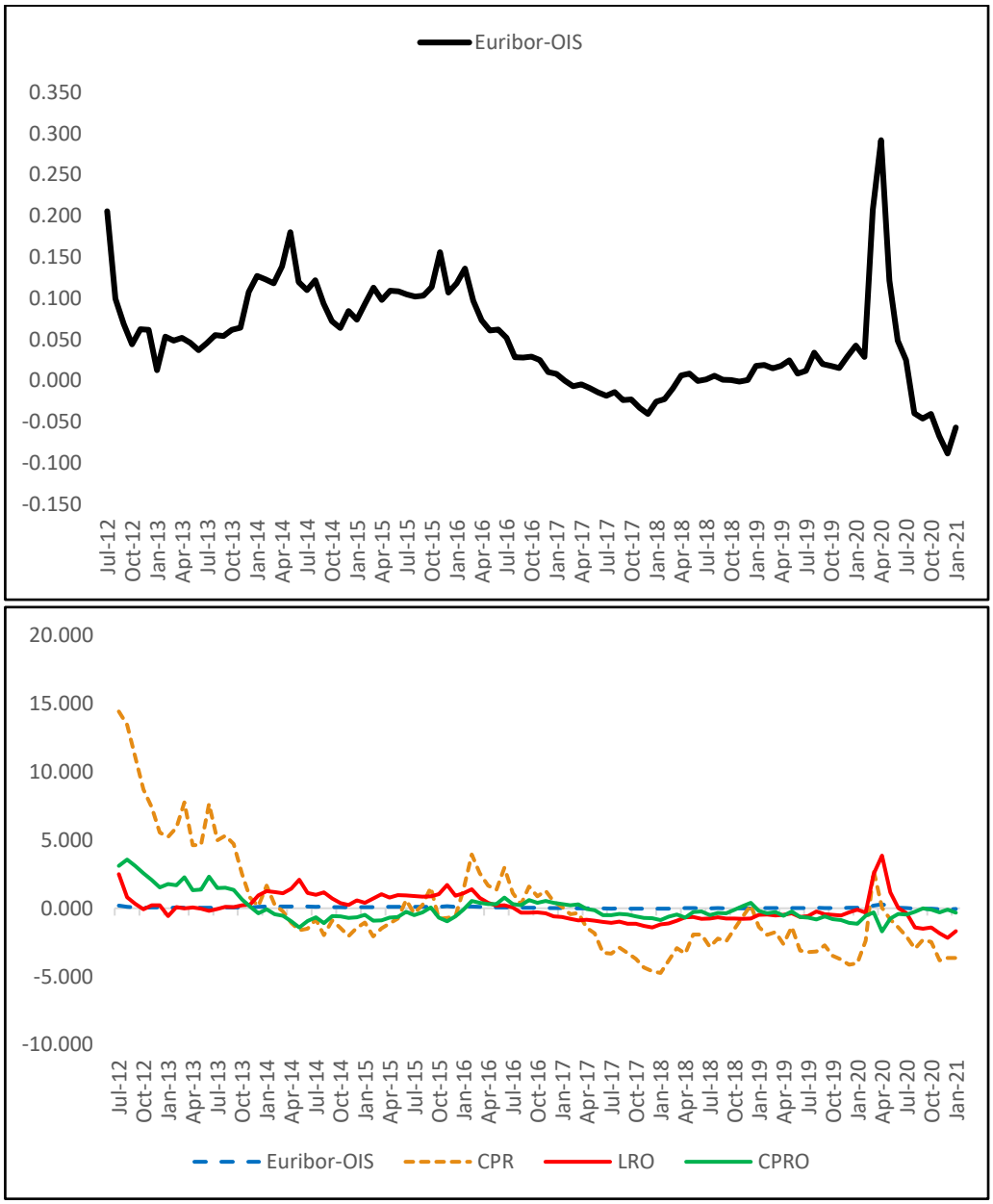


Figure 4. The fluctuations of EURIBOR-OIS and its components

The figure shows the dynamics of EURIBOR-OIS and its components over a period from mid-2012 to early 2021, highlighting the dramatic increase in EURIBOR-OIS at the onset of the Covid 19 pandemic, particularly in March 2020. The red line shows the fluctuations in the liquidity component (LRO) and the green line shows the dynamics of the orthogonalized counterparty risk component (CPRO). The orange dotted line shows the dynamics of the counterparty risk derived from the CDS market.



Chapter 3

The Puzzling Effects of Political Institutions on Banking Stability

The Puzzling Effects of Political Institutions on Banking Stability

Mehdi Janbaz

Abstract

This paper examines the nexus of deposit insurance and bank stability in the shadow of the political environment and the bank business model. Using a cross-country sample of 705 listed banks from 70 countries over the period from 2007 to 2021, we find further evidence that banks are more likely to take risks when an explicit deposit insurance is in place. The results also suggest that these adverse incentives induced by deposit insurance are likely to be mitigated for banks in a more politically developed environment and for banks that benefit from a less complex business model. This could be due to the fact that banks in politically developed countries tend to benefit from better banking supervision and regulation, which limit the moral hazard problem. The results are stable even after a series of robustness tests.

Keywords: Political Risk, Banking Stability, Deposit Insurance, Moral Hazard, Business Model.

JEL Classification: C36, G01, G21, G28, E58

1. Introduction

Recent political events at the heart of institutionally developed economies, especially in the aftermath of a pandemic and its severe global economic impact, should raise expectations of explicit support, especially in politically developed systems. Although political risk as a growing concern of the banking system may adversely affect bank stability, we will examine the other side of the coin, where political developments provide incentives for excessive risk taking. However, this scenario may be quite different if an explicit deposit insurance system is in place.

Government guarantees and deposit insurance schemes, as part of the safety net designed to restore bank stability and confidence, may have a negative impact on bank stability and performance by providing incentives for excessive risk-taking and creating the moral hazard problem (Dam and Koetter, 2012; Demirgueç-Kunt and Detragiache, 2002; Duchin and Sosyura, 2014; Keeley, 1990). Theoretically, an explicit deposit insurance system as a component of safety nets can affect the riskiness of protected banks through two channels, namely market discipline and bank charter values.

In the presence of deposit insurance, explicit support provides an incentive for banks to take more risks by reducing market discipline (Ioanniadou and Penas, 2010). When depositors are backed by the government, they are less likely to penalize their bank for taking risk or to charge a risk premium for higher perceived risk-taking, which reduces market discipline. The negative incentives of deposit insurance lead banks to be less prudent and also discourage creditors from monitoring their bank, leading to a decline in market discipline (Demirguc-Kunt and Huizinga, 2004).

Deposit insurance also affects bank risk-taking by affecting bank profit margins and charter values. Keeley (1990) emphasizes that deposit insurance weakens the dominant force of regulation to mitigate the trade-off between competition and stability. And increased competition due to the absence of monopolistic control lowers the charter value of the bank, which provides an incentive for banks to lower capital relative to assets and take further risks. Higher charter values reduce incentives for excessive risk-taking because the threat of loss of future earnings discourages risk-taking.

The impact of deposit insurance and government guarantees on bank stability is mainly argued using the political theory of government ownership (Iannotta et al., 2013), the competition-stability trade-off (Keeley, 1990), the competition-fragility trade-off (Boyd and De Nicolò, 2005), and moral hazard (Dam and Koetter, 2012). In this study, we focus on the moral hazard problem of deposit insurance with respect to bank stability using a new combination of balance sheet-based and market-based risk factors for a large cross-country sample of listed banks. We aim to investigate how a bank's business model and political environment matters for banking stability when an explicit deposit insurance scheme is in place.

We seek to contribute to the literature on deposit insurance and banking stability, in particular those that provide evidence on the moral hazard problem of explicit support (Anginer et al., 2014; Demirguc-Kunt and Detragiache, 2002; Demirguc-Kunt and Huizinga, 2004; Ioanniadou and Penas, 2010; Keeley, 1990), in two ways:

First, we examine whether a bank's business model affects the relationship between deposit insurance and bank stability. We posit that in the presence of an explicit deposit insurance scheme, banks that benefit from a more sustainable and diversified business model are more

likely to experience the disincentives to risk-taking triggered by deposit insurance. This can be interpreted on the basis that as complexity increases, market discipline decreases in the presence of the moral hazard problem. Our business model indicator is a composite measure based on banks' income structure, asset structure, liability structure and capital structure. However, we know that a bank's business model is usually not fall within the full discretion of shareholders and executives, as it is determined by the context and environment, especially the political and regulatory environment.

As Altunbaş et al. (2011) found, banks with higher leverage, larger banks, banks with robust credit growth, and banks more dependent on short-term funding are at greater risk. If government support triggers a moral hazard problem, an increase in bank complexity may weaken market discipline (Brandao-Marques et al., 2020). Hovakimian and Kane (2000) also found that risk shifting from bank to insurer due to deposit insurance is more likely for banks with higher deposit liability ratios, indicating the liability structure of the business model.

Second, we examine the impact of political institutions on bank risk-taking and the disincentives triggered by deposit insurance. We argue for a contradictory scenario that a politically developed environment may mitigate the adverse incentives induced by deposit insurance, while the soundness of the political environment itself may create incentives for excessive bank risk-taking.

One of the main characteristics of political risk is its relationship with the legal and political environment (Robock, 1971). As far as political institutions are concerned, a sound political environment leads to higher risk taking due to increased competition in the credit market and moral hazard triggered by a higher probability of bailouts in the wake of financial distress (Ashraf, 2017). Following Dam and Koetter (2012), who focus on political

determinants of bailout probability, Ashraf (2017) provides empirical evidence for this notion that more political constraints lead to excessive risk-taking and exacerbate the moral hazard problem because there is a higher expectation of being supported by the government in the event of a default.

Contrastingly, a sound political environment reduces information asymmetries, the problem of adverse selection, and the risk of expropriation, leading to greater bank stability. In addition, banks in countries with a sound political system are expected to be more stable, as better regulatory quality can promote competition, consistent with the competition-fragility tradeoff.

With respect to the legal environment, banks are expected to be more stable in countries with a more robust regulatory environment that promotes competition (Beck et al., 2006), which is inconsistent with the negative effects of competition on bank fragility (Keeley, 1990). However, with respect to the theory of law and finance (La Porta et al., 1998), banks in countries with stronger protection of credit rights are more willing to take risks (Houston et al., 2010). The legal environment can also mitigate the negative effects of explicit support by designing better capital rules.

The extent to which deposit insurance provides incentives for excessive risk-taking and leads to bank failure also depends on the quality of the institutional and political environment. There is some limited evidence that a weak institutional environment with high corruption and low political freedom may amplify the negative effects of deposit insurance on bank risk-taking (see, for example, Hovakimian et al., 2003). Demirguc-Kunt and Detragiache (2002) also concluded that deposit insurance increases the probability of a banking crisis, especially in countries with lower institutional quality, because they believe that a politically developed

system provides more effective supervision and regulation and limits the moral hazard problem of deposit insurance.

Developing Diamond and Dybvig's (1983) framework for risky investment options, deposit insurance falsification is contingent to the quality of the institutional and legal environment as well as the generosity of deposit insurance (Allen et al., 2011). Based on the Allen et al. (2011) survey, the unintended consequences of the deposit insurance system on bank stability can be corrected or worsened by the regulatory framework and political institutions. To complement this, we explore the scenario that a sound policy environment that creates incentives for banks to take more risks mitigates the moral hazard problem of the deposit insurance system.

Using a sample of 705 listed banks from 70 countries over the period from 2007 to 2021, we examine whether the negative incentives of deposit insurance on risk-taking are higher for banks with a more feasible business model. And does a more politically developed environment with lower political risk mitigate the moral hazard problem of explicit support? We first address these hypotheses using various bank-specific accounting and market risk measures through robust instrumental variable estimators. We then use logit regression to answer the questions raised for the probability of a banking crisis rather than for micro-risk.

2. Data

In this study, we focus on listed banks from around the world. However, banks with many missing values in the data series are excluded. The final sample includes 705 listed banks from 70 countries with different income levels. The number of banks per country is not the same for all countries. Our monthly panel covers a period from January 2007 to December 2021 and contains a total of 129,600 bank-month observations. The data are mainly from Bloomberg,

ICRG, WGI, and the dataset of Demirgueç-Kunt et al. (2015). Table 1 provides an overview of the variables, measures and sources.

Insert Table 1 about here

2.1. Micro risk

We use a combination of different accounting and market-based risk measures to obtain a detailed picture of banks' stability and risk behavior in the presence of deposit insurance. To measure a bank's overall risk behavior, we use the Z-score following the relevant literature (see, e.g., Beck et al., 2013). Due to the skewness of the z-score, we also used the natural logarithm. The z-score is calculated as follows:

$$Z = -1 * ln\,[1 + \frac{(EA + ROA)}{\sigma ROA}]$$

Where ROA stands for return on assets, EA for the ratio of equity to assets, and σROA for the standard deviation of ROA using a rolling three-month window. By this definition, a larger z-score indicates a smaller distance to insolvency and less stability. We also use the natural logarithm of the ratio of ROA to σROA and the ratio of EA to ROA as portfolio risk and leverage risk, respectively. These two measures are also multiplied by -1 to simplify interpretation.

Following Ashraf (2017), we use the rolling three-month standard deviation of the net interest margin (NIM) as another measure of banks' risk appetite. In order not to neglect the first three months of our sample due to the rolling three-month standard deviation of ROA and NIM, we first added the data for the last three months of 2006 for the calculations and later excluded them for the analysis. The natural logarithm of the ratio EA to σROA multiplied by -1 indicates a bank's leverage risk.

Following Fiordelisi et al. (2011), we use non-performing loans (NPL) as a ratio of total loans as a proxy for realized credit risk, in addition to the 5-year expected default frequency (EDF) for each bank calculated by Bloomberg, to capture a more complementary mix of risk measures. In addition, we use the ratio of loan loss provisions (LLP) to total assets, which shows how a bank is protected against potential losses in the future. Altunbaş et al. (2010) also used the same ratio as an ex-post credit risk indicator.

We consider bank funding liquidity using the ratio of bank deposits to assets, as described in the literature (see, e.g., Khan et al., 2017). Following Demirgueç-Kunt and Huizinga (2004), we also use the ratio of non-interest expenses to bank assets as a proxy for overhead costs. In addition, we construct a proxy for counterparty credit risk using the first principal component of credit default swap (CDS) spreads of sixteen CDS dealer banks. This approach to measuring counterparty risk was previously used by Antón et al. (2018).

Finally, we used PCA analysis to create two composite risk measures. The first is an aggregate accounting risk measure based on portfolio risk, leverage risk, standard deviation of non-interest margin, credit risk based on the ratio of NPLs to total loans, and funding liquidity. The second includes these five variables in addition to the z-score.

2.2. Deposit insurance and moral hazard

To examine the impact of the presence and generosity of a deposit insurance scheme on bank risk-taking, we used the comprehensive database of Demirgueç-Kunt et al. (2015). First, we use the deposit insurance dummy, which indicates the legal existence and adoption of an explicit deposit insurance system in a country in a given period. This dummy is assigned a value of 1 if the deposit insurance scheme protects depositors against bank failure and 0 otherwise.

Because the design of the deposit insurance system varies across countries, we use the coverage limit as a percentage of GDP per capita to account for the generosity of explicit support. We also use some other characteristics of deposit insurance, including the presence of ex ante funding, coverage of interbank deposits, coverage of foreign currency deposits, imposed losses, and backstop from government.

In addition, we create an overall binary variable based on four dummy variables from Demirgueç-Kunt et al. (2015) indicating that a country has provided at least one of the following guarantees: full government guarantees on bank deposits, limited government guarantees on bank deposits, government guarantees on non-deposit liabilities, or government guarantees on bank assets. This binary variable covers the period 2008-2013 and takes the value 1 if government guaranteed and 0 if not. Finally, we use the composite safety net index of Demirgueç-Kunt et al. (2015), which is equivalent to the moral hazard index of Demirgueç-Kunt and Detragiache (2002).

2.3. Political risk and institutional quality

The ICRG political risk rating is the main measure of political risk in this study. This monthly index of political risk consists of twelve components with unequal weights so that the total level is 100. These components are: Government stability (12 p.), socioeconomic conditions (12 p.), internal conflicts (12 p.), external conflicts (12 p.), investment profile (12 p.), democratic accountability (6 p.), law and order (6 p.), military in politics (6 p.), religious tensions (6 p.), ethnic tensions (6 p.), corruption (6 p.), and quality of bureaucracy (4 p.). On this index, a lower score means higher political risk and weaker political institutions.

As an alternative to the political risk measure, we created a dummy variable based on the average level of institutional quality in the World Bank's WGI database. If the average level of

institutional quality over the period 2007-2021 is higher than the average level of the index (> 50 p), then we take a value of 1 and consider it an institutionally more developed environment. If this average level is lower than the nominal average level of the index (< 50 p), we assume the value 0 and speak of a less developed institutional environment.

2.4. Bank business model

Following the framework proposed by Mergaerts and Vennet (2016), we developed a composite index for a bank's business model based on the principal component of four business model components, including asset structure, liability structure, capital structure, and income structure. Asset structure is represented by loan loss provisions (LLP) as a ratio of total loans. LLP to loans indicates how banks rate the quality of their loans. The ratio of deposits to liabilities and the ratio of equity to assets represent the liability and capital structure of banks, respectively. The income structure or diversification of bank income is represented by the ratio of non-interest income as follows (Mercieca et al., 2007):

$$DIV = \left(\frac{Non - Interest\ Income}{Net\ Operating\ Income}\right)\text{^}2 + \left(\frac{Net - Interest\ Income}{Net\ Operating\ Income}\right)\text{^}2$$

Where net operating income is the sum of non-interest income and net interest income.

2.5. Covariates

Based on the existing literature, we use a set of bank-specific, country-specific macroeconomic, and global market controls that are expected to affect bank risk-taking behavior. Bank size and Tier1 capital ratio are common bank characteristics that are widely used in the banking stability literature. Sovereign debt to GDP ratio and local market yield are the main country-specific control factors. The income level of a country is also controlled for by creating a dummy that takes the value 1 if it is a high-income or upper-middle-income country and takes the value 0 if it is a low-income or lower-middle-income country.

We also control for the impact of global market uncertainty on bank risk-taking using the VIX (CBOE) as the global market volatility index and the OVX as the crude oil volatility index. We also controlled for global economic policy uncertainty (GEPU) as another global factor likely to influence risk-taking behavior, and to distinguish the impact of policy uncertainty from political risk scores, since we focus on the quality of the policy environment rather than the overall level of political risk.

3. Empirical methodology

Primarily, we apply a robust instrumental variable approach with fixed effects using two-stage least-squares estimator to estimate how bank risk-taking behavior is affected by presence of an explicit deposit insurance system. The baseline model is as follow:

$$BS_{\mathrm{ijt}} = \alpha_0 + \beta_1 DI_{it} + \sum_{k=1}^{k} \beta_{2\ +\mathrm{k}} BC_{ijtk} + \sum_{m=1}^{m} \beta_{3+\mathrm{k+m}} MC_{itm} + \sum_{n=1}^{n} \beta_{4+\mathrm{k+m+n}} GC_{tn} + \gamma_i + \delta_j + \theta_t + \varepsilon_{ijt} \quad (1)$$

Where BS_{ijt} denotes the vector of bank stability indicators of bank i in country j in month t. α_0 is the constant term of the regression. $\beta_1, \beta_2, \beta_3, \beta_4, \ldots$ indicate the extent to which deposit insurance (DI_{it}), bank-specific controls (BC_{ijtk}), macroeconomic controls (MC_{itm}), and global controls (GC_{tn}) affect bank stability. γ_i denotes the bank fixed effect, δ_j belongs to the country fixed effect, θ_t refers to the time fixed effect, and ε_{ijt} is the error term.

Using the first specification, we examine whether the presence of an explicit deposit insurance system is associated with higher risk-taking (H1). We extend the baseline model to test our second hypothesis, which is that in the presence of an explicit deposit insurance system, banks that benefit from a more sustainable business model are more likely to experience the adverse incentives to risk-taking induced by deposit insurance (H2). However, we assume that

the sustainability of the business model itself improves bank stability. The second specification is as follows:

$$BS_{ijt} = \alpha_0 + \beta_1 DI_{it} + \beta_2 BM_{ijt} + \beta_3 BM_{ijt}\, x\, DI_{it} + \sum_{k=1}^{k} \beta_{4\ +k} BC_{ijtk} + \sum_{m=1}^{m} \beta_{5+k+m} MC_{itm} + \sum_{n=1}^{n} \beta_{6+k+m+n} GC_{tn} + \gamma_i + \delta_j + \theta_t + \varepsilon_{ijt} \quad (2)$$

Here β_1, β_2 and β_3 are the coefficients of deposit insurance (DI), bank business model (BM), and moderation effect respectively. The control variables and fixed effects are the same as in the first specification.

Similarly, we develop the third specification to test the third hypothesis. Although the development of political institutions provides incentives for higher risk-taking, the soundness of the political environment mitigates the negative incentives induced by deposit insurance (H3). The third specification can be formulated as follows:

$$BS_{ijt} = \alpha_0 + \beta_1 DI_{it} + \beta_2 PR_{it} + \beta_3 PR_{it}\, x\, DI_{it} + \sum_{k=1}^{k} \beta_{4\ +k} BC_{ijtk} + \sum_{m=1}^{m} \beta_{5+k+m} MC_{itm} + \sum_{n=1}^{n} \beta_{6+k+m+n} GC_{tn} + \gamma_i + \delta_j + \theta_t + \varepsilon_{ijt} \quad (3)$$

Here β_1, β_2 and β_3 are the coefficients for deposit insurance (DI), political risk (PR), and the moderation effect.

4. Results and discussion

4.1. Summary statistics

The summary statistics, correlation matrix, and other descriptive results are presented in Appendix A. Table A.1 provides some basic information about our sample, including the countries and the number of banks per country, as well as the average level of political risk (ICRG) and institutional quality (WGI) for each country over the period 2007-2021. These two measures are scored out of 100, with a higher score indicating lower political risk and higher

institutional quality. The discrepancy between these two indicators of political institutions is somehow puzzling.

Table A.2 and A.3 contain the summary statistics and correlation matrix of the main variables used in this study. Table A.4 and A.5 refer to the results of the PCA analysis to determine the counterparty risk and the aggregate risk measure, respectively.

4.2. Deposit insurance and banking stability

Table 2 shows the results of the first specification using the IV -estimator. The model is estimated for several indicators of bank stability, which are mainly accounting-based risk measures. First, we examine the relationship between deposit insurance and bank stability using banks' risk-taking behavior and distance from solvency.

Insert Table 2 about here

Taking a holistic view, the results show that the presence of an explicit deposit insurance scheme is associated with a significant increase in banks' risk-taking, which is consistent with the results demonstrating the moral hazard problem (Demirgueç-Kunt and Detragiache, 2002; Demirguc-Kunt and Huizinga, 2004; Ioanniadou and Penas, 2010).

In particular, deposit insurance is associated with a lower distance to solvency, higher leverage risk, higher volatility of net interest margins, lower levels of loan loss provisioning relative to total assets, higher overhead costs, and higher counterparty risk. In contrast, the presence of an explicit deposit insurance system results in lower credit risk, represented by the ratio of nonperforming loans to total loans, and higher deposit-to-asset ratios, indicating liquidity. The aggregate risk measures also show a positive and significant relationship between bank stability and deposit insurance. We find similar results for the aggregate measure of accounting-based risk factors.

The results also suggest that bank size has a negative effect on bank risk-taking. In other words, larger banks are more stable, which is consistent with the "too big to fail" phenomenon. In addition, banks with higher financial strength are more willing to take risks. Banks in countries with higher local market returns are more stable. In addition, the results show that banks in countries with higher government debt to GDP ratios take more risks. Although global market volatility leads to higher risk taking using the VIX, oil market volatility and global economic policy uncertainty are mainly associated with higher stability. Finally, we found mixed evidence that a country's income level is related to bank stability. The results show that the impact of a country's income level on banking system stability varies for different risk indicators.

4.3. Bank business model and risk-taking in presence of deposit insurance

Figure 1 plots the scatter matrix of the components of the banks' business model to clarify how these different characteristics relate to each other. It is clear that the scatter of points does not follow a strong linear pattern. However, it is difficult to view them as completely independent components.

Insert Figure 1 about here

If we assume that a bank with higher income diversification, lower leverage, higher loan loss provisions relative to total loans, and a higher deposit-to-liability ratio has a more sustainable business model, our results suggest that such a bank is more likely to be stable because complexity reduces the banks' risk profile.

Insert Table 3 about here

Table 3 shows that a one unit change in the business model leads to a 27.6% reduction in risk. For credit risk, this value is 13%. The results show that a more sustainable business model

can increase the distance to solvency, reduce the volatility of non-interest margins, reduce credit risk by decreasing non-performing loans relative to total loans and increasing loan loss provisions relative to total assets, reduce leverage risk and counterparty risk, and reduce overhead costs. In contrast, a one-unit change in the business model increases liquidity risk by 1.4 percent. Overall, a one-unit increase in the soundness of the business model reduces the bank's risk profile by 15 percent and 20 percent in terms of total risk and accounting risk, respectively.

However, complexity may also reduce market discipline and thus increase the moral hazard problem of deposit insurance. We find evidence for this hypothesis for the majority of risk factors, especially for the composite measures. Table 3 shows that a more sustainable business model can amplify the negative effects of deposit insurance on bank risk-taking, particularly in terms of non-performing loans relative to total loans, net interest margin volatility, provisioning relative to total loans, overhead costs, counterparty risk, and aggregate risk ratios. In contrast, the business model mitigates the negative impact of deposit insurance on liquidity risk. The results for the distance to solvency and debt risk are insignificant.

Although a, say, more sustainable business model may increase the stability of the system, increasing complexity and income diversification may increase risk-taking by reducing market discipline and exacerbating the moral hazard problem of explicit support.

4.4. Political risk and moral hazard problem of deposit insurance

Before turning to the empirical results, figure 2 illustrates how the overall risk profile of banks in our sample is affected by the various political risk components. As expected, there is a positive relationship between political development and bank risk. In other words, lower political risk or higher quality of the political and institutional environment is associated with

higher bank risk, which is true for most characteristics of political institutions. Only internal conflicts, military in politics, and investment profile show opposite behavior, supporting the view that political risk has a negative impact on bank stability. Recall that a higher political risk score (on a scale of 100) indicates a higher quality of the political environment and a lower political risk.

Insert Figure 2 about here

A limited number of literature documented the nexus of political risk and bank risk-taking. In a country with lower political risk and higher institutional quality, the banking system appears to be more stable. However, it has been observed that banks do not necessarily behave prudently in a sound political environment (Ashraf, 2017). In the presence of deposit insurance, the impact of political institutions on bank risk-taking could be quite different. Our results may represent a step forward in understanding the reasons behind this puzzle.

Insert Table 4 about here

Table 4 shows a significant association between political institutions and banking stability. Interestingly, political risk is negatively related to banking risk. In other words, political development is positively associated with the level of risk, which is consistent with the results of Ashraf (2017).

The third row of table 4 shows that banks in a country with a more politically developed system are more likely to have a lower distance to insolvency, higher leverage risk, lower profitability, higher credit risk, lower provisioning relative to total assets, higher counterparty risk, higher expected default probability, and higher overhead costs. For example, a one-unit change in the quality of the political environment increased the z-score, credit risk, leverage

risk, and counterparty risk by 32.2%, 21%, 66.1%, and 17.5%, respectively. However, a one-unit increase in the quality of the policy environment decreased bank liquidity risk by 7.7%.

Our results suggest that banks in a more politically developed environment tend to be less risk averse because these banks are more likely to be supported by the government and thus the soundness of political institutions exacerbates the moral hazard problem. The increase in competition due to institutional and regulatory soundness would be another explanation consistent with the tradeoff between competition and stability. This significant and sizable effect is consistent with Ashraf's (2017) reasoning on this phenomenon.

The aggregate measures also confirm the positive relationship between political development and bank risk-taking. A one-unit change in political development leads to a 15.4% and 26.2% increase in the aggregate index and the aggregate accounting risk index, respectively.

When an explicit deposit insurance system is in place, the soundness of the political environment behaves differently. The third line shows that policy developments weaken the impact of deposit insurance on bank risks for all indicators except liquidity risk. In other words, the deposit insurance adverse incentives are mitigated for banks operating in a more politically developed environment. For example, political development mitigates the negative effects of deposit insurance on bank risk-taking behavior and credit risk by 39.6% and 26.2%, respectively.

These results confirm the hypothesis developed. The results are nearly constant across different risks and do not differ from one risk measure to another. Consistent with the view of Demirguc-Kunt and Detragiache (2002), our results suggest that for all risk indicators except the deposit-to-asset ratio, political development mitigates the moral hazard problem of explicit

deposit insurance because such an environment benefits from higher government effectiveness and better regulation and supervision, which remove the competition and stability and limit the moral hazard problem of explicit deposit insurance.

4.5. Political institutions and banking crisis

Deposit insurance may increase the likelihood of a banking crisis by providing a disincentive for creditors to monitor banks and by reducing market discipline (Demirguc-Kunt and Huizinga, 2004). Using the deposit insurance measure of Demirgueç-Kunt and Detragiache (2002), Barth et al. (2004) show that the probability of a banking crisis is positively associated with moral hazard.

Using the banking crisis dummy of Demirgueç-Kunt et al. (2015), which indicates the presence of banking crises over the period 2007-2013, we test whether deposit insurance increases the likelihood of a banking crisis and how this relationship affects the banks' business model and the political environment. We also use the composite safety net index of Demirgueç-Kunt et al. (2015) to examine how a country's overall moral hazard profile affects the probability of a banking crisis.

Insert Table 5 about here

Table 5 shows how banking crises are affected by explicit deposit insurance, the coverage ratio to GDP, ex ante funding, the government backstop, the presence of government guarantees, and the overall safety net index. The first column shows that the presence of explicit deposit insurance significantly reduces the probability of a banking crisis. This positive effect is not limited to the presence of explicit support. The second column shows that countries with higher coverage are less likely to experience a banking crisis. Similarly, a banking crisis is less likely in countries with ex ante financing. In addition, countries with government guarantees (5th column) for at least one of the elements of bank assets, bank deposits (limited or full), or

non-deposit liabilities are less likely to experience a banking crisis. Overall, moral hazard is expected to increase with the probability of a banking crisis.

According to the second row, a banking crisis is more likely in a more politically developed environment. Thus, political development increases the probability of a banking crisis, which is consistent with our earlier results for micro risks. However, political development increases the adverse incentives of safety nets on the probability of a banking crisis. This may suggest that banks in a more advanced political system with lower political risk take more risks because they expect more guarantees from the government and are therefore more exposed to micro and macro risks. The results also show that the business model of banks reduces the probability of a banking crisis in most cases, which is consistent with the results for micro risks.

4.6. Robustness

We perform some robustness tests to check the extent to which our results differ from one measure to another. Since the deposit insurance system is not implemented in the same way in all countries, we test our research questions using a new variable that reflects the generosity of deposit insurance rather than its existence.

Insert Table 6 about here

When we use the coverage limit as a ratio to GDP per capita, we obtain exactly the same results. Table 6, panel A, shows that the coverage limit is positively associated with all bank risk indicators except liquidity risk. Although the size of the effect is much smaller than for the binary variable of deposit insurance, the effect is still significant.

Consistent with previous results, the soundness of political institutions is accompanied by higher risk-taking. For example, a one-unit change in the quality of the political environment leads to a 2.2%, 3%, 1.7%, and 2.4% change in insolvency risk, leverage risk, credit risk, and

counterparty risk, respectively. Political development still mitigate the negative incentive that deposit insurance provides in terms of system maturity. The business model of banks, which remains an important driver of stability, seems to reinforce the negative incentives created by the generosity of the deposit insurance system. This is also consistent with our earlier findings on the presence or absence of explicit support.

We further examine how the risk profile of banks is affected by the moral hazard index or the aggregate safety net index. Panel B shows that safety broadly reinforces bank stability. In other words, banks' risk appetite increases when the aggregate level of moral hazard decreases. However, the results for liquidity risk, loan loss provisions to total asset, and net interest margin volatility are mixed and show a positive linkage between moral hazard and risk.

The impact of political institutions on bank risk-taking cannot be clearly demonstrated using the new model. A sound political environment can reduce bank risk in terms of insolvency risk, leverage risk, credit risk, and expected default probability, while other risk factors are positively associated with political development. The results show that a politically developed system does indeed mitigate the impact of moral hazard on bank risk-taking. This impact varies by measure.

We also ran a multivariate regression to show how different deposit insurance characteristics are related to different bank risks (Table 7). The generosity of the deposit insurance system is high when interbank and foreign currency deposits are covered, ex ante funding is available, or no losses are incurred on uninsured deposits.

Insert Table 7 about here

The results show a limited positive relationship between the presence of ex ante financing and banks' risk appetite. Ex ante funding lead to higher risk appetite for 16.9% of banks and higher risk appetite for 28.4% of banks using aggregate risk measures. When losses are

imposed on depositors in the event of a banking crisis, banks are more likely to take risk, with the exception of liquidity risk. Interestingly, the presence of coverage for foreign currency deposits supports bank stability, while coverage for interbank deposits encourages banks to take more risk. Thus, interbank deposit coverage increases insolvency risk by 22.5% and credit risk by 20.6%.

Table 7 also shows that backstop from government reduces risk-taking, leverage risk, and liquidity risk. Finally, we examine how a government guarantee of bank assets, bank deposits, or non-deposit liabilities affects banks' risk-taking. The last row of the table shows that government guarantees generally reduce bank risk, except for liquidity risk.

5. Conclusion:

This study re-examines the impact of deposit insurance on bank stability to answer two novel questions. Using a cross-country sample of 705 listed banks from 70 countries with different income levels, we found further robust evidence of the adverse effects of deposit insurance on bank stability. These negative incentives are more pronounced for banks with a more sustainable business model and those located in a weaker political environment. Although deposit insurance provides incentives for excessive risk-taking, the presence and generosity of the deposit insurance system overall help reduce the likelihood of a banking crisis.

We show that banks with a more sustainable business model take more risks when deposit insurance is in place. However, these banks are also generally more stable. This implies that banks that are better prepared for future losses, rely more heavily on customer deposits, are less leveraged, and benefit from higher income diversification are safer and have more scope for excessive risk-taking to make more money.

This study also provides empirical evidence on the puzzling effects of policy development on bank risk-taking in the presence and absence of an explicit deposit insurance system. We first find evidence of the downside of policy development on banking stability by exacerbating the moral hazard problem or increasing competition. Banks in countries with a more developed political and institutional environment have a higher expectation that they will be supported by the government and therefore have an incentive to take more risks. When an explicit deposit insurance system is in place, a sound policy environment behaves differently and mitigates the negative incentives of deposit insurance on bank risk-taking by limiting the moral hazard problem.

To understand these confounding effects of political institutions on bank risk-taking, we need to refer to the fact that moral hazard is not only triggered by deposit insurance, and that the soundness of political institutions can lead to such a problem by increasing the likelihood of a government bailout. Although the soundness of political institutions leads to excessive risk-taking by banks by increasing the expectation of government support and triggering moral hazard, a developed and regulated policy environment can reduce the disincentives induced by deposit insurance and reduce banks' vulnerability to moral hazard of deposit insurance when explicit deposit insurance is in place.

The foremost policy implication of this study lies in the interpretation of our findings about the critical role of political institutions in offsetting the falsification of deposit insurance. Despite the quality and generosity of the deposit insurance system, regulators and market participants may consider the power of political and institutional quality in limiting moral hazard. More effective regulation, such as through higher capital requirements, can limit moral hazard by constraining excessive risk-taking. In formulating policy, policymakers can take into account that the moral hazard problem does not arise only from explicit support for deposit

insurance, but that the quality of policy institutions can amplify this problem. The double-edged effect of policy development on bank stability could also help policymakers limit the unintended consequences of explicit support by improving the design of safety nets.

This study also sheds light on the fact that political risk, as currently measured, is not necessarily a threat to bank stability, but that the metrics mainly reflect the political environment, which is only one feature of political risk. Political uncertainty as the second category and government and regulatory intervention as the third feature are subjective and difficult to measure on a continuous basis. When this is taken into account, the scenario may change.

Our results suggest that banks in a less institutionally developed environment that benefit from explicit deposit insurance are more likely to face the moral hazard problem of deposit insurance because of the inability of political institutions to mitigate the negative incentives induced by deposit insurance. However, this specific scenario should be further validated through another round of analysis with a focus group of banks in countries with weak institutional quality and an effective deposit insurance system. Future studies can extend this scenario by using expected government support instead of deposit insurance, quantifying the gap between issuer and individual credit ratings, creating a bank-specific moral hazard measure, and considering both the legal and policy environments.

References:

Allen, F., Carletti, E., & Leonello, A. (2011). Deposit insurance and risk taking. *Oxford Review of Economic Policy*, *27*(3), 464-478.

Altunbas, Y., Gambacorta, L., & Marques-Ibanez, D. (2010). Bank risk and monetary policy. *Journal of Financial Stability*, *6*(3), 121-129.

Altunbas, Y., Manganelli, S., & Marques-Ibanez, D. (2011). Bank risk during the financial crisis: do business models matter?.

Anginer, D., Demirguc-Kunt, A., & Zhu, M. (2014). How does deposit insurance affect bank risk? Evidence from the recent crisis. *Journal of Banking & finance*, *48*, 312-321.

Antón, M., Mayordomo, S., & Rodríguez-Moreno, M. (2018). Dealing with dealers: Sovereign CDS comovements. *Journal of Banking & Finance*, *90*, 96-112.

Ashraf, B. N. (2017). Political institutions and bank risk-taking behavior. *Journal of Financial Stability*, *29*, 13-35.

Beck, T., De Jonghe, O., & Schepens, G. (2013). Bank competition and stability: Cross-country heterogeneity. *Journal of financial Intermediation*, *22*(2), 218-244.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2006). Bank concentration, competition, and crises: First results. *Journal of banking & finance* , *30* (5), 1581-1603.

Boyd, J. H., & De Nicolo, G. (2005). The theory of bank risk taking and competition revisited. *The Journal of finance*, *60*(3), 1329-1343.

Brandao-Marques, L., Correa, R., & Sapriza, H. (2020). Government support, regulation, and risk taking in the banking sector. *Journal of Banking & Finance*, *112*, 105284.

Dam, L., & Koetter, M. (2012). Bank bailouts and moral hazard: Evidence from Germany. *The Review of Financial Studies*, *25*(8), 2343-2380.

Demirgüç-Kunt, A., & Detragiache, E. (2002). Does deposit insurance increase banking system stability? An empirical investigation. *Journal of monetary economics*, *49*(7), 1373-1406.

Demirgüç-Kunt, A., & Huizinga, H. (2004). Market discipline and deposit insurance. *Journal of monetary economics*, *51*(2), 375-399.

Demirgüç-Kunt, A., Kane, E., & Laeven, L. (2015). Deposit insurance around the world: A comprehensive analysis and database. *Journal of financial stability*, *20*, 155-183.

Diamond, D. W., & Dybvig, P. H. (1983). Bank runs, deposit insurance, and liquidity. *Journal of political economy*, *91*(3), 401-419.

Duchin, R., & Sosyura, D. (2014). Safer ratios, riskier portfolios: Banks ′ response to government aid. *Journal of Financial Economics* , *113* (1), 1-28.

Fiordelisi, F., Marques-Ibanez, D., & Molyneux, P. (2011). Efficiency and risk in European banking. *Journal of banking & finance*, *35*(5), 1315-1326.

Houston, J. F., Lin, C., Lin, P., & Ma, Y. (2010). Creditor rights, information sharing, and bank risk taking. *Journal of financial Economics*, *96*(3), 485-512.

Hovakimian, A., & Kane, E. J. (2000). Effectiveness of capital regulation at US commercial banks, 1985 to 1994. *the Journal of Finance*, *55*(1), 451-468.

Hovakimian, A., Kane, EJ, & Laeven, L. (2003). How country and safety-net characteristics affect bank risk-shifting. *Journal of financial services research* , *23* (3), 177-204.

Iannotta, G., Nocera, G., & Sironi, A. (2013). The impact of government ownership on bank

risk. *Journal of Financial Intermediation*, *22*(2), 152-176.

Ioannidou, VP, & Penas, MF (2010). Deposit insurance and bank risk-taking: Evidence from internal loan ratings. *Journal of Financial Intermediation* , *19* (1), 95-115.

Keeley, M. C. (1990). Deposit insurance, risk, and market power in banking. *The American economic review*, 1183-1200.

Khan, MS, Scheule, H., & Wu, E. (2017). Funding liquidity and bank risk taking. *Journal of Banking & Finance* , *82* , 203-216.

Mercieca, S., Schaeck, K., & Wolfe, S. (2007). Small European banks: Benefits from diversification?. *Journal of Banking & Finance*, *31*(7), 1975-1998.

Mergaerts, F., & Vander Vennet, R. (2016). Business models and bank performance: A long-term perspective. *Journal of Financial Stability* , *22* , 57-75.

Porta, R. L., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of political economy*, *106*(6), 1113-1155.

Robock, SH (1971). Political risk-identification and assessment. *Columbia Journal of world business* , *6* (4), 6-20.

Tables:

Table 3. Variable definitions.

Variable	Description	Source
A.	**Banking Stability Characteristics**	
Z-score	*The insolvency risk proxied by: -1*LN(1+(EA+ROA)/σROA)*	Bloomberg & Own Calc
σROA	*Three-year rolling time window standard deviation of return on assets*	Bloomberg & Own Calc
ROA/σROA	*The portfolio risk proxied by: -1*LN(ROA//σROA)*	Bloomberg & Own Calc
EA/σROA	*The leverage risk proxied by: -1*LN(EA//σROA)*	Bloomberg & Own Calc
σNIM	*Three-year rolling time window standard deviation of net interest margin.*	Bloomberg & Own Calc
NPL/TL	*The credit risk proxied by non-performing loans to total loans*	Bloomberg & Own Calc
TD/TA	*The liquidity risk proxied by total deposits to total assets*	Bloomberg & Own Calc
LLP/TA	*The ratio of loan loss provisions to total assets*	Bloomberg & Own Calc
Overhead	*The overhead is proxied as non-interest bank expenses divided by assets*	Bloomberg & Own Calc
CPR	*Counterparty risk is determined using the first principal component of the CDS spreads of the 16 major banks acting as dealers in the CDS market*	Bloomberg & Own Calc
EDF	*Aggregate default probability of a bank within 5 years*	Bloomberg
AGz	*Composite risk measure proxied by using the first principal component of the Z-score, EA/σROA, ROA/σROA, σNIM, NPL/TL, and TD/TA*	Bloomberg & Own Calc
AG	*Composite index of accounting-based risk measures proxied by using the first principal component of the EA/σROA, ROA/σROA, σNIM, NPL/TL, and TD/TA*	Bloomberg & Own Calc
BC	*The banking crisis dummy that represents a country experienced a banking crisis initiated during 2007-2013 (1=yes; 0=no)*	Demirgüç-Kunt et al. (2015)
B.	**Deposit Insurance System**	
DI	*The explicit deposit insurance system dummy (yes=1; no=0).*	Demirgüç-Kunt et al. (2015)
CL	*Deposit insurance coverage relative to GDP per capita*	Demirgüç-Kunt et al. (2015)
Ex Ante	*Ex-ante fund (yes=1; no=0)*	Demirgüç-Kunt et al. (2015)
LI	*Deposit losses imposed (yes=1; no=0)*	Demirgüç-Kunt et al. (2015)
CFC	*Coverage: foreign currency deposits (1=yes; 0=no)*	Demirgüç-Kunt et al. (2015)
CID	*Coverage: interbank deposits (1=yes; 0=no)*	Demirgüç-Kunt et al. (2015)
BFG	*Backstop from government (1=yes; 0=no)*	Demirgüç-Kunt et al. (2015)
GGOD	*A binary variable indicating the existence of a government guarantee on bank deposits (limited or full), non-deposit liabilities, or bank assets since 2008 (1=yes; 0=no)*	Demirgüç-Kunt et al. (2015) & Own Calc
MHI	*Moral hazard index based on principal component analysis of standardized design feature of thirteen dummy variables and coverage limit.* [1]	Demirgüç-Kunt et al. (2015)
C.	**Political Risk**	
PR	*The composite index of political risk rating*	ICRG PRS CDO
IQI	*A dummy variable based on the composite index of WGI Institutional Quality (IQ) (1= more institutionally developed (>50); less institutionally developed (<50))*	WGI & Own Calc
D.	**Bank Business Model**	
BM	*The composite index of bank business model based on principle component of DIV, CS, As, and LS.*	Bloomberg & Own Calc
DIV	*The income diversification proxied by non-interest income ratio*	Bloomberg & Own Calc
CS	*The capital structure is the ratio of equity to total assets.*	Bloomberg & Own Calc
AS	*The asset structure proxied by the ratio of loan loss provisions to loans.*	Bloomberg & Own Calc
LS	*The liability structure proxied by the ratio of deposits to liabilities.*	Bloomberg & Own Calc

E.	**Bank-specific Controls**	
Size	*The natural logarithm of total asset of each bank.*	Bloomberg & Own Calc
Tier1	*The ratio of a bank's core tier 1 capital to its total risk-weighted assets.*	Bloomberg
F.	**Country-specific Controls**	
Debt	*The total amount of sovereign debt of a country to its GDP*	Bloomberg & Own Calc
LMR	*The total return index based on net dividends of the main index of each country*	Bloomberg & Own Calc
HL	*A dummy representing the income level of each country (1= high income and upper middle income; 0= low income and lower middle income)*	World Bank
G.	**Global Market Controls**	
VIX	*The Chicago Board Options Exchange's CBOE Volatility Index*	Bloomberg
OVX	*The US CBOE Crude Oil Volatility Index*	Bloomberg
GEPU	*The news-based global economic policy uncertainty index based on 21 countries*	Davis (2016) EPU Web.

Table 4. Explicit deposit insurance system and banking stability

Variables	Z-score	EA/σROA	σNIM	NPL/TL	TD/TA	LLP/TA	CPR	EDF	Overhead	AGz	AG
DI	6.977***	4.557 ***	68.507 **	-1.517 **	0.424 ***	-0.028 ***	37.234 ***	-0.073 ***	1.321***	3.217 ***	4.546 ***
	[1.607]	[1.440]	[28.077]	[0.697]	[0.023]	[0.005]	[2.599]	[0.006]	[0.268]	[0.389]	[0.406]
Size	-0.031***	-0.022***	-1.747**	-0.036***	-0.016***	0.000***	-0.072***	-0.002***	-0.045***	-0.020***	-0.029***
	[0.007]	[0.007]	[0.708]	[0.002]	[0.000]	[0.000]	[0.013]	[0.000]	[0.003]	[0.002]	[0.002]
Tier1	0.000***	0.000***	0.000	-0.000*	0.000***	-0.000***	0.000***	0.000***	0.000*	0.000***	0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
LMR	-0.000***	-0.000***	0.000*	-0.000**	-0.000**	-0.000**	0.000**	-0.000***	0.000	-0.000***	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Debt	0.007***	0.003***	-0.023**	0.002***	0.001***	0.000	-0.012***	0.000***	-0.000	0.001***	0.000***
	[0.001]	[0.001]	[0.009]	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]	[0.000]
VIX	0.078***	0.077***	0.037	0.004	0.000	0.000*	0.119***	0.001***	0.003**	0.010***	0.002*
	[0.003]	[0.003]	[0.040]	[0.002]	[0.000]	[0.000]	[0.005]	[0.000]	[0.001]	[0.001]	[0.001]
OVX	-0.016***	-0.017***	-0.058*	-0.001	-0.000***	0.000	-0.028***	-0.000***	-0.001**	-0.002***	0.000
	[0.002]	[0.002]	[0.031]	[0.001]	[0.000]	[0.000]	[0.002]	[0.000]	[0.001]	[0.000]	[0.000]
GEPU	-0.013***	-0.013***	-0.017**	0.000	-0.000***	0.000*	0.013***	0.000***	-0.000	-0.004***	-0.003***
	[0.000]	[0.000]	[0.008]	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]	[0.000]
HL	1.611***	1.365***	4.160**	-0.249***	-0.055***	-0.003***	2.371***	-0.013***	0.048***	0.699***	0.820***
	[0.138]	[0.138]	[1.693]	[0.064]	[0.002]	[0.000]	[0.211]	[0.000]	[0.018]	[0.034]	[0.032]
Constant	-502.51***	480.56***	-857.40**	-27.646**	-6.147***	0.203***	662.167***	1.352***	-7.336	-156.236***	-145.501***
	[16.348]	[15.596]	[393.37]	[11.780]	[0.428]	[0.068]	[25.254]	[0.071]	[6.896]	[4.649]	[4.442]
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Model fit											
N (Obs.)	119,615	126,755	126,357	119,494	126,894	126,894	126,894	126,891	126,894	119,600	126,755
T (Years)	15	15	15	15	15	15	15	15	15	15	15
L (Banks)	705	705	705	705	705	705	705	705	705	705	705
K (Countries)	70	70	70	70	70	70	70	70	70	70	70
R-squared	0.368	0.372	0.373	0.380	0.375	0.373	0.373	0.373	0.373	0.369	0.373
First-Stage F	2218.500	2344.260	2202.840	2182.000	2347.030	2203.100	2203.100	2203.100	2203.10	2072.410	2192.380
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Wald $\chi 2$	2625.540	2003.040	4129.240	1298.190	22700.300	980.490	4601.660	6710.300	424.20	3507.730	3366.510
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Wu-Hausman	21.116	11.240	6.464	4.888	350.486	91.885	5506.970	198.416	5.670	110.945	326.101
	[0.000]	[0.001]	[0.011]	[0.027]	[0.000]	[0.000]	[0.000]	[0.000]	[0.017]	[0.000]	[0.000]

Note: This table presents the results of the IV regression, where the dependent variable is bank risk. The independent variable is deposit insurance. The standard errors are reported in parentheses. In the model fit section, the p-value of F of the first stage, Wald $\chi 2$, and Wu-Hausman's endogeneity test are given in parentheses. $***p < 0.01$, $**p < 0.05$, $*p < 0.10$.

Table 5. Bank business model and moral hazard problem

Variables	Z-score	EA/σROA	σNIM	NPL/TL	TD/TA	LLP/TA	CPR	EDF	Overhead	AGz	AG
DI	1.135**	1.398 ***	76.956 **	1.415 ***	0.399 ***	-0.012 ***	3.930 ***	-0.026 ***	0.758***	2.052 ***	3.314 ***
	[0.536]	[0.480]	[30.951]	[0.312]	[0.020]	[0.000]	[0.238]	[0.003]	[0.094]	[0.161]	[0.157]
BM	-0.276***	-0.321***	-13.434**	-0.129***	-0.014***	0.000***	-1.860***	0.001**	-0.029***	-0.153***	-0.197***
	[0.055]	[0.054]	[5.436]	[0.027]	[0.002]	[0.000]	[0.040]	[0.000]	[0.007]	[0.018]	[0.021]
DI * BM	-0.043	0.011	13.012**	0.171***	0.019***	-0.001***	0.316***	-0.002***	0.044***	0.085***	0.170***
	[0.056]	[0.055]	[5.255]	[0.029]	[0.002]	[0.000]	[0.040]	[0.000]	[0.011]	[0.018]	[0.021]
Size	-0.023***	-0.014*	-2.289**	-0.034***	-0.015***	0.000***	-0.023***	-0.002***	-0.046***	-0.017***	-0.026***
	[0.008]	[0.007]	[0.925]	[0.002]	[0.000]	[0.000]	[0.003]	[0.000]	[0.003]	[0.002]	[0.002]
Tier1	0.000***	0.000***	0.000	0.000***	0.000***	-0.000***	-0.000	0.000***	0.000	0.000***	0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
LMR	-0.000***	-0.000***	0.000**	0.000**	-0.000***	-0.000**	-0.000***	-0.000***	0.000	-0.000***	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Debt	0.010***	0.005***	-0.053**	0.000***	0.001***	-0.000**	-0.002***	0.000***	0.000	0.002***	0.001***
	[0.000]	[0.000]	[0.021]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
VIX	0.056***	0.057***	0.099	0.003	0.000	0.000***	0.131***	0.000***	0.006**	0.005***	-0.001
	[0.004]	[0.004]	[0.078]	[0.003]	[0.000]	[0.000]	[0.002]	[0.000]	[0.003]	[0.001]	[0.001]
OVX	0.018***	0.014***	-0.111*	-0.001	-0.000***	0.000	-0.005***	0.000***	-0.002**	0.006***	0.005***
	[0.002]	[0.002]	[0.061]	[0.001]	[0.000]	[0.000]	[0.001]	[0.000]	[0.001]	[0.001]	[0.001]
GEPU	-0.018***	-0.019***	-0.014	0.000	-0.000***	-0.000	0.031***	0.000***	-0.000	-0.005***	-0.004***
	[0.000]	[0.000]	[0.009]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
HL	1.245***	1.197***	4.344**	-0.044	-0.051***	-0.001***	0.261***	-0.009***	0.012	0.635***	0.753***
	[0.084]	[0.079]	[1.743]	[0.056]	[0.002]	[0.000]	[0.034]	[0.000]	[0.010]	[0.023]	[0.021]
Constant	-731.578***	-718.978***	-1049.021**	-24.730*	-7.102***	0.110***	398.139***	1.021***	-15.728	-221.065***	-192.698***
	[18.610]	[18.390]	[501.447]	[12.645]	[0.531]	[0.014]	[7.862]	[0.071]	[18.610]	[5.338]	[4.858]
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Model fit											
N (Obs.)	102,611	108,966	108,774	102,626	109,088	109,088	109,088	109,088	109,088	102,596	108.966
R-squared	0.404	0.409	0.409	0.412	0.407	0.408	0.408	0.408	0.408	0.404	0.408
First-Stage F	2163.81	2219.44	2225.05	2228.09	2288.97	2288.97	2288.97	2288.97	2288.97	2163.90	2280.02
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Wald $\chi 2$	3338.88	2859.07	6820.31	1200.52	25380.4	3244.03	66331.82	6904.94	515.93	4291.66	5507.19
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Wu-Hausman	7.415	13.970	37.921	9.938	1032.79	1942.58	409.314	108.267	6.720	222.859	891.397
	[0.006]	[0.000]	[0.000]	[0.002]	[0.000]	[0.000]	[0.000]	[0.000]	[0.009]	[0.000]	[0.000]

*Note: This table shows the results of the IV regression, where the dependent, independent, and moderating variables are bank risk, deposit insurance, and bank business model, respectively. The standard errors are reported in parentheses. The p-values of the specification tests are given in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 6. Political risk and moral hazard

Variables	Z-score	EA/σROA	σNIM	NPL/TL	TD/TA	LLP/TA	CPR	EDF	Overhead	AGz	AG
DI	24.209***	51.068 ***	760.007 **	16.387 ***	5.939 ***	-0.060 ***	12.816***	0.242***	8.474**	11.301 ***	19.694***
	[5.240]	[7.976]	[287.975]	[2.831]	[0.674]	[0.008]	[3.033]	[0.038]	[3.363]	[1.576]	[2.396]
PR	0.322***	0.661***	20.057***	0.210***	0.077***	-0.001***	0.175***	0.003***	0.108**	0.154***	0.262***
	[0.069]	[0.102]	[3.713]	[0.037]	[0.009]	[0.000]	[0.039]	[0.000]	[0.043]	[0.021]	[0.031]
DI * PR	-0.396***	-0.825***	-11.244**	-0.262***	-0.095***	0.001***	-0.205***	-0.004***	-0.133**	-0.184***	-0.316***
	[0.086]	[0.129]	[4.632]	[0.046]	[0.011]	[0.000]	[0.049]	[0.001]	[0.054]	[0.026]	[0.039]
BM	-0.310***	-0.269***	-61.610***	0.038**	0.009***	-0.000***	-1.562***	-0.001***	0.019*	-0.074***	-0.029***
	[0.020]	[0.025]	[3.726]	[0.015]	[0.002]	[0.000]	[0.010]	[0.000]	[0.011]	[0.006]	[0.008]
Size	-0.176***	-0.362***	8.218***	-0.151***	-0.052***	0.000***	-0.079***	-0.004***	-0.098***	-0.079***	-0.137***
	[0.036]	[0.056]	[2.486]	[0.022]	[0.004]	[0.000]	[0.021]	[0.000]	[0.024]	[0.011]	[0.017]
Tier1	0.000***	0.001***	0.051***	0.000***	0.000***	-0.000***	0.000	0.000***	0.000**	0.000***	0.000***
	[0.000]	[0.000]	[0.006]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
LMR	0.000*	0.000***	-0.008***	0.000**	0.000***	-0.000**	0.000	0.000***	0.000**	0.000***	0.000***
	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Debt	0.019***	0.025***	4.764***	0.008***	0.003***	-0.000**	0.003***	0.000***	0.003***	0.007***	0.009***
	[0.002]	[0.003]	[0.140]	[0.001]	[0.000]	[0.000]	[0.001]	[0.000]	[0.001]	[0.001]	[0.001]
VIX	0.057***	0.067***	0.962	0.006**	0.001***	0.000***	0.132***	0.000***	0.007**	0.006***	0.002
	[0.005]	[0.006]	[0.861]	[0.003]	[0.000]	[0.000]	[0.002]	[0.000]	[0.003]	[0.001]	[0.002]
OVX	0.021***	0.020***	2.887***	0.001	0.000*	-0.000*	-0.003***	0.000***	-0.001	0.008***	0.007***
	[0.003]	[0.003]	[0.465]	[0.002]	[0.000]	[0.000]	[0.001]	[0.000]	[0.001]	[0.001]	[0.001]
GEPU	-0.019***	-0.019***	-2.201***	0.000	-0.000**	0.000	0.031***	0.000***	-0.000	-0.005***	-0.004***
	[0.001]	[0.001]	[0.108]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
HL	-0.659*	-2.695***	232.675	-1.349***	-0.526***	0.005***	-1.216***	-0.023***	-0.664***	-0.467***	-1.149***
	[0.385]	[0.597]	[26.475]	[0.219]	[0.048]	[0.001]	[0.221]	[0.003]	[0.247]	[0.117]	[0.179]
Constant	-795.243***	-801.687***	-118320***	-57.910***	-16.605***	0.202***	377.600***	0.618***	-29.208**	-249.507***	-223.823***
	[24.038]	[26.598]	[3825.708]	[15.595]	[2.060]	[0.024]	[9.544]	[0.114]	[14.124]	[7.342]	[8.098]
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Model fit											
N (Obs.)	102,611	108,966	109,088	102,626	109,088	109,088	109,088	109,088	109,088	102,596	108,966
R-squared	0.899	0.893	0.895	0.894	0.893	0.893	0.893	0.893	0.893	0.899	0.893
First-Stage F	26934.73	24496.62	20219.09	29075.22	23682.5	23682.5	23682.5	23682.5	23682.5	26942.78	24496.62
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Wald $\chi 2$	2814.71	1635.25	10329.97	768.46	5735.65	1856.74	56675.55	4666.49	361.28	2909	2397.38
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Wu-Hausman	29.003	73.336	29.173	28.746	1403.37	260.222	25.285	50.037	6.707	86.412	220.478
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.010]	[0.000]	[0.000]

*Note: This table shows the results of the IV regression, where the dependent, independent, and moderating variables are bank risk, deposit insurance, and political risk, respectively. The standard errors are reported in parentheses. The p-values of the specification tests are given in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.*

Table 7. Banking crisis, deposit insurance, and political institutions

	Banking Crisis (BC)					
Variables	DI	CL	Ex Ante	BFG	GGOD	MHI
Safety Nets	-9.142***	-0.005 ***	-1.396***	0.228	-4.796***	2.696***
	[0.289]	[0.000]	[0.218]	[0.181]	[0.156]	[0.096]
PR	-0.016***	0.047***	0.056***	0.044***	0.015***	0.095***
	[0.004]	[0.001]	[0.003]	[0.001]	[0.001]	[0.002]
DI * PR	0.097***	0.000***	0.010***	0.082***	0.109***	-0.018***
	[0.004]	[0.000]	[0.003]	[0.002]	[0.002]	[0.001]
BM	0.009	-0.048***	-0.104***	-0.037**	0.056***	-0.192***
	[0.032]	[0.014]	[0.029]	[0.018]	[0.020]	[0.017]
DI *BM	-0.009	0	0.097***	0.020	-0.211***	0.029***
	[0.034]	[0.000]	[0.030]	[0.027]	[0.024]	[0.008]
Size	-0.353***	-0.410***	-0.342***	-0.235***	-0.246***	-0.178***
	[0.005]	[0.005]	[0.005]	[0.007]	[0.005]	[0.007]
Tier1	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
LMR	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Debt	0.005***	-0.002***	0.002***	0.036***	0.013***	0.010***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
VIX	-0.002	-0.002	-0.003	-0.000	-0.003	-0.002
	[0.002]	[0.002]	[0.003]	[0.003]	[0.003]	[0.003]
OVX	-0.004***	-0.004**	-0.004***	-0.003	-0.005***	-0.002
	[0.001]	[0.001]	[0.001]	[0.002]	[0.002]	[0.002]
GEPU	-0.000	-0.000	-0.000	-0.000	0.000	0.001***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Constant	-69.886***	-100.51***	-113.363	10.326	-54.316	-17.819
	[11.550]	[11.511]	[10.979]	[14.670]	[13.170]	[16.109]
HL FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Model fit						
N (Obs.)	90,093	90,093	90,093	90,093	90,093	85,560
Pseudo R2	0.548	0.555	0.517	0.728	0.664	0.746
LR $\chi 2$	62900.8	63790.5	59417	83604	76291.2	80778.2
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Pearson $\chi 2$	117603.4	104513	92610.8	45858.7	175462.1	369439.2
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

Note: This table shows the results of the logit regression, where the dependent variable is a binary variable indicating whether a country experienced a banking crisis that was triggered during 2007-2013. The independent variables are the presence of deposit insurance, the coverage ratio to GDP, the presence of ex ante funding, the presence of a backstop from government, the presence of a government guarantee on bank deposits, non-deposit liabilities or assets, and the composite safety net index. Political risk and bank business model are the moderators. Standard errors are reported in parentheses. The p-values of the specification tests are given in parentheses. $***p < 0.01$, $**p < 0.05$, $*p < 0.10$.

Table 8. Coverage limit and moral hazard

Panel A. Coverage Limit to GDP per capita

	Z-score	EA/σROA	σNIM	NPL/TL	TD/TA	LLP/TA	CPR	EDF	Overhead	AGz	AG
CL	0.000***	0.001***	0.008 **	0.000***	0.000***	-0.000***	0.000***	0.000***	0.000**	0.000***	0.000***
	[0.000]	[0.000]	[0.003]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
PR	0.022***	0.030***	0.664**	0.017***	0.005***	-0.000***	0.024***	0.000	0.007***	0.015***	0.022***
	[0.004]	[0.004]	[0.269]	[0.003]	[0.000]	[0.000]	[0.001]	[0.000]	[0.002]	[0.001]	[0.001]
DI * PR	-0.000***	-0.000***	-0.000**	-0.000***	-0.000***	0.000***	-0.000***	-0.000***	-0.000**	-0.000***	-0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
BM	-0.371***	-0.380***	-2.922**	-0.001	-0.004***	0.000***	-1.598***	0.000***	0.001	-0.096***	-0.065***
	[0.022]	[0.022]	[1.193]	[0.016]	[0.001]	[0.000]	[0.001]	[0.000]	[0.001]	[0.006]	[0.005]
DI * BM	0.000***	0.000***	0.000**	0.000***	0.000***	-0.000	0.000***	0.000***	0.000**	0.000***	0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Obs.)	93,444	99,546	99,354	93,206	99,668	99,668	99,668	99,668	99,668	93,429	93,546
R-squared	0.854	0.856	0.851	0.871	0.856	0.856	0.856	0.856	0.856	0.854	0.856
Wald χ2	3071.99	2664	1081.35	1203.74	36880.1	8944.89	63877.92	6998.42	628.47	4424.16	7604.29
	[0.022]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Wu-Hausman	38.51	80.28	5.78	14.58	1017.18	50.25	41.16	70.13	3.39	74.40	157.02
	[0.000]	[0.000]	[0.016]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.036]	[0.000]	[0.000]

Panel B. Aggregate Safety Nets Index

	Z-score	EA/σROA	σNIM	NPL/TL	TD/TA	LLP/TA	CPR	EDF	Overhead	AGz	AG
MHI	-0.895***	-1.328***	0.116 **	-0.441***	-0.040***	-0.003***	-0.736***	-0.006***	-0.017	-0.245***	-0.240***
	[0.163]	[0.166]	[0.052]	[0.033]	[0.004]	[0.000]	[0.068]	[0.000]	[0.036]	[0.042]	[0.034]
PR	-0.005**	-0.008***	0.002*	-0.001**	0.001***	-0.000***	0.011***	-0.000***	0.001***	0.005***	0.010***
	[0.002]	[0.002]	[0.001]	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]	[0.000]
DI * PR	0.013***	0.019**	-0.002**	0.007***	0.001***	0.000***	0.010***	0.000***	0.001	0.004***	0.004***
	[0.002]	[0.002]	[0.001]	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.000]	[0.000]
BM	-0.217***	-0.222***	0.009**	0.008	0.003***	0.000***	-1.575***	0.000***	0.009*	-0.061***	-0.044***
	[0.026]	[0.026]	[0.003]	[0.008]	[0.001]	[0.000]	[0.011]	[0.000]	[0.006]	[0.007]	[0.005]
DI * BM	-0.064***	-0.061***	0.002	0.004	-0.001***	-0.000***	-0.003	-0.001***	-0.002	-0.013***	-0.005***
	[0.008]	[0.008]	[0.002]	[0.004]	[0.000]	[0.000]	[0.003]	[0.000]	[0.003]	[0.002]	[0.002]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N (Obs.)	89,886	95,683	95,449	89,551	95,763	95,763	95,763	95,763	95,763	89,871	95,683
R-squared	0.970	0.970	0.970	0.972	0.970	0.970	0.970	0.970	0.970	0.969	0.970
Wald χ2	3241.04	2763.21	1299.27	1500.51	41337.6	8951.83	61788.4	9189.82	737.90	5036.04	8920.04
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Wu-Hausman	8.971	23.547	7.345	3.305	51.449	861.211	41.891	6.441	3.602	8.720	16.106
	[0.003]	[0.000]	[0.007]	[0.049]	[0.000]	[0.000]	[0.000]	[0.011]	[0.040]	[0.003]	[0.000]

Note: This table shows the results of the IV regression, where the dependent variable is bank risk. The independent variables are the deposit insurance coverage limit relative to GDP (panel A) and the aggregate safety net or moral hazard index (panel B). The moderating variables are political risk and the bank's business model. The

standard errors are reported in parentheses. The p-values of the specification tests are given in parentheses. ∗∗∗ $p < 0.01$, ∗∗ $p < 0.05$, ∗ $p < 0.10$.

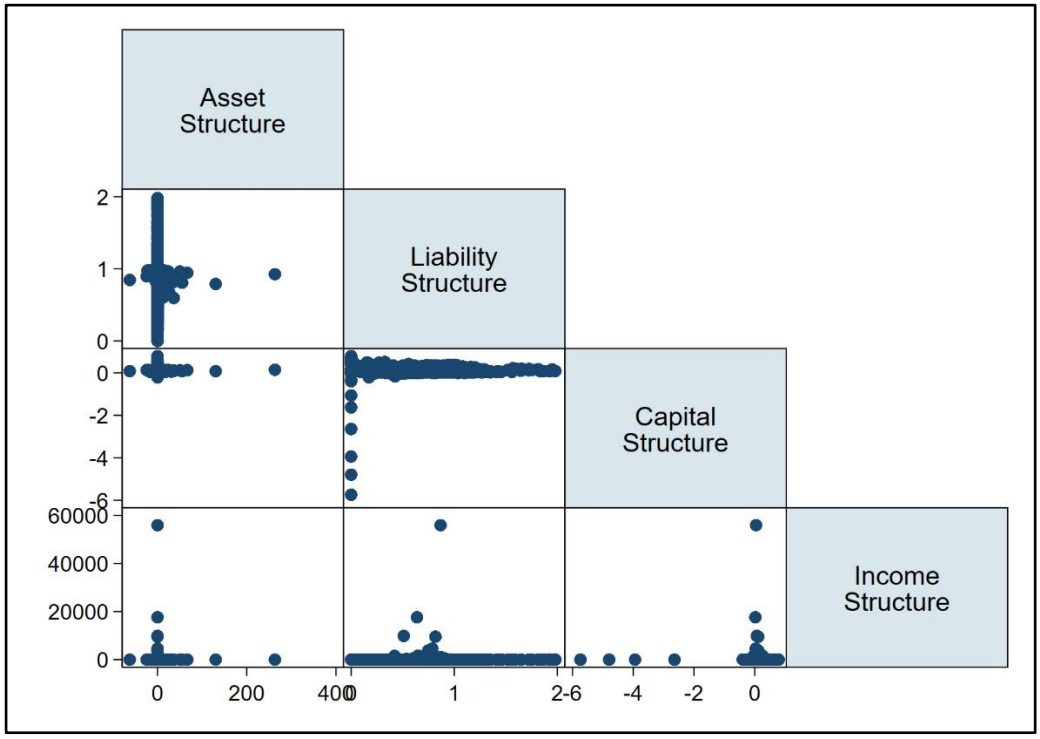
Table 9. A multivariate approach: deposit insurance features and bank risks

DI Features	Z-score	EA/σROA	σNIM	NPL/TL	TD/TA	LLP/TA	CPR	EDF	Overhead	AGz	AG
Ex Ante	0.079	-0.013	0.001	0.108	0.074***	0.000	0.017	0.003***	0.095*	0.169***	0.284***
LI	4.139***	5.295***	0.276***	0.943***	0.438***	0.000	0.132	0.017***	0.362*	1.413***	1.363***
CFC	-0.788***	-0.470***	0.017***	-0.027	-0.168***	0.002***	0.036	-0.001***	0.016	-0.281***	-0.292***
CID	0.225***	0.430***	0.021***	0.206***	0.028***	-0.001***	0.035	0.001***	0.154***	0.196***	0.236***
BFG	-0.300***	-0.278***	0.026***	0.045	0.063***	0.002***	-0.030	0.002***	0.013	-0.192***	-0.168***
GGOD	-0.750***	-1.093***	-0.016***	0.080	-0.144***	-0.002***	-0.154***	0.000	0.059	-0.190***	-0.093***
Constant	-8.019***	-5.884***	0.019***	-0.085	0.730***	0.002***	-0.041	0.014***	-0.105	-0.005	-0.122***

Note: This table shows the results of multivariate regression between various bank risk factors and deposit insurance characteristics. ∗∗∗ $p < 0.01$, ∗∗ $p < 0.05$, ∗ $p < 0.10$.

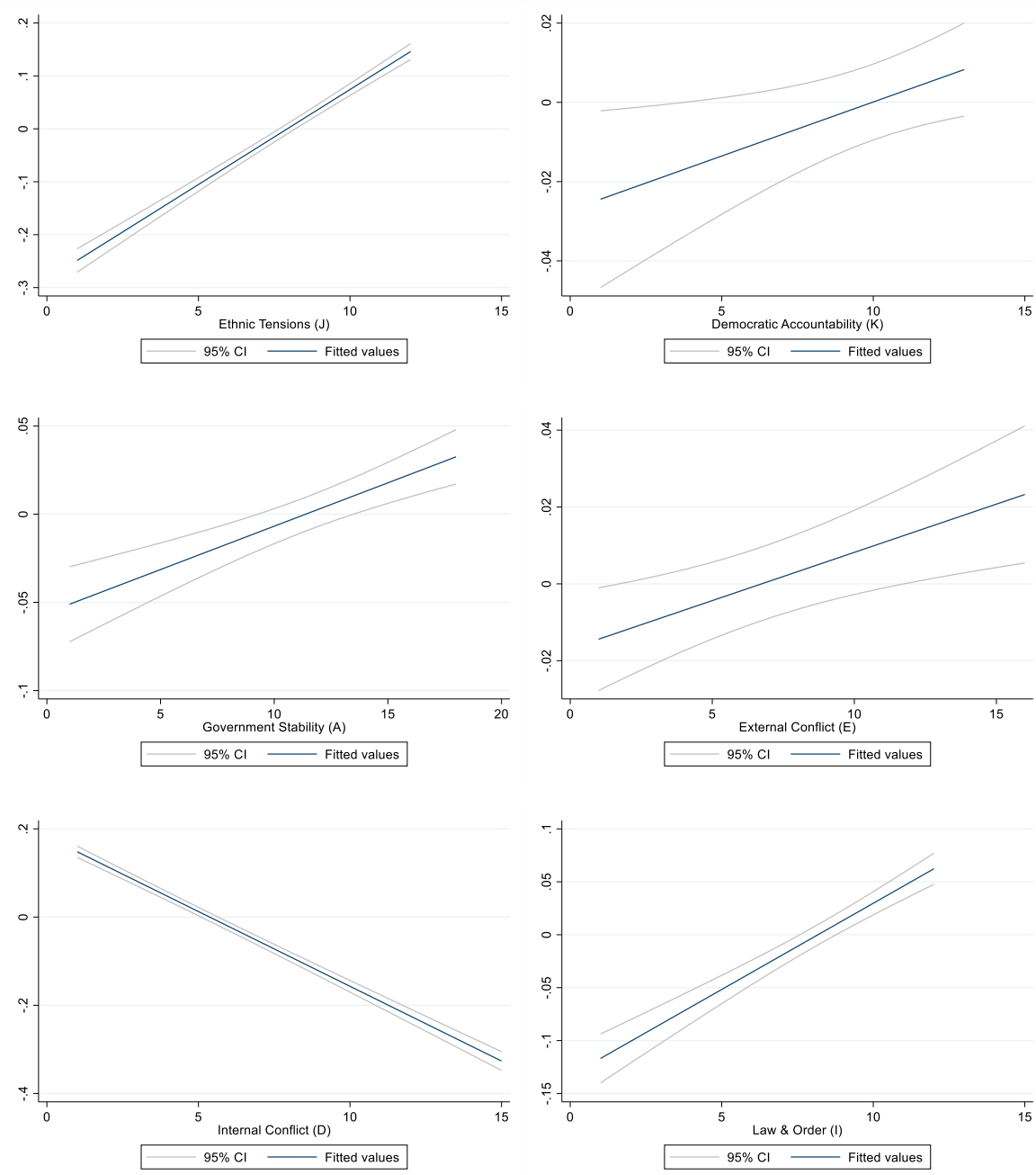
Figures:

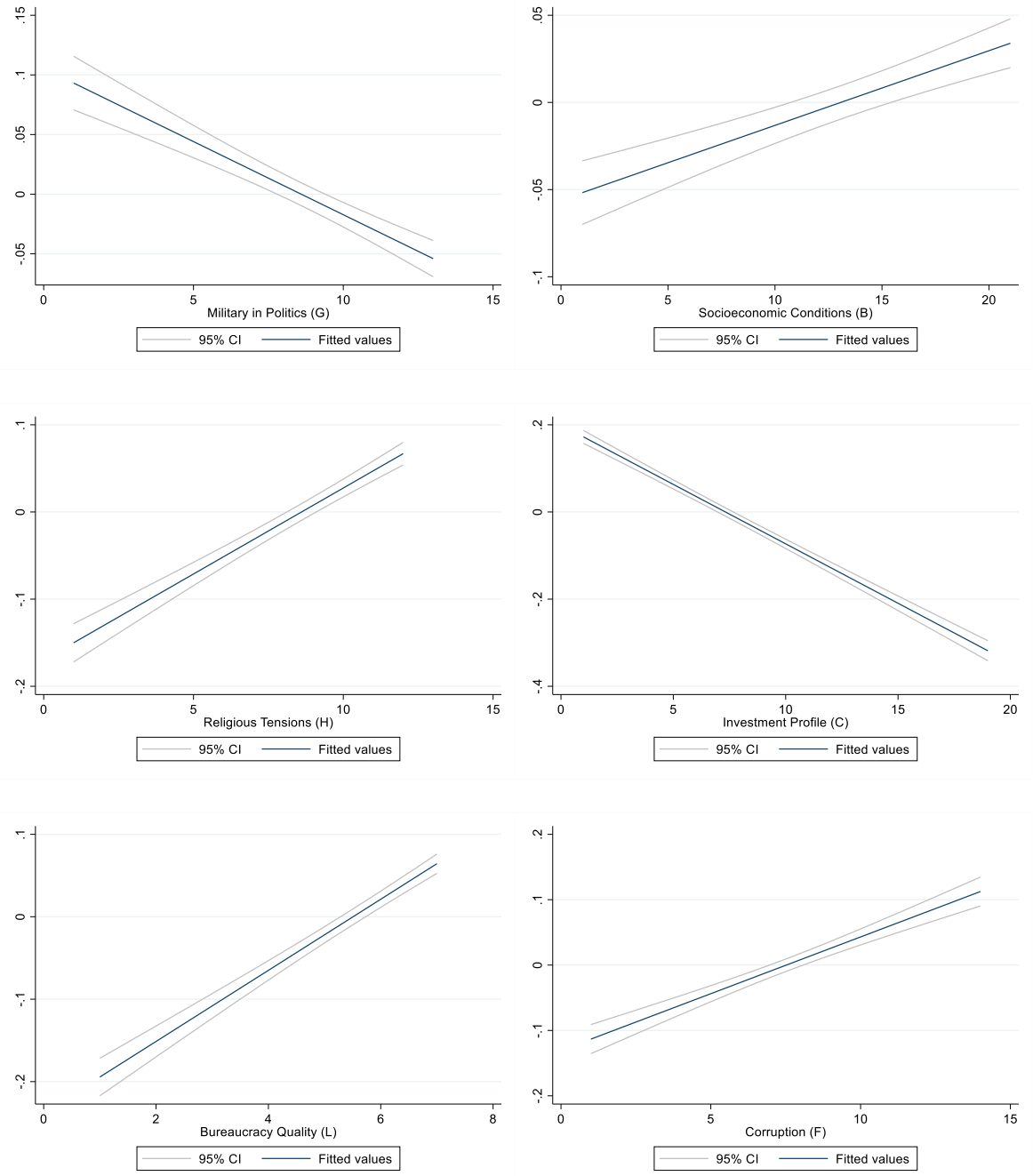
Figure 1. Scatter plot matrix of bank business model components



Note: This figure illustrates the relationship between different components of a bank's business model using a scatterplot matrix.

Figure 2. Characteristics of political institutions and bank risk-taking





Note: This figure illuminate the relationship between political risk components and overall bank risk using 12 scatter plots.

Appendix A. Summary statistics

Table A1. Countries, the number of banks per country, and the overall quality of political institutions

ID	Country Name	No. of Banks	Avg. PR	Avg. IQ	ID	Country Name	No. of Banks	Avg. PR	Avg. IQ
1	Argentina	6	65.68	43.35	**36**	Mexico	3	66.65	46.12
2	Australia	8	84.47	89.25	**37**	Morocco	5	66.56	41.85
3	Austria	5	84.37	92.91	**38**	Netherlands	1	84.36	90.54
4	Bahrain	3	66.22	53.41	**39**	New Zealand	1	87.05	97.39
5	Belgium	1	79.98	84.17	**40**	Nigeria	3	44.84	22.21
6	Brazil	3	65.66	52.32	**41**	Norway	18	88.08	91.06
7	Bulgaria	2	68.8	57.41	**42**	Oman	5	72.32	61.22
8	Canada	12	86.18	88.45	**43**	Pakistan	11	47.85	23.17
9	Chile	6	75.91	82.6	**44**	Peru	5	63.36	44.33
10	China	9	61.35	40.63	**45**	Philippines	11	61.7	40.35
11	Colombia	5	59.97	44.07	**46**	Poland	9	77.57	71.69
12	Croatia	4	72.19	63.91	**47**	Portugal	1	77.78	80.45
13	Cyprus	1	75.96	78.34	**48**	Qatar	6	72.15	68.35
14	Czech	1	77.62	78.71	**49**	Romania	2	66.95	58.43
15	Denmark	15	81.05	94.3	**50**	Russia	2	60.05	29.65
16	Egypt	6	54.49	32.03	**51**	Saudi Arabia	9	67.21	42.97
17	Finland	1	89.15	96.67	**52**	Singapore	3	82.82	85.11
18	France	17	74.13	84.44	**53**	Slovakia	2	75.2	74.66
19	Germany	4	84.12	89.26	**54**	South Africa	5	65.67	60.67
20	Greece	5	70.9	61.81	**55**	South Korea	1	77.36	69.41
21	Hong Kong	12	79.48	85.4	**56**	Spain	4	73.03	74.28
22	Hungary	2	76.08	71.48	**57**	Sri Lanka	1	56.74	43.83
23	India	9	60.96	47.88	**58**	Sweden	4	87.16	94.56
24	Indonesia	19	58.54	40.66	**59**	Swiss	12	87.57	96.82
25	Ireland	2	83.73	85.27	**60**	Taiwan	7	78.41	80.93
26	Israel	7	65.72	70.53	**61**	Tanzania	1	60.86	35.37
27	Italy	8	75.89	68.31	**62**	Thailand	7	56.61	46.37
28	Japan	61	81.09	85.26	**63**	Trinidad and Tobago	1	69.17	55.69
29	Jordan	5	64.04	52.49	**64**	Tunisia	2	65.66	45.98
30	Kazakhstan	1	67.75	36.4	**65**	Turkey	9	55.73	46.71
31	Kenya	1	56.33	30.5	**66**	UAE	14	77.41	64.83
32	Kuwait	8	70.09	53.37	**67**	UK	9	80.52	86.43
33	Lithuania	1	73.78	76.97	**68**	US	267	82.28	84.62
34	Malaysia	7	72.28	63.37	**69**	Venezuela	1	46.29	9.91
35	Malta	3	82.7	83.3	**70**	Vietnam	2	64.01	34.58

Note: This table shows the countries, the number of banks per country, the average political risk rating (PR) of each country over the period 2007-2021 (source: ICRG), and the average institutional quality index value (IQ) of each country over the period 2007-2021 (source: WGI). For both PR and IQ, a higher score indicates lower political risk and better quality of the political environment.

Table A2. Summary statistics

Variable	Obs	Mean	Std. dev.	Min	Max
Z-score	119615	-8.600	6.170	-23.138	4.762
EA/σROA	126755	-6.274	6.212	-15.882	10.221
σNIM	126360	1.325	179.784	0.000	30607.720
NPL/TL	119497	0.336	4.479	0.000	174.645
TD/TA	126894	0.708	0.166	0.000	1.989
LLP/TA	126894	0.002	0.016	-0.153	2.763
CPR	126900	0.000	3.379	-5.502	12.043
EDF	126900	0.023	0.030	0.000	0.657
Overhead	126900	0.178	3.667	0.000	490.500
AGz	119600	0.000	1.692	-3.262	3.616
AG	126755	0.000	1.425	-3.571	3.392
DI	126900	0.889	0.314	0.000	1.000
PR	126900	64.553	30.668	1.000	109.000
BM	109090	0.000	1.171	-3.643	6.788
Size	126894	10.751	3.277	-2.333	21.269
Tier1	126900	950.047	847.353	1.000	2850.000
LMR	126900	8421.313	55651.910	0.001	7198399.000
Debt	126900	72.246	50.244	0.100	236.400
VIX	126900	20.206	8.760	9.510	59.890
OVX	126900	38.031	17.122	15.610	170.550
GEPU	126900	163.984	72.632	54.375	437.245
HL	126900	0.898	0.303	0.000	1.000

Note: This table presents the summary statistics of monthly data for 705 bank stocks over the period January 2007 to December 2021. The upper part of the table is devoted to the dependent variables, while the lower part of the table contains the independent and control variables.

Table A3. Correlation matrix

	Z-score	EA/σROA	σNIM	NPL/TL	TD/TA	LLP/TA	CPR	EDF	Overhead	AGz	AG	DI	PR	BM	Size	Tier1	LMR	Debt	VIX	OVX	GEPU
Z-score	1.000																				
EA/σROA	0.994	1.000																			
σNIM	0.136	0.142	1.000																		
NPL/TL	0.004	0.004	-0.003	1.000																	
TD/TA	0.059	0.051	-0.015	0.023	1.000																
LLP/TA	-0.052	-0.045	0.189	-0.021	-0.110	1.000															
CPR	-0.013	-0.019	-0.007	0.001	-0.013	0.061	1.000														
EDF	0.082	0.057	0.003	0.022	0.102	0.069	0.213	1.000													
Overhead	0.006	0.006	-0.003	0.012	0.027	-0.014	0.003	0.022	1.000												
AGz	0.929	0.935	0.082	0.015	0.110	-0.101	-0.051	0.015	0.011	1.000											
AG	0.816	0.827	0.040	0.028	0.158	-0.141	-0.078	-0.025	0.015	0.971	1.000										
DI	0.015	-0.005	-0.039	0.014	0.047	-0.113	-0.003	0.095	0.018	0.019	0.036	1.000									
PR	0.069	0.041	-0.064	0.029	0.102	-0.278	-0.011	0.120	0.031	0.110	0.158	0.398	1.000								
BM	-0.056	-0.056	-0.008	0.017	0.041	-0.059	-0.458	-0.073	0.005	-0.024	0.010	0.039	0.135	1.000							
Size	-0.018	-0.010	-0.010	-0.046	-0.077	0.096	-0.011	-0.206	-0.053	-0.035	-0.061	-0.074	-0.377	-0.033	1.000						
Tier1	0.009	0.013	0.017	-0.001	-0.115	0.057	0.011	0.040	-0.009	-0.007	-0.018	-0.105	-0.079	-0.038	0.037	1.000					
LMR	-0.007	-0.008	0.027	-0.026	-0.088	0.144	-0.128	-0.113	-0.026	-0.025	-0.048	-0.173	-0.179	0.057	0.371	-0.072	1.000				
Debt	0.072	0.033	-0.054	-0.002	0.292	-0.192	-0.058	0.013	-0.007	0.073	0.077	0.216	0.283	0.026	0.237	-0.220	0.366	1.000			
VIX	0.013	0.011	0.015	-0.005	-0.062	0.098	0.492	0.279	0.007	-0.041	-0.075	-0.002	0.005	-0.195	-0.039	0.092	-0.130	-0.114	1.000		
OVX	0.025	0.023	0.010	0.000	-0.044	0.069	0.292	0.219	0.001	-0.004	-0.021	-0.001	0.021	0.037	-0.019	0.053	-0.064	-0.066	0.723	1.000	
GEPU	-0.052	-0.058	-0.023	0.017	0.037	-0.038	0.079	-0.040	-0.002	-0.028	-0.005	0.001	0.034	0.460	0.061	-0.094	0.127	0.097	-0.058	0.105	1.000

Note: This table reports the correlation coefficients of the main variables used in this study.

Table A4. Counterparty risk using PCA analysis

Variable	Mean	Std. dev.	Min	Max	Components	Eigenvalue	Proportion	SE_Prop	Bias
Bank of America	103.64	79.49	9.63	456.84	Comp1	12.03	0.75	0.02	0.02
Barclays	94.04	51.97	5.70	257.45	Comp2	1.52	0.10	0.01	0.02
J.P. Morgan	71.92	32.74	14.85	201.13	Comp3	1.03	0.06	0.01	-0.01
Citigroup	115.55	92.50	7.85	631.53	Comp4	0.42	0.03	0.00	0.00
Bank of China	137.78	69.72	16.04	371.41	Comp5	0.28	0.02	0.00	0.00
MUFG Bank	66.61	32.89	6.35	172.83	Comp6	0.22	0.01	0.00	-0.01
Deutsche Bank	226.14	114.94	14.42	519.72	Comp7	0.14	0.01	0.00	0.00
BNP Paribas	79.02	56.79	5.81	297.52	Comp8	0.10	0.01	0.00	0.00
Société Générale	95.32	74.63	6.29	379.05	Comp9	0.07	0.00	0.00	0.00
UniCredit	156.76	114.10	8.01	625.32	Comp10	0.05	0.00	0.00	0.00
Commerzbank	109.07	55.53	8.32	319.72	Comp11	0.04	0.00	0.00	0.00
Credit Suisse	88.21	39.92	10.06	215.34	Comp12	0.03	0.00	0.00	0.00
Goldman Sachs	115.85	73.28	21.88	419.39	Comp13	0.02	0.00	0.00	0.00
Morgan Stanley	136.17	122.09	23.17	1033.50	Comp14	0.02	0.00	0.00	0.00
Royal Bank	118.57	76.34	4.24	368.75	Comp15	0.01	0.00	0.00	0.00
UBS	76.30	55.91	4.87	315.34	Comp16	0.00	0.00	0.00	0.00

Note: This table reports the results of the PCA analysis for the constructed counterparty risk measure. It includes the list of banks used for the analysis, the summary statistics, the eigenvalues, and the proportion. The eigenvalues are used to examine how many of the principal components are important and should be retained, and the proportion shows how each component explains the variance in the data.

Table A5. Composite risk measures using PCA analysis

A. Aggregate overall risk index

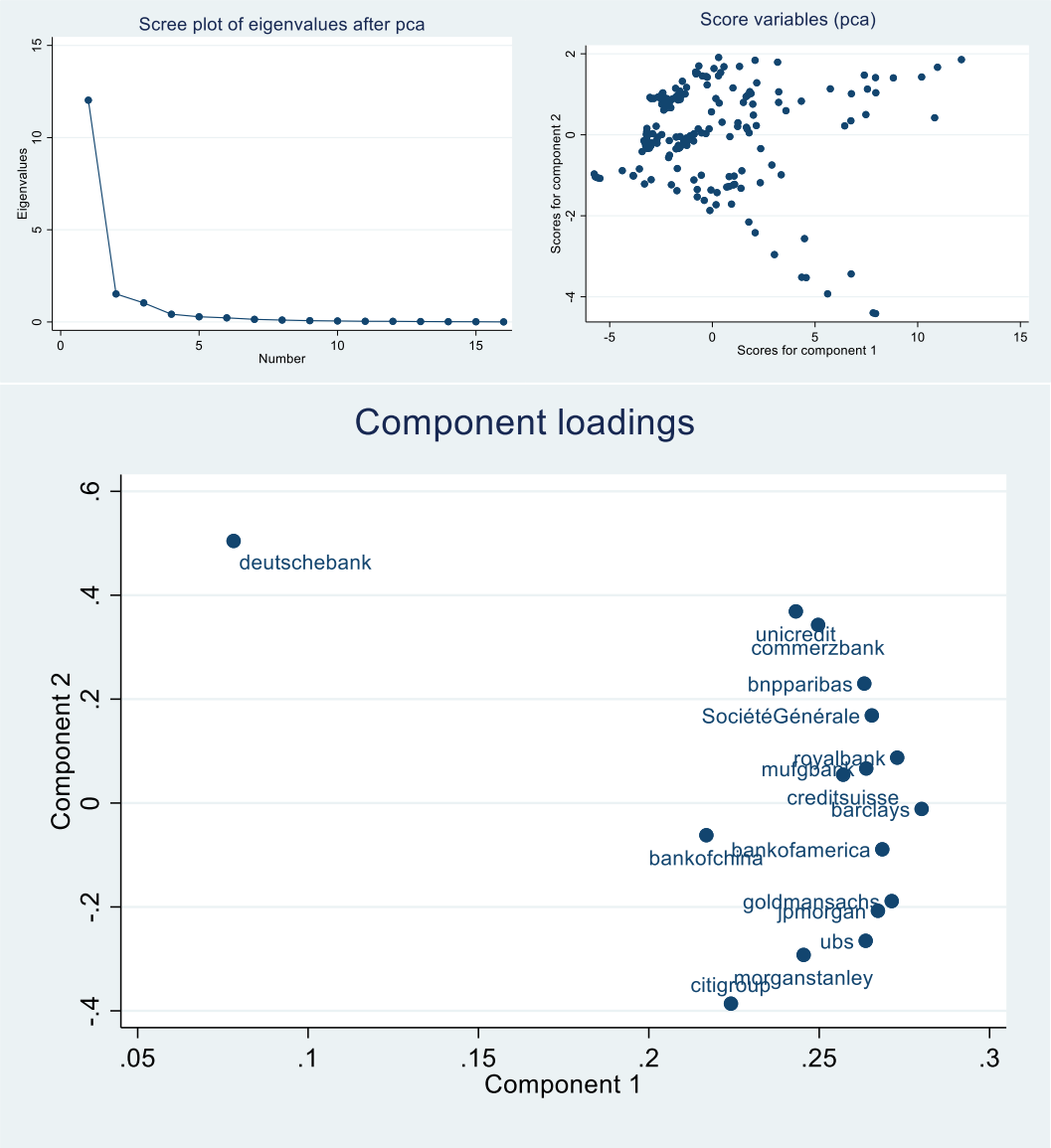
Variable	Mean	Std. dev.	Min	Max	Components	Eigenvalue	Proportion	SE_Prop	Bias
Z	-8.60	6.17	-23.14	4.76	Comp1	2.86	0.48	0.00	0.00
ROA/σROA	24711.15	15651.54	1.00	53339.00	Comp2	1.13	0.19	0.00	0.00
EA/σROA	-6.31	6.16	-15.88	10.22	Comp3	0.90	0.15	0.00	0.00
TD/TA	19920.83	11413.37	2.00	39281.00	Comp4	0.59	0.10	0.00	0.00
NPL/TL	17155.65	10994.41	1.00	36326.00	Comp5	0.51	0.09	0.00	0.00
σNIM	4076.63	1317.08	1.00	6264.00	Comp6	0.00	0.00	0.00	0.00

B. Aggregate accounting risk index

Variable	Mean	Std. dev.	Min	Max	Components	Eigenvalue	Proportion	SE_Prop	Bias
ROA/σROA	23316.33	16237.73	1.00	53339.00	Comp1	2.03	0.41	0.00	0.00
EA/σROA	-6.27	6.21	-15.88	10.22	Comp2	1.08	0.22	0.00	0.00
TD/TA	19861.20	11497.44	2.00	39281.00	Comp3	0.91	0.18	0.00	0.00
NPL/TL	16605.52	11103.06	1.00	36326.00	Comp4	0.53	0.11	0.00	0.00
σNIM	4067.17	1314.77	1.00	6264.00	Comp5	0.44	0.09	0.00	0.00

Note: This table presents the results of the PCA analysis for the two aggregate bank risk measures. It includes the list of variables used for the analysis, the summary statistics, the eigenvalues, and the proportion. The eigenvalues are used to examine how many of the principal components are important and should be retained, and the proportion shows how each component explains the variance in the data.

Figure A1. Component loading and scree plot for Counterparty risk composite index



Note: This figure shows more information about the construction of counterparty risk using PCA analysis. It includes a scree plot, a plot of score variables, and a plot of component loadings.

Bibliography

Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. *American Economic Review*, 91, 1369-1401.

Acharya, V. V., & Steffen, S. (2015). The "greatest" carry trade ever? Understanding eurozone bank risks. *Journal of Financial Economics*, *115*(2), 215-236.

Acharya, V., & Naqvi, H. (2012). The seeds of a crisis: A theory of bank liquidity and risk taking over the business cycle. *Journal of Financial Economics* , *106* (2), 349-366.

Acharya, V., Drechsler, I., & Schnabl, P. (2014). A pyrrhic victory? Bank bailouts and sovereign credit risk. *The Journal of Finance*, *69*(6), 2689-2739.

Aggarwal, R., & Goodell, J. W. (2009). Markets and institutions in financial intermediation: National characteristics as determinants. *Journal of Banking & Finance*, *33*(10), 1770-1780.

Aizenman, J., Hutchison, M., & Jinjarak, Y. (2013). What is the risk of European sovereign debt defaults? Fiscal space, CDS spreads and market pricing of risk. *Journal of International Money and Finance*, *34*, 37-59.

Aliber, R. Z. (1975). Exchange risk, political risk, and investor demand for external currency deposits. *Journal of Money, Credit and Banking*, 7, 161-179.

Allen, F., Carletti, E., & Leonello, A. (2011). Deposit insurance and risk taking. *Oxford Review of Economic Policy*, *27*(3), 464-478.

Allen, F., Carletti, E., Goldstein, I., & Leonello, A. (2015). Moral hazard and government guarantees in the banking industry. *Journal of Financial Regulation* , *1* (1), 30-50.

Alon, I., & Martin, M. A. (1998). Political Risk Assessment1. *Multinational Business Review*.

Altavilla, C., Pagano, M., & Simonelli, S. (2017). Bank exposures and sovereign stress transmission. *Review of Finance*, *21*(6), 2103-2139.

Alter, A., & Schüler, Y. S. (2012). Credit spread interdependencies of European states and banks during the financial crisis. *Journal of Banking & Finance*, *36*(12), 3444-3468.

Altunbas, Y., Gambacorta, L., & Marques-Ibanez, D. (2010). Bank risk and monetary policy. *Journal of Financial Stability*, *6*(3), 121-129.

Altunbas, Y., Manganelli, S., & Marques-Ibanez, D. (2011). Bank risk during the financial crisis: do business models matter?.

Andrianova, S., Demetriades, P., & Shortland, A. (2008). Government ownership of banks, institutions, and financial development. *Journal of Development Economics*, 85, 218-252.

Ang, A., and Longstaff, F.A. (2013). "Systemic Sovereign Credit Risk: Lessons from the US and Europe". *Journal of Monetary Economics 60(5)*, 493-510.

Anginer, D., Demirguc-Kunt, A., & Zhu, M. (2014). How does deposit insurance affect bank risk? Evidence from the recent crisis. *Journal of Banking & finance*, *48*, 312-321.

Antón, M., Mayordomo, S., & Rodríguez-Moreno, M. (2018). Dealing with dealers: Sovereign CDS comovements. *Journal of Banking & Finance*, *90*, 96-112.

Arce, O., Mayordomo, S., & Peña, J. I. (2013). Credit-risk valuation in the sovereign CDS and bonds markets: Evidence from the euro area crisis. *Journal of International Money and Finance*, *35*, 124-145.

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11, 959-975.

Ashraf, B. N. (2017). Political institutions and bank risk-taking behavior. *Journal of Financial Stability*, 29, 13-35.

Ashraf, B. N., & Shen, Y. (2019). Economic policy uncertainty and banks' loan pricing. *Journal of Financial Stability*, 44, 100695.

Augustin, P. (2018). The term structure of CDS spreads and sovereign credit risk. *Journal of Monetary Economics*, *96*, 53-76.

Augustin, P., Chernov, M., & Song, D. (2020). Sovereign credit risk and exchange rates: Evidence from CDS quanto spreads. *Journal of Financial Economics*, *137*(1), 129-151.

Bahoo, S., Alon, I., & Floreani, J. (2021). Corruption in economics: a bibliometric analysis and research agenda. *Applied Economics Letters*, *28*(7), 565-578.

Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *The Quarterly Journal of Economics*, 131, 1593-1636.

Bales, S. (2021). Policy uncertainty and the sovereign-bank nexus: A time-frequency analysis using wavelet transformation. *Finance Research Letters*, 102038.

Bank of England, 2007. Markets and operations, Quarterly Bulletin, 490-510.

Barth, J. R., Lin, C., Lin, P., & Song, F. M. (2009). Corruption in bank lending to firms: Cross-country micro evidence on the beneficial role of competition and information sharing. *Journal of Financial Economics*, 91, 361-388.

Barth, J. R., Lin, C., Ma, Y., Seade, J., & Song, F. M. (2013). Do bank regulation, supervision and monitoring enhance or impede bank efficiency?. *Journal of Banking & Finance*, 37, 2879-2892.

Barth, JR, Caprio Jr, G., & Levine, R. (2004). Bank regulation and supervision: what works best ?. *Journal of Financial intermediation* , *13* (2), 205-248.

Battistini, N., Pagano, M., & Simonelli, S. (2014). Systemic risk, sovereign yields and bank exposures in the euro crisis. *Economic Policy*, *29*(78), 203-251.

Baum, C. F., Caglayan, M., & Talavera, O. (2010). Parliamentary election cycles and the Turkish banking sector. *Journal of Banking & Finance*, 34, 2709-2719.

Bayazitova, D., & Shivdasani, A. (2012). Assessing tarp. *The Review of Financial Studies*, 25, 377-407.

Bechtel, A., Eisenschmidt, J., Ranaldo, A., & Veghazy, A. V. (2021). Quantitative easing and the safe asset illusion. *Available at SSRN 3864112*.

Beck, T., & Levine, R. (2002). Industry growth and capital allocation:: does having a market- or bank-based system matter?. *Journal of Financial Economics*, 64, 147-180.

Beck, T., De Jonghe, O., & Schepens, G. (2013). Bank competition and stability: Cross-country heterogeneity. *Journal of financial Intermediation*, *22*(2), 218-244.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2003). Law, endowments, and finance. *Journal of Financial Economics*, 70, 137-181.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2006). Bank concentration, competition, and crises: First results. *Journal of Banking & Finance*, 30, 1581-1603.

Beck, T., Levine, R., & Loayza, N. (2000). Finance and the Sources of Growth. *Journal of Financial Economics*, 58, 261-300.

Bekaert, G., Harvey, C. R, Lundblad, CT, & Siegel, S. (2014). Political risk spreads. *Journal of International Business Studies* , 45, 471-493.

Bermpei, T., Kalyvas, A., & Nguyen, T. C. (2018). Does institutional quality condition the effect of bank regulations and supervision on bank stability? Evidence from emerging and developing economies. *International Review of Financial Analysis*, *59*, 255-275.

Bitar, M., Hassan, M. K., & Walker, T. (2017). Political systems and the financial soundness of Islamic banks. *Journal of Financial Stability*, *31*, 18-44.

Black, L. K., & Hazelwood, L. N. (2013). The effect of TARP on bank risk-taking. *Journal of Financial Stability*, *9*(4), 790-803.

Blommestein, H., Eijffinger, S., & Qian, Z. (2016). Regime-dependent determinants of Euro area sovereign CDS spreads. *Journal of Financial Stability*, *22*, 10-21.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of econometrics*, *87*(1), 115-143.

Boateng, A., Liu, Y., & Brahma, S. (2019). Politically connected boards, ownership structure and credit risk: Evidence from Chinese commercial banks. *Research in International Business and Finance*, *47*, 162-173.

Böhm, H., & Eichler, S. (2020). Avoiding the fall into the loop: Isolating the transmission of bank-to-sovereign distress in the Euro Area. *Journal of Financial Stability* , *51* , 100763.

Bolton, P., & Jeanne, O. (2011). Sovereign default risk and bank fragility in financially integrated economies. *IMF Economic Review*, *59*(2), 162-194.

Bordo, M. D., Duca, J. V., & Koch, C. (2016). Economic policy uncertainty and the credit channel: Aggregate and bank level US evidence over several decades. *Journal of Financial Stability*, *26*, 90-106.

Boyd, J. H., & De Nicolo, G. (2005). The theory of bank risk taking and competition revisited. *The Journal of Finance*, 60, 1329-1343.

Brandao-Marques, L., Correa, R., & Sapriza, H. (2020). Government support, regulation, and risk taking in the banking sector. *Journal of Banking & Finance*, *112*, 105284.

Breckenfelder, J., & Schwaab, B. (2018). Bank to sovereign risk spillovers across borders: Evidence from the ECB's Comprehensive Assessment. *Journal of Empirical Finance*, *49*, 247-262.

Broner, F., Erce, A., Martin, A., & Ventura, J. (2014). Sovereign debt markets in turbulent times: Creditor discrimination and crowding-out effects. *Journal of Monetary Economics*, *61*, 114-142.

Brown, C. O., & Dinc, I. S. (2005). The politics of bank failures: Evidence from emerging markets. *The Quarterly Journal of Economics*, 120, 1413-1444.

Brown, C. O., & Dinç, I. S. (2011). Too many to fail? Evidence of regulatory forbearance when the banking sector is weak. *The Review of Financial Studies*, *24*(4), 1378-1405.

Brunnermeier, M. K., Garicano, L., Lane, P. R., Pagano, M., Reis, R., Santos, T., ... & Vayanos, D. (2016). The sovereign-bank diabolic loop and ESBies. *American Economic Review*, *106*(5), 508-12.

Brunnermeier, M., Garicano, L., Lane, P. R., Pagano, M., Reis, R., Santos, T., ... & Vayanos, D. (2011). European safe bonds (ESBies). *Euro-nomics. com*, *26*.

Brutti, F. (2011). Sovereign defaults and liquidity crises. *Journal of International Economics*, *84*(1), 65-72.

Buschmann, C., & Schmaltz, C. (2017). Sovereign collateral as a trojan horse: Why do we need an LCR+. *Journal of Financial Stability*, *33*, 311-330.

Carvalho, D. (2014). The real effects of government-owned banks: Evidence from an emerging market. *The Journal of Finance*, *69*(2), 577-609.

Chen, H. K., Liao, Y. C., Lin, C. Y., & Yen, J. F. (2018). The effect of the political connections of government bank CEOs on bank performance during the financial crisis. *Journal of Financial Stability*, 36, 130-143.

Cheng, M., Guo, P., Jin, J. Y., & Geng, H. (2021). Political uncertainty and city bank lending in China: Evidence from city government official changes. *Emerging Markets Review*, 100802.

Chernov, M., Schmid, L., & Schneider, A. (2020). A macrofinance view of US Sovereign CDS premiums. *The Journal of Finance*, *75*(5), 2809-2844.

Cole, S. (2009). Financial development, bank ownership, and growth: or, does quantity imply quality?. *The Review of Economics and Statistics*, 91, 33-51.

Collin-Dufresne, P., Goldstein, R.S. and Spencer, J.M. (2001). "The Determinants of Credit Spread Changes". *Journal of Finance 56*, 2177-208.

Cornett, M. M., Guo, L., Khaksari, S., & Tehranian, H. (2010). The impact of state ownership on performance differences in privately-owned versus state-owned banks: An international comparison. *Journal of Financial Intermediation*, 19, 74-94.

Correa, R., Lee, KH, Sapriza, H., & Suarez, GA (2014). Sovereign credit risk, banks' government support, and bank stock returns around the world. *Journal of Money, Credit and Banking* , *46* (s1), 93-121.

Cottrell, S., Yu, X., Delpachitra, S., & Ma, Y. (2021). What Determines Wholesale Funding Cost of the Global Systemically Important Banks ?. *Journal of Banking and Finance* , 106197.

Crosignani, M., Faria-e-Castro, M., & Fonseca, L. (2020). The (unintended?) consequences of the largest liquidity injection ever. *Journal of Monetary Economics*, *112*, 97-112.

Cui, J., In, F., & Maharaj, E. A. (2016). What drives the LIBOR–ois spread? evidence from five major currency LIBOR–ois spreads. *International Review of Economics & Finance, 45*, 358-375.

Dam, L., & Koetter, M. (2012). Bank bailouts and moral hazard: Evidence from Germany. *The Review of Financial Studies*, 25, 2343-2380.

Davis, S. J. (2016). *An index of global economic policy uncertainty* (No. w22740). National Bureau of Economic Research.

De Bellis, N. (2009). *Bibliometrics and citation analysis: from the science citation index to cybermetrics*. Scarecrow press.

De Bruyckere, V., Gerhardt, M., Schepens, G., & Vander Vennet, R. (2013). Bank/sovereign risk spillovers in the European debt crisis. *Journal of Banking and Finance*, *37*(12), 4793-4809.

de Haan, L., Holton, S., & van den End, J. W. (2021). The impact of central bank liquidity support on banks' sovereign exposures. *Applied Economics*, *53*(15), 1788-1806.

Delis, M. D., Hasan, I., & Ongena, S. (2020). Democracy and credit. *Journal of Financial Economics*, *136*(2), 571-596.

Dell'Ariccia, MG, Ferreira, C., Jenkinson, N., Laeven, ML, Martin, A., Minoiu, MC, & Popov, A. (2018). Managing the sovereign-bank nexus.

Demirgüç-Kunt, A., & Detragiache, E. (2002). Does deposit insurance increase banking system stability? An empirical investigation. *Journal of monetary economics*, *49*(7), 1373-1406.

Demirgüç-Kunt, A., & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: some international evidence. *The World Bank Economic Review*, 13, 379-408.

Demirgüç-Kunt, A., & Huizinga, H. (2004). Market discipline and deposit insurance. *Journal of monetary economics*, *51*(2), 375-399.

Demirgüç-Kunt, A., Kane, E., & Laeven, L. (2015). Deposit insurance around the world: A comprehensive analysis and database. *Journal of financial stability*, *20*, 155-183.

Demirgüç-Kunt, A., Laeven, L., & Levine, R. (2004). Regulations, Market Structure, Institutions, and the Cost of Financial Intermediation. *Journal of Money, Credit and Banking*, 3, 593-622.

Demirguc-Kunt, A., Pedraza, A., & Ruiz-Ortega, C. (2021). Banking sector performance during the covid-19 crisis. *Journal of Banking and Finance*, 106305.

Diamond, D. W., & Dybvig, P. H. (1983). Bank runs, deposit insurance, and liquidity. *Journal of political economy*, *91*(3), 401-419.

Dinç, I. S. (2005). Politicians and banks: Political influences on government-owned banks in emerging markets. *Journal of Financial Economics*, 77, 453-479.

Djankov, S., McLiesh, C., & Shleifer, A. (2007). Private credit in 129 countries. *Journal of Financial Economics*, 84, 299-329.

Dubecq, S., Monfort, A., Renne, JP, & Roussellet, G. (2016). Credit and liquidity in interbank rates: A quadratic approach. *Journal of Banking and Finance* , *68* , 29-46.

Duchin, R., & Sosyura, D. (2012). The politics of government investment. *Journal of Financial Economics*, 106, 24-48.

Duchin, R., & Sosyura, D. (2014). Safer ratios, riskier portfolios: Banks′ response to government aid. *Journal of Financial Economics*, 113, 1-28.

Dungey, M., Flavin, T., & Sheenan, L. (2021). Banks and sovereigns: did adversity bring them closer?. *The European Journal of Finance*, 1-26.

Erb, C. B., Harvey, C. R., & Viskanta, T. E. (1996). Political risk, economic risk, and financial risk. *Financial Analysts Journal*, *52*(6), 29-46.

Faccio, M. (2006). Politically connected firms. *American Economic Review*, 96, 369-386.

Faccio, M., Masulis, R. W., & McConnell, J. J. (2006). Political connections and corporate bailouts. *The Journal of Finance*, 61, 2597-2635.

Fang, Y., Hasan, I., & Marton, K. (2014). Institutional development and bank stability: Evidence from transition countries. *Journal of Banking & Finance*, 39, 160-176.

Fiordelisi, F., Galloppo, G., & Ricci, O. (2014). The effect of monetary policy interventions on interbank markets, equity indices and G-SIFIs during financial crisis. *Journal of Financial Stability*, *11*, 49-61.

Fiordelisi, F., Girardone, C., Minnucci, F., & Ricci, O. (2020). On the nexus between sovereign risk and banking crises. *Journal of Corporate Finance*, *65*, 101717.

Fiordelisi, F., Marques-Ibanez, D., & Molyneux, P. (2011). Efficiency and risk in European banking. *Journal of banking & finance*, *35*(5), 1315-1326.

Fitzpatrick, M. (1983). The definition and assessment of political risk in international business: A review of the literature. *Academy of Management Review*, 8, 249-254.

Fontana, A. and Scheicher, M. (2016). "An Analysis of Euro Area Sovereign CDS and Their Relation with Government Bonds". *Journal of Banking and Finance 62*, 126–140.

Fratzscher, M., & Rieth, M. (2019). Monetary policy, bank bailouts and the sovereign-bank risk nexus in the euro area. *Review of Finance*, *23*(4), 745-775.

Gao, H., Ru, H., & Tang, DY (2021). Subnational debt of China: The politics-finance nexus. *Journal of Financial Economics*.

Garfield, E. (2009). From the science of science to Scientometrics visualizing the history of science with HistCite software. *Journal of Informetrics*, 3, 173-179.

Gefang, D., Koop, G., & Potter, S. M. (2011). Understanding liquidity and credit risks in the financial crisis. *Journal of Empirical Finance*, *18*(5), 903-914.

Gennaioli, N., Martin, A., & Rossi, S. (2014). Sovereign default, domestic banks, and financial institutions. *The Journal of Finance*, *69*(2), 819-866.

Ghosh, S. (2016). Political transition and bank performance: how important was the Arab Spring?. *Journal of Comparative Economics*, 44, 372-382.

Golub, G. H., & Van Loan, C. F. (2013). *Matrix computations*. JHU press.

Gonzalez, F. (2005). Bank regulation and risk-taking incentives: An international comparison of bank risk. *Journal of Banking & Finance*, 29, 1153-1184.

Gorton, G., & Metrick, A. (2012). Securitized banking and the run on repo. *Journal of Financial economics* , *104* (3), 425-451.

Hadri, K. (2000). Testing for stationarity in heterogeneous panel data. *The Econometrics Journal*, *3*(2), 148-161.

Hart, O., Shleifer, A., & Vishny, R. W. (1997). The proper scope of government: theory and an application to prisons. *The Quarterly Journal of Economics*, 112, 1127-1161.

Hassan, M. K., Paltrinieri, A., Dreassi, A., Khan, A., & Bahoo, S. (2020). A bibliometric review of takaful literature. *International Review of Economics & Finance*, 69, 389-405.

Hassan, T. A., Hollander, S., van Lent, L., & Tahoun, A. (2019). Firm-level political risk: Measurement and effects. *The Quarterly Journal of Economics*, 134, 2135-2202.

Haw, I. M., Ho, S. S., Hu, B., & Wu, D. (2010). Concentrated control, institutions, and banking sector: An international study. *Journal of Banking & Finance*, 34, 485-497.

Heider, F., Hoerova, M., & Holthausen, C. (2015). Liquidity hoarding and interbank market rates: The role of counterparty risk. *Journal of Financial Economics*, *118*(2), 336-354.

Heinz, M. F. F., & Sun, M. Y. (2014). *Sovereign CDS spreads in Europe: The role of global risk aversion, economic fundamentals, liquidity, and spillovers.* International Monetary Fund.

Henisz, W. J. (2000). The institutional environment for economic growth. *Economics & Politics*, 12, 1-31.

Henisz, W. J., & Zelner, B. A. (1999). Political risk and infrastructure investment. *The Wharton School, University of Pennsylvania*.

Hollyer, JR, Rosendorff, BP, & Vreeland, JR (2011). Democracy and transparency. *The Journal of Politics* , *73* (4), 1191-1205.

Holmström, B., & Tirole, J. (1993). Market liquidity and performance monitoring. *Journal of Political economy*, *101*(4), 678-709.

Holmström, B., & Tirole, J. (1998). Private and public supply of liquidity. *Journal of political Economy*, *106*(1), 1-40.

Houston, J. F., Lin, C., Lin, P., & Ma, Y. (2010). Creditor rights, information sharing, and bank risk taking. *Journal of financial Economics*, *96*(3), 485-512.

Hovakimian, A., & Kane, E. J. (2000). Effectiveness of capital regulation at US commercial banks, 1985 to 1994. *the Journal of Finance*, *55*(1), 451-468.

Hovakimian, A., Kane, EJ, & Laeven, L. (2003). How country and safety-net characteristics affect bank risk-shifting. *Journal of financial services research* , *23* (3), 177-204.

Hryckiewicz, A. (2014). What do we know about the impact of government interventions in the banking sector? An assessment of various bailout programs on bank behavior. *Journal of Banking & Finance*, *46*, 246-265.

Hung, C. H. D., Jiang, Y., Liu, F. H., Tu, H., & Wang, S. (2017). Bank political connections and performance in China. *Journal of Financial Stability*, *32*, 57-69.

Iannotta, G., Nocera, G., & Sironi, A. (2013). The impact of government ownership on bank risk. *Journal of Financial Intermediation*, 22, 152-176.

Ioannidou, VP, & Penas, MF (2010). Deposit insurance and bank risk-taking: Evidence from internal loan ratings. *Journal of Financial Intermediation* , *19* (1), 95-115.

Jackowicz, K., Kowalewski, O., & Kozłowski, Ł. (2013). The influence of political factors on commercial banks in Central European countries. *Journal of Financial Stability*, 9, 759-777.

Jiménez, A., & Bjorvatn, T. (2018). The building blocks of political risk research: A bibliometric co-citation analysis. *International Journal of Emerging Markets*, 13, 631-652.

Julio, B., & Yook, Y. (2012). Political uncertainty and corporate investment cycles. *The Journal of Finance*, *67*(1), 45-83.

Kaminsky, G. L., Reinhart, C. M., & Vegh, C. A. (2003). The unholy trinity of financial contagion. *Journal of economic perspectives*, *17*(4), 51-74.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2003). *Governance matters III: Governance indicators for 1996–2002*. The World Bank.

Keeley, M. C. (1990). Deposit insurance, risk, and market power in banking. *The American Economic Review*, 80, 1183-1200.

Khan, MS, Scheule, H., & Wu, E. (2017). Funding liquidity and bank risk taking. *Journal of Banking & Finance* , *82* , 203-216.

Khwaja, A. I., & Mian, A. (2005). Do lenders favor politically connected firms? Rent provision in an emerging financial market. *The Quarterly Journal of Economics*, 120, 1371-1411.

King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, 108, 717-737.

Klingler, S., & Syrstad, O. (2021). Life after LIBOR. *Journal of Financial Economics*.

Klomp, J., & De Haan, J. (2009). Central bank independence and financial instability. *Journal of Financial Stability*, *5*(4), 321-338.

Kobrin, S. J. (1979). Political risk: A review and reconsideration. *Journal of International Business Studies*, 10, 67-80.

Koetter, M., & Popov, A. (2021). Political cycles in bank lending to the government. *The Review of Financial Studies*, *34*(6), 3138-3180.

Kraay, A., Kaufmann, D., & Mastruzzi, M. (2010). *The worldwide governance indicators: methodology and analytical issues*. The World Bank.

Kumar, N. (2020). Political interference and crowding out in bank lending. *Journal of Financial Intermediation*, 43, 100815.

La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). Government ownership of banks. *The Journal of Finance*, 57, 265-301.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (1999). The quality of government. *The Journal of Law, Economics, and Organization*, 15, 222-279.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. *The Journal of Finance*, 52, 1131-1150.

Laeven, L., & Levine, R. (2009). Bank governance, regulation and risk taking. *Journal of Financial Economics*, 9, 259-275.

Lensink, R., Meesters, A., & Naaborg, I. (2008). Bank efficiency and foreign ownership: Do good institutions matter?. *Journal of Banking & Finance*, 32, 834-844.

Leonello, A. (2018). Government guarantees and the two-way feedback between banking and sovereign debt crises. *Journal of Financial Economics*, *130*(3), 592-619.

Leung, X. Y., Sun, J., & Bai, B. (2017). Bibliometrics of social media research: A co-citation and co-word analysis. *International Journal of Hospitality Management*, 66, 35-45.

Levine, R. (1998). The legal environment, banks, and long-run economic growth. *Journal of Money, Credit and Banking*, 596-613.

Levine, R., & Barth, J. (2001). *Bank regulation and supervision: what works best?*. The World Bank.

Levine, R., & Zervos, S. (1998). Stock markets, banks, and economic growth. *American economic review* , 537-558.

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of monetary Economics*, *46*(1), 31-77.

Lewis, V., & Roth, M. (2019). The financial market effects of the ECB's asset purchase programs. *Journal of Financial Stability*, *43*, 40-52.

Liu, W. M., & Ngo, P. T. (2014). Elections, political competition and bank failure. *Journal of Financial Economics*, 112, 251-268.

Longstaff, F. A., Pan, J., Pedersen, L. H., & Singleton, K. J. (2011). How sovereign is sovereign credit risk?. *American Economic Journal: Macroeconomics*, *3*(2), 75-103.

Mauro, P. (1995). Corruption and growth. *The Quarterly Journal of Economics*, 110, 681-712.

Mercieca, S., Schaeck, K., & Wolfe, S. (2007). Small European banks: Benefits from diversification?. *Journal of Banking & Finance*, *31*(7), 1975-1998.

Mergaerts, F., & Vander Vennet, R. (2016). Business models and bank performance: A long-term perspective. *Journal of Financial Stability* , *22* , 57-75.

Micco, A., & Panizza, U. (2006). Bank ownership and lending behavior. *Economics Letters*, 93, 248-254.

Micco, A., Panizza, U., & Yanez, M. (2007). Bank ownership and performance. Does politics matter?. *Journal of Banking & Finance*, 31, 219-241.

Moessner, R. (2018). Effects of asset purchases and financial stability measures on term premia in the euro area. *Applied Economics*, *50*(43), 4617-4631.

Moessner, R., & de Haan, J. (2021). Effects of monetary policy announcements on term premia in the euro area during the COVID-19 pandemic. *Finance Research Letters* , 102055.

Nakaso, H. (2013). Financial markets without a risk-free sovereign. *BIS Paper*, (72n).

Nehrt, L. C. (1970). The political environment for foreign investment. *NY: Praeger Pub*.

North, D. C. (1991). Institutions. *Journal of Economic Perspectives*, *5*, 97-112.

Nys, E., Tarazi, A., & Trinugroho, I. (2015). Political connections, bank deposits, and formal deposit insurance. *Journal of financial stability*, *19*, 83-104.

Olson, E., Miller, S., & Wohar, M. E. (2012). "Black Swans" before the "Black Swan" evidence from international LIBOR–OIS spreads. *Journal of International Money and Finance*, *31*(6), 1339-1357.

Ongena, S., Popov, A., & Van Horen, N. (2019). The invisible hand of the government: Moral suasion during the European sovereign debt crisis. *American Economic Journal: Macroeconomics*, *11*(4), 346-79.

Palmén, O. (2020). Sovereign default risk and credit supply: Evidence from the euro area. *Journal of International Money and Finance*, *109*, 102257.

Park, J. (2012). Corruption, soundness of the banking sector, and economic growth: A cross-country study. *Journal of International Money and Finance*, 31, 907-929.

Passadore, J., & Xu, Y. (2022). Illiquidity in sovereign debt markets. *Journal of International Economics*, *137*, 103618.

Pastor, L., & Veronesi, P. (2012). Uncertainty about government policy and stock prices. *The Journal of Finance*, 67, 1219-1264.

Pástor, Ľ., & Veronesi, P. (2013). Political uncertainty and risk premia. *Journal of financial Economics*, *110*(3), 520-545.

Perotti, EC, & Van Oijen, P. (2001). Privatization, political risk and stock market development in emerging economies. *Journal of International Money and Finance* , *20* (1), 43-69.

Podstawski, M., & Velinov, A. (2018). The state dependent impact of bank exposure on sovereign risk. *Journal of Banking and Finance*, *88*, 63-75.

Porta, R. L., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy*, 106, 1113-1155.

Porta, R. L., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of political economy*, *106*(6), 1113-1155.

Qian, J., & Strahan, P. E. (2007). How laws and institutions shape financial contracts: The case of bank loans. *The Journal of Finance*, 62, 2803-2834.

Rajan, R. G., & Zingales, L. (2003). The great reversals: the politics of financial development in the twentieth century. *Journal of Financial Economics*, 69, 5-50.

Rajan, R., & Zingales, L. (1998). Financial development and growth. *American Economic Review*, 88, 559-586.

Reinhart, C. M., & Rogoff, K. S. (2011). From financial crash to debt crisis. *American Economic Review*, *101*(5), 1676-1706.

Robock, SH (1971). Political risk-identification and assessment. *Columbia Journal of world business* , *6* (4), 6-20.

Rodrik, D. (1999). Where did all the growth go? External shocks, social conflict, and growth collapses. *Journal of Economic Growth*, 4, 385-412.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The stata journal*, *9*(1), 86-136.

Root, F. R. (1972). Analyzing political risks in international business. *The Multinational Enterprise in Transition*, 354-365.

Sapienza, P. (2004). The effects of government ownership on bank lending. *Journal of Financial Economics*, 72, 357-384.

Schwarz, K. (2019). Mind the gap: Disentangling credit and liquidity in risk spreads. *Review of Finance*, *23*(3), 557-597.

Shen, C. H., & Lin, C. Y. (2012). Why government banks underperform: A political interference view. *Journal of Financial Intermediation*, 21, 181-202.

Shleifer, A., & Vishny, R. W. (1994). Politicians and firms. *The Quarterly Journal of Economics*, 109, 995-1025.

Simon, J. D. (1982). Political risk assessment-past trends and future-prospects. *Columbia Journal of World Business*, 17, 62-71.

Small, H. (1973). Co-citation in the scientific literature: A new measure of the relationship between two documents. *Journal of the American Society for Information Science*, 24, 265-269.

Sosa-Padilla, C. (2018). Sovereign defaults and banking crises. *Journal of Monetary Economics*, *99*, 88-105.

Stiglitz, J. E. (1993). The role of the state in financial markets. *The World Bank Economic Review*, 7(suppl_1), 19-52.

Taylor, J. B., & Williams, J. C. (2009). A black swan in the money market. *American Economic Journal: Macroeconomics*, *1*(1), 58-83.

Usher, D. (1965). Political risk. *Economic Development and Cultural Change*, *13*(4, Part 1), 453-462.

Van Eck, N. J., & Waltman, L. (2013). VOSviewer manual. *Leiden: Univeristeit Leiden*, *1*(1), 1-53.

Wang, L., Menkhoff, L., Schröder, M., & Xu, X. (2019). Politicians' promotion incentives and bank risk exposure in China. *Journal of Banking & Finance*, 99, 63-94.

Zupic, I., & Čater, T. (2015). Bibliometric methods in management and organization. *Organizational Research Methods*, 18, 429-472.