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Systemic Risk in the Banking Sector – The German Model

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Summary

As part of the completion of the European Banking Union, the decision on the organization of institutional and deposit protection is still pending. The mere linking of these two objectives, which are by no means necessarily identical in terms of content, has recently led to heated controversy. This article analyzes the fundamental components of systemic risk in (national) banking markets and provides a cursory insight into the structural characteristics of selected financial systems in the EMU.

With a focus on the situation in Germany, criteria are derived that should guide the Europe-wide organization of both institutional and deposit protection. It is empirically substantiated that a diversified (national) banking market, particularly in terms of business models, is fundamentally superior to a homogeneous supply structure in the financial sector. This applies explicitly when banking groups with a similar orientation ("Verbünde") have separate institutional protection schemes.

Zusammenfassung

Im Rahmen der Vollendung der Europäischen Bankenunion steht die Entscheidung über die Organisation der Instituts- bzw. Einlagensicherung weiterhin aus. Allein die Verknüpfung der beiden inhaltlich keineswegs zwingend identischen Ziele hat in jüngerer Zeit zu durchaus heftigen Kontroversen geführt. Der Beitrag analysiert die grundlegenden Komponenten des systemischen Risikos in (nationalen) Bankenmärkten und liefert einen kursorischen Einblick in die strukturellen Besonderheiten ausgewählter Finanzsysteme in der EWU.

Mit dem Fokus auf die Verhältnisse in Deutschland werden Kriterien abgeleitet, an denen sich die europaweite Organisation sowohl der Instituts- als auch der Einlagensicherung orientieren sollte. Es wird empirisch gestützt begründet, dass ein insbesondere hinsichtlich der Geschäftsmodelle diversifizierter (nationaler) Bankenmarkt einer homogenen Angebotsstruktur im Finanzsektor grundsätzlich überlegen ist. Dies gilt explizit

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dann, wenn Bankengruppen ähnlicher Ausrichtung („Verbünde“) über voneinander getrennte Institutssicherungssysteme verfügen.

JEL classification: G21, G28, L22, L51

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1. Introduction

Total risk in banking is systemic from two perspectives. Firstly, it deals with the threat that some negative events in the banking system will not only lead to the failure of a single entity, or a small number of banks, but to the collapse of an entire financial system. This risk, which is closely connected to the threat of a common bank run, can have most severe consequences for the whole economy on a national and even global level. Consequently, it represents the core justification for the extensive regulation of banks. Secondly, it can also be called systemic because its significance is determined by the systemic structure of the respective banking system. Thus, banking regulation should also take these structural components into account.

In this respect, we observe several adverse developments in recent years. Banks have become larger and more closely and directly linked through the establishment of virtually global markets. The similarity of business models increases the vulnerability to specific shocks. And modern information technology and social media increase the speed and contagiousness of bank runs.[1] Thus, despite the large efforts in banking regulation in the years after the global financial crisis, the threat of systemic instability is still prevalent, as the critical developments in the spring 2023 around Silicon Valley Bank and Credit Suisse demonstrated quite impressively.

On an international level, the response of regulators to systemic risk in its cross-border dimension has firstly been an increased international cooperation in the setting of what became the Basel Committee on Banking Supervision. From this evolved a framework for regulatory standards, in particular about regulatory capital requirements (Basel I to III). However, the member states of the European Monetary Union went beyond this level of alignment when the global financial crisis was followed by the state debt crisis of the Euro countries in 2010. They introduced the European Banking Union, submitting – in principle – all banks of the Eurozone to the same regulation and supervision in the Single Supervisory Mechanism SSM. Furthermore, the European Banking Union is intended to contain in its second and third pillar also provisions and re-

[1] See, e. g., recently Bales/Burghof (2024).

quirements for the banks' recovery and regulation, and for depositor protection in case of bank failures.

Thus, the countries of the European Monetary Union aim to guarantee a common level of safety to prevent that weak regulation and low levels of stability in some countries might endanger the financial stability of other member countries or even of the Monetary Union as such. At first sight, this seems to be best achieved be setting the same standards, proceedings and institutions in every member state, and much of the legal and regulatory activities on behalf of the European Banking Union follow this track. However, such a simplistic approach disregards the second aspect of systemic risk elaborated above, i. e., that it depends on the systemic structure of the respective banking system. The European Banking Union currently comprises of 20 national financial systems that are characterized by very differently structured national banking markets with sometimes rather different institutions. Thus, for structural reasons they represent rather different contributions to the systemic risk within the European Banking Union.

In the following, we discuss this issue in general, but also with regard to the third pillar of the European Banking Union concerning the protection of deposits. This pillar is actually embodied in the Directive 2014/49/EU, the Deposit Guarantee Scheme Directive. According to some regulators and financial economists, this third pillar is not implemented yet, as this Directive leaves room for different institutional solutions to guarantee the safety of deposits in the case of bank failure. The ECB, on its webpage on the European Banking Union, presently does not even mention the third pillar. For the proponents of this version of a European Banking Union, any solution apart from a single European deposit insurance falls short of the objective to guarantee the same safety level in any member state of the European Monetary Union. For them, any political compromises on the road can only be temporary. This holds for the said Directive, but presumably also for any other precautions and limitations of liability discussed to coerce all member states into approval, even though these states are aware that the solution does not fit into the special structure of their banking system and might even have detrimental effects on systemic risk.

2. Germany's "Unique" Banking System

In the past, the freedom from the Directive 2014/49/EU to maintain different solutions to protect depositors played a central role for the German banking market. In Germany, the concept of an ordinary deposit guarantee scheme (DGS) competes with so-called Institutional Protection Schemes (IPS), in which the failing institution is maintained as a legal entity to protect depositors. The concept as such, and the coexistence of both concepts within the market, is

closely linked with the special structure of the German banking industry. Thus, it is worthwhile to have a short look at two aspects of the German banking system that are related to this institutional solution.

As a first structural dimension, the German banking market is dominated by the so-called three pillars: three groups of banks that follow different objectives and organizational principles. These are firstly the private banks (Kreditbanken), mainly profit-oriented and fiercely competing with other private banks and with the banks of the other two pillars. Within this group you also find the largest banks (Großbanken), often with international ambitions or, in the case of the HypoVereinsbank, part of a large international banking group. They maintain a joint deposit insurance that is organized through their national federation.

Secondly, besides some rather large state-owned development banks like the KfW, there is a large group of public savings banks (Sparkassen) that are ultimately operated by some local or regional public authority but compete unsubsidized as common market participants. Their objectives are defined by law, although their actual behavior is also strongly determined by the pressure of competition and the need to accumulate capital through the generation of a sufficient profit. Competition within the group is somewhat limited, as most of the banks follow a regional business model and do few businesses outside their region.

The same holds for the banks of the third group, the cooperative banks (Kreditgenossenschaften), although we have more often overlapping business areas in this group. Credit Cooperatives are owned by their members, and work on behalf of these members to provide them (and other clients) with the financial services they need. From this perspective, profit plays a minor role in their objective function. However, the also undergo the same pressure from the market as the public savings banks. The last two pillars are organized in decentralized networks (Verbünde) that also organize a respective IPS for each of the groups.

The types of banks comprised in the last two pillars are not unique at all. We can find similar institutions, i. e., public savings banks and cooperative banks, in many other countries. But these special institutions have often little economic weight or are aggregated into large banking groups. Thus, the German specialty is that these groups remain highly relevant while maintaining a decentralized group structure. Within these groups, you can also find some large banks, i. e., the DZ-Bank in the cooperative banking group and the Landesbanken in the public savings bank group.

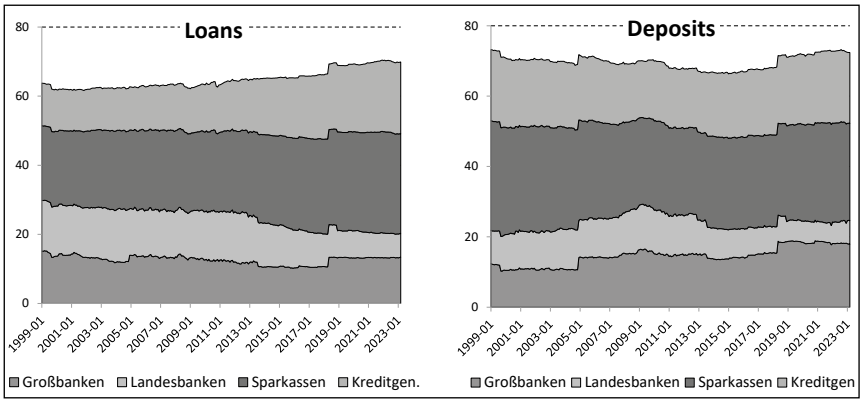

Figure 1: Market Structure

Source: Deutsche Bundesbank; own calculations.

The second special structural dimension of the German banking system is bank size. Compared to many other European countries, banks in Germany are rather small. This holds in particular within the second and third pillar. Seemingly, it is possible to successfully organize banking business in comparatively small units within these decentralized banking groups. The following table gives an overview of the size structure of the respective regional banks within the two groups.

Table 1

Structural Features

Feature (2022)	Sparkassen	Kreditgenossenschaften
Aggregate balance sheet total (bst) [mill €]	1.523.300	1.175.100
Number of institutions	361	737
Largest institution [bst tsd €]	57.541.030	54.184.310
Smallest institution [bst tsd €]	184.599	31.996
Average bank size [bst tsd €]	4.219.668	1.594.457
Median institution [bst tsd €]	2.761.359	702.585

Source: BVR, DSGB; own calculations.

Finally, we stress another special aspect of banking in Germany: many banks offer very stable long-term financial relationships with their clients, the so-called "Hausbankbeziehung". Especially the many small- and medium-sized companies have a strong demand for such a relationship-based banking, as it serves as insurance against the risk of technologically focused business models that naturally lack in diversification.[2] And they are also interested to maintain their valuable special relationship even if the bank gets into trouble. In this respect, having a DGS or an IPS might lead to different expectations and outcomes.

3. IPS Under Fire: The Technical Debate[3]

In 2022, three different discussion papers criticized the acceptance of the IPS as a valid system of depositor protection from different angels. Huizinga (2022) sees above all the danger that the joint use of collateral reserves for both the protection of the depositors and the institution could lead to a liquidity shortage in emergencies. Ippolito et al. (2022) also emphasize the described dual function of IPSs we discussed, but they additionally assume that IPSs are comparable to systemically relevant banking groups, which in turn are subject to direct supervision by the ECB. Haselmann et al. (2022) also highlight that network-specific protection schemes should be treated in the same way as SIFIs for supervisory purposes. Furthermore, the authors suspect cluster risks within the IPSs due to the similarity of the business models. In addition, the (presumably) inadequate contributions to the IPS are criticized. However, they do not explain why a DGS as such is not susceptible to similar problems.

The first and very plain argument against the acceptance of IPS in this literature is that it has to perform a double task: protecting depositors against potential losses and safeguarding the mere existence of the respective bank. Thus, depositor protection through an IPS should, in principle, be costlier than through a DGS. However, in practice the treatment of banks in distress does usually not differ very much, independently of the specification of the system of depositor protection. To safeguard valuable client relationships, avoid unnecessary irritations and prevent potential threats to systemic stability from lingering uncertainty, the bank is usually recapitalized and merged to another bank. In this process, the management team of the failing bank loses control and gets supplanted.[4] In some cases, a DGS might decide to just liquidate the bank, an option not

[2] See Elsas/Krahnen (1998).

[3] In the following chapters we strongly build on our unpublished working paper, Burghof/Gischer (2023).

[4] On the relative cost advantages of recapitalization in crisis bank resolution management see Cabral (2022).

available to an IPS. It is, to our best knowledge, an unresolved empirical issue how often this option is chosen. However, even in such cases the difference is not as big as it seems, because even in a restructuring through an IPS large business segments of the troubled bank can be closed down.

Thus, in a static setting, the expected costs of the crisis of an individual bank to the protection system might be somewhat higher for an IPS, as it lacks the valuable options to liquidate or to sell the defaulting bank to any interested acquirer. However, this statement does not hold in a dynamic setting. To safeguard valuable client relationships, the clients must be assured that these relationships remain intact and will fulfill their expectations even after the crisis of the bank. A fundamental insight of economic theory, the so-called Folk Theorem, tells us that such non-contractual long-term relationships are stable if and only if the probability that the respective coordination game ends is not too high. Consequently, clients will start to cheat or even abandon the relationship if a bank enters a crisis and there is a strong increase in the probability that the original relationship cannot be continued.

In the case of a DGS, this will happen if the bank might be liquidated or could be merged on a very different bank. Such an acquirer could have a totally different understanding of long-term financial relationships, or even follow a crude deal banking approach. Consequently, even the banks that, under the crisis management of a DGS, are allowed to continue either independently or within a new merged bank, will nonetheless loose valuable client relationships as the clients cannot foresee the result of the restructuring process. Due to this, time inconsistency might come at a high price. By contrast, a merger or takeover organized by an IPS within the respective pillar would lead to a new partner not too different from the old.

We see no perspective to quantify the expected costs of the crisis resolution under the two regimes. However, the result of a respective exercise would obviously depend on the specific type of the financial institution. If a bank mainly follows a deal banking concept, it has no valuable long-term relationships to lose. Such banks often follow a very formalized and centralized decision logic. On the other hand, relationship-based banks could lose much of the value if the clients don't trust in the long-term perspective of this relationship. Such banks are usually smaller, close to the clients, and they follow, at least as a group, a decentralized decision logic that leaves ample room for the design of individual long-term relationships. Most of these banks will have a regional focus. Thus, the bank's choice between a DGS and an IPS depends on its business model, and the preference of countries for either a pure DGS or the acceptance of both DGF and IPS mirrors the structure of the different financial systems.

We can draw two main conclusions from these considerations: firstly, neither the DGS nor the IPS are always cost-efficient. Choosing an IPS is a response to

a special way to organize banking business. It is a cost-efficient mean to protect depositors in such an environment. On the contrary, it is a component of a special banking model that enriches competition in the European banking market. Secondly, a non-recognition of the IPS as depositor protection scheme in the European Banking Union would reduce the efficiency of the relationship-based banking model, as it endangered the stability of long-term client relationships. The respective banking institutions would lose further ground against more centralized approaches that also profit from the technological development and the general upsurge of regulatory requirements. To cope with the high fixed costs of both trends, banks become bigger and less able to act as a long-term partner in individualized financial relationships. Besides, increasing bank size also has implications on systemic risk.

In this section we discuss the expected costs of crisis resolution under the two different depositor-protection regimes. However, to understand the role of IPS we have to place this institution within its context as an element within decentralized banking networks. These consist of at least some regional banks following the concept of relationship banking ("Verbünde"). We cannot fully predict the consequences if the institutions concerned were forced to replace the IPS with a mere DGS. We argued above that such regulatory change would result in a loss of efficiency. Furthermore, we expect that such banking network would lose some of their internal coherence. Both developments could endanger the feasibility of such decentralized banking networks within the banking market. Consequently, in the following we take a wider perspective, trying to understand the – positive or negative – contribution of decentralized banking networks to systemic stability.

4. Systemic Risk: The Structural Dimensions

The debate on systemic risk is dominated by two aspects: size and connectedness. Due to both aspects, a respectively significant single bank might be in the position to force state support in the case of a crisis. An insolvency of this institution could have wide-reaching consequences and might threaten to spread its losses and the ensuing loss of trust into the whole financial system, even across national borders. Thus, the bank is too-big-to-fail, or too-connected-to-fail, and therefore a threat to the stability of the whole system. The state has to pay for costly rescue operations to prevent further damage. However, the existence of such banks also undermines market discipline. These banks have strong incentives for excessive risk-taking, as they don't have to pay the full risk premium for such misbehavior.

Size can easily be measured, whereas connectedness is a more complex concept. In both respects, the question is the reference market that might be endan-

gered by the respective systemically important financial Institutions (SIFIs). E.g., according to the European Banking Authority guidelines there is a small group of global systemically important institutions (G-SII), and a much larger set of other systemically important institutions (O-SII), mainly with regard to European financial market. Thus, the criteria for ECB supervision of "significant" banks are defined on the EU level. The ECB also supervises the three largest banks in each member states, some of which are rather small and not very connected. The ECB states that it directly supervises 111 significant banks in the participating countries that represent 82 % of banking assets in these countries.[5] Thus, the institutions the ECB assesses as significant have a high relative importance. This could either be understood as an outflow of an overcautious extension of ECB supervision, or the number truly represents a European banking system with an extremely high systemic risk, as most of the banking activities within the European Monetary Union are performed through "significant" institutions. For our discussion, we can state that it had a positive impact on systemic stability if a banking system allowed for a larger portion of banking activities to be performed within non-systemic banking institutions. We can expect that, ceteris paribus, such a feature reduces the probability and relevance of a systemic crisis.

However, the objectives of EU policies are not as clear-cut as it seems when discussing the negative impact of significant banks on the stability of the financial system. Market integration implies a high level of cross-border activities in banking, and the common market makes it possible for financial institutions to do business in any European country. The concept fosters truly European banks and consequently highly connected and respectively large financial institutions. The dark side of this development is an increase in systemic risk due to size, connectedness, and a higher probability that problems in banking will cross borders. For our purpose, we can state that small, regional banks do not contribute to these dimensions of systemic risk even on a national level and will certainly not endanger the stability of the banking systems in other participating countries.

The common debate does not give full acclaim to two other important dimensions of systemic risk: the homogeneity of the business models and the centralization of decision-making. Both aspects deal with the process of risk-taking in banks and its consequences on the overall riskiness of banking organizations and the whole banking system. In this sense, regarding these additional dimensions provides a more dynamic view on risk creation in banking.

If banks followed the same business model, they all shared the same flaws and created similar risk structures. Consequently, in a very homogeneous banking

[5] https://www.bankingsupervision.europa.eu/banking/list/html/index.en.html, 25.08.2022.

system the systemic risk is high even if the banks are not too big to fail or not highly connected. If something goes systematically wrong, it goes wrong everywhere. One of the success factors of banking regulation should therefore be to avoid setting any incentives that make banks, on a national level, more homogeneous, and in the best case deliberately create free space for very different business models in banking.

To allow for relationship-based business models in banking, it is important to notice that such business models rely on a respective organizational structure. The link can be best explained using the theory of incomplete contracts. Such long-term relationships contain a high level of contractual incompleteness. The outcome of the relationship therefore depends to a great part on the expected behavior of the partners in any kind of future renegotiation. In particular, it requires a high degree of decentralization of decision power on the bank side to make it possible for the banks' managers to fulfill the implicit, i. e., non-contractible (and maybe even not describable) obligations from this relationship. In the centralized banking model, such special relationships with decision-makers within the bank would not be feasible for the great majority of clients.

Another reason why the degree of centralization within the bank or banking groups is important is diversification. Risk managers and regulators often take asset portfolios as given. Consequently, the risk of such portfolios is mainly driven by the correlation of asset returns, and, given a well-diversified portfolio, by the systematic risk of the portfolio. This view does not take into account how portfolios are created. Any corporation is based on the delegation of decision rights. E.g., traders in a bank could either go long or short in a certain bond or stock, or a specific market. Credit managers could either grant risky loans to growth companies or look for business with established companies with lower return and less risk. Losses occur if a decision-maker positions the bank on the wrong side of the market, naturally not knowing at the time the decision is made which side of the marketers this will be. From this perspective, it's the degree of correlation between "wrong decisions" that drives the risk of the bank's portfolio.

In the following, we assess the effect of decentralized banking networks with IPS ("Verbünde") on the systemic stability of the banking system according to the four criteria developed above: size, connectedness, homogeneity, and centralization. Thereby we have to keep in mind that the usage of IPS as depositor protection mechanism is an inherent element of such banking groups.

5. The Structural Dimensions of Systemic Risk and Decentralized Banking Networks

5.1 Size: The Too-Big-To-Fail Fallacy

Critics of decentralized banking networks often highlight the fact that some of these networks also contain rather large banks that pose a systemic risk. The rationale for the existence of such institutions ("Zentralbanken") is that they provide services to the clients that cannot be produced by the rather small regional banks ("Primärinstitute"). This concerns mainly international services (e. g., payments, financing, advice and networking) and capital market related services (e. g., issues of financial titles on the capital markets, large and complex capital market investments, complex corporate finance transactions). They also serve as a pool to reallocate liquidity within the network, as some of the regional banks are active in regions with a capital surplus, whereas others meet a strong demand for capital in their region. The naming of the institutions in German language stresses the servicing function of the central institutions, whereas the "primary" business is done by the smaller regional banks. However, even the larger institutions within the networks must develop a successful business model, which cannot be achieved if they reduce themselves to a small set of activities that are strictly defined through their serving function in the network.

Within the networks, the delineation between the activities of the small regional banks and the larger central institutions, and the overall scope of the business models of the larger banks are always at debate. In the past, many of the large banks within the networks developed ambitious business models and thereby emancipated themselves to a high degree from this specific origin. In some cases, they suffered severe losses in this process and did a heavy damage to the reputation of the respective banking network. Today, the large institutions are subject to the direct supervision of the ECB and in this sense under maximal regulatory scrutiny. However, despite the negative experiences with some of the larger institutions, some central resources and a bundling of competences are needed if a decentralized banking network wants to provide a comprehensive set of banking services and accomplish the available economies of scale and scope. Thereby, the decentralized banking networks in Europe gain the respective economic relevance that positively distinguishes them from grassroot financial institutions of self-help.

This aspect is also important with regard to systemic risk. The idea that a modern, capital-intensive economy in a globalized world can do without large, systemically dangerous banks is, at least for the time being, erroneous. To set a respective benchmark for decentralized banking networks, i. e., that they should not contain any systemic institutions, is equivalent to limiting them to a very small scale and scope of business, and respectively a very limited economic rel-

evance. The right question is rather if these special decentralized structures make it possible that a larger section of the banking activities takes place in institutions that pose no systemic risk to the stability of the financial and economic system.

To get some insight into this issue, we compare the banking market structures of the eight largest member states of the Eurozone, i. e., Germany, France, Italy, Spain, Netherlands, Belgium, Ireland, and Austria. Four of these countries contain decentralized banking networks using an IPS (Austria, Germany, Italy, Spain,), whereas the other four countries do without (Belgium, France, Ireland, Netherlands). However, Italy and Spain are special cases. In Spain, the Caja Rural Group, a medium sized network of 30 rural savings banks, established an IPS effectively only in 2018, but seemingly had an institution for internal support within the group even before this date. In Italy, the members of a decentralized banking network with IPS are all headquartered in the northern region of South Tyrol/Alto Adige. In this respect, the region follows traditions of the German speaking countries it is historically linked to.[6] In both countries, the respective section of the banking industry is rather small and will not influence the overall numbers of the country.

In the following, we present some data on the size structure of the national banking systems of the eight countries mentioned above to illustrate the marked differences. Thereby, we first focus on the number and average size of independent banking institutions. As banking organizations can choose very different levels of integration, the delineation of an independent banking institution is not as clear cut as one could wish. To avoid any disarray, we use data from the ECB.

Figure 2 displays the number of banks in our sample of Eurozone member states. These countries make up for more than 90 percent of all monetary financial institutions (MFI) in the Eurozone. We compare the year 2009 with 2022. In 2009, the eight countries exhibited 5,600 banks. This number has gone down by more than a third to rather 3,400 institutions in 2022. In the thirteen years since the financial crisis, the countries lost between one quarter (Belgium) and almost three quarters (Netherlands) of their independent banking institutions. From the perspective of both competition and systemic risk, this massive process of concentration of market power and increase in bank size should raise serious concerns. However, to our best knowledge, the European regulator is not interested, or even assesses the development positively as market "consolidation".

[6] Maybe not directly linked to the topic of this paper, it is nonetheless an interesting question if the EU should, through the intended non-recognition of IPS, disable a core organizational principle of the largest banking group of this very special Italian province.

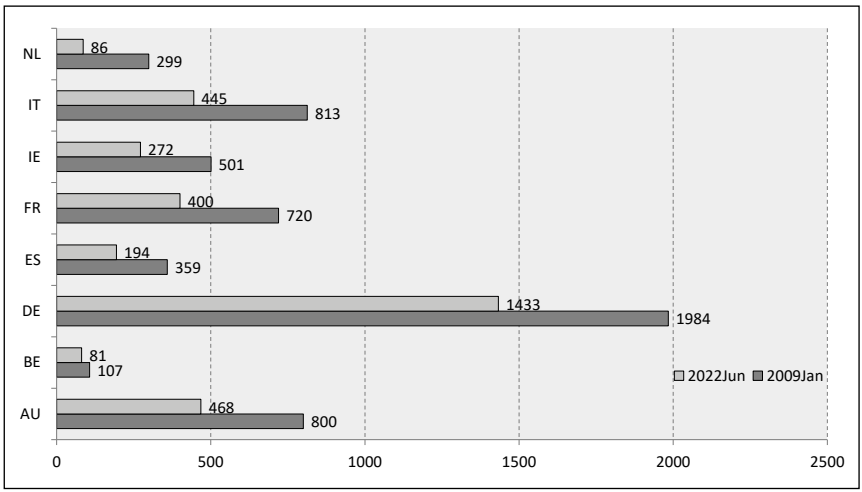

Figure 2: Number of banks in the 8 largest member states of the EMU

Source: ECB.

With regard to the total number of banks, Germany is still outstanding. The proportion of German banks in our sample has even increased, as the relative reduction of the number of banks in Germany was smaller than average. The other extreme represent Belgium and the Netherlands, both with a remarkably low number of independent banking institutions. As many of these banks are subsidiaries of foreign banks, the total number of Belgian and Dutch banks is even smaller, and the market is dominated by a few large players. On the other hand, both countries are remarkably well embedded into the European and the global economy, thus the overall impact of the small number of banking institutions on competition is uncertain. Amongst the smaller countries, Austria and Ireland still contain a comparatively large number of banks, although for very different reasons. Ireland plays a special role for international companies and financial institutions, leaving the retail market to a small number of Irish competitors. Austria represents the model case of a truly decentralized banking system with many competitors.

Comparing the absolute number of banks does not take the different size of the countries into account. However, the structural differences remain even by additionally controlling for the size of the countries. This could be shown if we calculated the number of banks relative to the size of the population or the economy. From the perspective of systemic risk, which is of principal importance for our paper, the ensuing size structure of banks is of interest. In Figure 3 we present the average size of banks in the eight countries, again comparing the numbers from 2022 with the situation in 2009.

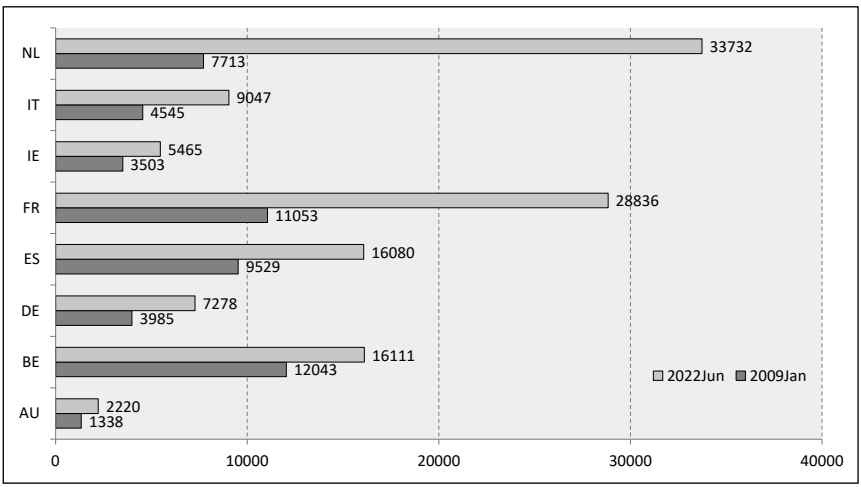

Figure 3: Average amount of total assets per bank (millions of Euros)

Source: ECB; own calculations.

We note that the average size of banks has strongly increased in all countries. However, with regard to size, the European banking system has become even more divers: The largest average size of banks in 2009 (Belgium) was about 9 times larger than the smallest (Austria). Today, the Dutch banks are on average more than 15 times larger than the average Austrian bank. For Germany, as the second country with a large market share of decentralized banking networks, this factor increased from about 3 (again compared to Belgium) to about 4.6 (Netherlands).[7] Thus, the different models seem to have to become even more distinct. The main driver of this development is, again, the extreme process of concentration in some countries.

With regard to the absolute numbers, the average bank size soared in France from 11 billion Euro to almost 29 billion Euro. In the Netherlands the number more than quadrupled from 7.7 to 33.7 billion Euro. In the Netherlands, and in France almost, banks have become so big that an "average bank" is seen as a threat to systemic stability according to the ECB's size criteria. In this sense, the exception becomes the rule. In Figure 4, we show the resulting effect on the overall share of systemically important banks (SIBs) in the eight countries. We observe an outstanding role of large, systemic institutions in many of the countries, in particular Spain, Netherlands, and France. The rate is comparably low

[7] The relative difference between Austria and Germany on the one hand and the Belgian banking system on the other hand with regard to average size did, however, decrease somewhat, as the number of banks in Belgium was already very small in 2009.

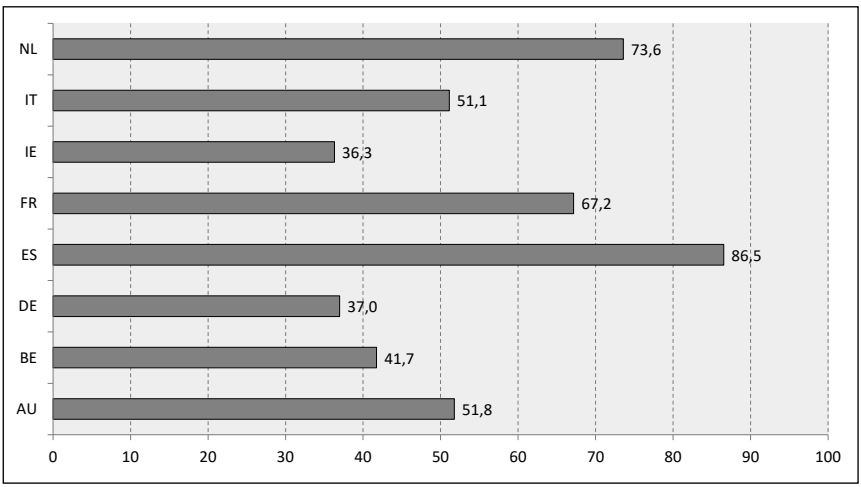

Figure 4: Share of SIBs (percent of assets incl. NCB) (2022 Mar)

Source: ECB; own calculations.

for Germany and Ireland. In Ireland, the explanation can again be seen in the special (and non-imitable) business model of the Irish financial center.

This size structure of the national banking systems in Europe is the result of the political, economic and the banking history of the respective country. Some countries tend to a high degree of centralization, whereas others have been successful with a decentralized system with politically and economically strong regions. Political structure, economic structure and also the structure of the banking system correspond in this development, which also contains a strife for efficiency under the specific conditions of the respective country. Thus, in a free market economy, banking systems are not just "outdated". With a similar patronizing stance, some authors call countries like Germany and Austria "overbanked". However, the banking sector in these countries is not extraordinarily big compared to the size of the economy. The total assets of 229 % (Germany) or 300 % (Austria) relative to GDP compare well to 343 % in Italy, 370 % in France, or the much larger numbers in the United Kingdom (423 %), Switzerland (525 %) and, certainly a special case, Luxemburg (1,386 %).[8] Thus, only the number of banks is bigger. There is no proof that large banks are more efficient. Without any causal implication, we note that a larger number of banks goes along with the existence of decentralized banking networks with well-established IPS. The larger number of banks in these countries, and the relatively

[8] See Germany Finance 2021, p. 12. Data for 2019.

larger share of small banks, is primarily a positive contribution to both competition and systemic stability.

Finally, some remarks on Italy are needed. As the banks participating in a decentralized banking network with IPS are mainly active in the Provincia Autonoma di Bolzano/Bozen, the national numbers do not reflect the relevance of this special institution. However, the number of banks in this province per 100,000 inhabitants is, with 10.56, much larger than the Italian average (1.20), and even much bigger than in Lombardy (1.29), the province with the Italian financial center Milan. Critics would say that the province is highly overbanked. In this criticism they are aided by the fact that it is very difficult to draw causal conclusions between such structural issues, efficiency, and economic performance of a region. However, it is worth to mention that, despite its agricultural traditions (and allegedly an inefficiently overbanked financial sector), the Provincia Autonoma di Bolzano/Bozen is, by far, the richest Italian province with regard to GDP per capita. So, there is at least something to lose by regulatory mismanagement if decentralized banking, with a market share of more than 50 % in the province,[9] played an important role for the economic success of this province.

5.2 Connectedness: The Multi-Dimensional Monster

In particular during the global financial crisis, economists and politicians became much aware of the fact that, besides size, also the degree of connectedness determines how strongly the crisis, or even failure, of an important banking institution threatens the stability of the financial system. A frictionless institutional money market is a necessary precondition for the efficient allocation and the cost-effective provision of financial services. Since many years, it is argued in the literature that the resulting mutual (business) dependencies of banks in a more or less closed system could lead to undesirable contagion effects.[10] However, empirical studies showed that most banks were well-diversified in their interbank lending, which made a spillover of risk along this path only not very probable.[11] But the global financial crises illustrated in a striking way that contagion follows many different paths, and that the culmination might have disastrous effects on systemic stability. Consequently, connectedness became again an important focus for scientist and the regulator.

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[9] According to the Raiffeisenverband Südtirol, the market share of the Raiffeisenkassen in their province with regard to loans to clients reached 50.42 % in 2021 and has been growing constantly over the last years.

[10] See, e. g., Rochet/Tirole (1996).

[11] See, e. g., Sheldon/Maurer (1998), Degryse/Ngyuen (2004).

Despite the last insight, we first have a look at interbank lending. We expect that banking systems with a greater number of regional banks will typically show a higher proportion of interbank claims. Large national or even European banks can channel liquidity within the bank from regions with capital surplus to regions with capital demand, and they might even choose a geographical structure that leads to high degree of autonomy from outside liquidity. Small and regional banks must refer to interbank lending to do so. However, in a close-knitted system of small banks, like the decentralized banking networks with IPS discussed in this paper, this interinstitutional liquidity balancing mainly happens within the network. The alliances create their own money market and can thus partially insulate themselves from external influences. The longstanding relationships of the cooperation partners reduce information costs as well as the factual liquidity risks, without having to subdue the individual institution to a central authority. In this context, the central institutions within the alliances act only as clearing houses and also represent the contact points to the financial community outside their own network.

From the data of the ECB (see figure 5), we get two insights: Firstly, for both 2008 and 2021, the share of the interbank claims of banks assets is highest in the two countries with large decentralized regional, but interconnected organizations (Austria, Germany). In this respect, the result is in line with our expectations. However, secondly, the relative importance of interbank lending has greatly decreased. The decrease is most pronounced in Ireland, Belgium and the Netherlands. The other countries also show a rather impressive decrease by be-

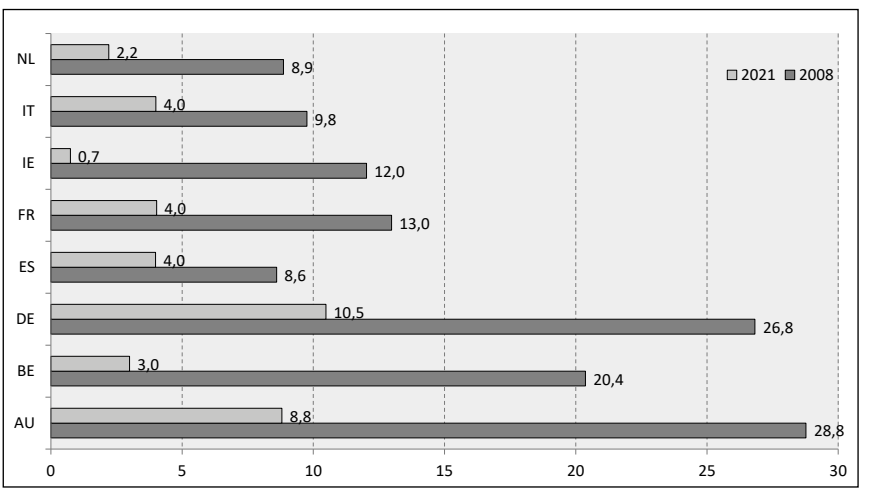

Figure 5: Interbank dependence (percent of assets)

Source: ECB.

tween 60 % and 70 %, which reduces the respective numbers even in Austria and Germany to 8.8 % and 10.5 % respectively. Thus, if the main driver of connectivity between banks' risk were interbank lending, its relevance was much reduced today.

This seemingly positive development comes at a high price. Unluckily, the main reason is not a reduction in the overall risk of the system, but a transfer of risk on the ECB. As figure 6 below shows, banks invest an increasing part of their wealth into central bank deposits, and the ECB provides most of the liquidity the banks and the economy need. Far beyond its function as a temporary lender of last resort, the ECB acts – on a permanent basis – as central intermediary and consequently bears an ever-increasing and overwhelmingly large portion of the intermediation risk in Europe. We present the data for 2008, 2018 and 2021 to show how the monetary policy of the ECB in reaction to the Corona crisis led to a further boost in this development. It will be interesting to see if the actual changes in the ECB's monetary policy will reverse this development.

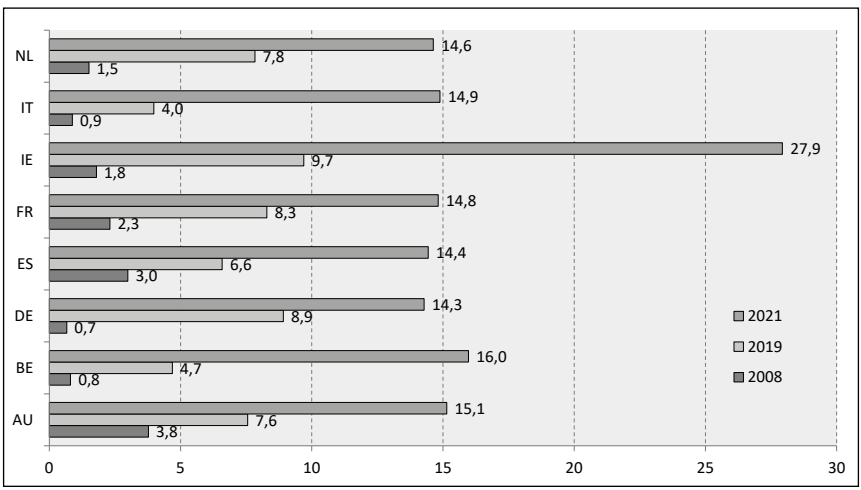

Figure 6: Cash balances and central bank deposits (percent of assets)

Source: ECB.

5.3 Systemic Risk and the Sovereign-Bank Nexus

As stated above, the classical interbank loan is not the only, and maybe even not the most important driver of connectivity between the individual risk of the banks. Without any claim for completeness, we like to mention similarities in the portfolio composition, strong changes of market prices due to fire sales, er-

ratically increasing collateral requirement for derivative positions, the multifold effects of rating changes, or possible threats to the liquidity of the short markets. Many of the respective markets are characterized by the dominance of a very small number of global players, which makes them particularly dangerous compared to the well-diversified interbank lending market. The respective data is not as easily available as the amounts of on-balance-sheet interbank claims, and probably cannot be aggregated into a measure for systemic risk.

An alternative approach is to deduce the market's view on the systemic risk of the banking sector from market data. In the literature, such an analysis is usually based on the prices for Credit Default Swaps.[12] By construction, these CDS spreads represent the credit risk of the respective underlying.[13] Unluckily, in our context, such market data is only available for sovereign debt and a few large banks. On the other hand, these large banks are exactly the institutions that play the most important role in the creation of systemic risk, and we are particularly interested in the impact of systemic risk from the banking sector on public finances. To characterize our set of European countries with regard to overall systemic risk, we look at two dimensions of this risk: Firstly, how closely linked is the credit risk of the large banks, and secondly, how strongly correlated is this risk with the credit risk of the respective country?[14] We present our result for a time period before the introduction of the Single Supervisory Mechanism (SSM) of the European Banking Union (January 2009 to October 2014), and for the period after this event until the beginning of the Corona crisis (November 2014 – December 2019),[15] as we observe that the introduction of the SSM had a significant positive effect on systemic risk in our operationalization.

Regarding the riskiness of the banks, we use the Principal Component Analysis (PCA) to identify if there is a strong common driver of credit risk for the large banks in the respective country sample. The reported number, the first principal component, shows how much of the variation of the CDS spreads of the different banks is explained by this common factor, and it is often interpreted in the literature as measure for the systemic risk of a banking system.[16] For the link between banks and states, we look at the correlation of the changes of

[12] See, e. g., Trapp/Wewel (2013) using CDS data for a cupola approach on systemic risk in the US and Europe, and in-between these two areas, during the financial crisis of 2007/2008.

[13] Technically, the CDS spreads is the quarterly premium the risk seller must pay to the risk buyer.

[14] In the following, we build on Bales (2022) and Bales/Burghof (2021). For a more detailed analysis, and for the cross-country spillover effects not regarded in this text, see these papers.

[15] Thus, we do not regard the special situation provoked by the pandemic, which led to certain rebound of systemic risk.

[16] See, e. g., Ballester/Casu/González-Urteaga (2016).

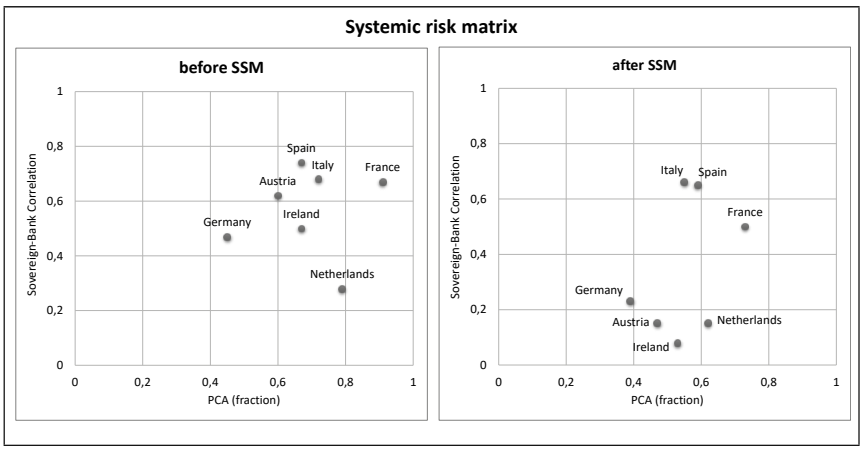

Figure 7: Systemic risk and the sovereign-bank nexus

Source: Own calculation based on the analysis in Bales (2022) and Bales/Burghof (2021).

the CDS spreads of the respective country and of the (weighted) CDS spreads of the banks in the country for a time horizon of one month.[17]

Our result shows that the introduction of the SSM (or simply the turn to a historical time period with lower perceived risk) is reflected in a clear and, with regard to our measures, even strictly dominant reduction of systemic risk with regard to both dimensions. Structurally, the situation has not changed and has become even more pronounced. Italy, Spain and France show a high systemic risk within the banking system, and also a high correlation with the credit risk of the respective states. Ireland and Netherlands present a similarly high systemic risk, whereas the link to the credit risk of the state is rather weak. This might be due to a successful and credible regulatory entrenchment of banking risks, and/or because of the increasingly strong fiscal positions of these countries. Germany and Austria represent the lowest systemic risk, whereas the correlation with the state credit risk is similar to the second group (Ireland and the Netherlands). For both last-mentioned groups, the link between the credit risk of the large banks and sovereign credit risk has become much weaker after the introduction of the SSM, whereas the advances in the first group (Italy, Spain and France) are rather limited.

Thus, according to the market data on CDS spreads, a potential for a massive banking crisis that could endanger the fiscal stability exists mainly in the three

[17] Unluckily, due to data limitations about available CDS spreads of banks, we cannot include Belgium into our analysis.

countries of the first group. This risk has decreased after 2014, although seemingly less than in the other countries. Furthermore, we know that systemic risk does not stop at borders. Nonetheless, it is important for our discussion to notice that the existence of decentralized banking networks with small and medium-sized regional banks, and a relevant market share of these networks, goes along with a relatively low systemic risk, whereas more concentrated banking systems without a relevant role for such co-operative concepts seemingly generate a stronger link between the credit risk of the large banks.

5.4 The Pleasures of Diversification: Business Models and Decision-Making Structures

In the preceding chapters, we mainly deal with the systemic risk caused by large banks, either due to their mere size or their connectedness. However, systemic risk is not limited to large banks. For both, large and small banks, the degree of systemic risk is linked to the level of diversification within the respective financial system. In this context, the concept of diversification must be understood in a rather broad sense. The classical capital market theory mainly deals with diversification as a dimension of the individual choice of an investment portfolio. Financial institutions with well diversified asset portfolios certainly represent a lower risk. However, from the perspective of systemic stability, this static and individual view is not relevant, as banks can rapidly change their exposure to risk through respective transactions on the capital market, and, regarding smaller banks, it is not the individual banks' risk that drives overall systemic risk.

However, the basic insights of modern portfolio theory do also hold on a more detached level. The most fundamental type of diversification concerns the different types of banking institutions as such, and their ensuing objectives. The legal form of a bank might be a good predictor for such differences. Listed companies serve to maximize shareholder value. Other, non-listed private companies are expected to act on behalf of the respective owners, who might have a whole set of monetary and non-monetary objectives. Co-operative banks serve their members in providing access to banking services of a special quality and price, and the monetary value of the share in the bank is of only tertiary importance. The manifold public banks must follow their respective, legally defined objectives, either as market participants competing on par with other banks, or as national or supranational development banks endowed with specific and often highly subsidized tasks.

The objectives of co-operative banks and public banks might also strongly depend on their degree of centralization, as the controlling peers might either be close to the people in the respective region or represent some supra-regional or

even national stakeholders and have to define their objective on a respectively aggregated level. However, if they stayed true to their task, even these kinds of stakeholders should not simply maximize shareholder value. Overall, we observe that the shareholder-value maximizing bank is not the rule within the European Monetary Union. There are several variants, and the relative weight of these variants differs greatly between the European countries even on this fundamental level. If we do not want to obliterate all these different objectives, we must take them into account in the evaluation of the success and performance of banks in the European Monetary Union.

From economic theory, we get that in a banking market with perfect competition such differences would not matter, as all competitor can just survive by maximizing net present value through a respective behavior. However, banks exist because financial intermediation is a mean to cope with multiple market imperfection. Thus, although every bank must keep its profitability in mind, the banks' behavior differs with the type of institution. This holds in particular when financial contracts are more incomplete.[18] In renegotiation, it matters who is your counterparty. Other differences might concern the degree of risk tolerance or such straightforward issues as the scale and scope of business or just the regional expansion of business.

The differences in the behavior of the various types of banks lead necessarily to diverse exposures to risk. Portfolio theory tells us that the ensuing risk of the whole system is reduced due to diversification. A banking system that leaves room for different types of banks, each with a relevant market share, is consequently more stable than a banking system that mainly favors one type of bank.[19] Above, we already discussed the conditions under which the special type of regional bank, usually in the legal form of a publicly bound bank ("Anstalt des öffentlichen Rechts") or co-operative bank,[20] can sustain a relevant market share, and also the stabilizing effect the IPS has on the respective decentralized banking networks.

A specific outcome of the different types of institutions and their respective objectives is the resulting business model. Ayadi et al. (2016) use a cluster approach based on balance sheet data to identify five different business models of European banks: focused retail banking, two types of retail banking with differ-

[18] See with regard to relationship banking in Germany, Elsas/Krahnen (1998).

[19] See Burghof (2011) or Schmidt (2018). For a specific example, see the stabilizing effect of different institutions in housing finance, empirically in Molterer/Amon/Tyrell (2023), and in an agent-based simulation approach on the same issue Braun/Burghof/Langer/Sommervoll (2022).

[20] Note that there are exceptions to the rule, like the traditional "Freien Sparkassen" in northern Germany, and other banks that changed the legal form without leaving their network and changing their overall objective.

ent extensions of the scope for a better diversification, wholesale banking, i. e., mainly interbank business, and investment banking. Regarding systemic risk, investment banking and wholesale banking are particularly dangerous, as these business models usually go along with large size, high connectivity and a strong exposure to erratic capital market developments. Focused retail might also be problematic, as it lacks diversification. However, these banks tend to be rather small.

With regard to the diversification argument, the mix of business models within a financial system is also of relevance for systemic risk. In our analysis based on recent data,[21] we observe (see figure 8 below) that Italy and Spain are dominated by banks that follow the investment banking approach. Regarding the business models of banks, these countries are not well diversified. In Ireland and France, the financial centers Dublin and Paris create a comparatively high relevance of risky wholesale banking, in the case of France combined with a strong investment banking orientation. Investment banking is also strong in the Netherlands and still rather significant in Belgium. Retail banking, focused or diversified, dominates Germany, Austria and, to lesser degree, Belgium and Ireland.

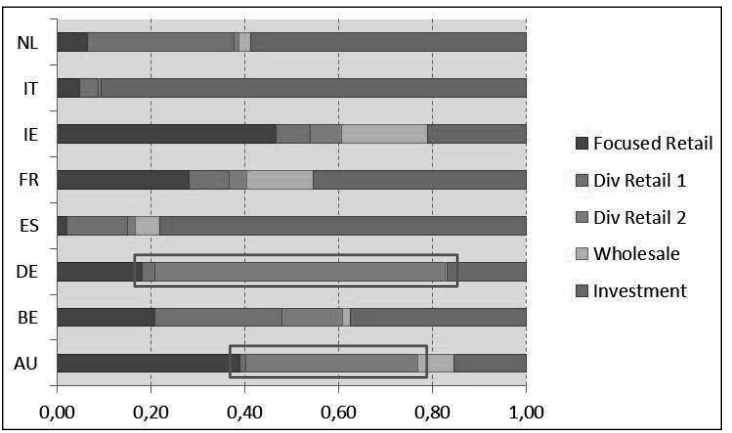

Figure 8: Banking business models in 2018 (percent of assets)

Source: Bureau van Dijk (2018); own calculations.

For each of the countries, the allocation of business models creates a unique profile with regard to systemic risk that, for the countries where the comparison is possible, corresponds surprisingly well with our empirical results visualized in the systemic risk matric presented above (Figure 7). The business models are

[21] See Gischer/Ilchmann (2018).

also correlated significantly with the spatial orientation:[22] the greater the emphasis on the investment motive, the less decentralized the institutions' structure. The opposite is true for financial institutions with a strong focus on relationship banking; they are regularly active not only in urban centers but also in more sparsely populated rural areas. Again, it is important to notice that such institutions are enabled to provide a comprehensive access to financial services through their participation in a decentralized banking network. Consequently, we see a dominant role of customer-oriented retail banking in the two countries where such networks play a significant role.

Bank behavior can also differ within the same business model. E. g., investment bankers can concentrate on providing services for businesses or wealthy private clients, or trade on the capital markets on behalf of the bank. Credit officers can invest in established companies or finance risky new projects. Banks can follow ambitious expansion policies or concentrate on their existing business. We can expect the management of a bank to define respective guidelines to create a consistent strategy, e. g., to be more ambitious and expansive, or to be more focused and cautious. The central management will do so based on the information that is available to it.

However, in a free market economy, independent banks cannot be forced to follow a strategy defined somewhere else. Thus, the degree of decentralization in a banking system also determines the variety of strategies pursued on the market. A very common preconception in this respect is that there are economies of scale in the aggregation and processing of information. Thus, large banks, through size and larger overheads (in absolute terms), developed superior, more efficient strategies. In such a world, small banks were an anachronism. However, much of the information from banking business about clients and markets is not quantifiable or verifiable. This so-called soft information can also not easily be transferred through the different levels of hierarchy. In small banks, soft information is either directly observed by the decision maker or can be credibly transferred through direct personal contacts that are much harder to establish in large organizations. Thus, small banking institutions have a pronounced advantage regarding the usage of soft information in their decision-making process.

Soft information plays an important role in banks that focus on certain regions and client-relationships, in particular in retail and corporate banking. On the other hand, capital market information – the central resource for investment banking – is not "soft". It is publicly available, and much of it is even quantifiable. Thus, it depends on the business model if a centralized or decentralized

[22] See Gischer/Ilchmann (2018), pp. 46 – 49, for further details.

banking model possesses superior information and is consequently more efficient.

Regarding systemic risk, creating a banking system with a greater diversity of strategies is a superior concept. The very fundamental reasoning behind this statement has already been put forward in section 3 above and need not to be repeated here in detail. In short: if the central management of large institution chooses the wrong strategy, it does so for the whole bank. Within decentralized banking networks containing smaller banks, the mistakes of decision makers in the individual banks get insignificant on a group level due to diversification.

Unluckily, the decision making in banks cannot easily be observed, or even categorized, from the outside. However, we might assume that the decentralized decision making should smooth the overall results. To show this effect, we compare the results of the two largest centralized private banking organizations in Germany, Deutsche Bank und Commerzbank, with the two large de-centralized banking networks in the same country, i. e., the group of institutes with a public mission ("Sparkassen") and the group of co-operative banks ("Genossenschaftsbanken"). These banking networks compete on the same market, and they have relevant weight within the European banking community. In the respective league tables, regarding total assets, Deutsche Bank is on position 8, Commerzbank on position 25. The Sparkassen, if treated as a single institution, would oust Deutsche Bank from position 8, whereas the co-operative banks would be placed directly behind this institution on position 9.

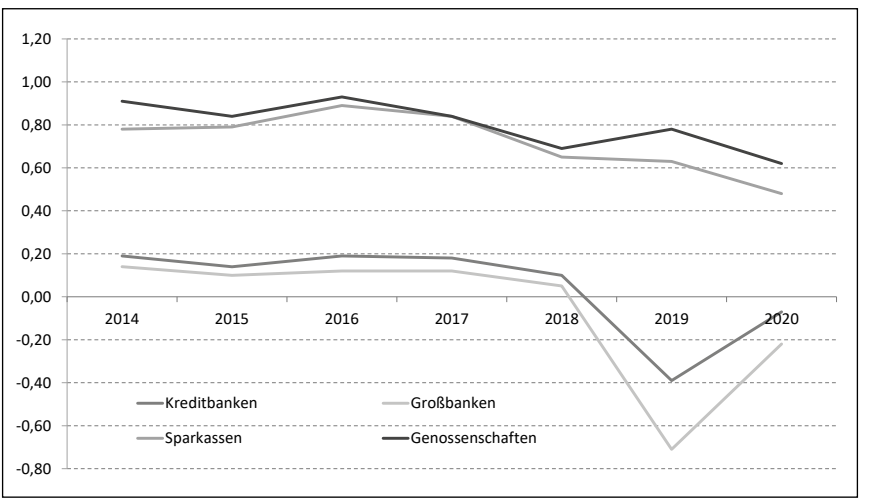

Figure 9: Profit before tax (percent of total assets)

Source: Deutsche Bundesbank.

Figure 9 shows the development of the return on assets of these four banking organizations from 2014 to 2020. The results for the large centralized banks are much more volatile. Many of the developments in these banks can be linked to distinct strategic decisions of the central management. On the other hand, the members of the decentralized banking networks, in particular the small regional banks ("Primärinstitute"), might, at first sight, also look very similar, as they share a similar business model, a joint reputation and, to some degree, even a joint corporate identity. However, a closer look at the individual institutions would reveal that many of them follow very individualized strategies with some interesting variations of the common business model. Consequently, for both Sparkassen and co-operative banks, the development of the return on assets is much smoother for the whole group, although they also follow the negative trend of German banking in these years.

Interestingly, this result also holds for longer time periods. Performance measures that are sensitive to leverage might lead to a different outcome, and the results for the private banks are certainly influenced by the unsatisfying performance of the two largest banks of the group over a rather long time period. However, as all these banks compete on the same market under similar conditions, the data does not support the idea that banks that act within a decentralized banking network and do not maximize shareholder value are necessarily less profitable. If at all, the opposite is true, which can be understood as a strong signal for the outstanding economic value of relationship banking with a long-term perspective.

6. The EU and Diversity in Banking

How can these insights be assessed from the perspective of European policy? After a complex selection process, in the year 2000 the European Parliament proclaimed a motto for the European Union that seems to fit closely to our discussion: "united in diversity". However, on the webpage of the European Union, the European commission provides a rather narrow and somewhat backward-looking interpretation of this motto: the motto signified "how Europeans have come together, in the form of the EU, to work for peace and prosperity, while at the same time being enriched by the continent's many different cultures, traditions and languages."[23] It remains an open question if, within the European Union, the respected differences in culture do also embrace different ways to organize economic institutions, like banks, and if the differences, in particular with regard to traditions and culture, should also be maintained and protected for the future. Seemingly, the special interpretation of the Commission

[23] See european-union.europa.eu/principles-countries-history/symbols/eu-motto_en, 25.08.2022.

would also allow the creation of a highly homogeneous, centralized European "Superstate" the motto as such seems to exclude.

The crucial shortcoming of the interpretation is that it negates much of the value of diversity. It is certainly more fun to live in a culturally diverse world with different languages, food, or colorful folkloristic events. However, the value of diversity is manifold and not limited to the cultural area. Our paper deals with value of diversity in the design of financial institutions. Reinhard Schmidt states in this context that "[p]reserving diversity in the financial sector should have a high political priority on the national, European and global level. Its long-term benefits probably outweigh by far the short-term disadvantages that too much diversity may seem to have."[24] Our paper provides arguments supporting this statement regarding decentralized banking networks that protect depositors through an IPS.

His statement also implies that it is always easy to find some short-term advantages from greater homogeneity – if only a reduction in complexity and lower transaction costs. However, economic institutions consist of a combination of several elements. Some of these elements are complementary to each other, and some might even be essential for the economic functioning of the institutions.[25] In this sense, the design of institutions is not arbitrary. A regulator who successively pulls some – maybe not well understood – elements from such a construction plays a kind of Jenga game. In the case of decentralized banking networks, the IPS would be such an element. Maybe the institution stays stable, maybe not. If the Jenga tower survives, the regulator can state that he was right, as the element was not essential, and some short-term advantages might be realized. If it breaks down, he could argue that it was doomed anyway. In both cases he denies responsibility for the negative impact of his action. In fact, playing this game destroys a valuable dimension of diversity in the design of financial institutions, and it destroys the market process of discovery of the optimal design of banking institutions. In both respect, banking markets loose both in stability and efficiency.

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[24] Schmidt (2018).

[25] See, e. g., Hackethal/Schmidt (2000).

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