HOW TO IDENTIFY SYSTEMICALLY IMPORTANT FINANCIAL INSTITUTIONS

Zlatuše Komárková, Václav Hausenblas and Jan Frait

The crisis has brought the issue of regulating large, complex and highly interconnected financial institutions back into the spotlight. Supervisory and other competent authorities have discovered that they have only limited ways of preventing an idiosyncratic shock in one institution from turning into a system-wide shock and of stopping the contagion spreading to other domestic and foreign financial institutions. This article aims to draw attention to the risks associated with the existence of systemically important financial institutions. It discusses methods for identifying systemically important financial institutions, including the approach proposed by BCBS (2011b), which is applied to the Czech banking system for illustration. Overall, our systemic importance results show that there is a large number of normally important financial institutions on average and a very small number of more important institutions. Moreover, there is high variance among the most important institutions in the results. In connection with the newly proposed regulation, the article presents possible instruments for increasing the resilience of such institutions to systemic risk.

1. INTRODUCTION

The current financial crisis has revealed significant risks associated with the activities of large, complex and interconnected financial institutions, known as systemically important financial institutions (SIFIs), and with the inadequate regulation and supervision of such institutions (IMF, 2010). Over the last two decades, banks in advanced economies have expanded to significant sizes, in many cases crossing the boundary at which economies of scale stop increasing. In many cases they have abandoned their traditional local or regional banking model and have started operating on a global scale. Most cross-border financial transactions are now intermediated by just a few financial institutions, between which there are very numerous and non-transparent links. Common trends in the behaviour of these institutions include a sharp increase in leverage, a reliance on short-term funding sources, significant growth in off-balance-sheet activities and maturity mismatches, and a high proportion of income from trading in complex structured products. The regulatory and supervisory regulations have been unable to react to the accumulating risks associated with the activities of such institutions, and their capital, which was supposed to act as a buffer against risks, has turned out to be not only too small, but also of poor quality.

A debate has been renewed at the international and national level about how to fix the regulatory and supervisory shortcomings and failures and to safeguard the stability of the financial system going forward. The G20 summit in April 2009 agreed to reform and strengthen the financial system and in particular to increase the resilience of individual financial institutions and the sector as a whole. The Financial Stability Board (FSB), the International Monetary Fund (IMF), the Bank for International Settlements (BIS) and, under it, the Basel Committee on Banking Supervision (BCBS) were tasked with implementing these objectives. In response to the G20 call, a general guidance document was issued in October 2009 to help national authorities identify global systemically important financial institutions, markets and infrastructures (FSB, IMF, BIS, 2009). This framework was updated at the October 2010 G20 summit by a set of recommendations for reducing the moral hazard posed by SIFIs (FSB, 2010). The BCBS also responded to the need to change the existing SIFI regulations in its new Basel III regulatory framework for the banking sector (BCBS, 2009 and 2011a) and in a document specifically targeted at the regulation of SIFIs (BCBS, 2011b) produced in response to the decisions adopted at the G20 level. And finally, at the G20 summit in November 2011, the FSB in consultation with the BCBS Macroprudential Supervision Group was asked to prepare guidelines for applying the framework for global institutions (G-SIFIs) to institutions that are systemically important at the domestic level (D-SIFIs).

The methodology for setting the instruments used to regulate the risks associated with SIFIs is closely linked to the identification of SIFIs. On a basic level, the instrument should be set as a function of the size of the institution, its interconnectedness with other institutions, the correlation
between the balance sheets of individual institutions, and other factors. It is assumed that purpose of the instrument is to reduce the probability of failure of SIFIs and mitigate the adverse effects of failures on the financial system. We are therefore seeing a shift in the debate on the new regulation of SIFIs, as the focus is no longer solely on how to effectively prevent the collapse of already impaired SIFIs, but on how to keep SIFIs sufficiently resilient to systemic risk.

This article is concerned with the identification and subsequent regulation of SIFIs. In Section 2 we look at the definition of SIFIs and the categorisation of their key characteristics. In Section 3 we focus on the methods that can be used to identify SIFIs and apply some of them to the Czech banking sector. Section 4 focuses primarily on prudential instruments for suppressing the contribution of SIFIs to systemic risk. The final section concludes.

2. DEFINING SYSTEMIC IMPORTANCE

The expansion of large and complex financial institutions (primarily in the form of large and complex banking groups) is associated with the global integration of markets and can therefore be regarded as a natural phenomenon. The constant push to obtain funds more easily, to smooth them over time, to diversify them and to use them effectively to finance global operations has essentially necessitated the creation of a large cross-border banks. The services of these financial institutions are used not only by large international non-financial corporations and investors, but also indirectly by governments seeking new creditors to fund their already high and still rising debt. The global banking industry is also highly concentrated, as evidenced by a high ratio of total cross-border transactions to the number of international financial institutions executing them.2 In connection with this trend, a complex structure of linkages has formed between financial institutions. This offers the benefit of credit and liquidity risk-sharing on the one hand, but poses an increased risk of contagion on the other (Rochet and Tirole, 1996; ECB, 2006). Contagion risk, also known as network risk, represents the main contribution of SIFIs to systemic risk (e.g. Frait and Komárková, 2011; Haldane, 2009; ECB, 2010). The potential direct crisis response by authorities to contagion risk is a significant source of moral hazard (FSB, 2010), as the expected bail-out of large and complex financial system institutions that become unstable causes markets to believe that they cannot fail. It also gives them easy access to cheap funds and encourages them to engage in riskier activities. The greater the risks these institutions accept, the more they contribute to systemic risk.

Defining the term systemically important institution is not straightforward given the widely varying conditions, regulations and levels of development of different financial markets. For the purposes of microprudential supervision a SIFI can be defined as an institution whose failure would cause its creditors and shareholders to suffer large losses in the form of direct costs. From the macroprudential perspective, a SIFI is a system component that contributes significantly to the accumulation of systemic risk and whose failure would impose large losses on its surroundings and would threaten the smooth functioning of the system as a whole and have adverse knock-on effects on the real economy. This macroprudential factor is larger, since it is the indirect impacts on the SIFI’s surroundings which have the potential to trigger a major and protracted crisis. A SIFI can be defined from the negative point of view as an institution whose uncontrolled failure has the potential to seriously damage the financial system, but it can also be defined from the positive point of view as an institution whose viability is crucial for the smooth functioning of the financial system and the real economy (Weistroffer, 2011).

From the perspective of microprudential and macroprudential policy instruments it is useful to create a practical definition of systemic importance (Thomson, 2009) that will give supervisory authorities room in reality to apply their instruments in order to influence the relevant financial institutions. In this sense it has been proposed to identify SIFIs by classifying their funding sources and measuring their contribution to systemic risk or events. The standard classification for identifying systemic importance (Brunnermeier et al., 2009; Thomson, 2009) is based on (i) the size of the financial institution, (ii) its interconnectedness, (iii) the correlation between financial institutions’ balance sheets, (iv) the concentration of financial institutions’ activities, and (v) the macrofinancial conditions and overall context (such as the structure of the financial industry and the political system).

The reason for this complicated classification is the existence of various factors that shape the systemic character of institutions. The original method for identifying

2 Goldstein and Véron (2011) state that the share of the five largest global banks in global banking assets doubled from 8% in 1998 to 16% in 2008. They also point out that this increase in concentration was particularly pronounced during the crisis, with the share of the 10 largest global banks in total global assets rising from 14% in 1999, to 19% in 2007, to 26% in 2009.
How to Identify Systemically Important Financial Institutions

Systemic importance was based solely on institution size, but this approach is inadequate for the current regulatory identification of SIFIs. The current crisis has shown that smaller financial institutions can also contribute significantly to systemic risk if, for example, they are financially too interconnected within the sector or have the potential to trigger a systemic event in some other way. Even a relatively small bank can have such potential if it has a significant share of an important market segment (e.g. mortgages), as distress at such a bank can cast doubt on the soundness of the entire segment. On the other hand, a large financial institution can act as a stabiliser of the financial sector thanks to its ability to absorb a large part of systemic risk. The identification of individual SIFIs and the subsequent application of combined instruments to enhance their resilience or suppress their contribution to systemic risk requires a higher degree of judgement (FSB, IMF, BIS, 2009).

The first criterion for classing a financial institution as a SIFI is the simple size (“too big to fail”) and/or concentration of its activities, or its lack of substitutability (as a dominant player in an economically significant financial market or a provider of a unique service, e.g. a central counterparty or clearing and settlement institution.). The size-based assessment of a financial institution’s systemic importance is related to the amount of financial services it provides (such as the volume of transactions it executes in various markets or the volume of assets it holds or manages, which are indicative of the extent to which its clients depend on its funds) and to its estimated negative impact on the system were it unable to provide them.

The second criterion is the interconnectedness of the financial institutions within and across the financial system (“too interconnected to fail”). Strong interconnectedness between financial institutions resulting from too many and too large inter-institution exposures creates a risk of direct contagion in the form of the transmission of idiosyncratic risk from one institution to another. The result is growth in systemic risk and ultimately also a reduction in the aggregate amount of financial services provided.

The third criterion for classing financial institutions as SIFIs is the degree of similarity and correlation of their balance sheets (“too many to fail”). If two or more institutions hold the same or similar assets, i.e. assets whose values are strongly correlated, a systemic shock to the value of those assets will affect the balance sheets of all those institutions simultaneously. Examples of such assets include claims on a common debtor or issuer (e.g. the public sector) and the concentration of lending in a single sector of the real economy (e.g. the property market). Correlation also represents a channel of indirect contagion in the time dimension of systemic risk. In the event of a systemic (idiosyncratic) shock, some institutions (one important institution) can, in an emergency, sell assets prematurely (fire sales). Depending on the size of the relevant market, this will drive down the price of those assets, further intensifying the crisis and increasing the risk of default of those and other institutions. Another symptom of correlation is herd behaviour, where several institutions behave in the same way. Balance sheets can also be correlated through the liability side. If too many financial institutions fund themselves through a single type of credit market, all of them will suddenly become vulnerable at the moment this market ceases to function. Simply put, in all these cases, multiple institutions behave like a single institution and need to be analysed and supervised as a single entity or cluster.

The fourth criterion is the macrofinancial or political conditions/context in which an institution can be identified as a SIFI. In difficult economic and financial conditions, a supervisory authority tends to be reluctant to identify financial institutions as distressed if it is sure that their solvency would improve significantly under normal conditions. So, a financial institution does not have to be extremely large or complex to be offered a bail-out (e.g. Bear Stearns and Long-Term Capital Management; see Thomson, 2009). The SIFI identification methods described above will not necessarily draw attention to financial institutions that are marginally important in terms of systemic risk in good times but whose failure can exacerbate bad financial conditions in markets during crises. Such institutions are relatively difficult – and sometimes even impossible – to identify ex ante.

Using the criteria described above, financial institutions can be allocated to categories according to how much they contribute to the build-up of systemic risk or the triggering of systemic events. Generally, a high level of prudential supervision is applied to financial institutions that satisfy the largest number of systemic importance criteria.

---

3 In addition to simple size, it is important to monitor the relative size of the institution in relation to individual markets. An example is the multinational insurance corporation AIG with its significant position on the CDS market.

4 The problem of the correlation of risky exposures across financial institutions is linked primarily with the time dimension of systemic risk (Frait and Komárková, 2011).
3. METHODS FOR IDENTIFYING SIFIS IN THE CZECH BANKING SECTOR

There are several ways of measuring systemic importance. They fall into two main categories: dynamic and static. The dynamic approach is based either on statistical modelling of losses of the system as a whole and their subsequent allocation to its individual components in order to determine the largest contributor to systemic risk (e.g. Tarashev et al., 2010), or on simulation modelling (e.g. Upper, 2011) of channels of contagion between components and over time (network analysis of exposures inside and outside the system). This is largely an academic approach and generally suffers from an absence of the data needed to construct or calibrate the individual models. Another downside of these models is that they do not account for the bias in market prices caused by the fact that systemic importance is already implicitly included in market pricing, as market participants assume that such institutions will be rescued by the government if they are at risk of failing (Berg, 2011).

For the reasons given above, the static approach is more practical for effective microprudential and macroprudential policy-making. This approach uses static quantitative and qualitative indicators which allow for simple comparison and further analysis of the individual components of the system. In addition, this method is flexible, simple and transparent, making it easier to communicate to system participants. It has been used to identify global systemically important banks (G-SIBs; see BCBS, 2011b). Drehmann and Tarashev (2011b) additionally show that correctly set simple indicators can proxy quite well for measures based on more complex models. On the other hand, it is clear that this method does not cover all forms of systemic risk. A major handicap is its inability to cover the time dimension of systemic risk, i.e. the rise and fall of systemic importance over the financial cycle. So, for example, it is no good for analysing the too-many-to-fail syndrome and other manifestations of herd behaviour, which increase the risk of indirect contagion.

The assessment of the results obtained from the above methods is conditioned by a number of considerations, and it is vital to interpret the results adequately. While some categories and their weights entering the systemic importance measure (such as size) can be assessed uniformly across financial institutions as regards the size of their contribution to systemic risk, others have to be treated differently from sector to sector to a large extent (e.g. interconnectedness). The assessment of systemic importance is also time-varying and depends on the current economic conditions. Simply put, the assessment of an institution’s systemic importance can differ in good times and crisis times because it is influenced by structural trends and cyclical factors. This implies the need for more frequent assessments of systemic importance in specific institutions. Finally, the methods for measuring and criteria for assessing systemic importance can differ according to whether the outcome is used primarily for (i) defining the regulatory perimeter, (ii) calibrating the intensity of oversight, or (iii) guiding decisions during a crisis, and also on whether they are measuring local, regional or international systemic importance. All the factors described above make it difficult to make measurements mechanically and demand a high degree of judgement by those assessing the results.

To analyse systemic importance in the Czech financial system in this article we used the composite quantitative indicator-based approach (Table 1, right-hand column) based on the recommendations in the FSB/IMF/BIS (2009) report submitted to G20 finance ministers and central bank governors in October 2009 (BCBS, 2011b; Table 1, middle column). The composite quantitative indicators are supplemented with two indicators obtained from network

---

5 This technique is referred to as the “top-down” approach. It is, however, possible to proceed in the opposite direction, expressing systemic risk as the sum of the contributions of the individual system components. This is known as the “bottom-up” approach.

6 Static indicators are useful, for example, for defining the regulatory perimeter.

7 The criteria of institution size and intra-sector connectedness can contribute differently to systemic risk. In this specific case, the weighting of these two criteria can depend heavily on the dependence of financial institutions on the financial market. If financial institutions in the system are dependent primarily on market sources of funding, the interconnectedness criterion may play a larger role than in a system where financial institutions are funded primarily by deposits or insurance premiums.

8 In worse economic conditions, the probability of financial institutions suffering correlated losses is significantly higher and the potential failure of financial institutions can trigger a general loss of confidence with all that that entails. By contrast, in good times the categories of complexity and cross-border interconnectedness can play a larger role.
Network analysis is a suite of methods for analysing the interconnectedness of the components in a system. It can be used to determine the importance of the components in relation to their position in the network. A network consists of nodes connected by links; in our case, the nodes are banks on the interbank market or in the CERTIS payment system and the links are the mutual exposures and payment operations between them (see Charts 3 and 4). The importance of a bank in the network is measured by its centrality, which is determined by its degree, betweenness, closeness and prestige in the network. According to network analysis, the importance of a node/bank increases with the number of links going in and out of it (degree), the number of other nodes it connects (betweenness), its proximity to other nodes (closeness) and the number of links it has with other important nodes (prestige). For more details on types of centralities, see von Peter (2007).

The reference system consists of 23 banks domiciled in the Czech Republic on a non-consolidated basis. The network analysis covers the entire interbank market/CERTIS payment system network, i.e. including branches of foreign banks operating in the Czech Republic.

For example, the score for the first indicator – gross credit exposure – was calculated by dividing the gross credit exposures of a particular bank by the total exposures across all the banks under analysis, and then giving the result a 10% weight. Simply put, this means that 10% of the share of the bank’s gross credit exposures in the aggregated sum of exposures enters the bank’s total systemic importance score (composite indicator).

In the method applied to the Czech banking system we initially – following BCBS (2011b) – assumed equal weights for each category and equal weights for the relevant indicators within each category. So, each category was given a weight of 20% and this was subdivided according to the number of indicators (i.e. where there are two indicators in a category each indicator was given a 10% weight, and where there were three the indicators were each weighted by 6.67%).

However, the allocation of weights in order to obtain the composite indicator of systemic importance is subject to numerous assumptions. Important roles are played by the current economic conditions, regulatory diversity, and the structure and level of development of the financial system.

### Table 1

**SUMMARY OF COMPOSITE QUANTITATIVE INDICATORS**

<table>
<thead>
<tr>
<th>Category</th>
<th>BCBS (2011b)</th>
<th>This study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size and activity</td>
<td>• total exposures</td>
<td>• gross credit exposure</td>
</tr>
<tr>
<td></td>
<td>Represents the factor of concentration.</td>
<td>• interest income and fee and commission income</td>
</tr>
<tr>
<td>Interconnectedness</td>
<td>• claims on credit institutions</td>
<td>• claims on credit institutions</td>
</tr>
<tr>
<td></td>
<td>Represents the factor of direct contamination.</td>
<td>• liabilities to credit institutions</td>
</tr>
<tr>
<td></td>
<td>Distress at highly interconnected institutions directly endangers the rest of</td>
<td>• wholesale funding ratio</td>
</tr>
<tr>
<td></td>
<td>the system through mutual exposures.</td>
<td>• mean centrality in interbank market network</td>
</tr>
<tr>
<td>Cross-border activity</td>
<td>• claims on non-residents</td>
<td>• claims on non-residents</td>
</tr>
<tr>
<td></td>
<td>Represents the potential channel of direct contagion from abroad.</td>
<td>• liabilities to non-residents</td>
</tr>
<tr>
<td>Substitutability</td>
<td>• assets under custody</td>
<td>• assets under custody</td>
</tr>
<tr>
<td></td>
<td>A non-substitutable institution is one whose place cannot be taken by another</td>
<td>• payments cleared and settled through payment systems</td>
</tr>
<tr>
<td></td>
<td>in the short run. Market participants and clients are therefore heavily</td>
<td>• values of underwritten transactions in debt and equity markets</td>
</tr>
<tr>
<td></td>
<td>dependent on its services and products.</td>
<td></td>
</tr>
<tr>
<td>Complexity</td>
<td>• trading book value and available for sale value</td>
<td>• trading book value and available for sale value</td>
</tr>
<tr>
<td></td>
<td>Not a systemic importance criterion, but creates a risk of inadequate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>supervision and regulatory arbitrage. Supervisory judgement should form a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>substantial part of this measure.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors, BCBS (2011b)

9 Network analysis is a suite of methods for analysing the interconnectedness of the components in a system. It can be used to determine the importance of the components in relation to their position in the network. A network consists of nodes connected by links; in our case, the nodes are banks on the interbank market or in the CERTIS payment system and the links are the mutual exposures and payment operations between them (see Charts 3 and 4). The importance of a bank in the network is measured by its centrality, which is determined by its degree, betweenness, closeness and prestige in the network. According to network analysis, the importance of a node/bank increases with the number of links going in and out of it (degree), the number of other nodes it connects (betweenness), its proximity to other nodes (closeness) and the number of links it has with other important nodes (prestige). For more details on types of centralities, see von Peter (2007).

10 The reference system consists of 23 banks domiciled in the Czech Republic on a non-consolidated basis. The network analysis covers the entire interbank market/CERTIS payment system network, i.e. including branches of foreign banks operating in the Czech Republic.

11 For example, the score for the first indicator – gross credit exposure – was calculated by dividing the gross credit exposures of a particular bank by the total exposures across all the banks under analysis, and then giving the result a 10% weight. Simply put, this means that 10% of the share of the bank’s gross credit exposures in the aggregated sum of exposures enters the bank’s total systemic importance score (composite indicator).
For these reasons, we performed a further two estimates of the systemic importance of Czech banks using alternative category weightings.

For the first alternative estimate, we changed the weights so that they better reflected the conservative nature of the Czech banking sector. Retail deposits remain its primary funding source, while market activities – especially on the international scale – play a minor role. The categories were reorganised and their weights changed while keeping the weights of the indicators within each category equal: substitutability (33.33%), size and activity (26.67%), interconnectedness (20%), cross-border activity (13.33%) and complexity (6.67%).

For the second alternative estimate, we assumed a medium-term growth phase of the Czech economy amid very low returns on domestic assets. Under these conditions one can expect depositors to be less interested in traditional bank products and depositors and financial institutions to focus more on financial markets, especially in other countries. Bigger weights were given to interconnectedness, cross-border activity and complexity (each 26%) and smaller weights to size and substitutability (both 11%). The weights on the indicators within each category remained equal in this second variant.

Chart 1 illustrates the statistical distribution of the resulting indicators. It shows that the categories of quantitative indicators all have relatively similar distributions. So, in each category separately we find a large number of institutions that have normal importance in the given respect (the left-hand part of the chart) and a small number of institutions that can be described as very important (the right-hand part of the chart). The correlation matrix of the relations among the analysed categories (see Chart 2) reveals that systemic importance cannot be entirely simplified to institution size. Nevertheless, it is evident from comparing the two parts of the matrix – the lower left-hand part, which covers the entire sample of banks under analysis, and the upper right-hand part, which excludes the five most important institutions on average – that the indicators for these five institutions are strongly correlated. Such strong correlations cannot be observed among less and medium-important institutions.
Unlike other (random or small-world) networks, scale-free networks have an exponential degree distribution and the observed points form an approximately straight line on a logarithmic plot of the cumulative distribution (see Chart 5). Two indicators from the set of interest were obtained using network analysis: (1) the mean centrality in the interbank market network in the interconnectedness category, and (2) the mean centrality in the CERTIS payment system network in the substitutability category. Simply put, the bank’s importance (centrality) in the interbank market and in CERTIS was measured. From the network structure it can be seen that the interconnectedness category is important for five banks (see Chart 3), as is the substitutability category (see Chart 4). When analysing a network one needs to take its structure (topology) into account, as this provides vital information on its effectiveness and stability (Barabási and Bonabeau, 2003). The interbank market network and CERTIS are both “scale-free” networks (see Chart 5), which display high effectiveness and stability in the event of random failures (Callaway et al., 2000). Simply put, the stability of a scale-free network depends strongly on a few key nodes, but most nodes present no risk to its stability. The key nodes (i.e. important banks) in this network function as stabilising components of the system, but their failure theoretically has catastrophic consequences in the form of a domino effect. Owing to this network risk, it is vital to include the bank’s network centrality – i.e. its importance in the interbank market and CERTIS – among the indicators for assessing systemic importance.

The results of the composite quantitative indicator-based approach indicate that there are just a few banks operating in the Czech banking sector which have a strong position both in the individual categories and overall. However, the ranking of the banks according to the resulting composite indicators does not match their asset ranking. The results therefore confirmed that size is not the deciding factor for determining systemic importance but does play an important role. Apart from two exceptions, this is evidenced by the generally stable scores across all three alternatives and confirmed by the closer correlation between the indicators for large banks (see Chart 2).

For four banks the composite indicator exceeded the mean score of the indicators for the whole system for all three estimates (see Chart 6). The cumulative sum of their

---

12 Unlike other (random or small-world) networks, scale-free networks have an exponential degree distribution and the observed points form an approximately straight line on a logarithmic plot of the cumulative distribution (see Chart 5).

13 The fourth and fifth-ranked banks in Chart 6; differences between the blue, red and green points.
scores represents 70% of the whole system. These banks can contribute significantly to systemic risk in the banking sector both separately and in particular as a group. The mean value of the assets of these four banks is not very high in international terms (13% of GDP and around 35% of state budget revenue), but under the assumption of strong interconnectedness and correlation of their balance sheets, the failure of these banks as a whole would have a significant impact on public finances.14

Different distances are apparent between the composite indicators for individual banks. Banks with above-average scores display a relatively high spread of their composite indicators, while banks with below-average scores tend to form clusters. According to this approach, banks forming clusters do not make a significant contribution to systemic risk individually, but together the score for their composite indicators (around 30% of the total) would exceed the highest individual bank score obtained (around 26%).

The method used to quantitatively determine D-SIBs helped us to rank the analysed banks by systemic importance in descending order using the defined key and identified banks with a high deviation from the average importance, but it did not adequately reveal which of these banks are systemically important due to their high risk absorbency and which are systemically important due to their ability to propagate risk quickly, directly or indirectly, within the system or to the real sector. The former stabilise the system, while the latter destabilise it. Moreover, it is impossible to discern from the results obtained whether an analysed bank contributes significantly to systemic risk by itself or via a group of banks; group failure can generate far higher systemic costs. For the final quantitative determination of systemically important institutions or systemically important groups which might potentially be subject to the new prudential regulations (see section 4), we need to further refine the quantitative indicator-based approach (especially in the complexity15 and substitutability categories) and also conduct further additional analyses (in particular an analysis of balance sheet correlation across banks and sectors). Such additional analyses could change the current quantitatively determined bank rankings and the deviations from the average importance.16

14 Expressing the costs of the negative externalities caused to SIFIs through the 100% write-off of their assets is an extreme assumption but yields information on the upper bound on the costs.
15 One way of further extending the analysis of the complexity of Czech financial institutions is to take into account their ownership structure, i.e. their links to parents and subsidiaries.
16 Owing to the complexity of the additional analyses they are not included in this article and will form part of further CNB research.
The quantitative determination of systemic importance is followed by qualitative determination, or supervisory judgement. This should primarily involve setting limits on the deviation of the importance of a particular bank from the mean or median importance. Qualitative judgement should therefore just confirm the quantitative results. In our case, it involves determining whether the quantitative indicator score for the first-ranked bank (over 26%; see Chart 6) is far enough from the mean (4.35%). However, qualitative judgements can be made only after sufficient results have been obtained for the quantitative determination of systemic importance.

4. SIFI REGULATION AND ITS INSTRUMENTS

The regulatory and supervisory standards for the banking sector developed by the Basel Committee were and still are mostly microprudentially oriented. This framework is based mostly on empirical experience with the operations of individual banks in advanced countries. However, in response to the recent financial crisis, Basel III and other Basel Committee initiatives are trying to expand the framework systematically to include instruments of a macroprudential nature. The first is the countercyclical capital buffer, targeted at the time dimension of systemic risk (Geršl and Seidler, 2011). The second are systemic capital surcharges (SCSs), aimed at the cross-dimensional component of systemic risk (BCBS, 2011b). Specifically, they are focused on the negative externalities associated with the potential failure of SIFIs.

It was agreed at the G20 summits that regulators would, within the framework of G-SIFI supervision, push for SIFIs to hold capital in excess of the level stipulated in Basel III to enable them to better absorb the additional losses arising from the higher risk associated with their failure. The first group of institutions that is supposed to meet these enhanced requirements is the G-SIBs. At the G20 summit in November 2011 an initial list of 29 G-SIBs was published. This list will be revised every year. The capital surcharges will start to be applied in 2016, with full implementation of the new regulations in 2019. In addition, the authorities in a number of countries (in Europe, for example, the Netherlands, Ireland and Sweden) have already announced that they will also introduce SCSs at national level for D-SIBs. The UK is planning to apply a similar approach as part of a reform of its banking sector.

When setting SCSs it is vital to start by realising that the objective is primarily macroprudential. The aim is not to stop SIFIs from getting into trouble or failing, but to at least partially reduce the likelihood of systemic crises, and in particular (as in the case of countercyclical capital buffers) to reduce the intensity of such crises by absorbing the negative impacts of SIFI failures. SCSs should therefore enhance the resilience of the system in terms of loss absorbency so that it is capable of performing its core functions even in the event of severe distress. In other words, the point of SCSs should be to prevent the kind of dramatic rise in uncertainty that occurred after the collapse of Lehman Brothers in 2008, which crippled the global financial system and disrupted global economic activity.

The usual objection to SCSs is that capital is costly and SCSs force banks to downsize their balance sheets. This could mean worse availability of credit to the private sector and slower economic growth. The advocates of higher capital adequacy and of SCSs usually respond to this objection by saying that investors in bank shares are currently demanding a higher rate of return than investors in non-financial corporations’ shares, because banks are more leveraged and therefore more risky (BCBS, 2010). This applies to SIFIs much more than it does to other institutions. If SCSs cause leverage to fall, banks will become less risky and investors will not demand such high returns on their shares. And if SIFIs decide not to provide some types of loans because of SCSs, they will be substituted by smaller non-SIFI banks subject to lower capital requirements. Another argument against the introduction of SCSs is based on economies of scale and states that the global financial system needs SIFIs. This argument is undermined by the fact that some global banks have expanded well beyond the point at which the economies of scale can increase any further and which is needed to fund activities in the global economy. The problem in assessing this debate is that the opinions of neither side are backed up by sufficient economic research. Consequently, the main argument against identifying SIFIs

---

17 Other types of instruments feature in the debate: liquidity surcharges, greater transparency of some types of exposures, limits on large exposures, etc.
18 Tarullo (2011) points out that SIFIs do not themselves have any incentive to hold capital to minimise the negative externalities of their own failure. With SCSs, Basel III should at least partly remedy this problem.
and imposing SCSSs is still that labelling an institution as a SIFI leads to growth in the moral hazard associated with it, since both it and the public are being told de facto that it is “too important to fail” and that even if it becomes insolvent the government or central bank will give it the funds or guarantees it needs to keep going. The counter-argument is that market participants do not need a formal label to know which institutions are systemically important. In this situation, imposing capital surcharges on such an institution can only reduce its riskiness, as they will cause individual and economy-wide expectations of its profitability to converge. This is because the surcharges will increase the institution’s funding costs, which were previously held down because the market regarded it as being too important to fail.

Numerous papers investigating the possible methods for setting SCSSs have appeared in the literature over the last three years (see, for example, Gauthier et al., 2010 for a review). In principle, SCSSs should be set to reflect the difference between the private and social profitability of the SIFI. In other words, the size of the SCSSs should create an incentive for SIFIs to stop expanding, to stop becoming more interconnected and to stop taking on more risks if there are no related benefits for the economy as a whole. On the general level, the calibration of SCSSs should be based on an estimate of the potential impact of SIFI failures on the entire financial system, which should be compared with the costs of additional regulation. This implies that the principal factors when setting SCSSs should be those which determine the potential impact of failures: the institution’s size and interconnectedness and the other factors discussed in sections 2 and 3.

However, the discussion in section 3 showed that estimating the impact of SIFI failures on the financial system and subsequently estimating the additional capital needed to reduce the probability of failure and the strength of the impact is a very difficult exercise. Berg (2011) describes the main complications in making such estimates. He points out that the existing methods do not consider the trade-off between the costs of regulation and the costs of SIFI failures and that they do not take into account how the costs of failure depend on the manner of regulation and on the resolution regime. In reality, SIFIs are usually rescued rather than being allowed to fail, and this affects the resolution costs. This is a crucial insight, because the key challenge for the planned regulation of SIFIs is to reduce systemic risk and the probability of events to which SIFIs contribute, and not to excessively curb the intermediary activity of regulated financial institutions and thereby cause unintended transfer of systemic risk to an unregulated segment of the domestic financial market or drive domestic financial activities out of the country.19

If we accept the aforementioned arguments of Berg (2011) and adopt the assumption that SIFI failures are the exception rather than the rule since most SIFI resolution situations end in rescue, the expected social costs of a SIFI rescue operation should be relevant for determining the SCSSs. And on a basic level those costs can be determined by the institution’s expected losses in the worst case scenario. This is why the Basel Committee focused directly on the additional capital needed to absorb SIFIs’ losses when formulating its SCSS recommendations. The quantitative models used to estimate this capital produced results lying in a wide range of 1–8% of risk-weighted assets in terms of CET1 equivalent, with a central tendency of around 2–4%. The final recommended calibration of 1–2.5%20 was therefore in the lower half of the range of estimates. This low SCSS calibration assumes coverage by high-quality capital capable of fully absorbing losses. If the risks of SIFIs are to be covered also by lower-quality capital, the total SCSSs should be set at a higher level.21

SCSSs are just one of the elements that can mitigate the systemic risks associated with SIFIs. The resolution framework occupies first place in the overall G-SIFI supervisory framework.22 The specific resolution rules should allow a SIFI to remain a going concern during a crisis, and the shareholders must accept losses associated with the institution’s poor financial condition. The risks associated with SIFIs can also, of course, be mitigated by supervisory instruments, which are primarily...
microprudential in nature. These include stricter, more regular and more detailed supervision of their operations and other instruments aimed at reducing the probability of failure of important institutions. It is important to realise, however, that it is naive to imagine that every future SIFI failure can be prevented. Moreover, stricter supervision is meaningless in situations where other institutions are afraid to do business with each other in reaction to distress at a SIFI. By contrast, if they are set at an economically important level, SCSs can reduce the uncertainty about the loss absorbency of a SIFI and significantly boost expectations that it will remain a going concern. To sum up, there is a significant relationship between the size of an SCS and the effectiveness of other instruments, especially resolution regimes. The more effective the other instruments are, the lower the SCS can be. However, advocates of SCSs argue that they can be introduced relatively quickly, whereas it can take years or even decades to introduce other instruments. They therefore suggest introducing SCSs over the next few years and then reducing them at a later stage, depending on the progress made with implementing other measures.

5. CONCLUSION

The current crisis, and in particular the collapse of Lehman Brothers, has led to a renewed national and international debate about enhancing the stability of systemically important financial institutions (SIFIs). The G20 summit in April 2009 agreed, among other things, to strengthen the resilience of international financial institutions. This agreement led first of all to the publication of a general guidance document for identifying global systemically important financial institutions, markets and infrastructures (G-SIFIs) and subsequently to regulatory documents specifically targeted at the regulation of SIFIs. It also gave rise to a debate about the possibility of transferring the SIFI identification and regulation methodology from the global level to individual domestic financial sectors (D-SIFIs).

In this article, we applied the BCBS-recommended method of static quantitative indicators for identifying SIFIs to the Czech banking sector for the purposes of pilot identification of domestic systemically important banks (D-SIBs). Using the results for 11 quantitative indicators combined into a single composite one, we ranked the 23 analysed banks in descending order from the most to the least systemically important. This method identified banks in the Czech banking sector which deviate significantly from the average importance in the sector and revealed several institutions which tend to form clusters in the sector. For the final identification of D-SIBs to which SIFI regulatory instruments might be applied, however, the method needs to be refined further. This is because it does not adequately capture some of the contributions of individual institutions (or groups of institutions operating together as SIFIs) to systemic risk (such as correlated activities of institutions in the system).

Besides refining the statistical method for identifying D-SIBs for the Czech banking sector, the remaining challenges include qualitative identification of D-SIBs by supervisory judgement and the allocation of individual potentially identified D-SIBs into categories based on their systemic importance and the subsequent setting of systemic capital surcharges.

6. REFERENCES


