

## The SSM at 1



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*Editors: Jens Ulbrich, Carl-Christoph Hedrich and Morten Balling*

*Authors:* Luc Laeven, Mario Draghi, Andreas Dombret, Ignazio Angeloni, Sergio Nicoletti-Altimari, Felix Hufeld, Ludger Schuknecht, Hendrik Ritter, Christian Thimann, Josef A. Korte, Sascha Steffen, Emilio Barucci, Roberto Baviera, Carlo Milani, Giacomo Calzolari, Jean-Edouard Colliard, Gyöngyi Lóránth, Ulf Mohrmann, Maximilian Muhn, Martin Nienhaus, Jan Riepe, Angela Maddaloni, Alessandro D. Scopelliti, Anna Damaskou, Giannoula Karamichailidou, David G. Mayes, Hanno Stremmel

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# TABLE OF CONTENTS

List of Authors. . . . .	5
<b>1. Introduction . . . . .</b>	<b>7</b>
<i>Jens Ulbrich, Carl-Christoph Hedrich and Morten Balling</i>	
<b>2. Monetary policy in the clutches of financial stability? . . . . .</b>	<b>17</b>
<i>Luc Laeven</i>	
2.1. Should central banks incorporate financial stability considerations in the conduct of monetary policy? . . . . .	18
2.2. Is macro-prudential policy effective in preventing the occurrence of financial instability? . . . . .	22
2.3. Should bank capital be raised to support financial stability? .	25
2.4. Conclusions. . . . .	27
References . . . . .	29
<b>3. How central banks meet the challenge of low inflation . . . . .</b>	<b>33</b>
<i>Mario Draghi</i>	
3.1. What is common for all. . . . .	33
3.1.1. The causes of too low inflation . . . . .	34
3.1.2. The response to too low inflation . . . . .	35
3.1.3. The costs of fighting too low inflation. . . . .	37
3.2. What is special to us . . . . .	39
3.2.1. Transmitting the stance. . . . .	39
3.2.2. Expanding the stance . . . . .	41
3.3. Conclusion . . . . .	42
<b>4. A success story? Reflecting on one year of European banking supervision . . . . .</b>	<b>43</b>
<i>Andreas Dombret</i>	
4.1. Introduction . . . . .	43
4.2. Coming together: the first year of European banking supervision . . . . .	43
4.3. Keeping together: where do we stand? . . . . .	44
4.4. Working together: the road to success. . . . .	46
4.5. Conclusion . . . . .	47

<b>5. Macroprudential policies to contain systemic risks</b> . . . . .	49
<i>Ignazio Angeloni</i>	
5.1. Introduction . . . . .	49
5.2. Where do we stand on the use of macroprudential policies? .	50
5.3. Some conceptual issues . . . . .	51
5.4. Institutional features in Europe . . . . .	53
5.5. Recent policy moves in the euro area. . . . .	55
5.6. Conclusions. . . . .	57
<b>6. Monetary and macroprudential policies in the euro area</b> . . . . .	59
<i>Sergio Nicoletti-Altimari</i>	
6.1. Introduction . . . . .	59
6.2. The relationship between monetary and macroprudential policies: few basic principles . . . . .	60
6.3. Monetary and macroprudential policies in the current euro area context. . . . .	63
6.4. Conclusions. . . . .	68
References . . . . .	69
<b>7. Has the stability of the big Eurozone banks improved after the comprehensive assessment?</b> . . . . .	71
<i>Felix Hufeld</i>	
<b>8. Non-bank financing and regulatory and fiscal challenges</b> . . . . .	73
<i>Hendrik Ritter and Ludger Schuknecht</i>	
8.1. Introduction . . . . .	73
8.2. Externalities in non-bank financing. . . . .	74
8.3. Fiscal challenges . . . . .	75
8.4. Conclusion . . . . .	77
<b>9. Views on insurance, regulation and the macro environment</b> . . . . .	79
<i>Christian Thimann</i>	
9.1. Insurers versus banks: key differences . . . . .	79
9.2. The role of diversification . . . . .	80
9.3. Insurers' balance sheet structure . . . . .	82
9.4. The influence of regulation on the balance sheet structure. . .	83
9.5. How insurers are preparing for durably low long-term interest rates . . . . .	85
9.6. Conclusion . . . . .	86
References . . . . .	86

<b>10. A ‘Sovereign Subsidy’ – Zero risk weights and sovereign risk spillovers</b> . . . . .	87
<i>Josef A. Korte and Sascha Steffen</i>	
10.1. Motivation . . . . .	87
10.2. Bank level exposures to sovereign debt . . . . .	88
10.3. The sovereign subsidy . . . . .	91
10.4. Zero risk weights and contagion within the Eurozone. . . . .	92
10.5. Closing the sovereign gap . . . . .	92
References . . . . .	93
<b>11. Is the comprehensive assessment really comprehensive?.</b> . . . . .	95
<i>Emilio Barucci, Roberto Baviera and Carlo Milani</i>	
11.1. Introduction . . . . .	95
11.2. Empirical model and main results . . . . .	97
11.3. Conclusions and policy implications . . . . .	104
References . . . . .	105
<b>12. The SSM and multinational banks.</b> . . . . .	107
<i>Giacomo Calzolari, Jean-Edouard Colliard and Gyöngyi Lóránth</i>	
12.1. Introduction . . . . .	107
12.2. MNBs’ representation form and supervision . . . . .	108
12.3. Supranational supervision of an MNB. . . . .	108
12.4. The strategic reaction of MNBs. . . . .	109
12.5. Does the Banking Union need additional supervisory tools? . . . . .	109
12.6. Conclusion . . . . .	110
References . . . . .	111
<b>13. “Believe me, it will be enough”</b> . . . . .	113
<i>Ulf Mohrmann, Maximilian Muhn, Martin Nienhaus and Jan Riepe</i>	
13.1. Motivation . . . . .	113
13.2. Research Question and Hypotheses. . . . .	113
13.3. Empirical Design . . . . .	115
13.4. Preliminary Results . . . . .	116
13.5. Contribution . . . . .	117
References . . . . .	118
<b>14. Prudential regulation, national differences and stability of EU banks</b>	121
<i>Angela Maddaloni and Alessandro D. Scopelliti</i>	
14.1. Introduction . . . . .	121
14.2. Capital Regulation and National Differences across the EU . . . . .	122

14.3. A Novel Indicator for Prudential Regulation in the EU . . . . .	123
14.4. Prudential Regulation and Crisis Public Support . . . . .	124
14.5. Empirical Analysis . . . . .	126
14.6. Empirical Results: Baseline Specification . . . . .	129
14.7. Empirical Results: Bank Heterogeneity . . . . .	131
14.7.1. Bank Liquidity . . . . .	131
14.7.2. Exposures to Government Bonds . . . . .	133
14.7.3. Reliance on Non-Lending Income Sources . . . . .	134
14.8. Conclusions and Policy Implications . . . . .	137
References . . . . .	138
15. <b>Banks v. SSM: the party has just started...</b> . . . . .	141
<i>Anna Damaskou</i>	
16. <b>Can financial cycle dynamics predict bank distress?</b> . . . . .	147
<i>Giannoula Karamichailidou, David G. Mayes and Hanno Stremmel</i>	
16.1. The Model . . . . .	148
16.1.1. Dependent variable: binary versus continuous . . . . .	149
16.1.2. Independent variables . . . . .	149
16.2. Sample and Descriptive Statistics . . . . .	152
16.3. Results and robustness tests . . . . .	152
16.4. Conclusions . . . . .	157
References . . . . .	158
SUERF – Société Universitaire Européenne de Recherches Financières . .	161
SUERF Publications . . . . .	161
SUERF Policy Notes (SPNs) . . . . .	162



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# 1. INTRODUCTION

*Jens Ulbrich, Carl-Christoph Hedrich and Morten Balling*

On February 3-4, 2016 SUERF – The European Money and Finance Forum –, Deutsche Bundesbank and Stiftung Geld und Wahrung jointly organized a Colloquium/Conference in Frankfurt in order to evaluate the experience with the SSM – the Single Supervisory Mechanism – during the first year of its existence. The present issue of SUERF Conference Proceedings includes a selection of papers based on the authors’ contributions to the Frankfurt event.

In chapter 2, “Monetary policy in the clutches of financial stability”, *Luc Laeven*, Director-General of the General Research Directorate of the European Central Bank poses three questions: 1) Should central banks incorporate financial stability considerations in the conduct of monetary policy? 2) Is macro-prudential policy effective in preventing the occurrence of financial instability? 3) Should bank capital be raised to support financial stability? Concerning the first question, the pre-crisis view was that central banks should focus on price stability, whereas financial stability objectives should be left to prudential authorities. After the crisis, a common view has been that central banks should incorporate financial stability considerations in the conduct of monetary policy. By leaning against the wind also by monetary policy instruments, the high costs of financial crises could be avoided. The appropriateness of leaning against the wind depends, however, on the relevance of the risk-taking channel of monetary policy. Different theoretical approaches deliver different predictions on the relationship between the monetary policy rate and bank risk taking. Portfolio allocation models predict that an exogenous decrease in the yield on safe assets will lead to greater risk taking. In models with limited liability and risk shifting, a decrease in interest rates may reduce risk taking by reducing the bank’s funding cost. The net effect of interest rates on bank risk taking is therefore an empirical question. Recent empirical studies support the presence of a risk-taking channel of monetary policy. Question 2 – the effectiveness of macro prudential regulation – is critical. Overall, the empirical literature supports the use of macro-prudential instruments in reducing the procyclicality of credit, but the extent to which they alone can effectively manage credit cycles and reduce systemic risk depends on circumstances. The cost of intervening too early and running the risk of stopping a desired boom have to be carefully weighed against the desire to prevent financial crises. In his answer to Question 3, the author writes that higher capital requirements are desirable for two reasons: They increase the likelihood that buffers will be sufficient to absorb shocks, and they reduce the need for monetary policy to act in support of financial stability. In his view, the general direction of higher

capital requirements taken by the Basel Committee seemed right. One should not forget, however, that corporate governance theory suggests that bank ownership structure influences risk taking.

In chapter 3, “How central banks meet the challenge of low inflation”, *Mario Draghi*, President of the ECB distinguishes between two types of monetary policy challenges: Challenges that are common to all central banks in advanced economies, and challenges that are special to the monetary authorities in the euro area. All central banks are faced with the question: can the price stability mandate be delivered? This leads to the question whether inflation is currently more rooted in global factors than in domestic ones. Or, whether more structural factors hold inflation down, *e.g.* demographic forces in ageing societies. President Draghi takes these arguments in turn, acknowledging that inflation has been affected significantly by oil and commodity price developments. This does not imply, however, that monetary policy can step back or treat these factors with benign neglect. If low inflation is increasingly being caused by structural factors in the global economy that cannot be addressed through domestic monetary stimulus, it would constitute a very fundamental criticism of central banks’ mandates. It seems, however, unlikely that demography can explain why inflation is low today across advanced economies that have very different demographic profiles. Other structural shifts are the long-term cycle in commodity prices, technological change and globalization. There is, however, no reason why any of these structural changes should make the current price stability objectives unobtainable. Central banks do typically refrain from reacting to supply shocks that have opposing effects on output and inflation, so as not to overreact and reinforce the effect on growth, in either direction. However, since there is always a backward-looking component in inflation developments, the longer inflation stays too low, the greater the risk that inflation does not return automatically to target. Low inflation can feed into inflation expectations and create second-round effects. Risks of acting too late may outweigh risks of acting too early. Lessons of monetary history in the US as well as in Japan underline the importance of full commitment from policymakers. If we have the will to meet our objective, we have the instruments. The lower bound for policy rates is not at zero. Furthermore, the ECB has demonstrated the suitability of non-standard measures. If all central banks act to deliver their mandates, then global disinflationary forces can eventually be tamed. Some observers have expressed concerns about the impact of expansionary monetary policies on accumulation of excessive foreign currency debt or asset bubbles abroad, especially in emerging markets. The president’s contra-argument is that it would not help emerging markets if advanced economy central banks failed on their mandates. Countries have the option to improve their financial regulation and supervision to make their financial systems more resilient to external shocks. They can also apply fiscal policy and macro-pruden-

tial measures. The institutional structure in the euro area implies special challenges. ECB conducts monetary policy in a segmented banking and capital market, and without a single area-wide fiscal authority as a counterpart. Segmentation of markets leads to lower sharing of risks. It means that the bank lending transmission channel and the balance sheet channel are more likely to be disrupted in the event of major shocks. It means also that financial fragmentation takes place along national lines. The ECB must design its instruments to compensate for this. Examples are the measures to substitute for the drying up of the interbank market, the intervention in sovereign debt markets and the credit-easing package. The creation of the European Banking Union (EBU) is, however, an important step to remove fragmentation risks more permanently. The two pillars – the SSM and SRM – are now in place. The third pillar – a European common deposit insurance scheme – is, however, still missing. The ECB welcomes the Commission’s proposal for such a scheme and expects it to contribute to both risk sharing and risk reduction and to ensure a more homogenous transmission of monetary policy. Under the existing institutional structure, ECB has to implement its asset purchases in multiple markets. It implies that the measures have an impact on credit allocation across regions and types of borrowers. ECB designs its monetary policy instruments in a way that minimizes distortions. The allocative effects can also be reduced by further integrating the markets, in which the ECB intervenes. To that end, a robust fiscal framework, which is enforced credibly would reduce the risk inherent in individual government bonds in the euro area.

In chapter 4, “A success story? Reflecting on one year of European banking supervision”, *Andreas Dombret*, Member of the Executive Board of the Deutsche Bundesbank starts by quoting Henry Ford, who once said: “Coming together is a beginning, keeping together is progress, working together is success”. European supervisors came together in November 2014, when the SSM became operational. The ECB assumed responsibility for supervising the most significant banks (the SIFIs) in the euro area. By this step, the ECB became the first supranational supervisor in the world and one of the biggest. Since the establishment, the experience with keeping together has been quite positive. Banks in the euro area are now supervised according to a set of harmonized standards. At the same time, the SSM has to meet the challenge of implementing supervisory practices that are proportionate to the specific characteristics of individual institutions. Institutions that are not SIFIs, continue to be directly supervised by the national competent authorities. The ECB and the national supervisors are currently in the process of developing joint standards for the supervision of these smaller banks. However, supervising the non-SIFIs is, and should be, a matter for national supervisors. That conforms to the principle of subsidiarity and represents the most effective and efficient solution. Since the ECB is responsible for European banking super-

vision, it follows that the Governing Council is accountable not just for monetary policy issues but also for matters of banking supervision. In order to minimize potential conflicts between monetary policy objectives and supervisory objectives, a governance structure has been put in place to limit the Governing Council's involvement in supervisory decisions. The European Banking Union (EBU) is scheduled to rely on three pillars: The Single Supervisory Mechanism (SSM), the Single Resolution Mechanism (SSR), and a common European deposit guarantee scheme. The SSR has been operational since January 1, 2016. In the view of the author, it would be premature at the present time to establish pillar no. 3, a single European deposit guarantee scheme. It would necessitate wide-ranging changes to both national and European legislation, which do not have sufficient political support. There is no justification for pan-European risk sharing without fundamental adjustments of the current framework. Significant progress has been made in the regulatory space in recent years. Basel III with stricter capital requirements and new liquidity rules is the most important measure. The author's regulatory priority is to finalize the Basel III reform package in 2016, i.e. the review of the trading book and banks' internal models for credit risk as well as calibration and design of the leverage ratio. He underlines that all these regulatory projects should not target on imposing further burdens on the banks. In his concluding remarks, Mr. Dombret comes back to the Henry Ford quotation: Working together – as regulators and supervisors, at the national, the European and the global level – would be a huge step towards successfully safeguarding financial stability.

In chapter 5, “Macroprudential policies to contain systemic risks”, *Ignazio Angeloni*, Supervisory Board Member, ECB, reflects on the present state of macroprudential policies. In the US, a Financial Stability Oversight Council and an Office of Financial Research have been established in order to coordinate analyses and policies to identify and respond to systemic risks. In the EU, the European Systemic Risk Board (ESRB) has been given the mandate to analyse systemic risks in the entire EU financial system, covering both the bank and non-bank sector. The ESRB has developed a rather extensive structure with a large number of technical and research sub-groups. The ESRB issues policy recommendations, the board is not a direct decision-maker. Under the SSM, the ECB and the national authorities share powers over the macroprudential toolkit provided for in the CRD IV and the CRR. The SSM Supervisory Board can launch the adoption of macroprudential measures within the limits of the ECB powers. Coordination of micro and macroprudential perspectives takes place in a Financial Stability Committee, a Macroprudential Coordination Group and a Macroprudential Forum. The complex institutional structure can make the overall process cumbersome and lengthy. In his concluding remarks, the author calls on regulators and supervisors to develop a broader concept of banking and financial stabil-

ity encompassing transmission links. All relevant macroeconomic interconnections must be accounted for.

In chapter 6, “Monetary and macroprudential policies in the euro area”, *Sergio Nicoletti-Altimari*, ECB, reviews a few basic principles concerning the relationship between monetary and macroprudential policies. The two policies partly act through the same channels. Macroprudential instruments can, however, be used in a more selective manner. The impact of monetary policy is more general. Price stability and financial stability tend to reinforce each other. In some cases, macroprudential policy can reduce trade-offs faced by monetary policy. Limits on bank leverage may for instance moderate the risk-taking channel of monetary policy. The effectiveness of macroprudential action is, however, still surrounded by high uncertainty. In the current euro area context, policies have to cope with differences across countries and sectors. Accordingly, there does not seem to be a clear trade-off between price and financial stability for the euro area as a whole. Local tensions are often better tackled with macroprudential instruments considering that developments are country (or even region) specific. There are certainly limits to the current toolkit available for macroprudential action, which may favor leakages or circumvention of macroprudential measures. This should lead to an effort to complete the toolkit and the macroprudential framework rather than to ask monetary policy to change its course in order to address risks emerging in certain parts of the financial sector.

In chapter 7, “Has the stability of the big Eurozone banks improved after the comprehensive assessment?”, *Felix Hufeld*, President of the German Federal Financial Supervisory Authority, Bafin, describes the comprehensive assessment (CA) as a resource and time-consuming project. The general objective was to restore confidence in the European banking market. The CA was designed to strengthen banks’ balance sheets, to enhance transparency and to ensure that banks will be soundly capitalized. The CA had a disciplinary effect due to the fact that it stimulated banks to anticipate higher capital demands in advance. SIFIs in the Eurozone are safer now than before but challenges remain. With the CA, an important step for a more robust Eurozone has been launched.

In chapter 8, “Non-bank financing and regulatory and fiscal challenges”, *Ludger Schuknecht* and *Hendrik Ritter*, German Ministry of Finance, present statistics, which shows that non-bank financing has increased in Europe since 2008, while bank financing of European companies has declined. They explain the change in the financing structure by referring to higher capital requirements for banks and the spread of digital technology, which facilitates non-bank financing and boosts lending by ‘Fin-Techs’. Non-bank financing poses risks from a regulatory perspective. The changing financing patterns make a ‘capital market union’ more desirable than a banking union. The key challenge for ensuring financial stability

is, however, not the growth of non-bank financing. The key challenge is to restore and maintain sound public finances. When governments fail to provide safe assets (bonds), volatility rises and private sector financing is disrupted. Investors lack a credible yard stick for valuing assets. Fears of the lack of a credible ‘backstop’ undermines financing conditions. The authors present a table with the development of ratings of long-term government bonds from 1993 to 2016. It shows that several of the bonds issued by Western governments have been downgraded from AAA to AA or even further. Korean and Chinese government bonds have been upgraded. In Europe, the main lesson to be drawn is neither to shift risk across countries nor to create common liability schemes. The main lesson is to reduce risks and to regain AAA ratings for government debt via sound fiscal policies in Western economies.

In chapter 9, “Views on insurance, regulation and the macro environment”, *Christian Thimann*, Head of Strategy, AXA, explains why insurance companies are different from banks. Insurers are not institutionally interconnected. They do not engage in maturity transformation. They are not exposed to liquidity risk, and their liabilities do not constitute money. Large insurance companies are highly diversified in their activity, risk and business mix. In their asset-liability management, they aim to match duration and liquidity profiles. Since year 2000, the proportion of government bonds on the asset side of insurance companies in the OECD area has risen sharply. The proportion of equities has declined. Portfolio decisions have in recent years been adapted to regulatory changes, in particular the implementation of Solvency II and new IFRS standards. The low interest rate environment in the Eurozone presents a challenge to the insurance industry, in particular in life insurance and other long-term savings products. Insurers try to reorient the flow of new business towards products with more risk-sharing with the policy holders.

The authors of chapter 10, “A ‘Sovereign Subsidy’ – zero risk weights and sovereign risk spillovers”, *Josef A. Korte*, Goethe University Frankfurt and *Sascha Steffen*, University of Mannheim, were awarded the 2016 Marjolin Prize. European banks hold large amounts of sovereign debt on their balance sheets. According to the EU Capital Requirements Directive banks are allowed to apply ‘zero risk weights’ for EU sovereign debt. By using data on sovereign CDS spreads, the authors demonstrate larger co-movement with other European CDS spreads if banks have large exposures for which they do not hold capital. In this way, they identify a transmission channel for sovereign risk within the euro area. They show that more capital as well as less aggressive risk-weighting can mitigate this transmission channel.

In chapter 11, “Is the comprehensive assessment really comprehensive?”, *Emilio Barucci* and *Roberto Baviera*, Politecnico di Milano and *Carlo Milani*, Centro



Europa Ricerche, Roma analyze an ECB database in order to evaluate the comprehensive assessment (CA) i.e. asset quality review (AQR) and stress test (ST) of banks carried out in 2014. They find that risk-adjusted capital ratios are negatively related to AQR shortfalls, but not to the stress test shortfalls. The CA is predominantly concentrated on traditional credit activity rather than on banks' financial assets. The CA seems, however, to be characterized by double standards. Non-core countries were penalized by the AQR. Use of national discretion in capital requirements and state aid did not help mostly peripheral countries to pass the assessment. The authors regard the CA as an important step towards a level playing field in the banking sector. It is, however, too concentrated on credit activity rather than financial assets. It is appropriate that the Basel III rules focus on leverage ratios.

In chapter 12, "The SSM and multinational banks", *Giacomo Calzolari*, University of Bologna, *Jean-Edouard Colliard*, HEC Paris and *Gyöngyi Lóránth*, CEPR look at the implications of establishing supranational supervision in the EU. They argue that the change in the EU supervisory framework and transfer of supervisory powers to the ECB will have an impact on multinational banks' strategic choices of representation form of their foreign units. MNBs are likely to change their organizational form from subsidiaries to branches or to domestic banking. This will also imply shifts of the burden of potential losses from host deposit insurance funds to home country funds. This endogenous reaction of the supervised banks needs to be taken into account when designing the supervisory framework.

The headline of chapter 13, "Believe me, it will be enough: Governmental guarantees and banks' risk taking in the fair value portfolio", by *Ulf Mohrmann*, University of Konstanz, *Maximilian Muhn*, Humboldt University of Berlin, *Martin Nienhaus*, University of Konstanz and *Jan Riepe*, University of Tübingen is inspired by ECB President Mario Draghi's announcement on 26<sup>th</sup> July 2012: "whatever it takes" to preserve the euro. This announcement was interpreted by the market as a signal about the ECB's willingness to put a floor under EU sovereign debt prices. The authors do, however, not focus on the consequences for the bond markets of the ECB announcement. Instead they argue that governmental guarantees in general span a safety net for banks and, as a consequence, risk taking becomes more attractive. They investigate whether the so-called 'Level 3 assets' are used as a way to exploit governmental guarantees. Model-based valuations contain a high degree of managerial discretion, which might be used to engage in regulatory arbitrage.

In chapter 14, "Prudential regulation, national differences and stability of EU banks", *Angela Maddaloni*, European Central Bank and *Alessandro Scopelliti*, University of Reggio Calabria, construct an indicator that captures the degree of

flexibility and discretion in prudential regulation for distinct countries. A higher value of the indicator means a more permissive treatment for all credit institutions or for some of them. Under EU law, national authorities have a number of options and discretions regarding definition of own funds, counterparty risk, the IRB approach, operational risk, the trading book etc. and for each of these categories the authors calculate a weighted overall indicator of prudential regulation and two sub-indicators of regulatory flexibility and supervisory discretion. They examine whether heterogeneity in banking regulation and supervision may explain differences in resilience of credit institutions located in distinct countries during the crisis period. The empirical study reveals that banks established in countries with a less stringent prudential framework display higher probability of being in distress during the crisis. The results are confirmed when support measures like recapitalisations, credit guarantees and liquidity facilities are considered. In their conclusion, the authors refer to the Single Rule-book, which is designed to eliminate or minimize differences in prudential regulation across EU countries. They explain also the need for a trade-off between rules and discretion in the design of prudential policies.

In chapter 15, “Banks v. SSM: The party has just started”, *Anna Damaskou*, University of Luxembourg, looks at possible challenges of the legal bases for annulment of SSM’s decisions. There are several legal questions with regard to SSM’s structure and procedure. One question is if the SSM has been constructed with the powers to issue decisions involving discretion of a political nature. Another is if the mode of construction of the SSM’s Administrative Board of Review ensures its independence and legality, given that its members are hired and paid by the ECB for a five-year term, renewable once for an equal period. The EU itself recognizes the imperfection of its current institutional and procedural framework and the need for reform. There is still plenty of room for further strengthening SSM’s institutional framework and for mending procedural flaws.

In chapter 16, “Can financial cycle dynamics predict bank distress?”, *Giannoula Karamichailidou* and *David G. Mayes*, both University of Auckland and *Hanno Stremmel*, University of Oslo address the research question in the call for papers: How to construct an early-warning system for systemic risk? They explore whether problems in individual banks can be detected early enough and resolved before they reach crisis proportions. The authors consider the importance of financial cycle fluctuations and other potential systemic risk influences both to the real economy and also to the banking sector. They attempt to improve existing early warning systems by incorporating a financial cycle measure. Z-scores are accounting-based measures, obtained from balance sheet and income statements of listed and unlisted institutions under investigation. They apply three categories of variables: Bank-specific variables, banking sector and macroeconomic variables and macrofinancial variables. Their sample comprises annual data on 2,239

banks in the EU-15 countries over the period 1999-2014. Their model displays a modest ability to explain banks' individual z-score in Europe. Bank-specific and banking system variables have the expected signs and plausible magnitudes. The model offers a clear impact of the financial cycle phase but the role of macro-economic variables appears to be rather limited. The authors are, however, not very optimistic about the early warning ability for individual banks in general.



## 2. MONETARY POLICY IN THE CLUTCHES OF FINANCIAL STABILITY?

*Luc Laeven*<sup>1</sup>

Ladies and gentlemen

It is a great pleasure to be speaking at the SUERF Colloquium and Deutsche Bundesbank conference “The SSM at 1”, and I am grateful to the organisers, and especially Jens Ulbrich, Erich Loeper, and Urs Birchler, for giving me the opportunity to do so.

Anniversaries offer an opportune moment to pause and look back or forward in time.

Looking back, the anniversary of the Single Supervisory Mechanism (SSM) – and banking union more broadly – is indeed an event worth celebrating. The banking union is an important milestone in the institution building of the European monetary union, and few of us would have foreseen its establishment in the years prior to the global financial crisis. A historical step indeed whose importance some have compared to the introduction of the euro. And, while most attention has gone to the establishment of the SSM, perhaps because of the large number of supervisors involved, one should not forget about the equally important establishment of the second pillar of the banking union, the Single Resolution Mechanism (SRM), which became fully operational at the beginning of this year.

Looking forward, while there is much cause for celebration, additional work is needed to solidify the banking union. A first anniversary is also known as a paper anniversary – a symbol of fragility and modest beginnings – and thus work in progress. Completing the banking union requires additional work in terms of implementation and institution building, including the establishment of common deposit insurance. Questions also remain about the degree of centralization of lender of last resort policies. Moreover the new setup has not been tested by a major financial crisis when conflicts may emerge between the various authorities responsible for monetary policy and financial stability.

Against this background, I will touch on three related issues associated with financial regulation and the conduct of monetary policy. First, whether central banks should incorporate financial stability considerations in the conduct of monetary policy. Second, whether macro-prudential regulations are effective in

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<sup>1</sup> Director-General of the Directorate General Research of the European Central Bank. The views expressed here are my own and not those of the ECB. Some of my views here draw on joint work with co-authors. Without implicating, I thank Frank Smets and Oreste Tristani for comments.

preventing the occurrence of financial instability. And third, whether bank capital should be raised to support financial stability.

## 2.1. SHOULD CENTRAL BANKS INCORPORATE FINANCIAL STABILITY CONSIDERATIONS IN THE CONDUCT OF MONETARY POLICY?

The global financial crisis has reignited the debate on the link between short-term interest rates and bank risk taking, also known as monetary policy's 'risk-taking' channel: the notion that interest rate policy affects the quality and not just the quantity of bank credit. Specifically, many hold the view that interest rates were held too low for too long in the run up to the crisis<sup>2</sup>, and that this helped fuel an asset price boom, spurring financial intermediaries to increase leverage and take on excessive risks<sup>3</sup>.

More recently, a related debate has ensued on whether continued exceptionally low interest rates and unconventional monetary policy are setting the stage for the next financial crisis<sup>4</sup>. More generally, there is a lively debate about the extent to which monetary policy frameworks should include financial stability considerations<sup>5</sup>.

The pre-crisis view was that central banks should focus on price stability, whereas financial stability objectives should be left to prudential authorities. Financial stability concerns should only be taken into account by the central bank to the extent they affect the medium term outlook for price stability. The main lesson from the crisis is that a more macro prudential perspective is needed to safeguard financial stability, with a regulatory framework that unlike micro prudential regulation takes the perspective of the system as a whole.

Under this view, the objectives and instruments of monetary and macro-prudential policy can easily be separated. It relies heavily on the premise that the interaction between monetary policy and macro prudential regulation is limited, that the monetary policy stance did not contribute to the build-up of imbalances during the boom period, that monetary policy is a very blunt tool to deal with those imbalances and its use would create too large distortions as opposed to more targeted prudential instruments, and that monetary policy works primarily

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<sup>2</sup> Taylor (2009).

<sup>3</sup> Borio and Zhu (2008) and Adrian and Shin (2009).

<sup>4</sup> For instance, Rajan, 2010; Krishnamurthy and Vissing-Jorgenson, 2011; Farhi and Tirole, 2012; Acharya *et al.*, 2013 and Chodorow-Reich, 2014.

<sup>5</sup> Woodford (2012) and Stein (2014).

through altering the volume of credit rather than the composition of credit and thus has no first-order effect on risk-taking incentives.

An alternative view that emerged following the crisis is that central banks should incorporate financial stability considerations in the conduct of monetary policy. This view starts from the premise that the costs of financial crises are very large, so that more emphasis is needed on their prevention; that the consequences of financial crises are problematic also for monetary policy and price stability, not just financial stability; that monetary policy interacts with important drivers of financial imbalances, including not only the quantity but also the quality of credit, the so-called risk-taking channel of monetary policy; that macro-prudential policy can in principle be used to manage such imbalances and risks but that its use needs to be closely coordinated with monetary policy to avoid coordination problems.

Financial crises are indeed a very costly affair, not just in terms of output losses and unemployment, but also in terms of sizable fiscal costs associated with government interventions needed to rescue and reignite the financial system<sup>6</sup>. These costs are transferred to future generations in the form of higher public debt, which represent a deadweight burden on the economy, dimming both its investment and growth prospects. The widespread belief prior to the crisis was that the frequency of such crises was low, at least for advanced economies, in part because central banks by promoting price stability also fostered more stable growth and financial stability, and that the clean-up following such crises was manageable and not very costly. However financial globalization may well have made the world riskier, making financial crises all but once in a lifetime events, and the growing interconnectedness, size, and complexity of financial systems made their clean-up much costlier than was foreseen.

This has led to an alternative view that one should err on the side of caution during booms, by leaning against the wind using all tools available, including monetary policy, to avoid the high cost of financial crises<sup>7</sup>.

But the extent to which one should use monetary policy to lean against the wind depends to a large degree on one's view of the relevance of the risk-taking channel of monetary policy. Leaning against the wind requires not just that the risk-taking channel is empirically relevant, but also that it is inefficient.

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<sup>6</sup> Laeven and Valencia (2012, 2013).

<sup>7</sup> At least semantically, most central banks at least indirectly have always considered financial stability implications for the real economy, including as their role as lenders of last resort (Goodhart, 1988). Indeed, the ECB's two-pillar monetary policy approach involving monetary analysis can be seen as implicitly incorporating an element of leaning against the wind. However, with the emergence of inflation targeting, there was a shift in focus toward price stability as the main objective.

Prior to the crisis, the effect of changes in interest rates on financial stability were broadly seen as operating through two different channels: the balance sheet channel and the leverage channel. The balance sheet channel predicts a positive effect of monetary accommodation on financial stability. A reduction in interest rates, by reducing interest rate burdens and an increase in the value of legacy assets, leads to a general improvement in the financial conditions of households and firms, boosting aggregate demand, profits, and employment. The leverage channel, on the other hand, by considering the endogenous response of leverage to changes in interest rates, predicts a negative effect of monetary accommodation on financial stability. A reduction in interest rates leads to an increase in leverage as borrowing costs decrease, reducing resilience to future shocks.

The risk taking channel of monetary policy is different from these more traditional channels because it also considers the impact of interest rate changes on the quality of credit.

Different theoretical approaches deliver different predictions on the relationship between the monetary policy rate and bank risk taking<sup>8,9</sup>.

Most portfolio allocation models will predict that an exogenous decrease in the yield on safe assets will lead to greater risk taking to achieve the same return in expectation. Similarly, under limited liability and asymmetric information, there could be a ‘search for yield’ effect for financial intermediaries with long-term liabilities and shorter-term assets (i.e., negative maturity mismatches), such as life insurance companies and pension funds<sup>10</sup>. These financial intermediaries may be induced to switch to riskier assets with higher expected yields when a monetary easing lowers the yield on their short-term assets relative to that on their long-term liabilities, and this effect would be more pronounced for lowly capitalized financial institutions.

Focusing instead on the liability side of the balance sheet, a growing number of models that incorporate asymmetric information and funding liquidity risk predict that banks may engage in riskier activities when real interest rates are low by increasing short-term market funding<sup>11</sup>.

In contrast, in models with limited liability and risk shifting, a decrease in interest rates may reduce risk taking by reducing the bank’s funding cost. A lower funding cost may increase bank profits when the pass-through to lending rates is partial

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<sup>8</sup> See Altunbas *et al.* (2010); Chodorow-Reich (2014) and Dell’Ariccia and Marquez (2013).

<sup>9</sup> Most models of the risk-taking channel are cast in terms of real, not nominal, interest rates. The empirical predictions from these models are valid as long as monetary policy, by setting the policy rate, has a direct influence on short-term real interest rates, which is the case as long as rigidities prevent prices from adjusting immediately. Indeed, the correlation between nominal and real interest rates in the US is high (0.9 over the past 20 years).

<sup>10</sup> Rajan (2005) and Dell’Ariccia and Marquez (2013).

<sup>11</sup> For instance, Adrian and Shin (2010) and Dell’Ariccia, Laeven and Marquez (2014).



and thereby increase in the franchise value of the bank. Under asymmetric information, this will lessen risk shifting and reduce bank risk taking. Further, the strength of this risk shifting effect depends on the leverage/capital of banks. It is the strongest for the least capitalized banks. These banks are more exposed to agency problems, which become more severe when interest rates are higher and their intermediation margins are compressed<sup>12</sup>. So, in traditional risk-shifting models, the least capitalized banks will be the most sensitive to interest rate changes.

The net effect of interest rates on bank risk taking, and its interaction with bank leverage, is therefore an empirical question. A more negative effect for highly capitalized banks would be consistent with the classical risk shifting effect while a more negative effect for lowly capitalized banks would be consistent with a 'search for yield'.

Recent empirical research broadly supports the existence of a negative link between interest rates and bank risk taking: lower interest rates promote risk taking, by affecting the quality of credit. However, not surprisingly given the opposite forces at work, results on the derivative of this effect with respect to bank leverage are mixed. Using detailed credit register data on corporate loans in Spain, Jimenez *et al.* (2014) find that the negative effect of interest rates on the riskiness of loans is more pronounced when bank capital is low, consistent with a search for yield channel. In contrast, in recent work with Giovanni Dell'Ariccia and Gustavo Suarez<sup>13</sup>, using detailed data on the internal risk ratings of individual bank loans in the US, we find that the effect of interest rates on bank risk taking is less pronounced for poorly capitalized banks, consistent with a traditional risk-shifting channel. By restricting our attention to the extension of new loans, we can focus on ex-ante risk taking, contrary to studies that analyse ex-post loan performance which could be affected by subsequent events.

While the effects differ, both studies provide support for the presence of a risk-taking channel of monetary policy. Does this imply that central banks should incorporate financial stability considerations in the conduct of monetary policy?

While results are statistically significant and robust, their economic magnitude is relatively small. At one level this is not surprising given that the underlying channels at work – portfolio rebalancing and risk shifting – point in opposite directions, such that the net effect on risk taking is small. At the same time, the effect is not trivial, given that even in the most closely scrutinized part of the banking business (i.e., making loans) banks appear to engage in this form of risk taking at a detectable scale.

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<sup>12</sup> Stiglitz and Weiss (1981) and Hellman *et al.* (2000).

<sup>13</sup> Dell'Ariccia, Laeven and Suarez (2015).

Further, these empirical results are not well suited to answer whether or not the additional risk taking of banks facing more accommodative monetary policy is excessive from a social welfare standpoint<sup>14</sup>.

It is also important to note that these results focus on a very specific margin of risk taking: the riskiness of new loans. While we find similar effects for banks' holdings of risky securities, the effect on the overall asset portfolio of banks could be different. And there are several other channels through which interest rate policy can affect bank stability: leverage, liquidity, maturity mismatches, etc.<sup>15</sup>. Moreover risky activity may flow from banks to other parts of the financial system<sup>16</sup>. As it has been the case for the lending channel literature, it might be easier to establish the existence of a risk taking channel than to quantify reliably its importance<sup>17</sup>.

More generally, the discussion on the risk taking channel of monetary policy is rather limited in its analysis. All papers focus on interest rate policy as the main margin of monetary policy. But monetary policy has many more instruments than interest rate policy alone. Liquidity provision was instrumental in preventing a financial collapse during the recent crisis<sup>18</sup>. A comprehensive assessment would need to consider all available monetary policy tools, including non-standard measures.

## 2.2. IS MACRO-PRUDENTIAL POLICY EFFECTIVE IN PREVENTING THE OCCURRENCE OF FINANCIAL INSTABILITY?

Both views of how central banks should deal with financial stability hold that prudential regulation needs to take a more macro prudential perspective, concerned with the stability of the financial system rather than that of individual financial institutions. Macro prudential policy in principle offers a more targeted approach than monetary policy to prevent unsustainable credit booms and increase resilience to busts.

However the views differ in the extent to which central banks should be involved in the setting of macro prudential regulation. Under the traditional view, monetary authorities should remain focused on price stability, and macro prudential regulation should be the purview of a macro-prudential authority with a mandate

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<sup>14</sup> For an exception, see Stein (2012).

<sup>15</sup> Adrian and Shin (2009).

<sup>16</sup> See, for instance, Chodorow-Reich (2014), and the discussion in Vissing-Jorgensen (2014).

<sup>17</sup> See, for instance, Kashyap and Stein (2000).

<sup>18</sup> An example is the ECB's full allotment policy, which offered unlimited liquidity support to banks.

to safeguard financial stability. Under the risk taking view of monetary policy, macro prudential policy and monetary policy should be used in combination to manage financial imbalances.

Under either view, a critical element is the effectiveness of macro prudential regulation.

Much of the research on the effectiveness of macro prudential instruments focusing on their preventive role during credit booms. This is not surprising given that credit growth is a powerful predictor of financial crises<sup>19</sup>. The recent global financial crisis has reinforced this notion. After all, one of the roots of the crisis was the rapid increase of mortgage loans in the United States. And the US regions that had experienced greater booms during the expansion were exactly the same as those that suffered greater increases in credit delinquency during the crisis<sup>20</sup>. In addition, across countries, many of the hardest-hit economies, such as Iceland, Ireland, Latvia, Spain, and Ukraine, had their own home-grown credit booms<sup>21</sup>.

Credit booms had also preceded many of the largest banking crises of the past 30 years: Chile (1982), Denmark, Finland, Norway, and Sweden (1990/91), Mexico (1994), and Korea, Malaysia, Philippines, and Thailand (1997/98).

Overall, there is still limited experience with macro prudential policies in advanced economies as policy frameworks have mostly only recently been established. While most macro-prudential instruments are from the micro-prudential toolkit, their use and application is different, and some macro prudential instruments are altogether different, especially those that operate on the borrower side. There also exist many tools to choose from, with potentially complex interactions, and identifying each their individual impact when they are used in combination is challenging.

Most of the evidence on its effectiveness comes from experiences in emerging market economies, which often use macro prudential policies to stem surges in capital inflows that can foster dangerous credit booms. This raises the question of how relevant this evidence is for advanced economies.

Moreover country experiences are difficult to compare because of differences in the intensity of the use of macro-prudential instruments. Weak results could indicate that the effectiveness of these instruments is limited, for instance due to circumvention of rules, or that the dosage has been too small. For instance, a study by Jimenez *et al.* (2014) on the effectiveness of dynamic provisioning rules in Spain found that they helped tame the credit cycle, building buffers to help

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<sup>19</sup> Borio and Lowe (2002) and Schularick and Taylor (2012).

<sup>20</sup> Dell'Ariccia, Igan and Laeven (2012).

<sup>21</sup> Claessens *et al.* (2010).

absorb the fallout during the credit bust, but that the overall effect was too small in scale.

The most comprehensive study to date is based on a recent IMF survey on the use of macro-prudential policies in 119 countries over the past 15 years<sup>22</sup>. This paper shows that emerging economies use macro-prudential policies most frequently, especially those aimed at foreign currency risk and capital inflows, while advanced countries focus mostly on borrower-based policies such as LTV and DTI ratios rather than those that target banks directly, such as countercyclical capital requirements or provisioning rules. Usage of instruments is generally associated with lower growth in credit, notably in household credit. Effects are weaker in financially more developed and open economies, and usage comes with greater cross-border borrowing, suggesting some avoidance. And while macro-prudential policies can help manage credit cycles, they work less well in busts.

Overall, the empirical literature supports the use of macro-prudential instruments in reducing the procyclicality of credit but the extent to which they alone can effectively manage credit cycles and reduce systemic risk depends on circumstances.

Circumvention of rules is a prime concern. In emerging economies experiencing rapid surges in capital inflows, banks will be hard pressed to find ways to circumvent rules. And in advanced economies with large shadow banking systems and developed capital markets, macro-prudential regulation that is limited to the regulated part of the financial system risks having a limited impact as activity may shift outside regulatory boundaries. One advantage of monetary policy is that it is more likely to reach the entire financial system and “get in all its cracks”. However this concern can be mitigated by expanding the regulatory perimeter.

Another concern is the politics of booms. Macro prudential policy, by targeting specific asset classes or borrowers, may face stiff political pressures from interest groups that would stand to lose from such targeted interventions. More generally, “nobody wants to stop a credit boom”. A blunt tool like monetary policy may be more palatable as its effects are less targeted. But therein lies also the risk of using monetary policy for financial stability means. It could well be used in excess to support insolvent borrowers under the guise of financial stability considerations. This reinforces the point that price stability should be monetary policy’s primary objective.

Macro-prudential policy may also have unintended consequences. First, by insuring against aggregate fluctuations, macro-prudential policy may increase risk taking in the cross-sectional dimension. Coordination with micro-prudential

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<sup>22</sup> Cerutti, Claessens and Laeven (2015).

policy is therefore important. And when set in uncoordinated fashion with monetary policy, there is a risk of ‘push me-pull you’ outcomes when the policies move in opposite directions over the cycle, and a risk of overtightening of financial conditions when both policies reinforce each other.

One additional complication is that no generally agreed concept of financial stability exists to date, much more so than is the case for price stability. Indeed some have argued that financial instability is inherently more difficult to measure than price stability, raising questions about whether macro-prudential policy should be conducted by central banks under a dual mandate<sup>23</sup>. A key priority should therefore be to develop generally accepted measures of financial instability. I believe that credit growth offers a good starting point.

Credit booms are a good predictor of crises: 1-in-3 credit booms<sup>24</sup> end up in a crisis for a sample of 170 countries over the period 1970-2010<sup>25</sup>. Credit booms that last longer and grow faster are more dangerous. And more precision can be gained by looking at disaggregated information.

For instance, in the US in the boom period leading up to the subprime crisis, low growth rates in overall credit masked rapid growth rates in mortgage loans<sup>26</sup>. Most crises follow a period of financial imbalances: sectoral imbalances, maturity mismatches, currency mismatches, and high leverage. And real estate booms are particularly vulnerable. This suggests that simple measures of excess credit growth can be used to track financial instability over time.

But not all credit booms are bad, and intervention therefore comes at a cost of reduced financial development that may have benefitted growth. This implies that the cost of intervening too early and running the risk of stopping a good boom have to be carefully weighed against the desire to prevent financial crises.

### 2.3. SHOULD BANK CAPITAL BE RAISED TO SUPPORT FINANCIAL STABILITY?

This brings me to my third and final question: Should bank capital be raised?

Bank capital serves at least two important roles. It builds buffers to absorb shocks and, under limited liability, lowers incentives for risk taking. Higher capital requirements are desirable for two reasons. First, higher capital requirements will increase the likelihood that buffers will be sufficient to absorb shocks, increasing

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<sup>23</sup> Blanchard, Dell’Ariccia and Di Mauro (2013).

<sup>24</sup> Defined either on the basis of real credit growth or deviations from trend.

<sup>25</sup> Dell’Ariccia, Igan, Laeven and Tong (2015).

<sup>26</sup> Dell’Ariccia, Igan and Laeven (2012).

the resilience of the financial system. While macroeconomic stabilization policies can in principle also reduce financial imbalances and help absorb shocks, their emphasis is more geared toward managing the cycle rather than building a resilient financial system. Moreover the politics of booms is such that the expectation is that too little will be done when relying exclusively on cyclical policies. Second, higher capital buffers will reduce the need for monetary policy to act in support of financial stability, allowing it to focus more on its primary mandate of price stability.

A recent IMF paper shows that an increase in capital to between 15 and 23 percent of risk weighted assets would have been sufficient to absorb the shocks emanating from about 85% of past crises<sup>27</sup>. Raising capital to such levels and maintaining it at such levels, and rebuilding it following crises, would be akin to a countercyclical capital rule. And when differentiating based on systemic risk contribution would go a long way to implementing macro-prudential policy that otherwise faces technical and political challenges.

Higher capital also lowers incentives for risk taking by reducing the downside protection offered by limited liability. When increasing capital requirements, financial firms will not only reduce leverage but also endogenously respond by lowering the riskiness of their assets, thus improving their survival rate. One lesson from the crisis is that more consideration should be given to the role of incentives in the financial sector, including in the design of regulation.

The desirability of raising capital requirements of course ultimately depends on its effects on the real economy. The same paper suggests that raising capital requirements to levels of 15 to 23 percent would come with minimal costs for the real economy if raised gradually. Set against the capacity of capital to reduce the likelihood of financial crises and to build buffers to absorb such shocks when they occur, the general direction of higher capital requirements taken by the Basel Committee seems right.

But what if the effectiveness of higher capital requirements in improving incentives depends on the governance structure of the bank and the regulatory enforcement of such requirements? What if the governance of banks is intrinsically linked to bank risk? And what if bank governance interacts with regulation to shape bank stability?

Ongoing financial reforms and re-regulations in response to the global financial crisis virtually ignore bank governance, including the ownership of banks and the incentives and conflicts that arise between bank owners and managers. For

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<sup>27</sup> Dell'Ariccia, Laeven, Ratnovski and Tong (2015).

instance, in the area of capital regulation, the general approach is that more capital is better, irrespective of who provides this capital.

This emphasis on using regulations to induce sound banking, while ignoring the role of bank governance, is surprising because corporate governance theory suggests that ownership structure influences corporate risk taking<sup>28</sup>. For example, shareholders with larger voting and cash flow rights have correspondingly greater power and incentives to shape corporate behaviour than smaller owners<sup>29</sup>. This means that the same regulations could have different effects on bank risk taking depending on the comparative power of shareholders within the ownership structure of each bank.

For instance, there is evidence that shareholder controlled banks exhibit higher risk taking behaviour than banks controlled by managers with relatively small shareholdings, and who enjoy large private benefits from the survival of the bank, and that these differences in risk become more pronounced following financial deregulation which relaxes regulatory constraints on shareholders to take risks<sup>30</sup>.

Recent research also shows that bank risk is generally higher in banks with more concentrated ownership, consistent with theories predicting that owners with substantial cash flow rights induce banks to increase risk taking<sup>31</sup>.

The incentives of supervisors to enforce regulations also matter. Intervention will depend on the reputational costs facing supervisors and on the degree of regulatory capture<sup>32</sup>. For instance, pressures not to intervene in national champions can be very large. In practice, regulatory forbearance is much reduced by an effective and credible resolution framework for banks, and the establishment of the SRM in the euro area is therefore a major step forward.

## 2.4. CONCLUSIONS

Let me conclude.

The costs of financial crises are very large: the need to build a robust financial system is evident.

Macro-prudential policy should be the first line of defence against financial excesses. It is more targeted than monetary policy, and when effective would allow monetary policy to focus on its primary objective of price stability. And the

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<sup>28</sup> Jensen and Meckling (1976).

<sup>29</sup> Shleifer and Vishny (1986).

<sup>30</sup> Saunders, Strock and Travlos (1990).

<sup>31</sup> Laeven and Levine (2009) and Beltratti and Stulz (2012).

<sup>32</sup> Agarwal *et al.* (2014) and Carletti *et al.* (2015).

evidence suggests that interest rates would have to be raised substantially to curb risk taking, with potential undesirable consequences for the overall economy<sup>33</sup>.

There is growing evidence that macro-prudential tools can be effectively deployed to stem credit booms, although circumvention often proves a challenge.

At the same time, there is evidence that monetary policy affects risk taking. Until macro-prudential frameworks are operational and effective, monetary policy may therefore need to play a role in preserving financial stability.

This is not without risks. First, as financial crises may nevertheless occur there is a risk that the reputation of the central bank is damaged, which may affect its overall independence and credibility. Second, a dual mandate of price and financial stability may give rise to time-inconsistency problems, including the incentive for monetary policy to inflate away part of the debt arising from financial crises. Third, a conflict may arise when using monetary policy toward both objectives. For instance when interest rates are held low for a prolonged period of time in response to a crisis this may lead to a search for yield, which could seed the next crisis, even though in the aftermath of a crisis economies typically suffer from too little rather than too much risk taking.

To mitigate these risks, it is important that price stability remains the primary objective of monetary policy, dominating financial stability considerations. But the framework should be flexible enough to allow the central bank to temporarily lean against the wind at times of growing financial imbalances, while maintaining its primary focus on price stability in the medium term<sup>34</sup>.

Given the challenges facing the implementation of macro-prudential policy, there is a strong case for raising bank capitalization levels above pre-crisis levels. Higher capital requirements, by increasing capital buffers to absorb shocks and improving incentives for risk taking, will improve the resilience of the financial system, and provide strong support to countercyclical policies. Moreover to achieve financial stability it is critical that the macro-prudential framework is supported by strong and effective supervision, to ensure circumvention of rules is minimised. To this end, the shared responsibility for financial stability across multiple authorities poses significant coordination challenges.

The prevention of financial crises requires a multifaceted approach which uses a combination of macroeconomic and prudential policies and accounts for systemic risk and the endogenous response to policy. However many questions remain unanswered on the optimal mix and design of such policies, including the organizational setup to implement such policies. I look forward to the discussions at this conference which I am sure will improve our understanding of these issues.

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<sup>33</sup> Dell'Ariccia, Laeven and Suarez (2015).

<sup>34</sup> Smets (2014).



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### 3. HOW CENTRAL BANKS MEET THE CHALLENGE OF LOW INFLATION

*Mario Draghi*<sup>1</sup>

Robert Marjolin was a pivotal figure in the birth of Economic and Monetary Union. When the Treaty of Rome was signed in 1956, the aims of European Economic Community were largely limited to creating a customs union and a common agricultural market. Neither was perceived to require monetary integration. It was only with the launch of the so-called ‘Marjolin Memorandum’ in 1962 that the recognition surfaced that a single market and a single money were linked and that a serious discussion on European monetary integration began.

Today, more than 60 years on, monetary integration in the euro area is both complete and secure. But monetary *policy* faces many challenges. Those challenges have not changed our mandate. But they have altered the way in which we deliver it.

To understand how we have responded to those challenges, it is useful to distinguish between two types.

First, there are challenges that are *common to all* central banks in advanced economies, which are linked to a global low inflation environment.

Second, there are challenges that are *special to us* in the euro area, which are linked to our particular institutional context.

#### 3.1. WHAT IS COMMON FOR ALL

The most fundamental question facing all major central banks today is this: can our price stability mandates still be delivered? Across advanced economies inflation is low, and has been low for some time. And in several of those economies, long-term inflation expectations, based on market prices, remain below our numerical definitions of price stability. That has led some to question whether it makes sense for central banks to pursue expansionary policies to meet their inflation objectives. Are they fighting a futile battle against forces beyond their control?

There are essentially *three lines of argument* in favour of monetary policy not reacting to the low inflation we see today.

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<sup>1</sup> President of the ECB.

### 3.1.1. The causes of too low inflation

The *first line of argument* is that low inflation is increasingly being caused by structural factors in the global economy that cannot be addressed through domestic monetary stimulus. As a result, it is said, previous notions of what we considered low and stable inflation – inflation rates around 2% – are no longer realistic. Central banks should adjust their objectives downwards accordingly.

If this argument were accurate, it would constitute a very fundamental criticism of central banks' mandates. After all, the decision to grant central banks price stability objectives, and to give them independence to deliver those objectives, was based on the understanding that inflation is always, ultimately, a monetary phenomenon. It could thus always be controlled in the medium-term by a committed monetary authority.

So is it true that structural changes we see today are having a permanent impact on long-term inflation levels?

One such change that is often mentioned in this respect is demographic change. This certainly heralds important economic shifts, but its impact on inflation is *ex ante* unclear. It might put downward pressure on prices if aggregate demand falls more than aggregate supply. But it might equally create upward price pressures: according to the life-cycle hypothesis, an aging population implies that the elderly eventually dissave and consume more<sup>2</sup>. Which effect dominates will depend on a range of factors. In any event, it seems unlikely that demography can explain why inflation is low today across advanced economies that have very different demographic profiles.

Moreover, even if ageing were to lead to a period of disinflation, for example through savings and investment imbalances, there is no reason why that should imply a permanently lower inflation rate. An excess of savings would simply mean that the equilibrium real interest rate required to deliver price stability would be lower, and the central bank would have to factor that into its monetary policy. Put another way, the effects of ageing would call for us to adjust our instruments, but not our objectives.

Other structural shifts are also seen by some as having a long-term impact on inflation. One is the fact that the long-term cycle in commodity prices is now

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<sup>2</sup> Most empirical results that find ageing is disinflationary have focused on Japan, as its transition from aging society to aged society is one of the fastest (see, for example, J.-W. YOON, J. KIM and J. LEE, 2014, *Impact of Demographic Changes on Inflation and the Macroeconomy*, IMF Working Papers 14/210, International Monetary Fund). However, a recent BIS working paper by Juselius and Takats (2015) contradicts the prevailing view: looking at low-frequency correlations, they find that a larger share of young or old cohorts is associated with higher inflation, while a larger share of working-age cohorts is correlated with lower inflation. This highlights how difficult it is to quantify the impact of this structural factor on inflation. See M. JUSELIUS and E. TAKATS, 2015, *Can demography affect inflation and monetary policy?*, BIS Working Papers 485, Bank for International Settlements.

going into reverse. Another is technological change, especially e-commerce, which increases price transparency and intensifies competition between suppliers and retailers, which may keep prices low. A third is globalisation, which may increase the importance of global prices relative to domestic prices, making it harder for advanced economies to avoid importing disinflation from abroad<sup>3</sup>.

Each of these changes might have an influence on the inflation rate. We cannot deny that. But there is nothing about them which suggests these effects are permanent. For example, permanent changes in the supply of energy are likely to have a permanent effect on the price level. But at some point energy price disinflation must reverse, if only due to base effects. Similarly, the price-containing impact of e-commerce, if any, will last only until the diffusion of e-commerce has stabilised. And lower imported inflation thanks to globalisation should eventually lead to higher prices elsewhere, as disposable income increases and the levels of wages and other costs equalise across countries.

So there is no reason why any of these structural changes should make our current price stability objectives unobtainable. They may create global disinflationary forces, but those forces are transitory in nature. What can affect our objective, however, is if those forces have a persistent impact on inflation – which is to say, if they become embedded in inflation dynamics and inflation expectations. But that is not a structural issue; it is about the credibility of monetary policy in anchoring inflation expectations.

This brings me to the *second line of argument* against active monetary policy.

### 3.1.2. The response to too low inflation

There are some who argue that, so long as we are experiencing mainly positive global supply shocks, there is no need for central banks to be overly responsive. We can simply redefine the medium-term horizon over which price stability is maintained and ‘wait it out’ until inflation returns to our objective. Indeed, the reason central banks do not define the medium-term as a period of calendar time is that the horizon for action depends on the nature of the shock.

This viewpoint is correct, as far as it goes. Central banks do typically refrain from reacting to supply shocks that have opposing effects on output and inflation, so as not to overreact and reinforce the effect on growth, in either direction. And that might even be the case when faced with a succession of supply shocks, such as the steep falls in oil prices we have experienced recently. Each shock should in

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<sup>3</sup> Inflation as a global phenomenon has been documented e.g. by M. CICCARELLI and B. MOJON, 2010, “Global Inflation”, *The Review of Economics and Statistics*, 92:524-535.

principle have a short duration and should not have a persistent effect on inflation.

However, since there is always a backward-looking component in inflation developments, the longer inflation stays too low, the greater the risk that inflation does not return automatically to target. Specifically, if agents start to look at the track record of recent inflation, rather than the inflation objective, it affects their benchmarks for wage and price setting decisions. What happens then is that low inflation feeds into inflation expectations and creates second-round effects.

In that situation, even what began as a positive supply shock can turn into a negative demand shock. As inflation expectations fall, it pushes up real interest rates, producing an unwarranted monetary tightening. And the unexpected low inflation raises real debt burdens, which has a negative effect on aggregate demand due to the different propensities to consume and invest of borrowers and lenders. Output and inflation, then move again in the same direction – but this time downwards.

For that reason, in a context of prolonged low inflation, monetary policy cannot be relaxed about a succession of supply shocks. Adopting a wait-and-see attitude and extending the policy horizon brings with it risks: namely a lasting de-anchoring of expectations leading to persistently weaker inflation. And if that were to happen, we would need a much more accommodative monetary policy to reverse it. Seen from that perspective, the risks of acting too late outweigh the risks of acting too early.

In sum, even when faced with protracted global shocks, it is still monetary policy that determines medium-term price stability. If we do not ‘surrender’ to low inflation – and we certainly do not – in the steady state it will return to levels consistent with our objective. If on the other hand we capitulate to ‘inexorable disinflationary forces’, or invoke long periods of transition for inflation to come down, we will in fact only perpetuate disinflation.

This is the clear lesson of monetary history, especially the experience of the 1970s. At that time, many policymakers argued that persistently high inflation was structural and central bankers could do little to reduce it. For example, in May 1971, when Arthur Burns was Chairman, the official staff presentation to the FOMC declared – like some of our critics today – that “*the question is whether monetary policy could or should do anything to combat a persisting residual rate of inflation... the answer, I think, is negative... it seems to me that we should regard continuing cost increases as a structural problem not amenable to macroeconomic measures*”<sup>4</sup>.

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<sup>4</sup> Federal Open Market Committee meeting, Memorandum of Discussion, 11 May 1971.



Similarly, Fed Chairman William Miller observed in his first FOMC meeting in March 1978 that, “*inflation is going to be left to the Federal Reserve and that’s going to be bad news. An effective program to reduce the rate of inflation has to extend beyond monetary policy and needs to be complemented by programs designed to enhance competition and to correct structural problems*”<sup>5</sup>. It was only when Paul Volcker arrived as Chairman in 1979 and shortened the policy horizon that the Fed took ownership for controlling inflation. Inflation, which peaked at around 15% in March 1980, fell below 3% by 1983.

Some argue that today the situation is different; that whereas Volcker could raise rates to 20% to tame inflation, central banks fighting disinflation are inhibited by the lower bound on interest rates. The Japanese experience after the bursting of the housing bubble in early 1990s is often presented as evidence.

But the Japanese case in fact only reinforces the importance of full commitment from policymakers. As long as the commitment of the Bank of Japan to a low positive inflation number was not clear, actual inflation and inflation expectations stayed in deflationary zone. Since the Bank of Japan has signaled its commitment to reach 2% inflation, however, core inflation has risen from less than -0.5% in 2012 to close to 1% today. This is still short of the 2% objective, to be sure, but downward price shocks are also hitting Japan like all other advanced economies.

We now have plenty of evidence that, if we have the will to meet our objective, we have the instruments. As the ECB and others have demonstrated, the lower bound for policy rates, wherever it might be, is not at zero. And we have also shown how non-standard tools can be used to deliver monetary stimulus even without altering much the overnight rate, and produce equivalent effects. For example, the non-standard measures the ECB has taken since summer 2014 have produced a pass-through equivalent to a 100 basis point rate cut in ‘normal’ conditions.

So there is no reason for central banks to resign their mandates simply because we are all being affected by global disinflation. In fact, if all central banks submit to that logic then it becomes self-fulfilling. If, on the other hand, we all act to deliver our mandates, then global disinflationary forces can eventually be tamed.

### 3.1.3. The costs of fighting too low inflation

Still, there are some that argue that even if central banks can lean against global disinflationary forces, in doing so they do more harm than good. In particular,

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<sup>5</sup> Federal Open Market Committee meeting, Transcript, 21 March 1978.

expansionary monetary policies at home lead to the accumulation of excessive foreign currency debt or asset price bubbles abroad, especially in emerging markets. And when these financial imbalances eventually unwind, it weakens global growth and only adds to global disinflation. This is the *third line of argument*.

But I ask, what would be the alternative? Would it help emerging markets if advanced economy central banks failed on their mandates? Would that be more likely to contribute to global growth? Clearly, the answer is no. The stability of large economies is vital to their trading partners and to the global economy, and diverting monetary policy away from that aim when our economies are still fragile would not be in their interest. In the euro area that is especially true for our neighbouring economies, which export around 50% of their goods and services to the euro area.

In fact, when central banks have pursued the alternative course – i.e. an unduly tight monetary policy in a nascent recovery – the track record has not been encouraging. Famously, the Fed began raising reserve requirements in 1936-37, partially due to fear of a renewed stock bubble, but had to reverse course the next year as the economy fell back into recession. That has also been the experience of some central banks in recent years: raising rates to offset financial stability risks has undermined the primary mandate, and ultimately required rates to stay lower for longer.

This suggests that the so-called ‘assignment problem’ between monetary policy and financial stability at the domestic level should also apply at the global level. Monetary policy should not try to balance opposing objectives: it is optimal for all parties if it delivers its mandate. And if that creates financial stability concerns, they need to be addressed by other policies more suited to the task. And in fact there are several policy levers available.

Countries can improve their financial regulation and supervision to make their financial systems more resilient to external shocks. They can adjust their fiscal policies. They can adopt macro-prudential measures. The evidence suggests that such policies can be effective: emerging market countries differ significantly in their sensitivity to global financial developments on account of their policy frameworks<sup>6</sup>. We also have some anecdotal evidence that macro-prudential measures are working in Asian economies, especially in cooling off the real estate sector.

Finally, these general considerations aside, it is worth questioning whether such arguments about monetary policy spillovers actually hold for the euro area. For example, if we look at spillovers into asset prices, there is no evidence that the

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<sup>6</sup> See B. BERNANKE, 2015, *Federal Reserve Policy in an International Context*, paper presented at the 16th Jacques Polak Annual Research Conference Hosted by the International Monetary Fund, November 5-6, 2015.

announcement of the APP induced a surge in portfolio flows into emerging market economies. In fact, empirical evidence suggests that global investors rebalanced out of emerging market bond and equity markets into bond markets of advanced economies, in particular in the euro area, in response to the APP launch<sup>7</sup>.

And if we look at foreign currency debt, while low euro area interest rates have led to significant increases in euro-denominated debt security issuance outside the euro area in the past two years, issues in euro still only account for about one-quarter of international bond issuance, while issues in dollar account for two-thirds. What is more, recent foreign bond issuance in euro is dominated by investment grade US corporates, and among the emerging markets, highly-rated issuers. The evidence of unhealthy spillovers and financial stability risks therefore seems limited.

## 3.2. WHAT IS SPECIAL TO US

So even in the face of common global shocks, central banks have the ability to deliver their mandates. But in the euro area, that requires a different monetary policy response than for others. That is because we also face a second set of challenges that are largely specific to us. They result from our institutional structure: conducting monetary policy in a segmented banking and capital market, and without a single area-wide fiscal authority as a counterpart. There are two types of challenges in particular that emerge from this.

### 3.2.1. Transmitting the stance

The first relates to monetary policy transmission. Many central banks have faced impairments in the transmission process during the crisis – that is why, for example, the Fed began intervening in markets for mortgage-backed securities, or the Bank of England launched its funding-for-lending programme. But it is clear that those impairments have been more severe in the euro area. And moreover, they have had a distinct regional dimension that was not visible in other jurisdictions.

Our specific challenge arises from having an incomplete banking and capital market, which leads to lower sharing of risks. Relative to a fully integrated market, portfolios of private assets in the euro area are less geographically diversified, concentrating the effect of local economic slumps. Credit markets are less

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<sup>7</sup> See J. GRÄB and G. GEORGIADIS, 2015, *Global Financial Market Impact of the Announcement of the ECB's Extended Asset Purchase Programme*, Federal Reserve Bank of Dallas Globalization and Monetary Policy Institute Working Paper No. 232, March.

integrated, making it harder for agents to borrow from other parts of the union to smooth out such shocks. And institutions for cross-border public risk-sharing are less developed, placing the full burden of dealing with the after-effects on individual sovereigns.

This has two consequences for monetary transmission. First, it means that some of the main transmission channels – namely the bank lending channel and the balance sheet channel – are more likely to be disrupted in the event of major shocks. And second, since private risk and sovereign risk are linked at the national level, it means that financial fragmentation takes place along national lines. That hampers the traction of monetary policy in the regions where monetary stimulus is most needed.

None of this means we cannot fulfill our mandate. But it does mean we have to design our instruments to compensate for it. That is why, for large parts of the crisis, our measures were also geared towards addressing impairments in the smooth transmission of our policy.

Early on in the crisis, this meant substituting for the drying up of the interbank market, including at longer maturities, to ensure the flow of cross-border liquidity. Later, we took out unwarranted redenomination risks from sovereign debt markets, helping attenuate the bank-sovereign nexus. More recently, we have launched a credit easing package which aims, among other things, to ensure that bank deleveraging does not produce excessive dispersion in lending rates across countries. The evidence suggests that each of these measures has been successful<sup>8</sup>.

Still, it is clear that fragmentation risks can only be definitively removed by addressing their institutional drivers. That is why the creation of Banking Union, which is the topic of our conference today, was such a fundamental addition to monetary union.

The Single Supervisory Mechanism provides a framework for a more integrated banking market, which would be less likely to fragment under stress. The Single Resolution Mechanism facilitates greater risk-sharing across borders. And the commitment to develop a Capital Markets Union is the first step towards greater geographical diversification, especially in cross-border holdings of equity.

What is still missing, however, is agreement on the third leg of Banking Union – deposit insurance – which is an essential part of a genuinely single money. For this reason, the Commission's proposal to establish a European Deposit Insurance Scheme is welcome. On the one hand, it sets out the ambitious objective of establishing a truly European system of depositors' protection. That will support

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<sup>8</sup> For evidence on the effectiveness of the ECB's measures since summer 2014 see speech by Mario Draghi at the European Banking Congress: Monetary Policy: Past, Present and Future, Frankfurt am Main, 20 November 2015.

the creation of an internal market for deposits in which the fungibility of deposits is assured independently of jurisdictions, and trust in deposits is equalised.

On the other, it is realistic in its design and provides a number of safeguards against moral hazard, so that risk-sharing does not become risk-shedding. ‘Risk reduction’ and ‘risk-sharing’ measures are two sides of the same coin and should be pursued in parallel: they are both essential to protect the stability of the European banking sector and ensure a homogenous transmission of our monetary policy.

### 3.2.2. Expanding the stance

The second, specific challenge we have faced in the euro area has come when we needed to expand our monetary stance – specifically, when we shifted from interest rates as the main instrument of monetary policy to asset purchases via the APP.

In part, large-scale asset purchases aim at reducing the risk-free rate by taking out duration from the market for sovereign bonds. In the euro area, however, we do not have a single risk-free rate since we do not have a single fiscal issuer that acts as a benchmark. And there is no national market which could act as a substitute, not only due to volume constraints, but also because no government security in the euro area is truly risk-free. The prohibition on monetary financing means that every sovereign bond carries a degree of credit risk.

In this context, asset purchases of the size we deemed appropriate must inevitably be implemented in multiple markets. And that means monetary policy operations may unwittingly impact on credit allocation across regions and types of borrowers. That is not unusual – all monetary policy has allocative consequences. Nor does it create a limit on us fulfilling our mandate. But it does require that we aim to mitigate those consequences, under the constraint that we achieve our price stability objective. That can be done in two ways.

The first is by designing our monetary policy instruments in a way that minimises distortions. We did this under the APP by intervening mainly in the most ‘commoditised’ asset classes, i.e. the government bond markets in each country, and by spreading our interventions proportionally across jurisdictions. That effectively constructs a diversified pan-euro area portfolio.

Second, allocative effects can also be reduced by further integrating the markets in which we intervene, in particular government bonds. To that end, a robust fiscal framework which is enforced credibly would reduce the risk inherent in individual government bonds in the euro area, which would in turn make the impact of interventions in different markets more homogenous.

Still, there can be no doubt that if we needed to adopt a more expansionary policy, the risk of side effects would not stand in our way. We always aim to limit the distortions caused by our policy, but what comes first is the price stability objective. That is the implication of the principle of monetary dominance, which is embedded in the Treaty and which lends monetary policy its credibility.

Monetary dominance means that we can – indeed we should – acknowledge and draw attention to all the consequences, intended or unintended, of our monetary policy operations. But it also means that we should never fail to deliver on our mandate solely on account of those consequences. Doing so would be tantamount to redrafting our mandate under the law, something we are not at liberty to do.

### 3.3. CONCLUSION

Let me summarise.

There are forces in the global economy today that are conspiring to hold inflation down. Those forces might cause inflation to return more slowly to our objective. But there is no reason why they should lead to a permanently lower inflation rate.

What matters is that central banks act within their mandates to fulfill their mandates. In the euro area, that might create different challenges than it does in other jurisdictions. But those challenges can be mitigated. They do not justify inaction.

## 4. A SUCCESS STORY? REFLECTING ON ONE YEAR OF EUROPEAN BANKING SUPERVISION

*Andreas Dombret*<sup>1</sup>

### 4.1. INTRODUCTION

Ladies and gentlemen

Thank you for the opportunity to speak at the joint conference of the SUERF Colloquium, the Deutsche Bundesbank and the Foundation *Geld und Währung*. It is a pleasure to be here this evening, and I hope that your discussions today have been fruitful and informative.

Henry Ford once said: “Coming together is a beginning, keeping together is progress, working together is success.” And that’s exactly what I would like to talk about tonight: Working together in European banking supervision, and the question of whether, and under what circumstances, the Single Supervisory Mechanism, or SSM for short, can write a success story of its own.

### 4.2. COMING TOGETHER: THE FIRST YEAR OF EUROPEAN BANKING SUPERVISION

European supervisors came together over a year ago to put the first pillar of the European banking union in place. The SSM became operational on 4 November 2014. That was the date on which the ECB assumed responsibility for supervising the most significant banks in the euro area. These banks, which number roughly 120 in all, account for more than 85% of the aggregate balance sheet of the euro area’s banking sector, making the European Central Bank one of the biggest banking supervisors in the world.

But besides being one of the largest banking supervisory authorities worldwide, there’s something else that makes the ECB one of a kind – it is the only supranational supervisor in the world. Never before have sovereign nation-states come together and surrendered their powers in the field of banking supervision to an independent authority.

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<sup>1</sup> Member of the Executive Board of the Deutsche Bundesbank.

### 4.3. KEEPING TOGETHER: WHERE DO WE STAND?

The SSM has been up and running for nearly a year and a half – and now is a good time to reflect on how it has fared so far. And I must say that our experience has been quite positive. But at the same time, it would be dishonest of me to say there weren't any challenges still facing European supranational supervision.

There are two particular challenges currently facing the SSM that I would like to discuss this evening: first, that of striking a balance between harmonisation and proportionality, and second, institutional challenges.

Since November 2014, banks in the euro area have been supervised according to a set of harmonised standards. This is an important step for creating a level playing field and improving supervisory effectiveness. Yet at the same time, we need to meet the challenge of implementing supervisory practices that are proportionate to the specific characteristics of individual institutions.

In practical terms, this means, for example, that supervisory expectations and requirements should be proportionate to the size, significance and riskiness of the supervised institution. We have to emphasise the role of proportionality in guiding the way we supervise differently sized banks.

Things are somewhat different for the less significant institutions, or LSIs for short. There are around 3,500 institutions in the euro area, of which 1,600 are German LSIs. Although the LSI sector as a whole is overseen by the ECB in matters of risk concentration, the individual institutions continue to be directly supervised by the national competent authorities. The ECB and the national supervisors are currently in the process of developing joint standards for the supervision of these smaller banks. Here, too, harmonising standards up to a certain degree is a necessary and welcome measure.

That said, it is particularly important – as far as LSIs are concerned – to give national supervisors sufficient leeway to allow for the particular characteristics of individual institutions. Supervising LSIs is, and should be, a matter for national supervisors. That conforms to the principle of subsidiarity and represents the most effective and efficient solution.

Another topic in this regard is debate on options and national discretions. Today, European supervisory legislation offers around 150 options to choose from. Because these options may be exercised in many different ways at the national level, they are sometimes regarded as obstacles for creating a regulatory level-playing field. To be sure, sometimes it is reasonable to interpret rules against the backdrop of specific national circumstances, but sometimes it is not. So we need to analyse all the options and discretionary scope provided at the national level very carefully. The ECB and the national supervisors have just kick-started this



evaluation process and until now, a number of national options have been harmonised.

The second challenge I would like to discuss is somewhat different because it is rooted in the existing legal framework, so it's not exactly a matter that's still taking shape.

Since the ECB is responsible for European banking supervision, so it follows that the Governing Council, as its supreme decision-making body, is accountable not just for monetary policy issues but also for matters of banking supervision. These two areas of responsibility overlap at the bank level. This, of course, gives rise to conflicts of interest, because after all, banks are not just a crucial element in the monetary policy transmission process; they are also subject to banking supervision. Thus, the ECB has to deal with the conflict of interest of being a banking supervisor with access to central bank liquidity and the other way round a central bank that decides about banks that are important in the monetary policy transmission process.

In an effort to minimise such conflicts of interest, a governance structure has been put in place to limit the Governing Council's involvement in supervisory decisions. Speaking personally, I have my doubts whether this set-up will truly help to prevent a clash between the ECB's monetary policy mandate and its role as a banking supervisor. You will most likely have explored this issue in much greater depth early on today.

As I mentioned earlier, the SSM is only the first pillar of the European banking union. The second is the European Single Resolution Mechanism which will deal with future bank failures. This mechanism has been operational since 1 January 2016. Its task is to realign incentives and make the entire banking system more stable. In cases where a bank is no longer viable, its shareholders and creditors will be first in line to bear the resulting losses – the taxpayer will only be asked to contribute as a very last resort. This is an urgently needed step in the right direction.

But in its final form, the European banking union will be made up of three pillars, the final one being a common deposit guarantee scheme. Let's make one thing clear – a single deposit guarantee arrangement is certainly the logical next step in terms of financial integration, but it is altogether premature at the present time because it would disequilibrate liability and control. Why do I say that? Well, we first need to achieve deeper integration before an integrated deposit guarantee scheme can work effectively. A single European banking supervision set-up has been put in place – that much is true – but national economic policy decisions still have a huge bearing on the economic wellbeing of domestic banks. The same holds true for the legal framework – just take insolvency law, which is still very

much rooted in the national domain. The existence of different rules has a direct impact on banks' risk situations. That's why Europe would have to be given stronger rights to intervene in national economic policies, and a harmonised set of rules would be needed, before a European deposit guarantee scheme can be set up. That path means ceding certain rights to control national budgets to the European level, and it is one that ultimately leads to what is known as a fiscal union. For sure, such a step would require euro-area countries to surrender a degree of national sovereignty to Europe.

A move of that kind would necessitate wide-ranging changes to both national and European legislation. And to be honest, I don't see much willingness to go down that path right now. Bearing that in mind, I strongly advise against taking the second step before the first. To be honest, I do not really see a reason for being in hurry in this issue. In 2014, we introduced largely harmonised rules for deposit insurances, ensuring that deposits up to 100.000 Euro are secured in case of a bank's insolvency. The risk of this insurance, today, lies with the respective Member State the defaulting bank is located in. I am convinced that as long as banks' well-being is still so much affected by national legislation, this is an appropriate setting and there is no justification for pan-European risk sharing without fundamental adjustments to the current framework.

#### **4.4. WORKING TOGETHER: THE ROAD TO SUCCESS**

The creation of the banking union has significantly bolstered the financial supervisory architecture in Europe. If we define 'success' as 'maintaining financial stability', then focusing our efforts solely on banking supervision would be like making the road to success a narrow, single-lane highway. Supervisors can only be as effective as the rules and regulations they apply. What we need to do, then, is add a second lane to that road – a sound regulatory framework for the banking system – for that was an area in which the financial crisis laid bare a number of shortcomings.

Significant progress has been made in the regulatory space in the more than seven years that have elapsed since Lehman Brothers went under. The most important measure was the Basel III framework in 2010, which introduced stricter capital requirements and new liquidity rules. When Basel III is fully implemented in 2019, regulatory capital requirements will be significantly higher and tougher than under Basel II, and I firmly believe that the financial system today is already more stable than before.

The Basel Committee has forged ahead along this path over the past few months – one of the items on its 'to do' list for 2016 is to finalise the Basel III reform

package before the end of the year. And things are moving along swiftly – the fundamental review of the trading book (FRTB) was endorsed by the central bank governors in January, which means that the new market risk framework will take effect in 2019. Work is also ongoing to address the problem of excessive variability in risk-weighted assets by the end of 2016. The Basel Committee has set its sights on two outcomes: removing internal model approaches for certain risk types, and placing constraints on the use of internal model approaches for credit risk, in particular through the use of floors. In parallel, the standardised approaches for credit and operational risk are reviewed. Another issue the committee is currently working on is the final design and calibration of the leverage ratio, so that it can be implemented as a Pillar 1 measure by 1 January 2018.

To make one thing clear: The regulatory projects mentioned do not target on imposing further burdens on the banks – which would mean first and foremost higher capital requirements. In that regard, I highly appreciate the overall impact study the Basel Committee will conduct this spring, which will give us precious hints on how all the regulatory measures interact and should be calibrated. I think the Basel Committee is on the right track, and finalising the Basel III reform package in 2016 is my regulatory priority in 2016.

While we may rightly expect much of the Basel III framework, it is no secret that higher capital standards and new liquidity requirements are not the only toolkit available when financial stability is at stake.

That's why the Basel III regime has been flanked by a host of other regulatory projects that have been launched in response to the financial crisis: the 'too big to fail' issue, sovereign exposures and the shadow banking system are just three regulatory projects I could name.

This is neither the time nor the place to explore these regulatory projects in any great detail, of course. But there is one point I really would like to stress. All the regulatory projects I mentioned just now call for international cooperation – and not just on the Basel Committee for Banking Supervision or the Financial Stability Board, where it works very well. If we as national regulators do not coordinate our approaches to regulation, we will create a fragmented financial system that opens up vast opportunities for regulatory arbitrage. So working together – as regulators and supervisors; at the national, the European and the global level – would be a huge step towards successfully safeguarding financial stability.

#### 4.5. CONCLUSION

The first one-and-a-half years of the SSM have been hailed as a success – and rightly so, in my eyes. Coming back to Henry Ford, whom I quoted at the begin-

ning of my speech, European supervisors have come together successfully in the shape of the SSM. Time will tell whether this project will prove to be a lasting success. Don't get me wrong: I certainly believe it will be, and I have good reason for saying that: the SSM has got off to a flying start – which is all the more impressive, given the short space of time in which it was created – and its day-to-day supervisory activities are gradually taking shape.

A number of challenges do remain, however, though that it is hardly surprising for such a new set-up. I discussed two of them today. But I am quite optimistic that these challenges will be met. Once the Basel III rules have been finalised during the course of this year, day-to-day supervisory activities will be based upon a sound, and hopefully coherent, framework.

At the end of the day, the work of the SSM will be measured in terms of its long-term success in maintaining a stable financial system. Successful European supervision needs more than just institutional structures and a sound regulatory framework – it also depends on employees who work together in a manner described by Winston Churchill when he said: “It is no use saying ‘We are doing our best’. You have got to succeed in doing what is necessary.”

I wish you a pleasant evening. Thank you for your attention.

## 5. MACROPRUDENTIAL POLICIES TO CONTAIN SYSTEMIC RISKS

*Ignazio Angeloni*<sup>1</sup>

### 5.1. INTRODUCTION<sup>2</sup>

I am grateful to the organisers of this conference on “The SSM at 1” for inviting me. The first birthday of the Single Supervisory Mechanism (SSM) was an important milestone, of special significance for those of us who have been involved in the build-up and activity of the new European supervisory body. On 4 November 2015, one year after the operational start of the SSM, the ECB launched a new conference on supervisory issues, whose proceedings are available on the SSM webpages. I am glad to see that the contents and the line-up of speakers today complement those of the conference organised by the ECB well.

Over the years, SUERF has built a tradition of fostering debates on macro, monetary and financial issues near the boundary between research and policymaking. Today’s programme is no exception. I would say that macroprudential policy is a topic that fits well with that tradition. Conceived originally by policymakers (Andrew Crockett is credited for introducing the concept in a 2000 speech<sup>3</sup>), macroprudential policy has recently stimulated a rich stream of academic research which shows no sign of abating. Yet, the ultimate test of success will require this area of policy to become part of the standard toolkit, regularly used alongside monetary policy, micro-supervision and financial regulation more broadly. When and whether this will happen remains to be seen.

With the launch of the SSM, the ECB has acquired macroprudential powers as well, sharing this competence with the national authorities. The modalities of interaction are described in the Capital Requirements Directive IV (CRD IV), the Capital Requirements Regulation (CRR) and the SSM Regulation. Moreover, since 2011 – so well before this – the ECB has hosted the European Systemic Risk Board (ESRB), the pan-EU body responsible for monitoring systemic risks and

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<sup>1</sup> Member of the Supervisory Board of the European Central Bank (ECB).

<sup>2</sup> I am grateful to Frank Dierick, Astrid Farrugia, Skander van den Heuvel, Giulio Nicoletti, Adam Pawlikowski, Evangelia Rentzou and Stephanie Stolz for helpful contributions and comments. This speech includes some material presented in a recent conference hosted by Bruegel (streaming available at <http://bruegel.org/events/monetary-policy-after-the-great-recession/>). The views expressed here are personal and should not be attributed to the ECB.

<sup>3</sup> See A. CROCKETT, *Marrying the micro- and macro-prudential dimensions of financial stability*, speech at the Eleventh International Conference of Banking Supervisors, Basel, September 2000. However, much earlier uses of this word have been reported by P. CLEMENT, (2010). *The term “macroprudential”: origins and evolution*, BIS Quarterly Review, March.

recommending macroprudential policy measures to the relevant authorities. In this dual role, the ECB has a strong interest, and actively participates, in the research and in the debates on macroprudential policies.

In my remarks today, I will offer some reflections on the present state of, and prospects of development for, this area of policy. I will discuss conceptual and implementation issues, the latter with particular reference to the euro area.

## 5.2. WHERE DO WE STAND ON THE USE OF MACROPRUDENTIAL POLICIES?

Let me start with a personal impression, which I hope will not sound too disappointing or pessimistic. It seems to me that, up to now, the interest in macroprudential policies demonstrated by the research community has been much greater than the readiness of policymakers to make actual use of such policies in practice. Now, ‘interest’ and ‘readiness’ are hard to measure, so the word ‘impression’ is in order, but the available evidence is suggestive. Consulting a popular catalogue of economic and financial research, I noted that the number of research papers published on the topic in question rose from less than five per year on average before 2009, to over 700 in 2014<sup>4</sup>. By contrast, an IMF study shows that the frequency that macroprudential instruments are used around the world merely doubled between 2000 and 2013, also starting from a level close to zero. The more frequent users are emerging market economies, much more so than industrialised countries<sup>5</sup>.

To some extent, one should expect research to precede implementation, but there are likely to be other reasons as well. In this regard, the experience of the United States after the crisis is interesting. The Dodd-Frank Act, which entered into force in 2010, “requires [*in the words of the then Chairman Ben Bernanke*] that the Federal Reserve and other financial regulatory agencies adopt a so-called macroprudential approach – that is, an approach that supplements traditional supervision and regulation of individual firms or markets with explicit consideration of threats to the stability of the financial system as a whole”<sup>6</sup>. For this purpose, a new Financial Stability Oversight Council was created, chaired by the Secretary of the Treasury and including federal and state regulators. The Council’s mandate is to coordinate analyses and policies to identify and respond to systemic risks.

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<sup>4</sup> IDEAS search engine; see <https://ideas.repec.org/search.html>.

<sup>5</sup> See E. CERUTTI, S. CLAESSENS and L. LAEVEN, *The use and effectiveness of macroprudential policies: new evidence*, IMF Working Paper n. 61, March 2015.

<sup>6</sup> B. BERNANKE, *Implementing a Macroprudential Approach to Supervision and Regulation*, speech at the 47th Annual Conference on Bank Structure and Competition, Chicago, Illinois, May 5, 2011.

Analytical backing is provided by a newly established Office of Financial Research (OFR), hosted by the US Treasury, which has produced regular reports and analyses since 2012<sup>7</sup>.

This important institutional and analytical build-up has not so far been matched by comparable policy action. In this regard, some remarks made last October by the President of the New York Fed, Bill Dudley, are revealing: “We need to do much more work in developing a coherent macroprudential framework before we start contemplating putting a number of countercyclical measures in place. Such a framework needs to take into consideration how it interacts with other policies [*such as microprudential and monetary policy*]. When are these policies substitutes? When are they complements? How will they interact? How will the governance work in coordinating across these three realms?”<sup>8</sup>. He refers here specifically to countercyclical instruments, but some of his arguments have more general validity.

This experience may depend somewhat on US-specific internal arrangements, but is also paradigmatic of two orders of complexity that macroprudential policy-makers have to face. One is *intrinsic*, inherent in the way the goals and instruments of this policy interact. The second is *institutional*, having to do with the way in which decision-making takes place. The first level of complexity is general, common to all countries. The second depends on the features of each jurisdiction.

Let me briefly comment on both, with specific reference, for the second, to the euro area.

### 5.3. SOME CONCEPTUAL ISSUES

One may cast macroprudential policy within the familiar target-instrument scheme proposed by Tinbergen and Theil in the 1950s and 60s. In its simplest version, this scheme requires that there be as many independent instruments as there are targets. Independent means that instruments must be distinct and their effect on the goals (their ‘transmission’) sufficiently different<sup>9</sup>.

In this scheme, the separate identification of macro- and micro-prudential policy instruments is matched by a distinction, on the target side, between ‘safety and

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<sup>7</sup> More details of the macroprudential institutional arrangements in the United States under Dodd-Frank are provided in the Annex.

<sup>8</sup> W. DUDLEY, *Is the active use of macroprudential tools institutionally realistic?*, panel remarks at the Macroprudential Monetary Policy Conference, Federal Reserve Bank of Boston, October 2015. Dudley’s remarks are partly based on a simulation exercise (‘table-top experiment’), conducted within the Federal Reserve System in 2015; see the Annex for details.

<sup>9</sup> If these conditions are fulfilled, then the targets are, in principle, attainable. In practice, the ease with which they are attained depends on the strength and reliability of the transmission and on a correct assignment of instruments to targets, possibly including coordination schemes among different policies.

soundness' of individual financial institutions and 'systemic stability'. Broadly speaking, the first implies that the risk taken by individual banks is measured and properly internalised<sup>10</sup>; the second that the system be stable, also taking into consideration the interactions and feedback in the financial sector and with the rest of the economy<sup>11</sup>. In this scheme, micro-prudential policy is supposed to take care of the first goal (safety and soundness), and macro-prudential policy the second (financial stability); monetary policy remains focused on price stability<sup>12</sup>.

This scheme has the merit of simplicity and of emphasising the distinction between traditional micro-supervision and macroprudential concerns. A broader instrument space may also be attractive if it helps alleviate policy trade-offs, for example between price stability and financial stability, which may arise especially at low levels of inflation and interest rates. Unfortunately, however, putting the scheme in practice is harder than it seems. First, distinguishing between 'safe and sound banks' and 'stable system' is not straightforward. Theoretical distinctions based on different types of externalities have been proposed<sup>13</sup>, but they are not easily operationalised. Second, macro- and microprudential instruments tend to coincide. Macroprudential instruments normally take the form of capital surcharges, liquidity requirements and other balance sheet restrictions, precisely the kind of tools employed by the micro-supervisor. Not only does this weaken the requirement that the instruments be distinct, but using the same instruments for different objectives may give rise to policy conflicts.

An alternative to the scheme just described would be to posit the recourse to two instruments, a prudential policy and monetary policy. While monetary policy remains geared to price stability, prudential policy uses the full range of supervisory instruments (pillar 1 and pillar 2 requirements, including macroprudential buffers) to pursue a broad notion of stability, including individual bank soundness as well as systemic stability. Conflicts between micro- and macroprudential goals over the cycle are addressed by setting appropriate countercyclical buffers. In essence, in this model the two authorities, if separate, must coordinate closely

<sup>10</sup> The concept of safety and soundness of banks alongside that of systemic stability is enshrined in supervisory practices by the Basel Committee on Banking Supervision's *Core Principles for Effective Banking Supervision*, issued in September 2012. Principle 1 states, *inter alia*, "The primary objective of banking supervision is to promote the safety and soundness of banks and the banking system. If the banking supervisor is assigned broader responsibilities, these are subordinate to the primary objective and do not conflict with it".

<sup>11</sup> The ECB defines financial stability as a condition in which the financial system – intermediaries, markets and market infrastructures – can withstand shocks without major disruption in financial intermediation and in the general supply of financial services. See for example ECB, *Financial Stability Review*, November 2015.

<sup>12</sup> For an illustration of this scheme, see, for example, the introductory chapter of D. SCHOENMAKER, *Macroprudentialism*, December 2014 ([www.voxeu.org/article/macroprudentialism-new-vox-ebook](http://www.voxeu.org/article/macroprudentialism-new-vox-ebook)).

<sup>13</sup> For example, S. G. HANSON, A. K. KASHYAP and J. C. STEIN (2011), "A Macroprudential Approach to Financial Regulation", *Journal of Economic Perspectives*, 25(1), pp. 3-28, emphasise the distinction between 'safety net' externalities (the control of which falls in the remit of the micro-supervisor) and 'network' or 'systemic' externalities (which fall under the responsibility of the macroprudential authority).



so as to attain jointly a broadly defined notion of financial stability<sup>14</sup>. This evidently requires appropriate institutional arrangements that facilitate timely information exchanges, unity of purpose and coordinated action.

This is where the institutional dimension comes in. Let me now move on to this, with specific focus on how Europe's arrangements respond to the need for coordination.

#### 5.4. INSTITUTIONAL FEATURES IN EUROPE

It must be noted at the outset that Europe's institutional framework adds a further element of complexity to those already considered: the presence of national and area-wide authorities<sup>15</sup>. Accordingly, the institutional set-up is built on two layers, at central (EU or euro area) and national level.

At the EU level, the European Systemic Risk Board (ESRB) has the mandate to analyse systemic risks in the entire EU financial system, covering both the bank and non-bank sector. It is a highly representative body (its General Board includes representatives of national central banks and regulators of all EU Member States, plus the ECB, the Commission and the ESAs, for a total of 95 members (of which 37 have voting right). Since its start, the ESRB has developed a rather extensive structure, with a large number of technical and research sub-groups to analyse various dimensions and sources of systemic risk. Notably, alongside an Advisory Technical Committee of central bank and supervisory officials, a large Advisory Scientific Committee, composed of outside experts and academics, prepares reports (including for publication) and is represented on the General Board with voting power. The ESRB, however, is not a direct decision-maker – it is only entitled to issue risk warnings and policy recommendations to the relevant authorities, national and European. In some of these dimensions, the ESRB is analogous to the FSOC in the United States.

In the euro area, following the entry into force of the Regulation establishing the SSM in November 2014, the ECB and national authorities share powers over the macroprudential toolkit provided for in the CRD IV and the CRR (including delegated acts issued by the Commission). This covers a number of lender-based

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<sup>14</sup> Coordination problems are greatly simplified when policy functions are concentrated in a single institution, albeit perhaps with some internal assignment criteria or firewalls. This is the case, for example, with the Bank of England, which houses both the micro- and macroprudential authorities (PRA and FPC respectively) and the monetary policy function (MPC). Recently the Bank of England has been comparatively active in this area, announcing a macroprudential tightening of lending standards to the real estate sector, announcing the future activation of the countercyclical capital buffer and last week introducing a systemic risk buffer for ringfenced banks beyond a given size threshold.

<sup>15</sup> To a lesser extent, this problem exists also in the United States between federal and state authorities; see the aforementioned speech by DUDLEY (see Annex).

tools, mainly on capital, liquidity and net stable funding<sup>16</sup>. However, it excludes borrower-based measures such as loan-to-value or loan-to-income limits, which act on the demand side; these instruments remain under the exclusive control of the national authorities<sup>17</sup>. The sharing of responsibility between the two levels is in the fact that the ECB can only tighten the policy stance, using the tools provided for in EU law, relative to what is determined by the national authorities. With this arrangement, the legislator has wanted to obviate a perceived tendency to inaction by national authorities, presumably deriving from cross-border externalities.

Within the ECB, pursuant to the EU Treaties all decisions are ultimately taken by the Governing Council, the same body that sets monetary policy. The SSM Supervisory Board (which includes heads of supervision and central bankers from all participating countries plus ECB representatives) prepares complete decisions in the microprudential area, submitted to the Governing Council for final adoption through a short non-objection procedure. In addition, the Supervisory Board can launch the adoption of macroprudential measures, within the limits of the ECB powers as described; complete proposals in this area are also adopted by the Governing Council<sup>18</sup>. In addition, a number of internal structures are involved to bring in the micro- and macroprudential perspectives, both within the ECB and in the SSM countries, and to cater for the necessary coordination. In particular:

- a Financial Stability Committee, involving banking supervisors and central bank representatives from SSM countries at a technical level, carries out analyses in the macroprudential field;
- a Macroprudential Coordination Group supports intra-ECB cooperation between the micro- and macroprudential function of the ECB;
- finally, a Macroprudential Forum, including all Governing Council and Supervisory Board members, operates as a platform for regular discussion at the most senior level.

This multiple interaction is new and still being tested in practice. It assembles all available information and expertise available at the ECB and among euro area authorities. But it is evident that all this comes at the cost of considerable complexity.

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<sup>16</sup> Pillar 2 requirements are have also been used in a macroprudential context in some cases; see some examples in EBA, “On the range of practices regarding macroprudential policy measures communicated to the EBA”, July 2015.

<sup>17</sup> There is evidence that borrower-based instruments are the most effective to curb excessive credit growth – see P. HARTMANN, *Real Estate Markets and macroprudential policy in Europe*, ECB Working Paper Series, No 1796 (May 2015).

<sup>18</sup> The Governing Council can also initiate the process to adopt macroprudential measures. In this case, it has to involve the Supervisory Board to prepare the decision, which is then re-submitted back to the Governing Council for adoption.

There are several consequences of this. First of all, up to six different institutions need to be involved for a decision by a Member State to be finalised (art. 458 CRR): the national authority, the ECB, the ESRB and the EBA, the European Commission and the European Council. Although short deadlines are provided for each step, the overall process can be cumbersome and lengthy.

In addition, the overlap of powers between the European and national levels may give rise to different goals. In the euro area, the instruments available for domestic macroeconomic management are often perceived to be too limited. There is a risk, in this situation, that macroprudential tools may be used as substitutes for ‘missing’ instruments, notably monetary policy. For example, limits on bank credit (in the form of capital surcharges) could be imposed at the national level to compensate for a single monetary policy that is perceived to be overly expansionary in relation to national conditions. This could give rise to distortions in credit markets and fuel the development of the unregulated sector<sup>19</sup>.

Furthermore, the institutional complexity can lead to inaction bias or to the possible use of instruments that are sub-optimal for the purpose. According to a recent EBA report<sup>20</sup>, macroprudential decisions under CRDIV/the CRR have been heavily affected by governance and legal requirements. The EBA report contains examples in which different measures were used to address similar risks (for instance on real estate), probably influenced not by the fit of the instrument to the purpose, but by its governance.

## 5.5. RECENT POLICY MOVES IN THE EURO AREA

Let me now briefly mention some of the macroprudential measures that have been adopted in the euro area since the new rules of the CRDIV/CRR came into force in 2014. The purpose is not to give a full picture, but only a first indication of how the relevant authorities are beginning to move in this area<sup>21</sup>.

The new legislation required, first of all, that each Member State identifies the domestic authority in charge of macroprudential policy. All of them have done so, but with specific arrangements in each country, as already mentioned. Moreover, the law requires Member States to adopt decisions concerning specific instruments, within limits set by the law itself. I will focus on the two most important ones: the systemic risk buffers and the countercyclical capital buffer.

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<sup>19</sup> A parallel that comes to my mind is with the imposition of credit guidelines or ceilings in the 1970s and 1980s. These were used, in some European countries, to maintain an expansionary monetary policy while mitigating undesired effects on inflation and the exchange rate. That experience was ultimately unsuccessful, and was followed by a generalised removal of credit controls in the course of the 1980s.

<sup>20</sup> See ESRB, *A review of macro-prudential policy in the EU one year after the introduction of the CRD/CRR*, June 2015.

<sup>21</sup> A full list of country notifications is available at [www.esrb.europa.eu/mppa/html/index.en.html](http://www.esrb.europa.eu/mppa/html/index.en.html).

Buffers on systemically important banking institutions include a general systemic risk buffer (potentially applied to a country's whole financial sector or a subset of it), as well as bank-specific buffers applied to globally important institutions (G-SIIs) and other systemically important institutions (O-SIIs). The determination of the former is done by applying a methodology established by the Basel Committee on Banking Supervision (BCBS) and implemented in Europe by the Commission, while for the latter, the choice of institutions and the extent of the buffer are up to the national authorities themselves. These capital surcharges are aimed at mitigating the 'too big to fail' issue. Buffers should take into account each institution's contribution to systemic risk which is assessed by their size, cross-border activity, interconnectedness, complexity and so on.

At the present time, only two SSM participating Member States have activated a general systemic risk buffer: Austria and the Netherlands. Slovakia will introduce it in 2018. By comparison, among other EU countries, Sweden has adopted it and the UK has announced the launch of a public consultation on it.

For the G-SII, a gradual phase-in is foreseen until end-2018<sup>22</sup>. Once fully loaded, the buffer ranges between 1% and 2.5% (an upper bucket of 3.5% is not used at present)<sup>23</sup>.

The range of buffers applied to O-SIIs varies considerably, also for banks that are comparable in size and business models. For instance, in Spain this buffer has been set at up to 1% (after the phasing-in period) on the major lenders, while in the Netherlands the corresponding value is at its top level of 2%. Italy has set a buffer of 0% on all its designated O-SII. Some countries, such as Lithuania, Portugal and Slovenia, have determined that buffers only apply to all banks from 2017 onwards, while in other countries they are already applied in 2016. There is also a wide variety in the number of banks designated as O-SII, even among countries with comparable size and banking structures.

The countercyclical capital buffer is meant to induce banks to build-up capital during periods of high aggregate credit growth associated with the build-up of systemic risk. No use has been made of this instrument among SSM members: all countries have set the relevant parameters at 0%. By comparison, Sweden has introduced it and in the UK the Financial Policy Committee has recently mentioned the possibility of introducing it in the future.

So far the ECB has decided not to exercise its macroprudential powers, not objecting to the measures adopted by the national authorities, based on an assessment of financial stability conditions. The initiative therefore has remained, so far, exclusively in national hands.

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<sup>22</sup> See CRD IV article 162(5).

<sup>23</sup> See [www.fsb.org/wp-content/uploads/2015-update-of-list-of-global-systemically-important-banks-G-SIBs.pdf](http://www.fsb.org/wp-content/uploads/2015-update-of-list-of-global-systemically-important-banks-G-SIBs.pdf).

My brief summary of the measures adopted so far under the new legal framework ends here. I will not attempt to analyse their determinants or pass any judgement on their overall consistency. It is probably premature to do so. But it will be important, at some stage, to analyse them closely not only from the viewpoint of their overall coherence for systemic stability, but also in order to identify the scope of possible action by the ECB.

## 5.6. CONCLUSIONS

Let me conclude with three statements.

The novelty and importance of the macro-prudential approach has long been recognised, and rightly so. Systemic risks and the related policies merit the close and active attention of supervisors and regulators. Prudential policies must go beyond traditional supervision. What is in question is not the validity of the approach, but how to apply it in practice.

We should resist the temptation to regard macroprudential policy as a separate compartment in the policy construct, institutionally and operationally disconnected. The policy instruments available and the nature of the goals involved do not allow such rigid separation. Any attempt in this direction may fuel policy conflict and take macroprudential policy away from its mission, which is to promote financial stability.

In my view, we should work towards developing among regulators and supervisors a broader concept of banking and financial stability, encompassing those transmission links. The full range of available instruments should be used to attain that goal. As fittingly suggested by André Sapir in a recent debate, the macroprudential approach is a ‘state of mind’: an operational awareness from those in charge of regulating and supervising finance that to promote a stable financial sector, all relevant macroeconomic interconnections must be accounted for. The challenge in doing so is to assemble expertise and judgement from different sources and, where different decision-makers are involved, to closely coordinate them in the pursuit of that goal.

This is a complex task, but a feasible one. More analyses, debates and experience are needed to get there. This is why conferences like this are so helpful.

Thank you for your attention.



## 6. MONETARY AND MACROPRUDENTIAL POLICIES IN THE EURO AREA

*Sergio Nicoletti-Altimari*<sup>1</sup>

### 6.1. INTRODUCTION

More than seven years after the start of the financial crisis economic and financial conditions in most advanced economies have not yet fully stabilized. In an effort to bring back inflation to target and sustain the recovery, monetary policies remain accommodative to a historically unprecedented degree. The prolonged period of record low interest rates and unconventional monetary policy measures has generated concerns on the possible consequences that such situation may have for financial stability. Is monetary policy creating the conditions for another crisis, very much as it did, according to some observers, in the pre-crisis 2001-07 period? Should it take into account these possible undesired effects and eventually change course?

At the same time, as an important part of the regulatory overhaul following the financial crisis, macroprudential authorities have been established and have started operating with the mandate of containing risks to financial stability. What should the role of the newly established macroprudential function be in the current context? How should monetary and macroprudential policies interact?

Answering these questions is not straightforward. Despite the growing research on macroprudential policy, many gaps remain in our knowledge. The still incomplete theoretical underpinning and scant empirical evidence do not provide clear indications on the effectiveness of macroprudential policy or on its relationship with other macroeconomic policies, in particular monetary policy<sup>2</sup>. This is however no excuse for policy makers, who nevertheless need to take decisions based as much as possible on robust guiding principles.

In my remarks I will briefly review some few, basic principles that can be extracted from the literature and the empirical evidence available so far that could be useful for policy making; through the lenses of these principles, I will then discuss the current situation in the euro area.

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<sup>1</sup> I wish to thank the SUERF and the Bundesbank for inviting me to the conference. I am also grateful to L. Cappiello, G. Nicoletti and S. Wredenberg for their input and the fruitful exchange of views and to A. Pellicani for the excellent editorial support. All opinions expressed are my own and do not necessarily reflect those of the European Central Bank.

<sup>2</sup> Useful reviews in this regard are provided by Cerutti, Claessens and Laeven (2015) and Smets (2014).

## 6.2. THE RELATIONSHIP BETWEEN MONETARY AND MACROPRUDENTIAL POLICIES: FEW BASIC PRINCIPLES

First of all, what are monetary and macroprudential policies and in what do they differ? Macroprudential policy, as emerged in recent years, is a policy function encompassing a relatively broad set of instruments aimed at containing systemic risk in the financial sector, which may stem from macroeconomic shocks or externalities and strategic behaviours that make the financial sector prone to episodes of acute instability<sup>3</sup>. In this respect, it is a complement and expansion of traditional micro-prudential supervision. Monetary policy on the other hand influences short-term interest rates (and with unconventional measures longer term rates as well) and manages the provision of liquidity to the economy<sup>4</sup>.

The two policies partly act through the same channels, i.e. their transmission mechanism overlaps to some extent. For example, they both affect demand and supply of credit and risk-taking behaviour, as well as the funding costs of intermediaries (which incidentally calls for coordination, or at least full understanding of each other's reaction functions). A main difference between the two policies is that macroprudential instruments can be used in a more selective manner than the typical monetary policy instrument. In particular, they can be directed at specific sectors, asset prices, practices as well as, very importantly in a monetary union, specific countries. The impact of monetary policy is instead more general and broad-based as its actions affect all asset prices and sectors of the economy and all countries in a monetary union.

These differences justify the assignment of different and specific primary objectives to the two policy functions, very much in line with Tinbergen's principle: monetary policy is a powerful tool for managing aggregate demand, therefore its primary objective relates to the business cycle: price stability and (directly or indirectly, depending on the mandate) real activity fluctuations; macroprudential policy on the other hand is better suited to address financial stability risks when and *where* they emerge (and in fact it was born for that).

Second, what do we know about the relation between these two primary objectives? Most economists would subscribe to the view that no long-run trade off exists between the two. Price stability and financial stability actually tend to rein-

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<sup>3</sup> Macroprudential instruments are so far mainly concentrated on the banking sector and include various capital and liquidity buffers, borrower-based measures such as limits to loan-to-value or debt-to-income ratios for mortgages and other prudential measures. ESRB (2014) provides a detailed description of the instruments available to the European authorities.

<sup>4</sup> In this note, the treatment of monetary policy does not include the core central bank's function of 'lender of last resort'. When used to address systemic liquidity risks, this function is at the crossroad of monetary and macroprudential policies as it serves both the purpose of preserving the monetary policy transmission mechanism, and thus its effectiveness in maintaining price stability, and at the same time of safeguarding financial stability.



force each other. Even more, it could be argued, they are each other's necessary conditions – although not sufficient conditions as the experience has shown. For example, a failure of monetary policy resulting in a deflationary spiral would have serious financial stability consequences in a world where most debt is denominated in nominal terms. Similarly it is obviously much harder for a central bank to maintain price stability in a situation of financial distress. This basic fact is sometimes forgotten but is crucial especially when considering the costs and benefits for a policy to deviate from focussing on its primary objective: because of the strict longer run interconnection between the two objectives such costs include a potential welfare loss from both the price and the financial stability perspectives – a point on which I will come back later.

Third, shorter term trade-offs may however appear at times. This is because the business and the financial cycles may not be synchronised, thus creating a possible trade-off between price/output stability and financial stability for the two policy functions. While there is not yet established evidence on financial cycles, and even the concept itself is sometimes questioned, existing estimates normally concur that the financial cycle tends to have larger amplitude and lower frequency than the normal business cycle, although some degree of correlation between the two is often detected<sup>5</sup>.

As the recent literature highlights, the seriousness of the trade-offs depends on the nature and the strength of the shocks and on the operating of some transmission channels. For example the risk-taking channel of monetary policy, by inducing higher risk-taking and leverage in the financial sector in periods when an accommodative policy stance is needed from a business cycle and price stability perspective, may generate a trade-off for monetary policy. For such risk-taking channel there is some theoretical and empirical support, although views differ on its relevance<sup>6</sup>.

Fourth, the extent of the 'disconnect' between the business and the financial cycles and the relevance of the trade-offs also depend on the two (monetary and macroprudential) policies' reaction functions. An important point in this respect is that the introduction of macroprudential policy as a separate policy function has the potential to significantly reduce the traditional trade-off between price and financial stability faced by monetary policy, thus unburdening monetary policy and allowing it to focus on its price stability mandate<sup>7</sup>.

There are several ways in which macroprudential policy can reduce the trade-off faced by monetary policy. First, by containing the amplitude of the fluctuations of the financial cycle itself – some of its instruments, such as the cyclical capital

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<sup>5</sup> See Drehmann, Borio and Tsatsaronis (2012).

<sup>6</sup> On this point see the contribution by L. Laeven in this volume.

<sup>7</sup> See for example Leduc and Natal (2015).

buffer, are explicitly designed for that purpose. Second, by increasing the resilience of financial intermediaries when shocks hit their balance sheets. Third, regulatory reforms with a macroprudential orientation may reduce some of the channels through which the trade-off was amplified. For example, it is likely that the introduction of limits on bank leverage or to the recourse to short term funding will moderate the risk-taking channel of monetary policy. Finally, and most importantly, financial imbalances tend normally to grow up in specific areas or sectors to then spread, if left unaddressed, to the rest of the financial sector due to the interconnectedness of financial intermediaries. The use of targeted instruments to tackle sectoral and localised imbalances (as well as measures to reduce the dangers of interconnectedness) will also help reducing the need for monetary policy to intervene to address financial stability risks. In a monetary union, macroprudential policies geared towards specific regional imbalances may help implement a more homogeneous monetary policy across countries and reduce macroeconomic volatility<sup>8</sup>.

There are of course some important caveats to take into account. In particular, the effectiveness of the macroprudential action is still surrounded by very high uncertainty; moreover, the instruments of prudential policies (both macro- and microprudential) do not cover the whole financial system leaving open the possibility that the actions by the authorities are circumvented. It cannot therefore be excluded that there will be cases in which it will be necessary for monetary policy as well to more directly address financial stability risks. However, because interest rate policy is too blunt an instrument to tackle specific, sectoral and tail risks, I would argue that a real trade-off for monetary policy appears only when, in spite of the action of prudential policies, imbalances are really broadly based, *e.g.* in a downturn a situation of generalised asset price misalignments and excessive credit growth emerges. But even in cases of generalized imbalances, a thorough cost-benefit analysis needs to be performed. The costs of deviating from business cycle and inflation management may be large in terms of *both* the risk of dis-anchoring expectations, thus prolonging further the deviation from the primary objective, *and* the financial stability consequences from this action (*e.g.* from deflation and/or recession)<sup>9</sup>. Moreover, on the benefits side as well the evidence is not particularly encouraging and many prominent academic and policy makers question whether monetary policy – through its main policy instrument, the short term interest rate – can effectively contain asset price bubbles, especially in house prices<sup>10</sup>.

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<sup>8</sup> Brzoza-Brzezina, Kolasa and Makarski (2013) and Quint and Rabanal (2013).

<sup>9</sup> Incidentally, these costs are normally not well-captured by the theoretical literature where typically models do not include the possibility of a dis-anchoring of expectations.

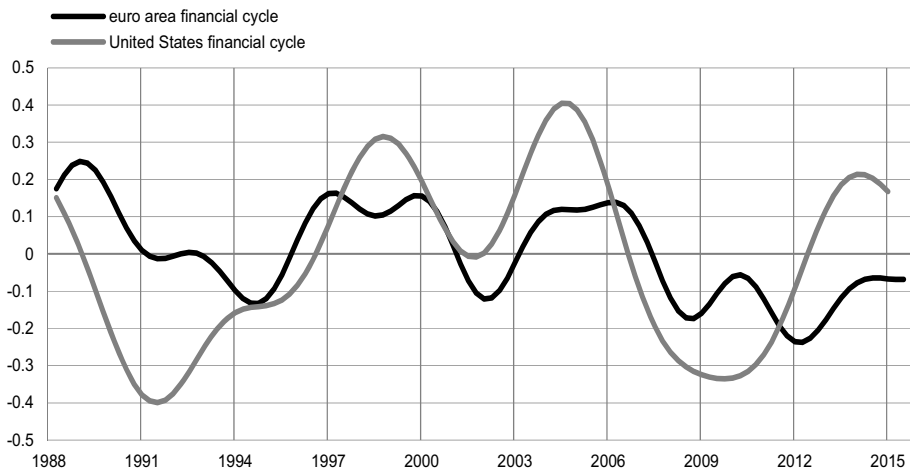
<sup>10</sup> Bean *et al.* (2010), Hartmann *et al.* (2013) and Svensson (2015) refer to the experience of Sweden in 2010, when monetary policy tried to address tensions in the real estate sector, to illustrate the dangers involved in deviating the course of monetary policy to tackle sector-specific risks.

### 6.3. MONETARY AND MACROPRUDENTIAL POLICIES IN THE CURRENT EURO AREA CONTEXT

Taking into account the above considerations, I turn to the assessment of the euro area current situation.

Chart 1 displays an estimate of the euro area and the US financial cycles, which consider co-movements in a broad set of segments of the financial sector (credit market, bonds, equity and real estate)<sup>11</sup>. The US financial cycle appears to be more mature than the one for the euro area aggregate, where the estimates indicate values below the historical norm.

Chart 1. Financial cycle estimates for the euro area and the US



Source: ECB calculations. Methodology: Y. SCHÜLER, P. HIEBERT and T. PELTONEN, *Characterising the financial cycle: a multivariate and time-varying approach*, European Central Bank, WP 1846/2015.

Note: The financial cycle for the United States runs until Q1 2015, the cycle for the euro area until Q3 2015.

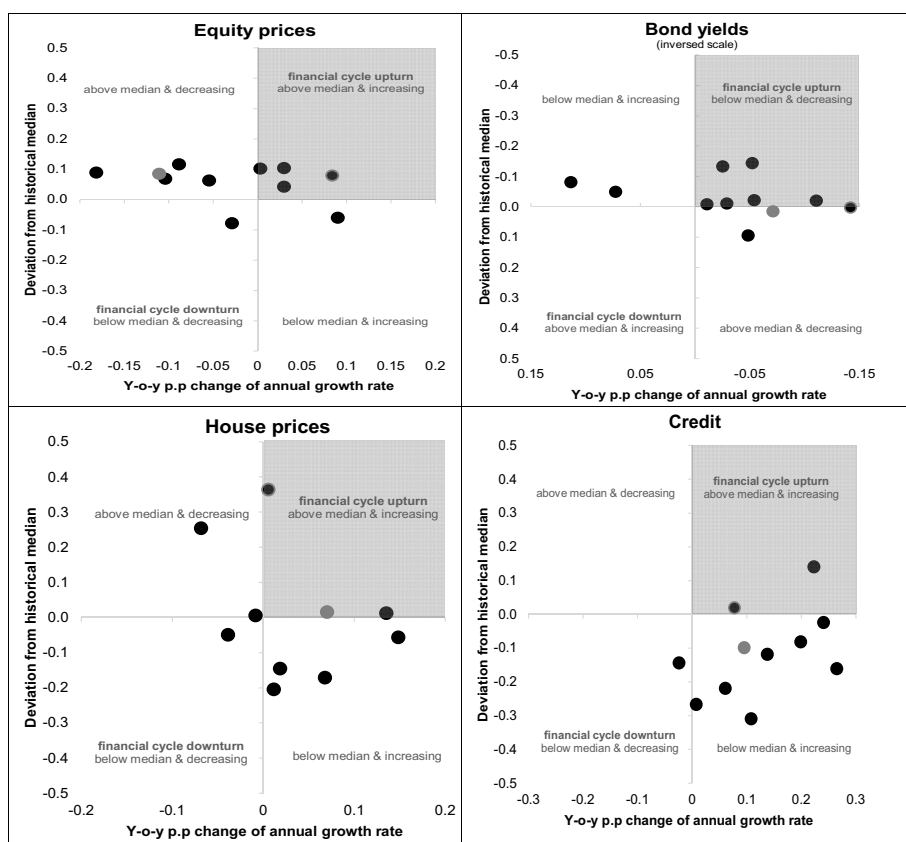
The aggregate estimates for the euro area however masks differences across countries and sectors. Chart 2 provides a breakdown of the aggregate estimates and shows the position of individual euro area countries in the different segments of the financial sector. In the chart, countries positioned below the horizontal axis are those where the cycle (in the given market segment) is below their historical norm (and vice versa for countries above); countries positioned on the right hand side of the vertical axis are those where the cycle is increasing (and vice versa for those on the left). Therefore, each quadrant of the chart represents a different

<sup>11</sup> Schüler, Hiebert and Peltonen (2015).

phase of the financial cycle: for example, countries positioned in the upper right quadrant are those experiencing a situation of above norm and expanding financial cycle.

In equity markets, countries are positioned around their historical norm (in line with indications that can be gathered from standard valuation measures such as price-to-earnings ratios). In bond markets, countries are positioned mostly in the upper right quadrant, indicating some squeezing in risk premia, which is also a reflection of the ECB’s action with its Asset Purchase Programme. In residential real estate, the situation is clearly more differentiated, as it is to be expected given the more local nature of these markets. Finally, for credit markets most countries are positioned in the right bottom quadrant, implying that credit growth is below the historical norm, although getting closer to it.

Chart 2. Financial cycle in the euro area countries: main components

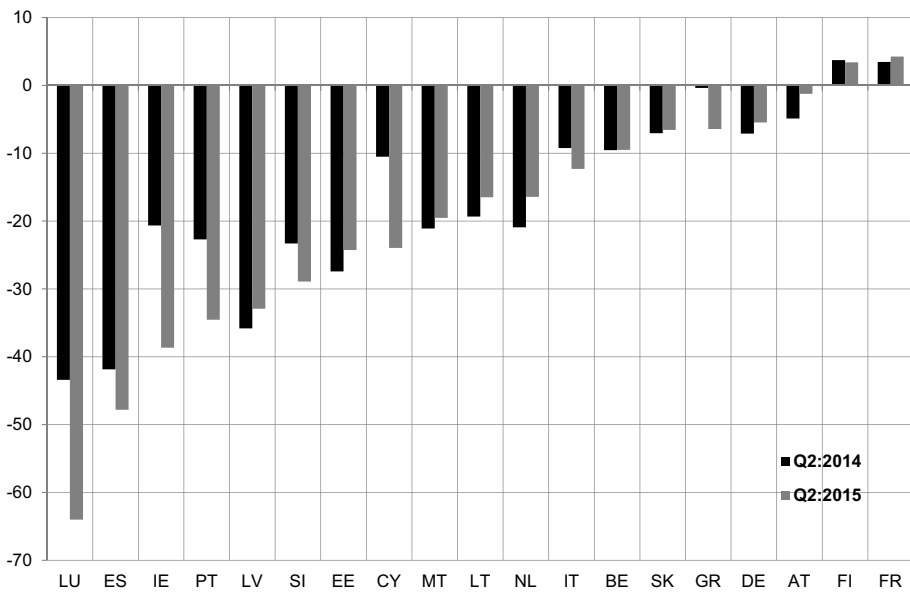


Source: ECB calculations. Y. SCHÜLER, P. HIEBERT and T. PELTONEN, *Characterising the financial cycle: a multivariate and time-varying approach*, European Central Bank, WP 1846/2015.

Note: the blue marks refer to individual countries position in the cycle for each market segment considered; the yellow mark refers to euro area aggregate values.

The overall picture emerging from this evidence is that there is not a situation of generalized credit-led asset price bubble in the euro area; in particular credit growth, while timidly recovering, is still subdued. As shown in Chart 3, negative credit gaps are present in most euro area countries. Consistently with this evidence, all macroprudential authorities have set the countercyclical capital buffer at zero at the beginning of 2016. Considering the large negative figures for some countries, there could be a case for releasing capital buffers, which is not possible because macroprudential buffers are not present. This highlights the difficult conditions faced by macroprudential policy in the initial post-crisis phase: banks had to undertake an intense effort of restructuring and deleveraging through asset sheltering and recapitalisation, thus contributing further to the credit squeeze, because the initial capital endowment was too low. In other words, in recent years countercyclical macroprudential policy could not be used, which aggravated the burden shouldered by monetary policy.

Chart 3. Total credit-to-GDP gaps in the euro area



Source: ECB calculations.

The situation just depicted in asset and credit markets couples with a still fragile macroeconomic environment and persistently low inflation rates. There is thus not a large disconnect between business and financial cycles at the present juncture in the euro area. In a situation of still high private and public debt the risk of deflation and subdued nominal growth is a main risk to financial stability. Against this background, the potential financial stability risks emerging from the

low interest rate environment and the operating of a risk-taking channel appear to be a second order concern at this juncture. In other words, there does not seem to be a trade-off between price and financial stability for monetary policy in the euro area.

Some localised tensions, in particular in real estate markets, are certainly present, although the vicious self-reinforcing spiral between sustained increase in mortgages and house prices observed in some countries in the pre-crisis period does not seem to be at play at this stage. As argued above, however, these local tensions are better tackled with macroprudential instruments, considering that developments are country (or even region) specific. In this respect, macroprudential authorities in the euro area are already quite active and indeed a number of macroprudential measures have been taken at the national level. Table 1 provides an overview of the instruments activated in euro area countries: they range from borrower-based measures, such as the introduction of LTV and DSTI/DTI limits, to asset-based measures, such as increased risk weights on real estate exposures for banks. While it is too early to formulate a complete assessment, the preliminary evidence is that these measures are being effective, *e.g.* property prices are moderating in countries that have introduced such measures.

**Table 1. Macroprudential measures for real estate activated in the euro area since 2013**

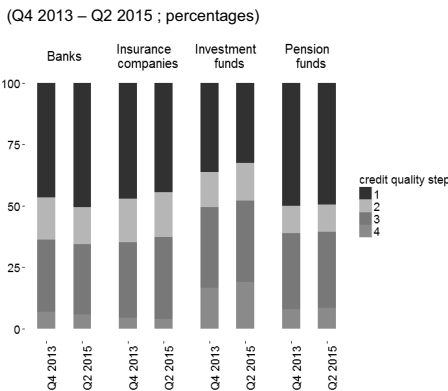
	<b>LTV limits</b> (reduces LGD)	<b>Income-based limits</b> (reduces PD)	<b>Max. maturity restriction</b> (reduces long-term interest rate sensitivity)	<b>Floors to risk-weights from IRB</b>
<b>Belgium</b>				RRE (5% add-on)
<b>Cyprus</b>	70%, 80%	DSTI: 35-60%		
<b>Estonia</b>	85%, 90%	DSTI: 50%	30 years	
<b>Finland</b>	90%, 95% (from July 2016)			
<b>Ireland</b>	70%, 80%, 90%	LTI: >3.5		CRE (brought to 100%)
<b>Latvia</b>	95%			
<b>Lithuania</b>	85% (2011)	DSTI: 40%, 50% w/ interest rate sensitivity test at origination	30 years	
<b>Malta</b>	70%	35%	40 years	
<b>Netherlands</b>	102% (1pp decline p.a. to 100% in 2018)	DSTI: 10-38%	30 years	
<b>Slovakia</b>	90%, 100%	Internal DSTI limits (max. 100%) w/ interest rate sensitivity test at origination	30 years	

Therefore, macroprudential policy is already playing a role and helping to reduce the monetary policy trade-off in the euro area. In particular, the activism of

macroprudential authorities in counteracting real estate related risks provides some confidence that the large imbalances in the pre-crisis period, such as those experienced by Ireland and Spain, will less likely materialize in the future.

As mentioned, there are of course limits on what macroprudential policy can deliver. In particular, as macroprudential instruments are available mainly for the banking sector, the possibility of leakages and arbitrage within the financial sector could reduce the effectiveness of macroprudential measures. What is the evidence in this respect? Do we have signs that in the current environment of accommodative monetary policy, risk-taking is increasing in sectors outside the reach of macroprudential policy in its current format? One piece of, admittedly partial, evidence is provided in the charts 4 and 5.

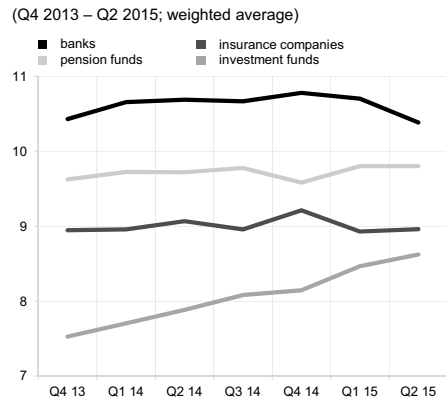
**Chart 4. Share in nominal debt securities holdings by sector and rating category**



Sources: ECB and ECB calculations.

Notes: Credit quality steps are defined in accordance with the Eurosystem credit assessment framework (ECAF), which provides a harmonised rating scale classifying ratings into three credit quality steps. The first category includes securities rated from AAA to AA-, the second from A+ to A- and the third from BBB+ to BBB-. A fourth category is added which includes all rated securities with a rating below credit quality step three.

**Chart 5. Residual maturity of debt securities holdings**



Sources: ECB and ECB calculations.

Notes: All 'alive', rated and non-rated euro and foreign currency-denominated debt securities are included. In order to estimate the average, residual maturities are weighted by the nominal amount held of each security by each sector over the total debt holdings of each sector.

Chart 4 shows the change over the past two years in the composition of security holdings, by rating of the securities, for different categories of market participants. There is no evidence of a shift towards more risky securities in banks' portfolios, where, on the contrary, a tendency towards an increase of safer securities can be detected. A move towards larger holdings of riskier securities is instead visible in the insurance industry (as low asset yields are putting pressure

on some business lines) and, more markedly, in the investment fund industry. In this latter sector, which is growing quite fast in the euro area, one can also observe a continuous increase in the maturity of securities holdings on the asset side (chart 5), which is coupled with short term funding on the liability side, mainly consisting of callable equity. All in all, some risk-shifting away from banks may thus be occurring, as it can be expected given the tougher regulatory environment on the banking sector. The fast development of the investment fund industry also entails positive consequences from a financial stability point of view, as risks are less concentrated in banks' balance sheets and shouldered by a wider community of final investors. It does however entail also new risks that would require the development of macroprudential tools tailored at the specific characteristics of the industry. The main point here is that there are certainly limits to the current toolkit available for macroprudential action, which may favour leakages or circumvention of macroprudential measures. However, this should lead to an effort to complete the toolkit and the macroprudential framework, rather than to ask monetary policy to change its course in order to address risks emerging in certain parts of the financial sector.

#### 6.4. CONCLUSIONS

Monetary policy and macroprudential policy should remain focused on their primary objectives, price and financial stability, respectively. Targeted macroprudential actions can be particularly useful to address financial risks that are more localised and affect specific sectors or countries within a monetary union, thus reducing the potential trade-off between price and financial stability that could otherwise emerge for monetary policy. There may still be circumstances in which generalised tensions in financial markets could not be fully tackled with macroprudential policy (and prudential policies in general). Even in such cases, the costs of deviating too much and for too long from the final goal must be carefully considered, not only from the perspective of the price stability goal, but also for the potential consequences that such deviation could have for financial stability.

In any event, the current situation of the euro area is very different from the pre-crisis period. Considering the still depressed credit cycle and the absence of generalised tensions in asset markets, there would be no justification for deviating monetary policy from its action to bring back inflation to the medium term objective and sustain the economic recovery.



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## 7. HAS THE STABILITY OF THE BIG EUROZONE BANKS IMPROVED AFTER THE COMPREHENSIVE ASSESSMENT?

*Felix Hufeld*

Before answering this question, one should briefly look back to the Comprehensive Assessment (CA): it may be described without exaggeration as a unique exercise for the supervisory community. It was both a resource and time-consuming project: 130 big banks took part, more than 800 different portfolios were checked (which means nearly 57% of the banks' risk-weighted assets), approximately 120,000 credit files were reviewed and 6,000 experts were involved and had to be coordinated – be it staff of National Competent Authorities (NCAs), National Central Banks (NCBs), the European Central Bank and third parties like consultants or auditors.

The targets for the exercise were designed very ambitiously. The general objective of the CA was to restore confidence in the European banking market by identifying 'rotten apples' in the annual accounts of the significant Eurozone banks. More precisely the CA was designed to

- strengthen banks' balance sheets by resolving the problems identified through the necessary remedial actions;
- enhance transparency by improving the quality of information available on the condition of the banks;
- build confidence by assuring all stakeholders that, on completion of the identified remedial actions, banks will be soundly capitalised.

The exercise shows substantial outcomes: overall, the CA identified a capital shortfall of EUR 24.6 billion across 25 participating banks, which lead to an increase of own funds in the Eurozone. In addition, the value adjustments (provisions and fair value adjustment) amount to EUR 47.5 billion which were expected as a matter of principle to be mirrored to a certain extent in the annual accounts. Against this background the CA can be seen as a robust basis for the ongoing supervision of the Single Supervisory Mechanism newly established in November 2014.

Nevertheless the exercise had to deal with three major challenges: firstly it had to cope with the point in time issue. The reference date of the exercise was mostly the end of December 2013. Secondly there was a limited time frame available. The entire project took place under extreme time pressure. The core elements had to be wrapped up within less than 6 months. Last but not least, the CA had to

face the harmonised approach vs. fragmented reality situation. The aim was to achieve a harmonised and comparable approach across all banks in 19 different countries. In this context consistency as a principle achieved peak importance. However, the reality was fragmented. I will mention two aspects: on the one hand, banks' internal systems were often not ready to be in line with the standardised requirements of the CA in a timely manner. On the other hand, national supervisory practices differ among the NCAs and NCBs.

Keeping this in mind when the question is posed whether the significant banks are safer now than before, the short answer is (in principle) yes, due to the fact that the CA has built up a good ground for further supervisory involvements. The CA had a disciplinary effect due to the fact that it stimulated banks to anticipate higher capital demands in advance. Furthermore it played a major role by identifying shortfall banks. In addition, the CA was a huge educational exercise for NCAs and NCBs regarding supervisory practices and providing a first common data platform for the newly created supervisory authority.

Looking at the current situation of the Single Supervisory Mechanism, there are number of challenges so that the setting up of a harmonised Eurozone banking surveillance system is of course work in progress – but the CA plays a crucial role in this process. It was a robust exercise which has increased transparency in the banking community and supported the development of common procedures in the Eurozone. This exercise should now be followed by intensive daily supervision.

On this basis, the SSM can establish an analytical framework for Pillar I and Pillar II of the regulatory framework to monitor and evaluate banks in a continuous and largely comparable way across all SSM countries. The main topics seem to be quantitative and qualitative aspects like capital requirements and stress testing issues and with the same importance governance, internal control and risk management issues.

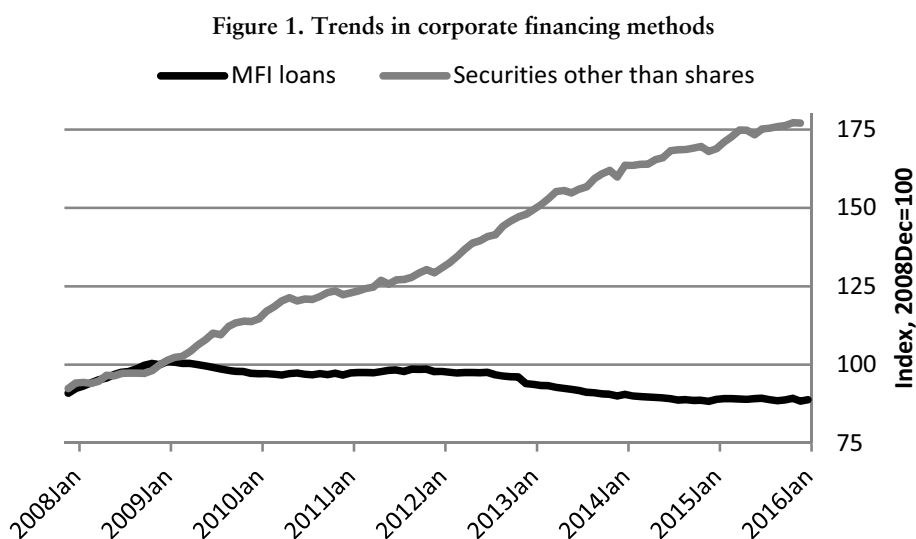
Does that mean that nothing bad will ever happen again? The answer is no. We do not live in a perfect world and supervision is not a 100% guarantee against any bank failure. In the market economy, it has never been and will never be the task of supervision to prevent the failure of banks whose business models do not work. However, with the CA an important step for a more robust Eurozone has been launched.

## 8. NON-BANK FINANCING AND REGULATORY AND FISCAL CHALLENGES

*Hendrik Ritter and Ludger Schuknecht<sup>1</sup>*

### 8.1. INTRODUCTION

There are signs of important changes in the corporate financing structure in Europe. Bank lending in the euro area has been declining since the deepening of the financial crisis in 2009. At the same time, non-bank financing and notably securities issuance have developed much more favourably in Europe (Figure 1). Additional changes are occurring, *e.g.*, via fund-based financing or insurances.



Source: ECB Statistical Datawarehouse.

We see four key factors driving these changes:

- (1) The current macroeconomic environment with negative central bank rates is putting pressure on the profitability of banks.
- (2) At the same time, consolidation within the European banking industry is progressing slowly (overbanking) while non-performing loans inhibit new lending in several euro area countries.

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- (3) Elevated costs due to stricter regulation and increased capital requirements have reduced the comparative cost advantage of banks in lending activities.
- (4) The spread of digital technology is affecting the financial industry by facilitating non-bank financing and boosting non-traditional competitors such as 'FinTechs'.

The shift towards non-bank financing challenges the business model of the banking industry while simultaneously giving rise to regulatory and fiscal concerns.

## 8.2. EXTERNALITIES IN NON-BANK FINANCING

From a regulatory perspective, the financial industry has gone through significant changes in recent years. Notably banks are facing stricter regulation, including increased capital and compliance requirements. At the same time, the so-called shadow banking sector (a very unfortunate term for non-bank financing) has also received significant regulatory attention.

From a regulatory perspective, the shift towards non-bank financing is important insofar as it may create externalities that require attention. First, greater reliance on fund-based financing such as money market funds or project management may imply the risk that such financing could come to a sudden stop if the funds themselves face redemptions and become subject to runs. Second, market-based financing via bond issuance may face liquidity risks and even potential fire sales if risk sentiment shifts. This and the reduced market making activity by banks due to higher regulatory costs could disrupt both the functioning of markets as well as the provision of financing via new issuances. In a similar vein, equity finance may be affected by market volatility in a risk-off environment. Third, there are unresolved issues in the area of central counterparties (CCPs) regarding recovery planning and resolvability.

The Financial Stability Board (FSB), which deals with these issues in the context of the G20 regulatory agenda for the financial sector, has adopted a two-pronged strategy to transform shadow banking into a resilient source of market-based financing. First, the FSB has created a system-wide monitoring framework to track financial sector developments outside the banking system with a view to identifying the build-up of systemic risks and initiating corrective actions where necessary. Second, it is coordinating and contributing to the development of policy measures in a number of areas where oversight and regulation need to be strengthened to reduce excessive build-up of leverage, as well as maturity and liquidity mismatch, in the system.

The FSB's global approach is superior to unilateral strategies, which risk being undermined by regulatory arbitrage. Consequently, there is no reason to set up a 'shadow banking union' for the euro area or the EU while, of course, full implementation of what has been agreed as part of the banking union is essential to deal with European banking sector challenges. Given the shift to non-bank financing, the European 'capital market union' project – including the revitalisation of the securities market – is highly desirable.

### 8.3. FISCAL CHALLENGES

The key challenge for ensuring favourable conditions and stability in the non-bank financing sector does not lie in the lack of regulation but rather in maintaining and restoring sound public finances. Governments have a multiple role here. They are providers of safe assets – which are referred to as benchmarks when the safety of other assets is measured. Needless to say, the provision of safe assets requires sound public finances and cannot hinge on the purely regulatory proclamation of a zero risk weight. In addition, sound public finances are a prerequisite for stabilising financial markets internationally in times of volatility: the proper functioning of the IMF, the ESM and other international insurance mechanisms ultimately depends on the solvency of their main shareholders.

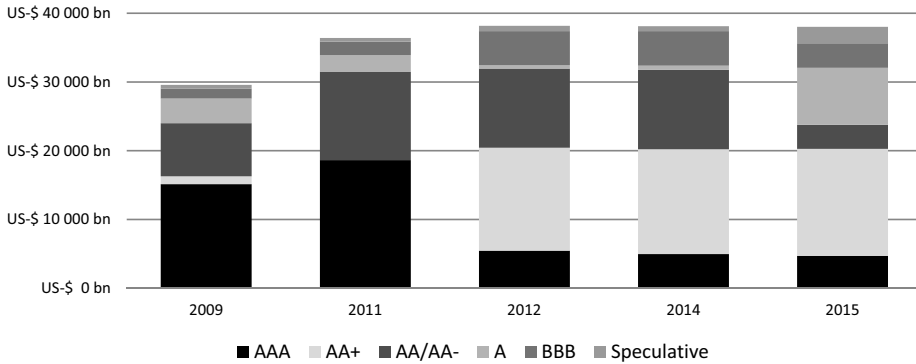
When governments fail to provide safe assets, volatility rises and private sector financing is disrupted. Investors lack a credible yard stick for valuing assets. If the balance sheets of financial institutions are loaded with government assets of deteriorating value, their ability to lend and provide services such as project finance, market making, etc. will suffer or cease. Ultimately, fears of the lack of a 'back-stop' and monetisation/fiscal dominance loom, further undermining financing conditions.

While Western economies on the whole seem well-removed from a scenario of 'disappearing safe assets', the tremendous increase in public debt through high deficits and bank bailout costs has changed the perceived safeness of some industrialised countries' government debt. For the first time in decades, industrialised countries in Europe have seen a fiscal crisis that in the past was conceivable only in developing and emerging economies.

But the more dramatic events in Europe in recent years have perhaps masked a more worrying general trend: namely that an AA rating, rather than an AAA rating, is becoming the new normal for leading industrialised countries. Figure 2 illustrates that in 2009, about half of total sovereign debt (or US\$ 15 trillion) was rated AAA according to S&P. By 2014, less than \$5 trillion of AAA-rated debt was left, and half of this amount was supplied by only two debtors: the

United Kingdom and Germany<sup>2</sup>. With the downgrading of the United States and France, the largest segment in 2015 was AA. The other major advanced country debtors – Japan, Italy, and Spain – have already been downgraded below AA. While Fitch and Moody’s hold a more favourable view (they have not downgraded the United States), the pattern is the same. In early 2016, only four AAA countries are left<sup>3</sup>.

**Figure 2. Market volume of central government debt securities by rating**



*End of each year or nearest available; only countries with data for all five years (see footnote 2), nonrated countries are considered speculative. Sources: Standard & Poor’s, World Bank.*

<sup>2</sup> Countries included in Figure 2: Albania, Armenia, Australia, Austria, Bangladesh, Belgium, Brazil, Bulgaria, Canada, China, Colombia, Costa Rica, Czech Republic, Denmark, El Salvador, Estonia, Finland, France, Georgia, Germany, Guatemala, Hungary, Iceland, Ireland, Israel, Italy, Japan, Kenya, Latvia, Lithuania, Luxembourg, Mauritius, Mexico, Moldova, Morocco, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Philippines, Poland, Portugal, Romania, Seychelles, Slovak Republic, South Africa, Spain, Sweden, Switzerland, Tonga, Turkey, Uganda, United Kingdom, and the United States. These countries account for over 98% of all reported central government securities in 2015.

<sup>3</sup> That is, four of those countries shown in the table. The following countries are also rated AAA by Standard & Poor’s as of the end of Q1 2016: Denmark, Hong Kong, Liechtenstein, Luxembourg, Norway, Singapore, and Sweden; however, their share in the global ‘safe asset market’ is limited.



**Table 1. Long-term Foreign Currency Ratings, Example S&P**

	12/1993	12/1999	12/2006	06/2011	02/2016
Germany	AAA	AAA	AAA	AAA	AAA
Netherlands	AAA	AAA	AAA	AAA	AAA
Switzerland	AAA	AAA	AAA	AAA	AAA
United Kingdom	AAA	AAA	AAA	AAA	AAA
Austria	AAA	AAA	AAA	AAA	AA+
United States	AAA	AAA	AAA	AAA	AA+
France	AAA	AAA	AAA	AAA	AA
Japan	AAA	AAA	AA-	AA-	A+
Canada	AA+	AA+	AAA	AAA	AAA
Australia	AA	AA+	AAA	AAA	AAA
Belgium	AA+	AA+	AA+	AA+	AA
Spain	AA	AA+	AAA	AA	BBB+
Italy	AA	AA	A+	A+	BBB-
Portugal	AA-	AA	AA-	BBB-	BB+
Greece	BBB-	A-	A	CCC	B-
India	BB+	BB	BB+	BBB-	BBB-
Korea	A+	BBB	A	A	AA-
China	BBB	BBB	A	AA-	AA-
Mexico	BB+	BB	BBB	BBB	BBB+
Russia		SD	BBB+	BBB+	BBB+

*Rating at the end of the month; source: Standard & Poor's.*

This picture contrasts with the improving status of emerging economy debt. Korea and in particular China have gained in ‘safety’ over the past 20 years and are now rated higher than southern Europe and even Japan. India, Mexico and Russia have reached investment grade status.

## 8.4. CONCLUSION

Important changes are occurring in the financing patterns of our economies. Non-bank financing appears to be playing a greater role while further changes are likely to lie ahead. The FSB appears to be best-suited for dealing with the regulatory challenges of non-bank financing. In contrast, the risk that unsound public finances pose for all sources of financing – both bank and non-bank financing – has increased in recent years.

European countries have made significant progress in consolidating public finances in recent years, and debt ratios have stabilised. However, not enough has been done yet to restore the resilience of governments to future shocks. This is

reflected in the significant deterioration of government debt ratings, notably over the past decade. It appears that AA ratings are becoming the new normal, with Asia catching up and parts of Europe falling behind.

Therefore, the lesson to be drawn from the fiscal crises of 2009-2012 in Europe – when the loss of confidence spreads across government bond markets – is neither to shift risks across countries nor to create common liability schemes. Rather, the lesson is to reduce risks and to regain AAA ratings for government debt in Western economies via sound fiscal policies. Only in this way can we be sure that bank and non-bank financing will support growth in an environment of financial stability.

## 9. VIEWS ON INSURANCE, REGULATION AND THE MACRO ENVIRONMENT

*Christian Thimann*<sup>1</sup>

As representing a leading insurance company, this invitation to speak on ‘shadow banking’ is a perfect occasion to better explain how insurance activities, its business model and its role in the economy are actually very different from the ones of banks and of potential ‘shadow banks’.

### 9.1. INSURERS VERSUS BANKS: KEY DIFFERENCES

Insurance is everything but a bank, as insurance is not another variation of bank-like funding mechanism for the economy. Part of the confusion arises as insurers are financial intermediaries as far as their life insurance business lines are concerned. Their liabilities represent financial claims for policyholders, and their assets are predominantly financial assets. Insurers collect savings, intermediate between savers and investors, channel funds, and fulfill a function of capital allocation in the economy.

As a consequence, insurance companies are large investors in financial markets. They receive insurance premia against a promise to cover adverse events and carry savings forward. The premia are invested in a diversified portfolio of assets, encompassing government and private sector bonds, equities, loans, infrastructure finance, and other assets.

But it is essential to highlight four reasons for why insurers are so different from banks as actors in the financial system, in particular when it comes to potential risks stemming from ‘shadow banking’:

- *Insurers are not institutionally interconnected* while banks operate through direct balance sheet exposure to each other in the form of unsecured and secured interbank lending. Insurers are stand-alone operators in institutional terms. There exists no ‘insurance system’, and no ‘central insurer’ comparable to a central bank. It is sometimes argued that insurers and reinsurers together constitute a system that resembles the banking system. But such a parallel overlooks the functions and size of reinsurers, which only

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take up portions of the primary risks of insurers. Munich Re has a balance sheet of EUR 105 billion – a fraction of the balance sheets of the largest banks or central banks for that matter (Baur *et al.*, 2003).

- *Insurers do not engage in maturity transformation.* They pursue a liability-driven investment approach, trying to match their asset profiles with their liability profiles. Since they are funded long-term, insurers are essentially ‘deep-pocket’ investors. This makes them react very differently to downward market pressure compared with a short-term funded or leveraged investor that transforms short-term liabilities into longer-term assets.
- *Liquidity risk is not inherent to insurance* as insurance liabilities are less fugitive than banking ones. Banks risk being liquidity-short; insurers are liquidity-rich. The liabilities for insurance of general protection, property, casualty, and health are indeed not callable at will. They relate to exogenous events that policyholders do not influence. The part of liabilities that are theoretically callable concerns those parts of life insurance business that are not annuities, but there are often penalties for early withdrawal, and tax benefits might vanish. In turn, liquidity risk is inherent in banking (Allen and Gale, 2000). Deposits are the largest item on banks’ balance sheets, and are predominantly short-term, withdrawable at will, and held exclusively by trust.
- *Insurers’ liabilities do not constitute money* but represent an illiquid financial claim. Moreover, insurers do not provide essential financial market utilities and are less integrated into the financial market infrastructure. In particular, they are not an organisational part of the payments or settlement systems. In contrast, banks deal with the payment function, they create credit, and their liabilities constitute money. This means that they are a means of payment and provide a public good function in a market economy. For the Eurozone, the stock of money measured by M3 amounts to EUR 9.9 trillion, of which 85% are bank deposits.

## 9.2. THE ROLE OF DIVERSIFICATION

Large insurance companies are highly diversified in their activity, risk and business mix. Insurance is the business of accepting insurable risks, managing them and providing compensation for possible losses. This statement describes insurance with three qualifications<sup>2</sup>:

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<sup>2</sup> These basic concepts of insurance pre-date modern economic theory and especially finance. But its key notions – especially that of risk – have been espoused by the economics profession from the 1920s onwards. They were transformed and popularised in particular by the development of financial economics in the 1950s and 1960s, and today they are omnipresent in economics, corporate finance and even the everyday media commentary about financial markets. In this process, the notions that were longstanding insurance concepts received a very different meaning.

- Insurable risks are faced by policyholders but beyond their control; they are not systematic but subject to the law of large numbers; and they are non-financial – that is, not directly related to the economic and financial cycle.
- The managing of risk takes place through pooling or mutualisation – that is, the aggregation of a large number of similar risks, linking the misfortune of the few to the fortune of the many; or it takes place through cession and diversification, which are the other ways to manage insurance risk.
- Compensation takes place for losses that have actually occurred, not for hypothetical losses nor for events that may have caused losses.

Concretely, for a global, multi-line insurance and asset management group, business is highly diversified, across business lines, customer segments and geographies. Take the AXA Group as one example: In 2015, 39% of revenues were stemming from ‘property & casualty’ insurance coverage; this includes retail motor and home insurance, SMEs business continuity insurance and large corporations insurance, on property & liability, to name but a few. Customers are natural persons, free professionals, small and medium-size companies and the largest corporations. Another 36% of revenues was stemming from ‘savings & asset management’, which includes individual life insurance but also the pension and savings plan of companies. Another 25% of revenues was coming from ‘protection & health’ business, including all insurance coverage linked to health, mortality and morbidity risks, all of which follow statistical distributions out of the policyholder’s control.

Geographically, as diversification is a major risk management tool for insurance companies, AXA has 103 million clients and operations in 59 countries. The breakdown of its revenues was such that France represented just above 20% of its activity in 2015; Northern, Central and Eastern Europe 29%, Mediterranean and Latin American countries 16%, United States 14%, Asia Pacific 8%, UK and Ireland 6% and Direct activities operated online 3%. The vast majority of European countries is included here, as are the US, Mexico, Brazil and Colombia in the Western Hemisphere; Egypt, Morocco, Nigeria and several smaller economies in Africa; the Gulf and the Middle East; as well as virtually all countries in Asia, including China, India, Hong Kong, Indonesia, Singapore, Thailand and the Philippines.

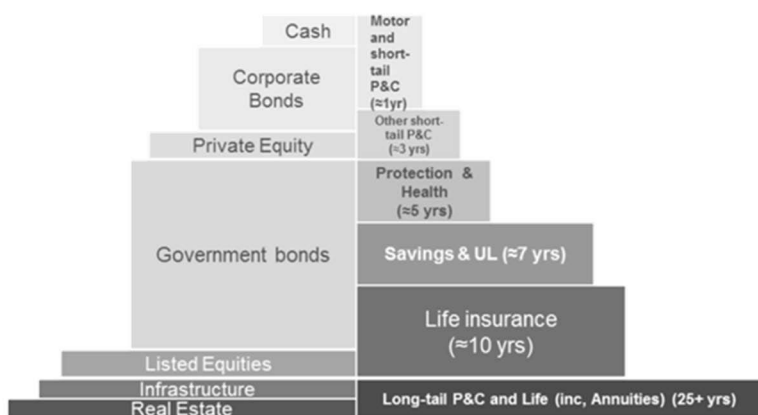
With such a diversified activity mix, the heart of our discussion today of bank-like activities in Europe, – *e.g.* savings management and long-term life insurance products – are in fact only a very small portion of what large multi-liners global insurance companies do.

### 9.3. INSURERS' BALANCE SHEET STRUCTURE

Insurance companies have a very specific balance sheet structure, highly structured and highly granular. Insurers have liabilities that are staggered over time, from short to medium, long-term and very long-term obligations. The bulk of their liabilities are not callable: property and casualty insurance, health insurance and annuities cannot be called; only a fraction of their liabilities, namely some life insurance products, can be called.

Insurers can always cover immediate needs out of their reserves and the key concern is to have enough reserves to cover long-term risks and very rare events. Longevity risks and climate risk (for example, natural catastrophes) are one of the key long-term concerns. Banks, in contrast, have a short-term concern: the bulk of their liabilities are short-term deposits that in principle can be withdrawn overnight. To put it bluntly: banks can die over days; insurers over decades.

Figure 1. Stylized illustration of an insurer's balance sheet



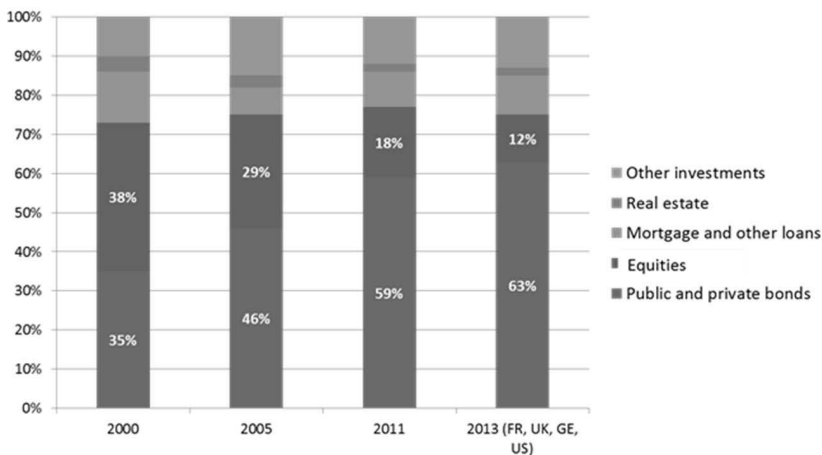
Note: Own equity and debt are excluded for simplicity; the horizontal dimension illustrates the maturity of the assets/liabilities. Source: Author's compilation.

These fundamentally different business models also result in different investment strategies, which for insurers are based on “Asset Liabilities Management” (ALM), where assets are bought so as to match liabilities in duration and liquidity profile (Figure 1). Moreover, as insurers differ significantly between each other – as their liabilities are very different – they have in principle different investment strategies between each other.

## 9.4. THE INFLUENCE OF REGULATION ON THE BALANCE SHEET STRUCTURE

Regulation has a major influence on insurers' behaviors and asset allocation. According to the OECD, the proportion of bonds (private and public) held by European life insurers has increased from 40% in 2000 to more than 60% in 2011, while the proportion of equities has decreased from 43% to 12% (Figure 2). Insurers have always held a significant share of fixed-income securities but the proportion of government bonds has sharply risen and that of other securities such as equities has further decreased. Large insurers that already operate under Solvency II have even lower equity holdings – AXA being at 3-4% of equity holdings on its General account portfolio at end 2014.

Figure 2. Asset allocation of insurers over time in percentage of total investment



Source: OECD.

The reason for such a decline is a result of a mix of technical measures, from capital charges applying to different asset classes (0% for sovereign bonds under the standards formula to 39% for listed equities) to accounting rules leading to a full marking-to-market of the balance sheet, particularly sensitive to market movements for more volatile assets such as equities.

In parallel from this reduction in exposure to equity in balance sheet, the development of Solvency II, a very comprehensive, technically advanced and complex risk-based prudential regime, regulators and supervisors favoured in its practical implementation some standardised approaches, even if the use of internal models is granted. These models, which are key to secure granularity in risk management and recognition of the benefits of diversification, remain nonetheless only used by very large companies investing time and resources developing them (for example, in France only two companies have an internal model).

In turn, the reliance on similar risk models and a standard formula creates mechanically a greater uniformity between financial actors.

In the case of Solvency II, one important example of uniformity is the so-called Volatility Adjuster, which is built on a single benchmark portfolio applied to all companies, independent of their actual investment portfolio.

The Volatility Adjuster is an essential tool as it limits the balance sheet impact of short-term market volatility that is not relevant for a long-term oriented insurer. But it has been built on a single set of portfolio weights for each currency and market taken from the average portfolio of insurance companies over the past year. An unintended consequence is that it strongly favours the convergence of all asset allocation in a given country to this average, independent of the actual needs deriving from each company’s specific liability structure and actually experienced volatility.

**Figure 3. An example of uniformity through regulation: the volatility adjuster for insurance**

Art 77d (2) of Solvency II Directive  
*The volatility adjustment shall be based on the spread between the interest rate from a reference portfolio and the rates of the relevant basic risk-free interest rate term structure.*  
*The reference portfolio shall be representative for the assets which insurance and reinsurance undertakings are invested in.*

➤ A single reference portfolio per market

Formula to calculate the spread underlying the volatility adjustment (art 50, EC Delegated Acts)

$$S = W_{gov} \cdot \max(S_{gov}, 0) + W_{corp} \cdot \max(S_{corp}, 0)$$

Generally based on market average of previous year



**Volatility Adjuster Calibration of the benchmark portfolio**

	Government Bonds	Other assets	CUR
EUR	38.7%	48.2%	EUR
BE	55.3%	34.3%	EUR
FR	37.1%	47.6%	EUR
DE	22.4%	68.5%	EUR
IT	62%	25.1%	EUR
ES	50.1%	37.7%	EUR
GBP	16.7%	30.3%	GBP
JPY	85.2%	11.4%	JPY
USD	18.2%	76.1%	USD
...	...	...	...

Source: Solvency II directive, EIOPA, author’s compilation.

Such a tool can create biases in the quality of resource allocation and reduce the diversity of strategies deriving from the diversity of investors. It can also inadvertently add to the lack of competition in a given market where diversity is weakened to the detriment of customers.

This all shows the high responsibility regulation and supervision have in providing incentives on the asset allocation of large institutions investors like insurance companies, exemplifying here the trade-off between stability on one hand (‘safe assets’ on the balance sheets) and economic growth (funding for companies, infrastructure and large projects).

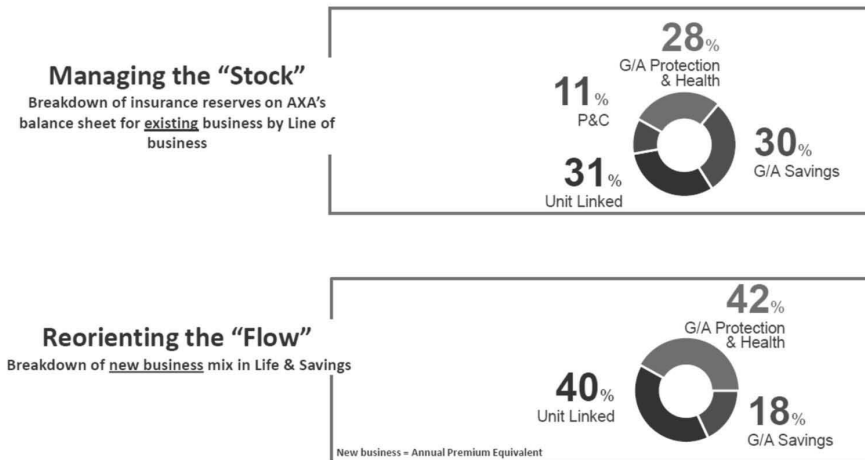


### 9.5. HOW INSURERS ARE PREPARING FOR DURABLY LOW LONG-TERM INTEREST RATES

European insurance companies also adapt to the new features of the economic environment of very low interest rates, by changing gradually their business mix in terms of savings products offered to clients. European insurance companies are getting prepared for longer than previously expected very low interest rates in the Eurozone. Indeed, as the impact on interest rates comes mostly from the stock of ECB bond holdings stemming from the Quantitative Easing impact (the portfolio effect), it will be felt way after a possible halt in purchases currently announced for 2017. The reason for the very long-lasting impact is that the average duration of sovereign bonds purchased is several years (7-8 years for France and Germany). From today’s perspective, even if purchases are discontinued in 2017, the purchased volume will have shrunk by 2025 by only half.

To adapt to this new and lasting reality, European insurance companies are both managing the stock of existing business to secure their capacity to deliver the guarantees and returns offered to the clients in traditional General Account savings products, and reorienting the flow of new business towards products with more risk-sharing with the policyholders and the prospect of higher returns in the long-run in the form mainly of unit-linked savings products. In parallel, investments in now businesses such as Health and Protection are taking place to diversify further the activity.

Figure 4. Insurance companies are adapting their savings’ business mix to the low interest rates. Illustration with AXA Group reality as of end 2014



## 9.6. CONCLUSION

Insurance companies have a business model that is fundamentally different from that of banks. In turn, insurance companies are very large institutional investors whose role is central in the funding of long-term projects given the specific nature of their balance sheets. This role has been varying over the last decades as a result of regulatory changes, and in particular implementation of Solvency II and new IFRS standards.

Before envisaging further regulation and control of financial flows in Europe, a stock-taking of the consequences of recently introduced regulatory frameworks on asset allocation of uniformity across European actors would be interesting to conduct, in particular in the current macro-economic context of very low interest rates and weak economic growth and private investment. In addition, the challenge of low interest rates for financial security and long-term savings plans should be analyzed carefully. The persistence of near-zero long-term interest rates implies that there is virtually no reward for planning for the future. This is bound to have substantial implications for social security systems, the purchasing power of retirees as well as financial stability.

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## 10. A ‘SOVEREIGN SUBSIDY’ – ZERO RISK WEIGHTS AND SOVEREIGN RISK SPILLOVERS

*Josef A. Korte<sup>1</sup> and Sascha Steffen<sup>2</sup>*

### Abstract

European banking regulation assigns a risk weight of zero to sovereign debt issued by EU member countries which makes it an attractive investment for European banks. Eventually, they invest too much and accumulate too much leverage. We propose a new measure that quantifies to what extent banks are undercapitalized due to zero risk weights which we call a ‘sovereign subsidy’. Using sovereign debt exposure data recently published by the European Banking Authority (EBA), this column describes the build-up of this subsidy over the March 2010 to June 2013 period for domestic as well as cross-country exposures. Moreover, we investigate whether zero risk weights help to explain contagion in the Eurozone measured as the co-movement of sovereign CDS prices.

### 10.1. MOTIVATION

Policymakers and academics have recently started to address severe distortions caused by the way banks are regulated in Europe. One of the most apparent flaws in banking regulation is the general application of zero risk weights for sovereign exposures<sup>3</sup>. In general, Basel capital requirements stipulate that banks have to hold capital for *all* asset classes either based on a given regulatory risk weight or based on internally modeled default probabilities. However, this key idea of the Basel Accord has not been followed in the Capital Requirements Directive (CRD) of the European Union. Consequently, EU banks usually employ a zero risk weight for sovereign debt and thus do not hold capital against any of the sovereign exposures to EU member states<sup>4</sup>.

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<sup>3</sup> There are other benefits associated with holding sovereign debt (for example, no exposure limits). We do not discuss those in our paper.

<sup>4</sup> Under the standardized approach, the CRD stipulates a zero risk weight for exposures to the European Central Bank and to member states’ sovereign debt issued in the domestic currency of that member state. While banks that use the IRB approach in theory have to hold capital against sovereign exposures, Nouy (2012) for example shows the IRB approach does not necessarily produce a positive risk weight for sovereign exposures. The probability of default (PD) applied to sovereign portfolios is not subject to a floor (contrary to the PD for other exposures). Hence, the IRB approach could result in a zero risk weight for sovereign exposures. Importantly, banks can also choose to switch to the standardized approach when assessing the capital requirements for their sovereign debt portfolio following the IRB permanent partial use – an exemption which banks usually operating under IRB indeed make frequent use of. Hence, the vast majority of banks eventually employs a zero risk weight for sovereign debt and consequently does not hold capital against any of the sovereign exposures to EU member states.

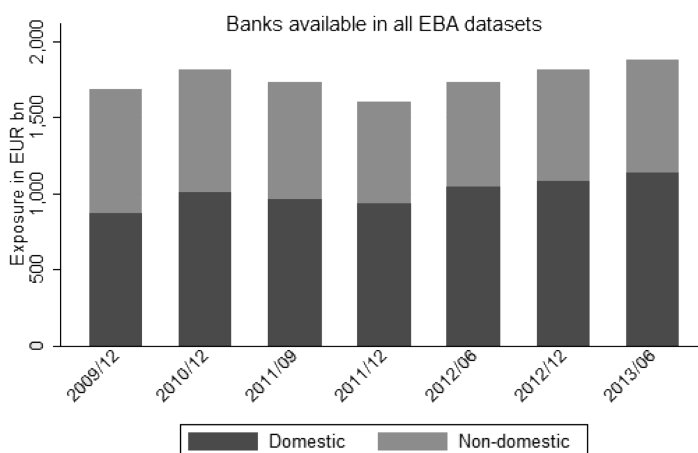
This regulatory treatment of sovereign debt contradicts the spirit of the Basel accords (Hannoun, 2011; Nouy, 2012). More importantly, it makes investments in risky sovereign debt particularly attractive (Acharya and Steffen, 2013; Battistini, Pagano and Simonelli, 2013). If sovereign risk materializes (as happened in the European sovereign debt crisis), banks might experience a substantial capital shortfall and might even require capital backstops by their domestic sovereigns.

We quantify the dimension of capital savings due to zero risk weights. Moreover, we discuss the economic implications associated with this regulatory treatment as it is an important determinant of the co-movement of sovereign CDS spreads within the Eurozone.

## 10.2. BANK LEVEL EXPOSURES TO SOVEREIGN DEBT

The European Banking Authority (EBA) has conducted several assessments of banks' exposures towards sovereign debt and capitalization over the March 2010 to June 2013 period. After 2 stress tests in 2010 and 2011, the EBA continued to assess EU banks and to disclose a substantial amount of data in an effort to increase transparency regarding the solvency of the European banking sector. The data comprises individual sovereign bond holdings of 62 major European banks (91 in earlier tests) at seven reporting dates. As exposure data is available for only 54 banks throughout over all reporting dates, we evaluate the development of sovereign exposures for this subsample<sup>5</sup>.

Figure 1. European banks' sovereign exposure



<sup>5</sup> As these are the largest banks in Europe, our subsample usually makes up more than 90% of the exposures in all banks that formed part of the EBA exercises.

Figure 1 shows that the sovereign exposure of the 54 largest European banks amounted to EUR 1.5 to 2 trillion over the last four years. Interestingly, the sovereign exposure of the banking sector did not decrease but rather increased as the sovereign debt crisis unfolded. The exposure is not just significant in absolute euro amounts, but also comparing it to the tier 1 capital of the respective bank. On average, sovereign bond exposures account for more than 200% of banks' tier 1 capital. Some banks even have sovereign exposures as high as 15 to 20 times their regulatory capital. Interestingly, non-domestic sovereign debt makes up between 40 to 50% of total sovereign exposures on European banks' balance sheets.

High exposures to domestic and non-domestic sovereigns is not just a phenomenon of banks in a few countries. The overall development of banks' sovereign exposure as well as the share of non-domestic sovereign debt, however, is very different for banks located in the GIIPS (Greece, Italy, Ireland, Portugal and Spain) or core-European countries. As Figure 2 shows, banks in peripheral countries increased their exposures by around 50% since 2009, mainly driven by domestic sovereign debt that accounts for approximately 80% of total exposures. Banks from the non-GIIPS countries did not significantly increase their exposures over time and have a much larger share (around 50%) invested in non-domestic sovereign bonds.

Figure 2. Sovereign exposure of non-GIIPS banks

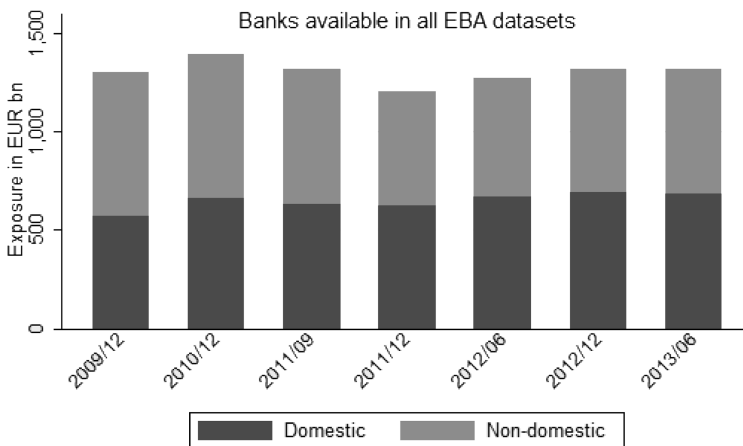


Figure 3 shows the exposure of the 10 largest GIIPS and non-GIIPS banks as of March 2010 (Panel A) and June 2013 (Panel B). We plot the banks' exposure as a percentage of tier 1 capital against their cross-boarder exposure as a percentage of total exposures. GIIPS banks have more domestic exposure and higher expo-

sure relative to tier 1 capital. Non-GIIPS banks, in contrast, hold a large percentage of cross-country sovereign debt with still high exposures relative to tier 1 capital. Large banks from core countries such as Germany and France hold sovereign exposures exceeding 100% of their tier 1 capital. Panel B of Figure 3 shows that GIIPS banks increase domestic sovereign bond exposures consistent with an increase in ‘home bias’ of GIIPS and non-GIIPS banks; also non-GIIPS banks substantially reduce their cross-country exposure but exposures overall remain high relative to tier 1 capital.

Figure 3. Panel A. Sovereign Exposures as of March 2010

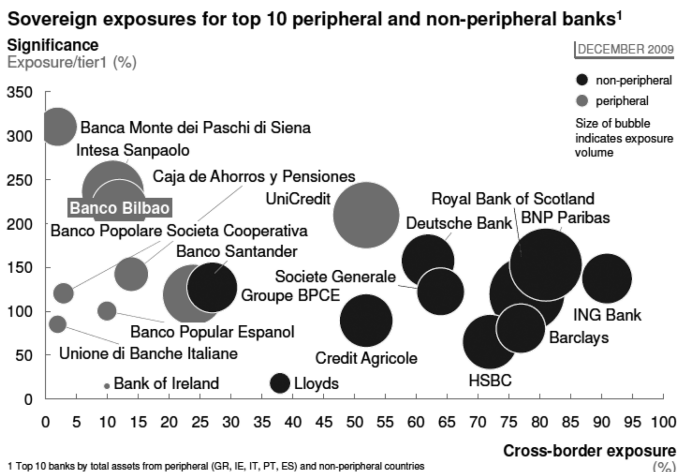
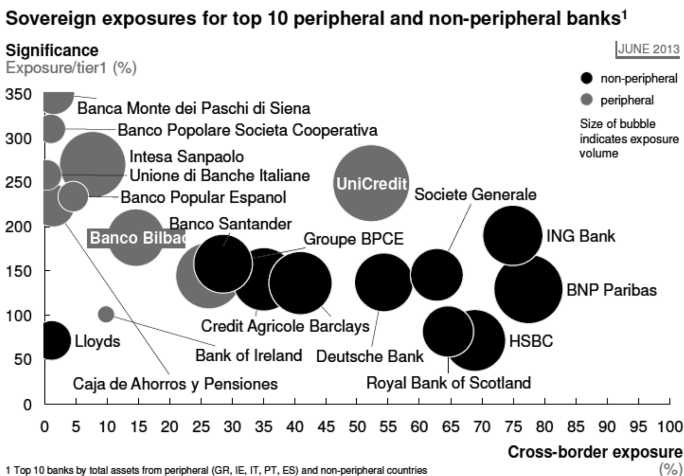


Figure 3. Panel B. Sovereign Exposures as of June 2013

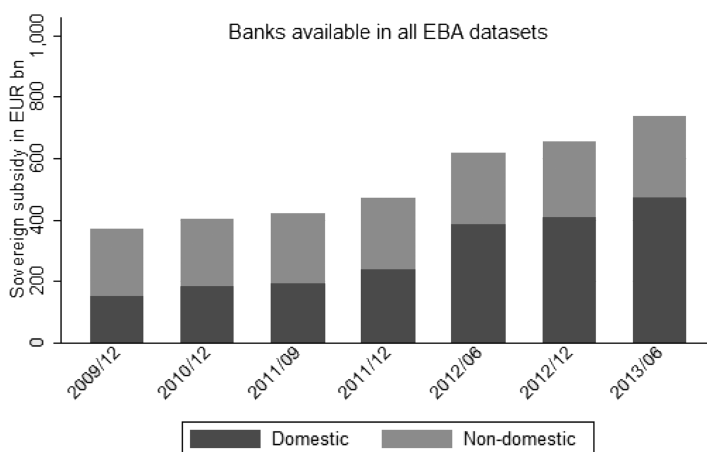


### 10.3. THE SOVEREIGN SUBSIDY

In Korte and Steffen (2014), we propose a new measure that quantifies the sovereign subsidy due to zero risk weights. We assign risk weights to each sovereign exposure and compute the corresponding risk weighted assets that are not adequately reflected in banks' capital. We call the latter the "sovereign subsidy" and use alternative methods to compute the appropriate risk weights for the sovereign exposures. Our main measure is similar to the EBA stress test methodology and uses the rating of a country, the corresponding probability of default, and the Basel approach to compute risk weights for sovereign debt.

Constructing this measure for the 54 banks that were part of all EBA exercises (Figure 4), we document that this subsidy accumulates to approximately EUR 750 billion as of June 2013. This corresponds to almost 100% of banks' tier 1 capital, on average – an exposure that is not adequately reflected in banks' capital position! Figure 4 also shows that the sovereign subsidy has nearly doubled over the last four years. This is only in part due to increasing sovereign exposures, but mostly driven by deteriorating sovereign credit risk and correspondingly increasing risk weights.

Figure 4. Sovereign subsidy



The EBA published the RWA that banks report for their sovereign debt exposure for Q4 2012 and Q2 2013. Based on this, we calculate the 'actual risk weights' that banks apply to sovereign debt. On average, this risk weight is 1.4%.

#### 10.4. ZERO RISK WEIGHTS AND CONTAGION WITHIN THE EUROZONE

As the sovereign subsidy considers risks that are not adequately reflected in a bank's capital, it measures a potential capital shortfall if the creditworthiness of a country deteriorates. A bank with a larger non-domestic sovereign subsidy may thus require a larger public backstop by its respective government<sup>6</sup>.

Therefore, as domestic banks' non-domestic sovereign exposure increases or becomes riskier, so does the contingent liability of the domestic sovereign. Consequently, a sovereign's risk is not only immediately linked to the risk of other EU sovereigns through the CDS market and other linkages, but also through the (implicit) bailout guarantees of the sovereign for its domestic banking sector. Zero risk weights thus create a channel through which sovereign risk can be transmitted among EU member states.

In our recent paper, we document that changes in a value-weighted non-domestic European Sovereign CDS Index indeed co-move with changes in sovereign CDS spreads. More importantly, this co-movement is amplified the larger the (non-domestic) sovereign subsidy of a country's domestic banking sector is, consistent with larger expected bailout costs in case of a sovereign default. These results hold controlling for other determinants of CDS spread changes, bond yield changes as alternative measure for sovereign risk as well as for credit ratings and CDS implied sovereign subsidy measures. They also hold when controlling for alternative channels of sovereign risk spillovers such as mutual bailout responsibilities and other linkages between member states. Exploring exposures to non-EU members as a falsification test, we find an insignificant effect of the sovereign subsidy on sovereign CDS spreads. Moreover, we find that the effect also becomes insignificant for non-domestic exposures to EU member states after the September 2011 capital exercise by the EBA when banks were required to build up a sovereign capital buffer.

#### 10.5. CLOSING THE SOVEREIGN GAP

Using recent EBA data, we document that domestic and non-domestic sovereign exposures are an important phenomenon for banks across Europe. Current regulatory capital requirements, however, leave banks severely under-capitalized given the riskiness of their sovereign bond portfolios which amplifies risk spill-

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<sup>6</sup> To the extent that there is a credible TBTF guarantee, the sovereign subsidy can be viewed as a put option on the sovereign's creditworthiness with a strike price at the face value of the exposure.



over within the Eurozone and increases the implicit bailout costs of the banking sector.

The implementation of Basel III through the CRD IV does not attempt to adequately address this problem. However, the additional capital requirement for sovereign debt holdings that has been introduced by the EBA' capital exercise in September 2011 could be a first step in this direction. Adequate risk weights for sovereign debt should be applied and be part of prudential capital regulation. As there is a large contingent capital shortage due to the zero risk weight, replacing it for a more risk-adequate treatment of sovereign exposures would most likely require an additional capitalization effort for banks and additional sovereign backstops.

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## 11. IS THE COMPREHENSIVE ASSESSMENT REALLY COMPREHENSIVE?

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### Abstract

The Comprehensive Assessment is the first action taken by the European Central Bank as supervisor of the banking sector in the euro area according to the Single Supervisory Mechanism. The key question relies on whether the exercise was truly comprehensive or not. The database, made available by the central bank and the European Banking Authority, allows to verify for the possibility of double standards with respect to banks' business models (traditional credit activity versus financial assets) and to their country of origin. Answers are surprising on both aspects.

### 11.1. INTRODUCTION

A few days before the start of the Single Supervisory Mechanism, on the 26th of October 2014, the results of the Comprehensive Assessment (CA) were released: CA can be considered the true kick off of the European Banking Union. CA was performed by the European Central Bank (ECB), in collaboration with the European Banking Authority (EBA) and the national competent authorities, in order to check financial health of the banks that ECB would have supervised within few days.

Two were the main tasks of the CA: i) it tried to define a level playing field in the euro-area banking sector, harmonizing the different national approaches to supervision, and ii) it sought for an adequate level of capitalization for European banks assessing their main risks. These two tasks were addressed through two 'exercises' that complement each other: the Asset Quality Review (AQR) which was focused more on the first task and a Stress Test (ST) analysis, tuned more on the second task. In the ST there were a baseline scenario and an adverse scenario, where the baseline scenario was derived from the (country specific) European Commission's three year forecasts while the adverse scenario was a downward perturbation of the baseline.

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While ST can be considered nowadays a ‘standard’ methodology for the banking sector in both in USA and Europe, the AQR was a detailed analysis of a selection of banks portfolios with the explicit mandate of harmonization on both traditional credit activity (*e.g.* the definition of non-performing exposure, impairment triggers, provisioning approaches for going concern non-performing exposures and point-in-time collective provisioning) and financial assets (mainly on the valuation methodologies of the most complex financial assets in a bank’s balance sheet – *i.e.* level 3 assets – and on CVA – credit value adjustment – calculation).

The AQR led to EUR 48 billion (bn) of adjustments to bank assets, while the capital adjustment related to the adverse ST scenario was EUR 263 bn, a median 4% reduction in the Common Equity Tier 1 (CET1) ratio (ECB, 2014).

Due to the relevance and novelty of the exercise in the euro area, several are the relevant questions that could be addressed. In this short contribution we just aim to identify whether the exercise was truly comprehensive and we verify for the possibility of double standards with respect to banks’ business models and to their country of origin. For broader questions as the capability of the CA to capture bank risk we refer to Acharya and Steffen (2014) and Barucci *et al.* (2016).

In order to achieve this objective, we investigate the determinants of the capital shortfall of a bank, considering two different measures: i) shortfall with respect to the AQR and ii) shortfall after the CA. The latter is obtained as the maximum of the three shortfalls (AQR and two ST scenarios) and it amounts to EUR 24.6 bn for 25 banks (ECB, 2014). As explanatory variables, we include country and balance sheet variables.

Our main findings are as follows: a) the assessment was biased against banks specializing in traditional activity; b) the leverage ratio performs better than the risk-weighted capital ratio, *i.e.* the CET1 ratio, in capturing the shortfall of the CA; c) the shortfall seems to depend on the country where the banking group is incorporated.

Even a purely descriptive analysis shows that the AQR exercise concentrated predominantly on traditional credit activity rather than on the financial assets detained by banks: only EUR 1.4 bn of the AQR adjustments were due to asset evaluation adjustments, EUR 3.1 bn came from the revision of CVA values while EUR 43 bn came from credit adjustments (ECB, 2014). Our analysis confirms this observation: the AQR shortfall and the CA shortfall are positively affected by the role of credit activity but they are not influenced by the presence of the financial assets, even those extremely difficult to evaluate (level 3 assets).

Our analysis sheds some light on the banking capital debate. As expected, the AQR shortfall is negatively affected by the CET1 ratio and by the leverage ratio.

However, we show that the CA shortfall is affected by the leverage ratio, whereas the CET1 ratio does not play any explanatory role. This view reinforces the scepticism concerning the reliability of risk-weighted capital ratios following the financial crisis (for European stress tests in 2011 and in 2014, see *e.g.* Acharya *et al.*, 2014; Acharya and Steffen, 2014; Haldane, 2012; Le Leslé and Avramova, 2012).

Furthermore, our results show some evidence that the CA shortfall depends on the country in which the bank group is incorporated: banks located in peripheral countries are penalized in comparison to those of core countries.

The remaining part of the paper is organized as follows. In Section 2 we describe the empirical model and we present our main results, both on the AQR shortfall and on the shortfall of the CA as a whole. In Section 3 we conclude and underline some policy implications.

## 11.2. EMPIRICAL MODEL AND MAIN RESULTS

We analyse bank-level data from the ECB and the EBA, with respect to shortfalls after the AQR and the ST. The CA involved 130 banks for the AQR with total assets of EUR 22 trillion (tr) and risk-weighted assets (RWAs) of EUR 8.5 tr, which account for 81.6% of the banking system under the umbrella of the Single Supervisory Mechanism. The AQR focused on bank assets as at the end of 2013, while the ST performed a scenario analysis on a three-year window up to 2016. Our sample is made up of 129 banks operating in the euro area<sup>3</sup>.

The gross domestic product (GDP) figures are 2013 values from the World Bank database.

Our research strategy is to estimate the shortfall of a bank associated with the AQR and with the CA (maximum of the shortfalls of the AQR, of the ST under the baseline scenario and of the ST under the adverse scenario). We refer respectively to the two shortfalls as  $SF_{AQR}$  and  $SF_{CA}$ . The capital shortfalls are obtained as the absolute value of the differences (floored at zero) between the CET1 ratio obtained after the AQR or the ST and the associated thresholds (8% for the AQR, 8% in 2016 post ST under the baseline scenario and 5.5% in 2016 post ST under the adverse scenario).

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<sup>3</sup> We omit data from Deutsche Bank Malta because of the abnormal CET1 ratio (281%).

We consider the following reference model:

$$SF\_Y_i = k + \beta_1 \cdot cap_i + \beta_2 \cdot lasset_i + \beta_3 \cdot lasset_i^2 + \beta_4 \cdot npe_i + \beta_5 \cdot cr_i + \beta_6 \cdot sys_i + \beta_7 \cdot marketcap_j + \beta_8 \cdot level3_i + \gamma \cdot X + \varepsilon_i \quad (1)$$

where  $SF\_Y_i$  denotes either the AQR or CA shortfalls of bank  $i$ , expressed in EUR bn. In the model we include two types of exogenous variables: bank-specific variables (lower case  $i$ ) and a country specific variable (lower case  $j$ ) that refers to the country in which the bank holding company is located.

We control for the size of the bank using the logarithm of total assets (*lasset*) and we allow for nonlinearities by also including the square of this variable (*lasset*<sup>2</sup>). The size of the balance sheet size could provide a control variable for the level of the shortfall for several reasons: on the one hand, a large bank is more likely to be supervised by the market and therefore the need for intervention from the supervisory authority could be less intense; on the other hand, a large bank is riskier from a systemic risk perspective, thus potentially making supervision softer or tougher. To investigate further how the bank's relevance affects the CA exercise, we also consider the ratio of the assets of the bank over the nominal GDP of the country in which the bank is incorporated (*sys*). This ratio should explicitly capture the systemic relevance associated with a bank in terms of the relationship between size and systemic risk (see *e.g.* Laeven *et al.*, 2014).

There is a still open debate on the appropriate capital ratio (risk-adjusted versus non-risk-adjusted) that should be considered in order to capture the riskiness of a bank's balance sheet. This debate leads us to introduce as capital ratio (*cap*) either the CET1 ratio (*cet1*) or the leverage ratio (*lr*)<sup>4</sup>. If a capital ratio is a reliable indicator of the bank's solidity, it should have a negative effect on the size of the shortfall for the AQR and for the CA as a whole. Note that the shortfall is defined with respect to CET1 thresholds and thus (in an obvious way) a lower shortfall should be associated with a higher CET1 ratio as a starting point (both for the AQR and for the CA as a whole).

We investigate how the composition of the balance sheet affects the shortfall. To capture how credit quality affects the shortfall of the AQR and of the CA, we consider the ratio of non-performing exposures over total exposures (*npe*) and the coverage ratio for non-performing exposures (*cr*), i.e. the ratio between credit loss provision funds and non-performing exposures. As far as the asset component is concerned, we consider the proportion of level 3 assets to total assets (*level3*).

<sup>4</sup> The leverage ratio is computed as CET1 capital over total assets and measured according to the Capital Requirements Regulation under the Capital Requirements Directive.

For the country-specific variables, we consider stock exchange market capitalization over nominal GDP (*marketcap*). Our goal is to control for a market discipline effect that may substitute supervisory scrutiny. Our hypothesis is that an economy with a well-developed financial market should be characterized by lower AQR and ST shortfalls because the market has already imposed on banks adequate capitalization/risk management tools.

We complete our analysis by inserting two further explicative variables. The dummy variable *Drestruct* takes a value equal to 1 in the case of a bank undergoing a restructuring process before 31 December 2013 and 0 otherwise: a restructuring plan for a bank is usually accompanied by tougher activity by the supervisory authority, deleveraging/cleaning of the books and public or private capital injections. We also include the dummy variable *Dirb* (which takes a value equal to 1 in the case of a bank with more than 50% of its RWAs computed according to the internal rating model) to check whether banks use the discretion of Basel II/III agreements to reduce RWAs (see *e.g.* Mariathasan and Merrouche, 2014).

We estimate (1) using a Tobit estimator, which overcomes the problem of inconsistent results derived from using the ordinary least squares estimator when the dependent variable is truncated (see Wooldridge, 2002).

Let us stress that according to the Basel II/III framework, if regulatory and supervisory activities work properly, then the CET1 ratio should provide exhaustive information about the soundness of the bank while other indicators should be redundant.

The reference model is estimated and the results are reported in Table 1, p. 100.

As expected, we find that a high CET1 ratio negatively affects the shortfall of the AQR (model I).

However, considering *SF\_CA*, the relationship is not confirmed. It seems that the CET1 ratio was considered a reliable capital indicator by national authorities and the ECB during the AQR, but that it was not able to capture adequately the risks of a bank and therefore the shortfall of the CA is not negatively affected by the CET1 ratio (models V and VI). On the other hand, the leverage ratio turns out to be always highly significant (models III, IV, VII and VIII): leveraged banks (low ratio) are characterized by higher capital shortfalls. In contrast to the general paradigm of the Basel II/III regulation, grounded on risk-adjusted capital ratios, this evidence signals that the CA's capital shortfalls are mainly driven by the leverage ratio.

As far as bank size is concerned, we observe an inverted U shape: the *SF\_AQR* and *SF\_CA* of medium-sized banks are higher than the shortfalls for small and

**Table 1. Regression results – reference model for capital shortfall.**  
The table reports the estimation results based on the Tobit estimator.

Dependent variable	Model							
	I	II	III	IV	V	VI	VII	VIII
	SF_AQR	SF_AQR	SF_AQR	SF_AQR	SF_CA	SF_CA	SF_CA	SF_CA
cet1	-0.098*** [0.027]	-0.099*** [0.020]	-	-	-0.071 [0.046]	-0.079 [0.049]	-	-
lr	-	-	-0.188*** [0.059]	-0.194*** [0.057]	-	-	-0.617*** [0.148]	-0.652*** [0.143]
lasset	0.615*** [0.188]	0.786** [0.343]	0.873 [0.605]	1.143** [0.560]	1.750** [0.805]	1.841** [0.872]	1.574 [0.987]	1.663 [1.089]
lasset <sup>2</sup>	-0.060** [0.025]	-0.082 [0.052]	-0.130 [0.094]	-0.174** [0.083]	-0.195** [0.098]	-0.222** [0.110]	-0.200 [0.123]	-0.229 [0.142]
npe	0.021** [0.009]	0.031*** [0.011]	0.054*** [0.012]	0.065*** [0.018]	0.096*** [0.035]	0.100*** [0.036]	0.153*** [0.033]	0.160*** [0.031]
cr	-0.010* [0.005]	-0.019*** [0.006]	-0.012* [0.007]	-0.022** [0.009]	-0.020** [0.010]	-0.020* [0.011]	0.006 [0.009]	0.006 [0.011]
sys	-0.005* [0.003]	-0.012*** [0.004]	-0.008*** [0.002]	-0.015*** [0.004]	-0.013 [0.009]	-0.019* [0.010]	-0.016** [0.007]	-0.023*** [0.008]
marketcap	-0.010** [0.004]	-0.018*** [0.005]	-0.016** [0.007]	-0.024*** [0.007]	-0.026** [0.012]	-0.034** [0.014]	-0.038*** [0.010]	-0.050*** [0.013]
level3	-0.087 [0.071]	-0.149* [0.079]	-0.044 [0.059]	-0.057 [0.067]	0.057 [0.129]	0.041 [0.126]	0.019 [0.112]	-0.030 [0.110]
Drestruct	-	0.696*** [0.234]	-	0.737*** [0.273]	-	1.041* [0.592]	-	1.207** [0.518]
Dirb	-	-0.196* [0.099]	-	-0.216 [0.152]	-	0.255 [0.496]	-	0.085 [0.396]
constant	-0.082 [0.359]	0.135 [0.546]	-0.214 [1.013]	-0.047 [1.077]	-2.768 [1.775]	-2.515 [1.977]	-0.533 [1.904]	-0.026 [2.048]
sigma	0.279*** [0.068]	0.206*** [0.029]	0.404*** [0.071]	0.357*** [0.053]	1.338*** [0.255]	1.287*** [0.236]	1.020*** [0.159]	0.933*** [0.117]
F statistic (p-value)	0.000	0.000	0.000	0.000	0.004	0.005	0.000	0.000
Uncensored obs	16	16	16	16	25	25	25	25
Obs	129	129	129	129	129	129	129	129

*Notes: Cluster-robust standard errors appear in parentheses. We use Stata11 for all calculations. \*, \*\*, \*\*\* indicate statistical significance of the parameters at the 10%, 5% and 1% significance levels respectively.*



large banks. The fact that large banks were not penalized by the CA is confirmed by the negative and significant coefficient associated with the variable capturing the systemic nature of the bank (*sys*). We can interpret this evidence as showing that the supervisors are captive to large banks. However, it may be the case that large banks are able to evaluate their assets more carefully or possibly were subject to greater supervision in the past due to the ‘too big to fail’ problem.

The role of financial markets can be easily understood: a well-developed financial market (represented by the variable *marketcap*) negatively affects both *SF\_AQR* and *SF\_CA*. This result illustrates the role of market supervision (Basel II’s third pillar), which complements the activity of the supervisory authority (Basel II’s second pillar).

Looking at the composition of the balance sheet, credit activity and financial assets play a different role. On the one hand, we observe that the shortfall is inflated by the ratio of non-performing loans, representing an indicator of the quality of credit: lower quality (higher ratio) induces a more significant shortfall; a phenomenon partially balanced by a high coverage ratio that negatively affects the shortfall (weakly in the case of the CA as a whole). On the other hand, surprisingly, the proportion of level 3 assets over total assets does not affect the shortfall of either the AQR or the CA: this outcome signals that the CA fails to capture higher risks related to illiquid and complex financial activities.

Taking into account the additional explanatory variables with respect to the reference model, we find first that the role of restructuring plans (*Drestruct*) is significant and robust as the specification varies: a bank under restructuring is characterized by a higher shortfall of the AQR and of the CA as a whole. Second, the coefficient associated with the dummy variable measuring whether a bank relies on the internal rating approach (*Dirb*) is rarely statistical significant: we can deduce that according to the CA, the adoption of the internal-based model is not associated with risk weight manipulation.

Looking at the overall fitness of the models, we find that the standard error of the regression (*sigma*) is the lowest when the CET1 ratio is included with the *SF\_AQR* as the dependent variable (model II), while the best fit for the *SF\_CA* is obtained by including the leverage ratio (model VIII).

We also develop our analysis comparing banks by country of origin. The CA exercise was followed by a dispute about the possibility that the ECB adopted double standards with respect to banks depending on their country of origin; to address this point, we provide some regressions considering among the exogenous variables a dummy variable (*Dcore*), which assumes a value equal to 1 in the case that a bank is incorporated in one of the core countries (Austria, Belgium, Germany, Finland, France, Luxembourg and the Netherlands) and 0 otherwise (peripheral countries). In Table 2 we provide some regressions for *SF\_AQR*.

**Table 2. Regression results – Core vs non-core country effects on capital shortfall in the AQR.**

The table reports the estimation results based on the Tobit estimator.

Dependent variable: SF\_AQR

	Model					
	I	II	III	IV	V	VI
cet1	-0.092*** [0.018]	-	-	-0.105*** [0.017]	-0.103*** [0.014]	-0.100*** [0.016]
lasset	0.773** [0.328]	0.759** [0.323]	1.166** [0.509]	0.754** [0.290]	0.908*** [0.332]	0.613** [0.284]
lasset <sup>2</sup>	-0.080 [0.050]	-0.078 [0.050]	-0.181** [0.077]	-0.078* [0.044]	-0.103** [0.052]	-0.051 [0.043]
sys	-0.011*** [0.004]	-0.012*** [0.003]	-0.014*** [0.005]	-0.011*** [0.003]	-0.012*** [0.003]	-
marketcap	-0.019*** [0.004]	-0.027*** [0.003]	-0.025** [0.010]	-0.024*** [0.003]	-0.027*** [0.004]	-0.022*** [0.003]
Drestruct	0.804*** [0.223]	1.039*** [0.155]	0.806** [0.406]	0.909*** [0.157]	1.017*** [0.185]	0.929*** [0.141]
Dirb	-0.201 [0.126]	-0.254*** [0.081]	-0.093 [0.193]	-0.196* [0.103]	-0.163 [0.105]	-0.328*** [0.092]
1-Dcore	0.410*** [0.147]	-2.397*** [0.809]	-0.092 [0.960]	-0.447* [0.248]	-0.830* [0.433]	-0.197 [0.165]
npe	0.025** [0.010]	0.018** [0.008]	0.054*** [0.016]	-	0.019** [0.008]	0.021*** [0.008]
cr	-0.028*** [0.009]	-0.006 [0.008]	-0.027 [0.019]	-0.008 [0.006]	-	-0.020*** [0.006]
level3	-0.232** [0.090]	-0.170** [0.075]	-0.114 [0.188]	-0.165** [0.071]	-0.154** [0.076]	-0.221*** [0.079]
cet1xDcore	-	-0.398*** [0.089]	-	-	-	-
cet1x(1-Dcore)	-	-0.103*** [0.014]	-	-	-	-
lrxDcore	-	-	-0.419** [0.203]	-	-	-
lrx(1-Dcore)	-	-	-0.157*** [0.050]	-	-	-
npexDcore	-	-	-	-27.057*** [7.951]	-	-
npex(1-Dcore)	-	-	-	1.849** [0.736]	-	-
crxDcore	-	-	-	-	-4.618***	-

**Table 2. Regression results – Core vs non-core country effects on capital shortfall in the AQR.**

The table reports the estimation results based on the Tobit estimator.  
Dependent variable: SF\_AQR

	Model					
	I	II	III	IV	V	VI
					[0.819]	
crx(1-Dcore)	-	-	-	-	-0.359	-
					[0.898]	
sysxDcore	-	-	-	-	-	-0.135***
						[0.029]
sysx(1-Dcore)	-	-	-	-	-	-0.011***
						[0.003]
constant	0.205	2.548***	0.311	0.639	0.672*	0.904*
	[0.468]	[0.565]	[1.021]	[0.404]	[0.401]	[0.469]
Sigma	0.183***	0.160***	0.337***	0.165***	0.164***	0.162***
	[0.025]	[0.026]	[0.048]	[0.024]	[0.025]	[0.027]
$\beta_{Dcore} = \beta_{(1-Dcore)}$ (p-value)	-	0.001	0.172	0.000	0.002	0.000
$\frac{\delta SF\_aqr}{\delta Z_{Dcore}} \Big _Z$	-	-5.518***	-1.773**	-58.026***	-189.6***	-3.523***
$\frac{\delta SF\_aqr}{\delta Z_{(1-Dcore)}} \Big _Z$	-	-3.542***	-1.054	18.775**	-16.382	-0.552***
F statistic (p-value)	0.000	0.000	0.000	0.000	0.000	0.000
Uncensored obs	16	16	16	16	16	16
Obs	129	129	129	129	129	129

Notes: Cluster-robust standard errors appear in parentheses. We use Stata11 for all calculations. \*, \*\*, \*\*\* indicate statistical significance of the parameters at the 10%, 5% and 1% significance levels respectively. Derivatives are evaluated at the median value of the Z control variable interacted with Dcore and (1-Dcore).

We consider the variable *1-Dcore* (Model I) and then we interact it with five different exogenous variables: i) CET1 ratio; ii) leverage ratio; iii) non-performing exposure; iv) coverage ratio; v) systemic risk indicator (models II to VI). To check whether the effect of core countries is statistically different from that of non-core ones, we report the Wald test for the equality of the coefficients. We also report the derivative of the five exogenous variables evaluated at the median value for the two different groups of countries.

First we observe that the effect of the *1-Dcore* variable, without interactions, on the shortfall of the AQR is positive and significant (model I). Then we notice that the coefficients of some exogenous variables (*cet1*, *npe*, *cr* and *sys*) interacted

with *Dcore* and *1-Dcore* are statistically different. In absolute values, the coefficients associated with banks incorporated in core countries are higher than the coefficients associated with banks incorporated in non-core countries. A high CET1 ratio (model II) for a bank of a core country negatively affects the shortfall more than in the case of a bank of a peripheral country. With respect to non-performing exposures, we find that the effect is positive and significant in the case of peripheral countries, while it is negative and significant for core countries (model IV). Confirming this evaluation, the effect of the coverage ratio in core countries is negative and significant, while in peripheral countries it is not significant (model V). Finally, we notice that the systemic risk indicator associated with a large bank implies a milder impact for credit institutions operating in core countries than for those located in peripheral ones (model VI).

These results can be interpreted in two different ways: either as a signal of ‘favour’ (severity) of country regulators in peripheral (core) countries before the CA exercise, or as evidence that the AQR was benevolent (tough) towards banks incorporated in core (non-core) countries.

### 11.3. CONCLUSIONS AND POLICY IMPLICATIONS

The results of the CA raised a number of questions related to the fact that it was not neutral. In particular, two issues were widely discussed: i) the CA was biased towards traditional credit activity; ii) banks located in peripheral countries were penalized.

The analysis of the shortfall of the CA provided in this paper highlights that some factors affect the shortfall besides the CET1 ratio starting point: i) banks located in non-core countries were penalized by the AQR; ii) medium-sized banks are either more risky or were penalized by the CA; iii) poor credit quality and credit specialization are the main balance sheet features driving the shortfall, while the proportion of assets that it is difficult to evaluate plays no role. Moreover, we find that the CET1 ratio is significant in explaining the shortfall of the AQR, but not in explaining the shortfall of the CA.

However, the leverage ratio is always significant: a less leveraged bank would experience a lower shortfall.

These results provide three interesting policy insights. First of all, the analysis shows that the leverage ratio constraint introduced by the Basel III regulation is a better indicator of financial soundness than the classic risk-weighted capital ratio. As the actual Basel III calibration of the leverage ratio is soft (see Basel Committee on Banking Supervision, 2015), the suggestion is to set a sharper constraint on the leverage ratio. The second implication is that the European

Banking Union marks an important step in harmonizing the banking sector at the European level considering that the national regulatory/supervisory standards were quite heterogeneous before the CA. However, our analysis shows that the ECB's supervision activity needs refinement as it is overly concentrated on traditional activity with a limited focus on the evaluation of financial assets. As the financial crisis has shown that complex assets evaluated according to a model may be a source of instability, a tougher approach by the ECB towards these assets seems necessary. Considering all these aspects, some doubts emerge about the ability of the CA to be really comprehensive. From this perspective, the Supervisory Review and Evaluation Process (SREP), promoted by the EBA and ECB from 1 January 2016, seems to be a useful step as the experience of the Federal Reserve (2015) suggests.

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## 12. THE SSM AND MULTINATIONAL BANKS

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### 12.1. INTRODUCTION

In its initial proposal to confer supervision powers to the European Central Bank (ECB), the European Commission referred to the necessity of complementing the European Union (EU)-wide regulatory framework with a supranational supervision mechanism in order to avoid “supervisory failings, [which] have, since the onset of the banking crisis, significantly eroded confidence in the EU banking sector and contributed to an aggravation of tensions in euro area sovereign debt markets”<sup>2</sup>. In particular, large multinational banks (MNBs) present in several countries pose a particular challenge for bank supervisors divided along national borders. Dexia, for instance, was supervised by the national authorities of Belgium, France, Luxembourg, and the Netherlands, and yet suffered a catastrophic failure leading to a 6 bln EUR bail-out in 2011.

The new supervisory architecture in the Euro Area aims at solving such failures by giving supervision powers to a supranational authority, namely the ECB. As of 2016, the 129 ‘most significant entities’ are directly supervised by the ECB, with many of them, and in particular the largest ones, having significant cross-border presence through a network of subsidiaries and branches. Organizing a foreign unit as a subsidiary or a branch has different implications regarding which supervisory authorities and deposit insurance funds are in charge, and how losses are shared inside the MNB. Changing the supervisory framework affects the trade-off faced by MNBs when opening a new foreign unit. We show that, through this channel, the Single Supervisory Mechanism (SSM) can have the unintended consequence of favoring branches over subsidiaries, in a way that puts more pressure on the weaker national deposit insurance funds. More generally, we highlight that the banking system will react to the new supervisory architecture in a way that severely limits the gains from centralizing bank supervision.

We thus join a burgeoning stream of theoretical papers that caution on the possible trade-offs and unintended consequences of the European Banking Union (see,

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<sup>2</sup> European Commission, *Proposal for a Council Regulation conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions*, 12 September 2012.

*e.g.*, Beck and Wagner, 2013; Colliard, 2014; Carletti, Dell’Ariccia and Marquez, 2016; Gornicka and Zoican, 2016). We also bring to this debate the perspective of the literature on supervision of MNBs, including papers such as Harr and Roende (2004), Lóránth and Morrison (2006), and Calzolari and Lóránth (2012).

## 12.2. MNBs’ REPRESENTATION FORM AND SUPERVISION

As already mentioned, there are two main forms the foreign unit of an MNB can take to operate in a foreign country:

A foreign *subsidiary* is a new legal entity, separate from the parent MNB. It is supervised by the host country’s supervisory authority, and its depositors are covered by the host deposit insurance fund. Moreover, in case of default, the parent MNB is protected by limited liability and does not have to cover the subsidiary’s losses.

On the contrary, a foreign *branch* is not legally distinct from the MNB. It is thus supervised by the home country’s authority and covered by the home country’s deposit insurance. Finally, losses in the foreign unit have to be covered by the MNB: the branch cannot default without the MNB defaulting.

Whether to operate with a branch or a subsidiary is a strategic decision of the MNB that entails different costs and benefits in terms of regulation. If the terms of the trade-off change due to a move towards supranational supervision, the MNB can also change the representation form of its foreign unit. It may also choose to simply shut down an existing foreign unit, and revert to domestic banking only.

## 12.3. SUPRANATIONAL SUPERVISION OF AN MNB

A specificity of the subsidiary structure is that it subjects the MNB to supervision by different authorities, at least one in the home country and one in the host country. Both authorities may have different objectives. In particular, they are supposed to protect different deposit insurance funds, which are national. When the host authority monitors the foreign subsidiary, this increases the value of the MNB’s foreign assets, which can be used to compensate potential losses in the home country and thus alleviate the burden on the home deposit insurance fund. In other words, the host supervisor exerts a positive externality on the home supervisor when monitoring the foreign unit. As a consequence, monitoring can be sub-optimally low under national supervision.



In principle, putting a supranational supervisor such as the ECB in charge of both units solves this problem, as the supervisor will internalize the effect of monitoring the foreign unit on the entire MNB. We thus have a micro-founded example of a ‘supervisory failing’ that can be solved by supranational supervision.

In our model, the shift to supranational supervision increases monitoring, which in turn decreases the interest rates that have to be served to the subsidiary’s creditors, and alleviates the burden on the deposit insurance funds of both countries. However, if the MNB reacts by changing its representation form, the unambiguously positive impact of supranational supervision is no longer warranted.

#### 12.4. THE STRATEGIC REACTION OF MNBs

The more intense monitoring of its foreign unit reduces the profitability of the MNB, so that supranational supervision is harmful to the subsidiary structure. In contrast, in our simple framework, supranational supervision makes little difference to branch-MNBs and to purely domestic MNBs. Indeed, in both cases only one supervisor is in charge, and all potential losses are covered by the national deposit insurance fund, so that there is no coordination problem in the first place.

In some cases, the MNB operates with a subsidiary precisely because it allows to exploit the coordination problem between national supervisors. When supranational supervision removes this friction, the implicit subsidy to the subsidiary structure disappears, and the MNB can find it more profitable to turn the subsidiary into a branch, or to shut it down. The banking system thus endogenously reacts to supranational supervision by reverting to an organization form in which supranational supervision is less needed.

When the MNB changes its organization form from subsidiary to either a branch or to domestic banking, it also shifts the burden of potential losses from the host deposit insurance fund to the home fund. Interestingly, we show that such a change can happen only when the home deposit insurance fund is actually weaker than the host fund. There is thus a risk that in the long-run the SSM may affect the organization of cross-border banking in a way that puts more weight on the most strained national deposit insurance schemes.

#### 12.5. DOES THE BANKING UNION NEED ADDITIONAL SUPERVISORY TOOLS?

A specificity of the current European Banking Union is the lack of overlap between the level at which supervision is organized and the level at which deposit

insurance is provided. Establishing a common deposit insurance scheme seems like a natural next step. Can it also solve the problem we are pointing at? Obviously, it does solve the problem that MNBs adopting a branch structure put more pressure on weaker national deposit insurance funds. However, common deposit insurance does not suppress the incentives to adopt a branch structure rather than a subsidiary structure. Actually, we find the opposite: the higher credibility of the common deposit insurance scheme increases the monitoring incentives of the supranational supervisor, thus heightening the discrepancy between the branch and the subsidiary structures.

A more natural solution would be for the supervisor to put a price on the use of the different legal structures. To the extent that branches and subsidiaries do not give rise to the same level of supervisory monitoring (and hence supervision costs) and to the same transfers from the deposit insurance fund, both supervisory fees and deposit insurance premia should in principle depend on the structure of the MNB. Indeed, we show that with ‘representation-form-dependent’ premia, banks can theoretically be given incentives to adopt the socially optimal representation form. In practice, this requires detailed information on the complex organizational structure of the MNB, but such an effort is necessary to understand and properly price the amount of public money at stake with the MNB.

## 12.6. CONCLUSION

The SSM is a major change in the organization of banking supervision in Europe. It is clear that the banking system itself cannot remain unaffected by such a drastic overhaul of the supervisory architecture. This endogenous reaction of the supervised banks needs to be taken into account when designing the supervisory framework. Otherwise, banks can react to the supervision change in a way that partially undoes what this change is trying to achieve. We precisely identify one such mechanism, namely the possibility for MNBs to reorganize their foreign units as branches, but the mechanism is of course more widely applicable.

More generally, the SSM is an interesting laboratory to illustrate the importance of how banking supervision is organized. The financial crisis brought about the realization that harmonized regulatory rules were not powerful enough without proper and coordinated supervision, so that the organization of supervisory authorities has been at the center of interesting regulatory debates, both in the European Union and in the United States. In particular, academics have started a fruitful discussion of the costs and benefits of centralized banking supervision, to which this work contributes.

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## 13. “BELIEVE ME, IT WILL BE ENOUGH”

### Governmental guarantees and banks’ risk taking in the fair value portfolio

*Ulf Mohrmann<sup>1</sup>, Maximilian Muhn<sup>2</sup>, Martin Nienhaus<sup>3</sup> and Jan Riepe<sup>4</sup>*

#### 13.1. MOTIVATION

On the 26<sup>th</sup> of July 2012, Mario Draghi, the president of the European Central Bank (ECB), announced the ECB’s willingness to engage in a large scale capital market intervention to foster the liquidity flow within the currency union, reduce the sovereign bond spreads of the most affected Euro countries, and preserve the Euro as a currency. On the following day, sovereign debt spreads in countries like Spain and Italy decreased by 1/3 (Heinz and Sun, 2014). This reestablished confidence in the financial health and power of those countries’ domestic institutions. Although the intervention mainly tackled the sovereign debt markets, it had far-reaching consequences for the banking industry. Because the value of any guarantee always depends on the financial health of the guarantor (Martinez-Peria and Schmukler, 2001), Draghi’s reassurance simultaneously represents one of the largest shocks to explicit as well as implicit governmental guarantees for the banking sector, with a distinct impact in crisis-prone countries.

#### 13.2. RESEARCH QUESTION AND HYPOTHESES

Governmental guarantees span a safety net for banks and, as a consequence, risk taking becomes more attractive because banks can shift risk onto the guarantor (Merton, 1977; Nier and Baumann, 2006; Farhi and Tirole, 2012; Fiechter, Landsman, Peasnell, and Renders, 2015; Acharya and Steffen, 2015). While there is a well-documented link between governmental guarantees and banks’ risk taking with respect to the loan portfolio (see, e.g., Gropp, Gruendl, and Guettler, 2013), little is known about the consequences of governmental guarantees on bank’s market portfolio. This gap in the literature is especially surprising because the capital market activities were at the heart of the 2007-financial crisis. One

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potential reason for this lack of empirical research goes back to the static nature of governmental guarantees that makes it challenging for the researcher to identify well suited empirical settings.

Regulatory capital requirements attempt to prevent excessive risk taking. However, because the regulatory risk limits are derived from financial statements, banks can use accounting discretion to increase the gap between reported regulatory capital and economic capital (Bushman, 2015). Beatty and Liao (2014) name delayed loan loss recognition, asset overvaluation, and the reclassification of financial assets as discretionary accounting choices of banks. While there is evidence for risk-shifting by means of delayed loan loss recognition (Bushman and Williams, 2012), we investigate whether banks overvalue their assets in the market portfolio to ease or circumvent the regulatory risk limits following the governmental guarantees' change in value.

The value of the implicit and explicit governmental guarantees depends on the confidence in the guarantor (Martinez-Peria and Schmukler, 2001). Before the announcement by Mario Draghi, there was considerable cross-country variation in the expected ability of the European countries to bail out their banks. With the ECB's willingness to assist the bailouts by supporting the governmental bonds, these differences substantially decreased. Thus, the statement of Mario Draghi strongly impacted the crisis-prone countries whereas other European countries remained largely unaffected. As a consequence, risk-shifting abilities of banks from the crisis-prone countries increased.

To quantify the changes in banks' risk taking following the positive shock on the value of governmental guarantees, we explore asset valuations in banks' market portfolio. We focus on Level 3 assets because these assets are estimated with unobservable inputs. The modelbased valuations contain a high degree of managerial discretion and, thus, are prone to overvaluations (Milbradt, 2012). We identify two distinct ways for banks to use the overvaluation of Level 3 assets to ease or circumvent regulatory risk limits. First, we explore valuation gains of the Level 3 assets in place. Furthermore, we consider transfers of existing assets into the Level 3 category. We test the hypothesis whether banks rely more heavily on non-market valuations methods (i.e., Level 3 measures) and assign higher values to these assets when the value of governmental guarantees is increasing. Furthermore, we expect that differences in the prudential filters (Bischof, Brüggemann, and Daske, 2014), which determine the magnitude of the regulatory impact, are supposed to moderate the effect. The overvaluation of existing Level 3 positions in the market portfolio allows for higher risk taking. However, the additional risk taking is not restricted to the market portfolio.

Second, we analyze the acquisition and divestiture of Level 3 fair value assets which directly influence the bank's risk position in the market portfolio. Transac-

tions in these assets are characterized by a higher information risk because there are no recent observable market prices from orderly transactions in active markets to serve as an external valuation benchmark. The higher information risk leads to adverse selection when liquidating those assets. Therefore, it harms the banks' ability to roll over bank debt (Thakor, 2012) and increases the short term default risk (Arora, Richardson, and Tuna, 2014). As the risk from illiquid assets was largely unregulated during the 2007-financial crisis, the risk appetite with respect to liquidity was unrestricted by the regulatory risk limits at the time. The typical elements of the Level 3 fair value category like (high-yield) bonds are preferable to other risky equity investments because of their lower regulatory risk weights. Using information on the acquisition of different fair value levels, we test the hypothesis whether banks take on larger positions of unregulated liquidity risk in response of changes in the governmental guarantees.

### 13.3. EMPIRICAL DESIGN

We use a hand-collected sample of the 150 largest European banks between 2009 and 2014. The hand-collection is especially valuable because it allows a) to study the gains and losses at different fair value levels, b) the assets' movements between the different levels, as well as c) the acquisitions and divestitures of assets at each fair value level. This information is not available from conventional databases.

The European setting has several advantages to investigate our research question. First, there is a plausibly exogenous shock on the value of governmental guarantees, which is known as the 'Draghi-Put', that we use as a quasi-natural experiment. At the height of the European sovereign debt crisis in July 2012, Mario Draghi, the European central bank's president, announced his willingness as the ECB president to do "whatever it takes" to preserve the Euro: "Believe me, it will be enough"<sup>5</sup>. This statement, which Draghi repeated at various occasions, was perceived by markets as a reliable signal on the ECB willingness to put a floor under EU sovereign debt prices, like a put option on those securities. Second, before the announcement of Mario Draghi, there was sufficient variation across the reliability of governmental guarantees and, hence, the Draghi-Put had a much stronger impact on the crisis-prone countries. Third, Europe is characterized by a strong harmonization with respect to the political stability, the rule-of-law, the accounting standards, and the banking regulation. Therefore, less affected countries provide a well suited control group to study the economic consequences of governmental guarantees. We exploit this unique setting with a difference-in-differences analysis. Furthermore, we run an event study on the announcement

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<sup>5</sup> [www.ecb.europa.eu/press/key/date/2012/html/sp120726.en.html](http://www.ecb.europa.eu/press/key/date/2012/html/sp120726.en.html).

day to gauge whether the markets' perception of this announcement is in line with our main analysis. This allows for a clear identification of the valuation consequences of the Draghi-Put.

### 13.4. PRELIMINARY RESULTS

Our preliminary results are based on an initial sample of 60 banks from ten countries. We classify five of these countries as treatment countries based on the magnitude of the reduction of their respective CDS spreads. The treatment countries are Belgium, Hungary, Ireland, Italy, and Portugal. In the descriptive statistics of Table 1, we find evidence that the relevance of banks' fair value portfolio for the overall business model is similar for our treatment group of crisis-prone countries and for the non-crisis countries. The means of the shares of fair value assets to total assets of 20.04% and 20.59% for the treatment and control countries, respectively, do not differ in statistical terms. However, the banks differ in the levelbreakdown of their fair value assets. The share of Level 3 assets relative to the total fair value assets is 6.21% (1.35%) for the treatment countries (the control countries). The difference is significant at the 1% level.

**Table 1. The Fair Value Portfolio**

Treatment	Banks	Countries	Fair Value Assets % of total	Level 3 Assets % of FVA
0	35	5	20.04 %	1.35 %
1	25	5	20.59 %	6.21 %
Total	60	10	20.27 %	3.37 %

*Table 1 shows the sample composition of affected versus unaffected banks, the overall relevance of the fair value portfolio on banks' business models, and the share of Level 3 fair value assets to the bank's total fair value assets.*

In a preliminary multivariate analysis, we start by looking at the open market purchases of Level 3 fair value assets by the banks. Our main variable of interest is an interaction term that indicates the treatment countries in the post-announcement period. In a regression of the Level 3 purchases scaled by the Level 3 assets at the beginning of the period on this interaction term we further include several control variables, and bank- and year-fixed effects. The main effects of the *Post Draghi* variable will be thereby incorporated in the year-fixed effects, whereas the main effect of the *Crisis Prone Bank* variable is already captured by the bank-fixed effect.



**Table 2. Preliminary Results on Level 3 Fair Value Asset Purchases**

Dep. Variable: Purchases of Level 3 Assets		
	(1)	(2)
Post Draghi * Crisis Prone Bank	0.326 *	0.347 *
Size (Ln TA)		1.517
Tier 1 Regulatory Capital Ratio		-0.559
Share of Level 3 Assets in place		-0.719
Loan to Assets		-0.268
Share of deposits to total assets		-0.679
Return on Equity		-0.002
Fixed Effects	B&Y	B&Y
N	240	191
R-squared	0.543	0.570

*Table 2 shows the consequences of the change in the governmental guarantee’s value on banks market purchases of illiquid Level 3 fair value assets. Firm- and year fixed-effects are included in all specifications. Robust standard errors are used with \* p<0.1.*

Looking at the preliminary evidence of Table 2, we find a statistically significant influence of the change in governmental guarantee’s value on banks’ asset acquisition behavior. Thus, treatment banks increase their Level 3 purchases when the value of the governmental guarantees increases, relative to the development of the Level 3 purchases of the less affected control banks. This is early support for our hypothesis that banks increase their risk position when their risk-shifting abilities become more pronounced.

### 13.5. CONTRIBUTION

This study relates to two streams of the literature. First, we contribute to the literature on the consequences of governmental guarantees by documenting the link between regulatory arbitrage and banks’ risk taking, especially the accumulation of illiquidity. Risk taking becomes more attractive if the governmental safety net becomes more resistant (Merton, 1977; Nier and Baumann, 2006; Farhi and Tirole, 2012; Fiechter, Landsman, Peasnell, and Renders, 2015; Acharya and Steffen, 2015). If governmental guarantees suddenly become reliable, the regulatory risk limits should prevent an excessive upward shift in risk taking. However, Hovakimian and Kane (2000) document the incapability of capital requirements to fully prevent risk-shifting onto the safety net. Accordingly, German evidence points towards lower risk taking in the loan book if governmental guarantees are abolished (Gropp *et al.*, 2013). This can be explained by regulatory arbitrage that can be achieved by using accounting discretion (Bush-

man, 2015). There is empirical evidence for the delayed recognition of loan losses to shift risks onto the safety net. Theoretical work by Milbradt (2012) and empirical evidence by Glaser, Mohrmann, and Riepe (2015) identify Level 3 valuations as an alternative device for regulatory arbitrage. In this paper we investigate whether Level 3 assets are specifically used as a way to exploit governmental guarantees.

Second, we contribute to the literature on the use of Level 3 fair value assets. According to IFRS 13, Level 3 valuations are to be used in situations without orderly transactions in active markets. However, there are some frictions that might influence the usage of Level 3 fair values in addition to market illiquidity. Botosan, Carrizosa, and Huffman (2011) document the impact of banks' valuation resources (proxied by the bank size) on the usage of Level 3 valuations. Moreover, IFRS 13 provides banks with some judgement that might be used opportunistically. Glaser, Mohrmann, and Riepe (2015) and Mohrmann, Riepe, and Stefani (2015) identify regulatory reporting incentives and audit firm size as drivers of the share of Level 3 valuations. We investigate whether governmental guarantees are an additional factor that impacts the use of Level 3 assets. Besides risk-shifting, this might be socially undesirable, because Level 3 valuations increase banks' information risk (Riedl and Serafeim, 2011).

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## 14. PRUDENTIAL REGULATION, NATIONAL DIFFERENCES AND STABILITY OF EU BANKS<sup>1</sup>

*Angela Maddaloni<sup>2</sup> and Alessandro D. Scopelliti<sup>3</sup>*

### 14.1. INTRODUCTION

The establishment of the Banking Union in the EU was driven by the need of ensuring a consistent and uniform application of EU banking rules in the aftermath of the financial crisis and the sovereign debt crisis. In such perspective, the two pillars of the Single Supervision and Resolution have been designed on the foundation of the Single Rule-Book, which defines the common framework for prudential regulation for all EU countries.

The idea of a Single Rule-Book for the prudential regulation of EU banks was firstly developed, even before the creation of the Banking Union, during the implementation process of Basel III. Indeed, the crisis experience raised the concern that heterogeneities at national level in prudential regulation across EU countries could have contributed to differences in the risk-taking of credit institutions before the crisis and consequently induced problems in the financial stability of their banking systems afterwards. This resulted also in negative spillovers on public finances as national governments intervened in support of distressed financial institutions.

In a recent paper (Maddaloni and Scopelliti, 2016), we investigate the role of cross-country differences in prudential regulation in the prevention of banking crises, by exploring the crisis resilience of credit institutions subject to different national regimes – before the crisis – within the context of the European Union. The analysis is based on a novel indicator of flexibility and discretion in prudential regulation, constructed by aggregating information from EU directive implementation, and provides new evidence on the importance of a level-playing field for prudential regulation across EU countries.

We find that credit institutions established in countries with less stringent prudential regulation had higher probability of being in distress during the crisis. This is quantified as measures of crisis support to banks implemented by EU Governments. Using the same framework, we also explore the potential trade-off between rules and discretion in the design of prudential regulation: general rules

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<sup>1</sup> This paper should not be reported as representing the views of the European Central Bank (ECB) or the Eurosystem. The views expressed are those of the authors and do not necessarily reflect those of the ECB or the Eurosystem.

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define the regulatory treatment for all banks in a given country, without requiring any previous supervisory assessment; while supervisory discretions assign to the supervisor the power to authorise specific banks to apply a more permissive treatment, on the basis of a case-by-case examination.

## 14.2. CAPITAL REGULATION AND NATIONAL DIFFERENCES ACROSS THE EU

This work contributes to the empirical literature on how banking regulation and supervision affect various aspects of banking system performance, such as stability, efficiency and loan provision. Some papers have examined the effect of prudential regulation on bank risk-taking, both in the domestic market and in foreign markets, by finding mixed results on the effectiveness of capital regulation in promoting the stability of national banking systems (see for example Barth, Caprio and Levine, 2004; Apanard, 2009; Altunbas, Manganelli and Marques-Ibanez, 2011; Beltratti and Stulz, 2012; Ongena, Popov and Udell, 2013). However, some issues may arise for instance when using global indicators of capital stringency for international comparisons. When these indicators are used to compare countries with a good level of harmonisation in the regulatory environment, due for example to the adoption of the Basel agreements, not enough heterogeneity is present.

The EU framework for banking regulation allows analysing this issue more in depth, by looking at the cross-country differences in the application of specific prudential rules, which can – within a general framework – significantly change the effective regulatory burden for credit institutions across different countries. We focus on the period before the starting of the financial crisis, when the key principles for banking regulation were established at the EU-level through directives, but then they were implemented at the country-level through national acts of transposition<sup>4</sup>. At the same time, banking supervision was exerted by national supervisors, which determined substantial differences in the application of prudential rules<sup>5</sup>.

Based on these observations, we construct an indicator of flexibility and discretion in banking regulation for EU countries, by exploiting information on the implementation of the Capital Requirements Directive in national systems. The construction of such indicator presents some elements of complexity, given the

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<sup>4</sup> This was the case for the implementation of both Basel I and Basel II.

<sup>5</sup> For a comparison with the regulatory design issues in the institutional context of the US banking system, see Agarwal *et al.* (2014).

number of countries as well as the technicality of the regulatory and supervisory issues involved in this work.

### 14.3. A NOVEL INDICATOR FOR PRUDENTIAL REGULATION IN THE EU

The basic idea on which the indicator relies is the fact that all countries in the EU adopted the guidelines of Basel I and then Basel II through the implementation of EU directives [precisely Dir. 48/2006 and Dir. 49/2006 for Basel II]. However, the directives allowed the existence of several options and national discretions which de facto created important cross-country differences on how the standards were implemented<sup>6</sup>. The European Banking Authority (EBA) has provided accurate information on these issues, following up on a request of the EU Commission. The EBA reports<sup>7</sup> which countries adopted such discretions and how they exerted them. We build the indicator by using this report from the EBA and integrate when necessary with information from the directives.

Given the large number of options and discretions, as well as the different impact of such options on capital requirements and regulatory burden, we construct a quantitative index that captures the degree of flexibility and discretion in prudential regulation for distinct countries. The possibility to exercise an option as defined in the Capital Requirements Directive (CRD) generally implies a more lenient regulatory treatment. We define the indicator such that the exercise of a regulatory option by a given country translates in higher values of the indicator. Then, a higher value of the indicator means a more permissive treatment for all credit institutions or for some of them (depending if the option is subject to supervisory approval).

The CRD contains two types of options and discretions (O&Ds), which can be classified along two different dimensions: Regulatory Flexibility and Supervisory Discretion. The general O&Ds – if exerted by the member country – allow for a more flexible banking regulation for all banks, as they relax the prudential requirements<sup>8</sup> or reduce some regulatory burden in terms of disclosure<sup>9</sup> (Regula-

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<sup>6</sup> In fact, also the current regulatory framework defined by the CRD4 Package for the implementation of Basel III (Dir. 36/2013 and Reg. 575/2013), although intended to establish a Single Rulebook, still contains a relevant amount of options and discretions. The ECB has recently undertaken an initiative with regard to the ones available to the supervisory authorities, in its capacity as the competent authority for significant institutions in the context of the SSM. See the draft Regulation and the Guide of the ECB on the exercise of options and discretions in Union Law (2015)

<sup>7</sup> The “Technical advice to the European Commission on options and discretions” was adopted in 2008 by the Committee of European Banking Supervisors, which was actually succeeded by the European Banking Authority on 1 January 2011. See CEBS (2008).

<sup>8</sup> For instance through some discretion in the implementation of accounting rules for own funds or item deductions, as well as in the application of the standardized or of the internal rating approaches.

<sup>9</sup> For example through some discretion in the disclosure framework for consolidated entities in banking groups.

tory Flexibility). At the same time, the case-by-case O&Ds attribute specific powers to the supervisory authorities, such that they are entitled to authorise the application of a more favourable regulatory regime for specific credit institutions (Supervisory Discretion).

The indicator addresses different aspects of the prudential framework in the Basel Accord, to assess their relative contributions to banking stability. We consider nine categories related to the implementation of the directive:

1. Definition of own funds
2. Scope of application
3. Counterparty risk
4. Standardised approach
5. IRB approach
6. Credit risk mitigation
7. Operational risk
8. Qualifying holdings
9. Trading book

For each of these categories we examined all the options that were allowed, inputting 1 for an option that indeed would increase regulatory flexibility or supervisory discretion and 0 otherwise. Moreover, acknowledging that not all the options had the same possible impact, we weight the input by 0.5 or 1, depending on the importance, as highlighted in the EBA report. For each category we calculate a weighted overall indicator of Prudential Regulation and two sub-indicators of Regulatory Flexibility and Supervisory Discretion. Figure 1 represents the values of the overall indicator and of the two sub-indicators for the EU countries in our sample<sup>10</sup>.

#### 14.4. PRUDENTIAL REGULATION AND CRISIS PUBLIC SUPPORT

By using the pre-crisis differences in the prudential framework across EU countries, we analyse the implications of such regulatory heterogeneities on the stability of financial intermediaries.

Based on the above described indicator, and controlling for bank-specific characteristics and country-specific factors, we examine whether cross-country heterogeneities in banking regulation and supervision may explain, in isolation or in

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<sup>10</sup> The details of the indicators are available upon request from the authors. Specific details about the exercise of options and discretions are not currently available for the Netherlands and Denmark.



**Figure 1. The Indicator of Prudential Regulation across EU Countries**  
**Regulatory Flexibility and Supervisory Discretion**

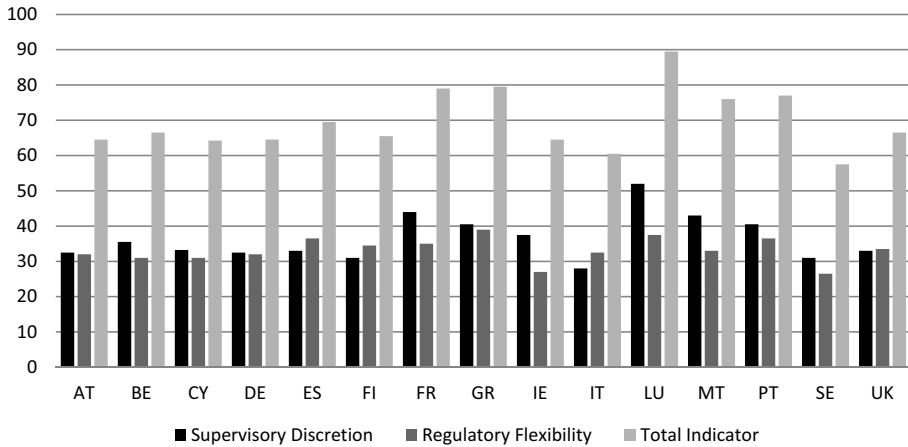


Figure 2. The above histogram displays the values of the overall indicator of Prudential Regulation, of the two sub-indicators of Supervisory Discretion and Regulatory Flexibility for 15 EU countries. The indicator is constructed on the basis of the exercise of national options and discretions in the implementation of the Capital Requirements Directive. A higher value of the indicator indicates a less stringent prudential framework in a given country.

combination with other factors, differences in the financial resilience of credit institutions located in distinct countries during the crisis period.

Given the extensive policy response to the banking crisis through various forms of public support, we identify episodes of bank distress for individual institutions by considering the measures of financial assistance, as implemented by EU Governments for banks<sup>11</sup>: capital injections, guarantees on bank liabilities, asset protection schemes and liquidity facilities (Stolz and Wedow, 2010).

Although these measures were enacted by national governments, EU law required – in order to avoid potential distortions to competition in the Single Market – the approval of state aid measures by the EU Commission, to ensure homogeneity of criteria in the public support of the financial sector across EU countries. In this way, the conditions required to authorise the provision of financial assistance to credit institutions in distress were set consistently across EU countries. This allows us to compare measures of public support implemented in different countries and to consider them jointly as episodes of bank distress.

For this reason, we collect the information on bank bail-out measures from the decisions of the European Commission (integrated with ad-hoc research using public information) on the approval of state aid to the financial sector and we

<sup>11</sup> See Laeven and Valencia (2012) for a cross-country analysis of banking crises in a global sample.

classify the various forms of support received by each bank. We restrict our analysis to the measures of crisis support implemented by EU countries from the beginning of 2008 to April 2011, in order to concentrate on the episodes of bank distress which can reasonably be linked to risk-taking conducts adopted by banks in the pre-crisis period<sup>12</sup>.

Table 1 presents some summary statistics of such measures for the banks included in our sample. We focus our analysis on banks established in 17 EU countries (EU15, Cyprus and Malta) with a minimum amount of assets of EUR 5 bn, based on the balance sheet data for the period 2000-2008 as available from Bankscope<sup>13</sup>.

The table shows that among the various forms of support, recapitalisations were the most common measures, immediately followed by credit guarantees: indeed, on average, 12.64% of the banks in our sample received capital injections, while 7.76% of the institutions benefited from credit guarantees. Asset relief schemes and liquidity facilities were relatively less common: the percentage of supported banks was equal to, respectively, 3.16% and 2.01% of the overall sample.

## 14.5. EMPIRICAL ANALYSIS

In order to conduct our analysis, we combine four sources of information: a) bank-level measures of crisis support (based on EU Commission archive); b) bank balance sheet variables (from Bankscope); c) country-level indicators of prudential regulation (as presented in section 14.3); d) country-level macro variables.

The main hypothesis to be tested is whether banks established in countries with a less stringent prudential framework experienced higher financial distress on average and then showed higher need for public support measures during the crisis.

For this purpose, we estimate a logit model for the probability of receiving a government bail-out as in equation (1):

$$P(\text{Support}_{i,j,Crisis}) = \Lambda(\mathbf{x}'\boldsymbol{\beta}) \quad (1)$$

where  $(\mathbf{x}'\boldsymbol{\beta}) = \alpha + \beta \text{Regul}_j + \gamma \text{BankControls}_{ijt} + \delta \text{MacroControls}_{jt} + \varepsilon_{ijt}$

where  $i$  denotes the bank,  $j$  identifies the country,  $Crisis$  refers to the period between Feb 2008<sup>14</sup> and April 2011 and  $t$  indicates the years from 2000 to 2008.

<sup>12</sup> We aim to exclude the episodes of bank distress which were determined more recently, as a consequence of the double dip recession affecting various EU countries, by the increase of non-performing loans for several credit institutions.

<sup>13</sup> To limit the restriction of the sample, we have considered banks reaching that minimum for at least one year in the considered period.

<sup>14</sup> The first public banking intervention was the nationalisation of Northern Rock by the UK Government

Table 1. Measures of Public Support to Banks

COUNTRY	RECAPITALISATIONS			GUARANTEES			ASSET RELIEF			LIQUIDITY SUPP.			ANY SUPPORT			ALL BANKS
	No. Inst.	Perc. Inst.	Perc. Assets	No. Inst.	Perc. Inst.	Perc. Assets	No. Inst.	Perc. Inst.	Perc. Assets	No. Inst.	Perc. Inst.	Perc. Assets	No. Inst.	Perc. Inst.	Perc. Assets	No. Inst.
AUSTRIA	6	16.22%	46.32%	6	16.22%	43.67%	3	8.11%	7.88%	0	0.00%	0.00%	7	18.92%	47.53%	37
BELGIUM	3	18.75%	83.65%	2	12.50%	65.00%	3	18.75%	83.65%	0	0.00%	0.00%	3	18.75%	83.65%	16
CYPRUS	0	0.00%	0.00%	5	62.50%	73.00%	0	0.00%	0.00%	0	0.00%	0.00%	5	62.50%	73.00%	8
GERMANY	9	5.49%	29.98%	8	4.88%	22.23%	6	3.66%	19.85%	0	0.00%	0.00%	11	6.71%	30.41%	164
DENMARK	0	0.00%	0.00%	8	66.67%	80.05%	0	0.00%	0.00%	0	0.00%	0.00%	8	66.67%	80.05%	12
GREECE	8	72.73%	86.26%	6	54.55%	81.20%	0	0.00%	0.00%	7	63.64%	84.79%	8	72.73%	86.26%	11
SPAIN	29	30.53%	20.34%	0	0.00%	0.00%	2	2.11%	1.16%	2	2.11%	1.16%	29	30.53%	20.34%	93
FINLAND	0	0.00%	0.00%	0	0.00%	0.00%	0	0.00%	0.00%	0	0.00%	0.00%	0	0.00%	0.00%	6
FRANCE	11	20.37%	83.57%	1	1.85%	4.93%	1	1.85%	4.93%	0	0.00%	0.00%	11	20.37%	83.57%	54
IRELAND	5	23.81%	50.77%	1	4.76%	9.95%	5	23.81%	50.77%	0	0.00%	0.00%	5	23.81%	50.77%	21
ITALY	4	4.60%	13.71%	0	0.00%	0.00%	0	0.00%	0.00%	0	0.00%	0.00%	4	4.60%	13.71%	87
LUXEMBOURG	1	1.96%	5.99%	1	1.96%	0.58%	0	0.00%	0.00%	1	1.96%	0.28%	3	5.88%	6.85%	51
MALTA	0	0.00%	0.00%	0	0.00%	0.00%	0	0.00%	0.00%	0	0.00%	0.00%	0	0.00%	0.00%	2
NETHERLANDS	6	18.18%	57.51%	7	21.21%	58.83%	1	3.03%	33.06%	1	3.03%	4.57%	9	27.27%	59.04%	33
PORTUGAL	0	0.00%	0.00%	5	29.41%	69.13%	0	0.00%	0.00%	1	5.88%	1.84%	5	29.41%	69.13%	17
SWEDEN	1	9.09%	40.87%	2	18.18%	16.38%	0	0.00%	0.00%	0	0.00%	0.00%	3	27.27%	57.24%	11
UNITED KINGDOM	5	7.04%	41.63%	2	2.82%	1.81%	1	1.41%	27.11%	2	2.82%	1.81%	5	7.04%	41.63%	71
ALL SAMPLE	88	12.64%	44.85%	54	7.76%	18.30%	22	3.16%	18.03%	14	2.01%	1.66%	116	16.67%	47.96%	696

Source: European Commission and authors' calculations.

In our baseline specification, we investigate whether banks established in countries with laxer prudential regulation had higher probability of receiving government support during the crisis, controlling for bank balance sheet variables and for macro variables. We consider, as dependent variables, either a general dummy for any type of public support, or specific dummies for peculiar measures of financial assistance (recapitalisations and liquidity facilities)<sup>15</sup>.

We use this framework to investigate two related research questions. First, we investigate the implications of different approaches to micro-prudential regulation, depending on whether it is based on general legal provisions or on ad hoc supervisory discretions.

For this purpose, we take advantage of the peculiar construction of our indicator, including the two sub-components of regulatory flexibility and supervisory discretion. Both sub-indicators measure the application of a more favourable regime to banks in terms of prudential requirements, although for different subsets of entities (all banks vs. specific banks on a case-by-case basis). We explore whether regulatory flexibility and supervisory discretion may affect the incentives for bank risk-taking in a different way.

Under regulatory flexibility, all banks can benefit from a more permissive treatment, without being subject to a supervisory decision: so credit institutions might not have an incentive to internalise possible consequences from excessive risk-taking, as they would not bear negative consequences from that – at least not in terms of prudential requirements. Under supervisory discretion, banks may take advantage of a less stringent regime only after an ad hoc supervisory decision: in such case, banks could have stronger incentives to undertake a more prudent conduct, in order to fulfil the conditions required by the supervisory authority for the approval of a more favourable regulatory treatment.

Second, we explore whether the relation between prudential regulation and bank distress probability may vary across banks depending on their ex-ante financial conditions.

To this aim, we exploit the heterogeneity of financial intermediaries with respect to their balance sheet position. In the logit regression, we introduce an interaction term between the indicator of prudential regulation and – depending on the specifications – different balance sheet ratios for liquidity position, asset composition and income structure. In this way, we intend to study whether a laxer prudential framework has incentivised bank risk-taking more for institutions which were ex-ante in weaker financial conditions.

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<sup>15</sup> For an analysis of the causes of bank recapitalisations and nationalisations in the UK, see Rose and Wieladek (2012)

## 14.6. EMPIRICAL RESULTS: BASELINE SPECIFICATION

Table 2 (p. 130) reports the marginal effects of the variables in the logit estimation<sup>16</sup>. We focus our attention on the results for the prudential regulation indicator: firstly, the overall indicator and, secondly, the two subcomponents of regulatory flexibility and supervisory discretion.

In general, banks established in countries with a less stringent prudential framework display higher probability of being in distress during the crisis, as evidenced by the provision of some form of government support: in particular (col.1), a 1-point increase in the indicator (implying less capital stringency) is associated with a 1.12% increase in the probability of crisis support (while the average probability of support is equal to 16% for the estimation sample<sup>17</sup>). Then, if we consider the cross-country variation in the indicator, an increase in the value from the minimum to the maximum (22 points) would increase the probability of support by 24.6%.

This effect is also confirmed when we consider the distinct categories of support measures, like recapitalisations, credit guarantees and liquidity facilities. The marginal effect of this indicator on the probability of specific forms of support is smaller in terms of magnitude, since also the average probability of particular measures is actually lower (banks may have received some types of financial assistance but not other ones).

Next, we estimate the model using the subcomponents of the indicators of regulatory flexibility and supervisory discretion, in order to investigate the implications of different approaches to prudential regulation for the stability of financial intermediaries. We find that regulatory flexibility implies a larger increase in the probability of crisis support than supervisory discretion, particularly when considering measures such as capital injections and liquidity facilities.

In general, a more favourable regulatory treatment may potentially increase the risk-taking of credit institutions and then also the probability of being in distress. At the same time, if the supervisory authority is able to implement a consistent approach to all the supervised entities, a larger recourse to supervisory discretion can be useful to reduce the potential negative implications of less stringent regulation for financial stability. This result would therefore bring some support to

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<sup>16</sup> The results discussed in this section are based on the estimation of the logit regression, by excluding Luxembourg, Netherlands and Denmark from the initial sample. Luxembourg is excluded for its peculiarities (a financial hub with a very favourable regulatory framework but with many subsidiaries of foreign institutions, which usually have received financial support from the Governments of their own countries of establishment). Denmark and Netherlands are not included because of missing information for the prudential regulation indicator.

<sup>17</sup> In this case we report the average values of the probability of public support or of specific crisis measures for the estimation sample, by excluding Luxembourg, the Netherlands and Denmark.

Table 2. Prudential Regulation and Probability of Crisis Support  
Marginal Effects of the Logit Estimation

VARIABLES	(1) SUPP	(2) RECAP	(3) GUAR	(4) LIQSUPP	(5) RECAP	(6) GUAR	(7) LIQSUPP	(8) RECAP	(9) GUAR	(10) LIQSUPP
<b>INDICATOR</b>										
Overall Indicator	0.0112*** (0.00293)	0.00942*** (0.00268)	0.00577** (0.00235)	0.00657*** (0.00149)	0.0104*** (0.00361)	0.00862*** (0.00265)	0.00628*** (0.00186)	0.0174** (0.00690)	0.00375 (0.00615)	0.0284*** (0.00554)
Superv. Discretion										
Regul. Flexibility										
<b>BANK CONTROLS</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
<b>MACRO CONTR.</b>	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	2,976	2,976	2,976	2,976	2,976	2,976	2,976	2,976	2,976	2,976

Robust (Bank-Cluster) Standard Errors in Parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

theories advocating supervisory discretion as opposed to rules in order to achieve superior outcomes<sup>18</sup>.

## 14.7. EMPIRICAL RESULTS: BANK HETEROGENEITY

In the baseline specification we have included some bank balance sheet variables as controls, in particular for liquidity, leverage, profitability, asset composition, income sources, to explore how balance sheet factors contribute to explain the variation in the probability of crisis support across banks.

In the following we examine the interaction between country-level prudential regulation and bank-specific balance sheet characteristics. We investigate whether the positive relation between laxness in prudential regulation and the probability of bank distress varies across banks depending on their ex-ante financial conditions. In particular, we focus on three aspects, which have been highlighted in the aftermath of the crisis as potential sources of concern for the stability of financial intermediaries: the inadequacy of liquidity buffers, the exposures to government bonds and the reliance on non-lending activities as source of income for banks.

### 14.7.1. Bank Liquidity

First, we explore the role of bank liquidity position in determining the marginal effect of a more permissive prudential regime on bank distress probability. For this purpose, we consider the ratio of liquid assets to deposits and short-term liabilities. This variable indicates how large is the buffer of liquid assets of a bank with respect to its short-term liabilities: a higher value indicates a better liquidity position of the institution. From the results in the baseline specification, we notice that in general banks with a stronger liquidity position show lower probability of distress during the crisis, as evidenced by the lower recourse to financial assistance measures (negative coefficient in the estimation).

If we include in the estimation the interaction of the prudential regulation indicator with the liquid assets ratio, we still observe that banks subject to laxer prudential regulation show higher probability of requiring public support during the crisis, but we also notice that this increase in the distress probability is actually higher for banks having ex-ante a more fragile liquidity position (as denoted by a lower liquid assets ratio). Figure 2 shows the plots for the average marginal effect of the prudential regulation indicator for different values of the liquid assets

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<sup>18</sup> The literature on rules and discretion in prudential policy is still relatively limited. For example, Walther and White, (2015) and Agur and Sharma (2013) analyse this topic in the perspective, respectively, of banking resolution and macro-prudential policy. These issues have been discussed also, using a qualitative approach, by some recent studies in the fields of political science and public policy

ratio. We show the marginal effect on the probability of getting any support and to get liquidity support.

Figure 2. Interaction with Liquidity

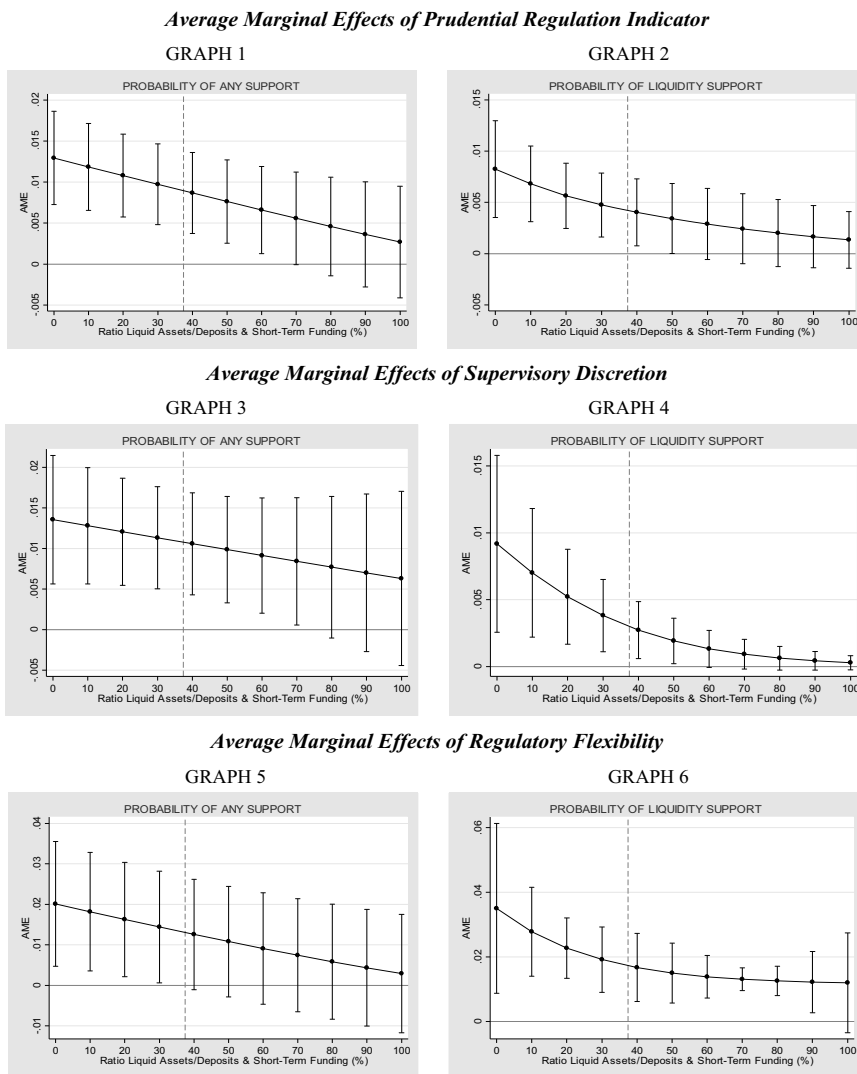


Figure 2. The above plots display the average marginal effects (AMEs) of the Prudential Regulation Indicator and of its two sub-components of Supervisory Discretion and Regulatory Flexibility on the probability of any form of support (Graphs 1-3-5) and on the probability of liquidity provision (Graphs 2-4-6) for different values of the Liquidity Ratio (Liquid Assets/Deposits and Short-Term Borrowing). The dashed line indicates the mean value of the liquid assets ratio in the estimation sample (Mean=37.44, St. Dev.=57.08). The AMEs are computed based on the estimation of a logit regression (with std. errors clustered by bank), including an interaction term between the prudential regulation indicator and the liquid assets ratio. Confidence intervals are drawn for the 5% level.



This holds also when we use as main explanatory variables the two sub-indicators of regulatory flexibility and supervisory discretion. Provided that the average value of the liquid assets ratio in the estimation sample is equal to 37.4%, we observe that – particularly for banks with lower values of this ratio – a 1-point increase in regulatory flexibility may imply a larger rise in the probability of bank distress than a corresponding increase in supervisory discretion.

### 14.7.2. Exposures to Government Bonds

Second, we consider the role of bank exposures to government securities. The European sovereign debt crisis has shown that sovereign exposures may result – in some cases – in very risky investments for banks. Nevertheless, EU prudential requirements for capital adequacy assign a 0% risk weight – under the Standardised Approach – to the investments in government securities issued by EU member states, independently from the issuer credit ratings and from the bond credit risk, and this has likely incentivised the purchase of treasury bonds by banks.

Our empirical analysis is focused on the public support provided to banks until April 2011. In this way, we can study the implications of the pre-crisis sovereign exposures on bank distress during the early stage of the financial crisis, before the peak in the tensions in the sovereign debt markets of Italy and Spain in summer 2011.

In the baseline specification (Table 2), we have introduced as control variable the ratio of government bond exposures to bank total assets. Now we interact the government exposure ratio with the indicator of prudential regulation, to explore whether and how the differences across banks in the exposures to sovereign debt may have changed the effect of prudential regulation on the probability of bank distress.

We focus our attention on the interaction between the sub-indicator of regulatory flexibility and the exposures to government debt. In fact, the evidence presented in some recent papers (Ongena, Popov and Van Horen, 2016; De Marco and Macchiavelli, 2015) suggest that national authorities in the EU (including eventually supervisory authorities) may have exerted some indirect or direct influence on domestic banks, to encourage the purchase and the holding of national sovereign bonds. Potentially, also the exercise of supervisory discretion – on a case-by-case basis – could have affected the decisions of banks to invest in government securities. In that case, supervisory discretion might not be exogenous with respect to the banks' decisions regarding their exposures to sovereign debt. On the other hand, this concern would be less meaningful for the sub-indicator of

regulatory flexibility, where all banks can benefit from a more favourable regime, independently from a supervisory authorisation<sup>19</sup>.

The plots of the average marginal effect for the sub-indicator of regulatory flexibility (Figure 3) show that a less stringent prudential framework increases the probability of needing financial assistance during the crisis (any support, recapitalisations and liquidity provisions) and that this increase in the probability is actually larger for banks having ex-ante a larger portfolio of government securities.

The underlying intuition for this result is that, under the 0% risk weight for prudential regulation, banks can increase their portfolio of government securities, without the need of raising additional capital for loss absorption. But, since treasury bonds still present some credit risk, a larger portfolio of sovereign exposures may imply an increase in the actual credit risk on the bank balance sheet, and then also in the overall bank risk. Banks in countries with more regulatory flexibility showed higher need of public support during the crisis. A higher percentage of sovereign exposures would have further increased the overall risk for individual institutions and so would have raised – *ceteris paribus* – also the probability of crisis support.

### 14.7.3. Reliance on Non-Lending Income Sources

Finally, we explore the role of the reliance on non-lending activities for the composition of bank income sources. In particular, we consider the ratio of non-interest income to total revenues: this ratio defines the percentage of total revenues from non-lending activities, like trading income or fees and commissions from investment banking activities.

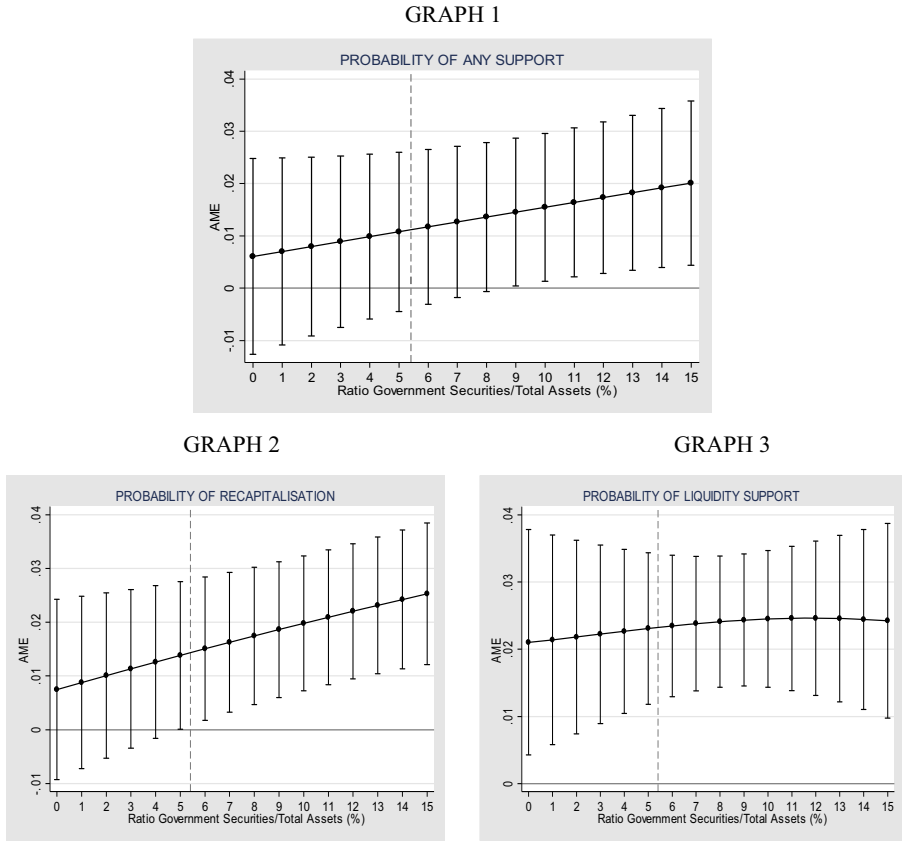
On the one hand, banks with a more diversified income structure may be able to better respond to financial shocks, especially if these are focused on some specific types of assets, such as non-performing loans with high expected losses. On the other hand, if a larger fraction of the bank income comes from riskier activities or if a bank expands excessively its trading book, higher non-interest income may lead to an increase in bank risk.

In Table 2, we have introduced the non-interest income ratio as a control variables and we have observed that banks with higher income diversification show lower probability of being in distress during the crisis (see the related negative coefficient). Now we interact the prudential regulation indicator with the non-interest income ratio, to study whether and how the relation between laxness in

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<sup>19</sup> We do observe some cross-country differences in regulatory flexibility, but they do not concern the regulatory treatment of sovereign exposures (0% risk weight for EU sovereign exposures in all EU countries).

**Figure 3. Interaction with Exposures to Government Bonds**  
*Average Marginal Effects of Regulatory Flexibility*



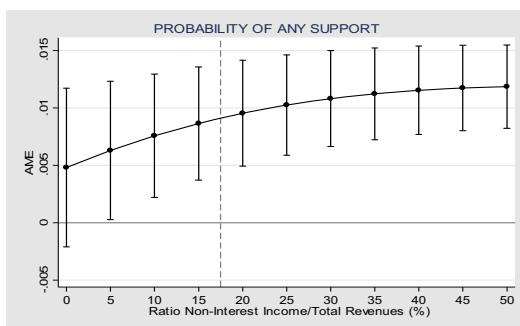
*Figure 3. The above plots display the average marginal effects (AMEs) of the Indicator of Regulatory Flexibility on the probability of government support [Any Support (Graph 1), Recapitalisation (Graph 2), Liquidity Provision (Graph 3)] for different values of the Government Exposure Ratio (Government Securities/Total Assets). The dashed line indicates the mean value of the government exposure ratio in the estimation sample (Mean=5.41, St. Dev.=8.47). The AMEs are computed based on the estimation of a logit regression (with std. errors clustered by bank), including an interaction term between the regulatory flexibility indicator and the government exposure ratio. Confidence intervals are drawn for the 5% level.*

prudential regulation and the probability of bank distress may vary for banks with different business models, depending on their income structure.

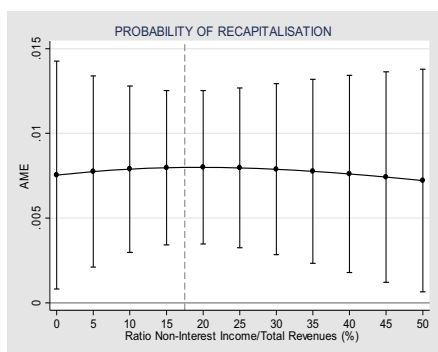
The plots for the interaction effect (Figure 4) reveal that banks in countries with less stringent regulation showed higher probability of crisis support and that this increase in probability was larger for institutions relying more ex-ante on non-lending sources of income. When we consider specific forms of support, this direction of the effect is confirmed in particular for credit guarantees and liquidity provision.

**Figure 4. Interaction with Non-Interest Income Ratio**  
*Average Marginal Effects of Prudential Regulation Indicator*

GRAPH 1



GRAPH 2



GRAPH 3

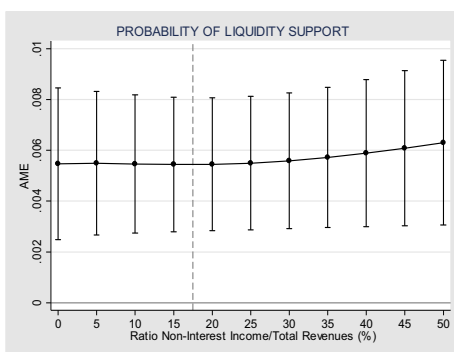


Figure 4. The above plots display the average marginal effects (AMEs) of the Prudential Regulation Indicator on the probability of government support [Any Support (Graph 1), Recapitalisation (Graph 2), Liquidity Provision (Graph 3)] for different values of the Non-Interest Income Ratio Ratio (Non-Interest Income/Total Revenues). The dashed line indicates the mean value of the non-interest income ratio in the estimation sample (Mean=17.5, St. Dev.=31.56). The AMEs are computed based on the estimation of a logit regression (with std. errors clustered by bank), including an interaction term between the prudential regulation indicator and the non-interest income ratio. Confidence intervals are drawn for the 5% level.

## 14.8. CONCLUSIONS AND POLICY IMPLICATIONS

This study, based on the analysis in Maddaloni and Scopelliti (2016), discusses the implications of the heterogeneity in the pre-crisis prudential regulation across EU countries on the stability of financial intermediaries during the crisis period. We construct a quantitative indicator of regulatory flexibility and supervisory discretion, based on the existence of national options and discretions in the implementation of the Capital Requirements Directive. Then we identify episodes of bank distress with regard to the measures of public support implemented by EU Governments during the period 2008-2011 and classify the various forms of financial assistance (recapitalisations, credit guarantees, liquidity provision). The results of the empirical work reveal that:

- 1) Banks established in countries with less stringent prudential regulation displayed higher probability of requiring government support during the crisis.
- 2) A more favourable regulatory treatment may potentially increase the risk-taking of credit institutions and then also the probability of being in distress. If the supervisory authority is able to implement a consistent approach to all the supervised entities, a larger recourse to supervisory discretion can be useful to reduce the potential negative implications of less stringent regulation for financial stability.
- 3) The increase in the distress probability for banks under laxer prudential regulation may be larger if institutions were ex-ante in weaker financial conditions (higher liquidity constraints, larger portfolio of government securities, wider reliance on non-interest income sources).

The results of the empirical analysis may suggest relevant policy implications for the design of prudential policies in the Banking Union, particularly on two aspects.

### *A) The Importance of the Level-Playing Field Regulation for Financial Stability*

The introduction of the Single Rule-Book, designed to eliminate – or to minimise – the differences in prudential regulation across EU countries, contributes in reducing the heterogeneities in the risk-taking of credit institutions and then in the stability of national banking systems, by realigning the regulatory incentives on the basis of a common prudential framework.

### *B) The Trade-Off between Rules and Discretion in the Design of Prudential Policies*

Prudential policies more reliant on (general) regulatory provisions can treat all institutions equally, but they may accentuate moral hazard problems for weak

and risky banks. Also, prudential policies more based on (case by case) supervisory decisions imply the assignment of substantial discretionary power to the supervisor, but they may be more tailored for the specific position of an intermediary and then potentially more effective in affecting the structure of bank incentives. The implementation of prudential policy in the Banking Union would need to find an appropriate equilibrium along these options.

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## 15. BANKS V. SSM: THE PARTY HAS JUST STARTED...

*Anna Damaskou*<sup>1</sup>

“*Happy 1<sup>st</sup> Birthday SSM!!! The parties of your life have just started...*” could be an alternative title for this contribution, inspired in January 2014, shortly after the birth of the Single Supervisory Mechanism (SSM), when the EU Court’s decision on the case of the *United Kingdom (UK) / Parliament and Council*<sup>2</sup>, was issued. In the case in name, the UK challenged the European Securities and Markets Authority (ESMA), *inter alia* on the basis that it had not been constructed with the powers to adopt emergency measures regulating or prohibiting short selling. The underlying reason for the challenge in name might have been perhaps that the UK did not wish to challenge on a case-by-case basis ESMA’s decisions on short selling, by referring each time to substantial arguments, i.e. why short-selling should not be banned, but, instead, it decided that it wanted to pre-empt ESMA one-off and render it incompetent to issue such decisions in the future.

In the case just described, UK’s position of doubting ESMA’s model of construction might be sincere, but this is not always the case. In other words, it is a common practice for lawyers, when they cannot win a case on substantial grounds, to go through the back door. This back door is doubting the procedure *via* which an unfavorable decision has been issued or even the legal basis on which the institution issuing the unfavorable decision has been established.

The first action against the SSM has already been submitted to the EU court by Landeskreditbank Baden-Württemberg<sup>3</sup>, which contests its categorization by the SSM among the systemically significant banks. On this occasion, the bank’s arguments are purely substantial. However, the SSM is empowered to address also enforcement and sanctions decisions to its supervised banks. Therefore, the day when a bank will doubt an SSM procedure or the institution’s construction model is not far away. And usually, when one decision is annulled on such grounds, then a massive wave of annulments follows, thus, de-stabilizing the system as a whole.

The present paper does not intend to examine in depth all points which raise concerns with regard to SSM’s structure and procedure, as drafting an exhaustive list obviously goes beyond the boundaries of the present contribution, while the analysis of each point on its own would probably justify the publication of a

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The present contribution is based on a presentation delivered during the 32nd SUERF Colloquium: “The SSM at 1”, which took place in the Frankfurt premises of Bundesbank during 3-4 February 2016.

<sup>2</sup> Case C-270/12, *United Kingdom / Parliament and Council*, ECLI:EU:C:2014:18.

<sup>3</sup> Case T-122/15, *Landeskreditbank Baden-Württemberg / ECB*, OJ C. 178, 1 June 2015, pp. 17 *et seq.*

volume. Thus, the objective is to highlight indicative points across a wide spectrum which could potentially constitute legal bases for annulment of SSM's decisions. Namely, the objective of this paper is to raise questions, in view of future contributions of the author, which will attempt to examine in depth the issues mentioned below.

#### Regarding possible institutional grounds for annulment of SSM's decisions<sup>4</sup>

- Would the ECB/SSM survive the *Meroni* test<sup>5</sup>, applied also in case C-270/12, *United Kingdom / Parliament and Council*?

Asked differently: has the SSM been constructed with the powers to issue decisions involving discretion of a political nature?

- The Vice-Chair of the Supervisory Board is also member of the Executive Board/Governing Council of the ECB, while it is also the Chair of the Mediation Panel<sup>6</sup>.

However, with regard to the four ECB representatives of the Supervisory Board, it is expressly prescribed that they should not be / have been involved with monetary policy<sup>7</sup>.

Thus, how 'Chinese' are the walls between European Central Bank (ECB)'s monetary policy and ECB/SSM's supervision<sup>8</sup>?

- Relatedly, does the mode of construction of the ECB/SSM's Mediation Panel ensure its independence and legality, given that the Vice-Chair of the Supervisory Board assumes the role of the Chair in the ECB/SSM's Mediation Panel<sup>9</sup>?

<sup>4</sup> See, in particular : L. BINI SMAGHI, *Independence and accountability of supervision in the european financial market*, speech during conference organized in Milan on 9 March 2006 by Bocconi University, also available at: [www.ecb.europa.eu/press/key/date/2006/html/sp060309.en.html](http://www.ecb.europa.eu/press/key/date/2006/html/sp060309.en.html); J.V. LOUIS, *Independence and accountability of the ECB as a supervisor Analysis of the SSM Regulation and of the Interinstitutional agreement between the European Parliament and the ECB*, presentation during conference organized in Athens on 09.10.2013 by the Hellenic Banking Association, also available at: [www.hba.gr/70milies-parousiaseis/UpFiles/parousiaseis/others/JVLOUIS.pdf](http://www.hba.gr/70milies-parousiaseis/UpFiles/parousiaseis/others/JVLOUIS.pdf); F. FABBRINI, E. BALLIN and H. SOMSEN (eds.), *What Form of Government for the European Union and the Eurozone?*, 2015.

<sup>5</sup> The so-called 'Meroni doctrine' of EU law is the outcome of joined cases C-9/56 and C-10/56, *Meroni / High Authority*, 1957/1958, European Court Reports, pp. 133 *et seq.* refers to the conditions under which EU institutions may delegate their competences to regulatory and specialized agencies.

<sup>6</sup> Article 26(3) of Council Regulation (EU) No 1024/2013 of 15 October 2013 conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions, OJ L. 287, 29 October 2013, pp. 63 *et seq.* (SSMR).

<sup>7</sup> Article 26(5) SSMR.

<sup>8</sup> ECB/2014/39 Decision of the European Central Bank of 17 September 2014 on the implementation of separation between the monetary policy and supervision functions of the European Central Bank (ECB/2014/39), OJ L. 300, 18 October 2014, pp. 57 *et seq.*

<sup>9</sup> Article 3(2) of Regulation (EU) No 673/2014 of the ECB of 2 June 2014 concerning the establishment of a Mediation Panel and its Rules of Procedure (ECB/2014/26), OJ L. 179, 2 June 2014, pp. 72 *et seq.*

- Does the mode of construction of the SSM's Administrative Board of Review ensure its independence and legality, given that its members are hired and paid by the ECB for a five-year term, renewable once for an equal period<sup>10</sup>?
- Given that national due process rules are also applicable with regard to SSM supervisory and sanctioning procedures carried out by National Competent Authorities (NCAs), does the ECB, as the authority competent for the smooth operation of the SSM, have a right to monitor NCAs conducts and impose its due process standards, so as national actions comply with EU law?

In other words, given the risk of legal fragmentation among the national and the EU jurisdiction, should the ECB/SSM act as a benchmark of best practices, although it is not hierarchically superior to NCAs?

Or should there be an ongoing dialogue between the EU and national law regarding optimal due process standards, as several national jurisdictions have better due process safeguards, compared to the EU ones<sup>11</sup>?

- Before which court(s) should a supervised entity submit an action for annulment against an NCA supervisory decision issued on the basis of an ECB instruction?

What should national courts going to accept as admissible and how are they going to decide on the issues challenged before them?

Would there be added value in providing explicit and detailed rules in the SSM legal framework ?

### Regarding possible procedural grounds for annulment of SSM's decisions<sup>12</sup>

- Are the rules on the admissibility of evidence adequately detailed<sup>13</sup>?
- Do parties to supervisory procedures have a right to invite witnesses and experts<sup>14</sup>?

<sup>10</sup> Article 4(3) of Decision of the European Central Bank of 14 April 2014 concerning the establishment of the Administrative Board of Review and its Operating Rules (ECB/2014/16), OJ L. 175, 14 June 2014, pp. 47 *et seq.*

<sup>11</sup> Case C-617/10, *Aklagaren / Hans Akerberg Fransson*, ECLI:EU:C:2013:105 ; case C-399/11, *Melloni / Ministerio Fiscal*, ECLI:EU:C:2013:107; case C-105/14, *Taricco and Others*, ECLI:EU:C:2015:555.

<sup>12</sup> See, in particular: R. D'AMBROSIO, *Due Process and Safeguards of the Persons Subject to SSM Supervisory and Sanctioning Proceedings*, 2013.

<sup>13</sup> Article 29 of Regulation (EU) No 468/2014 of the European Central Bank of 16 April 2014 establishing the framework for cooperation within the Single Supervisory Mechanism between the European Central Bank and national competent authorities and with national designated authorities (SSM Framework Regulation) (ECB/2014/17), OJ L. 141, 14 May 2014, pp. 1 *et seq.* (SSMFR).

<sup>14</sup> Article 30 SSMFR.

- Persons to whom an ECB supervisory decision may be of direct and individual concern are not parties to ECB supervisory procedures and, thus, not beneficiaries of procedural rights<sup>15</sup>.

Is there an adequate justification for this exclusion?

- The right to access to file excludes confidential information<sup>16</sup>.

However, a definition of ‘confidential information’, the process for declaring information as confidential, as well as the timeframe during which information remains confidential, are not provided.

EU courts’ jurisprudence<sup>17</sup> and the ECB Decision on ‘chinese walls’<sup>18</sup> offer some guidance.

Should, however, more explicit and codified rules be provided within the SSM framework?

- The principle of non-self-incrimination does not apply *vis-à-vis* the SSM<sup>19</sup>.

This is an outcome of the principle of cooperation with the regulator, developed during the 1980s in the context of EU competition procedures, when the EU/ECJ prioritized the legal interest of the internal market, to the detriment of the defendant’s interest to adequate procedural safeguards<sup>20</sup>.

However, nowadays the European Court of Human Rights has altered this picture<sup>21</sup>.

Thus, why should the EU offer less protection to defendants?

- The scope of review of the SSM’s Administrative Board of Review is limited to the examination of the grounds proposed by the applicant<sup>22</sup>.

Does, however, the SSM Regulation provide a basis for such a limitation<sup>23</sup>?

<sup>15</sup> Article 26 SSMFR; see, indicatively: Freshfields Bruckhaus Deringer, *The SSM Framework Regulation Part 2 : Administrative Procedure, Legal Remedies and Transitional Provisions*, 2014, also available at: [www.freshfields.com/uploadedFiles/SiteWide/Knowledge/Briefing%20SSMFR\\_Part\\_2.pdf](http://www.freshfields.com/uploadedFiles/SiteWide/Knowledge/Briefing%20SSMFR_Part_2.pdf).

<sup>16</sup> Article 32 SSMFR.

<sup>17</sup> On the ‘supervisory privilege’, see, in particular: case C-110/84, *Commune de Hillegom / Cornelis Hillenius*, European Court Reports 1985, pp. 3947 *et seq.*; cases T-590/10 and C-28/13-P, *Thesing and Bloomberg Finance / ECB*, ECLI:EU:T:2012:635 and ECLI:EU:T:2013:55.

<sup>18</sup> ECB/2014/39 Decision of the European Central Bank of 17 September 2014 on the implementation of separation between the monetary policy and supervision functions of the European Central Bank (ECB/2014/39), OJ L. 300, 18 October 2014, pp. 57 *et seq.*

<sup>19</sup> Articles 28 and 29 SSMFR.

<sup>20</sup> Case C-374/87, *Orkem / Commission*, ECLI:EU:C:1989:387; case C-27/88, *Solvay Cie / Commission of the European Communities*, European Court Reports 1989, pp. 3355 *et seq.*

<sup>21</sup> Case A/256-A, *Funke / France*, [1993] 1 CMLR 897.

<sup>22</sup> Article 10(2) of Decision of the European Central Bank of 14 April 2014 concerning the establishment of the Administrative Board of Review and its Operating Rules (ECB/2014/16), OJ L. 175, 14 June 2014, pp. 47 *et seq.*; see, indicatively: FRESHFIELDS BRUCKHAUS DERINGER, *The SSM Framework Regulation Part 2 : Administrative Procedure, Legal Remedies and Transitional Provisions*, 2014, also available at: [www.freshfields.com/uploadedFiles/SiteWide/Knowledge/Briefing%20SSMFR\\_Part\\_2.pdf](http://www.freshfields.com/uploadedFiles/SiteWide/Knowledge/Briefing%20SSMFR_Part_2.pdf).

<sup>23</sup> Article 24 SSMR.

- When reading the SSM Framework Regulation<sup>24</sup>, the extensive provisions on due process in supervisory decisions<sup>25</sup> give the impression that they offer more protection than the limited provisions on due process in administrative penalties<sup>26</sup>.

However, a more careful reading of the provisions on due process in supervisory decisions reveals that the extensive legal framework in name is applicable also in the context of processes for the imposition of administrative penalties.

In the absence of an EU procedural code, would there be added value in codifying more clearly the due process rules applicable on administrative penalties, for the sake of legal certainty?

- Is the enhancement of due process rules for investigatory procedures necessary<sup>27</sup>?

Given the above, a reconceptualization of the terms of ‘macro-prudential’ and ‘micro-prudential’ supervision could be attempted. If the terms in name had not been already reserved by economists, lawyers could have used them with an alternative meaning. The term ‘macro-prudential supervision’ could be perceived as encompassing the supervision carried out by an institution prudentially constructed, when viewed in the zoom-out macro-picture, i.e. the picture composed of all the EU institutions operating concurrently. Similarly, the term ‘micro-prudential supervision’ could be perceived as encompassing the supervision carried out by an institution prudentially operating internally, i.e. when viewed in the zoom-in micro-picture. Namely, it is crucial with respect to the added value of a new institution, not only to fit in harmoniously within the existing system of institutions, but also to operate prudently on its own.

In light of the above, what could be concluded is that it is never too early for a reform. The EU itself recognizes the imperfection of its current institutional and procedural framework and the need for reform<sup>28</sup>. Moreover, EU institutions themselves have also recognized the imperfection of their institutional and proce-

<sup>24</sup> Regulation (EU) No 468/2014 of the European Central Bank of 16 April 2014 establishing the framework for cooperation within the Single Supervisory Mechanism between the European Central Bank and national competent authorities and with national designated authorities (SSM Framework Regulation) (ECB/2014/17), OJ L 141, 14 May 2014, pp. 1 *et seq.* (SSMFR).

<sup>25</sup> Articles 120-131 SSMFR.

<sup>26</sup> Article 26 SSMFR.

<sup>27</sup> Articles 10-13 SSMR and 142-146 SSMFR ; see, indicatively: FRESHFIELDS BRUCKHAUS DERINGER, *The SSM Framework Regulation Part 4 : Investigatory Measures and Sanctioning Powers*, 2014, also available at: [www.freshfields.com/uploadedFiles/SiteWide/Knowledge/Briefing%20SSMFR\\_Part\\_4.pdf](http://www.freshfields.com/uploadedFiles/SiteWide/Knowledge/Briefing%20SSMFR_Part_4.pdf).

<sup>28</sup> See, indicatively: European Parliament, *Resolution with Recommendation to the Commission of a Law of Administrative Procedure of the European Union*, 15 January 2013, also available at: [www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P7-TA-2013-0004+0+DOC+PDF+V0//EN](http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P7-TA-2013-0004+0+DOC+PDF+V0//EN); EUROPEAN COMMISSION, *A New EU Framework to Strengthen the Rule of Law*, 19 March 2014, also available at: [http://ec.europa.eu/justice/effective-justice/files/com\\_2014\\_158\\_en.pdf](http://ec.europa.eu/justice/effective-justice/files/com_2014_158_en.pdf).

dural frameworks and the subsequent need for their reform, even when their previous reform has been very recent and almost not yet applied. The most vivid relevant example is probably OLAF, the EU institution which conducts administrative investigations for abuses of the EU budget and currency, established in 1988. Procedural safeguards for individuals trapped in OLAF's investigations were considerably strengthened in 2013<sup>29</sup>. However, since 2014, new legislative initiatives have taken place, so as to further reinforce those rights of the individuals, with the appointment of a Controller for Procedural Safeguards within OLAF<sup>30</sup>.

Relatedly, current discussions on the establishment of the European Public Prosecutor's Office (EPPO) for the conduct of criminal investigations for abuses against the EU budget<sup>31</sup> have touched also on whether the EPPO should have competence also for crimes in the field of the EU banking and financial services. The potential establishment of the EPPO and the possible widening of its competence obviously intensify the need for remedying the aforementioned institutional and procedural flaws of the SSM, as the interests involved will be multiple and grave. In any case, of course, the ECB's as well as the National Competent Authorities' (NCAs') SSM-related decisions are subject to review before the EU and national courts, respectively. This puts an onus on both the ECB and the NCAs to aim at excellency.

SSM is still at its infancy. Thus, there is still plenty of room for further strengthening its aforementioned institutional and procedural flaws. What should be borne in mind, at all times, is that the success of the SSM will be assessed also on the basis of the soundness and legality of its decisions. What is even more important to be borne in mind, though, is that the SSM is not an end in itself. It is a means to the development of the EU and the well-being of its citizens. Given the economic crisis currently tormenting the EU, the SSM's duty of success is imperative.

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<sup>29</sup> Regulation (EU, Euratom) No 883/2013 of the European Parliament and of the Council of 11 September 2013 concerning investigations conducted by the European Anti-Fraud Office (OLAF) and repealing Regulation (EC) No 1073/1999 of the European Parliament and of the Council and Council Regulation (Euratom) No 1074/1999, *OJ L*. 248, 18 September 2013, pp. 1 *et seq.*

<sup>30</sup> European Commission, Proposal for a Regulation of the European Parliament And Of The Council amending Regulation (EU, Euratom) No 883/2013 as regards the establishment of a Controller of procedural guarantees (SWD(2014) 183 final, COM(2014) 340 final, 11 June 2014.

<sup>31</sup> European Commission, Proposal for a Council Regulation on the establishment of the European Public Prosecutor's Office (SWD(2013) 274 final) (SWD(2013) 275 final), COM(2013) 534 final 2013/0255 (APP), 17 July 2013.

## 16. CAN FINANCIAL CYCLE DYNAMICS PREDICT BANK DISTRESS?

*Giannoula Karamichailidou, David G. Mayes and Hanno Stremmel<sup>1</sup>*

### Abstract

The global financial crisis has emphasised the importance of the financial cycle in contributing to bank failures. In this paper, we consider how far it is possible to anticipate problems in banks by using early-warning indicators available from published information on the financial cycle in the economy. We use a traditional z-score model that incorporates bank-specific, banking sector and macro-economic variables to which we add financial cycle indicators. Testing this model on an unbalanced panel of 2,239 European banks over the period 1999-2014, we find that the financial cycle adds noticeably to the ability to predict bank distress up to two years into the future.



Financial crises and their associated bank failures have been a common but unwelcome feature of economic life since the financial sector has had any importance. We explore whether it is possible to identify bank problems relatively early on so that corrective measures can be applied before problems reach crisis proportions. In their analysis of 800 years of such crises, Reinhart and Rogoff (2009) illustrate that, while each crisis has its own characteristics and causes, many of the features of such crises are disappointingly similar. The regularity in the features of crises should mean that to some extent they are predictable both at the aggregate and the individual bank level. We focus on the individual bank level. While individual banks can fail at any time for idiosyncratic reasons, bank failures tend to be associated with problems in the banking system and economy as a whole. The problem is to sort out which of the banks are most at risk, as while many stabilising measures apply to the whole sector or economy, some need to be applied to individual institutions. Hence, exposing macroeconomic pressures is only part of the concern and even if they cannot be forecast reliably there is still usefulness in exposing risks for individual banks.

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A striking feature of the global financial crisis (GFC) was that it illustrated a major swing in the financial cycle, indeed to some extent this is simply the description of a crisis. Some crisis explanations, such as that by Minsky (1986) focus entirely on this dimension. One might, therefore, expect the cycle to lie at the heart of predictive models. On the whole, however, prior early-warning models have incorporated macroeconomic, banking sector and bank-specific indicators and have placed less weight on variables relating to the financial cycle. We expand that analysis by adding financial cycle indicators. Our concern is to construct an early-warning tool relating to measures and indicators of financial stress, which takes more factors into account, most especially the types of variables that are being addressed by the European Systemic Risk Board (ESRB) and other macroprudential regulators (ESRB, 2014).

If intervention in banks can be triggered early, then it is likely that the losses will be reduced and the chance of a bank recovering before failure and hence avoiding the costs of resolution will be higher. Expanding the use of contingent convertible securities (CoCos) and other debt that can be bailed in on the strength of objective market indicators is an aspect of trying to achieve this. Yet in practice anticipating problems has been difficult to do. As Garcia (2012) pointed out in the case of the US in the GFC, *ex post* material loss reviews indicated that the signals of problems in banks that failed were evident but not acted on in practice.

Overall, we find that financial indicators can predict one, two and even three years ahead. Furthermore, we find behaviour is asymmetric, depending on the phase of the financial cycle. Of course there is always a chance that some failures will be missed and some banks will be mistakenly described as being at risk. However, even a limited ability is of value. Moreover, the data we use, which are obtained from Bankscope, the Bank for International Settlements (BIS) and the International Monetary Fund (IMF), are inferior to the information that banks have available to themselves and to that provided in confidence to their supervisory authorities. Hence, the actual ability to act early should be greater than with our model.

We use data from EU-15. Section 1 sets out the model, Section 2 explains the data, while Section 3 analyses the main results and provides a range of robustness tests. Section 4 concludes.

## 16.1. THE MODEL

Our approach is straightforward. Banking problems are a function of bank-specific, banking sector, macroeconomic and macrofinancial variables. In this section, we explain our choice of those variables, including our measure of bank-



ing problems, and the model we use to estimate the relationships. Our choice is deliberately conventional, not least to make our analysis as comparable as possible with the existing literature.

### 16.1.1. Dependent variable: binary versus continuous

Most previous research tends to use some form of logit or probit model to explain banking failures or distress by taking the occurrence of such failure or distress as their dependent variable. However, we are not seeking simply to explain failure but also to identify when banks are getting into difficulty so early action can take place. Thus, using a continuous variable that proxies for bank distress would be more appropriate. The most widely used continuous indicators are z-scores and distance to default.

We focus on z-scores, because this permits us to use a larger sample, and leave distance to default for subsequent study. z-scores are accounting-based measures, obtained from balance sheet and income statements of the banks and financial institutions under investigation, which, unlike distance to default, can be applied to both listed and unlisted firms. In essence, a z-score shows the number of standard deviations that a bank's rate of return on assets can fall in a single period before it becomes insolvent. Thus, a higher z-score signals a lower probability of bank insolvency.

The z-score can be calculated as follows:

$$z_{i,t} = \frac{ROA_{i,t} + \left(\frac{E}{A}\right)_{i,t}}{\sigma(ROA)_{i,t}}$$

where  $ROA_{i,t}$  is the return on assets of bank  $i$  in year  $t$ ,  $E/A$  is the equity to asset ratio, and  $\sigma(ROA)_{i,t}$  is the standard deviation of return on assets calculated over the whole sample period, as in Köhler (2012)<sup>2</sup>. Even with a z-score we cannot get away from problems from a skewed distribution of the dependent variable, so we take the natural logarithm of the z-score.

### 16.1.2. Independent variables

We build on the considerable literature published on early warning indicators to identify the variables that help predict vulnerabilities in banks and the financial system (see Table 1 for variable descriptions):

<sup>2</sup> In common with the literature we also explore a three-year window but this tends to be unstable.

*Bank-specific variables:* We have followed the commonly used explanatory variables in the literature in choosing which variables to use in our analysis, although our choice is constrained by data availability. In general terms, these variables run across the six categories thought relevant by the Federal Deposit Insurance Corporation (FDIC) in its own monitoring of banks in the US, which goes by the acronym of CAMELS (FDIC, 2015); where the components stand for: C capital adequacy; A asset quality; M management competence and expertise; E earning ability and strength; L liquidity; S sensitivity to market risk. Most authors find it difficult to obtain measures for M and S, so we use: equity to customer and short term funding ratio (C); loan loss provisions to total assets ratio (A); cost to income ratio and net interest margin (E); liquid assets to total assets ratio (L)<sup>3</sup>.

*Banking sector and macroeconomic variables:* We follow previous literature in using a banking market concentration index<sup>4</sup> but also include the banking sector z-score. Building on the extensive evidence that adverse macroeconomic conditions can lead to banking problems (Borio and Drehmann, 2009), we use GDP growth and inflation as the addition of further such variables seems to add little to the explanation.

*Macrofinancial variables:* While the bank-specific variables identify which banks are weakest at any one time it is the cyclical variables which give the best leading indicators of when those weakest banks will be pushed into distress and even ultimately failure. While the macroeconomic cycle worked well in the case of the central and eastern European countries before the GFC (Männasoo and Mayes, 2009), it is the financial cycle variables that have shown most fluctuation since then and hence *prima facie* may be the better leading indicators of problems when economic and financial cycles coincide. Both sets of variables are however needed as macroeconomic cycles have a higher frequency than financial cycles and may hence indicate incipient problems when the macrofinancial indicators do not.

There are two obvious groups of macrofinancial variables to include. The first relates to money and credit aggregates. If all banks are expanding lending particularly rapidly at any one time then the chances are that risks are being built up as such rapid growth tends to be reflected in declining credit quality. The second relates to asset prices, particularly real estate. We therefore incorporate debt service ratios of non-financial corporations and of households; market capitalization to GDP and nominal M3 money supply aggregate to GDP ratios.

*Financial cycle phase:* Vulnerabilities within a financial system reflect not just adverse shocks but cyclical movements of financial influences which may pose risks to financial stability and may lead to serious financial and macroeconomic

<sup>3</sup> As part of robustness testing we explored a much wider range of similar variables available in Bankscope.

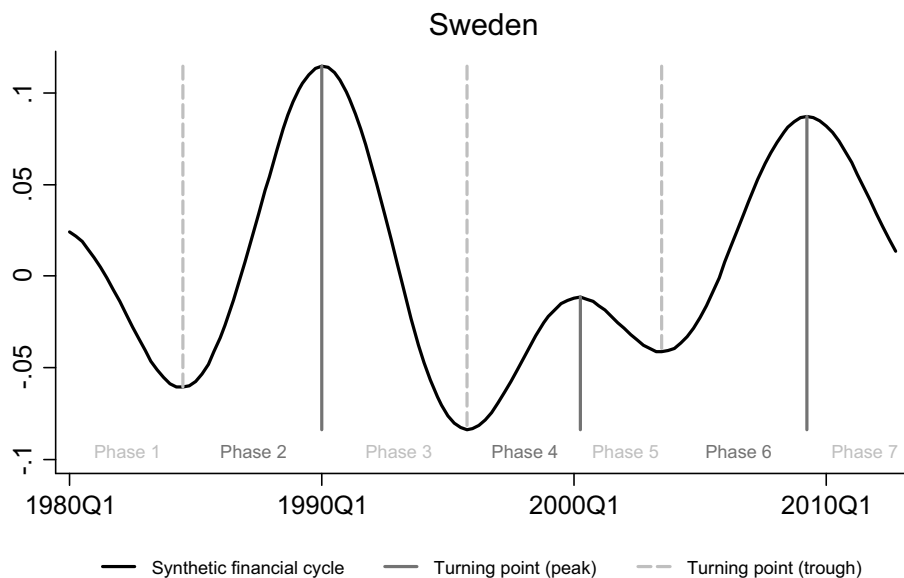
<sup>4</sup> We are grateful to Leone Leonidas for suggesting that the square of concentration should be added as he found that relationship was curvilinear, varying from negative to positive depending on the level of concentration.

tensions. Because the finance sector is prone to overshooting and asset prices reflect anticipated returns over the future life of the asset, where the actual returns are unknown beforehand, such prices can vary widely for longer term assets on the basis of quite limited news. We thus can get considerable volatility, which is helpful in a forecasting context. Moreover, markets seem to be subject to ‘herding’, which means that, rather than a limited number of people changing their minds on a particular occasion, many people make a similar change rapidly. We thus get very sharp changes in sentiment, which alter how markets behave. Financial cycles are different from business cycles, both in their length and amplitude. The typical business cycle is around four or five years in length whereas the financial cycle is usually two to three times as long. It also tends to have greater asymmetry, with sharper falls and longer recovery periods.

While the relevant variables that contribute to financial cycles are well-known there is no accepted measure of the cycle as such. Stremmel (2015) therefore approximates the cyclical regularities using filtering techniques, since no ‘natural’ financial cycle measure is available. This financial cycle thus condenses the financial information which is relevant for overall financial conditions and development within a country into one single indicator. Various different combinations of asset prices, credit aggregates and banking sector variables are explored but Stremmel concludes, on the basis of European data, that the best fitting financial cycle measure includes credit-to-GDP ratio, credit growth and house-prices-to-income ratio.

We are therefore able to approach the contribution of financial cycles to forecasting impending banking distress from two directions. First we simply include the financial cycle indicators themselves to add to the ability to explain. Secondly, we distinguish behaviour in the up phase of the cycle from the down phase. Figure 1 illustrates how the financial cycle measure operates, using the example of Sweden. The financial cycle is divided into two phases, each phase lasting from one turning point to the next. They, hence, represent either expansion or contraction. The hypothesis advanced to underpin this is that markets and financial institutions are subject to different pressures and behaviour in the two phases. Although Minsky (1986) may have a rather more complex set of phases in the financial cycles he describes, here the concern is that in the contraction phase, banks are faced with a need to recapitalise, at least some of which will be achieved through trying to contract lending. Asset prices will also fall as banks try to increase their liquidity. Thus, there is a distinct change in behaviour represented by the direction of change of the cycle and not just by the levels of the variables from which it is calculated. The financial cycle dummy variable in our analysis takes the value of 1 when the cycle moves down and 0 otherwise.

Figure 1. Financial Cycles



Based on: *Stremmel (2015)*.

## 16.2. SAMPLE AND DESCRIPTIVE STATISTICS

Our sample comprises annual data on 2,239 banks in the EU-15 countries over the period 1999-2014. While the end date is the most recent available, the starting date is also constrained by the availability in the database. The accounting data on European banks are obtained from Bankscope; data on macroeconomic variables are obtained from International Financial Statistics (IFS) of IMF; banking sector and macrofinancial data are obtained from the Bank for International Settlements (BIS). Table 1 sets the variables with their mnemonics and their descriptive statistics. Cross-correlations among the variables are limited so we should encounter little problem from multicollinearity.

## 16.3. RESULTS AND ROBUSTNESS TESTS

We use a fixed-effects panel data model with robust errors, so that each bank can differ in its basic z-score from the average and so that each year can reflect a different setting of z-scores. Our panel is unbalanced so that we can include each bank for as many years as possible rather than restricting ourselves just to those banks that survive for the entire period. While there might be some reason for

**Table 1. Descriptive statistics of the variables used**

Variable Name	Variable Description	Mean	Median	Std Dev	Minimum	Maximum
Z-score	The sum of the mean return on assets and the mean ratio of equity to assets divided by the standard deviation of the return on assets	35.92	22.81	45.15	1.18	300.98
CI	Cost to income ratio	64.23	63.48	24.98	7.24	182.50
ECSTF	Equity to customer & short term funding ratio	18.33	9.50	39.26	1.06	319.77
LAA	Liquid assets to total assets ratio	24.34	16.29	22.83	0.32	97.16
LLPA	Loan loss provisions to total assets ratio	0.42	0.23	0.69	-0.54	4.27
NIIGR	Non-interest income to gross revenues ratio	34.32	30.82	29.01	-66.90	114.42
NIM	Net interest margin	2.10	1.93	1.47	-0.62	8.21
TA	Total assets (in millions)	28010	2251	102481	26	767213
BC	Bank concentration (Herfindahl Index)	65.81	66.35	16.85	27.01	96.15
BSZ	Banking sector z-score	15.39	14.85	6.96	2.19	39.39
GDP growth	Annual GDP growth (%)	1.46	1.77	2.55	-5.64	8.42
Inflation	Annual change in CPI (%)	2.07	2.07	0.96	-0.29	4.48
DSRNFC	Debt service ratio of non-financial corporations	35.70	33.95	12.63	15.97	79.77
DSRHHS	Debt service ratio of households	15.78	12.98	6.95	7.89	33.01
MC_GDP	Market capitalization to GDP ratio	72.60	65.59	42.40	13.48	210.51
M3_GDP	Nominal M3 to GDP ratio	129.28	90.16	160.17	42.78	831.33

excluding new banks, as they sometimes behave differently (Mayes and Stremmel, 2014), it makes little sense to exclude banks that have merged or been divided during the period. In particular, we do not want to exclude banks that have failed as they will have contributed the most useful downside values that policymakers will want to identify in the future. Total assets (TA) and the banking sector z-score (BSZ), which are not expressed in percentages or ratios, undergo logarithmic transformation to reduce any skewness and heteroscedasticity problems that might occur in the regression. For our model to be useful it needs to forecast, so, all the explanatory variables are lagged. This also mitigates reverse causality concerns.

Table 2 shows the results for our model (baseline) as well as robustness tests. It is immediately clear from the first column that most of the variation is left unexplained but then this is not surprising with panel data and where forecasting has been poor traditionally. The question is whether the information included is robust enough to detect future problems. Five of the seven bank-specific variables seem to be able to explain the future z-score, along with total assets, which acts as a scale variable. The signs are largely as expected. If costs are high relative to income then the bank is relatively inefficient. Similarly, the greater equity is

compared with short-term funding then the greater the ability of the bank to withstand funding shocks. Greater loan loss provisions are a clear sign of weakness, since these provisions are normally only made when the bank realises that its loan portfolio is impaired. Clearly, if the expected loan losses were similar across banks, then having greater provisions would indicate a safer bank. Net interest margin is also positive, indicating a more profitable and hence stronger bank.

Turning to the banking sector variables, concentration shows a clear nonlinear relationship, with the overall relationship turning positive as concentration increases. A higher z-score for banking as a whole, however, seems to presage difficulty for individual banks. Both macroeconomic variables have the expected sign but only inflation is statistically significant. The macrofinancial variables give an idea of impending problems. Risks are built up in the up phase of the cycle and realised in the down phase, which is when banks get into difficulty. As credit and debt rise, so the potential for an adverse reaction when economic times get harder increases. Financial crises normally coincide with economic downturns but not all economic downturns lead to a financial crisis. It is noticeable that there is some variation in the significance of these terms across the various specifications. In part, this is because we only have one full financial cycle for many of the countries and hence there is some relation between this and the time dummies. This is partly because of the differences in lag structure. M3 on the other hand shows a positive relationship, which is more difficult to interpret. This may simply be because of the role of deposits, which act as a stabilising influence.

As discussed above, the financial cycle variable is composed of weights on the main factors we consider: credit-to-GDP ratio, credit growth and house-prices-to-income ratio. Our suggestion is that z-scores are affected by the phase of the cycle. We see that in the down phase z-scores are lower – given the values of all the other variables in the model. One might interpret this as the cycle picking up misspecification elsewhere in the model. We consider whether all of the coefficients in the model vary across the phases of the cycle rather than just the simple step change between the two phases explored thus far.

As we have quite a large sample we have checked whether we are constraining the analysis too much by treating all banks as being subject to the same model. We considered whether the euro area banks perform differently from their counterparts outside the area. Given that the EU has created the SSM, presided over by the ECB, mainly for the euro area banks, this distinction may be of practical value from a decision-making point of view. A Chow test suggests that the restriction is too harsh but the differences in the coefficients are relatively small. There are no striking sign or magnitude differences except for the financial cycle, although the euro area results are somewhat better determined, no doubt assisted by the

Table 2. Baseline estimates and robustness tests

	EURO Area				Size			Financial Cycle	
	Baseline	Yes	No	Small	Medium	Large	Downside	Upside	
Constant	10.318*** (14.05)	9.944*** (11.14)	11.139*** (9.16)	12.813*** (12.23)	10.543*** (10.80)	10.227*** (2.83)	9.223*** (5.41)	10.328*** (8.28)	
Cost to income	-0.0016*** (-3.88)	-0.0015*** (-3.04)	-0.0016* (-1.89)	-0.0032*** (-4.34)	-0.0011** (-2.04)	0.0020 (1.06)	0.0009 (0.97)	-0.0018** (-2.35)	
Equity to customer & short term funding	0.0015*** (3.58)	0.0018*** (3.93)	0.0007 (0.94)	0.0018** (2.54)	0.0013*** (3.17)	-0.0058*** (-2.72)	0.0015** (1.98)	0.0004 (0.80)	
Liquid assets to total assets	-0.0012 (-1.39)	-0.0013 (-1.29)	-0.0008 (-0.53)	-0.0015 (-1.19)	-0.0012 (-1.30)	0.0056 (1.46)	0.0006 (0.40)	-0.0003 (-0.24)	
Loan loss provisions to total assets	-0.0477*** (-4.56)	-0.0480*** (-3.70)	-0.0469*** (-2.66)	-0.0518*** (-4.04)	-0.0415*** (-2.71)	-0.0926 (-0.74)	-0.0237 (-1.16)	-0.0241 (-1.32)	
Non-interest income to gross revenues	-0.0004 (-0.80)	-0.0006 (-0.91)	-0.0006 (-0.64)	-0.0004 (-0.44)	0.0002 (0.23)	0.0025 (1.33)	0.0009 (0.81)	-0.0013 (-1.58)	
Net interest margin	0.0502*** (3.65)	0.0429*** (2.87)	0.0578* (1.70)	-0.0029 (-0.21)	0.0781*** (4.65)	0.2657*** (3.09)	0.0768*** (2.79)	-0.0159 (-0.80)	
Total assets	-0.3145*** (-9.26)	-0.2874*** (-7.00)	-0.4100*** (-8.86)	-0.4636*** (-8.75)	-0.3146*** (-7.07)	-0.2809** (-2.11)	-0.2131*** (-3.35)	-0.3165*** (-5.96)	
Bank concentration	-0.0118*** (-3.24)	-0.0096* (-2.09)	0.0720 (1.52)	-0.0084 (-1.53)	-0.0189*** (-4.02)	-0.0558*** (-3.38)	-0.0483** (-2.00)	-6.81e-06 (-0.00)	
Bank concentration squared	0.0001*** (3.03)	0.0001* (1.86)	-0.0006 (-1.47)	0.0001 (1.43)	0.0002*** (3.57)	0.0004*** (2.92)	0.0003* (1.77)	-0.0001 (-0.93)	
Banking sector z-score	-0.0392* (-1.80)	-0.0694*** (-2.58)	-0.0472 (-0.40)	-0.0584* (-1.68)	0.0189 (0.80)	0.0504 (0.57)	0.0796 (1.18)	-0.1889*** (-2.61)	
Annual GDP growth	0.0062 (1.39)	0.0062 (1.12)	0.0128 (1.16)	0.0167** (2.18)	0.0001 (0.15)	-0.0003 (-0.02)	0.0330** (2.40)	0.0081 (1.23)	
Annual change in CPI	-0.0354*** (-2.74)	-0.0421*** (-2.81)	-0.0620 (-1.14)	0.0084 (0.61)	0.0172 (1.40)	0.0162 (0.41)	-0.1489*** (-4.40)	-0.0098 (-0.42)	
Debt service ratio of non-fin. corporations	0.0001 (0.07)	0.0056* (1.91)	-0.0002 (-0.01)	-0.0011 (-0.32)	0.0006 (0.24)	-0.0071 (-1.21)	0.0113 (1.21)	-0.0101* (-1.64)	

	Baseline		EURO Area				Size			Financial Cycle	
			Yes	No	Small	Medium	Large	Downside	Upside		
Debt service ratio of households	-0.0231*** (-5.14)	-0.0164** (-2.25)	-0.0557 (-1.26)	-0.0169*** (-2.96)	-0.0248*** (-2.87)	0.0446 (1.52)	-0.0520*** (-2.64)	-0.0212 (-1.09)			
Market capitalization to GDP	0.0003 (0.81)	0.0008 (1.52)	-0.0011 (-0.68)	0.0001 (0.14)	0.0001 (0.14)	-0.0003 (-0.18)	-0.0033 (-1.45)	0.0012 (0.67)			
Nominal M3 to GDP	0.0029*** (3.48)	-0.0029 (-1.43)	0.0063** (2.12)	0.0017 (1.36)	0.0017 (1.36)	0.0035 (1.06)	0.0105*** (4.07)	0.0109 (1.45)			
Financial cycle dummy	-0.0192** (-2.20)	-0.0281*** (-2.67)	0.1052 (0.81)	-0.0332*** (-3.37)	-0.0025 (-0.15)	-0.0818* (-1.76)					
Number of observations	9,385	7,704	1,681	5,490	2,910	523	3,644	3,253			
Number of banks	1,521	1,249	272	982	506	102	1,200	1,115			
R <sup>2</sup> (within)	0.1912	0.1657	0.3499	0.2398	0.2754	0.3539	0.1028	0.1558			

Note: In all specifications the bank-specific variables, banking sector variables, and debt to service ratio are lagged by one period while the remaining variables are lagged by two periods. Specification (2) differs from specification (1) in that the time effects are removed.

\*, \*\*, and \*\*\* denote significance at 10%, 5% and 1% respectively, t statistics in parenthesis.



greater sample size. In one sense, the results are expected as with a common monetary policy one might expect the euro area countries to be subject to different pressures from their non-euro counterparts, each of whom has a different policy. Although, with its peg to the euro, one might expect Denmark to be similar to the euro area. Similarly, with their closer economic integration we might expect the parameters to be less affected by country variation.

In our main regressions thus far, size, as represented by total assets, has normally been highly significant but negative. We have, therefore, tried splitting the sample by size to see whether other factors lead to this perhaps surprising result. We divide the data into three categories as proposed in BCBS (2014). While signs vary little over the three groups, magnitudes of coefficients are sometimes very different. For example, efficiency in the sense of cost/income only seems important for small banks. Cyclical factors are most important for the medium-sized banks, while the phase of the financial cycle does not seem important for small banks. Within the size categories, total assets retain their negative sign and the variable is significant across all sizes of banks. z-scores are rather better explained in the case of the large banks than the others. As the Chow test shows, it is not warranted to restrict coefficients to be the same for all three groups.

Finally, instead of simply seeing whether z-scores were lower in the down phase of the cycle we have split estimation between the down and up phases. Here the results are striking. Many of the variables change sign and magnitudes can be substantially different. It is clear that behaviour is not symmetric across the cycle but varies considerably. We only have enough data to estimate a simple split in regimes rather than a smooth transition model. However, this is a case where the transition is likely to be rapid when the economy switches from growth to contraction and the problems are realised. It is at the other end of the transition where a sharp switch is less plausible. Recoveries in confidence tend to emerge only slowly and even if one has a Minskyan view of the way speculative bubbles build up, the process is progressive and involves a series of stages where risk-taking increases (Minsky, 1986).

## 16.4. CONCLUSIONS

This paper explores whether problems in individual banks can be detected early enough and resolved before they reach crisis proportions. Examining the EU-15 banks over the period 1999-2014, we find that financial cycle dynamics can provide additional useful forecasts of weakness and potential problems in banks at least a year ahead. We also show that there is clear variation among banks according to their size and whether they are located in the euro area or not, although the sources of this are difficult to ascertain. But most importantly we

can show that the determination of weakness varies strongly with respect to the phase of the financial cycle. Banks become asymmetrically weak in the down phase.

While this may seem rather straightforward, the fact that we can identify this potential weakness up to two years ahead provides some hope for the usefulness of this approach as an early warning system. Our analysis is based purely on data from Bankscope, IMF, and BIS. Supervisors have access to more detail and confidential data but above all the banks' management has the best source of information. Since in the early phase of trying to right problems in banks – the recovery phase to use the common terminology – the responsibility for action lies with the bank itself, encouraged by the supervisor, that privileged access is just what is needed. The fact that outsiders can also see the emerging difficulties will provide a further incentive to the bank management to act early. That said, history suggests that despite the early warning signals both bank management and supervisors tend to delay action (Garcia, 2012). In part, this may be that they feel they can explain away the tensions equivalent to Reinhart and Rogoff's (2009) suggestion that banking crises occur despite the signals because people convince themselves that 'this time is different'. Further research including more countries, using alternative measures of bank distress and employing alternative econometric approaches may shed additional light on the topic.

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Issue No 5 “Some seeming paradoxes or interesting points of Russia’s economy and banking sector” by Stephan BARISITZ.

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Issue No 7 “Ten Myths in the Brexit Debate” by David T. LLEWELLYN.