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The impact of financial regulation on business models of cooperative banks in Germany

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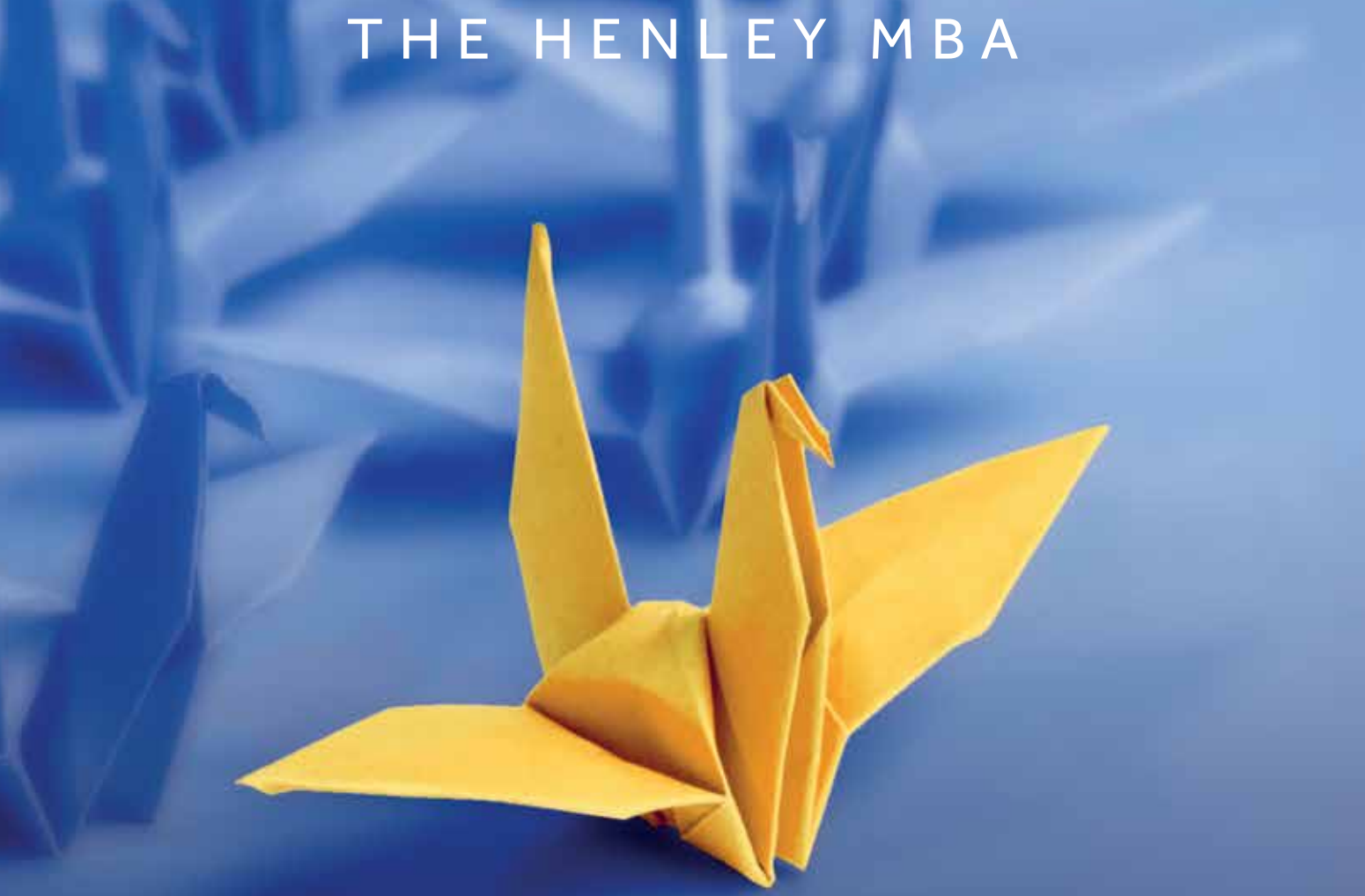

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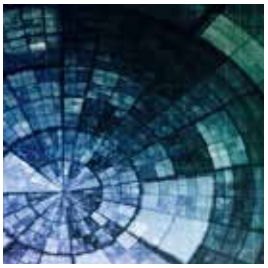

BUSINESS MODELS

INVESTMENTS

The impact of financial regulation on business models of cooperative banks in Germany

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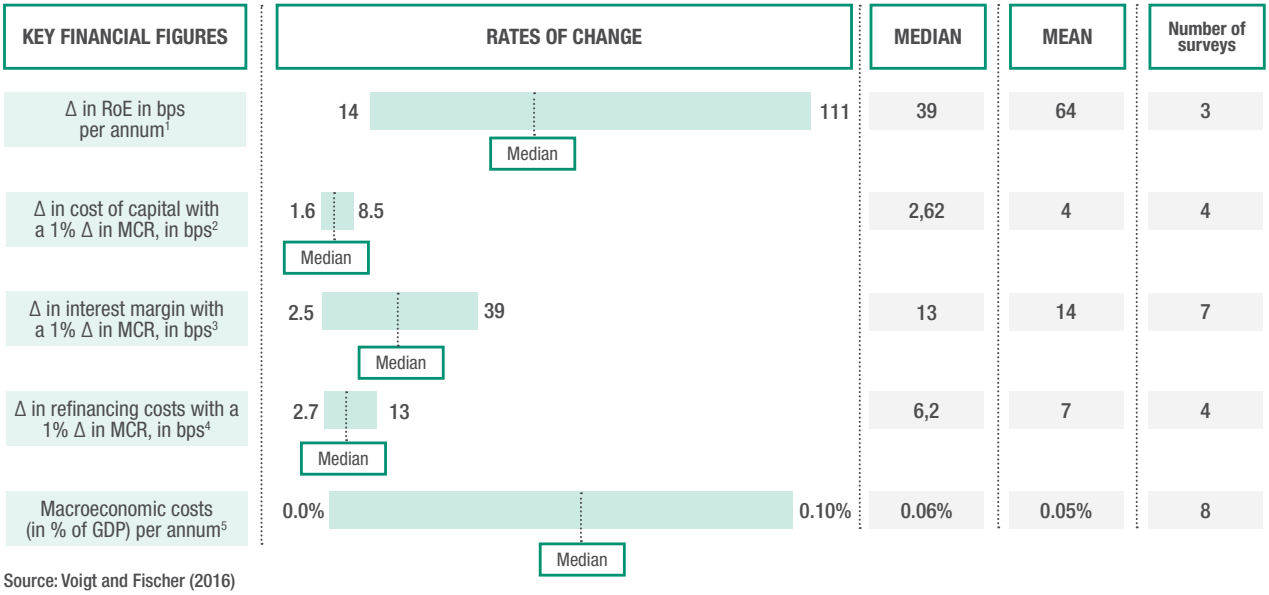
ABSTRACT

A number of studies have highlighted the potential negative implications of stronger financial regulations, however, only a few studies have attempted to quantify the regulatory impact of Basel III on profitability. Regulation has specific costs, as well as benefits, for any economy. Likewise, it has consequences for the cost of capital of banks, as well as their interest margin. The analysis provided in this article has calculated the implications of Basel III on the profitability of banks and found that they range between 14 and 111 basis points – in case no countermeasures are taken by the respective banks. In addition, this article looks at the implications of interest rate risks on banks, and the potential negative impact on bank capital ratios in the case of interest rate risk integrated in the capital requirements of pillar 1 of Basel III. Consequently, using the balance sheet data from 756 cooperative banks in Germany, we have examined the implications of the "Basel interest rate shock," where a sudden parallel shift in the yield curve of 200 basis points happens. The three test calculation scenarios assume the following: (1) a full implementation of Basel III without the integration of interest rate risks in the banking book of pillar 1, (2) analysis of theoretical maturities for the calculation of the interest rate risk, and (3) using legal contract terms and maturities as the basis for calculation of the interest rate risks. The results of the study show that in a scenario where the legal contract term was used, 5.3% of the analyzed group did not reach the minimum ratio for core capital of 4.5%, and another 46.6% of the banks would be below the 7% ratio and, therefore, would be limited in their earnings distributions; 86.9% of the cooperative banks in the analyzed group would fall below the threshold of 10.5%. We reach the conclusion that financial regulation should not follow the rule of "one-size-fits -all" because the business models of small cooperative banks in Germany are different to those of major global banks. A global or European uniform regulation for all banks, neglecting size and business model, could also jeopardize the culture of fixed interest financing for mid- and long-term loans for German SMEs.

Figure 1: Implications of regulatory changes on key financial figures



Source: Voigt and Fischer (2016)
[1]Yearly change in return on equity (ROE) in basis points in case no countermeasures are induced.
[2]Change in weighted average cost of capital (WACC) in basis points if minimum capital requirements (MCR) change by one percentage point.
[3]Change in interest margin in basis points (spread between deposit rates and credit rates) in case MCRs change by one percentage point.
[4]Change in cost of borrowing capital in basis points in case MCRs change by one percentage point.
[5]Cost for the respective economy, including economic benefits of regulation, stated as percentage of GDP per year.

1. THE IMPACT OF REGULATION ON THE PROFITABILITY OF CREDIT COOPERATIVES[1]

Since January 1, 2014, the Basel III regulation has been implemented in Europe under the auspices of the Capital Requirements Directive IV (CRD-IV). The key requirements of the new regulation are: a more stringent definition of regulatory capital, greater weighting for core capital, higher minimum capital ratios, the introduction of an anticyclical buffer as well as a leverage ratio, stricter requirements for liquidity [liquidity coverage ratio (LCR) and net stable funding ratio (NSFR)], and a more significant consideration for counterparty risks.[2]

There are numerous studies that look at the negative consequences of the more stringent regulations on the profitability of banks, but only a few quantifications are available for the relevant financial ratios. Consequently, we examine the existing regulatory studies to derive profitability parameters for the forecast calculations in banks.

Banks can use different strategy alternatives to respond to regulatory changes. In the studies analyzed, the alternative strategies are simulated either as an ad-hoc measure or as an optimization measure over the course of time. Many studies focused predominantly on the consequences of the new minimum capital requirements.

Overall, the results of 23 studies have been examined; however, only 13 provide comparable results to allow for the estimation of delta parameters for the impact of regulation. In terms of applying delta parameters, the studies need to be adapted according to the size of the credit institutions, their business models, and their respective countries.

The various studies also have different assumptions regarding growth for core capital [common equity tier 1 (CET1)], the additional core capital (Tier 1), and the supplementary capital (Tier 2). Most studies refer to CET1 capital and additional Tier 1 capital, while Tier 2 capital is not included in their calculations.[3] In empirical studies, the analyzed banks are mostly larger institutions of different countries, whereas the rather small credit cooperatives have hardly been considered. Table A1, in the Appendix, presents the studies considered.

[1] Results of the analysis have been published in Voigt and Fischer (2016).
[2] Additional capital will be required for systematically important financial institutions (SIFIs)
[3] Exceptions are the studies by McKinsey (2010) and BCG (2011), where a full implementation of the new regulation has been assumed at the time of the study.

Figure 1 shows the estimated annual negative impact of regulations on the return on equity (RoE) until the full implementation of the capital requirements in 2019. The changes range from Delta-RoE minus 14 basis points (bps) to minus 111 bps, with the median at minus 39 bps and the mean value at minus 64bps. However, there are large differences in the assessment criteria used in the RoE calculations. For example, the NSFR effect is explicitly taken into account in one study, while in another study the return of EBT is used instead of RoE. Accordingly, a team knowledgeable in banking has to develop adaptations of the delta parameters in Figure 1 when applying the spreads for bank profit forecast calculations.

2. INTEREST RATE RISK IN BANKS AND REGULATORY CAPITAL REQUIREMENTS

Management of interest rate risks is traditionally a key component of the business model of banks. Credit institutions have the task of converting short-term deposits into long-term loans, also referred to as term transformation.

A rising interest rate curve is a prerequisite for the generation of income from the term transformation. In Germany, interest rate curves over several years – the average interest rate structure – are typically upwards sloping.

Figure 2 demonstrates that the shapes of the interest rate curves are by no means static. The interest yield curves for the U.S. are shown for the period between September 2007 and September 2015. The yield is exposed to permanent interest rate fluctuations in the various maturities. A parallel shift in the overall interest yield curve is not the rule. Rather, changes in interest rates also occur independently of one another during the individual maturities and ensure varied yield curves of treasury bonds. In the years 2007 to 2015, the U.S. yield curve has maintained its normal structure. The challenge for credit institutions is primarily to correctly forecast future changes in the interest rate structures and to implement appropriate management measures while at the same time meeting regulatory requirements.

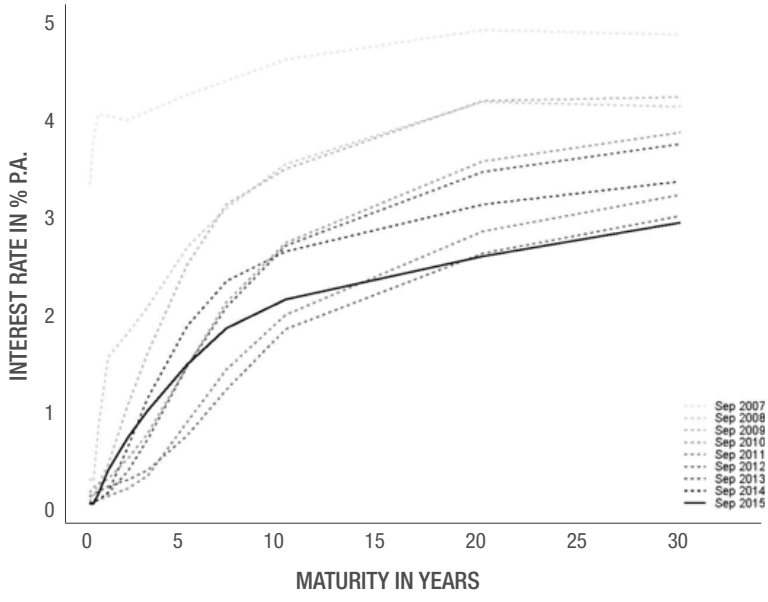
From an accounting perspective, interest rate risks in banks can be incorporated with both the trading book and the banking book. By the end of 2013, the distinction between trading book and banking book was regulated in section 1a KWG Kreditwesengesetz. Since 2014, the distinction has been anchored in Regulation (EU) No. 575/2013 of the European Parliament and of the Council, the so-called Capital Requirements Regulation (CRR). However, no significant changes were made with regards to the allocation criteria for the trading or banking book [Weigel and Sierleja (2015)].

Transactions for the purpose of generating a profit for the bank by the short-term use of existing or expected differences between bid and ask prices or the utilization of market price fluctuations are part of the trading book. The banking book is a residual value and covers all transactions that cannot be assigned to the trading book.

Interest rate risks in the banking book have so far not been part of the quantitative minimum capital requirements according to pillar 1 of the Basel framework, but have been allocated in the "qualitative" pillar 2. Pillar 2 requires appropriate risk control and controlling processes for interest rate risks in the banking book. All the risks identified in Pillar 2 of the Basel Regulatory Approach must also be included in the calculation of the risk-bearing capacity of the banks.

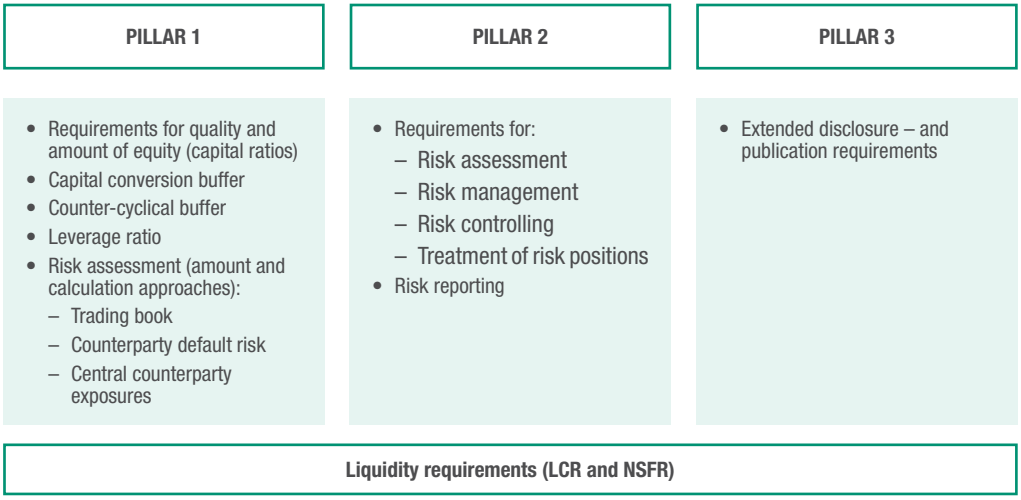
Pillar 1 of the Basel rules aims to standardize the capital requirements in order to ensure their international comparability. In pillar 2, institutions are granted more freedom with regard to the individual capital and risk assessment. Financial institutes should identify all risks of relevance, quantify them with suitable methods, and

Figure 2: U.S. Treasury Yield Curves per September for the years 2007 until 2015



Source: Voigt and Fischer (2016), with data from U.S. Department of the Treasury, 2015

Figure 3: The pillars of Basel II with specific consideration of Basel III



Source: Voigt and Fischer (2016)

provide them with adequate capital. The reasons for this kind of differentiation between pillar 1 and 2 are the different risk circumstances of individual banks, which could not justify a complete standardization. In addition, the two pillars differ in the fact that the first pillar focuses on the current business, while the second pillar also considers future changes in the bank's own business or the market environment [Deutsche Bundesbank (2013)]. Figure 3 summarizes the most important requirements of the three-pillar model.

3. INTEREST RATE RISK STRESS-TEST AND CALCULATION METHODOLOGY

The Basel Committee on Banking Supervision is aware of the interest rate risk in the banking book. However, the originally planned integration of the interest rate risks into the first pillar of Basel II was not realized due to a lack of an international consensus regarding the calculation methods for interest rate risks. There is no international standard procedure for the parameterization of asset and liability positions with undefined capital or interest rate fixation. In addition, with regards to a periodic or present value approach of interest rate risks there is no common standard used by supervisory bodies in the various countries, as national market structures for credit institutions are also very different [Deutsche Bundesbank (2012), Basler Ausschuss für Bankenaufsicht (2006), Österreichische Nationalbank (2008), BaFin (2014.)

As part of the implementation of Basel III, the capital adequacy for interest rate risks in the banking book is discussed in order to limit the bank's risk of insolvency. Additional equity should serve as a risk buffer for losses from unexpected changes in market interest rates. The supervisor examines the implications of an ad-hoc increase or fall in market interest rates by 200 basis points [Fischer and Heil (2015a)]. This indicator is also known as the "Basel interest rate shock" and measures the present value effects of an unexpected interest rate change on the company's own funds. It has to be determined in accordance with BaFin circular 11/2011 and must be reported to the supervisory authorities, but financial institutions are allowed to choose the yield curve used in the internal calculations. All banking book positions with undefined periods for capital commitment and interest rate fixation, or with implicit interest rate options, must be adequately represented in the internal calculations of the bank. However, the methods and procedures for the calculation of interest rate risk must meet the minimum requirements for risk management (MaRisk). Credit institutions with a negative change of more than 20% in the present value of the regulatory capital are classified as being of higher interest rate risk [BaFin (2011)].

The Basel interest rate shock only considers the present value effects of a sudden parallel shift in the yield curve. The net present value calculation helps to improve the comparability between credit institutions, but is particularly controversial in the case of banks that use the P&L-oriented methodologies to monitor

their interest rate risks. For credit institutions with P&L guidelines for interest rate risk management, the German supervisory body, BaFin, offers an alternative procedure for estimating the change in present value; the potential disadvantage of the alternative calculation method could be an overestimation of the risks by using specified modified durations for the respective maturities in contrast to using internal models [BaFin (2011)].

A standardized calculation methodology for interest rate risk would be preferred for international comparisons of its implications. A regulatory model that avoids undesirable effects for banks and their clients should consider incorporate the following [Fischer and Heil (2015a)]:

- A standardized composition of the financial ratio.
- A dynamic interest rate scenario specified by the supervisor.
- The capital requirement for market value and interest rate risks in the banking book.
- The consideration of individual business models of credit institutions or the definition of a threshold as the upper limit for an interest rate risk that is not subject to capital requirements.

4. SIMULATION FOR THE CALCULATION OF INTEREST RATE RISK AND NEW CAPITAL REQUIREMENT RULES

4.1 Database and assumptions

The impact of the possible capital requirement for interest rate risks was tested in the year 2015 based on data from 756 cooperative banks in Germany [Fischer and Heil (2015a, b)]. For the legal duration of the respective financial contract, the following calculation assumes an approximation for the change in the present value; the present value is calculated on the key date and no further possible balance sheet or profit growth is taken into account. The calculation considers the present value calculation of interest rate risks for the banking book and a static position of the bank's capital. The simulation assumes an immediate implementation of CRD IV regulation. The equity capital employed in the simulation was adjusted in accordance with the CRR Capital Requirements Directive. The risk weighted assets were increased by 1.4% for the Basel III scenario.[4]

4.2 Three interest rate scenarios for the core capital ratio

Three scenarios are presented for the effects of the regulatory changes on the core capital ratio of 4.5% and of 7%, including the capital conservation buffer. Figures 4, 5, and 6 show the three scenarios of regulatory capital adequacy for interest rate risks with respect to the core capital ratios. Scenario 1 involves the core capital ratios of the analyzed banks for the adjustment to Basel III without the integration of interest rate risks in the banking book in pillar 1 of Basel III. Scenario 2 involves the core capital ratio with the assumption of theoretical or fictitious maturities for the calculation of the interest rate risk. Scenario 3 includes the extreme scenario of the legal contract term and maturities as the basis for calculation of the interest rate risks.

Figure 4 presents the results of scenario 1, examining the core capital ratios of all banks exclusively on the basis of the CRR and CRD IV requirements and excluding the interest rate risks in the banking book. All of the banks remain above the minimum ratio of 4.5% and only 1.5% of the banks remain below the minimum ratio of 7% (4.5% plus 2.5% capital retention buffer). Only 1.5% of the banks would be sanctioned with restrictions on the payout of earnings [Fischer and Heil (2015a), Voigt and Fischer (2016)].

Figure 5 presents the results of scenario 2, calculating the core capital ratio according to CRR as well as the

Figure 4: Core capital ratio according to CRR without integration of interest rate risk in pillar 1 – scenario 1

[4] The increase of 1.4% was based on estimations of Deutsche Bundesbank (2015) and Fischer and Heil (2015a).

interest rate risks being subject to capital requirements. The assumption of theoretical maturities was used to calculate the maximum present value loss due to interest rate risks. As a result, the equity ratio deteriorated significantly. Only 0.7% of the banks did not reach the minimum ratio of 4.5% for the core capital and have to adapt their business models immediately or create ad-hoc additional common equity. A total of 20.8% (0.7% + 20.1%) of the banks in the analyzed group would have to limit their earnings payout because they are below the hurdle of 7%.

Figure 6 presents the results of scenario 3, where the legal contract term of the balance sheet items is used as the basis for the interest risk calculation instead of the theoretical maturity. 5.3%, or 40, banks of the analyzed group do not reach the minimum ratio for core capital of 4.5% and another 46.6% of the banks would be below the 7% ratio and, therefore, would be limited in their earnings distributions.

4.3. Three scenarios for the regulatory equity ratio and interest rate risk

In the next step, three regulatory escalation steps are simulated for the minimum capital ratio. Figures 7, 8, and 9 illustrate the impact of the integration of interest rate risks on regulatory capital ratios of 8% and 10.5%, respectively, including capital conservation buffers.

Scenario 1 examines the capital adequacy ratios of the analyzed banks for the adjustment to Basel III but without integration in Pillar 1. Scenario 2 looks at the capital ratios for the calculation with theoretical maturities. Scenario 3 examines the extreme scenario of the interest rate calculation with legal contract terms for all balance sheet items.

Figure 7 presents the results for scenario 1, where the regulatory capital ratios of all banks are calculated on the basis of the requirements according to CRD IV, without taking into account the interest rate risks in pillar 1. Overall 17.9% (2% + 15.9%) of the banks are below the minimum ratio of 10.5% (8% plus capital conservation buffer of 2.5%), 2% are below the hurdle of 8%, and a further 15.9% must be subject to earnings distribution restrictions.

Figure 8 presents the results of scenario 2, and shows the integration of the interest rate risks in pillar 1 with the assumption of theoretical maturities for balance sheet items. 20% of the banks (58 banks) do not reach the minimum ratio of 8% and another 40.4% of the

Figure 5: Core capital ratio according to CRR with integration of interest rate risks in pillar 1 – scenario 2

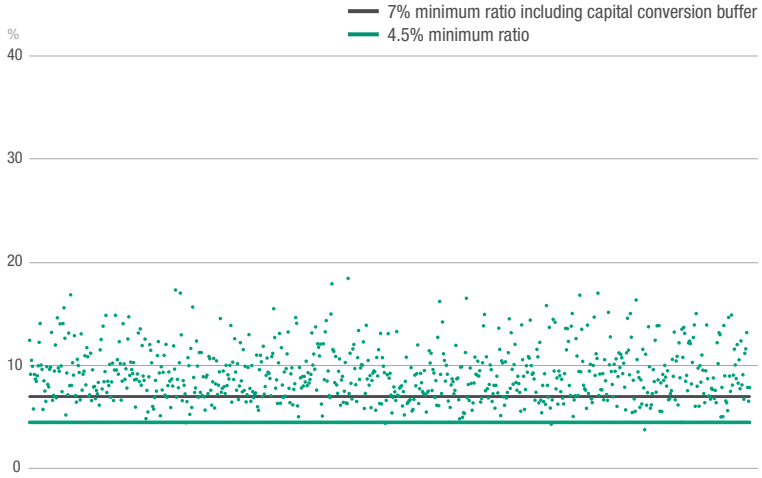
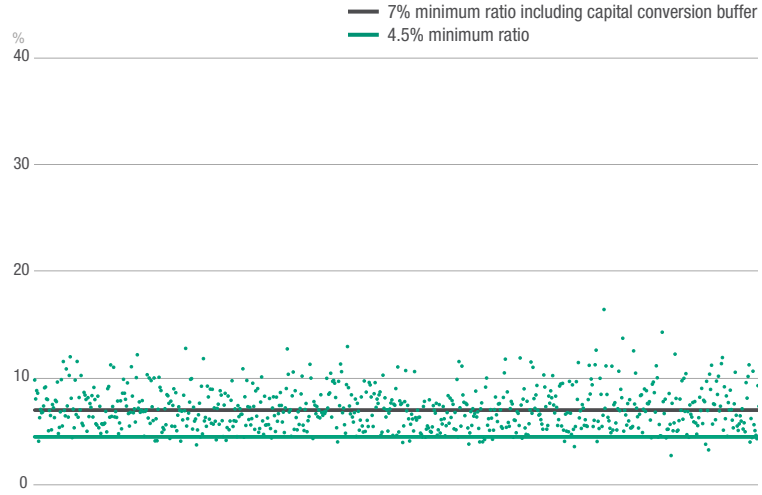


Figure 6: Core capital ratio according CRR with integration of interest rate risk in pillar 1 – scenario 3



Sources: Fischer and Heil (2015a) and Voigt and Fischer (2016)
Database: 756 German cooperative banks from the year 2013; the analysis is reporting date related – no budgeted balance sheet, no earnings growth considered. The change in present value due to interest rate risks is an approximation.

analyzed group would have to restrict their earnings payout as they are below the minimum ratio of 10.5%, including the capital conservation buffer.

Figure 9 presents the results of scenario 3, and applies the extreme scenario of the legal contract term as calculation basis for interest rate risks. A total of 81 banks, or 53.3%, are below the minimum capital ratio of 8%; a further 33.6% are below the minimum ratio of 10.5% including capital conservation buffer and would thus be restricted in their earnings payout potential. In the extreme scenario of the legal term of the contract for all balance sheet items, a total of 86.9% of the banks under investigation would be below the threshold of 10.5%.

5. TERM TRANSFORMATION AND INTEREST RATE INCOME

In a sustained low-interest rate environment, Deutsche Bundesbank sees the risk that financial institutions with low profitability will be open to take more risks and that they will try to compensate the lower interest income with a higher structural contribution; this refers in particular to savings banks and credit cooperatives, which are strongly dependent on the net interest income [Deutsche Bundesbank, (2014)].

The interest contribution is calculated as the difference between the agreed customer interest and the interest income from a fixed-term investment in the money and capital market with the respective maturities. The structural contribution is mainly the result of different maturities of interest rates regarding assets and liabilities generated by term transformation [Becker and Peppmeier (2011)].

The structural contribution has a significant impact on the interest income of savings banks and credit cooperatives. According to Memmel (2010), bank-specific management decisions are responsible for 83% of the adjustments of interest rate risk. In contrast, the regulatory quantitative limitations of interest rate risk in Basel II is only relevant for 8% of the changes. Table 1 presents the respective proportion of the interest income resulting from term transformation for

Sources: Fischer and Heil (2015a) and Voigt and Fischer (2016)
Database: 756 German cooperative banks from the year 2013; the analysis is reporting date related – no budgeted balance sheet, no earnings growth considered. The change in present value due to interest rate risks is an approximation.

Figure 7: Regulatory capital ratio according to CRR with integration of interest rate risk in pillar 1 – scenario 1

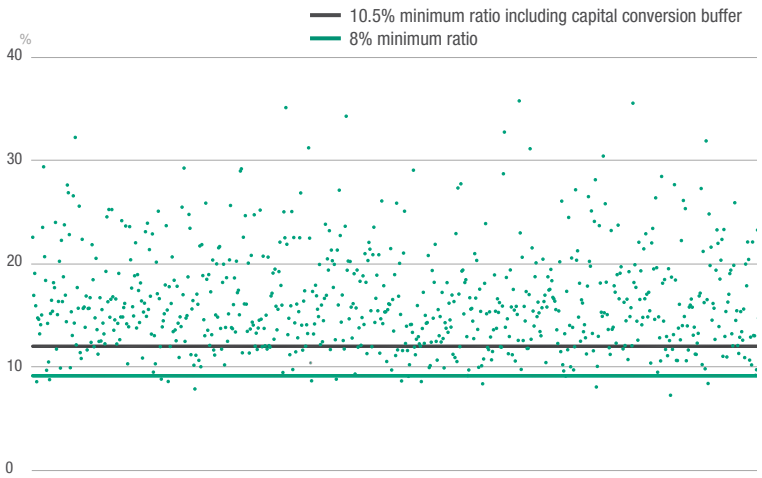


Figure 8: Regulatory capital ratio according CRR with integration of interest rate risk in pillar 1 – scenario 2

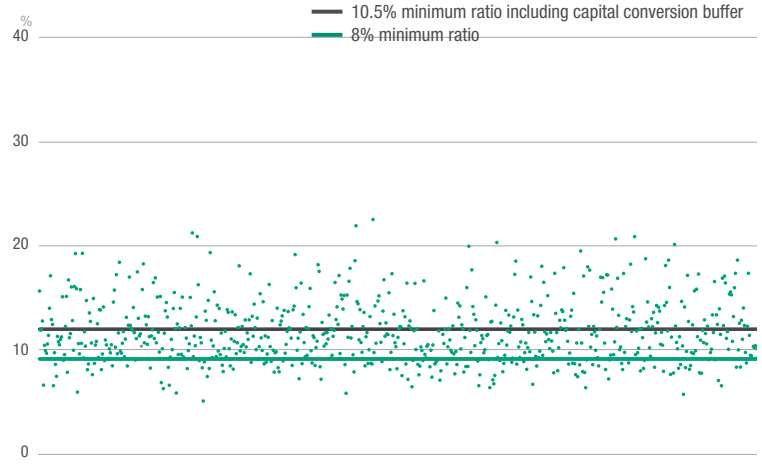
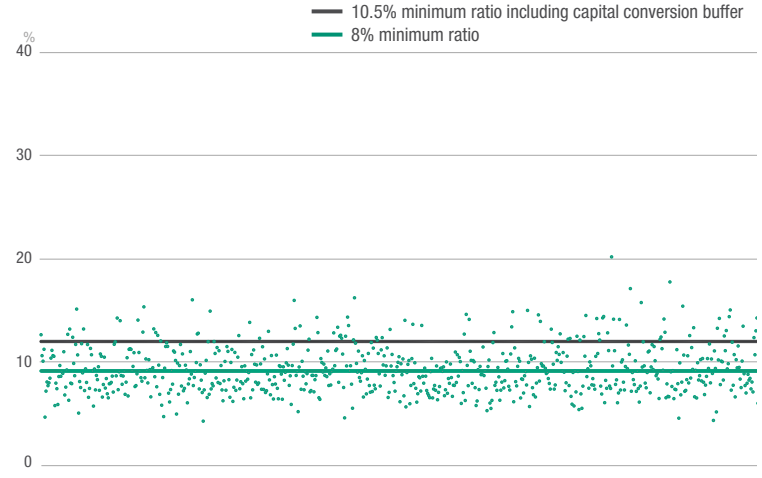


Figure 9: Regulatory capital ratios according CRR with integration of interest rate risk in pillar 1 – scenario 3



different banking groups, and is subject to significant fluctuations over time. For credit cooperatives, the proportion of interest income resulting from term transformation is 4.7% in 2008 and 24.8% in 2009.

6. INTEREST RATE RISK AND LONG-TERM FINANCING HABITS

Interest rate risks in the banking book are a major risk type as well as an important source of income for many banks. Term transformation also has macroeconomic implications, since it matches the different consumption and investment patterns of individuals and companies. In the case of long-term financing in Germany, fixed rates provide planning certainty for small- and medium-sized enterprises (SMEs), as well as for private individuals. A change in the financing culture toward short-term variable-interest loans, instead of long-term fixed-rate loans, motivated by banking supervisors will transfer the management of interest rate risks to the credit clients. The effects of such a supervision policy would be different from country to country. The German corporate finance market is primarily focused on the bank loan booked in the bank balance sheet but the Anglo-Saxon companies, on the other hand, are primarily capital market oriented. In addition, floating-rate loans are far more important in the U.S. or in the U.K. than in Germany. From a cost perspective, it is not advisable for most German SMEs to place a corporate bond on the money and capital market instead of asking the bank for a loan; since only when raising millions of euros in the upper double digit range does raising capital in the capital markets become economically viable for SMEs [Hausschild and Kral (2013)].

The risk of interest rate changes is not the only factor relevant for the assessment of financing in an economy. The NSFR also has a negative impact on long-term financing for fixed-term loans. Credit cooperatives, such as the Volksbanken and Raiffeisenbanken, will have to pass on the costs of intensified regulations in case of interest rate risks to the customers.

The creation of a common “level playing field” with international standards in regulation is, on the one hand, to be welcomed. However, the simplification of rules can quickly lead to a pragmatic but unrealistic “one-size-fits-all” approach. There is no doubt that the competitiveness of SMEs varies widely from country to country. Financing cultures do differ historically and borrowers vary dramatically in figures like average size, internationality, equity ratio, growth or RoE. An undifferentiated harmonization of the regulatory system can lead to the destruction of long-term financing structures in Germany. Capital adequacy for interest rate risks and the introduction of the NSFR would certainly change the financing habits of SMEs in Continental Europe.

Table 1: Annual proportion of interest income resulting from term transformation

BANKING GROUP	2005	2006	2007	2008	2009	2005-2009
Private commercial banks	11.2%	6.2%	1.8%	1.4%	8.7%	4.6%
Savings banks	25.8%	18.2%	6.5%	4.8%	24.9%	14.6%
Cooperative banks	23.5%	16.8%	5.9%	4.7%	24.8%	12.7%
Other banks	21.3%	15.4%	5.6%	2.9%	13.5%	8.7%
All banks	23.8%	16.9%	5.9%	4.6%	24.3%	12.3%

Memmel (2010)

7. CONCLUSION

The "one-size-fits-all" approach to regulation places small credit institutions at a disadvantage compared to large credit institutions. Regulatory rules should take account of the differences in size between the individual banks, the focus of the business models, as well as country-specific characteristics in order to avoid distortions of competition. The integration of interest rate risks in pillar 1 of Basel III would have significant implications for credit cooperatives, for example, in Germany. Depending on the regulatory escalation stage regarding capital maturities, up to 86.9% of the credit cooperatives could have a minimum capital ratio of less than 10.5%. Consequently, capital requirements for interest rate risk in the banking book could change the long-term financing habit of fixed interest rates. The capital requirements within the framework of Basel III will worsen the banks' RoE, until its fully implemented, between 14 and 111 basis points per year, unless countermeasures are initiated.

References

Admati, A., P. DeMarzo, M. Hellwig, and P. Pfleiderer, 2013, "Fallacies, irrelevant facts, and myths in the discussion of capital regulation: why bank equity is not socially expensive," Graduate School of Business working paper no. 2065, Stanford University, http://stanford.io/2v0vs4T

BaFin, 2011, "Rundschreiben 11/2011 (BA)," Bundesanstalt für Finanzdienstleistungsaufsicht, http://bit.ly/2a8OkIT

BaFin, 2014, "Neujahrspresseempfang der BaFin 2014 - Rede von Dr. Elke König, Präsidentin der BaFin, am 16. Januar 2014 in Frankfurt am Main," http://bit.ly/2eYx4H5

Bank of England, 2014, "Financial Stability Report," issue no. 36, http://bit.ly/2uHLpl9

BCG, 2011, "Risk report 2011 – facing new realities in global banking," Boston Consulting Group, http://bit.ly/2v0LHi0

Becker, H. P., and A. Peppmeier, 2011, Bankbetriebslehre (8. Aufl.), Herne: Kiehl

Berg, T., and M. Uzik, 2011, "Auswirkungsstudie Basel III: Studie im Auftrag des Bundesverband mittelständische Wirtschaft," http://bit.ly/2w9DRb6

BIS, 2006, "Internationale Konvergenz der Eigenkapitalmessung und Eigenkapitalanforderungen. Überarbeitete Rahmenvereinbarung," Bank for International Settlements, http://bit.ly/2uldhW5

BIS, 2010a, "An assessment of the long-term economic impact of stronger capital and liquidity requirements," Bank for International Settlements, http://bit.ly/2vD3Whr

BIS, 2010b, "Assessing the macroeconomic impact of the transition to stronger capital and liquidity requirements," Macroeconomic Assessment Group, Bank for International Settlements, http://bit.ly/2vD3Whr

Bonner, C., 2012, "Liquidity regulation, funding costs and corporate lending," DNB working paper nr. 361, http://bit.ly/2uOnU5F

Bridges, J., D. Gregory, M. Nielsen, S. Pezzini, A. Radia, and M. Spaltro, 2014, "The impact of capital requirements on bank lending," Bank of England working paper nr. 486, http://bit.ly/2wPwQcA

CEBS, 2010, "Results of the comprehensive quantitative impact study," Committee of European Banking Supervisors, http://bit.ly/2v0z5Yz

De Nicolò, G., A. Gamba, and M. Lucchetta, 2012, "Capital regulation, liquidity requirements and taxation in a dynamic model of banking," IMF working paper nr. 72, http://bit.ly/2uOk6l3

Deutsche Bundesbank, 2006, "Bestimmungsgründe der Zinsstruktur - Ansätze zur Kombination arbitragefreier Modelle und monetärer Makroökonomik," Monatsbericht April, http://bit.ly/2i5uinv

Deutsche Bundesbank, 2011, "Basel III – Leitfaden zu den neuen Eigenkapital- und Liquiditätsregeln für Banken," http://bit.ly/2v0ZQvT

Deutsche Bundesbank, 2012, "Die Rolle des „Baseler Zinsschocks" bei der bankaufsichtlichen Beurteilung von Zinsänderungsrisiken im Anlagebuch," Monatsbericht Juni, http://bit.ly/2vHChtL

Deutsche Bundesbank, 2013, " Bankinterne Methoden zur Ermittlung und Sicherstellung der Risikotragfähigkeit und ihre bankaufsichtliche Bedeutung," Monatsbericht März, http://bit.ly/2wBrZ0t

Deutsche Bundesbank, 2014, "Finanzstabilitätsbericht 2014," http://bit.ly/2w00iiE

Deutsche Bundesbank, 2015, "Ergebnisse des Basel III Monitoring für deutsche Institute," http://bit.ly/2i4OEgl

Dietrich, A., G. Wanzenried, and K. Hess, 2013, "The good and bad news about the new liquidity rules of Basel III in Western European countries," Journal of Banking and Finance 44, 13-25

Elliott, D. J., 2010, "Quantifying the effects on lending of increased capital requirements," http://brook.gs/2v111eN

EBA, 2014, "Results of 2014 EU-wide stress test," European Banking Authority, http://bit.ly/1tzlNyi

Fischer, M., and D. Heil, 2015a, "Negative Folgen für die Kreditvergabe," Profil – das bayerische Genossenschaftsblatt, 2(2015), 26–28

Fischer, M., and D. Heil, 2015b, "Zinsänderungsrisiken aus dem Anlagebuch und Eigenkapitalunterlegung für Banken," http://bit.ly/2w0y3Qx

Fischer, M., and S. Lanz, 2004, "Finanzkennzahlenanalyse bei Banken – zwischen Erkenntnis und Illusion," in Fischer, M., (Hrsg.), Wertmanagement in Banken und Versicherungen (S. 355-391). Wiesbaden: Gabler

Hausschild, S., and S. Kral, 2013, "Mittelstand setzt weiter auf Bankkredit," Betriebswirtschaftliche Blätter

Kashyap, A. K., J. C. Stein, and S. Hanson, 2010, "An analysis of the impact of "substantially heightened" capital requirements on large financial institutions," http://hbs.me/2i4VS43

King, M. R., 2010, "Mapping capital and liquidity requirements to bank lending spreads," BIS Working Paper nr. 324, http://bit.ly/2vHJytA

Marchesi, M., M. P. Giudici, J. Cariboni, S. Zedda, and F. Campolongo, 2012, "Macroeconomic cost-benefit analysis of Basel III minimum capital requirements and of introducing Deposit Guarantee Schemes and Resolution Funds," JRC Scientific and Policy Reports, http://bit.ly/2v0NKTj

McKinsey 2010, "Basel III and European banking: its impact, how banks might respond, and the challenges of implementation," McKinsey working paper on risk nr. 26, http://bit.ly/2i5yV0M

Memmel, C., 2010, "Banks' exposure to interest rate risk, their earnings from term transformation and the dynamics of the term structure," Deutsche Bundesbank discussion paper nr. 7, http://bit.ly/2uO6rup

Miles, D., J. Yang, and G. Marcheggiano, 2011, "Optimal bank capital," Bank of England discussion paper nr. 31, http://bit.ly/2vCLO6Z

Österreichische Nationalbank, 2008, "Leitfaden zum Management des Zinsrisikos im Bankbuch," http://bit.ly/2w120VT

Reifner, U., D. Neuberger, R. Rissi, and S. Clerc-Renaud, 2011, "CRD IV – impact assessment of the different measures within the Capital Requirements Directive IV," Directorate General For Internal Policies Study, http://bit.ly/2x3JYdn

Schätzle, D., 2014a, "Impacts of Basel III capital regulation to German cooperative banks - an empirical analysis based on a balance sheet simulation," http://bit.ly/2w134El

Schätzle, D., 2014b, "Die Auswirkungen von Basel III auf Genossenschaftsbanken. Eine Betrachtung der Kernkapitalquoten und Liquiditätskennziffern sowie eine empirische Analyse auf Basis von Bilanzsimulationen," in Theurl, T. (Hrsg.), Münstersche Schriften zur Kooperation, Band 110. Aachen: Shaker

Slovik, P., and B. Cournède, 2011, "Macroeconomic impact of Basel III," OECD Economics Department working paper nr. 844, http://bit.ly/2vDsZks

Schierenbeck, H., M. Lister, and S. Kirmße, 2014, Ertragsorientiertes Bankmanagement (9. Aufl.). Wiesbaden: Springer Gabler

Schmale, I. (2012). Genossenschaften und soziale Marktwirtschaft in einer pluralistischen Gesellschaft. Wege zu einer gerechten und leistungsfähigen Entwicklung, in Ringle, G., and H. Münkner (Hrsg.), Genossenschaftliche Kooperation - anders wirtschaften! (Bd. 111, S.19-35). Marburger Schriften zum Genossenschaftswesen, Baden-Baden: Nomos

Schmaltz, C., S. Pokutta, T. Heidorn, and S. Andrae, 2013, "How to make regulators and shareholders happy under Basel III," Journal of Banking and Finance 46, 311–325

Voigt, K. I., and M. Fischer, 2016, Genossenschaftsbanken im Umbruch, Einfluss der Finanzmarktregulierung auf das Geschäftsmodell der Kreditgenossenschaften, De Gruyter Oldenbourg, Berlin.

Weigel, W., and L. Sierleja, 2015, "Besonderheiten bei der Rechnungslegung von Kreditinstituten und deren Auswirkungen auf die Bilanzanalyse und die Analyse von Kennzahlen," in Everling, O., and K. H. Goedeckemeyer (Hrsg.), Bankenrating (2. Aufl., S. 205-248). Wiesbaden: Springer Gabler

Table A1: Studies analyzed on the implications of regulations on financial institutions

#	AUTHOR	TITLE
1	King (2010)	Mapping capital and liquidity requirements to bank lending spreads
2	Schätzle (2014a)	Impacts of Basel III capital regulation to German cooperative banks – An empirical analysis based on a balance sheet simulation
3	Elliott (2010)	Quantifying the Effects on Lending of Increased Capital Requirements
4	Kashyap et al. (2010)	An analysis of the impact of "substantially heightened" capital requirements on large financial institutions
5	Bonner (2012)	Liquidity Regulation, Funding Costs and Corporate Lending
6	EBA (2014)	Results of 2014 E.U.-wide stress test
7	Schmaltz et al. (2013)	How to make regulators and shareholders happy under Basel III
8	BIS (2010b)	Assessing the macroeconomic impact of the transition to stronger capital and liquidity requirements
9	De Nicolò et al. (2012)	Capital Regulation, Liquidity Requirements and Taxation in a Dynamic Model of Banking
10	Brides et al. (2014)	The impact of capital requirements on bank lending
11	Dietrich et al. (2013)	The good and bad news about the new liquidity
12	McKinsey (2013)	Basel III and European banking: Its impact, how banks might respond, and the challenges of implementation
13	CEBS (2010)	Results of the comprehensive quantitative impact study
14	Deutsche Bundesbank (2015)	Ergebnisse des Basel III Monitoring für deutsche Institute
15	Admati et al. (2013)	Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity is Not Socially Expensive
16	BCG (2011)	Risk Report 2011
17	Bank of England (2014)	Financial Stability Report
18	Berg and Uzik (2011)	Auswirkungsstudie Basel III – Die Folgen für den deutschen Mittelstand
19	Marchesi et al. (2012)	Macroeconomic cost-benefit analysis of Basel III minimum capital requirements and of introducing Deposit Guarantee Schemes and Resolution Funds
20	Miles et al. (2011)	Optimal bank capital
21	Basler Ausschuss für Bankenaufsicht (2010)	An assessment of the long-term economic impact of stronger capital and liquidity requirements
22	Slovik and Cournède (2011)	Macroeconomic Impact of Basel III
23	Reifner et al. (2011)	CRD IV – Impact Assessment of the Different Measures within the Capital Requirements Directive IV

Source: Voigt and Fischer (2016)

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