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Financial Market Regulation in Germany under the Special Focus of Capital Requirements of Financial Institutions

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Abstract:

This paper examines capital adequacy regulation in Germany. After a short overview about financial regulation in Germany in general, the paper focuses on the most important development in the area of capital adequacy regulation from the 1930s up to the financial crisis. Two main trends are identified: a gradual softening of the eligibility criteria for regulatory equity and the increasing reliance on banks' internal risk models for the determination of risk weights. The first trend has been reversed with the regulatory reforms following the financial crisis. Internal risk models will still play a central role. The rest of the paper focuses on the problems with the use of internal risk models for regulatory purposes. The discussion includes the moral hazard problem, the technical problems with the models, the difference between economically and socially optimal capital requirements, the pro-cyclicality of the models and the problem occurring due to the existence of fundamental uncertainty. The regulatory reforms due to Basel 2.5 and Basel III and their potential to alleviate the identified problems are then examined. It is concluded that those cannot solve the most relevant problems and that currently the use of models for financial regulation is problematic. Finally, some suggestions of how the problems could be addressed are given.

JEL Classification: G18, G28, N24, N44.

Keywords: Banking Regulation, Financial Regulation, Capital Requirements, Capital Adequacy, Bank Capital, Basel Accord, Risk Management, Risk Models, Germany.

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1 Introduction

Since the beginning of the financial crisis in 2007 Germany has experienced a series of problems in the banking sector unseen for decades. Massive government intervention causing high costs to the public wallet was used to contain a more severe crisis. Similar interventions were also necessary in a range of other countries. The financial crisis not only unveiled serious weaknesses in the supervision and regulation of the financial sector, but also revealed substantial flaws in financial institutions' internal risk management and governance structure. A major problem was the severe undercapitalisation of banks prior to the crisis. Therefore, capital adequacy was central in the debate on the crisis and major reforms in this area will be initiated with Basel III. Capital requirements have a long tradition in the banking regulation of Germany. While for many countries capital requirements were first adopted in the 1970s¹, in Germany such regulation had already been introduced in the 1930s. This paper will review the capital requirement regulation in Germany from a historical perspective, whereby it will identify general trends and point out some severe problems associated with the current approaches in regulation. To give the reader some background information, a general overview of the regulatory framework for banks and financial markets in Germany is presented. Thereafter, the focus will be on capital requirements. First, a short overview about the theoretical justifications for capital regulation is given. Then, the development of regulatory capital requirements in Germany before the financial crisis is examined in detail and its most important trends are highlighted. These include the gradual softening of the eligibility criteria for regulatory equity, and the reliance on internal risk models for the determination of risk weights. While the former trend has been reversed after the crisis, the latter is still pursued. Therefore, the problems inherent in internal risk models to determine capital requirements will be discussed. The changes due to Basel 2.5 and Basel III in this area and their potential to address the identified problems will be examined. The paper concludes with an outline of the implications for capital adequacy regulation.

¹ J.P. Krahen and E. Carletti, 'Kapitalregulierung von Banken und systemische Risiken im Lichte von Basel II', *Kreditwesen*, 8 (2007)

2 A general overview of financial regulation in Germany

In Germany, banking regulation was established relatively late during the banking crisis in 1931 when Chancellor Brüning established it by emergency decree. In 1934 the Law of the German Reich on Banking (*Reichsgesetz über das Kreditwesen*) was implemented which put all credit institutions under supervision. The Banking Act (*Gesetz über das Kreditwesen*) established in 1961, which is still the central law governing banking today, was based on this law.² The law organised the Federal Banking Supervisory Office (FBSO, *Bundesaufsichtsamt für das Kreditwesen*) as the new supervisory authority on a federal level. It was central to the German banking regulation that it was restricted to set certain standards, like liquidity or capital requirements, but that direct intervention into banks' business decision remained limited. Limits on banking activities, portfolio composition, interest rate regulations or branching restrictions were not important or were abolished much earlier than in other countries.³

Germany always followed the universal banking principle; hence, there are only few restrictions on the types of financial service activities banks can pursue. At the same time the Banking Act has a very encompassing definition of banking so that many financial service activities, not regarded as banking in many other countries, have been monopolised by the banking sector. This limits the development of non-bank financial actors to certain restricted areas (building and loans, insurance, securities industries) that are governed by special laws. Due to their restrictions on assets and liabilities, those actors are not competing with the main business areas of the banks. This encompassing regulatory framework limited regulatory arbitrage and the development of a shadow banking system.⁴

² S. Lütz, *Der Staat und die Globalisierung von Finanzmärkten. Regulative Politik in Deutschland, Großbritannien und den USA* (Frankfurt 2002), pp. 116 – 33

³ D. Detzer, N. Dodig, T. Evans, E. Hein and H. Herr, 'The German Financial System', *FESSUD Studies in Financial Systems*, 3 (2013), pp. 115-36

⁴ S. Vitols, 'Inflation versus Central Bank Independence? Banking Regulation and Financial Stability in the U.S. and Germany', WZB Discussion Paper FS I 95-312 (Berlin, 1995)

While banking was regulated tightly, financial market regulation was underdeveloped. Security exchanges were organised regionally and were largely self-regulating. The formal supervisory authority was the respective German states (*Länder*), which pursued a policy of non-interference.⁵ The regulatory framework was characterised by a lack of transparency and accountability, low protection of minority shareholders and no binding rules against insider trading. Additionally, German accounting rules were geared towards creditor protection.⁶ Capital markets were dominated by the big banks, which had a strong position in most of the self-regulating bodies of the German exchanges. Their power allowed them to stabilise the regional structure by distributing business among the different exchanges. The corresponding higher costs had to be borne by the customers in the form of higher fees and commissions.⁷

Prior to the 1990s the regulatory framework remained relatively stable. The stability of the existing system was supported by the big banks and the Bundesbank. The big banks had lucrative businesses in providing long term finance to large German corporations and were, therefore, not interested in a change of the existing framework.⁸ The Bundesbank resisted liberalisation and the introduction of many financial innovations, due to monetary policy concerns. The main regulatory changes during this time were due to weaknesses in the existing framework discovered during crises occurring in single institutions, like the default of the Bankhaus Herstatt in 1974 or the near default of the Bankhaus Schröder, Münchmeyer & Hengst due to large loan losses.⁹

Two main trends starting in the 1970s had major impacts on the German system of financial regulation. Within Germany the support of the bank based system through the big banks decreased. Traditionally, there were strong links between the big banks and the large German industrial companies. Financial institutions formed the core of a dense network of cross-shareholdings among

⁵ Lütz, *Der Staat und die Globalisierung*, pp. 79-89

⁶ Detzer, Dodig, Evans, Hein, Herr, 'The German Financial System', pp. 73-91

⁷ Lütz, *Der Staat und die Globalisierung*, pp. 79-89

⁸ O. Graf Lambsdorff, 'Die Macht aus den Hinterzimmern', *Die Zeit*, 44, 27.10.1989

⁹ Detzer, Dodig, Evans, Hein, Herr, 'The German Financial System', pp. 115-36

the big German corporations. Additionally, those financial institutions were members of many supervisory boards. By acting as house banks of those large firms and by providing long term and stable financing to them, the big banks occupied a profitable field of business.¹⁰ However, since the 1970s the demand for external finance of the big firms declined. Lower fixed investment compared to the post-war years and high retained earnings in the non-financial corporate sector were the main reasons. Additionally, international banks as well as the Landesbanken, which are the head organisations of the savings banks, started to compete for business with the big banks. Simultaneously, the big firms increased their financial independence from the banks overall by establishing their own finance departments or in-house banks and by increasingly using financial markets directly to acquire external finance.¹¹ Initially the big banks tried to increase their business with small and medium sized companies, but then focused on pushing for the development of security markets, where they could earn fees instead of interest income. Their efforts took the form of the initiative "Finanzplatz Deutschland" (Germany as a financial center). Big German firms and the German government both supported this initiative.¹² Those efforts led to major changes in the German financial regulation, particularly in securities and securities market regulation. The authorisation of new financial innovations started in the 1980s. The following four financial market promotion acts between 1990 and 2002 increased investor protection and criminalised insider trading and allowed new financial actors like, money market funds, and later, hedge funds to evolve. It also set the regulatory framework for a market for corporate control. To sum up, the regulatory structure was changed in such a way that it is more favourable for the development of financial markets.¹³

At the same time attempts to coordinate and harmonise financial regulations at the level of the European Economic Community (EEC) as a whole impacted the German system of financial

¹⁰ Detzer, Dodig, Evans, Hein, Herr, 'The German Financial System', pp. 73-91

¹¹ R. Deeg, *Finance capitalism unveiled: banks and the German political economy* (Michigan 1999), pp. 73-122

¹² U. Perina, 'Angst vor der Macht am Main' *Die Zeit*, 14, 30.3.1990

¹³ Deeg, *Finance Capitalism Unveiled*, pp. 73-122

regulation. Starting in 1977, directives were released to gradually harmonise regulatory frameworks among member states and to create a single market for financial services. Starting with the First Banking Co-ordination Directive (77/780/EEC) minimum licensing requirements were established. After only minor impacts on the EEC-level in the areas of consolidation and accounting rules were observed, other major steps were taken and presented in the form of the Second Banking Co-ordination Directive, which had to be fully implemented until 1992. It introduced the European Passport for banks. It allowed a licensed bank in one member state to conduct business in any of the other member states, while supervision remained with the home country. This required a further harmonisation in other areas. Hence, parallel to the implementation of the European Passport capital requirements were harmonised on the basis of Basel I. Subsequently, many directives adopted similar measures in a range of areas such as large exposure rules, investment services, deposit insurance, financial conglomerates and crisis management and only a few fields in the banking and financial market regulation remained purely national.¹⁴

3 Theory of capital requirements

In banking regulation capital requirements are one of the main regulatory tools and the discussion about their appropriate size and application gained new prominence in the aftermath of the financial crisis. Allen and Gale criticised that the development of financial regulation was based on an empirical process – a process of trial and error – rather than on formal theory. For capital requirements there is no commonly agreed theoretical basis. However, there are different theoretical ideas and a range of intuitive arguments that enrich the general discussion.¹⁵

In a hypothetical world where financial markets are complete, so that depositors are perfectly informed about risks and failure probabilities of banks, the Modigliani-Miller indeterminacy

¹⁴ T. Heinrich and H. Hirte, 'Bankrechtskoordinierung und –integration', in P. Derleder, K.-O. Knops and H. G. Bamberger (eds.), *Handbuch zum deutschen und europäischen Bankrecht* (Berlin 2009)

¹⁵ F. Allen and D.M. Gale, 'Capital Adequacy Regulation: In Search of a Rationale', WFC Working Paper, 03-07 (2002)

principle would apply and the market value of banks would be independent of their capital-asset ratio. If a bankruptcy cost is introduced, banks would choose an optimal asset composition spontaneously so that failure would not occur. This is due to market discipline. Perfectly informed creditors and depositors would demand higher returns when the risk increases. In such a world regulatory capital requirements would not be needed.¹⁶

In a more realistic approach bank depositors are not perfectly informed. Under these conditions inefficient bank runs are possible, which can lead to systemic financial crises. At the same time those bank runs are seen as a disciplining device to ensure prudent behaviour of banks. The prevention of inefficient bank runs and, therefore, of financial crisis justifies the introduction of deposit insurance. However, this leads to a moral hazard problem. In combination with limited liability it can be shown that shareholder value is maximised by decreasing capital and increasing risk. Depositors' incentives to monitor banks are reduced due to the insurance. The increasing risk is at the expense of the deposit insurance. To solve this problem flat capital requirements are a debated solution. They can reduce but not fully eliminate the problem and in some cases they may even lead to increased risk taking by banks. The most favoured solution is risk based capital requirements. Nevertheless, an additional risk independent capital ratio is necessary in some cases.¹⁷ Another argument based on moral hazard relates to the too-important-to-fail argument. If it can be expected that a bank will be bailed out by the government when it is faced with the risk of default, the incentive of depositors to monitor the banks behaviour is highly limited and simultaneously may induce banks to choose higher risk levels.¹⁸

Another justification for capital requirements are the existence of external effects. Those can be found, for example, in network models of the banking sector, where the problems of one bank ultimately affect other banks and can, thus, lead to systemic instability. The effect can either be

¹⁶ X. Freixas and J.-C. Rochet, *Microeconomics of Banking* (2008)

¹⁷ Ibid.

¹⁸ M. Labonte, 'Systemically Important or "Too Big to Fail" Financial Institutions', CRS Report for Congress (2013)

directly due to defaults on interbank liabilities, or indirectly due to fire sales and asset price collapses.¹⁹ If those externalities are taken into consideration, chosen capital levels of unregulated banks are too low from a macro-prudential point of view and the regulation of capital requirements is justified due to banks' systemic externalities.

Hence, there are a range of justifications for capital requirements. But as Allen and Gale pointed out, a consistent and widely agreed theoretical framework, which examines the effects of capital requirements on financial stability or on macroeconomic performance, is still missing. This may explain why very different views about the appropriateness of capital requirements, their size and their proper application exist. The lack of such a framework may also be able to explain the widely spread myths²⁰ about the negative effects of capital requirements, not only in the general public but also among practitioners, policy makers and academics, often used by bank lobbyist to fend of stricter regulation.

4 The development of capital requirements in Germany until the financial crisis²¹

4.1 The national period

Capital requirements have a long tradition in Germany. The law of the German Reich on Banking (*Reichsgesetz über das Kreditwesen*) of 1934 already allowed to implement capital requirements. However, actual guidelines were never enacted. In 1951 the Bank of the German

¹⁹ M.K. Brunnermeier and M. Oehmke, 'Bubbles, Financial Crises, and Systemic Risk', in G.M. Constantinides, M. Harris and R.M. Stulz (eds.), *Handbook of the Economics of Finance* (2013), pp. 1221-88

²⁰ For an overview about those myths see: A. Admati, P.M. DeMarzo, M.F. Hellwig and P. Pfleiderer, 'Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity is Not Socially Expensive', Rock Center for Corporate Governance at Stanford University Working Paper, 161 (2013)

²¹ A more detailed overview of the developments described here is added in the appendix to this paper. The following section and the appendix are largely based on work done for the EU-Project "Financialisation, Economy, Society & Sustainable development"

(<http://fessud.eu/>).

States (Bank deutscher Länder – former central bank) compiled a range of guidelines that specified capital requirements banks should fulfil if they wanted to use the central bank as a refinancing facility. Despite the fact that the guidelines were not legally binding the banks at large adhered to them.

After WWII in 1961 the Banking Act was established (*Kreditwesengesetz*). Paragraph 10 of this law stated that banks had to ensure their endowment of liable funds was adequate enough to guarantee the fulfilment of their obligations to their creditors and to safeguard the assets entrusted to them. It included a provision that allowed the FBSO in collaboration with the Bundesbank to formulate the details of what was regarded as adequate in form of an ordinance. For the first time such an ordinance detailing capital requirements was enacted in 1962 and named “principle I”. It required a bank to hold equity in relation to its assets, so that the amount of assets was limited to 18 times the bank’s capital (=capital ratio of 5.56 per cent). There was no risk weighting, but some positions were excluded e.g. loans to governmental entities or some specific collateralised loans.²²

The balance sheet positions eligible to fulfil equity requirements were quite narrow and had to accomplish three principles: They needed to be fully paid up, capable of meeting current losses and had to be permanently available to the bank.²³ Therefore, the following positions could be included in the capital base: paid-in capital, open reserves, capital contributions of dormant partners, whereby retained net-profits could be added if it was decided that they would stay within the company, net-losses had to be subtracted. A special provision allowed cooperative banks to add their members’ uncalled liabilities to their regulatory equity by up to a maximum of 50 per cent of the amounts of paid up member shares and reserves. Undisclosed reserves were not eligible as liable capital.²⁴

²² Deutsche Bundesbank, Monthly Report, March (Frankfurt 1962)

²³ Deutsche Bundesbank, Monthly Report, January (Frankfurt 1988)

²⁴ Deutsche Bundesbank, Monthly Report, March (Frankfurt 1962)

In two revisions conducted in 1965 and 1969 the range of institutions covered was extended. More importantly a simple system of risk weights for loans to certain debtors (e.g. government, other banks), or for a particular type of business (e.g. guarantees) or with certain collateral (e.g. real estate and ship mortgages) was introduced.²⁵

The next larger amendment was triggered by the default of the Bankhaus Herstatt KG in 1974. Consequently, a Commission on Fundamental Issues in Banking (Studienkommission "Grundsatzfragen der Kreditwirtschaft") was appointed to find regulatory answers to issues raised in regards to the crisis. Parallel to this, the second amendment of the Banking Act in 1976 was introduced to address the most severe weaknesses of the current regulation revealed in the crisis. While there were changes in many areas, the area of capital requirements was also affected. A new Principle Ia was introduced, which limited the net exposure to foreign currencies to 30 per cent of a bank's equity.²⁶ Later in 1980, it was amended to also include open positions in gold, silver and platinum. Here for the first time price risks became subject to banking regulation.

With the next amendment of the Banking Act in 1985 a consolidation principle was introduced and the eligible forms of regulatory equity were adapted. The consolidation principle became necessary to prevent banks from using subsidiaries to build credit pyramids; through which equity was used multiple times to extend much more credit than would be allowed under principle I. This weakness of the existing regulatory framework played a major role in the crisis of the bank Schröder, Münchmeyer, Hengst & Co, which used a range of loopholes to extend large amounts of credit to the IBH-Holding, a large construction equipment manufacturer, which later went bankrupt. This was possible in parts because the credit was channelled through subsidiaries in Luxembourg and so was hidden from German supervisors.²⁷ Also, the report of the commission established after the

²⁵ Deutsche Bundesbank, Monthly Report, December, (Frankfurt 1964) and Deutsche Bundesbank, Monthly Report, March, (Frankfurt 1969)

²⁶ Deutsche Bundesbank, Monthly Report, July, (Frankfurt 1976)

²⁷ R. Herlt, 'Intelligente Bankiers oder Gauner?', Die Zeit, 3, 10.1.1986

1974 crisis proposed the introduction of a consolidation rule. Since the problem was not merely a German one, it was also recognised on a European level, where a directive had been passed, which demanded the introduction of consolidation guidelines until 1985. From now on, banks had not only to fulfil equity requirements at each single institution, but also for the group as a whole including most daughter banks and financial institutions. The German legislator chose a stricter consolidation threshold than demanded by the guideline.²⁸ About 46 per cent of the 50 biggest banks did not fulfil principle I calculated according to the new rules. The big banks, some private commercial banks and the head organisations of the cooperative sector had to adjust largely. However, a very long transition period up to 1991 allowed for gradual adjustments.²⁹

The second bigger issue regarding capital requirements was the question of which forms of liabilities could be regarded as regulatory equity. One of the main issues raised was the demand of the savings banks and the municipalities to acknowledge the public guarantee (*Gewährträgerhaftung*) in form of an addition to the savings banks' liable capital, similar to the allowance of the cooperative banks. While the support of the Länder was mixed, the Bundesbank and the central government opposed the idea.³⁰ Eventually, the proposal was rejected. Instead, the allowance of cooperative banks was gradually reduced to 25 per cent of their capital base over the next 10 year. Also, the eligibility criteria for capital provided by dormant partners were tightened to conform to the three principles. The proposal to include subordinated liabilities was rejected as well because they would not correspond to the three principles. The only concession made was that certain forms of *jouissance* right capital (*Genussrechtskapital*)³¹ were allowed to count towards regulatory equity.³² While the actual changes in the forms of eligible capital were less relevant, the

²⁸ Deutsche Bundesbank, Monthly Report, March, (Frankfurt 1985)

²⁹ Deutsche Bundestag, Entwurf eines Dritten Gesetzes zur Änderung des Gesetzes über das Kreditwesen, Drucksache 10/1441, Bonn 14 May 1984

³⁰ Deutscher Bundesrat, 545. Sitzung, Bonn 20 Dec. 1984

³¹ A *Genussrecht* is a liability, which combines elements of equity and debt instruments.

³² Deutsche Bundesbank, Monthly Report, March, (Frankfurt 1985)

discussion shows there was a strong resistance to lower equity standards. Also, while the discussion was much about a level playing field of the different banking groups in Germany, there was no concern about international competitiveness. This is also reflected in the stricter consolidation threshold chosen by the authorities. The main focus was on stability.

With an amendment of Principles I and Ia in October 1990 the exorbitant growth of off-balance sheet operations in derivative markets was addressed. Until then, Principle I did only apply to risk from book credits and equity holdings. In its amended form the risk stemming from counterparty failures arising from business in certain financial derivatives was also included. Principle I was extended from being mainly concerned with credit risk to dealing with counterparty risks in general. Principle Ia was also extended and now limited the exposure to certain derivative deals that included a price risk to 60 per cent of equity.³³

4.2 The international period

The Basel Committee was organised in 1974 as a reaction to the Herstatt failure and a crisis at the Franklin National Bank of New York. It was supposed to ensure international cooperation in banking supervision. When, in an environment of increasing international exposure taken on by banks, capital ratios of international banks declined, its main focus shifted towards developing a common framework for minimum capital requirements. The result of this work was presented as the Basel Capital Accord in 1988.³⁴ The EEC adopted the results and based the Solvency Directive³⁵ and the Own Funds Directive³⁶ on the Accord. However, while the Basel Accord was developed for internationally active banks, the directives aimed at all banks. They were translated into German law by the fourth amendment of the Banking Act and a reform of Principle I in 1992. The changes of Principle I mainly contained an extension of the on- and off-balance sheet positions and transactions

³³ Deutsche Bundesbank, Monthly Report, August, (Frankfurt 1990)

³⁴ Basel Committee on Banking Supervision, 'A brief history of the Basel Committee', Bank for International Settlement (2013)

³⁵ Council Directive 89/647/EEC of 18 December 1989 on a solvency ratio for credit institutions

³⁶ Council Directive 89/299/EEC of 17 April 1989 on the own funds of credit institutions

so that almost all assets and the most relevant uncompleted transactions had to be backed by capital. The backing of counterparty risks from financial swaps, forwards, options (cover loss), was in anticipation of the directive already introduced in 1990. However, in addition to the interest- and currency contracts demanded by the directive, Principle I included contracts with other price risks as well. Also, the risk weights for different counterparties, types of transactions and certain collateralised loans were adapted according to the directives. In addition to the broader asset base that had to be covered, the capital ratio³⁷ was raised from 5.56 to 8 per cent.³⁸ The 8 per cent capital ratio was taken from the Basel Accord. Here, it was seen as a politically agreeable minimum standard.³⁹

As a compensating measure for the broader asset base and the higher capital ratio, the eligible forms of capital were extended. This can be seen as a major change in the overall direction of capital regulation in Germany. The new rules allowed banks to include positions as capital that did not conform to the three principles mentioned earlier. Already during the preparation of the Basel guidelines the Bundesbank made clear that it was opposing to such a softening of the capital requirements. The new rules divided own funds into core and additional capital. The 8 per cent of the risk weighted assets now had to be backed with core and additional capital, whereby the minimum amount of core capital was 4 per cent.⁴⁰ Table 1 shows the composition of core capital. Core capital consists only of items that are available to the institution for unrestricted and immediate use to cover risk or losses as soon as they occur. Therefore, core capital largely conforms to the three principles valid in Germany before the fourth amendment. Forms of liabilities eligible as additional capital (see table 2) can be regarded as of lower quality than core capital, since they are either not

³⁷ The capital ratio is calculated as $\frac{\text{regulatory equity}}{\text{risk weighted assets}}$ (later also market and operational risks multiplied by a factor of 12.5 were included in the denominator).

³⁸ Deutsche Bundesbank, Monthly Report, March, (Frankfurt 1993)

³⁹ Committee on Banking Regulation and Supervisory Practices, 'Proposal for international convergence of capital measures and capital standards', consultative paper (Dec. 1987)

⁴⁰ Deutsche Bundesbank, Monthly Report, January, (Frankfurt 1993)

visible on the balance sheet, or are not directly liable or repayable. The additional capital contains some positions which have not been acknowledged as regulatory capital until then, e.g. contingency reserves, unrealised reserves⁴¹ and subordinated liabilities. In particular the recognition of the unrealised reserves was a highly debated issue in the German discussions. The Bundesbank and the supervisory authority were opposed to the acknowledgement of unrealised reserves at all, since they expected pro-cyclical effects. The government envisaged only very restrictive use of unrealised reserves in its original proposal. Lobbying by the banks, mainly with the argument that too strict rules would put them internationally at a competitive disadvantage, led to a relatively softening of the rule. To be able to include unrealised reserves as additional capital, banks needed to hold at least 4.4 per cent as core capital. The maximum of eligible additional capital made up of unrealised reserves, then, is 1.4 per cent. This can be seen as a compromise solution, since it is still stricter than the requirements prescribed by the directive. Therefore, the translation of the directive into German law led to major changes in the capital requirement regulations in Germany. Besides broadening the assets to be included (this was already on the agenda for some time in Germany before the directive) it led to a softening of the established eligibility criteria for regulatory capital.⁴² Also, the issue of banks' international competitiveness became more prevalent in the discussions.

Table 1: Composition of core capital

| |
|--|
| 1. Paid-up capital less own shares less cumulative preferential shares |
| 2. Published reserves |
| 3. Approved transfers to reserves |
| 4. Assets contributed by silent partners |
| 5. Fund for general banking risks pursuant to section 340 g of the German Commercial Code |
| = core capital (gross) less losses less intangible assets |
| = core capital (net) |

Source: Deutsche Bundesbank, Monthly Report, January, (Frankfurt 1993)

⁴¹ Unrealised reserves occur when the market value of an asset is above its value in the balance sheet.

⁴² Deutsche Bundesbank, Monthly Report, January, (Frankfurt 1993)

Table 2: Additional capital since 1993

| | |
|---|--|
| 1. Contingency reserves pursuant to section 340 f of the German Commercial Code | |
| 2. Cumulative preferential shares | |
| 3. Unrealised reserves | |
| 4. Reserves pursuant to section 6b of the German Income Tax Act | |
| 5. Capital represented by participation rights (section 10 (5) of the German Banking Act) | |
| 6. Subordinated liabilities | (Not more than 50 % of the core capital) |
| 7. Commitments of members of credit institutions organised as cooperative societies | |

Source: Deutsche Bundesbank, Monthly Report, January, (Frankfurt 1993)

The structure of banking regulation in Germany was further affected in 1997 by the implementation of the Capital Adequacy⁴³ and the Financial Services⁴⁴ Directives, which again were based on a recommendation of the Basel Committee. Additionally, some elements of the Second Capital Adequacy Directive⁴⁵ were implemented. There were four main changes relevant for capital requirement regulation in Germany. A change of the eligible own funds for regulatory purposes, the introduction of the trading book, the introduction of capital requirements for market price risks and the allowance for banks to use internal risk models. The changes were implemented with the sixth amendment of the Banking Act and an amendment of Principle I and Ia.⁴⁶

While the Financial Service Directive mainly aimed at creating a level playing field for investment firms and banks, the Capital Adequacy Directive introduced the same capital requirements for the same business when carried out by banks or by investment firms. The business of investment firms is largely related to securities transactions. Now banks have to put this type of business in a so called "trading book" while the rest of a bank's business remains in the so called "banking book". All own-account positions in financial instruments, marketable assets and equities, taken on by the institution with the intention of profiting from short-term price variations, have to be

⁴³ Directive 93/6/EEC on the capital adequacy of investments firms and credit institutions

⁴⁴ Directive 93/22/EEC on investment services in the securities field

⁴⁵ Directive 98/31/EC amending Council Directive 93/6/EEC on the capital adequacy of investment firms and credit institutions

⁴⁶ Deutsche Bundesbank, Monthly Report, May (Frankfurt 1998)

included in the trading book. The own funds requirements for the trading book are then equally valid for banks and investment firms. However, if a bank's trading book business is small it can be exempt from the regulation.⁴⁷

One of the most relevant changes was that the eligible capital base was extended again. Now Tier-3 capital could be used to cover certain risk positions of the trading book. The net-profits of the trading book and short-term subordinated liabilities were recognised as Tier-3 capital.⁴⁸ Different to the discussion about the softening of eligibility criteria for capital with the fourth amendment of the Banking Act, this issue gained only little attention.

A further important change was made in the regulation of market price risks in 1998. Until then banks only had to back their counterparty and credit risks with capital (Principle I). Principle Ia only limited the positions with market price risks as a ratio to equity. This was changed. Principle Ia was abandoned and market price risks had now to be backed with own funds. For the determination of the market risks, the institutions have the choice between using a standardised method or internal risk models. Originally, the proposal of the Basel Committee included only a standard method to determine market risk. Only after complaints by the banks, which noted that the standard method did not encourage the improvement of risk management systems and did not acknowledge risk diversification and the internal risk measurement systems of banks sufficiently, a second proposal was released, which allowed banks to use internal risk models for supervisory purposes. The use of an internal risk model avoids, according to the Bundesbank, multiple calculations for internal and supervisory purposes and so saves costs. Additionally, it avoids problems of the standard methods, like the misallocation of credit. If institutions decide to use internal models, the supervisory authority needs to approve them.⁴⁹ Only few banks use internal risk models. In 1997 three banks were using internal risk models, in 2006 the number had increased to 16 and by 2012 it had fallen to 11⁵⁰.

⁴⁷ Deutsche Bundesbank, Monthly Report, May (Frankfurt 1998)

⁴⁸ Ibid.

⁴⁹ Ibid.

On an international level the work on Basel II was already ongoing for a while. In 1999 the first and in 2001 the second consultation papers were published. After the release of additional consultative papers and quantitative impact studies, the final version of Basel II was published in June 2004. The EU Commission translated the contents of Basel II into the directives 2006/48/EC⁵¹ and 2006/49/EC⁵². Those had to be translated into national law until 2007 and 2008.⁵³ During the discussion the German negotiators had two main goals. One was related to loans towards SMEs, where they pushed for lower capital requirements and the second one was related to intergroup liabilities in the saving and cooperative banking groups, where they pushed for a zero risk weight. They succeeded in both issues.⁵⁴ In Germany, the directives were implemented through changes in the Banking Act, in the German Large Loans Regulation (*GroMiKV*) and in the Minimum Requirements for Risk Management (*MaRisk*), as well as through the introduction of the Solvency Regulation (*Solvabilitätsverordnung*) which replaced Principle I.

In the Banking Act, the main change regarding capital requirements was the introduction of the so called modified available capital. Modified available capital is the new key indicator for the solvency regulation and, therefore, for the calculation of capital adequacy. Compared to the liable capital consisting of core and additional capital, the modified available capital has some add-ons or deductions resulting from the use of certain calculation methods.

Principle I was replaced by the new solvency regulation. The banks had to apply it starting in January 2007. However, they could opt for applying Principle I for one more year. The main changes introduced were capital requirements for operational risks and new calculation methods for credit risks. Until the introduction of the Solvency Regulation, risks other than market and credit risk were

⁵⁰ However, since the banks using the models are most likely big banks, the share of the banking sector in terms of assets can still be substantial.

⁵¹ Directive 2006/48/EC relating to the taking up and pursuit of the business of credit institutions

⁵² Directive 2006/49/EC on the capital adequacy of investment firms and credit institutions

⁵³ Deutsche Bundesbank, Monthly Report, December (Frankfurt 2006)

⁵⁴ Deutscher Bundestag, Plenarprotokoll 16/18, Berlin 15 Feb. 2006

considered covered by the 8 per cent solvency ratio. Of particular importance among those other risks is operational risk⁵⁵, which, according to the new solvency regulation, has to be explicitly determined and covered with capital. Banks can use three different methods for the calculation of operational risk. The most basic one determines the capital requirement by multiplying certain positions from the profit and losses accounts with a certain factor. The most sophisticated one allows banks to use internal risk calculation models, after the approval by the supervisors.

The standard approach for the calculation of credit risk was replaced by two options. Institutions can use a new standardised approach or an internal rating based approach (IRB). The standardised approach is based on external ratings of rating agencies. Depending on the external rating, different risk weights are applied. For certain types of loans, such as retail loans, SME loans, or loans collateralised with residential mortgages, preferential risk weights are applied across the board without considering external ratings.⁵⁶ As an alternative to the standard approach, banks can use internal ratings. This is the so called internal rating based approach (IRB-approach). To calculate the actual risk from an exposure, different risk components have to be considered: the probability of default, loss given default, exposure at default. Furthermore, the residual maturity of a loan plays a role as a risk component in the IRB approach.⁵⁷ The banks have a choice between using the simple IRB approach and an advanced approach. For the simple approach they only need to estimate the probability of default of the rating classes themselves, while for the other components standard values provided by the supervisor are used. In the advanced approach all components are determined by the banks' internal models. Also, for the calculation of risk exposures in derivatives the range of calculation approaches was extended and the calculation can be based on internal models.⁵⁸ In the new approaches the range of recognised risk reducing collateral is extended. In the standard approach most financial collateral can be used (and mortgages are already recognised as an

⁵⁵ Losses caused due to inadequateness or failure of internal processes, of human and systems or external factors.

⁵⁶ Deutsche Bundesbank, Monthly Report, December (Frankfurt 2006)

⁵⁷ Deutsche Bundesbank, Monthly Report, April (Frankfurt 2001)

⁵⁸ Deutsche Bundesbank, Monthly Report, December (Frankfurt 2006)

own category). Institutions that use an IRB-approach can additionally reduce their regulatory risk weight with collateral in form of claims or physical assets. Institutions using the advanced approach can use all types of collateral as long as they are able to determine reliable estimates of the asset values. Again, only few institutions use internal risk models. In 2011 only 47 institutions used an IRB approach, of which 15 use an advanced approach, compared to 1846 institutions that use the standard approach.⁵⁹ According to the Bundesbank, the banks using the internal approaches are either big and internationally active or specialised small or medium sized institutions. While the number of institutions using the IRB approaches for credit risk is small, in terms of balance sheet size they covered 62 per cent of the banking sector.⁶⁰

4.3 Main trends and phases

To sum up, until 1992 the development of capital requirement regulation in Germany was a largely national issue. While international coordination attempts picked up shortly after the Herstatt crisis, those only directly affected German capital requirement regulation in 1992 through EEC-directives, which in turn were mostly based on recommendations and agreement from the Basel Committee. An overarching trend in capital requirement regulation was the gradual acknowledgement of new risk. After the increased internationalisation of some banks, the Herstatt crisis unveiled that banks in this new environment were increasingly exposed to a new forms of risk. In 1976 for the first time price risks due to foreign exchange positions were regulated. Later on in 1980 other price risks from positions in gold, silver and platinum were limited as well. The increasing exposure of banks towards off balance sheet derivatives was first addressed in 1990. The counterparty risk of those trades had to be covered with equity. Also, the total risks from derivatives a bank could incur were limited. In 1992 the range of assets that had to be backed for their credit and counterparty risk was extended. In 1998 a major change happened. While before, market price risks were limited by principle Ia, this regulation was abandoned and instead market price risks had to be

⁵⁹ Bundesanstalt für Finanzdienstleistungsaufsicht, Jahresbericht 2011 (Bonn 2012)

⁶⁰ Deutsche Bundesbank, Monthly Report, January (Frankfurt 2009)

covered with equity. Since 2007 also operational risks had to be determined explicitly and covered with equity. Until then it was assumed that those risks were covered by the 8 per cent capital ratio.

Figure 1: Main Trends in Capital Adequacy Regulation

| | | Gradual softening of eligibility criteria for capital | | | |
|----------------------------------|--|--|--|---|---|
| | | 1961 – 1992 | 1993 | 1996 | 2006 |
| Eligibility criteria for capital | | Relatively strict – oriented along the 3 principles, mostly “core capital” | additional capital (tier-2) recognized | tier-3 capital recognized for trading book risk | modified capital introduced |
| | | | | | |
| | | Increasing reliance on banks’ own risk assessment | | | |
| | | 1961 – 1992 | 1993 | 1996 | 2006 |
| Risk weight determination | | crude supervisory determined risk weights according to type of risk and counterparty | risk weights are adapted to solvency directive / Basel I | Internal models for determination of market risk possible | Internal models for determination of market and operational risk possible |
| | | | | | |

Regarding the eligibility criteria of regulatory equity one can divide the development into two phases. During the first and largely national period between 1961 and 1992, the eligibility criteria for capital were oriented alongside the three principles of being fully paid up, capable of meeting current losses and being permanently available. The Bundesbank, politicians and the supervisory authorities strongly resisted to soften these. A prime example for this resistance was the attempt of the savings banks to get a surcharge for their public guarantee. It was rejected and, instead, led to the reduction of the cooperative banks surcharge for their members call liability. The parliamentary discussions were largely concerned with the stability of the banks or with the level playing field for the different parts of the national financial system. Concerns about German banks’ international competitiveness were limited. Starting from 1992 when Basel I was implemented, the eligibility criteria for capital were gradually relaxed. In 1992 additional capital was introduced to implement the own funds directive. The discussion in the parliament demonstrated the resistance against the

softening of the criteria. Nevertheless, lobbying by banks, which strongly raised the argument about international competitiveness, was fruitful and led the German legislators to enact a version of the law less strict than originally envisioned. However, the eligibility criteria were still stricter than in the directive. In 1998 a further step was taken and the capital adequacy directive was introduced. Now Tier-3 capital was allowed to cover market price risks. Discussions on the issue were limited. Still, the implementation was again a little stricter than demanded by the directive. A cap for the maximum of net-profits of the trading book was introduced to limit the amount of business that could be built on those unrealised profits. A further change in the eligibility criteria of capital was the introduction of modified capital with Basel II. Different to preceding changes the German legislator, instead of topping up the regulation completely, stated that it had, when drafting the necessary regulatory amendments, adhered strictly to the minimum requirements of the EC directive to avoid overburdening of the banks.⁶¹ Overall, attempts of international regulation and harmonisation in this period have led to a gradual softening of the capital eligibility criteria. While German legislator tended to move beyond the directives and top up on the minimum standard, the argument of the international competitiveness became more influential in the discussions.

Another important change in capital requirement regulations was the determination of risk weights. In Germany, some crude risk weights and also deductions for certain collateralised loans were introduced relatively early. Those were adapted to an internationally agreed framework of risk weights when Basel I was introduced. A major change in the determination of risk weights took place when the capital adequacy directive was launched in 1998. First of all, banks had to determine which of their assets were allocated to the banking and which to the trading book respectively. The capital requirement for positions held in the trading book was substantially lower than for the banking book.⁶² For the first time own internal models could be applied to determine market risk. Initially, this was not an idea of the Basel Committee, which proposed a standard framework for the

⁶¹ Deutscher Bundestag, Plenarprotokoll 16/18, Berlin, 15 Feb. 2006

⁶² Basle Committee on Banking Supervision, 'Capital requirements and bank behaviour: the impact of the Basel Accord', BCBS Working Papers, 1 (1999)

determination of market risk capital requirements in 1993, and was only introduced after banks lobbied for it. When the rules for the determination of credit risk were renewed with Basel II, there was again a standard approach, but as with market risk, banks were allowed to use their own internal risk models to determine their capital requirements. The same was true for operational risk, where banks, again, could choose between standardised approaches or use internal models.

5 A critique on the shortcomings of allowing banks to determine their own capital requirements

As demonstrated above, the international regulation led to a gradual softening of eligibility criteria for banks' capital in Germany. At the same time banks were given a major role in determining their own risk weights. As a reaction to the financial crisis there was a widely held view that those two trends were responsible in enabling some banks to become severely undercapitalised and to hold very little hard core capital. This led to major regulatory reforms in this area. The overall capital ratio will be increased. Also, the share of capital that has to be held as core capital will increase.⁶³ Similar insights did not seem to have occurred for the determination of risk weights, where internal risk models will still play a central role. The following section shows, why the approach to rely on banks' internal models to determine risk and, therefore, necessary capital is problematic.

Why is the current system of allowing banks to use their own risk models to determine risk weights and, therefore, capital ratios problematic? The argument here is threefold. Firstly, it is argued there are severe incentive problems that will encourage banks to use their discretion in determining the risk models to reduce their capital requirements. Secondly, even if banks behave prudently and incentives were correct, there are externalities that managers will not take into account and, therefore, capital levels will be too low from the viewpoint of society. Thirdly, the possibility of measuring risk accurately is flawed in its own rights. Here it can be argued that banks miss the necessary data and information to do so and even further that in a world of uncertainty it is

⁶³ However, the capital ratio required is still far below the demands of some critics, which argue for ratios of 20 to 30 per cent (see e.g. A.

Admati and M. Hellwig, *The Bankers' New Clothes: What's Wrong with Banking and What to Do About It* (Princeton 2013)).

not even theoretically possible to obtain this information. Moreover, there is further criticism on the models used that will be discussed below.

Regarding the first point, one should be reminded of the theoretical rationale for capital requirements discussed earlier. Due to limited liability and the “too-important-to-fail” problematic, owners have an incentive to take on excessive risk levels and reduce capital. Deposit insurance and “too-important-to-fail” weaken possible market discipline that would otherwise enforce higher capital levels. Therefore, banks chose distorted capital-risk combinations. Regulatory capital requirements are introduced to correct this distortion. It was argued that uniform or crude regulatory risk weights would lead banks to choose particular risky assets. As a response, regulators tried to fine-tune risk weights. In the search for optimal risk weights banks’ internal risk models were seen as the solution. However, in the course of this process the purpose of capital regulation was lost. The possibility that banks, who want low capital and high risk to boost their return on equity, might use their control over risk models to manipulate risk measurements in their own interest was ignored.⁶⁴ That banks have sufficient leeway to manipulate models can be seen by narrative evidence of their reaction on the need to increase capital in response to the financial crisis and Basel III. US banks’ senior officials’ comments on their use of financial restructuring and managing of assets to achieve higher capital levels speaks volumes.⁶⁵ More quantitative evidence can be found in European banks. Risk weighted assets of the Deutsche Bank were reduced by 55 billion Euro in the last quarter of 2012 to achieve a higher capital ratio. Only a part of it was achieved by an actual reduction of balance sheet positions. About one half to three quarters of the reduction was due to “finer calibration” of the risk models. According to a large rating agency the ratio of risk weighted assets to balance sheet size in the banking sector was reduced between 2007 and 2012 from 65 per cent to 35 per cent. This can hardly be explained by the reduction of risky business.⁶⁶ The British FSA asked 13

⁶⁴ Admati and Hellwig, *The Bankers’ New Clothes*, p. 184

⁶⁵ T. Braithwaite, ‘Banks turn to financial alchemy in search for capital’, *Financial Times*, 24.10.2011

⁶⁶ A. Hübner and L. Noonan, ‘Banken rechnen sich ihre Bilanzrisiken schön’, *Format.at*, 13.02.2013. available at:

<http://www.format.at/articles/1307/935/352504/banken-bilanzrisiken>

banks to calculate the default risk of a portfolio of securities. The highest calculated risk was six times higher than the lowest calculation.⁶⁷ The use of own risk models was allowed because of the argument that the risk weights of Basel I lead to distortions. Nevertheless, the use of risk models also leads to distortions. Admati and Hellwig argued that banks tend to move into assets where risk weights can be easily manipulated. In particular mortgage backed securities benefited from this distortion, while SME loans suffered.⁶⁸ For example, due to lower risk weights in the trading book for MBS than for whole mortgages (1.6 vs. 4 per cent) the process of securitisation was driven by the banks' attempts to economise on equity.⁶⁹

However, even if banks' risk managers were most prudent and had proper economic incentives, the attempt to align economic and prudential capital requirements is problematic. Externalities, such as systemic risk, will lead to a deviation of socially optimal and privately optimal capital ratios. The economic capital that banks want to hold depends on their individual risk. It is not clear why banks should internalise externalities such as systemic risk, even if they could determine it. Therefore, basing regulatory capital requirements on economic capital calculations, when there are externalities, will lead to capital ratios that are lower than what would be socially optimal.⁷⁰

Additionally, attempts to measure risk with the help of risk models have severe technical flaws and weaknesses. Most regulatory risk models, e.g. the value at risk approach, view risk as an exogenous variable. However, volatility is determined in markets by the behaviour of all individual agents. Therefore risk is endogenous. Financial modelling and acting on those models will change the statistical laws of the process and, therefore, will leave the modeller always a step behind. In normal times, where agents are heterogeneous and their actions cancel each other out, the failure to

⁶⁷ O. Storbeck, 'Wie Banken ihre Risiken klein rechnen', Handelsblatt.com, 19.02.2012, available at:

<http://www.handelsblatt.com/politik/oekonomie/nachrichten/das-grosse-risiko-versteckspiel-wie-banken-ihre-risiken-klein-rechnen/6219734.html>

⁶⁸ Admati and Hellwig, *The Bankers' New Clothes*

⁶⁹ The Financial Crisis Inquiry Commission, 'The Financial Crisis Inquiry Report' (2011), p. 476

⁷⁰ C.A.E. Goodhart, 'Financial Regulation, Credit Risk and Financial Stability', *National Institute Economic Review*, 192 (2005)

acknowledge this endogeneity is less problematic. It becomes relevant in times of crisis, when agents act more homogenous as a result, this ignorance will have severe consequences. The process that drives the underlying data will be interrupted by a structural break, violating one of the central assumptions of the VaR approach. Also, the data immediately preceding the structural break will be useless to estimate risk. That means risk models become useless the moment they are most needed. Additionally, the use of relatively uniform risk modelling techniques across banks will enhance the homogeneous behaviour, since risk models will propose similar actions and so can aggravate the crisis.⁷¹ There are many other shortcomings in practice. Danielson showed that risk models, as used in practice, are not robust across different asset classes, time horizons and risk levels. Further issues are the high volatility of risk estimates and risk managers reaction to them, the choice of the model estimation horizon, the problems with calculating VaR estimates for different holding periods and the problem of changing correlations. Using different risk models and number of observations estimating the VaR for an IBM stock he obtains results differing by the factor of two.⁷² He argued that: "Given current technology, risk modelling is simply too unreliable, it is too hard to define what constitutes a risk and the moral hazard issues are too complicated for risk modelling to be an effective part of regulatory design, whether for market, credit, liquidity, or operational risk."⁷³

Another often discussed flaw of risk models is their pro-cyclicality. In good times, models will show low risk levels. That means based on a certain amount of equity banks can purchase more assets and give more loans. As soon as a crisis situation occurs, risk estimates will increase and show higher capital requirements. If the bank in this situation cannot raise additional equity, it will have to sell assets. This puts pressure on asset prices and can aggravate a downward spiral.⁷⁴

⁷¹ J. Danielsson, P. Embrechts, C. Goodhart, C. Keating, F. Muennich, O. Renault and H.S. Shin, 'An Academic Response to Basel II', LSE Financial Markets Group an ESRC Research Centre Special Paper Series, 130 (2001)

⁷² J. Danielson, 'The Emperor has no Clothes: Limits to Risk Modelling', *Journal of Banking and Finance*, 26 (2002), pp. 1273-96

⁷³ Danielson, 'The Emperor has no Clothes', p. 1292

⁷⁴ S. Angius, C. Frati, A. Gerken, P. Härle, M. Piccitto and U. Stegemann, 'Risk modeling in a new paradigm: developing new insight and foresight on structural risk', *McKinsey Working Papers on Risk*, 13 (2011)

While those technical aspects are highly relevant, they probably could be overcome with further improvement of models and techniques. More fundamental is the problem of uncertainty. The risk weights in the models are calculated based on past experiences. Yet, there is nothing that guarantees that the future will be as the past. For many of the relevant events it is impossible to assign fixed probabilities. Additionally, one does not know what the relevant events might even be. Donald Rumsfeld famous quote describes the idea quite well: "There are known unknowns; that is to say there are things we now know we don't know. But there are also unknown unknowns; there are things we do not know we don't know."⁷⁵ Therefore, all attempts to precisely measure an optimal amount of equity are flawed. One cannot know whether the actual chosen capital levels are too high or too low. Therefore, appropriate capital levels cannot be determined scientifically. The eventual decision will be political and depend on the uncertain trade-off between robustness of the financial system and the potential prevention of costly crisis and the potential costs for society in terms of lower growth or efficiency.⁷⁶

The limitations of the models become particularly problematic if bankers become too confident with their risk management abilities and forget about their shortcomings. Similar to the observation that the perception of safety provided by seatbelts causes people to drive faster, the high confidence provided by risk management techniques and models could lead to taking on higher risk, since one has the apparent ability to manage it.⁷⁷ Similar, Krahenen und Carletti argued that there is an enormous capacity build up in risk management and risk measurement skills in banks. The ability of banks to quantitatively founded risk measurements can enhance their ability to limit risks. However, the perceived increased risk competence can as well lead to increased risk appetite. This is

⁷⁵ D.H. Rumsfeld at Department of Defense News Briefing, 12 Feb. 2002. Transcript available at:

<http://www.defense.gov/transcripts/transcript.aspx?transcriptid=2636>

⁷⁶ Some authors argue that while there are private costs, there are no or much lower costs for society as a whole. See for example Admati and Hellwig, *The Bankers' New Clothes*

⁷⁷ Admati and Hellwig, *The Bankers' New Clothes*

particularly severe if the above mentioned practical and theoretical problems of the risk measurement techniques are not acknowledged.⁷⁸

There are massive problems with internal risk models, reaching from theoretical issues to problems of practical implementation. Considering these problems in combination with the incentives of banks to “game” the regulation, the central role of internal risk models in capital adequacy regulation before the crisis is incomprehensible. Shortly after the crisis hit many adjustments were made, first, through the revisions of the Basel II market risk framework (known as Basel 2.5) and then through Basel III. Will those help to solve the problems? Basel 2.5 introduced an incremental risk charge (addresses e.g. the risk of securities being downgraded) and a stressed value at risk (which assumes a crisis-like scenario). From now on, the new minimum trading book capital is composed of those together with the already used value at risk. A quantitative impact study of 43 banks estimated that capital requirements would increase on average by 11.5 per cent (median 3.2 per cent).⁷⁹ Additionally, some securitised positions can no longer be calculated with the help of internal models, instead a standard approach needs to be applied. For some specific positions a so called comprehensive risk measure can be applied. With the application of Basel III some additional changes will take place. Overall, the general level of capital and in particular its quality is increased. Additionally, due to a countercyclical buffer and a capital conservation buffer, some anti-cyclical elements are introduced, which will help to mechanically correct some of the pro-cyclical features of the risk models.

While those proposals address some of the issues mentioned above, e.g. some of the weaknesses of the VaR or the pro-cyclicality, and will, compared to the current situation, lead to higher capital requirement it does not address the fundamental issues. While they try to improve the models, the moral hazard problem is not solved – banks still have leeway and incentives to use the

⁷⁸ Krahen and Carletti, ‘Kapitalregulierung von Banken’

⁷⁹ Basel Committee on Banking Supervision, ‘Analysis of the trading book quantitative impact study’, Bank for International Settlement (2009)

models to reduce their capital requirements. The introduction of the stressed value at risk will alleviate some of the problems with structural changes in the data, but cannot address the fundamental problem of uncertainty. Currently, the Bank for International Settlement works on further improvements of the models used for the determination of market risk.⁸⁰ While many of the proposed measures indeed will help to alleviate some of the technical issues and make the models more crisis-proof (e.g. the use of expected shortfall measures instead of VaR) they still will not address all the problems. No matter how well the models are designed, in a world of uncertainty they cannot be able to give precise risk measures. The additional incentive problem will also not be resolved. This does not mean we should completely abandon risk models and risk management. They can be a useful tool for internal management decisions. The decision makers in the banks need to understand the shortcomings of the models and realise that they still have some management responsibility going further than acting according to numbers retrieved from a model. While the risk models can be a valuable addition to management decisions, they should not replace them. If this is not understood, risk management may even be detrimental to the company. Considering the current shortcomings of the models and the moral hazard problems, for regulatory purposes models seem even less qualified. It could, as it is currently tried, to prescribe better models to the banks. However, with the moral hazard problem in place, banks will go on trying to “game” the models so that regulators will have to make very precise specifications. This in turn will lead to a homogenisation of the models and so aggravate the problem of endogenous risk. At the same time, the innovative capacity in risk modelling in the banks will be undermined. Given those constraints banks’ internal risk models should not be used for regulatory purposes. Instead, one could focus on the standardised approaches and try to minimise the problems by refining them and reduce the incentives for regulatory arbitrage. Alternatively, one could think about prescribing a high capital floor so that risk models only matter at the margin.

⁸⁰ Basel Committee on Banking Supervision, ‘Fundamental review of the trading book: A revised market risk framework’, consultative document, Bank for International Settlement (Oct. 2013)

6 Conclusions

This paper attempted to give the reader an overview about the development in capital requirement regulations in Germany. After an overview about the general regulatory environment of the financial sector in Germany and a theoretical discussion of reasons for capital requirements, the development of the regulation since the 1930s in this area is reviewed. Different trends were identified. Overall, through the increased internationalisation and complexity of banking, new risks occurred, which were gradually addressed by regulation. While in the beginning regulation was focusing on credit risk, later, market risks, counterparty risks and operational risks became subject to regulation, too. Since 1992 capital requirement regulation is largely determined on an international level. Since then, the overall trend demonstrates a gradual softening of the notion of capital and the increased determination of risk weights and, therefore, capital requirements with the help of banks' internal risk models. Both trends are seen as problematic and have contributed to the incomprehensibly low capital endowments of some banks prior to the financial crisis. While the trend towards the softening of capital has been reversed with Basel III, the trend towards using internal risk models in determining regulatory capital charges was not. Therefore, this paper outlined the problems of using risk models. Besides technical problems, there are problems with banks' incentives, the difference between social and economic capital adequacy if there is systemic risk, with uncertainty and the increased trust in models for decision making. Currently, regulators try to improve the models to fix their apparent technical problems and make them more crisis-proof. However, this is problematic. It is argued that since many of the mentioned problems are not addressed properly or even recognised, the further reliance on models as a central tool for capital adequacy regulation is a mistake at least within the current regulatory framework. So what would be the appropriate regulatory response to the different issues identified?

The *technical shortcomings* of the models are probably the most obvious problems that can be addressed. Experts are already working on improvements to overcome many of the issues associated with the risk models currently used in practice. The planned replacement of VaR with a

measure of the expected shortfall is only one example and others have been discussed above. Therefore, as we have seen in the past, through better technology and more research, risk measurement techniques will gradually improve. They will become more accurate, reliable and robust.

The *problem of pro-cyclicality* can be addressed as well. One approach in Basel III is to solve it mechanically by introducing a counter-cyclical capital requirement triggered when the financial sector is growing excessively. This approach is similar to ideas some economist and central bankers, such as Charles Goodhart, proposed before.⁸¹ An alternative or supplementary instrument to address this problem could be the application of Asset Based Reserve Requirements. This would be particularly helpful if it is intended to address problems in specific markets and would give an additional instrument to regulators.⁸² Using a through-the-cycle instead of a point-in-time approach could help to alleviate the problem directly in the models.⁸³ Overall, there are promising attempts and possibilities to address the problem of pro-cyclicality on the banks' level or through intervention by the supervisors.

The problem of *differences in economically and socially optimal capital levels* needs to be addressed by the supervisors. The most apparent issue here is systemic risk. Individual banks lack the incentive but also the necessary information to internalise systemic risk automatically into their capital ratios. The supervisors' role, therefore, is to develop appropriate measures to capture systemic risk. Capital charges for this risk would be added to the individually appropriate capital requirement. Basel III incorporates some of those ideas. There will be higher capital requirements for systemically important institutions and supervisors have discretion to add additional relatively

⁸¹ See for example: C.A.E. Goodhart, 'Financial Regulation, Credit Risk and Financial Stability'

⁸² For a discussion of Asset Based Reserve Requirements see: D. Detzer, 'New instruments for banking regulation and monetary policy after the crisis', *Intervention. European Journal of Economics and Economic Policies*, 9-2 (2012), pp. 233-54

⁸³ N. Masschelein, 'Monitoring pro-cyclicality under the capital requirements directive : preliminary concepts for developing a framework' National Bank of Belgium Working Paper, 120 (2007)

flexible capital charges that can be applied on a sectorial level, for groups of institutions or for specific activities or claims.

The *moral hazard problem* of banks' incentives to understate their individual capital requirements still remains. Bank managers and owners prefer lower capital to boost their return on equity. There are attempts to address this problem. Higher overall capital requirements so that owners have more skin in the game, living wills and regulations on managers' compensation packages may help to alleviate the moral hazard problems. Whether they are able to fully address the issues remain unforeseeable.

The remaining problem is *uncertainty*. Even if regulation manages to alleviate the moral hazard problem, the technical problems of the models are resolved and the regulators apply correct systemic risk charges, the determined capital ratios may still be inappropriate. There are events, whose probabilities cannot be examined and there will be events, no one would have even imagined. There is fundamental uncertainty about the future. If one accepts this, the determined risk measures and the derived capital ratios can only be rough guides to determine the capital requirements for banks. The eventual decision is an uncertain political decision. A society needs to decide between the uncertain benefits of a better capitalised financial system, when the next unforeseen shock arrives and the potential costs of asking banks to hold higher capital. Politicians should be aware that there is a political decision to make and that their task cannot be taken over by those "scientifically" derived figures, no matter how well they are derived.

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8 Appendix: The development of capital requirements

| Year of national implementation / national measure | EU Directives and Regulations (year of due implementation) | Main content of the law |
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| 1934 Law of the German Reich on banking (Reichsgesetz über das Kreditwesen) | | Included provisions that allowed for the enactment of capital requirements. However, those were never enacted. |
| 1951 Bank of the German States (Bank deutscher Länder) enacts guidelines for banks that want to use its refinancing facility | | Guidelines included capital requirements. |
| 1961 Banking Act is established | | Included a provision that allows the Federal Banking Supervisory Authority (FBSO) to enact binding capital requirements in consultation with the Bundesbank |
| 1962 Principle I enacted | | <p>FBSO enacts Principle I</p> <ul style="list-style-type: none"> • Limits a bank's assets to 18 times its equity (5,5% equity requirement) • No risk weighting • Exclusion of some positions, e.g. some loans to domestic and foreign government entities or some specific collateralised loans • Narrow definition of capital applied, according to which eligible capital had to fulfil three principles: <ul style="list-style-type: none"> - It had to be fully paid up, - capable of meeting current losses, - and permanently available to the bank • Exception for uncalled members liabilities of cooperative banks |
| 1965 Amendment of Principle I | | <ul style="list-style-type: none"> • Formerly excluded public mortgage banks (Öffentlich Rechtliche Grundkreditanstalten) are put under the regulation • Simple risk weights are introduced <ul style="list-style-type: none"> - A risk weight of 50% for formerly excluded loans collateralised with ships or real estate and for loans backed with public guarantees was introduced |
| 1969 | | <ul style="list-style-type: none"> • Formerly excluded credit guarantee associations and Teilzahlungskreditinstitute are put under the regulation • Risk weights were refined |

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| Amendment of Principle I | | <ul style="list-style-type: none"> - 20% for Domestic banks - 50% for foreign banks - 50% for contingent claims - 100% for foreign public entities (due to concerns about transfer and currency risk) |
| 1976 Second Amendment of the Banking Act | | <ul style="list-style-type: none"> • Reaction towards weakness in banking regulation unveiled during the Herrstatt crisis of 1974 • Introduction of Principle Ia <ul style="list-style-type: none"> - Limits open currency positions to 30% of equity |
| 1980 Amendment of Principle Ia | | <ul style="list-style-type: none"> • In addition to the restrictions on currency the principle now also limits the exposure to positions in gold, silver and platinum |
| 1985 Third Amendment of the Banking Act | | <ul style="list-style-type: none"> • Change in the eligibility criteria of capital <ul style="list-style-type: none"> - Allowance for cooperative banks to add their members' uncalled liabilities to regulatory capital was reduced from a maximum of 50% of paid up member shares and reserves to only 25%. There was a transition period of 10 years. - Rules for acknowledgment of capital provided by dormant partners as regulatory capital were tightened to conform with the 3 principles - Jouissance right capital could now be acknowledged as regulatory capital if it was ensured that it participated in current losses and would not receive any payouts during times of bad performance |
| 1990 Amendment of Principle I and Principle Ia | | <ul style="list-style-type: none"> • Main reason for amendment was the exorbitant growth in derivative business • Principle I was extended to cover not only credit risk, but counterparty risk more generally <ul style="list-style-type: none"> - Risk of counterparty failure of business in financial swaps, forward contracts and option rights had to be backed with equity <ul style="list-style-type: none"> ▪ Credit equivalents could be calculated according to the original exposure method or the marking to market method (those were chosen in anticipation of the EU-Solvency directive) • Principle Ia was extended to limit a wider range of transactions <ul style="list-style-type: none"> - The principle was extended to limit now interest rate risks from interest rate forwards and options and other price risks from forward and option contracts (mainly share and index linked contracts) - Total of those risks was limited to 60% of a bank's equity |
| 1993 Implementation by Act for the Amendment of the Banking Act and of Other Banking Regulations (<i>Gesetz zur Änderung des Gesetzes über das Kreditwesen und anderer Vorschriften über Kreditinstitute</i> ; 21.12.1992) Incl. <ul style="list-style-type: none"> • Fourth Amendment of the Banking Act • Change of Principle I | 89/299/EEC (1993) | The main change has been a broadening of the eligible capital base that banks could use to cover their regulatory requirements. This implied a softening of the established eligibility criteria in Germany. Own funds have been divided into core and additional capital. The 8 per cent of the risk weighted assets now had to be backed with core and additional capital, whereby the amount of core capital needs to be higher. |

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| <p>1993</p> <p>Implementation by</p> <p>Change of Principle I in October 1990</p> <p>Act for the Amendment of the Banking Act and of Other Banking Regulations (<i>Gesetz zur Änderung des Gesetzes über das Kreditwesen und anderer Vorschriften über Kreditinstitute</i>; 21.12.1992)</p> <p>Incl.</p> <ul style="list-style-type: none"> • Fourth Amendment of the Banking act <p>Further change of Principle I</p> | <p>89/647/EEC (1993)</p> | <ul style="list-style-type: none"> • Principle I was changed in October 1990 to include off-balance sheet operations in derivative markets. For the calculation of the cover loss the Original Exposure Method and the Marking to Market Method were allowed. Therefore, Principle I was extended from dealing with credit risk to dealing with counterparty risk in general. German supervisors imposed stricter regulations than the directive required and also demanded contracts with other price risks to be backed with capital (directive only concerned with currency and interest contracts) • With the changes in 1992 Principle I was amended to include now almost all asset items. In particular all securities and tangible assets were now included and had to be backed with capital • Traditional off-balance sheet positions, like guarantees, were differentiated and weighted according to risk categories of 100, 50, 20 and 0% • The minimum capital ratio was raised from 5.56% to 8% |
| <p>1995</p> <p>Minimum Requirements for the Trading Activities of Credit Institutions (<i>Mindestanforderungen an das Betreiben von Handelsgeschäften der Kreditinstitute</i>; 23.10.1995)</p> | | <p>The existing Minimum Requirements for the Internal Control Rules for Foreign Exchange Transactions and the Minimum Requirements for Security Trading have been replaced and extended to include all trading activities, especially money market and precious metal transactions and trading derivatives. Here for the first time banks had to establish risk management systems for their trading activities, including systems for the internal measurement of the risk of their trading positions. While those were only for internal use, it was planned to use them later for the determination of capital requirements for market risks.</p> |
| <p>1997</p> <p>Implementation by</p> <p>Act on the Implementation of Directives for the Harmonisation of Bank and Security Related Regulations (<i>Gesetz zur Umsetzung von EG-Richtlinien zur Harmonisierung bank- und wertpapieraufsichtrechtlicher Vorschriften vom 22/10/1997</i>)</p> <p>Incl.</p> <ul style="list-style-type: none"> • Sixth Act Amending the Banking Act • Change of the Securities Trading Act | <p>93/6/EEC (CAD) (1996)</p> | <p>The Capital Adequacy Directive aimed at establishing uniform capital requirements for banks and investment firms with the objective of covering market risks arising from the securities and foreign exchange trading activities of these institutions.</p> <ul style="list-style-type: none"> • Financial service institutions fall under the regulation of the Banking Act and Principle I • Changes in the definition and determination of own funds <ul style="list-style-type: none"> - Introduction of automatic adjustment mechanism for the determination of own funds, so that banks constantly have to determine their current capital base - Tier-3 capital was introduced (net-profits of trading book and short-term subordinated liabilities) and can be used in particular to cover risks from the trading book • Introduction of a “trading book” for banks <ul style="list-style-type: none"> - All own-account positions in financial instruments, marketable assets and equities taken on by the institution for profiting in the short-term from price variations have to be included in the trading book - Institutions with trading book business below 5% of entire business can be exempt and use banking book rules also for trading book positions • Market price risk has to be covered with capital <ul style="list-style-type: none"> - Market price risk of foreign exchange and commodity positions has to be determined and covered with own funds - Trading book institutions have to determine the market price risk of their trading book positions and cover it with own funds |

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| Change of Principle I and Principle Ia | | <ul style="list-style-type: none"> • Determination of market price risk with standard method or internal risk models <ul style="list-style-type: none"> - Market price risk can be determined by a standard method or by banks' internal risk models - If internal risk models are used, they have to be approved by the supervisory authority |
| 2000 Announcement of the Amendment and Supplementation of the Principles Regarding Equity and Liquidity (<i>Bekanntmachung über die Änderung und Ergänzung der Grundsätze über die Eigenmittel und die Liquidität der Institute; 20.07.2000</i>) | 98/31/EC (2000) | <p>Most of the content of the directive was already introduced with the sixth amendment of the banking act and the changes in principle I in 1997. Therefore, only some minor changes were necessary to conform to the directive.</p> <ul style="list-style-type: none"> • The rules regarding the calculation of the capital charges for market risk stemming from commodity business and from business in commodity related financial instruments were already included. Therefore only the rules regarding the counterparty risk of the trading book were adapted • Also the rules regarding the use of internal risk measurement models for the determination of general and specific price risks in the trading book were already included. Only some rules for their use to determine the specific risk of net interest- and net stock positions had to be added |
| 2002 Fourth Financial Markets Promotion Act (<i>Gesetz zur weiteren Fortentwicklung des Finanzplatzes Deutschland (Viertes Finanzmarktförderungsgesetz); 21.07.2002</i>) | | <ul style="list-style-type: none"> • Principle I was changed from being an administrative order to be a statutory regulation • The distinction between the trading book and the banking book will in the future be established by a regulation to adapt the rules more speedily to EC directives |
| 2002 Minimum Requirements for the Credit Business of Credit Institutions (<i>Mindestanforderungen an das Kreditgeschäft der Kreditinstitute; 20.12.2002</i>) | | <ul style="list-style-type: none"> • The Minimum Requirements for the Credit Business of Credit Institutions substantiate the general requirements of a proper business organisation, of adequate internal control mechanisms and rules for the management, supervision and control of risks • The establishment of proper risk classification systems was demanded also for credit risk. Even though the regulation did not ask for Basel II compliant internal rating systems, banks that wanted to use the internal rating based approach later, it was sensible to establish such models already by then |
| 2006 Implementation by Act implementing the Revised Banking Directive and the Revised Capital Adequacy Directive | 2006/48/EC and 2006/49/EC (CRD I) (2007/2008) | <p>The Directives served to translate essential contents of Basel II into national law.</p> <ul style="list-style-type: none"> • Introduction of modified capital as the new basis for the calculation of capital adequacy <ul style="list-style-type: none"> - Compared to the former definition of capital, modified capital has some additional add-ons and deductions for example for large exposures, etc. • Operational risk has now to be explicitly calculated and covered • New methods to calculate credit risk |

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| <p>(Gesetz zur Umsetzung der neu gefassten Bankenrichtlinie und der neu gefassten Kapitaladäquanrichtlinie; 22.11.2006)</p> <p>Incl.</p> <ul style="list-style-type: none"> • Changes in the Banking Act <p>Replacement of Principle I by the new Solvency Regulation</p> <p>Replacement of the Principles II and III by the new Liquidity Regulation</p> <p>Amendment of the Large Exposure Regulation</p> | | <ul style="list-style-type: none"> - Choice between standardised approach or internal rating based approach (IRB) - Standardised approach based on external ratings of rating agencies; for unrated positions there are risk weights applied across the board; retail business and some SMEs weighted with only 75%; lower risk weights for claims secured by residential real estate (35% instead of 50%); banks are rated according to the second option of the Directive so that they are rated one class below the rating class of the country of domicile - Alternatively banks can use an internal rating based approach; here there is a choice between a simple version, where only the probability of default is determined internally and other factors are provided by the supervisor and an advanced version where all relevant factors are determined by internal systems • Extension of the calculation approaches for the credit equivalent amounts of risk exposure in derivatives <ul style="list-style-type: none"> - Besides the original exposure method and the mark-to-market method an internal model approach and a standardised method can be used • Range of recognised risk reducing collaterals was extended <ul style="list-style-type: none"> - Institutions using the standard approach are allowed to use most financial collateral - Institutions using the advanced approach can use any kind of collateral as long as they can determine reliable estimates of the asset value • Rules for capital requirement for securitisation transactions were adopted from the directive • New standard approach for the determination of market risks for positions not taken account for in earlier regulation, such as financial transactions based on weather variables, CO2 emissions or other macroeconomic variables. The approach is based on historical simulations |
| <p>2010</p> <p>Implementation by</p> <p>Act Implementing the Amended Banking Directive and the Amended Capital Adequacy Directive (Gesetz zur Umsetzung der geänderten Bankenrichtlinie und der geänderten Kapitaladäquanrichtlinie; 24.11.2010)</p> <p>Incl.</p> <ul style="list-style-type: none"> • Changes in the Banking Act <p>Regulation Further Implementing the Amended Banking Directive and the Amended Capital Adequacy Directive (Verordnung zur weiteren Umsetzung der geänderten Bankenrichtlinie und der geänderten Kapitaladäquanrichtlinie; 05.10.2010)</p> <p>Incl.</p> <ul style="list-style-type: none"> • changes in the Large | <p>Directive 2009/111/EC (CRD II) (2010)</p> | <ul style="list-style-type: none"> • Rules for the allowance of hybrid capital as core capital changed <ul style="list-style-type: none"> - German rules based allowance on the form of capital and allowed jouissance right capital and capital by silent partners - Replaced in accordance with the directive by a principle based system focusing on the qualitative characteristics of the instrument - Differentiated upper limits for hybrid capital that is allowed as core capital based on qualitative characteristics such as permanence and loss bearing capacity - Total and hybrid capital with highest quality can make up at maximum 50% of core capital (for lower qualities lower limits) • Changes in the allowance of investment fund shares and life insurance policies as collateral |

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| <p>Exposures Regulation</p> <ul style="list-style-type: none"> • changes in the Solvency Regulation | | |
| <p>December 2011</p> <p>Implementation by</p> <p>Second Regulation Further Implementing the Amended Banking Directive and the Amended Capital Adequacy Directive (Zweite Verordnung zur weiteren Umsetzung der geänderten Bankenrichtlinie und der geänderten Kapitaladäquanzrichtlinie; 26.10.2011)</p> <p>Incl.</p> <ul style="list-style-type: none"> • Changes in the Solvency Regulation | <p>Directive 2010/76/EU (CRD III) (2011)</p> | <ul style="list-style-type: none"> • Increased own funds requirements for trading book position <ul style="list-style-type: none"> - Institutes that use their own risk models have to hold additional equity to cover stressed-VaR (which relates to a crisis-like market development) - Institutes that use their own risk models to calculate the specific risk of interest bearing instruments have to hold additional equity to cover default and migration risk (Incremental risk charge) - It is drawn into doubt whether institutes are able to calculate the risk of securitised positions adequately. Therefore the specific risk for securitised positions in the trading book has now to be calculated by a standard method, similar to that already used for banking book positions. For positions with highly liquid underlyings (Correlation Trading Portfolios) a modified method is introduced and under certain conditions they can use own models (so called Comprehensive Risk Measure, CRM) <ul style="list-style-type: none"> - For institutes not using own risk models the new rules increase the capital requirements for shares to 8% (2% or 4% before) • Increased own funds for re-securitised assets <ul style="list-style-type: none"> - An increased risk weight for re-securitised positions is introduced in the credit risk standard and in the internal rating based approaches • Increased publication requirements <ul style="list-style-type: none"> - regarding calculated market risk and calculation method - regarding securitised assets |
| | <p>Regulation 575/2013 CRR (2014)</p> | <p>The regulation applies directly. There are changes necessary to remove superfluous or conflicting national rules. The CRR allows for some national options. These will be made with the CRDIV Implementation act, which is currently in the legislative process and will mainly change the Banking Act. Among others, §10 which until then regulated capital requirements will largely be removed and be replaced by the authority to issue a regulation regarding solvency rules – which still need to be fleshed out at the national level – as well as rules governing the imposition of stricter capital adequacy requirements by the BaFin. There will also be changes necessary in the Solvency Regulation, the Liquidity Regulation and the Large Exposure Regulation. The effective implementation dates for the new rules depend on the coming into effect of the CRR.</p> <p>The CRR is only applicable to enterprises that conduct deposit and lending business, the current definition of a credit institution in the banking act is broader. Also the definition of a financial service institution is broader in the banking act than what is covered in the CRR as an investment firm. A provision in the banking act is made that also the institutes not covered from the CRR directly have to apply the new rules (with some exceptions).</p> <p>The CRR will lead to the following main changes:</p> <ul style="list-style-type: none"> • New definition of capital <ul style="list-style-type: none"> - There will be only 3 categories of capital: tier-1 capital, additional tier-1 capital and tier-2 capital - Tier-1 capital is composed only of paid-in capital instruments and disclosed reserves; it has to be available for unrestricted and immediate use to cover risks or losses; there are 13 characteristics outlined in the CRR that capital instruments have to fulfil to count as tier-1 capital - Additional tier-1 capital should be continuously available for loss absorbency purposes, thereby enabling the bank to continue on a going-concern basis; further characteristics are that the capital is subordinated, perpetual, and that distributions is fully discretionary; the instrument has to be convertible to capital or depreciate if tier-1 capital falls below 5.125% - Tier-2 capital's function is limited to capital protection in case of bankruptcy. The following requirements apply: minimum original maturity of 5 years, subordinated in case of bankruptcy, no incentives to redeem, redemption before maturity only with the consent of the supervisor - Tier-3 capital is eliminated in the new capital structure - Deduction rules have been tightened |

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| | | <ul style="list-style-type: none"> • Higher quality capital necessary to fulfil 8% capital requirements <ul style="list-style-type: none"> - Minimum tier-1 capital increases from 2% to 4.5% of risk weighted assets - Minimum additional tier-1 capital of 1.5% of risk weighted assets - Tier-2 capital only up to a maximum of 2% of risk weighted assets - Transition period until 2018 with decreasing allowance for existing capital elements • Higher capital requirements for derivative trades <ul style="list-style-type: none"> - Realisation that most losses from derivatives were not due to default of counterparty, but due to losses in market value of the instrument caused by a deterioration of credit-worthiness of the counterparty - Therefore additional capital charge will be introduced for derivatives not traded through a central counterparty to cover such losses – Credit Valuation Adjustments - Far-reaching exemptions: some trades with non-financial corporations and certain intra-group transactions are excluded. Additionally, deals with pension funds, central banks, sovereigns and certain public sector entities are exempt - Also for derivatives cleared through a central counterparty a small capital charge is introduced • Introduction of a Leverage Ratio <ul style="list-style-type: none"> - It is planned to introduce a leverage ratio that is tier-1 capital over total exposure - Differently from the risk-based capital requirements for the calculation of the leverage ratio, the positions enter with their nominal value - From 2015 on all institutes are supposed to publish the leverage ratio - No minimum requirement, but observation phase until January 2017. Thereafter a decision on whether to set a binding minimum value for the leverage ratio and, if so, how high that level should be, is made • Higher capital charges for systemic risk <ul style="list-style-type: none"> - To address systemic risk on a national level the member states have the possibility to tighten certain requirements, among them capital requirements. However, that has to be communicated to the European Parliament, the European Commission, the Council, the ESRB and the EBA and justification has to be submitted - The council can veto the measure under certain conditions - However, there are certain measures that the member states can always take: increasing the risk weight for real estate and interbank loans by 25% and lowering the upper limit for large exposures by 15 percentage points - The regulation gives the commission the possibility to tighten requirements for the EU as a whole, if all member states are affected • Lower capital charges for small and medium-sized enterprises (SMEs) <ul style="list-style-type: none"> - The capital requirements for SMEs are multiplied with a factor of 0.7619, which is basically neutralising the newly introduced capital conservation buffer of 2.5% - SMEs are defined as having annual revenues below 50 million euro; additionally the exposure of one institute against one SME is not to exceed 1.5 million euro |
| | <p>Directive 2013/36/EU (CRD IV) (2014)</p> | <p>The directive contains the elements of Basel III and some further European initiatives that still need to be implemented on a national level. The CRDIV is implemented by the CRDIV Implementation act, which is currently in the legislative process and will mainly change the Banking Act. Additionally, there are changes in the solvency regulation necessary.</p> <ul style="list-style-type: none"> • Capital conservation buffer is introduced <ul style="list-style-type: none"> - This buffer consists of tier-1 capital and is 2.5% of risk weighted assets. It has to be held additionally to the 4.5% tier -1 capital and has to be build up gradually from 2015 until 2018 - If an institute falls below its conservation factor an gradually increasing restriction on the distribution of profits and bonuses applies • Countercyclical buffer is introduced <ul style="list-style-type: none"> - This buffer is between 0% and 2.5%. It is increased when the financial sector is growing excessively - The rate applied depends on the country the claim is against, e.g. if a German bank lends to a French company, the French countercyclical capital buffer has to be applied |

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| | | <ul style="list-style-type: none"> - The BaFin does determine the rate for Germany and can determine the rates for third countries that do not apply such a rate. If a country increases rates to above 2.5%, an acknowledgement of the BaFin is necessary to make the rate binding for German institutes • Systemic risk buffer is introduced <ul style="list-style-type: none"> - This buffer is at least 1% and can be applied flexibly. It can be applied to specific groups of institutions or specific claims and is supposed to address long-term, non-cyclical, systemic or macro prudential risks on the national level - Depending on the size and type of buffer different procedures have to be followed to be allowed to apply the buffer. Up to 3% a simple notification and the deployment of the reasons for the buffer to the European Commission, the EBA, the ESRB and foreign authorities affected is sufficient - Systemic risk buffers from other member states can be acknowledged by national supervisors and would then also apply to national institutes • Introduction of buffer for systemically important institution <ul style="list-style-type: none"> - As from 2016, global systemically important institution (G- SII) will be required to maintain, on a consolidated basis, an additional systemic risk buffer, which, depending on the systemic importance of the group in question, is between 1% and 3.5% of risk weighted assets - G- SII are identified by internationally agreed on criteria - National supervisory authorities likewise have the option of imposing an additional capital buffer of up to 2% on other systemically important institutions (O- SII) as from 2016 - If a buffer is impose on O-SII the national authority must notify and justify the planned measure to the European Commission, the EBA and the ESRB as well as to the competent authorities of any member state affected • Sanctions if combined buffers are not fulfilled <ul style="list-style-type: none"> - If an institution fails to fulfil its combined buffer requirements restrictions on the distribution of profits apply - Additionally, a capital conservation plan has to be worked out and submitted to the BaFin and the Bundesbank |
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