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LOOKING FOR OPTIMAL CAPITAL REGULATIONS AND LEVELS IN POST-CRISIS FINANCIAL INSTITUTIONS – THE CAPITAL VERSUS RISK DEBATE

Introduction

Minimum capital requirements towards banks are present in virtually all developed and developing market banking systems. Their strictness and level of detail vary, depending on national supervisory regimes. The revised framework for capital adequacy drafted by the Basel Committee on Banking Supervision and referred to hereafter as „Basel II" was designed to provide uniform capital regulations for internationally active banks. The detailed regulations contained therein and multilateral lengthy consultations on the final shape of Basel II were meant to provide optimal regulations that would be the basis for national supervisors in setting local capital standards. However, the implementation phase of Basel II has coincided with a fully unexpected and severe banking crisis, cutting across developed market countries. Thus, the anticipated triumphant new era in international capital regulations has not materialised. Although Basel II implementation is continuing, serious doubts arise as to the revised framework's efficiency in preventing financial crises, of the kind witnessed today, from re-surfacing in the future.

This paper is a summary of a continuing debate on the role of capital in financial institutions and more specifically, its relation with risk. Despite the prevalence of capital requirements throughout the world, researchers have not yet reached a consensus regarding their effects. Some theoretical and empirical models question the necessity and efficiency of capital regulations, both on an individual bank level as well as on the banking system side. Various authors propose different tools improving the efficiency of minimum capital requirements for various parties, including banks themselves, their depositors and shareholders.

1. Capital – a safety net and prevention of risk

Literature relating to capital regulations, capital levels and its links with other bank variables has been expanding continuously in recent years, additionally fuelled by Basel II discussions. Excellent literature reviews on capital and capital regulation include Berger et al. (1995), Santos (2001) and Van Hoose (2007), where the interested reader may find ample references. The discussion below centres around the relation between capital and risk and is not meant as an exhaustive material on all aspects of capital in financial institutions.

In standard banking textbooks, such as Mishkin (2007), bank capital is viewed as „a cushion against a drop in the value of assets, which could force the bank into insolvency" (p. 222). More broadly, already Basle I indicated that capital should be „freely available to meet unidentified losses" (BIS 1988, p. 5). Its primary function is thus to prevent bank failure by performing the 'safety net' role, which allows equity to absorb larger losses without affecting liability holders. Within this 'reserve cushion' vein, in recent years capital has been studied in the context of the portfolio selection framework. The focus lies on the effect of higher capital requirements on risky asset choices, the so-called „asset-substitution effect". These choices are presumed to be significantly influenced by moral hazard considerations, described among others by Besanko and Katanas (1996) and Morrison and White (2005)[1].

The second popular area of research examines the mechanism through which capital affects returns of shareholders. The discussion on bank capital is largely centred on the two above aspects, namely the optimal capital level to reduce bank risk – through a capital buffer and/or improved asset choices – and maximisation of shareholder returns. In addition, an important role of deposit protection funds is also studied.

Deposit protection is present in most banking systems and is designed to limit the damage to bank deposit holders in case of insolvency. Deposit insurance diminishes the potential for bank runs, when financial institutions are experiencing problems. However, as many researchers claim, deposit insurance possibly eliminates bank runs at the expense of inducing moral hazard. Both traditional models of bank risk and models viewing deposit insurance as a put option suggest that introducing deposit protection increases risk appetites of banks, especially if deposit insurance premiums are risk-independent, as suggested by Santos (2001).

An implied tradeoff between bank safety and shareholder returns, as well as moral hazard spurred by deposit protection, create a need for minimum capital requirements[2]. They should restrain the shareholder profit-maximising drive, limit

[1] Here, moral hazard exists on the side of banks, which may be induced to choose risky, rather than safe, assets.

[2] The literature provides many other motivations for capital regulations, such as e.g. a tradeoff between social benefit of reducing risk of social cost of bank failures and social cost of diminished financial intermediation on the market – put forward by Berger et al. (1995).

moral hazard and enhance overall bank safety. The introduction of minimum capital requirements by banking system supervisors relies on this general assumption that higher capital in fact enhances both individual bank and banking system safety. This statement has been under detailed scrutiny by numerous researchers.

The first positive feature of capital, the 'safety net' function, is treated as a given in most models. With large losses emerging, better capitalised banks are able to avoid default by absorbing negative retained earnings into their thicker equity base. The safety net approach regards capital as a financial cushion for depositors, which the capital requirements protect through forcing banks to be either recapitalised or closed before it is depleted, as in Morrison and White (2005). In consequence, the academic argument concerns the state *before* imminent bankruptcy, or rather the factors that lead to it. Many moral hazard theories assume that if banks have insufficient equity they may take excessive risks to maximise equity returns at the expense of debt-holders or the deposit insurance fund. Enforcing minimum capital requirements spurs prudent bank behaviour and protects the liability holders and deposits insurer from incurring costs.

The relation between capital requirements (and levels) and asset risk is studied within the portfolio selection framework, the primary assumption being that capital requirements have a non-zero effect on asset choices. The majority of models of capital and asset risk, some additionally including the option value of deposit protection, prove that higher capital clearly *reduces* asset risk. This is demonstrated (to name just a few) by Furlong and Keeley (1989), Keeley and Furlong (1990) and Morrison and White (2005). According to Morrison and White (2005) and Hellmann et al. (2000), minimum capital regulations work because they put bank equity at risk – instead of transferring the whole risk onto deposit/debt holders. In case of losses, shareholders risk their own money more than they would if equity was lower – then only providers of deposit protection would suffer. Bearing the risk of investing in risky assets is called by Hellmann et al. (2000) the 'capital-at-risk effect'. The risk reduction emerges because banks under minimum capital requirements may be more inclined to choose asset classes with lower risk, because of 'capital-at-risk' considerations.

Due to a higher cost of funds caused by increased capital requirements (capital is assumed to be more costly than deposits), banks may also engage in credit-rationing and fuel a 'credit crunch', extensively discussed by Berger et al. (1995). As a result, one of implications of higher minimum capital requirements could be a decrease in overall credit size, potentially also affecting better quality borrowers. Within the adverse selection framework on the side of banks, Thakor (1996) shows that higher capital requirements increase cost of funds for banks, while banking competition makes pre-loan borrower screening costly. As a result, higher capital induces banks to refrain from screening and lending altogether, causing credit rationing. Fuelled by capital regulations that at the time did not require capital coverage of interest

rate risk inherent in government securities, Thakor demonstrates how under Basle I banks tended to shift assets away from loans to securities and overall bank credit supply fell. In the aftermath of the financial crisis, Repullo and Suarez (2009) reconsider the role of capital regulation and its procyclicality on overall credit supply. In their dynamic equilibrium model, the cyclical variations of the Basel II Internal Ratings based approach (IRB) are contrasted with flat Basel I capital framework. Their results again point to potential credit crunch effects, in the context of contemporary regulations. They conclude that „advantages of cyclically-varying capital requirements in terms of preserving banks' solvency over the business cycle are disproportionately small relative to the credit crunch effects that they may produce" (p. 2). This indicates, that although capital buffers do allow to absorb losses, they induce banks to contract their credit supply in recessions. This is caused by the fact that although banks maintain capital reserves in excess of regulatory minima, they remain insufficient to prevent procyclicality in credit extension.

Apart from theoretical work, many empirical studies of capital and bank failures provide support for the higher capital/lower risk hypothesis, as higher equity-to-assets ratios prove related to lower future probabilities of failure. Broad empirical evidence is provided by Berger et al.(1995), demonstrating that maintaining higher equity levels results in improved profitability for many institutions.

2. Capital requirements and risky asset choices

On the other hand, many recent models demonstrate that higher capital requirements may in fact *increase* asset portfolio risk and thus compromise the overall soundness of the banking system, contrary to the regulators' ultimate goal. More stringent capital requirements may encourage more risky asset choices, or gambling by bank management, within the moral hazard framework. In some settings, such as discussed by Van Hoose (2007) and Santos (2001), players that are more aggressive respond to higher leverage requirements by increasing their asset risk.

In a static model with deposit insurance treated as a government subsidy, Genotte and Pyle (1991) demonstrate that it is possible for a capital tightening to raise the probability of bank bankruptcy due to increased asset risk. The authors stipulate that „required increases in bank capital are not a substitute for the monitoring and control of asset risk by the bank regulator and may imply an increased need for such surveillance" (p. 820). In an interesting dynamic model with imperfect information, Besanko and Katanas (1996) equally claim that higher capital requirements may lead to augmented bank risk. Their result is driven primarily by the fluctuation of effort in loan monitoring by bank shareholders. Nonetheless, in the first part of the model, the authors confirm the *risk-reducing* traits of higher capital standards: „if asset-substitution moral hazard were the only consideration, an increase in the

capital standard would unambiguously improve bank safety in that it reduces the range in which the bank selects the riskier portfolio" (p. 169). This changes only when bank 'insiders' (shareholders and managers) start to hold a smaller share in total bank equity and thus decrease their overall effort in loan monitoring[3]. Thus, the positive effect of choosing lower risk assets due to higher capital requirements is eradicated by the negative effect of lower effort.

Other models analysing links between capital and loan monitoring show that minimum capital requirements and credit monitoring can sometimes be substitutes. If monitoring is costly and difficult, raising capital requirements seems an easier option, as demonstrated by Campbell et al. (1992). Additionally, in order to solve the problem of monitoring and unobservable cash flows, some studies propose implementing a requirement of issuing subordinated debt.

Many researchers underline the lack of consensus in the capital-versus-risk discussion. An earlier analysis of Berger et al. (1995) brings forward the opposing positions of both sides, emphasising the importance of moral hazard and agency problems in bank capital considerations. Here, differences between regulator-determined and market-driven capital ratios are analysed, along with their effect on asset risk and overall bank safety. In the absence of capital regulations, banks face market capital requirements, which are defined as a capital ratio maximising the market value of a bank. This market value is either the sum of market values of equity and debt, or for non-traded banks, the discounted net present value of expected future cash flows to shareholders. Berger et al. (1995) expose the role of deposit insurance in reducing the market-determined capital ratios, which may thus not reflect the full underlying risk. As a result, regulatory capital requirements are necessary to protect the main party exposed to asset risks, namely the provider of deposit insurance, which is ultimately the government. The authors present a detailed review of literature on imperfections of regulatory capital requirements (Basle 1 regulations – at the time), but indicate that despite these drawbacks, capital regulations enhance bank safety and secure the deposit protection provider and the general public from possible adverse effects of bank systemic risk. In addition, Berger et al. (1995) analyse the influence of higher capital levels on agency problems between shareholders, managers and creditors and indicate main sources of potential conflicts of interests. They conclude that higher capital avoids expropriation problems between shareholders and creditors but increases conflicts of interest between shareholders and managers.

Some models indicate that the diverging conclusions on the capital versus asset risk question stem from different assumptions regarding complete or incomplete

[3] Effort is assumed to depend linearly from the ownership fraction. The authors regard effort in two possible ways. It may be simply senior management monitoring and supervising of loan officers and credit risk. Alternatively, seen more broadly, effort may include forgone perquisite consumption or empire-building opportunities as well as psychic costs of firing inefficient employees. Thus less effort implies a higher non-interest expense ratio, a proxy for perquisite consumption.

markets. Others, similarly to Berger et al. (1995), underline the role of agency conflicts. Jeitschko and Jeung (2005) suppose that the source of differing effects of capital regulation on asset risk could lie in the decision making power held either by deposit insurers, shareholders or managers. Depending on which agent dominates the portfolio decisions, capital tightening may yield various results, as all three sides have their own goals. If shareholders and managers dominate, higher capitalisation could also imply higher risk asset choices.

The majority of capital models rely on static, 'representative bank' setups, with a fixed *ex ante* capital position where only marginal effects of capital increases are considered. However, a full relationship between a bank's capital position and its portfolio choices can only be established through dynamic, intertemporal modelling. Such models usually view capital more broadly, as one of many items within bank balance sheet management. They incorporate a bank's continuous intertemporal cost/benefit analysis, contrasting the gains from higher asset risk with the costs of a potential regulatory breach. Implications here are also frequently ambiguous, with capital increasing or reducing risky asset choices, depending on the setting.

3. Mixed evidence for the capital-risk relation

In an important comprehensive analysis, Calem and Rob (1999) present a dynamic portfolio choice model with heterogeneous banks having different capital positions. Portfolio decisions depend on a bank's capital position and realisation of past investments. The theoretical model is subsequently calibrated, using empirical US bank data from the period 1984-1993. The authors find a U-shaped relationship between capital and risk taking. Banks with the lowest capital accept maximum risk but as capital increases, risk diminishes. However, once capital reaches a certain level, risk-taking starts growing again. Calem and Rob (1999) thus join the two opposing results of other researchers claiming that higher capital either increases or diminishes risk-taking. They suggest that a third possibility should be taken into account, namely that risk-taking can either fall or rise, depending on the level of capital. The authors believe the rationale behind the risk appetite of two extreme sorts of banks to be different. Undercapitalised banks take on more risk because in case of bankruptcy the costs are shifted to the deposit protection fund. This is the equivalent of the popular notion of moral hazard, with the aim of exploiting deposit insurance. Highly capitalised banks, on the other hand, present higher profitability and lower probability of default, so they can 'allow' themselves to take on more risk. This is not moral hazard as these banks are remote from bankruptcy dangers and risky portfolio choices inflict a low probability of default. As a result, minimum capital requirements have to be sufficient to place banks outside the moral hazard range, and thus can diminish bank risk-taking for undercapitalised institutions.

Some additional limits of the amount of risk taken by undercapitalised banks are also enforced through unfavourable market pricing of uninsured liabilities, referred to as 'market discipline'. Diminishing moral hazard through the market requires for the risk pricing to happen ex ante, as a result of changes in bank portfolio risk. In case of well-capitalised banks, this pricing is shown to have little effect on portfolio choice decisions. Importantly, Calem and Rob recognise the danger of larger institutions engaging in capital arbitrage (maximising risk per given capital levels) and thus come nearer the moral hazard, without effectively violating capital requirements. Even without capital arbitrage, well-capitalised institutions respond to higher capital requirements by increasing risk, as they add capital. As a result, there are limits to the risk-reducing capacities of imposing higher capital standards; at some point of high capital, they no longer diminish the probability of default, if this probability is quite small.

A similar view on moral hazard is presented by Gorton and Rosen (1995) who argue that the moral hazard problem applies primarily to undercapitalised banks. In that sense they do not include in their model weakly-capitalised banks at the verge of bankruptcy, but rather they seek reasons for why well-capitalised banks may find themselves in such a position. They explore the deterioration of US banks' profitability, using bank data between 1984-1990, and believe a significant role was played by corporate control considerations, outweighing moral hazard issues. Gorton and Rosen find that bank managers tend to take on excessive risk in markets possessing few good lending opportunities, managers with private benefits coming from running the bank and shareholders without full control of insiders. This is due to the managerial stakes in the bank, which are large enough to make shareholder control costly, but not sufficient to fully align shareholder and manager interests.

A different approach to bank capital including both sides of the balance sheet is presented by Diamond and Rajan (2000). The cornerstone of their model is a bank's role as a liquidity provider, both on the asset – and the liability side. Capital requirements studied in this context affect both deposit volumes and lending capacities. A model of optimal capital choices is considered, given a built-in fragility of the deposit base due to existence of demand deposits. Although it significantly increases a potential for a bank run, such funding is low-cost and enables banks to extend more credit. Capital serves as a financial cushion that buffers against shocks to asset values and – unlike deposits – can be renegotiated in bad times. Importantly, Diamond and Rajan believe that 'requiring more capital will make the bank safer' (p. 2454), so they subscribe to overall risk-reducing effects of higher capital. In their model, the main costs of better capitalisation are reduced liquidity creation possibilities. Their primary conclusion implies that increased underlying liquidity of projects financed by banks urges a more levered bank structure, with a higher proportion of deposits. According to the authors, this explains a decrease in capital ratios over the past. Other researchers have extended the financial fragility approach

of Diamond and Rajan (2000). As extensively discussed by Van Hoose (2007), they demonstrate that sufficient capital supplied by the market prevents liquidity crises and insolvency and thus market-determined capital could take place of both regulatory supervision and a financial cushion.

4. Potential extensions to capital requirements

Interactions between asset and liability sides in banks have also been studied in the context of regulatory tools supplementing capital requirements. Some of the authors demonstrating that capital requirements may increase asset risk conclude that they should be supplemented by additional regulatory tools allowing asset risk control, such as risk-weighting of assets. On the liability side, an interesting alternative within the additional tools supplementing capital requirements are deposit rate ceilings, put forward initially by Bhattacharya (1982) and extended – among others – by Hellman et al. (2000). Taking into consideration recent discussions in Poland relating to the 'deposit war', wiping out bank earnings with extortionately high interest rates paid on deposits by some banks, the deposit rate ceilings are presented below in somewhat more detail.

Within the asymmetric information framework, Bhattacharya (1982) presents a simple multi-period model of banks facing investment choices between risky and less risky assets, with risky assets yielding higher returns. Due to deposit insurance, deposit holders are only interested in the highest possible interest rates and bank default probability does not determine their bank choice. Unlimited competition for deposits drives intermediaries to invest in risky assets to achieve a satisfactory spread, given high borrowing rates. Given a sufficient spread, financial institutions will be driven to choose the least risky distributions. If the spread falls below a certain level, banks switch to more risky assets with higher payoffs. Due to the fact that risky asset choices are unobservable, deposit insurance agents are not able to charge such banks higher risk premiums so these may not be used to control risky asset choices. In consequence, deposit rate ceilings are the only tool of limiting such choices, given that in the other case, competition would drive deposit rates so high as to urge banks to switch to more risky asset choices.

Hellman et al. (2000) extend the model of Bhattacharya (1982) by including capital requirement considerations, with bank asset choices presented in the moral hazard context. Hellman et al. (2000) show that in some settings imposing more stringent capital requirements may induce banks to take on *greater* risk. The authors stipulate that a combination of minimum capital requirements and maximum deposit rates could encourage banks to reduce their asset risk. The effects of financial liberalisation is assumed to have contributed to a higher frequency of banking crises, with an important role played by moral hazard. The

important notion of 'gambling on resurrection' is regarded, with higher asset risk choices implying high profits for banks if it succeeds and high costs for depositors/deposit insurers if it fails. Financial liberalisation is usually linked to increased competition, which erodes profitability as banks are competing for deposits through offering inefficiently high interest rates. Lower profitability diminishes the discounted value of future profits (franchise values) for banks, and thus incentives for making good loans are diminished and these for moral hazard – boosted. Increased competition leads to gambling, and free interest rates are thus in opposition to prudent bank behaviour. The authors find that capital requirements may eliminate moral hazard, but the banks are forced to hold inefficiently high amounts of capital. As a result, the costs of maintaining such amounts of capital limit the banks' competitive drives in terms of offering high deposit rates. A more direct way of achieving this would be to control deposit rates as such, along with capital requirements. Introducing deposit rate ceilings implies reducing competition for deposits across the whole banking system. Deposit rate ceilings may create franchise value for banks, which are seen as a form of 'intangible capital' for banks, a substitute for tangible capital. Hellman et al. (2000) underline the need for tailor-made solutions rather than uniform rules, like Basle II. Following the results of their model, gambling opportunities and the degree of competition should determine the optimal level of capital requirements (and deposit rate ceilings) and these factors are not the same in different countries. However, the idea of imposing deposit-rate ceilings has received little empirical support from the real-world perspective and has been criticised for its purely theoretical application (for references see Van Hoose 2007).

Other instruments put forward by Hellman et al. (2000) that could have similar effects to deposit rate ceilings are asset-class restrictions, along with exposure rules, entry restrictions and enhanced direct supervision, as well as risk-based deposit-insurance premiums. They all either limit the banks' possibilities of engaging in moral hazard or increase incentives of prudent investments, even though the authors realise establishing some of them would difficult (e.g. defining appropriate risk classes). Another tool could be a 'speed limit' on loan growth, as gambling strategies base on rapid portfolio expansion to take advantage of the artificially high current return on the gambling asset.

In his post-crisis analysis, Borio (2008) puts forward similar measures supplementing capital regulations. He indicates that although prudential frameworks have been strengthened through implementing Basel II, they should be further enhanced. This could include building up sufficiently high anticyclical reserve cushions that would expand in good times and be used up in recessions, a tool similar to statistical loan loss provisioning, introduced by the Bank of Spain. Other limits proposed by Borio (2008) also relate to lending, and comprise conservative loan-to-value ratios, prudent collateral valuation and controls over counterparty

risk. As a result, higher capital is not regarded as a sufficient measure to curb risk in view of the recent financial crisis.

The last function of capital regulation is put forward by Morrison and White (2005). Minimum capital requirements can be used to solve adverse selection problems for the regulators, in that they discourage weak quality banks from entering the system in the first place. They may be a tool of selecting bad banks out of the system (avoiding adverse selection), but they have to be tighter than these that aim simply to solve the moral hazard problem of gambling by undercapitalised banks. If regulatory ability to monitor banks ex-ante is low and screening costs are sufficiently high, high minimum capital requirements allow to avoid licensing poor quality banks (even if banking sector size is compromised). Stronger regulators with a high screening ability are able to use it to keep weaker quality newcomers away from the system, so minimum capital requirements only need to solve the moral hazard problem. Morrison and White argue that introducing uniform capital requirements through Basle Accord is inefficient – it is likely to deepen crises in countries with poor quality regulators and unnecessarily limit bank size in competent-regulator economies. However, in the light of 2007/2008 financial crisis, hypotheses of high reputation of developed market regulators and their ex-ante screening ability cannot be sustained after the fully unexpected boost of bad loans throughout the US banking system. The reputation of regulators *per se* does not seem to have played a significant role and would have to be revised.

Another recent example of Basel II criticism may be Blum (2008), who argues that the supervisory bank's ability to evaluate true bank risk types is strongly limited and may be of an *ex-post* nature only. The ability of sanctioning banks ex-post may also be limited, leading to no, or very few incentives for risky banks to truly report their risk types. In consequence, Blum (2008) along with similar voices in the literature claim that risk-based capital requirements (such as imposed by Basel II Internal Ratings Approach) need to be supplemented by a leverage ratio restriction. Such a restriction ties capital amounts to the size of bank assets, so seems to go back to more traditional capital requirements. As a result, further amendments to Basel II, originating from either the authors of the framework themselves or negative outside opinions, are highly likely.

Conclusion

Studies of the role of capital as a 'safety net' are unanimous in apprehending its value in a soft landing in case of a bank failure threat. However, theoretical and empirical models exploring capital regulations and relations between capital and risk do not provide equally undivided answers. Some authors emphasise risk-reducing traits of capital regulations, which create incentives for banks to diminish moral

hazard behaviour and refrain from risky asset choices. Other studies indicate adverse effects of minimum capital requirements, which in some setups may urge banks to increase risk, through behaviour like gambling for resurrection or diminished loan monitoring efforts. In this areas, authors call for additional tools curbing risk taking, complementary to capital regulations. In addition, capital requirements that are procyclical may induce a credit crunch, which deprives the economy of its financial backing when it is mostly needed. In general, the existence of a strong link between capital regulations and levels and asset risk is assumed, but the causality and sign of this relation remains under continuous debate[4].

Many authors call for changes in current capital regulations, as a result of the financial crisis. The problem of procycliclity of capital requirements makes Repullo and Suarez (2009) call for „a radical adjustment of the regulation" (p. 35). Borio (2008) suggests further enhancements to the Basel II framework that would curb asset risk in banks. These voices have however been visible in the capital-risk debate already before the crisis, as presented in this paper, but have been ignored to a large extent by the overly optimistic banking community. There are few new capital models that have surfaced since the outbreak of the financial turmoil. The above mentioned concerns regarding the capital-risk relation have been academically considered already before the implementation of Basel II and have not lost their validity. The unpleasant wake-up call in the form of the recent financial crisis may simply make them more audible.

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[4] Basle II regulations obviously assume that minimum requirements enhance individual bank safety and stability of banking systems as such.

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W POSZUKIWANIU OPTYMALNYCH REGULACJI I POZIOMU KAPITAŁU W POSTKRYZYSOWYCH INSTYTUCJACH FINANSOWYCH – DEBATA 'KAPITAŁ A RYZYKO'

Streszczenie

Artykuł prezentuje niedawne badania dotyczące określania optymalnego poziomu kapitału i regulacji kapitałowych w bankach, biorąc pod uwagę niezerowy wpływ, jaki kapitał wywiera na efekty substytucji aktywów. Zarówno analizy teoretyczne, jak empiryczne ukazują związek między wysokością kapitału a wyborami dotyczącymi struktury aktywów, jednakże znak tej relacji jest przedmiotem dalszych dyskusji. Pomimo iż regulacje ostrożno-

ściowe zakładają, że wymogi adekwatności kapitałowej powodują mniejszą ryzykowność banków i mniej agresywne podejmowanie ryzyka przez banki, niektórzy autorzy podają to w wątpliwość i zalecają stosowanie dodatkowych lub alternatywnych instrumentów. Niedostatki istniejących regulacji kapitałowych zostały uwydatnione w czasie kryzysu finansowego, co wskazuje, że relacja między ryzykiem a kapitałem wymaga dalszych badań. Najpilniejsze kwestie to między innymi określenie poziomu kapitału, który zapewni lepszą ochronę instytucjom gwarantującym depozyty, a jednocześnie powstrzyma banki od agresywnego podejmowania ryzyka.