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Minimum capital requirements, bank supervision and special resolution schemes. Consequences for bank risk-taking

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ABSTRACT

This paper analyzes the incentive effects of special bank resolution schemes which were introduced during the recent financial crisis. These schemes allow regulators to take control over a systemically important financial institution before bankruptcy. We ask how special resolution schemes influence banks' risk-taking and whether regulators should combine them with minimum capital requirements. We model a single bank which is supervised by a regulator who receives an imperfect signal about the bank's probability of success. We find that capital requirements are better than resolution from a welfare point of view if the quality of the signal is low, if it is difficult for the bank to attract deposits, or if the project return is low.

1. Introduction

A major lesson learnt from the recent financial crisis was that existing regulatory frameworks were inadequate for preventing banks from excessive risk-taking (Dewatripont et al., 2010). Pre-crisis prudential bank regulation basically allowed regulators to set minimum capital requirements and supervisors to take corrective action when confronted with violations of regulations. While these provisions made banks more resilient against losses, they provided only incomplete protection against moral hazard, especially by systemically important financial institutions (SIFIs), because authorities lacked proper instruments to intervene into the banks' business before failure.

Without proper bank resolution tools, authorities were confined to two costly alternatives: to open corporate bankruptcy procedures or to bail-out failing banks. For SIFIs, a sudden and disorderly bankruptcy, as in the case of Lehman Brothers, can result in disruptions of the payment system, in contagion, and in sharp increases in interbank interest rates with systemic consequences. Ordinary bankruptcy procedures may also be inadequate because authorities lose control over actions taken by courts which often tend to maximize creditors' claims. When bankruptcy procedures become too costly for authorities, public bail-outs are the only alternative. With bankruptcy being an incredible threat, banks are "too big to fail" which creates moral hazard (Čihak and Nier, 2012).

To make the existing regulatory framework more effective, the Financial Stability Board (2010), the Basel Committee on Banking Supervision (2010), and the European Commission (2010, 2012) made recommendations how to handle SIFIs. They proposed introducing special bank resolution schemes which ensure high-speed procedures and specify, ex ante, conditions that would allow regulators to take control over a bank, even before failure.[1] The resolution process is triggered by authorities who also choose the appropriate method. The bank concerned may be treated as a going concern or, if necessary, be liquidated, nationalized, transferred to a bridge bank or sold to an assuming bank.[2]

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[1] A case in point for such a bank resolution scheme is provided by the German banking law which allows BaFin to resolve a bank in danger of collapsing without corrective measures (Deutsche Bundesbank, 2011). Similar provisions exist in other EU countries, see Čihak and Nier (2012), and in the US as well. Japan had already introduced a resolution scheme in 1998 (Nakaso, 2001).

[2] Note that bank resolution schemes differ from both bankruptcy procedures and removals of a bank license. Bankruptcy procedures commence only after bank failure, banking license withdrawal occurs only if existing regulations have been violated, but not if the bank assets have become too risky.

While authorities introduced special resolution schemes primarily to contain externalities from contagion effects, they may also have consequences for banks' risk-taking and for the prevention of future banking crises. In this paper, we deal with the ex-ante aspect of risk-taking and ask whether regulators should be able to resolve banks and/or to set minimum capital requirements.

We specify a model of a risk-neutral bank which is endowed with a given amount of equity capital, raises deposits from the market, and invests funds in a risky project. The bank acts under monopolistic (or rather: monopsonistic) competition and is able to set interest rates for deposits. This derives from the fact that we consider a systemically relevant bank which cannot be a price taker.[3] We assume that the bank does not choose among different projects, but considers one, only. It (i) has to decide whether or not to start a project and (ii) needs to fix the interest rate on deposits and thus, through the given supply function for deposits, the project's size. The bank ignores depositors' welfare for two reasons. Firstly, since deposits are insured by a deposit insurer, it has an incentive to accept higher leverage than socially optimal and the balance sheet tends to be "too large". If the bank goes bankrupt, it does not care about the depositors' (or the deposit insurance's) loss. Secondly, as a monopsonist, the bank sets too low an interest rate on deposits. Similar to a Cournot monopolist who produces "too little", the bank's balance sheet is "too small". Thus, the two inefficiencies work in opposite directions.

The bank is regulated and supervised by a public regulator who cares about social welfare. We model riskiness of the bank by the project's success probabilities. While the bank learns the true probabilities, the regulator receives an imperfect signal about the true probability, only. We assume that the bank has no possibility to inform the regulator about the true success probability in a verifiable manner. The regulator has two instruments available and may introduce a ceiling on deposits, i.e., the bank has to hold a minimum amount of (uninsured) equity capital, and/or supervise and eventually resolve the bank. Minimum capital requirements use the bank's information about the project, but imply that the regulator does not realize possible welfare gains in case of project success. In contrast, bank-closure policies do not use the bank's information and do not deleverage the project. Hence the two instruments are not perfect substitutes.

Our model generates the following main results:

- Under asymmetric information without signals about the success probability, the two instruments can be used interchangeably in most situations. However, there exists one interesting situation where the bank likes to pursue the project for both low and high probability while the regulator prefers the project for the high success probability, only. Then, capital regulation is weakly superior to bank resolution from a welfare point of view.
- Assume, now, that the regulator decides on capital requirements and resolution sequentially. Then, with signals, binding capital requirements should be chosen from a welfare point of view if (i) the signal quality is relatively bad and/or if (ii) it is difficult for the bank to attract deposits and/or if (iii) the project's rate of return is relatively low.

With this focus, our paper adds to the literature on bank regulation. The bulk of the literature analyzes the effect of solvency regulations on banks' risk-taking in a portfolio framework or in a principal-agent framework. These models, however, either do not offer any room for supervision or are not suitable for SIFIs because they implicitly assume a bank that is managed by the bank owner (Freixas and Rochet, 2008). This is different in another strand of the literature which applies the incomplete contracts approach to prudential bank regulation (Dewatripont and Tirole, 1993, 1994; Tirole, 1994). Crucial for this approach is the assumption that a public regulator – through supervision – receives an imperfect and non-verifiable signal about the solvency of a bank with a given balance sheet. The regulator may withdraw property rights away from the bank owners and assign them to depositors (or the deposit insurance).

In this paper, we adapt this framework and assume that the regulator resolves the bank after receiving a bad signal, instead of transferring property rights to depositors. Under this assumption, the regulating authority maximizes expected payments from the bank instead of maximizing expected payments to depositors (or minimizing expected payments from the deposit insurance). This seems to fit better with empirical evidence at least during the recent financial crisis when regulators often did not liquidate supervised banks but nationalized them and continued their business.

To our best knowledge, only few papers discuss the consequences of bank resolution schemes. Aggarwal and Jacques (2001) and Kocherlakota and Shim (2007) consider prompt corrective action (PCA) which was introduced in the USA after the financial crisis of the 1980s. Under PCA, the regulator may mandate restrictions on the bank's activities if the capital ratio falls below certain levels; in extreme cases, the bank may be placed under conservatorship or receivership (Weinstock, 2009). In consequence, the bank can trade-off lower capital ratios against larger interventions. Under special resolution schemes as analyzed in this paper, however, such a trade-off is not possible since the regulator's decision is not based upon fulfillment of capital requirements but depends on the regulator's perception of the bank's future profitability.

Finally, a last strand of the literature (Avgoulaeas et al., 2012; DeYoung et al., in press) discusses limits to resolution technology and 'Living Wills' which specify, ex ante, how banks will act in order to recover from financial difficulties. Living Wills also provide authorities with necessary information, such as the bank's importance for the financial infrastructure, which helps regulators implement a resolution, should resolution be required (Huertas, 2010). They thus diminish opaqueness and complexity of banks and help authorities to reduce ex post systemic costs after a bank has failed. They supplement special bank resolution schemes which, together with capital requirements, are ex ante devices to reduce banks' risk-taking before failure occurs.

Since we restrict our analysis to a single bank, we neither consider macroeconomic effects of special resolution schemes nor discuss the merits of an international harmonization of special bankruptcy regimes for banks. Furthermore, we take the advantageousness of a bank resolution mechanism as given and do not compare it with either ordinary bankruptcy procedures or public bank bail-outs. Finally, we abstract from other regulatory measures introduced in many countries together with resolution schemes, such as a bank levy.

The paper is organized as follows: Section 2 describes the model setting and compares minimum capital adequacy ratios with resolution policy under symmetric information. Section 3 deals with asymmetric information without the regulator receiving any signals, while Section 4 discusses signals obtained by the regulator. Section 5 concludes.

[3] Calem and Carlino (1991) present evidence for the US that banks do not behave competitively on retail deposit markets; Hughes and Mester (1993) find that, for large banks, an increase in size significantly influences the price of unsecured deposits.