

## 論文の内容の要旨

論文題目 Essays in Financial Crisis and Regulation

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The recent financial crisis followed by the severe credit shrink and economic downturn has prompted the debate over financial regulation. Despite the rigorousness and complexity of the regulations imposed on financial institutions, there still seems to be room for discussion of rationale and impact of these changes in regulatory frameworks. The present research demonstrates how the regulation concerned in the current version of Basel Accord affects stability in the banking sector and real economy from various aspects.

The first essay, *Capital and liquidity regulation*, examines the effect of capital and liquidity regulation on financial stability and asset prices. There are mainly two backgrounds that motivate the research. The first is that liquidity regulation, a part of a major reform in the Basel Accord, lacks theoretical support compared to capital regulation. The second is that pro-cyclicality, the recognized disadvantage of capital regulation, should be reconsidered. It is a widely shared view that capital regulation, on the one hand, improves financial stability by restricting banks' leverage taking, but on the other hand, brings economic downturn by discouraging investment. However, the negative effect of capital regulation should be analyzed in the presence of the positive effect. The purpose of the paper is to reveal whether capital and liquidity regulation stabilize or destabilize the economy and how they do so. It employs a general equilibrium model in infinite horizon, which incorporates bank runs. In addition, the model features three types of assets: households' bank deposits, government bonds, and illiquid assets. Based on this model, two types of regulation are introduced: capital regulation, which restricts the ratio of a bank's risk-adjusted assets to its net worth, and liquidity regulation, which sets the minimum ratio of a bank's liquid assets to its obligations.

Simulations of the calibrated model show that both capital and liquidity regulations in the style of current Basel Accord not only stabilize the banking sector, but also mitigate an economic downturn after a recession. That is, the pro-cyclical effect is dominated by the financial stabilizing effect. The mechanism behind the result is that the low probability of a financial crisis brought about by financial regulation enhances the recovery of the asset price through the agents' expectation on stability. The result supports the introduction of capital and liquidity regulation, taking into account their effect on the real economy. Although this feature is mentioned in the current literature, the present model which incorporates government bond allows the positive effect to arise with robustness. Further, it is shown that stability is achieved at a lower cost than in the current regulation by giving a lower bound on the banks' holdings of government bonds. In this regulation, stability is generated from the high recovery rate of banks in the event of run. This is because of, first, the large amount of safe assets held by banks, and second, high asset price by the promotion of banks' investment. Since it does not restrict banks' asset holdings, the asset price recovers quicker than in the capital and liquidity regulation in the current accord.

The second essay, *Effect of stringent capital requirement on large financial institutions*, examines the effect of tighter capital regulation on large financial institutions compared to that on small- and medium-sized institutions. In today's financial sector, financial intermediaries are diversified both in terms of their business and size of balance sheet. These differences within the financial sector are assumed to have a significant impact on the financial stability and overall economy. In fact, supervisors place a high importance on heterogeneity such that Basel III introduces a surcharge on capital held by systemically important financial institutions (SIFIs). With this background, this study aims to reveal how stringent capital regulation on SIFIs affects stability and asset price. The model describes the systemically important banks as wholesale banks that are net borrowers in the interbank market. The banks that fall under this classification are retail banks, which supply interbank lending. In addition, the model introduces capital regulation in the form of leverage restriction to the general equilibrium model, which includes wholesale and retail banks. Then, it

compares two regimes: one imposes capital regulation only on wholesale banks, and the other on both wholesale and retail banks.

Simulations show that capital regulation imposed only on wholesale banks is superior to that imposed both on wholesale and retail banks in preventing financial crisis, with or without agents' expectation on this aspect. When financial stability is expected, both regimes perform similarly in improving financial stability. However, stability is achieved with a smaller drop in the asset price under the regulation only on wholesalers. This is because the regime causes less restriction on efficient asset management. When agents take into account the probability of crisis in the future, the drop in the asset price under capital regulation only on wholesalers becomes moderate, because the low probability of bank run mitigates the increase in the required rate of return on assets. On the contrary, capital regulation both on wholesalers and retailers rather increases the probability of crisis: unlike in the unanticipated case, it now destabilizes the interbank lending market. This is because the heavy drop in the asset price caused by a large amount of assets allocated to households worsens wholesalers' expected ability to repay deposits in the crisis. Even if the thick capital buffer has a stabilization effect to some extent, wholesalers' recovery rate is weakened because the expected liquidation price of assets is so low. These results support the stringent regulation on SIFIs introduced in the recent regulatory reform, in that tighter capital regulation on wholesale banks than on retail banks prevents bank runs at a lower social cost.

The third essay, *Financial contagion in core-periphery networks and real economy*, also focuses on the heterogeneity of financial intermediaries. However, unlike the first and second papers, it models the network of borrowing and lending in the interbank market. Specifically, the model abstracts diversity in financial institutions from the perspective of connectivity to others. In reality, influential intermediaries tend to be financed by many agents on the liability side, and hold claims on many obligors on the asset side. Such intermediaries include investment banks that operate globally, and special investment vehicles founded to originate e asset-backed securities. Meanwhile,

less influential intermediaries, such as local banks, borrow and lend within a limited community.

The model simplifies this reality by assuming a hypothetical financial market composed of core and peripheral banks: all core banks borrow from and lend to one another, whereas each peripheral bank only deals with one of the core banks. Given the composition and size of each bank's balance sheet, a financial crisis is described as a shock to an individual asset held by a peripheral bank, followed by the insolvency of other institutions linked through the network of financial intermediation.

Simulations without assuming regulation show that the degree of expansion of a shock depends on the size of mutual lending among core banks; a shock is less likely to cause insolvency of banks when a core bank holds an extremely large or an extremely small amount of lending to the other cores. Intuitively, in the case where core banks are engaged in a large amount of mutual lending, the links between core banks and peripheral banks are so weak that a shock to a peripheral bank has a small impact on the core bank linked to it. Conversely, if a core bank has a small exposure to the other cores, transmission of the shock among core banks is less likely. Thus, even if the core bank that has a link to the peripheral bank hit by the shock is affected, it does not further damage the other cores. If the interconnection between core banks is neither too high nor too low, that is, when the core-to-core lending is in the intermediate range, the shock is more likely to spread. Although these results have already been observed in preceding research, this paper provides analytical proof of the phenomenon. Capital regulation is introduced so that banks maintain their leverage below a threshold. Under stringent capital regulation for core banks, widespread contagious default is more likely to occur, because the regulation excludes banks whose leverage falls below the threshold. The study highlights the destabilizing effect of capital regulation by employing a model that focuses on the downside of being linked together.