

The Efficient Regulation and Supervision of Banks in the Information Technology Era

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The Efficient Regulation and Supervision of Banks: An Overview

- ◆ Why do banks need public regulation and supervision?
- ◆ The meaning of efficiency
- ◆ What can the information and communication technology revolution contribute?
- ◆ The Chinese case

Fundamental Ideas: What Can the Information Technology and Communication Revolution Offer?

- ◆ Makes possible new ways of organizing the activities of the financial sector, in particular, the further specialization and division of labor. The resulting modification and re-distribution of the loci of risks enable simpler but at the same time more effective regulation and supervision.
- ◆ Provides more precise and differentiated instruments for inducing desirable behavior on the part of the banks (e.g., investing in less risky assets).
- ◆ Develops new, risk-reducing products and processes.
- ◆ Provides more powerful tools for ex ante monitoring and ex post determination of responsibility.
- ◆ Strengthens internal control and enforcement of compliance.
- ◆ Enables rapid response to identified problems on the part of the regulatory agency.
- ◆ Permits the fuller exploitation of economies of scale in banking which in turn enables the realization of economies of scale in regulation.

Why Do Banks Need Public Regulation and Supervision?

- ◆ What is the public interest in the regulation and supervision of banks?
- ◆ The public interest arises from the large negative externalities that misbehavior and failure of individual banks may generate and that may potentially affect the solvency and liquidity of other banks and eventually the stability of the entire financial system.
- ◆ Such externalities may involve the starting of a panic on the part of depositors of other banks, whether justified or not, potentially leading to runs on otherwise sound financial institutions; failure of clearing and settlement of payments and transfers through the failed banks; the domino effects of the sudden disappearance of liquidity on the part of the customers (firms and households) of the failed banks; and generally undermining the confidence of the common citizens in the financial system as a whole.
- ◆ Historical experiences of the contagion of bank failures lead to the rise of bank regulation and supervision.

Public Regulation and Supervision are Necessary Because of:

- ◆ **Asymmetric information** between the depositors and the banks. Depositors, especially small ones, are unwilling (too costly) and unable (lack of access and transparency) to acquire adequate information to evaluate the safety and soundness of the competing banks and are susceptible to rumors with or without substance. There is a need to protect the public through at least licensing (pyramid schemes are very common in developing countries.)
- ◆ **Moral hazard** induced by the low capital ratio (or equivalently, high leverage) of the banks. There is said to be moral hazard when the negative consequences of (possibly hidden) actions, including excessive risk-taking, is borne in whole or in part by others (risking “other people’s money”). A capital requirement of 8% of assets, as recommended by the Bank for International Settlements (BIS)—an increase from the original 3%—is still far too low, in and of itself, to provide an adequate buffer for potential loan losses and to discourage moral hazard (investing in highly risky assets) on the part of the owners and managers of the banks.

Public Regulation and Supervision are Necessary Because of:

- ◆ The existence of explicit or implicit **deposit insurance**. Deposit insurance encourages moral hazard on the part of the depositors—they have no incentive to differentiate between good banks and bad banks adequately. Deposit insurance effectively enables an insured financial institution to attract deposits with sovereign credit, regardless of its own financial conditions. Thus, deposit insurance also implies the existence of significant contingent liabilities resulting from bank failures to be borne by the government and ultimately the taxpayers. If there were no deposit insurance, either explicit or implicit, then the depositors will have to watch out for themselves and the government will have little or no contingent liabilities, the case for public regulation and supervision will be significantly weakened.
- ◆ The status of the central bank or the government as **the lender of last resort**. The central bank and/or the government may have to rescue banks and/or their depositors. The central bank and the government therefore have an interest to establish and enforce rules of bank behavior that reduce the probability of bank failure.

The Meaning of Efficiency

- ◆ Efficient regulation and supervision imply regulatory requirements that are simple, inexpensive and easy to implement, readily enforceable, and minimally disruptive of the normal operations of a bank, but are sufficient to detect and identify problems well before they grow to threaten the safety and soundness of the bank and possibly cause a widespread systemic failure.
- ◆ Efficiency is subject to the ability to maintain a given level of overall safety and soundness of the entire banking system.
- ◆ For any given structure of availability of information, efficiency depends on the precise design of the structure of the financial system—some systems can be more efficiently regulated than others.

How Can Efficiency be Enhanced?

- ◆ **Efficiency enhancement through institutional design.** A financial system may by design require minimal regulation and supervision. E.g.
 - ◆ Banks without public retail depositors need only minimal regulation or supervision.
 - ◆ Banks that invest only in short-term government securities and do not make loans or acquire risky assets also need only minimal regulation or supervision.
 - ◆ The question is: Can such specialization be economically desirable and viable?
- ◆ **Incentive-compatible self-regulation.** Rules should be devised so that they provide incentives for bank behavior that is desirable from the regulatory agency's point of view—rules that align the interests of the owners and managers of the banks on the one hand and the public and the regulators and supervisors on the other. E.g., a higher capital requirement reduces moral hazard and hence excessive risk-taking; a risk-based deposit insurance premium rate also discourages excessive risk-taking.
- ◆ **Reduction of excessive leverage in the system** (debt or liabilities to equity ratio) of the borrowers and the banks themselves. In general, a lower debt/equity ratio reduces the “domino effect” or the “spillover effect” of insolvency and bankruptcy of one enterprise on other enterprises and financial institutions, which in turn reduces the probability of a failure of the entire financial system. If the degree of leverage is too high, there is no room for any error or shock. Reduction in the leverage per se also helps to reduce the moral hazard of managers and owners of banks because a higher proportion of the potential loss will be borne by the owners and managers themselves. A low leverage requires less regulation and supervision.

How Can Efficiency be Enhanced?

- ◆ **Making fuller and better use of** available information from the existing management information systems (**MIS**) of the banks. Regulatory targets should be based on readily available, timely and continuously updated information that can be easily and inexpensively extracted from the MIS database of the bank. Improvements in the MIS of banks over time greatly facilitate the flow of information and hence regulation and supervision.
- ◆ **Randomly timed examinations** using systematic stratified sampling methodologies and automated tests.
- ◆ **Economies of scale** in regulation. Regulation and supervision are easier if there are a small number of large banks rather than a large number of small banks
 - ◆ Large banks tend to have a more formalized and rigorous system of internal control and their senior executives have the responsibility and the incentive to supervise their subordinates properly.
 - ◆ The internal risks can be pooled and large banks are thus less prone to failure, other things being equal.

The Implications of the Availability of More, Timely, Accurate and Inexpensive Information

- ◆ **Specialization and division of labor.** New configurations (institutional designs) of the banking system and new forms of financial institutions (e.g., the “narrow banks” suggested by the late Nobel Laureate in Economic, James Tobin) are made possible with the improvements in the availability, cost and timeliness of information and the ability for its exchange and sharing, and for inter-enterprise coordination. The benefits of specialization and division of labor can be realized.
- ◆ Just as in the real sector, the financial sector has also been undergoing “de-verticalization.” Different links of the financial supply chain can be out-sourced. Some banks begin to specialize in niche markets and grow to dominate their particular links of the financial supply chain.
- ◆ Examples of out-sourced services include: credit cards, mortgage loans, MIS, and reliance on the inter-bank market for funding (e.g., Japanese banks in overseas markets), which can be thought of as “out-sourcing” of deposit-taking.
- ◆ Examples of specialization include the provision of securities custody and fund management services (State Street Bank). Securitization of loans is another manifestation of specialization that has been greatly facilitated by the ICT revolution in the documentation, standardization, and the collateralization of the assets backing these securities, and in their trading in secondary markets. Securitization further enables the separation of different lines of loan business. Without the ICT revolution, the transactions costs of securitization would have been very high.

Specialization versus Joint Production

- ◆ The ICT revolution has lowered very significantly transactions and coordination costs and made possible the “economically efficient” separation of deposit-taking and lending activities. The growth of the capital markets in many developed countries has shrunk the role of bank financing—many enterprises go directly to the capital markets by issuing their own debt instruments (commercial paper, bills, notes, bonds, etc.); many loans are packaged together and sold in the markets to individual and institutional investors (securitization). Better, more timely, and standardized flow of information has reduced the need for financial intermediation by the banks.
- ◆ Historically, there are synergies between deposit-taking and loan-making—information on the history of deposits and payments of customers can be extremely useful for determining whether they should be granted credit. Before the ICT revolution, the transaction costs for outside lenders to acquire this information were too high. However, with the decline in transactions costs and the commoditization of credit information, the synergies that may have existed for a bank to make loans to its depositors have been largely eroded.

Specialization versus Joint Production

- ◆ Even before the ICT revolution, the maturity mis-match can negate much of the synergies between deposit-taking and loan-making. For example, a bank depositor may desire a long-term fixed-rate owner-occupied residential mortgage loan, but the bank, even though it knows that the customer is a good credit, may not be able to accommodate him or her. Ultimately the bank customer may obtain a loan from a mortgage loan company which in turns packages and sells the mortgage loans on the market.
- ◆ Bank loans to enterprises in countries with well developed capital markets are now limited to those that are not able to access the public markets directly themselves--the segment of business that is the most risky. This raises the question of whether the capital requirements of banks making such loans as traditionally determined are adequate.

The Implications of the Availability of More, Timely, Accurate and Inexpensive Information

- ◆ **Differentiation** of capital requirements, reserve requirements; and deposit insurance premia. The enhanced flow of information facilitates differentiation—thus different types of banks can, depending on its business line and risk characteristics, have different regulatory requirements. Differentiation also allows different types of banks to be incentivized in different ways.
- ◆ **New risk-reducing products and processes.** Real-time clearing and settlement of transactions have become a realistic possibility, potentially reducing greatly the systemic risk. Debit, credit, and other smart cards and electronic fund transfer will completely revolutionize the payments system. Assets can be marked to market almost instantaneously. The ICT revolution also enables the development of financial derivatives to reduce and share risks.

Specialization and Differentiation of Banks: Capital, Reserve and Deposit Insurance

- ◆ Pure transactions banks--demand deposits to be matched with investments in only short-term government securities (no more than 30 days) and no loans—a low reserve requirement (in the aggregate, the total funds should balance) and no loans. Regulation and supervision of this type of banks can be minimal—requiring only the verification of the inflows and outflows of funds and the quantities and types of assets held. The capital and reserve (liquidity) requirements can be minimal. Deposit insurance is not necessary so long as these banks adhere to their professed investment policy. These transactions banks differ from money market funds investing exclusively in short-term government securities only in terms of the wider accessibility enjoyed by their customers (through ATMs and electronic funds transfer, for example).
- ◆ Pure savings banks--deposits to be matched with investments in longer-term government securities (depending on the maturity distribution of the savings deposits) and no loans—minimal capital requirement and no deposit insurance, and an even lower reserve (liquidity) requirement than pure transactions banks (e.g., postal savings banks).
- ◆ Non-deposit taking banks making asset-backed loans. E.g., mortgage banks, and banks specializing in consumer durable (e.g. automobiles) financing, and credit card receivables. These banks are funded by securitizing their loans, backed by the underlying assets. Since no deposits are taken, no reserves and no deposit insurance are required. No formal capital requirement is necessary.

Specialization and Differentiation of Banks: Capital, Reserve and Deposit Insurance

- ◆ Non-retail-deposit taking banks with funding raised through issuance of bank debt instruments in the capital markets
 - ◆ Such banks will need to be much better capitalized, even in the absence of an explicit government requirement, because any funds that they need beyond their own capital must either be raised directly from the capital market by issuing commercial papers, notes and bills, or borrowed from other banks, without the benefit of government guarantee/deposit insurance. It is difficult to imagine that such banks can issue debt equal to 12.5 times its capital (corresponding to an 8% regulatory capital requirement) on the market. The maximum debt to equity ratio for such banks is likely to be around 3, implying a capital ratio of 25%. A capital ratio of this magnitude should be effective in reducing moral hazard on the part of the owners and managers of the bank.
 - ◆ Regulation and supervision of this type of banks can be limited to making sure that they do not take public retail deposits illegally. With no deposits, there need not be any reserve requirement or deposit insurance. And since no public funds or guarantees are involved, there is also no need for a capital requirement beyond what is demanded by the market. Capital ratios and the rates of interest are functions of the market conditions and the specific characteristics of the credit of these banks.
 - ◆ Contingent liabilities, e.g., enhancements of the debt instruments issued by other enterprises, should be fully disclosed and should count against the debt (or liabilities) to equity ratio.
- ◆ For traditional deposit-taking and loan-making banks, the capital requirements can be set at a higher level than 8%, say 20-25%, to provide an adequate buffer for potential loan losses and to discourage moral hazard. There need to be reserve requirements as well as deposit insurance. The deposit insurance premium rates can be linked to the nature and quality of the assets.

Rationalization of Explicit Deposit Insurance

- ◆ Implicit insurance can be treacherous because it implies no upper limit to the coverage and encourages moral hazard.
- ◆ Deposit insurance limits should be consolidated to a per person basis rather than a per account basis for each bank failure. This effectively implies, in practice, that there is an upper limit to the insurance provided to each person for the failure of each financial institution (since it is not likely that more than one financial institution will fail at the same time). The existence of this per person limit will at least force risk-averse depositors to diversify across financial institutions and hence lower the potential liability of the deposit insurance agency in the event of the failure of any single bank.

Rationalization of Explicit Deposit Insurance— Feasible Objective Risk-Based Premium Rates

- ◆ Differentiation of deposit insurance premium rates by the quality of the assets, principally loans (e.g., the good driver discount, the non-smoker discount).
- ◆ Objective, easily implementable and verifiable indicators should be used—ratings by credit rating agencies are unlikely to be helpful before the fact (just recall how few rating downgrades are actually made before the problem becomes obvious rather than afterwards).
- ◆ Deposit insurance premium should be tied to:
 - ◆ The weighted average debt/equity ratio of the borrowers—the lower the average debt/equity ratio, the lower the insurance premium. Thus the financial institutions will have the incentive to lend to borrowers with lower debt/equity ratios.
 - ◆ The actual capital ratio of the bank. The capital or equity of the banks serves as “co-insurance.”
 - ◆ The total size of the financial institution as measured by its net capital (marked to market). The higher the total net capital is, the lower the insurance premium, thus encouraging the emergence of larger financial institutions that are better able to pool risks themselves (otherwise the existence of deposit insurance enables the proliferation of small financial institutions).
 - ◆ The degree of concentration by borrower, by industry and by type of assets in the loan portfolio. The higher the concentration is, the higher the insurance premium, thus encouraging diversification and discouraging over-exposure to particular borrowers, industries and types of assets on the part of the financial institutions.

The Implications of the Availability of More, Timely, Accurate and Inexpensive Information

- ◆ **Improved external monitoring.** Randomly timed examinations; random tests of the adequacy of internal systems of audit, monitoring, control, enforcement of compliance and risk management; verification of compliance with legal and regulatory requirements.
- ◆ **Improved internal systems of audit, monitoring, control, enforcement of compliance and risk management.** Ex post analysis of the causes of bad investments and loans and accurate attribution of responsibility based on electronic records of the approval processes and signing authorities.
- ◆ **Timely takeover of failed banks.**
- ◆ **Economies of scale** in banking can be realized through the expansion of the span of control made possible by the ICT revolution. Larger banks in turn facilitate regulation and supervision and lower systemic risks.

Timely Takeover of Failed Banks

- ◆ Instantaneous and seamless assumption of deposit liabilities in the event of a bank failure.
- ◆ There is no need for a “lender of last resort” as long as there is effective deposit insurance and rapid response is possible—early detection of trouble and timely assumption of control.
- ◆ A bank should be closed as soon as possible when it is discovered to be insolvent. A fast resolution and assumption of responsibility (but not liabilities beyond insured deposits) by the deposit insurance agency can minimize losses. The longer one waits, the more difficult it becomes, because of implicit assurances made to various parties—correspondent banks, large depositors (e.g., The Continental Illinois case). A fast resolution reduces moral hazard and lowers the ultimate cost to the deposit insurance agency and taxpayers.

The Chinese Case—The Possibility of Leap-Frogging—The Payments System

- ◆ The payments system for individuals--Ordinary Chinese citizens do not have personal checking accounts and most of them never will—they will be using smart cards linked to their bank accounts for payment and transactions purposes. All transactions can be done in real time and cleared and settled instantaneously. There will be no more “bounced checks,” “insufficient funds,” kiting, or overdrafts (although other types of fraud will probably be “invented”).

The Chinese Case—The Possibility of Leap-Frogging—Specialized Banks

- ◆ Pure transactions banks and pure savings bank. The Chinese postal savings system can easily evolve into banks of this type, that take demand and savings deposits but do not make loans or otherwise risky investments. Such banks invest only in short-term (transactions banks) and medium-term (savings banks) Chinese Government securities so that there is no credit risk and no interest-rate risk arising from maturity mis-match.
- ◆ Specialized non-deposit-taking but loan-making banks. These include mortgage banks and “small business investment corporations.” These banks will by and large rely on their own capital, on the securitization of their loans to the extent that they are asset-backed, and on issuance of debt instruments in the capital market. Since they are non-deposit-taking, they do not require government insurance or guarantee. They will require much less regulation and supervision than deposit-taking banks. They will still be subject to capital, audit and disclosure requirements to the extent they raise funds from the public markets. In all likelihood, however, the market will demand a capital ratio significantly higher than 8.5%, perhaps on the order of 25%.

The Chinese Case—The Possibility of Learning from Other People's Mistakes

- ◆ Institution of an explicit system of bank deposit insurance with clear limits on coverage on an individual depositor's basis and objective risk-based premium rates.
- ◆ Accelerated development of the market for debt securities, both government and non-government.
 - ◆ Securitization of standardized asset-backed loans, especially residential housing mortgage loans, should be promoted and encouraged because it protects the banks from the risks of failure resulting from maturity mis-match (There is no reason for Chinese banks to repeat the savings and loan association debacle in the U.S.).
 - ◆ Promotion of direct issuance of publicly traded debt by major enterprises (and banks), without any government guarantee, explicit or implicit, but subject to a "safe" debt-to-equity ratio.
 - ◆ Encouragement of participation by institutional investors.
 - ◆ Insurance companies, pension funds and endowments.
 - ◆ Mutual funds