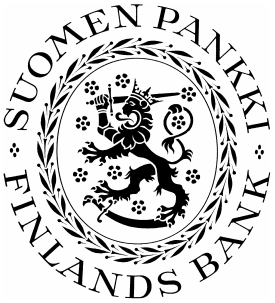

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Capital adequacy regulation and financial conglomerates

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Ville Mälkönen
Research Department

Abstract

A topical concern in public-policy debate is that the current capital adequacy regulation designed for stand-alone financial institutions exhibits several weaknesses due to the emergence of large financial institutions combining several activities under common control. This paper addresses these concerns using a theoretical framework derived from the economic literature. I will first describe the possible causes of the emergence of financial conglomerates, proceed to consider the theoretical background for the regulation of financial institutions, especially insurance and banking companies, and, finally, examine the limitations of the current regulatory framework in controlling the risks in financial conglomerates. My conclusions provide little support for the view that the regulatory approach should be modified towards a more consolidated one (ie harmonization).

Key words: banking, capital adequacy regulation, insurance, financial conglomerates

JEL classification numbers: G21, G22, G28

Finanssiryhmittymien vakavaraisuusvalvonta

Suomen Pankin keskustelualoitteita 10/2004

Ville Mälkönen
Tutkimusosasto

Tiivistelmä

Pankeille ja vakuutuslaitoksille suunniteltujen vakavaraisuusvaatimusten sopivuus finanssiryhmittymien valvontaan on noussut tärkeäksi aiheeksi rahoituslaitosten vakavaraisuusvalvonnan suunnittelussa. Tässä keskustelualoitteessa tarkastellaan taloustieteellisestä näkökulmasta finanssiryhmittymien toimintaa ja tuodaan esille ongelmia, jotka tulisi ottaa huomioon finanssiryhmittymille suunniteltavissa vakavaraisuusvaatimuksissa. Alussa käsitellään lyhyesti finanssiryhmittymien syntymistä ja niiden muodostumisen edellytyksiä. Tämän jälkeen esitellään vakavaraisuusvalvonnan talousteoreettiset perustelut sekä pankki- että vakuutustoiminnan tapauksissa. Keskustelualoitteen viimeisissä luvuissa tarkastellaan teoreettisesta näkökulmasta vallitsevien valvontaperiaatteiden soveltuvuutta finanssiryhmittymiin. Johtopäätöksenä on, että pankki- ja vakuutustoiminnan vakavaraisuusvaateiden yhtenäistämiselle finanssiryhmittymissä ei ole vahvoja teoreettisia tai empiirisiä perusteluja.

Avainsanat: finanssiryhmittymät, pankkitoiminta, vakavaraisuusvaateet, vakuutustoiminta

JEL-luokittelu: G21, G22, G28

Contents

1 Introduction

In the recent decades, financial markets have changed shape as the providers of financial services have extended their scope of activities. Before this development took place a financial institution could relatively easily be defined as a bank, a securities company, or an insurance company, but recently such categorization has become less clear. The new organizational arrangements are known as financial conglomerates.[1] The emergence of financial conglomerates has been driven by competitive pressures in the traditional banking sector and synergies across complementary financial services that helped financial institutions to capture economies of scope and scale. While the synergies may well improve the efficiency of the financial market, it is less clear whether conglomeration changes the nature of risks inherent in these businesses.

The usual concern in the public policy debate is that conglomeration combined with more diverse and sophisticated financial products may leave the financial market exposed to unexpected risks, generating a need for reassessing the current regulatory framework for financial institutions. These regulatory concerns are addressed in the ongoing Basel 2 revisions of the 1988 Basel Capital Accords. This is because regulators cannot effectively apply the standards designed for banking without some attention to the role of conglomerates. While most supervisors admit that conglomerates deserve some form of specialized supervision, it is less clear to what extent conglomeration should be taken into account in capital adequacy regulation.

In this paper I will discuss financial conglomeration and the regulatory concerns on the basis of existing economic literature on financial markets and financial regulation. Reflecting the European experience, I will focus on institutions that combine insurance and banking services. To this end, I will first outline the developments that have led to the emergence of financial conglomerates. Second, to gain understanding of the theoretical foundations that underlie the regulatory concerns I present a theoretical framework for optimal regulation of banking and insurance markets. Finally, I examine whether the conceptual framework of regulating financial institutions as stand-alone entities applies to institutions that combine different activities and discuss the extent to which the emergence of financial conglomerates should influence regulation in financial markets.

The following section briefly reviews the proposed reasons for the emergence of financial conglomerates. The third section first examines the economic principles underlying the reasons for the existence of insurers and banks and discusses the theoretical framework for their regulation. Section four discusses the regulation of financial conglomerates. Section five concludes.

[1] The Joint Forum (2001a) defines financial conglomerate as any group of companies under common control whose exclusive or predominant activities consists of providing significant services in at least two different financial sectors (banking, securities, insurance).

2 The fomation of financial conglomerates

There are three structural forms according to which financial conglomerates are organized. One form is the universal bank, in which all operations are centralized within a single corporate entity. The second form is the parent subsidiary model, in which operations are conducted in subsidiaries of parent companies which are usually banks. Finally, in a holding company model businesses are conducted in legally distinct entities each with separate management and capital, but owned by a (potentially unregulated) corporation.

Diversification of business lines in financial markets has been a rather unique phenomenon as we have been witnessing in recent years a general trend towards less diversified international corporations. For instance, the Finnish corporation Nokia has changed its organizational form dramatically from a diversified conglomerate that sold, among other things, rubber boots and tires, to a world-leading telecommunications company. In the case of financial industry, conglomeration has been motivated by economic benefits of combining different financial activities under one roof so as to capture economies of scale and scope across business lines. These economies are generated by higher operational efficiency and by innovation of products that allow, for instance, capitalizing on consumers' willingness to pay for 'one-stop shopping' (See Berger et al 1996). Conglomerates' profit may also be less volatile at a group level insofar as they can efficiently diversify their risk and revenue profiles.[2]

One source of higher operational efficiency is *information advantages*. Information advantages arise from financial conglomerates' ability to offer a broader set of information-relevant financial services to their clients than they would on stand-alone basis. For instance, when a bank or an insurer establishes a relationship with a client it incurs costs in gathering information about the client. An institution that combines these services can reduce these costs by using a common information system and reusing gathered information.[3]

Empirical evidence on the information advantages is scarce, but there are a few papers confirming the hypothesis that information generated in relationships between financial conglomerates and clients can be an important source of cost reductions. Jappelli and Pagano (2002) use cross-country data and show that information-sharing diminishes the adverse selection problem inherent in credit-relationships and reduces the default rate in credit market. Hence, it is plausible to think that if production of a more diverse set of services entails sharing relevant information, financial conglomeration should generate information benefits. Indeed, Mester, Nakamura and Renault (2002) find empirical support for the argument that information gathered from different financial services gives an advantage for institutions that combine these services over other lending institutions. The study reports that banks can gather information on borrowers through checking account services which

[2]There are, however, a number of reasons why more specialized financial institutions exhibit superior operational efficiency.

[3]It should, however, be noted that in some countries the sharing of information between financial services is limited by public regulation.

give banks an information advantage over other lenders in terms of mitigating the monitoring problem with loans. Vander Vennet (2002) provides similar evidence in the case of European financial conglomerates and establishes that they have an information advantage over specialized institutions due to their superior ability to monitor and thereby reduce moral-hazard among borrowers.

Economies of scope on the production side arise whenever costs can be shared across product lines. Berger (2000) surveys the literature and identifies several cost-efficiency gains associated with combining multiple product lines. First, a financial conglomerate with a common information system that can be used across product lines incurs the cost of gathering information only once. Second, delivery, marketing and physical inputs can be combined in production of a larger set of services. Finally, when risks in different services are imperfectly correlated, there is a potential for economies in risk management through a diversified risk portfolio. However, Berger (2000) also points out that in general the results are mixed.

A financial institution that combines different activities can be more stable than a specialized institution due to *risk diversification*. This is because the correlation between the return of different financial activities is imperfect. In theory, it follows that earnings should become less volatile as the scope of activities generating them becomes more diverse. Allen and Jagtiani (2000) estimate the potential for diversification benefits for US bank holding companies. The study establishes that offering more services may indeed reduce the overall risk, but leaves the companies exposed to higher systematic risk that outweighs the diversification benefits. Stiroh (2002) provides evidence that US banks have not gained much from their shift away from a traditional net interest income during the past twenty years.[4]

Economies of scope on the consumption side of the market emerge if buying financial services from the same institution benefits consumers through reduced search, information and monitoring costs. Furthermore, a standard theory of a multi-product firm predicts that financial conglomerates may engage in cross-subsidization across product lines allowing consumers to negotiate for better deals.[5] Finally, consumers may benefit from lower product prices, insofar as the market is competitive enough for cost-reductions associated with conglomeration to pass through to prices.

Although the empirical evidence and theoretical predictions on potential gains generated by financial conglomeration is ambiguous, these organizations have gained importance in recent years as cross-sectoral consolidation in financial industry has been gathering pace in recent decade.[6] Lown et al (2000) record that between 1985 and 1999, banks consolidating with other banks accounted for 49% of total mergers and acquisitions activity in Europe. Cross-sectoral consolidation accounted for 24% of total mergers and acquisitions, indicating that conglomeration has been a notable trend in the financial markets. In Scandinavia, financial conglomerates have

[4]For a survey of the relevant literature, see eg Kwan and Laderman (1999).

[5]See, for instance Tirole (1988) and in the case of banking Chiappori et al (1995).

[6]If the lack of robust empirical evidence on the conglomeration-benefits indicates that such economies do not exist, then we should expect to see some degree of disintegration of large financial conglomerates into retail-banks and insurers.

captured a notable share of financial markets. For instance, in year 2000 financial conglomerates held 79% and 67% of deposit markets in Finland and Sweden, respectively.[7] At the same time the US financial sector exhibited less cross-sectoral consolidation. Lown et al (2000) argue that this is due to legal barriers that were in place until the implementation of the Gramm-Leach-Bailey act, which allows for a wider scope of financial services to occur within the same business group.

3 The regulation of financial institutions

Financial conglomerates have captured a significant share of financial markets in most industrialized countries. This has raised concerns that financial regulation is lagging behind and thereby making the financial market subject to unexpected failures. Since efficient and stable financial system is vital for all modern economies, the potential for market failures constitutes an important issue in public-policy discussion.[8]

Financial institutions are regulated and supervised for several overlapping reasons. The most important are consumer protection and the provision of correct market incentives. These reasons are linked to the special nature of financial products and the vulnerability of the financial system to information imperfections, which may under specific circumstances lead to market failures that induce significant social costs both in financial and real sector.

Although few disagree with the notion that financial market is vulnerable to failures, there are two opposite views on the justification for financial regulation. Critics of regulation argue that a free financial market provides agents with correct incentives and in the case of potential market failures the costs are not high enough to offset the deadweight loss generated by the regulation.[9] Most financial supervisors, however, argue that financial stability is at risk under a free financial market and failures of financial institutions are extremely costly to tax-payers. Therefore, financial institutions should be regulated through prudential regulation or the conduct of business regulation.[10] The former aims to promote solvency among financial institutions and prudential regulation provides a more protected business environment for the consumers.[11]

In what follows I consider reasons for the regulation of financial conglomerates on the basis of existing theoretical literature on financial regulation. Reflecting the European practice, I will focus on financial

[7] See, van Lelyveld and Schilder (2002). These numbers are likely to rise due to cross-border consolidation of Scandinavian financial institutions.

[8] King and Levine (1993); and Rajan and Zingales (1998) establish that financial development is an important determinant of countries' economic growth. Rajan and Zingales (2001) and Hyytinen et al (2003) discuss the extent to which financial development influences the nature and behavior of firms.

[9] See, for example, Glasner (1989).

[10] This argument is put forward by several authors eg Diamond and Dybvig (1983).

[11] For information on the contemporary challenges in financial regulation with an attention to the recent financial crisis in Scandinavian countries, see Mayes et al (2001).

conglomerates that combine banking and insurance services.[12] I will first briefly review the theoretical foundations of banking and insurance activities. Second, given the potential for market failures in these businesses I will examine the proposed regulatory framework for stand-alone financial institutions. These considerations establish the conceptual background for the analysis of capital adequacy regulation of financial conglomerates.

3.1 Banks and financial intermediation

There are, in particular, two well established reasons why financial intermediaries such as banks are valuable for the society: Banks are valuable in their role as a provider of liquidity insurance and as a delegated monitor to investors. The idea of provision of liquidity insurance and banking is put forward by Diamond and Dybvig (1983). Depositors have excess capital which gives them an incentive to invest in financial market, but they are subject to liquidity shocks due to uncertainty about the timing of their consumption decisions. Since the maturity of direct investment is usually rather long and rigid, the depositors are willing to pay for a liquidity-insurance which allows them to withdraw their funds at any given date. Banks can establish such *ex ante* commitment to meet the claims through *maturity transformation*. Maturity transformation refers to transformation of assets with short maturities into assets with long maturities, desired by depositors and borrowers, respectively.

Banks' value as delegated monitors to investors is generated through preventing the duplication of monitoring costs (Diamond 1984).[13] The reasoning is that firms (borrowers) usually have superior information about the project than investors. Since information acquisition is costly, investors rather delegate the monitoring task to the bank through which the firm raises its funding. This improves the efficiency of the financial market, for banks can save on monitoring costs and make funding available to firms at a lower cost.

Among others, these theories of market imperfections provide the justification for the existence of banks which have the ability to exploit the imperfections. It cannot, however, be ruled out that market for financial intermediation is subject to failures. The mechanisms driving the failures are closely related to market imperfections in banking and the special nature of banking services.

The inherent problem that generates market failures in banking is that of asymmetric information between banks and its most important debt-holders, depositors. In an ideal situation depositors could perfectly observe the risk their bank is taking and demand a specific rate of return for their deposits

[12] Traditionally European banks fell under the label 'universal bank', ie an institution that combines securities and banking activities. Extending the scope into insurance business has been more recent phenomenon.

[13] A similar point was made by Grossman and Stiglitz (1980) who argue that banks are better in screening the borrowers than the average investor.

on the basis of the observed risk-portfolio.[14] Under such perfect market environment the interest rates would perfectly reflect the banks' risk taking and thereby provide incentives for banks to invest prudentially. However, in real world depositors tend to have limited information on banks' financial status which generates a distortion in the form of moral hazard, which shows up in inefficiently risky investment portfolios and increased potential for bank insolvency.

The problem of asymmetric information is common in most credit relationships, but in the case of bank-depositor relationship it is exacerbated for the following reasons. First, recall that the existence of financial intermediaries is based on liquidity insurance which, in turn, implies that depositors are entitled to an immediate withdrawal of funds at any given date. It follows that deposits are partially insured in the sense that banks are required to compensate depositors insofar as the liquidation value of bank's assets is large enough to cover the claims. Secondly, depositors have a first-come, first-served right to withdraw their funds. These privileges combined with the features that depositors have imperfect information about their bank's balance sheet, where the liquidation value of its assets is less than the value of the liquid deposits, leaves the banks exposed to runs.[15]

Bank runs are a result of panics generated by depositors' imperfect information about banks' risk portfolio and liquidity insurance offered by their bank. The mechanism is straightforward. Depositors observe that regardless of the bank's financial status, it is required to return the assets of each client. If the bank, however, cannot meet its liabilities in full, the value of depositors' assets depend on the timing of the withdrawal. When each depositor has the same conjecture, a widespread withdrawal may occur as a rational response by depositors. Such withdrawal can be triggered by adverse information about the bank's financial condition as depositors are induced to withdraw their assets in the fear that other depositors will do so first.

A bank failure generates negative externalities for it destroys economic value and it may lead to further contagion losses. Contagion may occur both because of a change in depositors expectations on bank returns and because of banks' financial interdependence. It is important to note that a change in depositors' expectations leading to financial contagion can also be rational. For instance, if a bank failure serves as an adverse signal on bank-assets in general, depositors are induced to update their beliefs, whereby widespread withdrawal may occur in solvent banks as well.[16] Furthermore, in the presence of reciprocal claims between financial institutions, these claims may serve as a channel through which a financial crisis of one institution may propagate to

[14]The main risks to which banks are exposed are interest rate/market risk, liquidity risk and credit risk, as well as broader systemic risk. The credit risk refers to a risk that counterparty fails to fully discharge terms of the contract. Interest rate risk derives from variation of market prices owing to interest rate change. Market risk is a more general term for risk of market price shifts. Liquidity risk is a potential for asset owner to be unable to recover the full value of asset.

[15]See Diamond and Dybvig (1983).

[16]See eg Chari and Jagannathan (1988).

other institutions and lead to further runs.[17] These considerations imply that a failure of a single bank may affect both the real and the perceived stability of the financial system.

3.1.1 Regulation

An effective regulatory mechanism prevents widespread withdrawals resulting from panics and provides correct incentives for banks to invest prudentially. Deposit insurance limits bank-fragility by ensuring that depositors are not subject to loss in the case of a bank-failure. It thus insulates banks from runs as depositors are not subject to panics. Deposit insurance, however, exacerbates banks' excessive risk-taking, for depositors' have diminished incentives to monitor banks' financial status. This generates a moral hazard effect on the financial market as depositors do not demand a higher interest rate in exchange for the higher risk of bank insolvency, and hence, lack of market discipline diminishes banks' incentives to invest prudentially.[18]

Capital adequacy regulation can be used to mitigate the moral hazard effect for it is an instrument that generates a price for the activities a bank otherwise would ignore. Lack of market discipline implies that the rate of return on depositors' assets does not reflect bank's insolvency risk; hence the banks' risk-taking is not priced on the market.[19] However, when capital requirements are in place, a bank failure implies losses to shareholders which are therefore more concerned about the banks' excessive risk-taking inducing the bank to undertake more prudential investments.[20] Capital adequacy regulation also prevents bank runs in the sense that it serves as a commitment device for banks to hold sufficient liquid funds to meet depositors' claims in full and thus prevents the depositor panics.

Berger et al (1995) define an ideal capital adequacy requirement as a mandatory requirement that reflects the marginal social benefit of reducing the risk of the negative externalities generated by bank failures and the marginal social cost in terms of increased deadweight-loss. Since the design of such regulatory system is a virtually impossible task, the usual framework entails uniform ratios below which banks are subject to regulatory sanctions, and these minimum ratios remain relatively stable over time. There are several papers that elaborate the implications of flat and risk-based capital requirements on banks' risk-taking. Among others Furlong and Keeley (1989) show that flat capital requirements indeed reduce banks risk-taking, but they fail to

[17] For information on financial contagion in the case of interbank lending, see eg Allen and Gale (2000); and Rochet and Tirole (1996).

[18] If the deposit insurance premium is not sensitive to risks, banks have an incentive to increase the risk, which leads to implicit subsidization of high-risk banks on the expense of low-risk ones. However, when there is asymmetric information, the existence of such premium is questionable. For instance, Chan, Greenbaum and Thakor (1992), show that incentive compatible premiums do not generally exist.

[19] This effect is further pronounced when deposit insurance is in place, as depositors have no incentives to monitor bank.

[20] See, eg Hellman, Murdoch and Stiglitz (2000); Holmström and Tirole (1997) and Rochet (1992).

completely diminish the moral-hazard incentives. Some argue, however, that flat capital requirements tend to exacerbate banks' risk taking as banks have an incentive to compensate the diminished return through investing in riskier assets.[21] More recently, Kim and Santomero (1988) and Rochet (1992) have pointed out that risk-based capital adequacy requirements can eliminate the risk taking incentives, provided that the risk-weights are chosen correctly.

The current regulatory system in EU is based on Basel Capital Accords which applies the above conceptual framework for European credit institutions. According to Basel 1, credit institutions are obliged to continually meet specific minimum capital adequacy ratios which depend on the nature of the risk of the banks' assets and the definitions of eligible capital. The definition of eligible capital consists of Tiers 1 and 2. Tier 1 capital refers to a core capital including shareholders' equity and retained earnings. These categories are public information and they appear in the annual accounts of the bank. Tier 2 capital refers to a supplementary capital representing other elements which fall short of the characteristics of the core capital, but which contribute to the overall strength of the bank. Total Tier 2 capital cannot exceed Tier 1 capital.

To illustrate the calculation of the capital adequacy ratio consider a bank's credit risk exposure to an 'A' rated counterparty. According to Basel 1, the capital adequacy ratio for such risk exposure is 8% indicating that for each Euro invested in a risky project the bank is required to add 8 cents equity to its own capital. Since Tier 2 capital cannot exceed the core capital, 8% ratio implies a minimum Tier 1 capital requirement equal to 4% of outstandings.

The ongoing (Basel 2) revisions of the Basel 1 capital accord put more emphasis on incentive-based regulatory mechanisms. The new framework is set to ensure the stability of the financial system by improving market discipline through linking capital adequacy requirements more closely with the risks in the banks assets and providing market-based incentives to improve their risk management capabilities. Furthermore, BIS 1 only covered internationally active banks. Harmonization across all sectors in the financial industry is one of the focuses of the Basel 2 which aims to implement detailed disclosure and capital adequacy requirements for all operational components of a bank. In a holding-company level the revisions thus indicate a move toward a regulatory system that is more risk-sensitive by business class and asset class.

To summarize the discussion, banking theory defines banks as institutions providing investment and maturities transformation services. The nature of financial intermediation, however, leaves banks exposed to runs which may emerge as an equilibrium phenomenon. Since failures are socially costly, a few mechanisms have been suggested to insulate banks from runs. Deposit insurance is an efficient instrument to prevent widespread withdrawals resulting from panics, but it leads to inefficiently high risk-taking in the financial market in the form of moral hazard. A regulator can influence the banks' risk-taking by imposing minimum capital standards. Capital adequacy standards generate a cost for the risk the banks are willing to take and therefore shift the risk-portfolio toward the one that obtains when depositors could observe risk-taking of their bank. The current regulatory framework

[21] This argument is put forward by Koehn and Santomero (1980).

is based on BIS 1. The regulation requires banks to continually meet a specific minimum capital adequacy ratio, which determines the amount and the structure of the solvency reserve for specific risk exposures. The Basel 2 capital adequacy framework is aimed to emphasize risk management and to encourage ongoing improvement in risk assessment capabilities of banks and other financial institutions.

3.2 Insurance markets

The existence of insurance market follows directly from that risk-averse individuals are willing to pay at least a fair premium to ensure a compensation should a specific event occur in the future. An insurer supplies a contract which details a future payment under specified circumstances. Such contract entails gains of trade insofar as the premium paid is at least as high as the expected loss to the insurer. Premiums charged to all policy-holders are redistributed to those who are entitled to payments.[22]

Insurance markets take many forms as the motivation for buying insurance differs between agents. Insurance policies can be divided into three classes. In *life insurance* annuities component is a contract that details a payments at specific dates, provided that the policy-holder is still alive. Life insurance contract can also entail a fixed payment to specific parties in case of death of the policy holder. Life insurance is thus a form of savings driven by bequest and retirement incentives. It is natural to analyze life insurance decisions as savings decisions in a similar framework as banking.

Business insurance policy is a method of sharing and reallocating of risk between or within businesses. Business insurance arrangements entail credit-risk transfer between banks and insurers,[23] reinsurance[24] and direct insurance contracts between insurers and businesses. Since business insurance covers a wide range of business-specific risks, it is thus plausible to consider the market as contracting in a bilateral bargaining and game theoretic framework.

Property and casualty insurance consists of a wide range of insurance policies sold to individuals who wish to protect themselves against property and health related losses. The market for such contracts is large and buyers of policies tend to have little bargaining power. It follows that the variety of policies available is often limited to few standardized contracts. It is therefore plausible to presume that the nature of competition on the market ranges between perfectly competitive markets to oligopoly pricing depending on the number of active insurers.

There are several potential sources of market failures in insurance business.

[22]Note that for each signed policy the insurer may incur loss, the law of large numbers indicates that when the number of contracts increases and the policy is appropriately priced, so that the premium equals expected loss of each individual contract, the insurer gains nonnegative profit in the long-run.

[23]That is, banks insure themselves against credit losses.

[24]Reinsurance transfers a fraction of the risk associated with the initial insurance between the primary insurer and policy holder to another insurer. When the contracts are reciprocal, they provide an efficient tool of risk diversification for risk-averse insurers.

Most of the theoretical research on insurance has focused on the problems of adverse selection and moral hazard in insurance market. A number studies elaborate the seminal work of Rotschild and Stiglitz (1976). Rotschild and Stiglitz (1976) show that when the buyers are heterogeneous in their accident-probabilities which is private information to the buyer, asymmetric information between the insurer and the policy holder inhibits the design of an efficient contract. A high-risk type buyer observes that the insurer would like to charge a higher premium from high-risk individuals, who therefore have a disincentive to reveal their type. This distorts the market, for the insurer cannot design a contract that induces each client to reveal their respective risk types. The welfare loss of the distortion is that low-risk types are charged inefficiently high premiums as the insurer must design a standardized contract which does not fully reflect the risk associated with each individual contract.

Insurers enter the market with equity capital and issue insurance policies which are a form of debt capital. The funds raised by issuing both types of capital are invested, until needed to pay claims. While the primary purpose of insurance is to be able to meet the claims at all times, they are also exposed to a large number of risks. The solvency risks are labeled as *technical* and *investment risks*.[25] *Technical risk* consists of two types of risks: under-pricing and under-provision. Under-pricing refers to situation in which the insurer attracts buyers by setting excessively low premiums which do not cover the expected claims. Technical provisions represent largest share of insurers' debt, and they are a measure of its obligations to policy-holders. In case of under-provision, the technical provisions are inadequate to meet the obligations. *Investment risk* is generated by insurers' role as a financial intermediary, and reflects the feature that insurer is exposed to similar risk of insolvency as banks.[26]

Risk of insolvency generates a market failure, when the market price does not fully reflect the insolvency risk. In a world of perfect information the economic theory proposes that competition and rational behavior ensure that the risk should be reflected by consumers' willingness to pay, and therefore, induce efficient risk-management among insurers.[27] However, in order to correctly assess the insurer's solvency the buyer should be equipped with a sufficient data on the joint distribution of loss claims; the return on the insurer's asset portfolio; and technical reserves the insurer will hold at the time of payment of benefits. Such information is in practice costly or unavailable for buyers. It is thus plausible to think that they cannot fully assess the financial strength of their insurer and thereby the quality of the insurance

[25] In addition to investment and technical risks, the insurer is exposed to risk of default by partner (eg reinsurer), risk of mismanagement and systemic risk.

[26] Insurer's role as a financial intermediary is generated by the lapse between collection of premiums and payment of benefits. If the lapse is sufficiently long, the insurer can invest the premiums in financial market until the asset must be liquidated to match the claim specified in the contract. In case of life insurance, the model is almost identical to Diamond and Dybvig (1983). However, life insurers are less vulnerable to runs, because termination of life insurance policy is often costly and the contract does not entail a liquidity insurance component, ie the policy-holder does not have the right to demand immediate repayment of debt.

[27] See eg Rees et al (1999).

contract. It should be noted that the problem of asymmetric information about insolvency is exactly the opposite to the information problem addressed in most of the literature on insurance market (eg Rotschild and Stiglitz 1976), but it is closely related to the market distortions in banking which are driven by lack of transparency.

3.2.1 Solvency regulation in insurance

In theory of banking excessive risk-taking is driven by the feature that unsophisticated depositors do not price the risk the bank is taking. In insurance business the unsophisticated counterparts are the buyers of personal insurance who cannot properly assess the insurance companies' financial strength in relation to their prices.[28] It follows that insurance premiums do not fully reflect the risk of insurer insolvency; hence, the shareholders of insurance companies have diminished incentives to maintain low risk-levels insofar as their own assets are not at risk in case of insolvency.[29] As in the case of banking and deposit insurance, the moral hazard increases with insolvency guarantees set up by the state or insurance companies themselves, for these funds further reduce the policy-holders' incentives to consider the insurers' financial strength when buying insurance policies.

There are several arguments for and against capital adequacy regulation in the insurance business. The advocates of free insurance market claim that the problem of asymmetric information is less severe than in banking and bank failures are more costly because insurers' role in the economy is less significant than that of banks. Rees and Kessner (1999) and comments therein provides a good overview of the conceptual issues associated with insurance regulation. Rees and Kessner argue for free insurance market on the basis of some theoretical studies and a support of an empirical exercise comparing the performance of the relatively tightly regulated German market and the unregulated market in United Kingdom.

The argument put forward by Rees and Kessner follows Rees et al (1999), which is one of the few theoretical studies that examine insurance solvency regulation. In short, the formal analysis establishes that in the absence of asymmetric information about insurers' risk portfolio, regulation can only exert distortional effects on insurance markets. The reason is that the buyers are always willing to pay for an insurance that guarantees solvency. Each insurer observes that exposure to insolvency risk diminishes their demand for any given price level, and therefore, they create enough capital reserves to ensure solvency. Hence, the insurers' *economic capital* decision is efficient and regulation can only impose deadweight loss on the market. The theoretical

[28] Personal insurance refers to large scale life insurance and property and liability insurance market. It is plausible to think that large businesses are better equipped to evaluate the insurers' financial status, which allows them to condition the contract on the insurers' risk-taking.

[29] For instance, Hellman, Murdoch and Stiglitz (2000); and Repullo (2003) argue that financial institutes have an incentive to voluntary limit risk, insofar as it increases the charter value of the institute.

argument that solvency regulation is inefficient relies on the presumption that the consumers are fully informed about the insolvency risk.[30] However, comments by Paul Klemperer and Carmen Matutes exhibit less confidence on this assumption that drives the argument for deregulation. In their opinion it is too optimistic to assume that consumers can fully understand the solvency risk for they tend to have limited incentives or ability to use the relevant information.

In what comes to empirical evidence on efficiency in German and UK insurance market, Rees and Kessner establish that deregulated British insurance market is more efficient than German market. However, as Paul Klemperer points out in his comment the evidence is not conclusive enough to debunk the arguments for regulation. For instance, the study employs data for a rather short period (1992–1994), which allows for several measurement errors and market-specific trends. In addition to the methodological issues the study neglects the social cost of potential insurance failures which is one of the primary reasons for financial regulation in the first place. Grace et al (2003) consider the cost of insurance company failures during 1986–1999. The study reports that the magnitude of losses of insolvency incurred by insurance guarantee funds is relatively higher than in case of other financial institutions.[31] This result provides an important qualification to the argument put forward by Rees and Kessner which implicitly claims that efficiency benefits achieved under free market outweigh the potential costs associated with insurance company failures.

Despite the arguments for a 'free insurance market', insurance solvency regulation is a common practice in most industrialized countries.[32] In the EU the insurance solvency regulation is largely harmonized, but it leaves some latitude for application in the case of certain policies. To illustrate the difference between capital adequacy requirements in banking and insurance it is useful to consider the management of identical risk in these businesses. Suppose that a bank transfers its credit risk exposure to an 'A' rated counterparty to insurance company through credit insurance.[33] Suppose further that the insurer observes the borrower's default probability and sets a fair premium equal to expected loss, say, 5% of the outstandings.

The EU regulation requires the insurance company to hold equity capital equal to 16% of the gross premiums written annually.[34] The amount of premiums written is a natural approximation for the technical risk in insurance insofar as insurers do not engage in underpricing of policies. However, although the risk-exposure reflected by the premium is identical to the insurer and to the bank, the annual capital adequacy ratio for the insurer is 0.8% which is considerably lower than the bank's 4% solvency ratio.

[30] Rees and Kessner (1999) justify the assumption by the feature that in most countries collect and publish the relevant data so as to diminish the information problem.

[31] Grace et al (2003) show that on average insurance guarantee funds incurred a cost equal to 1.30$ per 1$ asset invested the companies before insolvency.

[32] See eg OECD (2002).

[33] This form 'credit-risk transfer' has become a common trend in financial market.

[34] For more detailed information on various approaches to insurance solvency regulation, see OECD (2003).

There are a number of explanations for the regulatory difference between these sectors. First, as opposed to banks, insurers are less vulnerable to contagious runs that would lead to a system-wide financial distress, hence the industry is considered more stable and thereby lower level of regulatory capital is an appropriate policy instrument. Second, the technical risks of an insurance company might be less correlated than banks' credit risks, making the insurer less vulnerable to unexpected shifts in its risk distribution. Third, insurers have better ability to diversify their risk-portfolio through, for instance reinsurance. Finally, there is a potential that the existing solvency regulation in insurance business is lagging behind as it fails anticipate the effect of the new financial instruments which bring the risk-portfolio of the insurers closer to that of the banks.

To summarize, although insolvency risk in insurance business is becoming similar to risks in banking, it is less clear to what extent capital adequacy regulation is needed to insulate the market for these risks. The advocates for a free insurance market argue that since insurers do not provide liquidity insurance, there is no counterpart for bank runs in insurance business. The second notion in favor for free insurance market is that a large proportion of debt-holders in insurance companies consist of sophisticated investors who can evaluate the company's financial strength, implying that insurance market should provide better incentives for efficient risk management. Those in favor of strict insurance regulation claim that lack of market discipline in insurance market may give raise to costly failures that may propagate to other financial sectors through new and more sophisticated financial products such as credit risk derivatives. The current EU regulatory approach, however, seems to support the idea that capital adequacy standards should be lower in insurance than in banking. That is, although some of the risk exposures in both businesses may well be identical, the current regulation requires insurers to hold less equity capital than banks. In the case of financial conglomerates this generates an incentive for regulatory arbitrage if the risks can be transferred between the product lines.

4 The regulation of financial conglomerates

The previous section outlines the theoretical principles for solvency regulation of insurance companies and banks as stand-alone entities. The current regulatory approach, the so-called silo-approach, adopted in most industrialized countries is consistent with these principles. That is, in the case of insurance companies the regulatory requirements are identical to each firm operating in the same sector, regardless of their organizational arrangements.[35] Although the concept of the silo-approach lies on solid theoretical foundations, the emergence of more complex and larger institutions has blurred the boundaries between financial sectors which arguably presents a number challenges for the regulators.

[35] See eg Joint Forum (2001b)

While the regulatory challenges have been pronounced in the public policy debate, the empirical evidence and theoretical predictions on the impact of conglomeration on financial stability is ambiguous. The discussion has, broadly, focused on the limitations of the silo-approach and on the regulatory implications of emergence of larger and more complex institutions in the form of 'too-big-to-fail' (TBTF) policies. The following subsections treat these concerns in more detail within the conceptual framework for capital adequacy regulation described in section three.

4.1 Potential limitations of silo-approach

This section discusses the potential limitations of the silo-approach and elaborates the extent to which these limitations constitute a regulatory failure that should be corrected through a shift toward a more consolidated regulation. The limitations fall into three categories.

First, the silo-approach is considered *inconsistent*. Although different branches of a conglomerate are exposed to similar risks, the management of the risk depends on where it is booked due to differences in capital adequacy requirements. It follows immediately that financial conglomerate may reduce aggregate capital requirements by booking risks where capital requirements are lightest. Such regulatory arbitrage may threaten the stability of the financial system, and therefore, some argue that capital adequacy regulation should be designed to prevent risk transfer across businesses within a conglomerate. Another issue related with consistency is 'double gearing' of capital, where the same capital issued by the conglomerate is being counted twice to satisfy capital adequacy requirements in both banking and insurance. Second limitation to the silo-approach is the problem of *aggregation*. Namely, the risk assumed by a conglomerate may be larger or smaller than a sum of its parts. Third, the silo approach is *incomplete*, for it does not take into account the unlicensed entities of conglomerate that are engaged in commercial activities which may threaten the stability of the entire organization.

4.1.1 Consistency

Consider, for instance, the current EU regulatory framework described briefly in the previous section. According to Basel 1, a bank is required to put up 4% of Tier 1 in case of credit risk exposure when the counterparty has a rating A. However, a conglomerate with a more diverse product variety may also book the risk as a credit-insurance in an insurance subsidiary. In the above example of credit-risk transfer the capital requirement for the same risk-exposure to the insurer would be 0.8%, assuming that the insurer does not knowingly under-price the risk and the assessment of the risk-exposure coincides with that of the bank. Provided that the price for equity capital is the same for both businesses, lower capital requirement in insurance suggests lower cost for an identical risk-exposure in insurance than in banking. This naturally generates an incentive for booking the risk in insurance company instead of

bank. Potential for such *regulatory arbitrage* has raised concerns that it may increase the insurer's insolvency risk.

While regulatory arbitrage arguably modifies the risk portfolio of the institutions involved, it does not necessarily imply a market failure. Instead regulatory arbitrage might improve market efficiency if the risks are transferred to the market where investors are better equipped to assess and bear the insolvency risk, and the institutions that assume the risk are not vulnerable to contagious runs. The key in understanding this is the relation between insolvency risk and asymmetric information is the concept of *economic capital.*

Economic capital is financial firm's own assessment of capital reserves necessary to operate normally given its risk profile and economic environment; hence, it can be used as a common measure of risk-taking and market discipline across businesses. In a full information environment there is a trade-off in choosing economic capital. On the one hand, customers' willingness to pay for financial services is based on the perceived value of the service, in which the risk of insolvency plays a crucial role. On the other hand, capital reserves are costly for institutions; hence, they have a disincentive to hold excess capital. Under full information economic capital levels should be efficient as the debt-holders of the institutions can observe the true value of their assets and price them accordingly.[36] In an asymmetric information environment, the institution may choose a lower level of capital as the debt-holders cannot fully assess the risk-taking of the institution.

Regulatory capital is one instrument that regulator can use to correct for the gap between the economic capital level and the level that obtains in a full-information environment. The difference between the economic and regulatory capital thus depends on customers' and debtors' ability to observe the insolvency risk in the businesses. Previous section established that capital adequacy regulation of banks is required to mitigate excessive risk taking which is driven by lack of market discipline. Lack of market discipline in banking reflects the feature that a large proportion of banks' debt-holders are unsophisticated depositors who are protected by deposit insurance. Since the market does not discipline the banks, the role of the regulator is to discourage banks from inefficiently high risk-taking. To this end capital adequacy requirements can be used to create a cost for the risk that is not priced on the market and induce banks for more prudential behavior.

Debt and policy holders of insurance companies, in turn, have less protection from the government and a central bank. Furthermore, unlike in banking, a large proportion of insurance companies' debt is being held by financially sophisticated institutions.[37] It follows that investors should have better incentives to monitor the solvency of the insurer and price the risk more efficiently. Higher market discipline implies a higher level of economic capital in insurance business than in banking.

The aim of Basel 2 revisions is to better align the regulatory capital level with the economic capital level that obtains under full information. It is

[36] That is, discipline financial institutions for their risk-taking by demanding a higher rate of return for their assets.

[37] In some countries the insurance companies have funds that serve the role of deposit insurance.

therefore plausible to think that capital adequacy requirements for the same risk should be identical for all financial institutions. However, recall that in an ideal situation a socially optimal capital requirement equates the marginal cost of regulation and the marginal benefit in terms of reduction in expected externalities associated with the failures. If one accepts this as a target for financial regulation, we may argue that the level of regulatory capital should not be identical in insurance and banking. This is because the insurance market should provide greater incentives for prudential risk management than in banking and the expected cost in terms of externalities associated with market failures tend to be lower in insurance due to lower risk of financial contagion and the feature that there is no counterpart to bank-runs in insurance.[38]

Cross-shareholding in financial conglomerates has raised concerns for *double gearing of capital*. Double gearing of capital refers to a situation in which one entity holds regulatory capital issued by another entity with the same group and the issuer is allowed to count the capital in its own balance sheet. Double (or multiple) gearing of capital is likely to overstate the amount of *external* capital of the group. Thus, in order to prevent multiple gearing the regulators should have a clear definition of eligible capital and bear in mind that while internally generated capital may provide support for individual subsidiaries it has limited effect on the solvency of the group as a whole.

To summarize, although the inconsistencies in the current regulatory approach allows the financial conglomerates to reallocate risk between different business lines, the concern for higher insolvency risk could be overestimated. The reason being that the key mechanism that underlies the risk of insolvency, namely lack of market discipline, differs between these businesses, and hence, insurance market should provide incentives for prudential risk management. It follows that the silo-approach could be a suitable framework for capital adequacy regulation of financial conglomerates, regardless of the potential for regulatory arbitrage. However, the prevention double gearing of capital requires clear definitions of eligible capital, especially in terms of the role of intragroup holdings in general assessments of group capital.

4.1.2 Aggregation

In theory, the volatility of profits should decrease as the activities generating them become more diverse. By applying this argument to financial conglomerates it seems plausible to think that conglomeration diminishes the likelihood of failures in financial markets by generating an additional safety-net for institutions against financial distress. Hence, risk diversification should reduce the regulatory capital levels applied to financial conglomerates. On the other hand, a similar line of reasoning indicates that the silo-approach neglects risk-concentration. For example, an acceptable level of credit risk in a stand-alone institution's banking book may become a concentration of risks with high correlation if other institutions under the same roof have exposures to same counterparty in their risk portfolio.

[38] A similar point is made by Morrison (2003).

In a practical level, the extent to which risk diversification and concentration should be taken into account in the design of optimal capital adequacy requirements depends on the regulator's ability to measure the risk correlations. The quantification of the diversification benefits has been conducted in a few studies. However, as noted by Berger (2000) the results are far from conclusive and there are studies which argue that regardless of diversification benefits, financial conglomerates' overall risk may increase due to increase in systematic risk.[39] Since the existing literature provides little support for diversification benefits, the argument that diversification calls for lower capital adequacy requirements for financial conglomerates is less clear and requires more robust empirical evidence.

In addition to the measurement problems, also the theoretical predictions for risk aggregation are ambiguous. In principle, diversification requires that when a financial crisis hits, say an insurance subsidiary, the bank within the same conglomerate should rescue it through recapitalization. This feature has two important implications. First, it leaves the bank exposed to a risk of internal contagion which represents a threat to financial stability. If the legislation, however, *does not require the bank to bail out* the failing subsidiaries, the rationale for reducing capital adequacy requirements due to aggregation would be lost. The second implication is that when a subsidiary is required to finance the one that is failing, the subsidiaries may exhibit diminished incentives to manage their own risk portfolio prudentially. This argument is developed by Boot and Schmeit (2000). Boot and Schmeit show that when a conglomerate consists of two branches with separate managers, their operations might become distorted by 'Moral hazard in teams' -effect.[40] The intuition is that when subsidiaries are committed to provide additional finance to the one that is failing, the additional safety-net diminishes the subsidiaries' incentives to invest prudentially.

These arguments can be summarized as follows. The extent to which risk diversification improves the efficiency on financial markets lacks unambiguous empirical evidence. Furthermore, risk aggregation implies a higher risk of contagion between business lines in a conglomerate, which could reduce market discipline and increase the systemic risk. It follows that reducing capital adequacy requirements on the basis of risk diversification, could have severe implications on the financial stability.

4.1.3 Incompleteness

Financial institutions that do not offer insurance or banking services are unlicensed for they are not subject to similar failures as banks and insurers. This is because unlicensed subsidiaries do not offer liquidity insurance to debt-holders and they are subject to standard bankruptcy procedures. This is common knowledge for each debt-holder and they will plan their investments accordingly. Therefore, a run generated by investor-panic should not represent

[39] See Allen and Jagtiani (2000).
[40] See Holmström (1982).

a risk in unlicensed institutions. Second, since unlicensed subsidiaries are not offering insurance services they are not subject to the various problems of asymmetric information in insurance market. Finally, most debt-holders of unlicensed financial firms are sophisticated investors; therefore, the subsidiaries are subject to similar market discipline as other organizations in financial market.

These are the basic reasons why some institutions are not being licensed as specific financial institutions in the first place and why the debt-holders of these institutions do not require government protection. Hence, extending capital adequacy requirements to unlicensed subsidiaries might be unnecessary as there are several other instruments the regulator can use to insulate the conglomerates against internal contagion effects within a conglomerate, eg definitions of eligible capital and firewalls. Extending capital adequacy requirements to unlicensed entities would only exert distortions on the market.

To sum up these arguments I infer that unlicensed subsidiaries are not subject to socially costly failures, hence, there is little reason to extend capital adequacy requirements to these companies. However, unlicensed subsidiaries impose increased risk of contagion when there is no regulation of cross-sectoral ownership within the conglomerate. Contagion risk should therefore be corrected through policies that control for excessive cross-ownership of assets between subsidiaries.

4.2 Too-big-to-fail policies

The cross-sectoral consolidation of financial institutions is fueling a public policy debate on the implications of the size and complexity of financial institutions on the financial system stability. Several authors argue that large financial institutions receive implicit subsidies through too-big-to-fail (TBTF) policies.[41] Emergence of financial conglomerates has also raised concerns that complex international financial institutions may receive similar benefits through too-complex-to-fail (TCTF) policies.

TBTF policy refers to a particular form of time inconsistency in financial regulation that may lead to moral hazard in large banks. When a financial institution becomes large enough, the regulator might be induced to extend the financial safety net beyond standard policy measures to prevent system wide financial crisis. Its unintended consequence is a market perception that when a financial crisis hits an institution that qualifies as TBTF, the government will provide refinance regardless of the circumstances that led to the crisis. Such implicit insurance system gives large institutions an advantage over small ones which is unrelated to their ability to manage risk and thereby increasing the vulnerability of the financial system.[42]

The recent trend toward conglomeration combined with globalization and innovation of new financial products which allow for reallocation of risks

[41] See eg Mishkin (1999).

[42] Morgan and Stiroh (2002) provide evidence that banks considered TBTF are subject to less strict market discipline than small banks.

across sectors, implies that financial conglomerates might be considered too-complex-to-fail.[43] The reasoning is that financial crisis of complex financial institutions may propagate more easily across business lines and countries through cross-holding of assets. Therefore, governments have an incentive to engage in costly interventions to refinance failing institutions so as to prevent widespread failures of a financial conglomerates.[44] As in case of TBTF policies TCTF policies diminish the market discipline giving a competitive advantage to complex financial conglomerates over stand-alone institutions.

In theory, the regulator can correct for excessive risk taking through supplementary regulation applied to institutions that are considered to be TBTF or TCTF. In practice, however, applying supplementary regulation requires first a clear definition of legal entities subject to supplementary regulation. Second, quantification of the effect of TBTF-principle on the financial conglomerates risk is not readily available. These complications combined with the constant evolution of the financial sector imply that it is quite unlikely that the regulator can design efficient supplementary requirements. Instead of capital adequacy regulation, failures associated with TBTF principle should be corrected through improving procedures dealing with insolvent financial conglomerates.[45] This entails a commitment to a particular bankruptcy process with clear definitions of relevant legal entities. These definitions with sufficient transparency requirements and firewalls to prevent excessive inter-bank lending, should provide correct incentives for the agents in the financial market to price the risks associated with each financial institution regardless of their size or structure.

5 Conclusion

It remains to be seen how Basel 2 revisions of the capital accords will eventually treat financial conglomerates. Thus far, the public-policy discussion has focused on the limitations of the current silo-approach in regulation of financial conglomerates and on implications of too-big-to-fail policies on financial fragility. In particular, advocates of free financial markets are concerned that extending the standards to non-banking institutions will inevitably lead to inefficiently high deadweight loss, which cannot be justified on the basis of ensuring financial stability. However, some argue that the current regulatory framework leaves the financial market exposed to costly failures, and therefore, the capital adequacy requirements should be extended to institutions that do not provide traditional banking services.

One suggested limitation of the silo-approach is *inconsistent* capital adequacy requirements between product lines which allow the institutions to engage in regulatory arbitrage. Although regulatory arbitrage may well change

[43] See, Herring (2002).

[44] In addition to TBTF and TCTF principles, there is a potential that financial conglomerates become too-big-to-save. That is, refinancing a failing institution may be too costly for governments.

[45] For more detailed information on the issue see Mayes and Liuksila (2004).

the risk-profile of the involved institutions, it is less clear whether it generates a market-failure that requires regulatory attention. The reason is that the extent to which the market disciplines institutions for their risk-taking differs between financial sectors and the social cost of failures are unlikely to be the same between insurers and banks. A risk-transfer to a sector with lower capital adequacy requirements reflecting lower risk of insolvency and lower potential for contagious failures may actually improve the efficiency, provided that the market responds adequately to changes in the institutions' risk profile.

The concern for risk *aggregation* refers to the property that the silo-approach ignores risk diversification. While some argue that diversification reduces the volatility of profits and thereby the risk of insolvency, the empirical evidence on these gains is ambiguous. Furthermore, some analytical predictions also suggest that diversification may increase systematic risk through internal contagion effects.

The silo-approach is also considered *incomplete* as unlicensed subsidiaries are not subject to capital adequacy requirements. Unlicensed subsidiaries are not subject to similar failures as licensed financial institutions. Hence, the fact that these institutions are not being licensed in the first place constitutes a sufficient justification for not extending the capital adequacy requirements to these institutions.

Although financial conglomerates may well be considered too-big-to-fail or too-complex-to-fail, the policy response should be directed to improvements in bankruptcy legislation and regulation of the structure of the conglomerates' risk-portfolio. This is because the TBTF principle can be difficult to quantify and supplementary regulation applied to financial conglomerates requires a clear definitions of institutions that qualify as financial conglomerates. If the TBTF principle is taken into account in industry-wide capital adequacy regulation, it might impose an unnecessary deadweight loss on the market.

These arguments suggest that economic literature lacks unambiguous empirical evidence and clear theoretical predictions on the risks associated with financial conglomerates. Hence, before modifications of capital adequacy requirements takes place, more rigorous economic analysis is needed to address the potential market failures. Meanwhile, the focus should be on improving the transparency of the new, more complex, financial institutions and providing clear definitions of eligible capital to prevent cross-ownership of assets and enhance the market discipline.

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