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# The Economics of Capital Regulation in Financial Conglomerates*

by Alan D. Morrison**

## 1. Introduction

The financial services landscape has changed significantly in recent years. A combination of improved information technology and financial innovations such as derivatives contracts has in most developed countries reduced the proportion which interest income contributes to financial GDP.[1] Banks have reacted by developing fee-based businesses. The consequence of these developments has been an increasing degree of financial conglomeration, involving the creation of entities which combine banking, insurance and other financial services under one umbrella.

European conglomeration has been gathering pace for about a decade. Motivated by substantial cost advantages arising from economies of scale and scope in insurance sales and underwriting, banks have combined with life insurance firms to form "bancassurance" firms which have generated a return on sales and on capital of 20 to 30 per cent. Between 1985 and 1999 the value of merger and acquisition deals involving a commercial bank and an insurance company was U.S.$ 89.6 billion, or 11.6 per cent of all acquisitions by European financial institutions.[2]

Similar imperatives have driven the creation of bancassurance markets in Latin America,[3] but conglomeration was prevented in the United States until the passage in November 1999 of the Gramm-Leach-Bliley Act, which dismantled legal barriers to the integration of financial services firms that had been erected by the 1933 passage of the Glass-Stegall Act. Prior to the passage of the Gramm-Leach-Bliley Act, the Federal Reserve Board had reacted to the market forces driving conglomeration firstly by allowing the creation of "Section 20 subsidiaries" which could perform a limited amount of security underwriting, and later by approving the 1998 merger of Citicorp and Travelers and granting the merged entity a five-year charter to operate as a universal bank.

The emergence of financial conglomerates has been accompanied by a debate about the most appropriate way to regulate them, and in particular about the appropriate levels of

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[1] Allen and Santomero (2001).

[2] See Lown, Osler, Strahan and Sufi (2000) for detailed discussion about and statistics concerning the development of the European bancassurance market. A detailed discussion of conglomeration rationales and the experience in the Benelux countries is provided by the National Bank of Belgium (2002).

[3] Benoist (2002).

regulatory capital. The discussion has centred upon three issues.[4] At present, bank and insurance companies face different requirements for regulatory capital. When both types of company co-exist in the same conglomerate there is clear potential for "capital arbitrage": in other words, for shifting assets between the companies so as to reduce aggregate capital requirements. Should the regulators respond to this state of affairs by harmonizing capital requirements across the two types of institution? At present, capital requirements for the various businesses in a conglomerate are computed on a stand-alone basis. Should the regulator reward diversification effects with reduced capital requirements? And finally, should the unlicensed subsidiaries of financial conglomerates be subject to capital regulation?

In this article I provide an academic but non-technical perspective upon these questions. I discuss the role of, and the justification for, financial regulation in general and I use the academic literature to identify the most important questions in capital regulation. I discuss the relevance of these questions to the various businesses in financial conglomerates. From this discussion some general policy conclusions emerge. Some of my observations are slightly at odds with opinions expressed by practitioners: I conclude that regulatory capital requirements for banks and insurance companies should be different, even when they have similar assets, and I question the received industry view that regulators should account for diversification effects at the holding company level.

## 2. A framework for capital adequacy policy

A coherent regulatory policy must rest upon solid intellectual foundations. In this section I briefly explain why regulation must be justified and I give the justification upon which the arguments in this paper rest. I then ask on that basis why capital levels in particular should be regulated.

Economists since Adam Smith (1776) have understood the power of market mechanisms to achieve welfare-maximizing outcomes. Modern welfare economics has provided a rich body of theory to support Smith's intuition. Undergraduates learn early in their careers that individuals equipped with the right information and acting freely will be guided by the price mechanism to allocate their resources so as to maximize the utility which they extract from them. Microeconomics textbooks tell us that resources cannot then be reallocated without making someone worse off:[5] in this sense, free markets yield efficient outcomes. Why then is the operation of markets so frequently subject to the interference of regulators?

Of course, regulation may not be concerned with economic efficiency *per se*. It may be imposed by a government intent upon redistribution of wealth, or it may be the result of lobbying by special interest groups.[6] Policies should not be set by special interest groups and even well-meaning attempts to redistribute wealth equitably by reducing the impact of market forces are likely to have unforeseen consequences and may, by reducing the available surplus, make everyone worse off.[7] In this article I will adopt a presumption in favour of market forces

[4] In a document prepared for the seminar at which this paper was first presented, Oliver, Wyman and Company (2001) survey the concerns expressed by practitioners and identify these questions.

[5] See for example Varian (1978).

[6] See Kane (1997) for a discussion of these points.

[7] Market manipulation may introduce allocative inefficiencies which lower output below the level attainable with existing technology. Liberal economists have also stressed the importance of free trade to individual freedom and to incentives to innovate: Booth (1997) provides a clear summary of the relevant literature in the context of the insurance markets.

and the price system. Regulation can be justified only when there is a clear danger that the market will not on its own maximize welfare.

Left to their own devices, individuals (and companies, which are ultimately owned by individuals) should weigh up the costs and benefits of their actions so as to pick the best resource allocation. Regulation is necessary only when they can be expected to leave important features out of their calculations. This will happen only when they do not directly experience a cost or a benefit which results from their choices: in other words, when *they fail to price it*. The textbook example is the person who drives into the countryside without considering the polluting effect which his action will have upon the residents: fuel tax will help him to account for this effect, or to *internalise* it. In this case competition need not achieve the first best outcome[8] and there is a case for regulation to provide the correct economic incentives.

In the light of this discussion, why is capital regulated in financial firms? The answer to this question is not immediately clear. After all, a firm's capital requirement is simply the proportion of its financing which is equity-based. We do not impose capital requirements on non-financial firms (such as Coca-Cola): why should we do so when dealing with financial firms?

At this stage, we should remind ourselves of what the classical theory has to say about capital levels in standard firms. The Modigliani and Miller propositions of 1958 imply that capital requirements for corporations are irrelevant: changing the capital structure of a firm will not change its value. In the light of the current debate about capital requirements this seems an unrealistic conclusion, but their work is still at the heart of modern finance and it contributed towards their Nobel prizes. It rests upon the observation that as a company reduces its capital levels and increases the amount of debt in its balance sheet, its debt becomes progressively more expensive. In other words, cheap bond financing disappears as soon as a firm attempts to use it. Why does it not hold for corporations in general and for financial firms in particular?

The general point has been widely addressed by theorists.[9] There are several explanations concerning tax, costs of financial distress (the "under-investment problem"), bankruptcy costs, and agency effects,[10] but the most important appears to be the cost of going to the market to raise additional equity capital: in addition to the fees which this involves, it seems to send an adverse signal to the market-place which shareholders would prefer to avoid.[11] They therefore attempt to relate the riskiness of their business to the total amount of capital which they have, so as to trade off the advantage of running large projects against the possible costs of raising new capital.[12]

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[8] This statement receives support even from the strongest proponents of free market solutions. For example, Friedrich A. von Hayek, possibly the most significant liberal economist of the 20th century, argues that "[sometimes] there is a divergence between the items which enter into private calculations and those which affect social welfare; and whenever this divergence becomes important some method other than competition may have to be found to supply the services in question" (Hayek,1944, p. 40).

[9] Harris and Raviv (1991) survey the major themes.

[10] The seminal work in this field appears in Modigliani and Miller (1958, 1963), Miller (1977), Myers (1974) and Jensen and Meckling (1976).

[11] The first formal statement of this is due to Myers and Majluf (1984).

[12] This idea is developed in the context of risk management by Froot, Scharfstein and Stein (1993) and in a discussion of capital structure by Bolton and Freixas (2000).

The preceding paragraph suggests that there may be an optimal capital level. If shareholders select it for themselves by trading off capital levels against the cost of new capital so as to maximize value, how do regulators increase welfare? It is easiest to find an answer to this question in the banking sector. The most important holders of a bank's debt are its depositors and they have privileges which differentiate them from other debt-holders. Firstly, their deposits are at least partially insured: in the event that their bank fails, they will be compensated to some extent. Secondly, they have a first-come, first-served right to demand repayment of their debt: in other words, to withdraw their deposits upon demand. If the bank fails as a result of a widespread withdrawal of funds, then they do not have to wait in line with the other claimants on the bank while it goes through the bankruptcy courts.

Deposit insurance is provided for several excellent and well-known reasons relating to the stability of the financial system which I shall not address here.[13] Its inevitable consequence is that it insulates depositors from the risks which their bank is taking. As depositors are not exposed to the bank's risk, *they will not price it*. In other words, because the regulator assumes the risk of bank failure, depositors will not demand higher rates which reflect this risk. Shareholders then have a clear interest in ensuring that their bank takes excessive risks. This is a form of moral hazard which is often referred to in the financial economics literature as *risk-shifting*: in a rather polar example, it resulted in the Savings and Loans crisis in the United States. A welfare-maximizing regulator should attempt to discourage bankers from gambling with taxpayers' money like this. This is accomplished by imposing minimum capital levels. When the shareholders of the bank stand to lose their own money, they will be more careful about the risks which the bank takes.[14]

What about the demand nature of deposit contracts? Suppose that several depositors decide simultaneously to withdraw their money. The bank must honour every withdrawal request. If enough people demand their funds back it will be forced to sell illiquid loan assets at a loss and this will lead eventually to bank failure. The problem again is that depositors are taking withdrawal decisions without considering their effect upon the value of the bank: again, *they are not pricing the effects of their actions*. Widespread withdrawals are a result of panic: imposing capital requirements can act to abate their effects.[15]

The Basle II document states that in general capital requirements should "ensure the safety and soundness of the financial system". In addition to the phenomena which I have already addressed, this refers to the danger of financial contagion: in other words, the risk that the failure of one bank may result in the failure of additional, perfectly healthy banks. Does the bank manager think about contagion risks when she selects her investment portfolio? Of course not: once again, they are not priced. But if the regulator sets costly capital requirements which increase in line with the bank's contribution to systemic risk, then her shareholders will force her to take contagion into account.

There is a very important difference in emphasis between the regulator's objectives and those of the banker and the bank's shareholders. The banker sets capital requirements in order to maximize shareholder value, for example, by trading off the costs and benefits of achieving a particular rating. The regulator should set capital requirements which reflect the magnitude

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[13] See Freixas and Rochet (1997) for a survey of the relevant literature.

[14] This idea is developed by Flannery (1989), Hellman, Murdock and Stiglitz (2000), Holmström and Tirole (1997), Morrison and White (2002) and Rochet (1992).

[15] The relevance of bank runs in the determination of capital adequacy requirements was identified by Diamond and Dybvig (1983). A related story is told by Diamond and Rajan (2000).

and importance of risks which the banker fails to account for in her investment decisions: those which are not priced. Inevitably, there is and there should be a difference between the objectives of the banker and those of the regulator.

This is a crucial point: the policy questions concern the risks for which the banker does not otherwise account. The goal of capital regulation is to charge the banker (or rather, to charge her shareholders) for the risks which she otherwise ignores and thus positively to affect her behaviour. A clear consequence of this line of reasoning is that in writing policy for capital regulation, it is not sufficient to extrapolate directly from existing industry practices. The regulator should attempt to determine which risks are not being adequately priced in the market-place and should respond to these.

We can understand the existing regulatory framework in these terms.[16] For example, the regulator is often described as a representative of the depositors.[17] Depositors are dispersed and are financially unsophisticated. Even in the absence of deposit insurance, it would be difficult for them to evaluate the complicated risk-taking activities of the bank for themselves and to co-ordinate corrective action in the wake of banker misbehaviour. For this reason, the banker's risk-taking activities may be incorrectly evaluated by the market. There are structural solutions to this problem concerning competition policy[18] and reputation protection,[19] but there is also a role for the regulator to compel disclosure of risky activities and to punish transgressions on behalf of the depositors. In other words, to perform prudential supervision.

I have outlined an intellectual framework within which regulatory policy may be evaluated and described. For the remainder of this article, I will apply it to financial conglomerates, and use it to discuss the three policy questions identified in the introduction:

(1) Should the risks in different business units be regulated in the same way? Is consistency across businesses desirable?
(2) Should unlicensed subsidiaries be subject to capital regulation?
(3) What is the value of diversification? How should the regulator reward it?

## 3. Consistency

Are the risks in the insurance business really economically the same as those in the banking sector? This question must again be addressed both from the banker's perspective and from that of the regulator. I firstly consider the insurance business as a stand-alone entity, and later ask whether conglomeration affects my conclusions.

Recall that the bank's concern with capital levels is a consequence of the costs of refinancing. When capital levels are low, or when fresh capital is expensive, the bank's shareholders will show less willingness to assume risk. Capital market imperfections, rather than anthropomorphism, are therefore responsible for the "risk aversion" which financial

[16] Llewellyn (1999) provides a very complete non-technical examination of the theory of financial regulation. He identifies seven rationales for regulation. Ultimately, each can be traced back to a missing price, either as a consequence of poor information, or of institutional features of the type which I identify above. See Bhattacharya, Boot and Thakor (1998) for a comprehensive review of the academic literature on bank regulation.

[17] This idea is developed in detail by Dewatripont and Tirole (1993a,1993b).

[18] See for example Boot and Greenbaum (1993) and Morrison (2002).

[19] Banks will sometimes make first best decisions to build their reputation: see Diamond (1991).

institutions exhibit.[20] If the cost of capital in insurance is similar to that in the banking sector[21] then *economic* capital requirements will be the same in both businesses.

It does not follow from this that *regulatory* requirements should be the same for both businesses, however. Regulatory capital is one of the mechanisms which the regulator uses to correct for risks which are not otherwise priced in the market. When risks *are* priced then the imposition of additional capital requirements may inefficiently distort investment decisions.

I argued earlier that bank regulation is necessary because of the special nature of deposits and as a response to the lack of depositor sophistication. The unsophisticated counterparts in the insurance business to bank depositors are the purchasers of personal insurance. They are typically ill-equipped to evaluate the financial strength of the insurers with whom they deal. There is a danger that equity holders will write insurance policies at actuarially insufficient prices and then gamble with the premia. As in the case of the banking firm, they do not bear the costs of failure and they therefore do not price them.

In this context, there is a clear need for someone to represent the interests of the depositors and this role is assumed by the regulator. There are significant differences between this situation and the insurance one, however. Firstly, regulators do not typically promise to bail out failing insurance and pension companies.[22] Unlike depositors, purchasers of insurance therefore have some incentive to monitor the activities of their insurer. Households typically cannot do this, but large businesses can. If they can price the risk of failure to pay by their insurance company then any additional capital requirements imposed by the regulator will represent a dead weight and will result in an inefficient increase in the cost of insurance.

The second difference between the two businesses is in their financing. The costs of excessive risk-taking in any firm are borne by its debt-holders: they take all of the associated losses without participating in the profits. In the banking firm the major class of debt-holders is the unsophisticated depositors, who can rely upon deposit insurance. In an insurance firm the policyholders occupy an analogous position with less protection from the state. Moreover, any debt securities issued by the insurance company will be held by unprotected and financially sophisticated institutions who are capable of monitoring and enforcement activities. In other words, the risk-shifting dangers which are unpriced in a banking firm will be at least partially accounted for in an insurance firm. This suggests a reduced role for capital adequacy requirements in the insurance firm.

I also discussed earlier the danger of bank runs and of financial contagion in the banking sector: as these risks are not priced they provide a rationale for capital regulation. Is the insurance business subject to the same risks?

Firstly, consider the danger of runs. These occur in the banking sector because deposits are repayable upon demand on a first-come, first-served basis and they result in the destruction of economic value. The debt-holders in insurance firms do not have the same privileges as

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[20] This perspective is developed in detail by Froot and Stein (1998).

[21] Typically, the cost of capital is related to the opacity of the business which requires it: if investors cannot easily evaluate the business then they will assume that it is of poor quality and will adjust their required return accordingly. As a consequence of their extreme complexity and their reliance upon relationship information, financial businesses are amongst the most opaque and this accounts for the concern amongst their managers for risk management: see Froot and Stein (1998) for a detailed discussion. There are good reasons for believing that this effect is as severe in the insurance business as it is in banking.

[22] In the United Kingdom, an industry-funded compensation scheme was established under the Policy Holders' Protection Acts of 1975 and 1997. Such a scheme encourages peer-group monitoring in place of consumer monitoring. Moreover, Howard Davies (2002) notes that that the cost to retail consumers of insurer insolvency is non-trivial in the U.K., suggesting that consumers bear some residual risks.

depositors. They cannot demand early repayment and in the event of insolvency they have to join the repayment queue with everyone else. In other words, they cannot precipitate a run. What about the policyholders? Early policy termination is possible, but in a with-profits fund it does not result in a destruction of value. The insurance company simply liquidates some investments at the market price to repay the policyholder and charges him a substantial administrative fee, which serves to discourage liquidation in the first place. On the whole, it seems that insurance companies, and in particular the life companies which make up the bulk of the bancassurance market, are not subject to runs in the same way as banks. It follows that there is no need to set capital requirements to protect the system against them.

The statement that policyholders cannot precipitate a run on a life insurance company might appear to be contradicted by recent experiences relating to guaranteed return products. For example, in the U.K., the Equitable Life Assurance Society was forced by a July 2000 House of Lords ruling to honour 90,000 guaranteed annuity rate policies ("GARs") granted to with-profit policyholders, at a cost to non-GAR policyholders of £1.5 billion. As a result it was forced to stop accepting new members and to change its investment policies.[23] The guaranteed return offered by the Equitable was similar to that offered to depositors, but there are significant differences between a GAR policy and a deposit contract. Firstly, GAR holders cannot exercise their rights until their retirement date; depositors can withdraw at any time. As discussed in the preceding paragraph and in contrast to bank depositors, policyholders who elect to withdraw their funds early suffer a penalty: in this case, of 10 per cent. Secondly, the law as interpreted by the Lords demands equal treatment for policyholders, but does not guarantee that all will be paid in the event of a market fall.[24]

The situation facing Equitable Life's non-GAR policyholders, whilst tragic, has not resulted in forced early asset liquidation of the type which attends a bank run, and the appropriate regulatory response probably relates to disclosure, rather than capital, requirements. Any insurance firm offering guaranteed return policies with on demand first-come, first-served withdrawal rights would in effect be offering deposit contracts and would require a banking licence. Although this did not happen in the Equitable Life case, a failure correctly to classify such products would be a consequence of poor regulation, and not of poor legislation.

Secondly, consider contagion effects. Will the failure of one insurance company lead to the failure of other, solvent, companies? To answer this question, I firstly ask whether the forces which cause contagion in the banking sector are of relevance to the insurance market. I then discuss the extent to which these forces can destroy economic value in the insurance market.

Work to understand contagion between banks is the basis of ongoing research and it is not possible here to discuss all of the explanations. They fall, however, into two broad categories. One explanation is that bank contagion is a consequence of cross-holdings between banks.[25] Insurance companies relying upon the reinsurance market are subject to similar risks: in the wake of the catastrophe losses which hit the world market between 1987 and 1990 the reinsurance market acted to concentrate rather than to spread risk in the London

[23] A very clear account of the economics of this affair is given by Blake (2001).

[24] Much of the controversy surrounding their Lordships' judgment concerned the interpretation of "equal" when both GAR holders and non-GAR holders were paid from the same source: see Blake (2001).

[25] See, for example, Allen and Gale (2000), Freixas, Parigi and Rochet (1999) and Rochet and Tirole (1996).

market.[26] The question from a regulatory perspective is of course whether insurers account for these mechanisms when writing reinsurance contracts. In general, institutions should be able adequately to assess the risks of contracts which they write with each other.[27] Correcting with capital requirements the failure of those who do not merely penalizes their more able competitors.

The second explanation for bank contagion relates to the opacity of the banking business and the perceived level of correlation between different bank portfolios.[28] If I see a bank fail, I may deduce that my own bank, whose investments are hard to evaluate, is likely to be in trouble. The extent to which this phenomenon arises in the insurance market depends upon the degree to which insurance company risks are correlated. This is dependent upon the nature of the business, but correlation need not exist: if my life business takes an unexpected hit, there is no *a priori* reason to assume that yours will. Again, the forces causing contagion appear to be lower in the insurance market than in the banking sector.

The crucial argument concerns the extent to which contagious forces can destroy economic value. This occurs in the banking sector when contagion results in a needless and destructive run on the bank. I have argued already that runs cannot occur in precisely the same way in the insurance sector: I stated that any company offering products which expose it to the danger of runs should have a banking licence. This clinches the contagion argument. Without runs, the rather attenuated forces of contagion which obtain in the insurance sector will have a vastly diminished impact and the corresponding need for capital regulation will be greatly reduced.

In summary, I have argued that the need for capital regulation in the insurance sector is lower than that in the banking sector. The regulator's role as the representative of the policyholders is unquestionable. Her role in tackling runs and financial fragility is minimal. My analysis therefore suggests that compulsory capital requirements should be lower for insurance businesses than for banks. Of course, this does not mean that capital *levels* will necessarily be any lower: simply that the market is more likely to make the correct decision in the insurance business without assistance from the regulator and hence that interference is likely to be distortionary.

## 4. Incompleteness

Should unlicensed firms within a financial conglomerate be subject to capital requirements? I have already argued that in the developed world licensing is a response to externalities, or to unpriced risks. To develop this point, I will consider in turn financial and non-financial subsidiaries.

Non-licensed financial firms are typically engaged in lending or leasing activities. They are not financed using demand deposits so that neither destructive runs nor financial contagion is a risk for them. Their debt-holders are not insured against losses and they are sophisticated investors who can correctly price their investments. The only obvious role for

[26] Bain (1999) provides an account of this effect, an "insurance spiral", which arose when those who *ex ante* purchased reinsurance and who simultaneously provided reinsurance to the market wound up *ex post* providing cover to their own insurers.

[27] This arguably did not happen in the London market, although Bain (1999) notes that underwriters accepted business because of "unexpected demand for cover at attractive rates", which suggests that they understood the risks but felt that they were well rewarded for taking them.

[28] For example, Chari and Jagannathan (1988), Chen (1999) and Morrison (2000).

regulation is in ensuring that unsophisticated borrowers are aware of the terms of their loans and the state provides a legal system which aims to achieve this. There is no role for capital requirements. Imposing them will simply cause the cost of loans and of leases to increase.

On a stand-alone basis, the capital structure of a non-financial firm is similarly unregulated for a good reason. The market will correctly price the risks which the firm is taking and thus will supply the correct incentives to the firm's managers. Regulatory interference will serve only to distort the firm's investment decisions.

I therefore argue that the current approach to capital regulation for unlicensed subsidiaries is entirely correct on a stand-alone basis: there is no role for capital regulation in these businesses.

## 5. Aggregation

How does conglomeration affect the arguments which I have presented? To what extent should regulators take account of diversification when setting capital requirements?

Diversification and its effects upon both shareholder value and social welfare is a difficult subject and once again it is worth remembering what the classical theory has to say about this. The classical argument was first made by Modigliani and Miller, who noted that the value of a firm is determined by its shareholders and its debt-holders. If they want diversification then they can achieve it at the level of their own portfolios. Diversification by the manager adds no value whatsoever to the firm. This intuition was strengthened by the Capital Asset Pricing Model ("CAPM"), which came along a few years later.[29] It states that the only risk which should be priced is risk which cannot be diversified away. It makes no difference where you buy your assets: diversification is against the global portfolio. Since investors price only that part of the firm's risk which they cannot diversify away, diversification by the manager does not affect their valuation of the firm.

This story is still widely accepted by corporations and by corporate financiers, but it does not square with the capital management activities which we see in the financial markets. Current practice in this area is based upon portfolio models. In the light of the CAPM, how does Value at Risk reporting increase shareholder value?

The explanation is again related to the costs of external capital. The CAPM tells me that with perfect capital markets I will not be rewarded by the market for bearing diversifiable risk. This risk may however cause a depletion of my capital reserves and when capital is costly (i.e., when capital markets are imperfect) this will be value-reductive. Diversification reduces the chance that I will have to access the capital markets and is otherwise value-neutral.

Again, we must ask ourselves what the consequences of diversification are for non-priced risks. By reducing the likelihood of large swings in the value of the firm, diversification lowers to some extent the likelihood that a drop in investment values will damage the interests of depositors or of the uninformed policyholders when these individuals are not able to diversify their risks. Similarly, it may reduce the danger that a run or a contagious panic will develop in response to sharp swings in company value. These are different motivations to those which concern the manager, however. Sometimes (as in the case of market risk requirements for the banking sector) the regulator will set higher capital requirements than those which the banker determines for himself. It does *not* follow, as the industry sometimes argues, that the regulator has therefore got it wrong.

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[29] It was developed independently by Sharpe (1964), Litner (1965) and Mossin (1966).

This gives us a motivation for relating regulatory capital requirements at the level of the individual business to diversification effects, although the case is not cut and dried. As the B.I.S. and several national regulators have noted,[30] quantification of diversification benefits is very hard to accomplish in some businesses, such as lending, and the figures are probably of little use when regulatory capital is most important: specifically, during a contagious panic when asset return correlations across the entire economy approach one.

The regulatory case for risk aggregation is still less clear at the level of the holding company. Naturally, diversification across the conglomerate has the effect of reducing still further the volatility of aggregate returns and this may reduce systemic risk. The story is not, however, as one-sided as industry players sometimes suggest. Aggregation of risks will reduce the volatility of returns only if profits in one part of the business are used to offset losses in another. If aggregated risk figures were used for determining capital adequacy requirements, then the regulator would effectively be pooling the capital of each of the conglomerate's businesses and using it to underwrite the entire conglomerate.

Such a pooling of capital would have profound effects. Suppose that the insurance company sustained a massive loss. Risk aggregation implies that the bank must bail out the company. If this requirement was waived then the regulator would effectively be operating a stand-alone business policy with reduced capital requirements, and this would certainly have undesirable systemic consequences. In other words, a policy of risk aggregation at the holding company level effectively compels the bank to underwrite the insurance company's risks (and vice versa). Insurance company failure would therefore place the bank under strain. It follows that aggregation of capital measures at the level of the holding company may serve to open new channels for financial contagion and hence to *increase* the level of systemic risk.

Conglomerate-level aggregation of risks has a similar consequence for the non-licensed subsidiaries of the holding company. I have already argued that there is little reason to extend the current regulatory capital framework to these companies on a stand-alone basis. Suppose now that the portfolio effects of these companies is incorporated in a group-level capital calculation. Once again, this would be a *de facto* pooling of capital across businesses, and the bank would again be compelled to bail out failing non-licensed subsidiaries. In this situation, the shareholders of the non-licensed subsidiary could lean upon the bank's deposit insurance. This would give them an incentive to take excessive risks. Computing capital requirements at the holding company level in this case would therefore reduce market discipline and would render capital regulation necessary where previously it was not.

To reiterate, allowing for group level diversification effects in regulatory capital calculations would amount to a concrete commitment that the various firms in the business would underwrite one another. This would have two undesirable effects. Firstly, it would open a contagion channel from non-banking businesses to the banking sector. Secondly, it would enable the conglomerate to shift losses from non-bank subsidiaries to its insured bank subsidiary and would therefore provide incentives for gambling. These incentives were well understood by the U.S. legislators who drafted the 1933 and 1987 sections of the Federal Reserve Act which required the construction of "firewalls" in large complex banking organizations to prevent loss-shifting.[31]

Allowing for conglomerate level risk aggregation would reintroduce the problems

[30] B.I.S. (1999).

[31] Walter (1996) provides a detailed discussion of firewall legislation.

which firewalls were designed to address. It would therefore reduce the power of market incentives and hence would result in an *increased* requirement for regulation.

Contrast this with the current situation, in which group level aggregation does not affect regulatory capital requirements. The owners of the holding company can account for aggregation in their own calculations of economic capital. The potential for cross-subsidization diminishes the danger that the firm will have to approach the capital markets and so increases its value. The key difference between this situation and one in which holding company level diversification affects regulatory policy is that the holding company is not currently *compelled* to perform this aggregation. If one of its subsidiaries makes a massive loss then it can walk away from it without undermining the credibility of the regulator's capital adequacy regime. This may have dire consequences for its reputation, but these are presumably not as severe as the consequences of bailing out the failing subsidiary.[32]

## 6. Conclusion

I have put the case for a particular view of capital regulation. The purpose of capital regulation is to correct for failures in the market: specifically, to force managers to account for risks which they would not otherwise price. This is an entirely different story from the one which identifies capital requirements with the economic capital figures which managers compute. The two should clearly be related and they can use a lot of common technology, but they are by definition distinct. If the manager is already correctly pricing a risk then it does not need to be regulated.

My analysis has three conclusions:

(1) There is no reason why regulatory capital requirements for the same asset should necessarily be the same whether it is held in a bank or an insurance company. Capital requirements in the banking sector are a response to the unique institutional features of the industry. These features do not obtain in the insurance industry where market failure is less likely.
(2) Unlicensed subsidiaries are not subject to externalities (non-priced risks) and there is no good argument for subjecting them to capital regulation at the stand-alone level.
(3) Allowing for diversification effects at the holding company level in the computation of capital requirements may have negative consequences. It may serve to *increase* systemic risk and to *reduce* market discipline. A great deal of further work is required to quantify these effects before any substantive changes to policy can be made.

REFERENCES

ALLEN, F. and GALE, D., 2000, "Financial Contagion", *Journal of Political Economy*, 108, pp. 1–33.
ALLEN, F. and SANTOMERO, A.M., 2001, "What Do Financial Intermediaries Do?", *Journal of Banking and Finance*, 25, pp. 271–94.
BAIN, A., 1999, "Insurance Spirals and the London Market", *Geneva Papers on Risk and Insurance – Issues and Practice*, 24, pp. 228–42.
BENOIST, G., 2002, "Bancassurance: The New Challenges", *Geneva Papers on Risk and Insurance – Issues and Practice*, 27, pp. 295–303.

[32] Allowing the manager discretion gives him an opportunity to liquefy his reputational capital and hence may be welfare-increasing: see Boot, Greenbaum and Thakor (1993).

BHATTACHARYA, S., BOOT, A.W.A. and THAKOR, A.V., 1998, "The Economics of Bank Regulation", *Journal of Money, Credit and Banking*, 30, pp. 745–70.
B.I.S., 1999, "Credit Risk Modeling: Current Practices and Applications", Basel Committee Publication 49, Bank for International Settlements, Basle.
BLAKE, D., 2001, "An Assessment of the Adequacy and Objectivity of the Information Provided by the Board of the Equitable Life Assurance Society in Connection with the Compromise Scheme Proposal of 6 December 2001", Report prepared for the Equitable Members Action Group, http://www.emag.org.uk.
BOLTON, P. and FREIXAS, X., 2000, "Equity, Bonds and Bank Debt: Capital Structure and Financial Market Equilibrium under Asymmetric Information", *Journal of Political Economy*, 108, pp. 324–51.
BOOT, A.W.A. and GREENBAUM, S.I., 1993, "Bank Regulation, Reputation and Rents", in C. Mayer and X. Vives (eds.), *Capital Markets and Financial Intermediation.* Cambridge: Cambridge University Press.
BOOT, A.W.A., GREENBAUM, S.I. and THAKOR, A.V., 1993, "Reputation and Discretion in Financial Contracting", *American Economic Review*, 83, pp.1165–83.
BOOTH, P.M., 1997, "The Political Economy of Regulation", *British Actuarial Journal*, 3, pp. 675–707.
CHARI, V.V. and JAGANNATHAN, R., 1988, "Banking Panics, Information and Rational Expectations", *Journal of Finance*, 43, pp. 749–61.
CHEN, Y., 1999, "Banking Panics: The Role of the First-Come, First-Served Rule and Information Externalities", *Journal of Political Economy*, 107, pp. 946–68.
DAVIES, H., 2002, " 'Rational Expectations' – What Should the Market, and Policy Holders, Expect from Insurance Regulation?", Howard Davies (Chairman, Financial Services Authority), AIRMIC Annual Lecture, RAC Club, Pall Mall, London, U.K.
DEWATRIPONT, M. and TIROLE, J., 1993a, "Efficient Governance Structure", in C. Mayer and X. Vives (eds.), *Capital Markets and Financial Intermediation*. Cambridge: Cambridge University Press.
DEWATRIPONT, M. and TIROLE, J., 1993b, *The Prudential Regulation of Banks*. Cambridge, Mass.: MIT.
DIAMOND, D.W., 1991, "Monitoring and Reputation: The Choice Between Bank Loans and Directly Placed Debt", *Journal of Political Economy*, 99, pp. 689–721.
DIAMOND, D. W. and DYBVIG, P., 1983, "Bank Runs, Deposit Insurance and Liquidity", *Journal of Political Economy*, 91, pp. 401–19.
DIAMOND, D.W. and RAJAN, R.G., 2000, "A Theory of Bank Capital", *Journal of Finance*, 55, pp. 2431–65.
FLANNERY, M.J., 1989, "Capital Regulation and Insured Banks' Choice of Individual Loan Default Risks", *Journal of Monetary Economics*, 24, pp. 235–58.
FREIXAS, X., PARIGI, B. and ROCHET, J.-C., 1999, "Systemic Risk, Interbank Relations and Liquidity Provision by the Central Bank", Discussion Paper 2325, CEPR, London.
FREIXAS, X. and ROCHET, J.-C., 1997, *Microeconomics of Banking*. Cambridge, Mass.: MIT.
FROOT, K.A., SCHARFSTEIN, D.S. and STEIN, J.C., 1993, "Risk Management: Coordinating Corporate Investment and Financing Decisions", *Journal of Finance*, 48, pp. 1629–58.
FROOT, K.A. and STEIN, J.C., 1998, "Risk Management, Capital Budgeting, and Capital Structure Policy for Financial Institutions: An Integrated Approach", *Journal of Financial Economics*, 47, pp. 55–82.
HARRIS, M. and RAVIV, A., 1991, "The Theory of Capital Structure", *Journal of Finance*, 46, pp. 297–355.
HAYEK, F.A., 1944, *The Road to Serfdom* (Routledge Classics, 2001 edn) London: George Routledge & Sons.
HELLMAN, T.F., MURDOCK, K.C. and STIGLITZ, J.E., 2000, "Liberalization, Moral Hazard in Banking, and Prudential Regulation: Are Capital Requirements Enough?", *American Economic Review*, 90, pp. 147–65.
HOLMSTRÖM, B. and TIROLE, J., 1997, "Financial Intermediation, Loanable Funds and the Real Sector", *Quarterly Journal of Economics*, 112, pp. 663–91.
JENSEN, M. and MECKLING, W., 1976, "Theory of the Firm: Managerial Behaviour, Agency Costs and Capital Structure", *Journal of Financial Economics*, 3, pp. 305–60.
KANE, E.J., 1997, "Ethical Foundations of Financial Regulation", *Journal of Financial Services Research*, 12, pp. 51–74.
LITNER, J., 1965, "The Valuation of Risky Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets", *Review of Economics and Statistics*, 47, pp. 13–37.
LLEWELLYN, D., 1999, "The Economic Rationale for Financial Regulation", Occasional Paper Series 1, Financial Services Authority, London.
LOWN, C.S., OSLER, C.L., STRAHAN, P.E. and SUFI, A., 2000, "The Changing Landscape of the Financial Services Industry: What Lies Ahead?", *Federal Reserve Bank of New York Economic Policy Review*, 6, pp. 39–55.
MILLER, M., 1977, "Debt and Taxes", *Journal of Finance*, 32, pp. 261–75.
MODIGLIANI, F. and MILLER, M., 1958, "The Cost of Capital, Corporation Finance and the Theory of Investment", *American Economic Review*, 48, pp. 261–97.

MODIGLIANI, F. and MILLER, M., 1963, "Corporate Income Taxes and the Cost of Capital: A Correction", *American Economic Review*, 53, pp. 433–43.
MORRISON, A.D., 2000, "Risk Averse Banks and Uncertain Correlation Parameters: A Theory of Rational Bank Panics", Working Paper 2000-FE-08, Oxford Financial Research Centre, University of Oxford.
MORRISON, A.D., 2002, "Banking Licences, Bailouts and Regulator Ability", Working Paper 2000-FE-07, Oxford Financial Research Centre, University of Oxford.
MORRISON, A.D. and WHITE, L., 2002, "Crises and Capital Requirements in Banking", Working Paper 2002-FE-05, Oxford Financial Research Centre, University of Oxford.
MOSSIN, J., 1966, "Equilibrium in Capital Asset Markets", *Econometrica*, 34, pp. 768–83.
MYERS, S.C., 1974, "Interactions of Corporation Financing and Investment Decisions – Implications for Capital Budgeting", *Journal of Finance*, 29, pp. 1–25.
MYERS, S. and MAJLUF, N., 1984, "Corporate Financing and Investment Decisions When Firms Have Information Investors Do Not Have", *Journal of Financial Economics*, 13, pp. 187–222.
NATIONAL BANK OF BELGIUM, 2002, "Financial Conglomerates", *Financial Stability Review*, 1, pp. 61–80.
OLIVER, WYMAN & COMPANY, 2001, "Study on the Risk Profile and Capital Adequacy of Financial Conglomerates", Study commissioned by Dutch regulators (De Nederlandsche Bank, Pensioen- & Verzekeringskamer, Stichting Toezicht Effectenverkeer, Nederlandse Vereniging van Banken, Verbond van Verzekeraars).
ROCHET, J., 1992, "Capital Requirements and the Behaviour of Commercial Banks", *European Economic Review*, 36, pp. 1137–78.
ROCHET, J.-C. and TIROLE, J., 1996, "Interbank Lending and Systemic Risk", *Journal of Money, Credit and Banking*, 28, pp. 733–62.
SHARPE, W., 1964, "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk", *Journal of Finance*, 19, pp. 425–42.
SMITH, A., 1776, *An Inquiry Into the Nature and Causes of the Wealth of Nations*.
VARIAN, H.R., 1978, *Microeconomic Analysis*. New York: W.M. Norton & Company, Inc.
WALTER, J.R., 1996, "Firewalls", *Federal Reserve Bank of Richmond Economic Quarterly*, 82, pp. 15–39.