

The EC and BIS risk weighted capital adequacy measures: A critical analysis

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ABSTRACT

In July 1988, the Basle Committee on Banking Regulations and Supervisory Practices published a document proposing new rules for the regulation of bank capital. In 1991, the EC Own Funds and Solvency Directives came into law. These came into force in Ireland in January 1993. The risk adjusted value of the banks' asset portfolio is calculated and a minimum of 8% is recommended for the ratio of bank capital to the risk adjusted value of the bank's asset portfolio. The validity of risk adjusted capital adequacy rules and their application to Ireland is examined in the light of evidence from the economics of regulation and from finance theory. It is found that there is a clear interrelationship between protective regulation, in the form of deposit insurance, and prudential regulation such as risk weighted capital asset ratios. The Basle risk asset ratio is a first attempt at an internationally agreed definition of portfolio risk. Its great advantage is its simplicity. However, this simplicity may have been gained at the expense of full coverage of portfolio risk. The failure to account for asset covariances limits the effectiveness of the Basle ratio.

FULL TEXT

INTRODUCTION

In July 1988 the Basle Committee on Banking Regulations and Supervisory Practices (Basle Committee) published a document proposing new rules for the regulation of bank capital. In 1991 the EC Own Funds and Solvency Ratio Directives came into law. These came into force in Ireland in January 1993. As well as providing an internationally agreed definition of capital the Basle guide-lines provided an agreed measure of the adequacy of Bank capital. This has been continued in the EC directives. Bank assets are assigned differential weights according to the level of riskiness of the assets. The risk adjusted value of the banks asset portfolio is calculated and a minimum value of 8% is recommended for the ratio of bank capital to the risk adjusted value of the bank's asset portfolio. The purpose of this paper is to examine the validity of risk adjusted capital adequacy rules and their application to Ireland in the light of evidence from the economics of regulation and from finance theory.

THE ECONOMIC REASONS FOR REGULATION

The financial sector is highly regulated in most market economies. The requirement that banks, and other financial institutions, hold a minimum level of capital in relation to their assets is just one of the many instruments that the regulatory authorities use to constrain the behaviour of financial institutions.

REASONS FOR REGULATION

The primary economic rationale for intervention in any market, and thus in the financial markets, is the existence of what is termed 'market failure'. In the financial context, this failure results from the existence of externalities, due mainly to informational asymmetries between one bank and another and between banks and their customers. Banks have an informational advantage over their customers in relation to the level of risk in their asset portfolios. As a consequence, customers may have difficulty in determining quality, even after purchase. Goods, such as financial services, which have this characteristic are termed 'Credence Goods'. The cost of obtaining comparable information to the vendor is prohibitive. Most professional services are such goods--consider the medical and legal professions. Depositors (especially smaller non-corporate customers) are usually unable to distinguish fully between prudent, financially sound banks and banks adopting a high risk (or possibly fraudulent) investment strategy.

In an unregulated environment these informational asymmetries would have a number of negative consequences. As can be seen above, deposit rates would incorporate an unnecessary risk premium for 'safe' banks, while rates for 'risky' banks would be too low.

This distortion in the cost of funds would lead to a misallocation of risk taking in the economy with prudent banks adopting an excessively conservative lending strategy while risky institutions would be able to free ride on the good habits of safe banks. These are classic examples of adverse selection and moral hazard problems, common in insurance markets.

Insurance companies try to counteract these problems by splitting the market with pricing strategies designed to attract different customers, and by screening customers to ascertain their risk characteristics.

To some extent, customers can screen banks by reputation and past performance but the customers' information set can never be complete. Mistakes can be hidden by a bank until it is too late. In addition banks with a good track record can change strategies.

Another negative externality resulting from information asymmetries is the danger of contagion. Banks produce positive externalities in their role as intermediaries, matching short term funds from call deposits with the longer term funding needs of borrowers. Banks derive their profits from this activity because of their comparative advantage in the collection of information on risk and uncertainty.

However, this informational advantage over their depositors, together with the highly liquid nature of their liabilities compared to their assets makes banks vulnerable to a loss of confidence on the part of their depositors. If depositors lose confidence in the safety of a bank's portfolio, they may wish to withdraw their funds, forcing the bank to liquidate its assets. The bank could fail if it cannot liquidate sufficient funds to meet the run on its deposits. Contagion arises where the loss of confidence in one bank spreads throughout the system. Customers, unable to distinguish between a localised problem in one or two banks, and a system wide problem, may wish to withdraw funds from perfectly sound banks.

This divergence between the private and social costs of bank failure provides a further rationale for market intervention. The banking collapse of 1930-33 in the USA is a prime example of the real effects of large scale bank failure. Friedman and Schwartz (1963) outlined two ways in which the banking collapse of the 1930's in the USA worsened the economic depression of the period. Firstly, the losses suffered by shareholders and depositors led to a negative wealth effect on aggregate output. Secondly, the collapse resulted in a severe contraction in the money supply. They argued that the second effect, which distinguishes bank failure from other business failure, was the most important aspect of the banking collapse and was the principal reason for the severity of the Great Depression.

Bernanke (1983) argued that in the absence of long term non-neutrality of money (the hypothesis that changes in the money stock does have an effect on real variables), the fall in the money supply would not explain the protracted nature of the decline in aggregate output. He argued that the disruptions of 1930-33 reduced the effectiveness of the banks in their role as market makers and information gatherers. This led to an increase in the costs of intermediation and 'helped convert the severe but not unprecedented downturn of 1929-30 into a protracted depression.'

The divergence of private and social costs and benefits in banking suggests that the optimal investment strategy for the banking firm, with its consequent mixture of return and risk, may not always conform with societies' optimal portfolio. Consequentially it may be necessary to intervene to control the level of risk adopted by banks.

The final rationale for market intervention relates to the banking system's role in the creation of money. The aggregate money supply has traditionally been a concern for government, since it has a direct effect on the price level. To control the level, and ensure stability in the money supply, the authorities intervene by imposing minimum reserve requirements on banks. There is recent work, however, that strongly indicates that in a competitive environment with financial innovation, the sustainability of reserve requirements is doubtful (Stevens 1991).

Having discussed the economic rationale for market intervention in banking, we now discuss the various instruments of regulation used by the authorities.

PROTECTIVE REGULATION

The purpose of protective regulation is to protect agents against the consequences of bank failure. The principal instruments under this heading are deposit insurance and lender of last resort facilities. In circumstances of contagious bank runs the authorities may intervene by providing short term emergency liquidity to solvent banks which might

otherwise fail. If capital markets were perfect, solvent banks would always be able to obtain funds to offset the liquidity problems caused by contagion. However, in the presence of market imperfections, such as the nontradability of many bank assets, a sound bank may fail if it cannot liquidate sufficient funds in a short period, despite being economically solvent in the long run. In that case, governments or their agents may provide short term funds, to prevent a collapse and possible contagion. However, this facility can potentially lead to moral hazard, even though most schemes are discretionary in nature. If the industry is highly concentrated, as is the case in most European countries, the failure of an individual bank may have wider macro economic consequences. If a bank correctly perceives that it's failure would have such adverse consequences for the macro economy that the authorities will always intervene to save it in the event of insolvency, they may then adopt a more risky portfolio than would have been adopted in the absence of a lender of last resort facility. The problem of moral hazard is also a feature of deposit insurance. Deposit insurance was introduced in the United States in response to the banking collapse of 1930-33, when many sound banks failed due to the problem of contagion. Deposit insurance was introduced in Canada in 1967. The EC now has in place legislation that will harmonise deposit insurance requirements across states.

The Irish scheme was introduced under the Central Bank Act 1989. The scheme is funded by the deposit protection account. Banks are required to deposit 0.2% of their Irish pound deposits in this fund. Note that this is not a pure deposit insurance scheme, in that the premia do not accumulate year after year.

Deposit insurance may help to correct two externalities which result in market failures. Firstly, it provides protection for small depositors in the event of bank failure. This addresses the externality which results from the information advantage banks enjoy over their customers. Secondly, it leaves depositors less sensitive to the risk of bank failure. This reduces the risk premium on deposit rates and also addresses a second major market failure, namely the risk of contagious bank runs. As was mentioned above, deposit insurance, like the lender of last resort facility can lead to moral hazard problems. Since deposit rates, in the presence of deposit insurance, will not reflect the degree of risk in the bank's asset portfolio, banks have an incentive to increase the risk profile of their assets and increase the leverage in their balance sheets. Although not necessarily due to deposit insurance alone, the crisis in the savings and loans institutions of the United States is a good example of the negative consequences of moral hazard.

One response to the problem of moral hazard associated with deposit insurance is to apply risk adjusted premiums to banks. Merton (1977) has argued that deposit insurance is equivalent to a put option on the assets of the bank and consequentially the Black-Scholes (1973) model of option pricing could be used to price deposit insurance according to portfolio risk. This model has been amended by Ronn & Verma (1986, 1989). This concept can be seen from the fact that, in a put option, the holder has the right to sell a financial instrument at a specific pre-agreed price. In deposit insurance the depositor has also the right to receive money, the insured amount. A problem with deposit insurance is that it is reactive rather than preventive. Banks which warrant high premiums may not be in a position to pay. An alternative solution is to use preventive measures, such as capital asset ratios, which will be discussed below under the heading of prudential regulation.

PRUDENTIAL REGULATION

Prudential regulation limits competition and risk taking in the banking industry to reduce the probability of bank failure. Its motivation is the prevention of failure, rather than protection in the event of failure. Instruments under this heading are varied. The most common ones are: restrictions on market entry, diversification rules, interest rate controls, limits on permissible businesses and capital adequacy requirements.

The control of market entry and interest rate regulation are designed to limit the level of competition in banking. They are predicated on the belief that excessive competition, and the consequent lowering of margins, will result in too high a probability of bank failure. An example is that it was felt that deposit interest rates being controlled would lead to a maintenance of profit margins. In practice, they result in cross subsidisation and non-price competition and are being progressively abandoned in many countries. Restrictions on market entry protect existing banks and allow them to make supernormal profits. The monopoly power conferred on existing banks may result in inefficiency.

Minimum capital asset ratios are designed to lower the probability of bank failure. Given the divergence between the private and social costs of bank failure, society is likely to prefer a lower probability of bank failure than individual banks.

Capital acts as a buffer stock to cover future losses. The higher the level of capital in relation to assets, the lower the probability of bank failure, since the bank can sustain losses for a longer period. Once capital falls below a certain level, the probability of failure increases dramatically, so it is vital that a certain minimum level of capital adequacy is maintained. By imposing a binding constraint on a bank's leverage, the authorities can lower the probability of bank failure.

CAPITAL ASSET RATIOS AND DEPOSIT INSURANCE

Minimum Capital Asset ratios are also a response to the moral hazard problems associated with flat rate deposit insurance. The existence of deposit insurance transfers risk from the depositor to the insurer. As a consequence, the bank has an incentive to adopt a higher level of leverage in its balance sheet and to adopt a higher degree of risk in its asset portfolio. Kahane (1977) and Koen and Santomero (1988) among others have used the mean variance-approach, common in the finance literature, to show that binding capital asset constraints might lead to an increase in the riskiness of a bank's asset portfolio. This would imply a need for risk adjustment to capital asset ratios. This risk adjustment is operationalised in Ronn & Verma (1989). Keeley and Furlong (1990) have shown that the mean-variance approach is misleading since it ignores the option value of deposit insurance. They show that a binding leverage constraint leads to an unambiguous reduction in the probability of bank failure if existing asset portfolio risk regulation is held constant. This is because the gain from increased risk taking increases as the capital asset ratio declines. Consequentially, a binding leverage constraint which forced a bank to increase its capital asset ratio would result in a reduction in risk taking. However they also show that since the option value of deposit insurance is an increasing function of asset portfolio risk there is a necessity to control portfolio risk. In other words, there is a complete interrelationship between the two approaches. It is not sufficient to impose one independently of the other.

One approach to the control of portfolio risk is the introduction of risk adjusted capital asset ratios such as the Basle regulations, where assets are weighted according to risk, with a requirement to hold more capital for riskier classes of assets.

This paper does not explain in detail the operation of the BIS or EC capital adequacy schemes. Details of these schema can be found in Quinn & Lucey (1991) and in the Central Bank Quarterly Bulletin for Autumn 1991.

AN ASSESSMENT OF RISK WEIGHTED CAPITAL ADEQUACY SCHEMES

The EC and the Basle capital adequacy rules apply differential risk weights to bank assets. These weights are used to calculate the risk adjusted value of a bank's portfolio of assets. Minimum capital adequacy ratios are applied to these risk adjusted portfolios. If the rules are to be effective, the risk weights must be a true reflection of relative asset risk.

In this section of the paper we take a critical look at such rules in the light of finance theory. We start our analysis by looking at portfolio risk. We then look at individual asset risk. Having described the appropriate measures of portfolio and asset risk we look at the extent to which they are reflected in the Basle rules. We then describe an alternative method of calculating risk adjusted asset portfolios which retains the simplicity of the Basle rules while, in our opinion, providing a more accurate measure of differential asset risk.

ASSESSING PORTFOLIO RISK

For a given level of capital the risk of bank insolvency will depend on the expected value of the bank at a future date, and some measure of the volatility of the banks portfolio of assets. In the finance literature the standard measure of portfolio risk is the standard deviation or variance of total asset value.

If two portfolios have the same expected value, then the portfolio with the largest variance or standard deviation will be the most risky (see Rothschild and Stiglitz, (1970)). Consider two portfolios each with the same mean value C . One portfolio is described by the probability distribution P while the other is described by P^* , a probability distribution with a greater variance. Define $C \sup B$ as the point where the value of the asset portfolio equals the value of the banks liabilities. If asset values fall below $C \sup B$ the bank will fail. The area under the curve to the left of $C \sup B$ measures the probability of bank failure. Since P^* is more dispersed around the mean than P , the probability of portfolio P^* being below $C \sup B$ is greater than for P . So the portfolio described by P^* is riskier than the portfolio described by P .

ASSESSING INDIVIDUAL ASSET RISK

The variance of the value of total assets is a sufficient measure of the degree of risk in a portfolio of assets. However, since the Basle weights refer to individual assets, it is necessary here to define an appropriate measure of individual asset risk. To

do this, we will look more closely at total portfolio risk and its relationship with the volatility of the value of its component assets.

The variance of the portfolio is the weighted sum of the variances and covariances of the component assets.

As a simple example consider the case of a portfolio with two assets, X and Y. The proportion of the portfolio in X is α while $1-\alpha$ is invested in Y. The values of X and Y are normally distributed.

The variance of the portfolio will be given by

$$\text{Var}(P) = E(P-E(P))^2 = \alpha^2 \text{Var}(X) + (1-\alpha)^2 \text{Var}(Y) + 2\alpha(1-\alpha)\text{Cov}(X,Y)$$

In the case of an N asset portfolio, with asset weights α_i the variance will be (Equation omitted).

In this case, while the 2 asset case has 2 variance and 2 covariance terms, the N asset case will have N variance and $N(N-1)/2$ covariance terms. As $N \rightarrow \infty$ the importance of the variance terms decline and the covariance terms become more important. Thus, in a 20 asset case, while there are 20 variance terms, there are 190 covariance terms. The variance of the portfolio declines as the number of assets increases and converges to the average covariance (see Copeland and Weston, 1988).

In an equally weighted portfolio the variance of the portfolio converges to the average of the constituent asset covariances. In reality, the weights of the assets will differ and the variance of the portfolio will depend, not just on the covariances but also on the asset weights. In the case of the BIS weights, there are 23 categories of risk asset if one excludes the off balance sheet categories, and 31 if one includes them. In the case of the EC scheme, no less than 26 categories of on balance sheet risk asset are recognised, and it is implied that there will be no change in the number of off balance sheet categories. That is a total of 34 categories. The BIS covariance matrix would then have 961 entries, 498 unique entries, only 31 of which, or 6.25% are used. In other words over 90% of relevant information, is ignored. In the case of the EC rules, the covariance matrix would have 1156 entries, 595 being unique, and only 34 or 5.7% being used. In both cases, nearly all the relevant information is ignored.

In the light of the above analysis it would seem that if one wishes to apply risk weights to assets one should focus on the entire covariance matrix of asset values and not just on the individual asset variances. This is in fact what is done in the alternative approach described below.

THE BIS AND EC RISK WEIGHTS

For a given portfolio of assets, the risk of bank failure will depend on the level of capital and the volatility of the asset portfolio. In formal terms, if asset values are normally distributed the probability of capital exhaustion will depend on the Exhaustion Ratio

(Equation omitted)

where K = Bank Capital and $\text{Var}(P)$ is the variance of the portfolio of assets.

The Basle & EC rules apply risk weights to assets and calculate the risk adjusted value of the portfolio which equals (Equation omitted)

where X_i is the value of the asset i and W_i is the risk weight of asset i .

The risk asset ratio is the ratio of capital to the weighted value of the portfolio i.e. (Equation omitted).

As Schaefer (1987) has noted, these two ratios, while bearing a broad resemblance to each other, have some significant differences. The denominator of the risk asset ratio is simply a linear function of the asset quantities and the risk weights. The denominator of the exhaustion ratio is nonlinear. That depends on the variance of the individual asset values and on the asset covariances while the risk asset ratio ignores the interrelationships between the asset values. The two ratios are equivalent only if there is a perfect correlation between the asset values. Another difference is that the risk asset ratio is stationary because of the fixed risk weights while the exhaustion ratio will change over time as the variance and covariance change.

AN ALTERNATIVE RISK ASSET RATIO

In the light of the above limitations of the Basle ratio, but accepting the value of its simplicity, Schaefer suggests an alternative linear risk measure which retains the simplicity of the Basle ratio but is likely to be a more reliable risk measure.

Schaefer defines his risk weights, $Z_{sub\ i}$ as the covariance between the change in value of an individual asset and the change in the value of the portfolio.

(Equation omitted)

where $\Delta V_{sub\ i}$ is the change in value of asset i and X_i is the number of assets of type i held in the portfolio.

The variance of the portfolio is now

(Equation omitted)

Schaefer further assumes that banks hold similar portfolios so that covariance terms will be the same across portfolios and common Z can be applied.

In essence the Z are equivalent to the Beta values in the capital pricing model (CAPM) of stock prices. In the CAPM the risk of a stock can be divided into two parts; asset specific risk and market risk. The Beta values measure the sensitivity of the stock value to changes in the value of the market portfolio.

In a well diversified portfolio, individual stock risk can be diversified away. However, the market risk cannot. Accordingly, the Beta value is an appropriate measure of risk of the stock. Likewise, the Z measures the sensitivity of asset values to changes in the value of the bank portfolio and (since it is assumed that portfolios are broadly similar across banks), to changes in the value of the portfolio of the banking sector as a whole. This is the asset risk which can not be diversified away.

Schaefer calculated $Z_{sub\ i}$ values for four categories of assets assigning proxies for the values of the assets. Table 1 below lists the asset categories, their average share in UK bank balance sheets and the proxies used to measure their changes in value. (Table 1 omitted). Table 2 shows summary statistics relating to these asset categories and the relative risk weights. (Table 2 omitted).

Sterling advances are used as a numeraire and the Z defined relative to the weight for sterling advances. The formula is:
(Formula omitted)

where subscript a refers to the numeraire asset, in this case sterling loans, a is the proportion of the portfolio invested in an asset and σ is the standard deviation of the rate of return on the asset.

It is notable that the Z calculated by Schaefer are substantially different from the risk asset ratio. However, Schaefer points out that his results should be treated with caution due to the nature of the proxies used. Nevertheless his results are interesting.

It is particularly notable that foreign currency assets seem so risky. Schaefer notes that this was mainly due to currency fluctuations.

EMPIRICAL WEIGHTS FOR IRELAND

As stated above, Schaefer applied his analysis to a number of risk categories, thus giving some weights for illustrative purposes. Recall that these weights were based on the covariance of individual assets with the portfolio as a whole. It was decided to attempt to replicate this for the Irish case. The data used are collected in order to implement the Basle rules for Irish financial institutions. These rules have been in place since January 1 1990. Accordingly, aggregate data was used for a number of Irish Financial Institutions, monthly through 1990. Not all risk assets were analysed: off balance sheet items were excluded.

Table 3 below shows the covariances of various categories of risk assets, with total risk assets, numbered as on the Central Bank monthly return, supplement 1:B Risk asset analysis, and the implied weights. (Table 3 omitted). The highest covariance has been scaled to 100.

Caution should be foremost in mind when interpreting these data. Firstly, only a portion of the banking system is being analysed and items such as off balance sheet activities are not included. Secondly, what is used here is a short run (12 months) of asset amounts. This implicitly assumes that changes are due to policy actions by the bank, and that 12 months is a complete cycle. However, the data do indicate the feasibility of the approach. For a fuller analysis, a long run of returns to assets in various risk categories, and including off balance sheet items, should be used. It is planned to extend the analysis in this way in future work. When the Basle weights are compared with our implicit weights, it is clear that there are some very considerable differences. However, the rankings are broadly similar. This suggests that while the Basle weights are a reasonable first approximation of portfolio risk, they can be improved by accounting for covariance risk.

CONCLUSION

This paper provides a review, and critique, of the Basle capital adequacy rules together with an overview of the economic reasons for bank regulation.

In section II we reviewed the economic rationale for bank regulation. The most important conclusion from this section is that there is a clear interrelationship between protective regulation, in the form of deposit insurance, and prudential regulation such as risk weighted capital asset ratios. The existence of flat rate deposit insurance creates serious moral hazard problems. The transfer of portfolio risk to the regulator, in the presence of flat rate deposit insurance, necessitates the control of risk in the asset portfolio through the imposition of binding constraints on the ratio of capital to assets. To ensure that minimum capital asset ratios are equally binding on all banks it is necessary to adjust the portfolio for different degrees of risk. The application of appropriate risk weights to assets can achieve this objective.

In section III we critically examined the BIS and EC risk asset ratios. The Basle risk asset ratio is a first attempt at an internationally agreed definition of portfolio risk. It's great advantage is it's simplicity. However, this simplicity may have been gained at the expense of full coverage of portfolio risk. In particular from our analysis we conclude that the failure to account for asset covariances limits the effectiveness of the Basle ratio. We believe that the alternative risk asset ratio suggested by Schaefer, which retains the linearity of the Basle ratio while focusing on the covariance of the value of the individual assets with the overall portfolio provides a better indication of individual asset risk.

The Schaefer risk weights are closely related to the Beta value of the capital asset pricing model (CAPM) which are generally regarded in the finance literature as a good indicator of asset risk. The paper suggests the need for future work in the area of the economics of bank regulation. In particular, it would be useful to apply the Black-Scholes model of option pricing to insurance premiums. Preliminary work by one of the authors is addressing this area.

The use of stock exchange indices and national accounts data could also facilitate the calculation of more detailed risk weights to cater for the large proportion of bank assets which are now grouped under 'Other Non-Government Credit' in the Basle categories of bank assets. This sector contains a heterogeneous loan set and as such may be expected to exhibit, with it, many disparate types of risky assets. As such, it is very broad at its present level of aggregation. The data in table 4 look at the covariances of the various sectors of the economy that this other credit is lent to. (Table 4 omitted). These show that there is a considerable wealth of detail that is not being taken into account at present.

It is clear from this that there should be considerable differences between the sectors, in terms of the weights that are allocated to them. These should perhaps be investigated. In addition, sectoral sub aggregates in terms of returns should be investigated.

REFERENCES

- Alfriend, MC. (1988), 'International Risk-based Capital Standard: History and Explanation', Federal Reserve Bank of Richmond Economic Review, November/December 1988
- Baltensperger, E & Dermine, J. (1987), 'The Role of public policy in ensuring financial stability: a cross-country comparative perspective' in Threats to International Financial Stability, eds Richard Porters & Alexander K. Swoboda, Centre for Economic Policy Research (CEPR)
- Bank of International Settlements (1988), Committee on Banking Regulations & Supervisory Practices, 'International Convergence of Capital Measurement & Capital Standards', Document B5/86/62e, July 1988
- Bernanke, B., (1983), 'Non monetary Effects of the Financial Crisis in the propagation of the Great Depression', American Economic Review, June 1983
- Black, F. & Scholes, M., (1973), 'The Pricing of Options & Corporate Liabilities', Journal of Political Economy, May/June 1973
- Copeland, T. & Weston, J. (1988), Financial Theory & Corporate Policy, Third Edition, Addison-Wesley
- Deasy, M. (1990), 'Credit Institutions Incorporated in Ireland: Revised Capital Adequacy Requirements', Central Bank of Ireland Quarterly Bulletin, Winter 1990
- Friedman, M. & Schwartz, A. (1963), A Monetary History of the United States 1867-1960, Princeton University Press
- Goodhart, C. (1988), The Evolution of Central Banks, MIT Press
- Kahane, Y (1977), 'Capital Adequacy & the Regulation of Financial Intermediaries', Journal of Banking & Finance, Vol 1, No 2
- Keeley, M. & Furlong, F. (1990), 'A reexamination of mean-variance analysis of bank capital regulation', Journal of Banking &

Finance, March 1990

King, M. (1990), 'International Harmonisation of the Regulation of Capital Markets: An Introduction', European Economic Review, Papers & Proceedings, May 1990

Koehn, M. & Santomero A. (1980), 'Regulation of Bank Capital & Portfolio Risk', Journal of Finance, December 1980

Llewellyn, D. (1986), 'The Regulation & Supervision of Financial Institutions', Gilband Lecture on Banking, Institute of Bankers

Llewellyn, D. (1988), 'The policy framework: Capital Adequacy', in Managing Bank Assets & Liabilities, ed J.S.G. Wilson, Euromoney Publications, London

Llewellyn, D. (1990). 'Competition & Regulation: Trends in Financial Systems', Sveriges Riksbank Quarterly Review 4, 1990

McKenzie, G (1990), 'Capital Adequacy Requirements, Deposit Insurance & Bank Behaviour', Economic Social Review, July 1990

Merton, R (1977), 'An analytic derivation of the cost of deposit insurance & loan guarantees: An application of modern option pricing theory', Journal of Banking & Finance, Vol. 1 No. 1

Quinn, T & Lucey, B (1991), 'The Basle Capital Adequacy Rules & the Economics of Regulation', Central Bank of Ireland Technical Paper 2/RT/91

Ronn, E. & Verma, A. (1986), 'Pricing Risk adjusted deposit Insurance: An option based model', Journal of Finance, September 1986

Ronn, E. & Verma, A. (1989), 'Risk Based Capital Adequacy Standards for a Sample of 43 Major Banks', Journal of Banking & Finance September 1989

Rothschild, M. & Stiglitz J. (1970), 'Increasing Risk: A definition', Journal of Economic Theory, Vol. 2, no. 3

Schaefer, S (1987), 'The design of bank regulation & supervision: some lessons from the theory of finance', in Threats to International Financial Stability, op cit

Sherman, J. (Editor) (1981), 'Risk & Capital Adequacy' in Commercial Banks, National Bureau of Economic Research, University of Chicago Press

Stevens, EJ (1991), 'Is there any Rationale for Reserve Requirements?', Economic Review of the Federal Reserve Bank of Cleveland ,1991 Q 3

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DETAILS

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