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REGULATION, RISK AND THE PRICING OF AUSTRALIAN BANK SHARES, 1957-76

by

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REGULATION, RISK AND THE PRICING OF AUSTRALIAN BANK SHARES, 1957-76

1 Introduction

Recent developments in the theory of regulation suggest that discriminatory regulation may have impacts on firms' risk as well as wealth effects [17]. This paper examines such possibilities in the context of Australian banking regulation which from time to time has borne selectively on Australian banks. While Holmes [11], Sharpe [26], Stammer [29] and others have described the likely qualitative impact of banking and financial regulation in Australia, quantitative evidence on the burden of direct banking controls has, until this time, been notably absent. The analysis of pricing behaviour of Australian bank shares offered in this paper for the two decades, 1957 to 1976, points to various imperfections in banking and financial markets reflecting regulatory performance.

During such a lengthy period structural changes and developments within the economy are also likely to bear upon an industry's risk. By comparing the banking industry with the activities of finance companies, some perspective on structural change associated with the banking industry is provided.

Yet this is only one feature of structural change. During the sixties the Australian economy experienced a powerful boom associated with the exploration and development of new discoveries of minerals, crude oil and natural gas. These developments altered relative valuations in capital markets. This feature is treated separately for its implications when measuring risk and wealth effects.

The paper is structured in the following way. In the next section, aspects of the theory and analysis of regulation are discussed while the third section is devoted to a discussion of the institutional and regulatory framework within which Australian monetary policy has been conducted over the last two decades. Methodological themes are treated in the fourth section. The work is based upon various formulations of the capital asset pricing model and requires a comprehensive data base for calculating monthly rates of return applicable to firms and industry groups. Sections five and six then examine

the empirical estimates of risk and abnormal returns associated with major changes in Australian banking regulation. Finally, abnormal returns associated with a particular type of direct control on banks, namely statutory cash reserve requirements, are analysed in section seven.

2 Risk and Wealth Effects of Regulation

Possible effects of regulation on a market or a firm have attracted increased attention since the pioneering studies of Stigler [30]. Much of this work calls into question the effectiveness of policy measures designed to regulate outcomes in a market. Peltzman's recent extension of Stigler's work concentrates on the ways in which the "gains" and "losses" from regulatory determinations are distributed amongst the main participants in a market experiencing public intervention. Demand, price and cost elements are important for regulatory outcomes.

"Gains" and "losses" from regulatory determinations bear upon prospective cash flows and profitability of firms. These, in turn, will be reflected in market valuations; changes in valuations being the wealth effects of the regulation which is borne by the owners of the firm. In an efficient capital market, should regulatory changes not be anticipated, they would be reflected in prices of company shares. On the other hand, were the changes previously anticipated by the market, wealth effects would be diffused.

In addition to this wealth effect, Peltzman [17], Breen and Lerner [6] and Myers [15] argue that regulation affects a firm's risk. Peltzman [17, p. 230] concludes:

> "Regulation should reduce conventional measures of owner risk. By buffering the firm against demand and cost changes, the variability of profits (and stock prices) should be lower than otherwise. To the extent that the cost and demand changes are economy-wide, regulation should reduce systematic as well as diversifiable risk".

The empirical evidence, to which Peltzman appeals, reflects occasions when major regulatory measures were introduced. However, a regulatory authority may change the relative distribution of "gains" and "losses" at any time within the framework of an existing measure. Thus attention must be paid to the nature of regulatory policies if their impact is to be interpreted correctly. Empirical studies [16] have established a relationship between a firm's systematic (or undiversifiable) risk and such factors as growth in earnings, stability of earnings patterns, dividend payout ratios, firm and

market size, and leverage in the firm's financial structure. Hence there are many factors to be considered when evaluating the effect of a regulatory measure on a firm's systematic risk.

The U.S. President's Commission on the Financial Structure and Regulation [31], the Bank of England [4] in its Competition and Credit Control and many monetary economists have identified the wealth and risk effects associated with selective banking and financial regulation. H.G. Johnson [12, p. 97] has argued the position cogently:

> "... the conventional non-payment of interest on commercial bank reserve holdings of central bank liabilities constitutes an implicit tax on the provision of deposit money through the commercial banking system. The burden of this tax is increased by the stipulation of minimum or average cash reserve ratios, to the extent that such stipulation obliges the banks to hold a larger volume of non-interest-earning reserves than they would voluntarily choose to hold for the efficient conduct of their business. ... the commercial banks, and ultimately the deposit holding public, are taxed indirectly in a variety of other ways through regulations adopted either to control the banks' commercial operations, to facilitate central bank control, or to cushion the market for government debt against the impact of monetary policy. Thus, prohibiting the banks from undertaking certain kinds of lending or restricting the amount of such lending they can undertake, either permanently or in times of restrictive monetary policy, reduces the commercial profitability of banking; so does the fixing of liquid asset ratios ... the fixing of maximum interest rates on certain kinds of banking lending, such as consumer loans and mortgage lending, acts as an implicit tax by confining banks to those loans in these categories for which the credit risk is low enough to justify lending at the permitted rate".

While the impact of direct controls on bank profitability is a familiar theme, equally significant is the suggestion about risk and lending. Regulations of the types listed by Johnson curtail market influences on asset management. By confining lending to low risk situations, the relative riskiness of banking operations will be reduced.

Questions on the incidence of the implicit tax burden associated with discriminatory regulation are complicated. For Johnson, in circumstances where the banking industry is competitive and banking services provided at constant cost, the tax is borne by bank depositors. Where a banking industry exhibits oligopolistic features, if not those akin to monopoly, or experiences increasing costs this burden is shared between the depositors and banks.

A further dimension to the incidence question is provided by Penner and Silber [18]. They show that the burden of an implicit tax on an intermediary, in this case the banks, will be shifted to depositors if the institutions being controlled have liabilities which are poor substitutes for the liabilities of those institutions not subject to control. Should the degree of substitution between liabilities be high then the controlled intermediary will bear the brunt of the burden.

In summary, should the banking industry be oligopolistic and the degree of substitution between liabilities of banks and those of uncontrolled non-bank financial intermediaries be high, then the banking industry will bear the brunt of the implicit tax burden. In the following section this set of conditions is seen to apply to the Australian banking industry.

3 Australian Banking Regulations

An examination of Australian monetary policy indicates a heavy reliance from time to time on selective controls on the Banking Industry. Extensive surveys have been provided by Arndt and Stammer [1, Ch. 7] and Davis and Lewis [7]. The postwar regulatory environment for Australian banks had its origins in the emergency measures of the National Security (Banking) Regulations 1939-41. This provided for the establishment of a "special account" procedure (a form of minimum cash reserve requirement), provided the monetary authority with powers to license banks, control bank interest rates, issue directives on bank advance policy, and control bank investments.

Unlike most other industries in which wartime controls were dismantled soon after the successful conclusion of the war, the general provisions of the 1941 banking regulations were continued with only minor modifications. After 1945 the banking industry was by far the most heavily regulated activity in the market sector of the Australian economy. Movements in long-run government bond rates occurred at intervals of three to four years while bank interest rates were pegged at very low levels resulting in significant shifts of funds to controlled financial activities from early in the fifties. This stance on monetary and debt management strategies persisted throughout the fifties. Controls on the banking industry were further strengthened at the end of the period. This was evident from about the middle of 1959 first by increases in statutory cash reserve requirements and then a rise in the minimum liquidity convention from 14 to 16 per cent. These were reinforced by a Reserve Bank

request for banks to achieve an early and significant reduction in the aggregate rate of new lending. The effect of these restraints was a sharp reduction in the capacity of commercial banks to extend credit. The strong contractionary impact of quantitative restraints on the banks was in advance of the real downturn in the economy. But given restrictions on banks' earning capacity, the impact was immediate and severe owing to the competition for funds with non-bank financial intermediaries (NBFI). Company debentures and notes outstanding more than doubled between June 1958 and June 1960 while trading banking deposits rose by a modest 11 per cent.

At the beginning of the sixties there was a shift in emphasis with monetary policy. In part this was a belated recognition that the restraints upon the banking system had encouraged the growth of NBFIs. Rather than rely upon quantitative restraints and administrative directions, the authorities opted for a more pervasive approach with more attention being given to interest rate adjustments than had hitherto been canvassed. This broadening in the scope of monetary policy to a concern with the general liquidity of the financial system enhanced the relative position of the banking industry as holders of funds sought to redress the imbalance of their portfolios of financial assets. This greater market orientation was reflected in a statement in 1971 by the then Governor of the Reserve Bank of Australia, J.G. Phillips [20, p.27]:

> "In recent years the Bank has tried to move towards reducing its reliance on direct controls over banks, and towards action which operates over a wider field. While direct controls can be a useful help to policy in the short run, they cannot be used continuously in the long run without support from appropriate market-oriented policies: as time goes on, the market tends to find ways around a direct control".

It is difficult to establish a precise date for the shift in policy stance. In a public lecture during 1964 the same Governor said [19, p. 69]:

> "... the last few years have been marked by a greater readiness on the part of the authorities to take the initiative in varying monetary policy, particularly in the field of interest rates".

The 1962 Annual Report of the Reserve Bank of Australia described some April 1962 changes in banking arrangements:

> "The object of the new arrangements is to enable the trading banks to contribute more effectively to recovery and development by allowing them greater flexibility and range in the conduct of their business, while maintaining adequate control in the hands of the monetary authorities over bank credit and banking operations generally".

In the same report the Reserve Bank referred to the November 1960 increases in bank interest rates in the following terms:

> "The increase in fixed deposit rates was intended, among other things, to slow down the turnover of funds through the various non-bank financial institutions ...."

Yet some further evidence supports an interpretation of the change in monetary strategy being inaugurated late in 1960. In Figure 1 the interest differential between the theoretical yield on government securities with two years to maturity and the three to twelve month fixed deposit rate for the period 1957(1) to 1969(12) is shown. Prior to November 1960 the interest differential was approximately two per cent but it was permitted to decline to approximately a half a per cent in 1961 and remained at this level for much of the 1960s. All the evidence suggests that the banking industry's competitive position improved substantially towards the close of 1960 and early in 1961. Ceteris paribus, this would have been reflected in improved bank profitability in 1961 and 1962.

This commitment to a market-oriented strategy has from time to time been weakened owing to the re-instituting of direct controls on bank lending. This was most evident during 1975 and 1976 when the authorities were challenged by problems of inflation, rising unemployment and stagnation in real activity. A series of measures were adopted in order to curtail banking activities. The main featues were:

(1) the raising of the Statutory Reserve Deposit (SRD) requirement from 3 per cent to 7.6 per cent between 16 July 1975 and 16 January 1976;

(2) the request to the trading banks to contain the level of new lending commitments to that achieved in the preceding fiscal year, 1974-75;

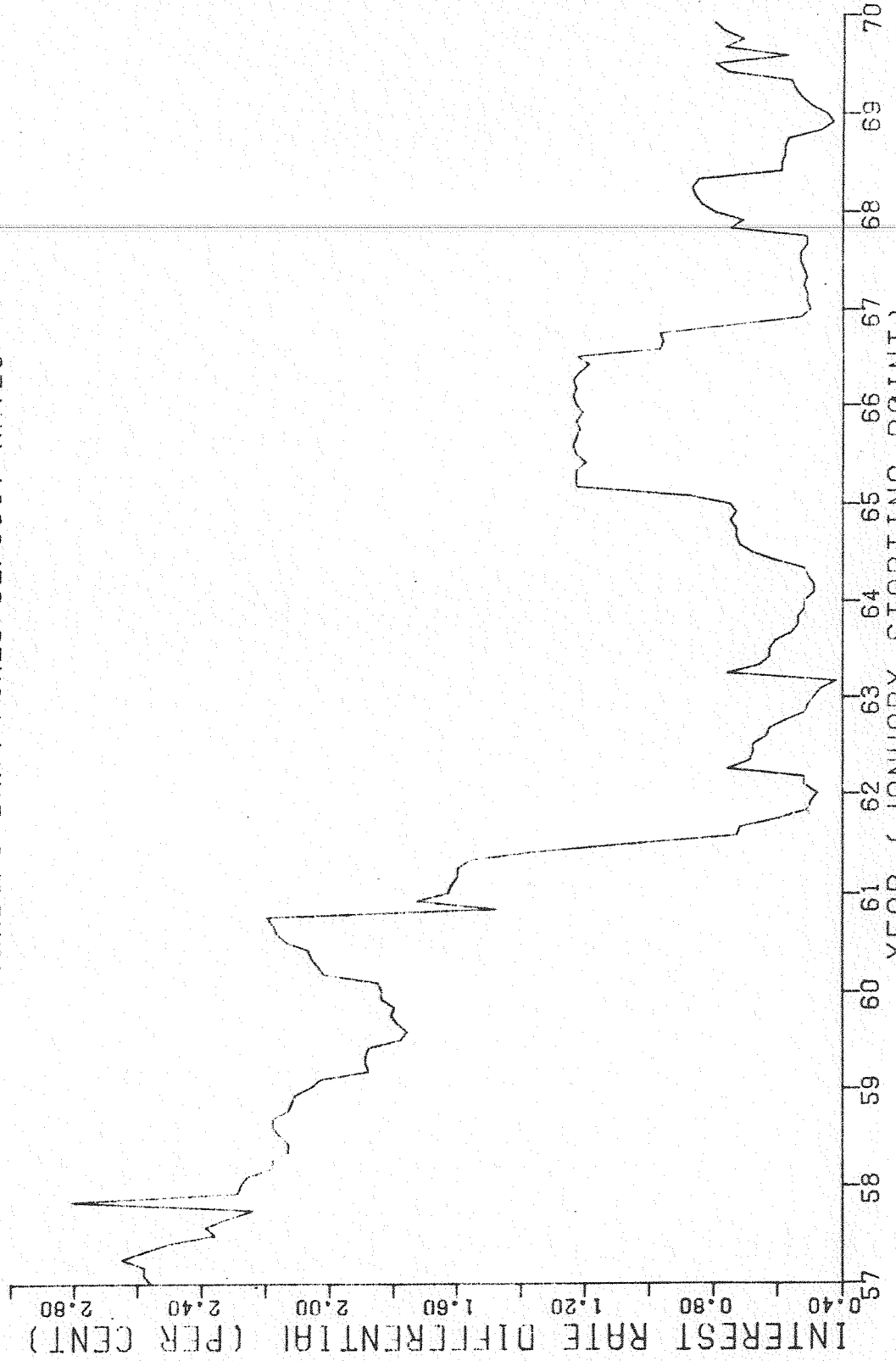
(3) the request to the trading banks to maintain a high rate of cancellation and reductions of overdraft limits and revealed in the higher rate than in previous years for most months in late 1975 and early 1976;

(4) reductions in interest rates on "small" overdrafts, savings bank loans and comparable credit arrangements; and,

(5) the imposing of a rise in the minimum liquidity convention from 18 per cent to 23 per cent from the beginning of February 1976 until 1 April 1977.

FIGURE 1

THE DIFFERENTIAL BETWEEN TWO-YEAR THEORETICAL YIELD ON GOVERNMENT SECURITIES AND SHORT TERM TRADING BANK FIXED DEPOSIT RATES



When evaluating these quantitative restraints on the conducting of business by the trading banks Davis and Lewis [7, p. 11] conclude, "there appears to have been a swing back to the extensive use of direct controls over banks".

The question of regulatory changes being reflected in risk and wealth effects on the banking industry depends upon the degree of competition amongst the banks and between them and other financial intermediaries. The Australian banking industry is highly concentrated with about 90 per cent of the business of all cheque paying banks being conducted by the government-owned Commonwealth Bank of Australia and the five major private trading banks. Until recently, banking competition was characterised by non-price behaviour. This is in sharp contrast with the competitive efforts of the non-bank financial intermediaries (NBFI) such as finance companies, permanent building societies (akin to savings and loan associations), merchant banks and money market companies. All provide intensive competition for the banks in the management of assets and liabilities.

This environment provides the theoretical conditions for a significant portion of the implicit tax burden emanating from discriminatory banking regulation being borne by the banking companies. There is one indication of this being recognised by the monetary authorities; from 10 November 1976 interest payable on statutory cash reserve deposits (SRD) maintained by the banks at the Reserve Bank of Australia was increased from 0.75 per cent to 2.5 per cent.

In later sections risk and abnormal returns for the banking industry are analysed for their association with significant changes in banking regulation during 1959-63 and 1975-76. Furthermore, frequent alterations in banks' SRDs permit analysis of the wealth effects of such changes. This has particular relevance to Johnson's hypothesis about monetary systems modelled on the British banking arrangements exhibiting characteristics whereby these changes, "tend to be used as a tax on banks rather than for monetary control" [13, p. 142]. The same possibilities exist for testing the impact of the rise in interest rates on SRD accounts mentioned above.

4 Methodology

Techniques applied in this paper are derived from recent developments in portfolio theory and the theory of capital asset pricing in market equilibrium. In this section the analytical approach developed from theory of capital markets is spelt out, the applications to this study are described, and several problems arising in these applications are reviewed.

4.1 Review of Capital Market Theory

The development of the model in this section closely follows the two step presentation in Fama [8]. First, the two-parameter (mean variance) model of portfolio choice, as developed by Markowitz is described. Then the implications of this model for the pricing of individual securities, are examined.

Beginning with the assumption that the joint distribution of the returns on 'n' securities is multivariate normal then it may be shown that the return on a portfolio 'p', comprised of securities i = 1, ..., n with weights x_{ip} such that $\sum_{i=1}^{n} x_{ip} = 1$, is distributed normally. This then permits the portfolio choice decision to be analysed in terms of two parameters, the mean and standard deviation of portfolio returns, $E(\tilde{R}_p)$ and $\sigma(\tilde{R}_p)$ respectively. Further simplification of the portfolio choice decision is attained by imposing two behavioural assumptions: (i) the investor prefers more expected portfolio return to less for a given level of risk, $\sigma(\tilde{R}_p)$; and (ii) the investor is risk-averse in that he prefers less standard deviation of portfolio return to more for a given level of expected portfolio return. The essence of portfolio analysis then is to identify "efficient" portfolios where an "efficient" portfolio has the maximum expected return for a given standard deviation of return and has the minimum standard deviation of return for a given expected return.

Mathematically the problem is to select the portfolio weights x_{ip} for i = 1, ..., n which will

$$\text{Minimise } \sigma^2(\tilde{R}_p) \qquad \ldots (1)$$

subject to the constraints

$$\sum_{i=1}^{n} x_{ip} E(\tilde{R}_i) = E(\tilde{R}_e) \qquad \ldots (2)$$

$$\sum_{i=1}^{n} x_{ip} = 1.0 \qquad \ldots (3)$$

where $E(\tilde{R}_e)$ is some given level of expected return. Forming the Lagrangian expression

$$L = \sigma^2(\tilde{R}_p) + 2\lambda_e[E(\tilde{R}_e) - \sum_{i=1}^{n} x_{ip}\, E(\tilde{R}_i)] + 2\phi_e[1 - \sum_{i=1}^{n} x_{ip}] \qquad \ldots (4)$$

and differentiating L with respect to $2\lambda_e$, $2\phi_e$, and x_{ip}, i = 1, ..., n yields (n+2) first order conditions for minimisation of L. They are equations (2) and (3) above and

$$\sum_{j=1}^{n} x_{je}\, \sigma_{ij} - \lambda_e\, E(\tilde{R}_i) - \phi_e = 0.0 \qquad i = 1, \ldots, n \qquad \ldots (5)$$

where x_{je} are the weights of the individual securities in the minimum variance portfolio with the given expected return $E(\tilde{R}_e)$. The (n+2) first order conditions may then be solved to determine the portfolio weights x_{je}, j = 1, ..., n and the Lagrange multipliers, λ_e and ϕ_e. Repeating this procedure for alternative values of $E(\tilde{R}_e)$ we obtain the locus of minimum variance portfolios depicted in Figure 2. Only those minimum variance portfolios lying above 'b' are "efficient".

Equation (5) implies a relationship between the expected return on a security, $E(\tilde{R}_i)$, and its risk in the minimum variance portfolio e. It holds for all securities so, with two such securities, i and k, then:

$$\sum_{j=1}^{n} x_{je}\, \sigma_{ij} - \lambda_e\, E(\tilde{R}_i) - \phi_e = 0 \qquad \ldots (6)$$

and

$$\sum_{j=1}^{n} x_{je}\, \sigma_{kj} - \lambda_e\, E(\tilde{R}_k) - \phi_e = 0 \qquad \ldots (7)$$

Equating (6) and (7)

$$\sum_{j=1}^{n} x_{je}\, \sigma_{kj} - \lambda_e\, E(\tilde{R}_k) = \sum_{j=1}^{n} x_{je}\, \sigma_{ij} - \lambda_e\, E(\tilde{R}_i) \qquad \ldots (8)$$

and multiplying each side of (8) by x_{ke} and summing over k = 1, ..., n then

$$\sigma^2(\tilde{R}_e) - \lambda_e\, E(\tilde{R}_e) = \sum_{j=1}^{n} x_{je}\, \sigma_{ij} - \lambda_e\, E(\tilde{R}_i) \qquad \ldots (9)$$

which upon re-arrangement yields

$$E(\tilde{R}_i) - E(\tilde{R}_e) = \frac{1}{\lambda_e}\left[\sum_{j=1}^{n} x_{je}\,\sigma_{ij} - \sigma^2(\tilde{R}_e)\right] \quad i = 1, \ldots, n \qquad \ldots(10)$$

Let S_e be the slope of the locus of minimum variance portfolios in Figure 2 at the point e corresponding to the expected portfolio return $E(\tilde{R}_e)$. Then

$$S_e = \frac{d\,E(\tilde{R}_e)}{d\,\sigma(\tilde{R}_e)}$$

$$= \frac{d\,E(\tilde{R}_e)}{d\,\sigma^2(\tilde{R}_e)} \cdot \frac{d\,\sigma^2(\tilde{R}_e)}{d\,\sigma(\tilde{R}_e)}$$

$$= \frac{d\,E(\tilde{R}_e)}{d\,\sigma^2(\tilde{R}_e)} \cdot 2\,\sigma(\tilde{R}_e) \qquad \ldots(11)$$

However the Lagrangean multiplier $2\lambda_e$ is the rate of change of $\sigma^2(\tilde{R}_e)$ with respect to a small change in the given level of expected portfolio return $E(\tilde{R}_e)$ or

$$2\lambda_e = \frac{d\,\sigma^2(\tilde{R}_e)}{d\,E(\tilde{R}_e)} \qquad \ldots(12)$$

Substituting (12) into (11)

$$S_e = \frac{1}{2\lambda_e} \cdot 2\,\sigma(\tilde{R}_e)$$

or

$$\frac{1}{\lambda_e} = \frac{S_e}{\sigma(\tilde{R}_e)}$$

$$= \frac{S_e\,\sigma(\tilde{R}_e)}{\sigma^2(\tilde{R}_e)} \qquad \ldots(13)$$

In Figure 2 let the line drawn tangent to the locus of minimum variance portfolios at e intersect the vertical axis at a rate of return $E(\tilde{R}_o)$. Then from the tangency condition:

$$S_e \quad (\tilde{R}_e) \quad = \quad E(\tilde{R}_e) - E(\tilde{R}_o)$$

so that

$$\frac{1}{\lambda_e} = \frac{E(\tilde{R}_e) - E(\tilde{R}_o)}{\sigma^2 (\tilde{R}_e)} \qquad \ldots(14)$$

Substituting (14) into (10) and writing $\text{Cov}(\tilde{R}_i, \tilde{R}_e)$ for $\sum_{j=1}^{n} x_{je} \sigma_{ij}$ then

$$E(\tilde{R}_i) = E(\tilde{R}_o) + [E(\tilde{R}_e) - E(\tilde{R}_o)] \beta_{ie} \qquad \ldots(15)$$

where

$$\beta_{ie} = \frac{\text{Cov}(\tilde{R}_i, \tilde{R}_e)}{\sigma^2(\tilde{R}_e)} \qquad \ldots(16)$$

and where $E(\tilde{R}_o)$ is the expected return on a security whose return is uncorrelated with the return on e. Alternatively $E(\tilde{R}_o)$ is the expected return on a security which has the property that $\beta_{ie} = 0.0$. Equation (15) is depicted in Figure 3.

The above analysis applies to an individual investor in a two parameter world. We now examine the implications of this model for the pricing of individual securities in capital market equilibrium. There are two general approaches to the pricing of securities: (i) the Sharpe [28]/Lintner [14] model which assumes the existence of a riskless asset (unrestricted risk-free borrowing and lending); or (ii) the Black [5] model which assumes unrestricted short-selling of (positive variance) securities. Each of the approaches assumes a perfectly competitive capital market, complete agreement (homogeneous expectations) among investors as to the parameters of the joint distribution of security returns and portfolio behaviour in accordance with the two parameter mean/variance model. In terms of Figure 2 the perfect agreement assumption implies that the locus of efficient portfolios is identical for all investors. However, depending on investors' preferences for risk relative to expected return, investors may select different efficient portfolios.

FIGURE 2 MINIMUM VARIANCE PORTFOLIOS

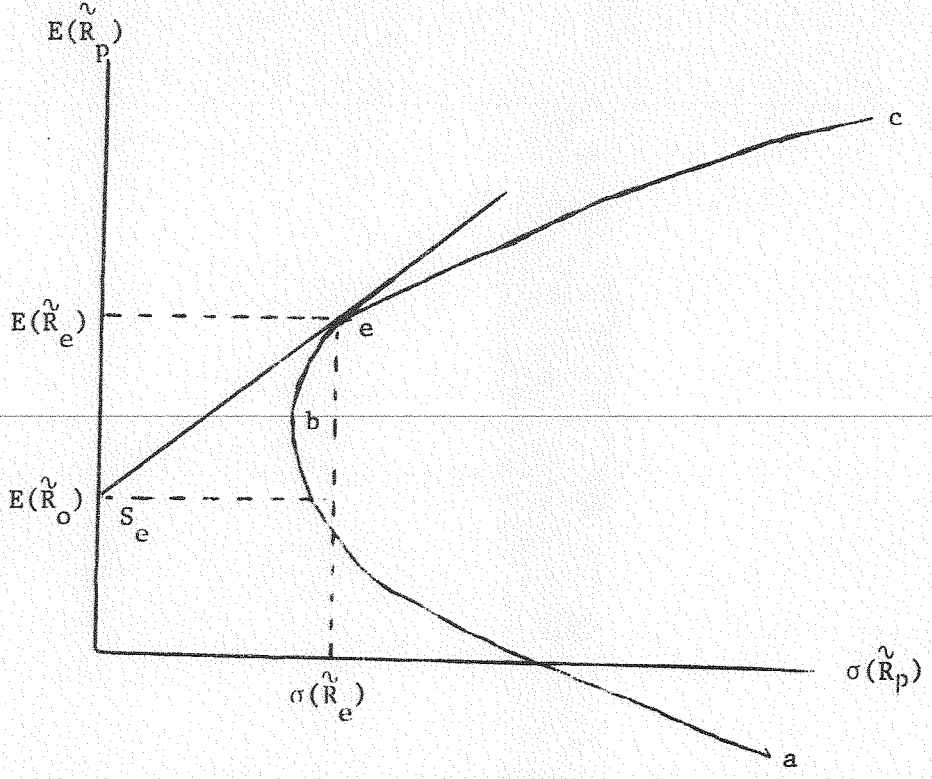
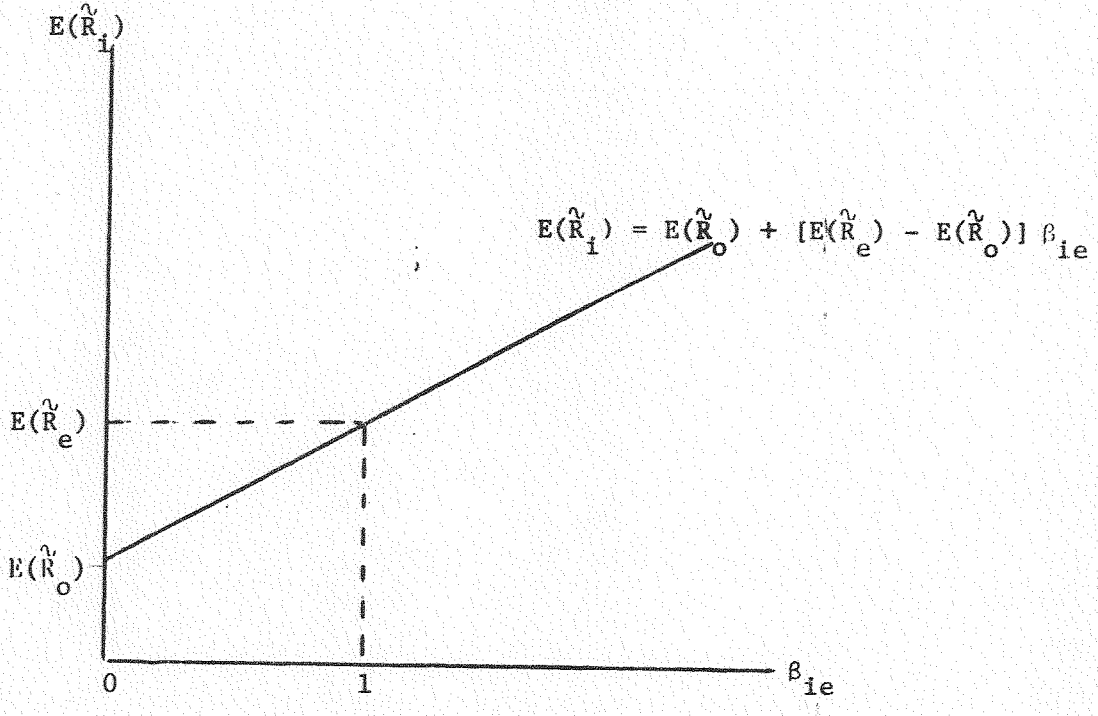
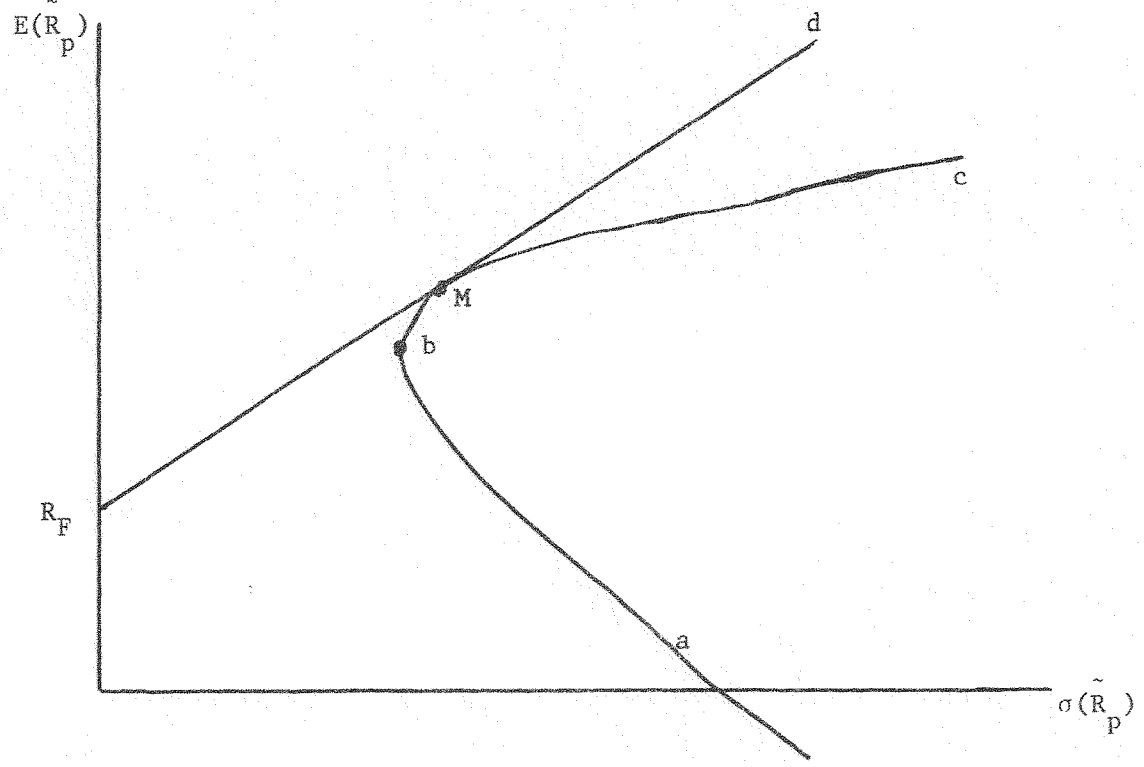


FIGURE 3 RELATIONSHIP BETWEEN EXPECTED RETURN AND RISK FOR SECURITIES IN THE MINIMUM VARIANCE PORTFOLIO e



The Sharpe/Lintner model is conceptually the simplest of the two approaches. Assume that investors can borrow or lend at the market clearing risk-free rate of interest R_F. Additionally assume that the efficient frontier of risky securities is given by the locus abc in Figure 4. Combining the risk-free security with an efficient portfolio of risky securities e, the locus of risk return possibilities is found to be a straight line from R_F on the vertical axis to the point e on the efficient frontier of risky securities. By moving the point 'e' along the efficient frontier of risky securities a point M is found where the straight line from R_F to M is tangent to the efficient frontier of risky securities. The line R_FMd is then the efficient frontier combining both risk-free and risky securities. Investors hold identical combinations of risky securities, M, and differ only in the amount of borrowing or lending.

FIGURE 4 MARKET EQUILIBRIUM WITH
UNRESTRICTED RISK-FREE BORROWING AND LENDING



In capital market equilibrium the total market demand for each security must be equal to total supply. The total supply of all risky securities is the total market value of all outstanding units of all securities which we refer to as the market portfolio. Because of the perfect agreement assumption, a market equilibrium situation will not be reached until the tagency portfolio M in Figure 4 is the market portfolio. The Sharpe/Lintner security pricing relationship

is thus given by

$$E(\tilde{R}_i) = R_F + [E(\tilde{R}_M) - R_F]\ \beta_{iM} \qquad \ldots(17)$$

where

$$\beta_{iM} = \frac{Cov(\tilde{R}_i, \tilde{R}_M)}{\sigma^2(\tilde{R}_M)} \qquad \ldots(18)$$

and M is the value weighted version of the market portfolio.

Whereas in the Sharpe/Lintner model the existence of a risk-free asset in conjunction with the assumption of complete agreement implies that all investors hold the market portfolio M, in the Black model investors differ in their holdings of risky securities. In terms of Figure 2, depending on the investor's preference for risk relative to return an investor's optimal combination of risky securities could lie anywhere above 'b' along the abc locus. The total market demand for securities is thus the sum of individual demands each of which lies along the same efficient frontier (because of the perfect agreement assumption). Fama [8, pp. 279-284] proves that a portfolio which is comprised of a weighted combination of efficient portfolios is itself an efficient portfolio. As the market portfolio is the weighted sum of efficient portfolios the market portfolio must also be efficient and must lie above b along the efficient frontier abc in Figure 2. By substitution of the market portfolio M for e in equations (15) and (16) Black's capital asset pricing relationship is obtained:

$$E(\tilde{R}_i) = E(\tilde{R}_o) + [E(\tilde{R}_M) - E(\tilde{R}_o)]\ \beta_{iM} \qquad \ldots(19)$$

where β_{iM} is as defined in equation (18) and $E(\tilde{R}_o)$ is now the expected return on a security which is uncorrelated with the market portfolio M.

4.2 Estimation Technique

The measure of risk for individual securities in the capital asset pricing literature is the beta defined in equation (18). It is often referred to as systematic or undiversifiable risk and is estimated using ordinary least squares techniques from the market model.

$$R_{it} = \hat{a}_i + \hat{\beta}_i R_{Mt} + \hat{e}_{it} \qquad t = t_0 \text{ to } t_1 \qquad \ldots(20)$$

Comparing equations (20) and (17), $\hat{a}$ is an estimate of $(1-\beta_{iM})R_F$ while the properties of the regression estimates are such that $\hat{\beta}_i$ is an estimate of β_{iM} defined in equation (18). Finally $\hat{e}_i$ is a normally distributed error term with expected value equal to zero.

Because of the desirability of obtaining stable beta estimates $(t_1 - t_0 + 1)$, the number of monthly observations, was initially set at 61. The beta estimate obtained was centred and by moving the sample period one observation at a time, a time series of the beta was obtained for 1959(7) to 1974(6). In order to obtain a beta estimate for the periods 1957(2)-1959(6) and 1974(7)-1976(12) the number of observations was reduced by two observations on each adjustment until the number of observations in the regression reached 17. In each case the beta estimate was centred thereby providing a time series of the beta for all but the first and final eight observations. In these cases it was assumed that the beta calculated for the seventeen observations applied thereby completing a continuous time series of beta from 1957(2) to 1976(12).

The risk-return relationships of equations (17) and (19), and variants of them, have been used extensively to examine the stock market's reaction to company-specific information. Essentially these studies attempt to isolate "abnormal" stock exchange returns in months surrounding an event of interest. The pricing relationships of equations (17) and (19), or their variants, are used to determine the expected returns in each period and the residual or error term is assumed to be the "abnormal" component.

In section 6 three alternative approaches are applied in an attempt to isolate the wealth effects of Australian banking regulation:

(1) residuals from the Sharpe [28], Lintner [14] capital market equilibrium pricing relationship;

(2) the Fama and MacBeth [9] two step methodology to obtain the residuals from Black's [5] capital market equilibrium pricing relationship; and,

(3) a matched portfolio approach.

The Sharpe/Lintner approach is computationally the easiest to implement. Using the return on Australian Government treasury notes as a proxy for the return on a risk-free asset and substituting actual returns for expected returns, ordinary least squares estimates of

$$R_{it} - R_{Ft} = \hat{\beta}_i(R_{Mt} - R_{Ft}) + \hat{m}_{it} \qquad ...(21)$$

are obtained. The residuals, $\hat{m}_{it}$, reflect short-run disequilibrium phenomena resulting from unanticipated information announcements or regulatory changes. Using the moving regression technique described above and isolating the centre residual in each regression, a time series of residuals for the entire period under analysis is obtained.

The first stage in Fama and MacBeth's procedure for estimating Black's model is the calculation of betas of individual securities using time series data. Securities are then combined into portfolios on the basis of their beta rankings and portfolio returns and betas determined. In the second stage portfolio returns and betas are used in cross-section regressions of the form

$$R_i = \hat{\lambda}_0 + \hat{\lambda}_1\beta_i + \hat{n}_i \qquad ...(22)$$

The procedure adopted in this paper differs only in the method of grouping securities into portfolios. Instead of using a beta ranking, securities are classified by industry and the two stage procedure applied to industry portfolios.

The matched portfolio approach involves the formation of a control portfolio consisting of securities unaffected by the information announcement or regulatory change being considered. When banking regulation is considered, all industries except banking are formed into a portfolio with the relative weights of each industry such that the control portfolio has a beta equal to that of the banking industry. Any unanticipated industry specific regulation bearing upon the banks would be expected to produce a discrepancy between the return on the banking industry portfolio and the control portfolio.

Previous Australian studies examining the pricing of Australian shares and market reaction to the release of new public information have utilised variants of the three approaches (see Ball, Brown and Finn [2], Ball, Brown and Officer [3], and Sharpe and Walker [27]). As each approach associates the wealth effect with abnormal rates of return to the group of affected companies, the techniques are appropriate for examining discriminatory policy actions but

inappropriate for general policy measures (such as open market operations) which bear upon the workings of the economy. This is not meant to suggest that in practice, the effects of a specific policy measure may not encompass both influences. It is always possible for some measure directed at a particular activity, to spill over to other markets or activities. For example, tariff adjustments affect the level of protection enjoyed by producers of certain tradable goods but the outcome changes the relative prices of the tradable goods affected to those for non-tradable goods and services. The result may be a shift in the relative demands for all these goods. Nevertheless, the influence from this spillover will be minor compared with the discriminatory action towards the industry or forms directly involved.

4.3 The Market Portfolio and Structural Change

Underlying the analysis are the estimates of industry betas which in turn necessitate knowledge of the market rate of return. However problems arise in relation to the nature of the market portfolio and to the issue of whether value weighted or equal weighted industry and market portfolios should be utilised in the study. Roll [22] argues that the capital asset pricing model is not testable unless the exact composition of the true market portfolio is known and used. The implication is that all assets including real estate, company debentures, human capital, shares, etc. ... should be included in the market portfolio on a value-weighted basis. However, because of data limitations we initially used a value-weighted portfolio of shares in 329 companies traded on the Sydney Stock Exchange as a proxy for the true market portfolio.

A closely related problem arises from the fact that the betas are a relative measure of risk. If the character or composition of the market portfolio should change due to a major structural change in the economy then individual industry betas, which vary directly with the covariance of the industry and market returns and inversely with the variance of the market rate of return, could also be expected to vary. With the mining boom gathering momentum in Australia in 1968 and 1969 a significant change emerged in the market portfolio. Whereas the mining industry sample comprised only 14 per cent of the total market capitalisation value in 1965, by December 1969 this proportion had risen to a peak of 46 per cent. Also in 1967-68 the market capitalisation of the sole steel producer in Australia, the Broken Hill Proprietary Company Limited (BHP), increased significantly because of its

success in exploration and development of crude oil and natural gas fields. Initially this company was included in the steel and engineering industry classification. Clearly a fundamental change occurred in the nature of the total market portfolio during the period from 1967 to 1971.

Preliminary estimates of equation 20 indicated that the mining boom influenced the study in two ways. First, it biassed the value-weighted sum of industry betas for the period 1965 to 1967 in a downward direction when the market return was assumed to be the return on a value-weighted portfolio of the 329 company shares (including mining) traded on the Sydney Stock Exchange. This bias is evident in Figure 5A which depicts the value-weighted sum of industry betas together with the 95 per cent confidence interval of the weighted sum around unity. When the market index is defined to exclude the mining industry and BHP the weighted sum of industry betas, shown in Figure 5B is not significantly different from unity. Secondly, because the mining industry has a relatively high beta the increased market share of mining would tend to reduce the beta of other industries in this period. In Table 1 the banking industry beta for four 5 year periods using three alternative proxies for the market portfolio are shown:

(1) the total market;

(2) the total market less the mining industry; and,

(3) the total market less mining and less BHP.

The strong decline in the banking industry beta in the 1966(12) to 1971(12) period evident in the first set of results is not present when the mining industry and BHP are excluded from the market index.

TABLE 1

Banking Industry Betas for Alternative Proxies of the Market Portfolio

Market Portfolio Proxy	Banking Industry Beta*			
	1957(2) to 1961(12)	1961(12) to 1966(12)	1966(12) to 1971(12)	1971(12) to 1976(12)
1. Total Market	.703 (.109)	.975 (.137)	.580 (.078)	1.217 (.079)
2. Total Market less Mining Industry	.741 (.110)	1.050 (.139)	.809 (.089)	1.268 (.075)
3. Total Market less (Mining Industry + BHP)	.740 (.101)	1.064 (.131)	1.042 (.109)	1.316 (.080)

*S.E. in parentheses.

FIGURE 5A

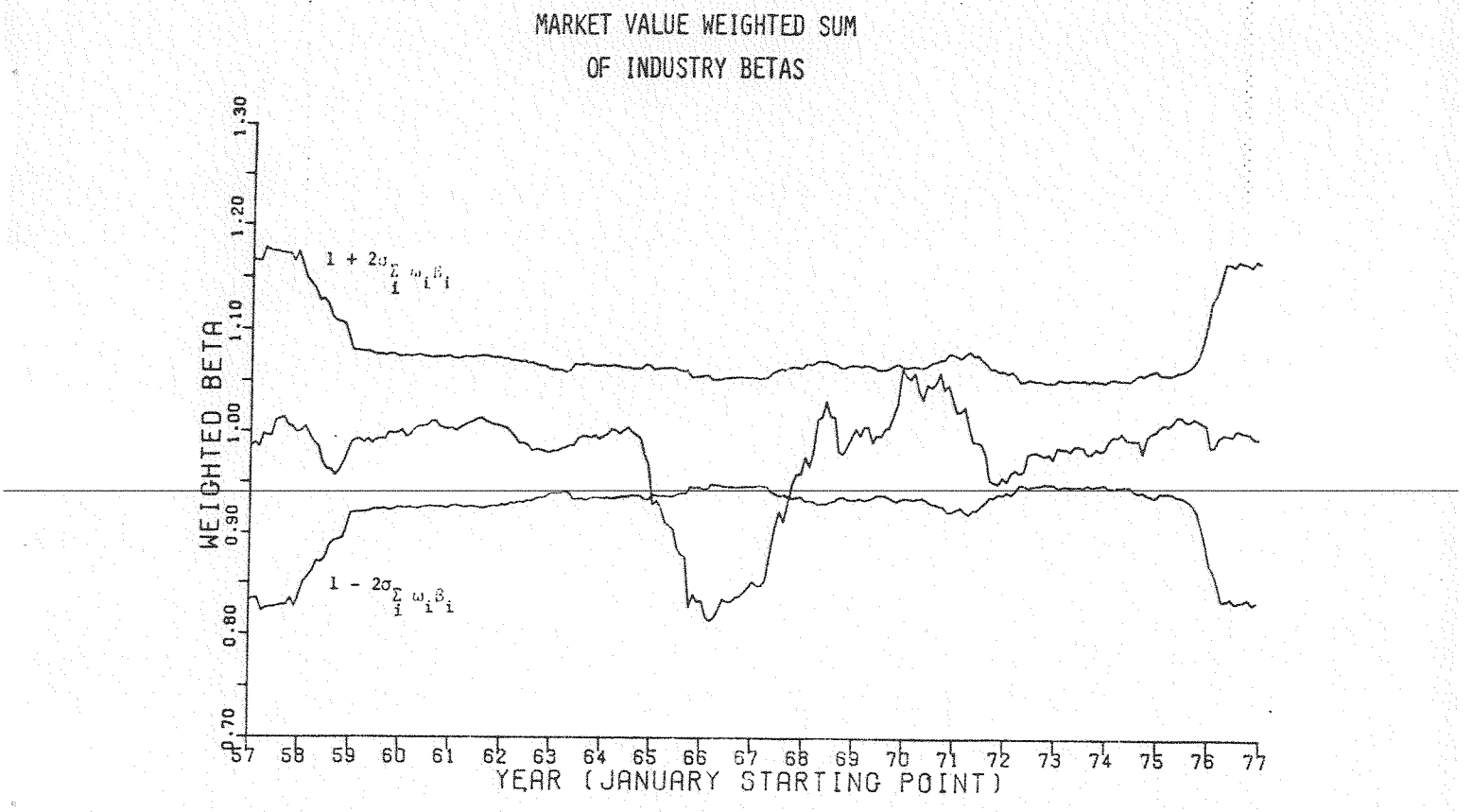
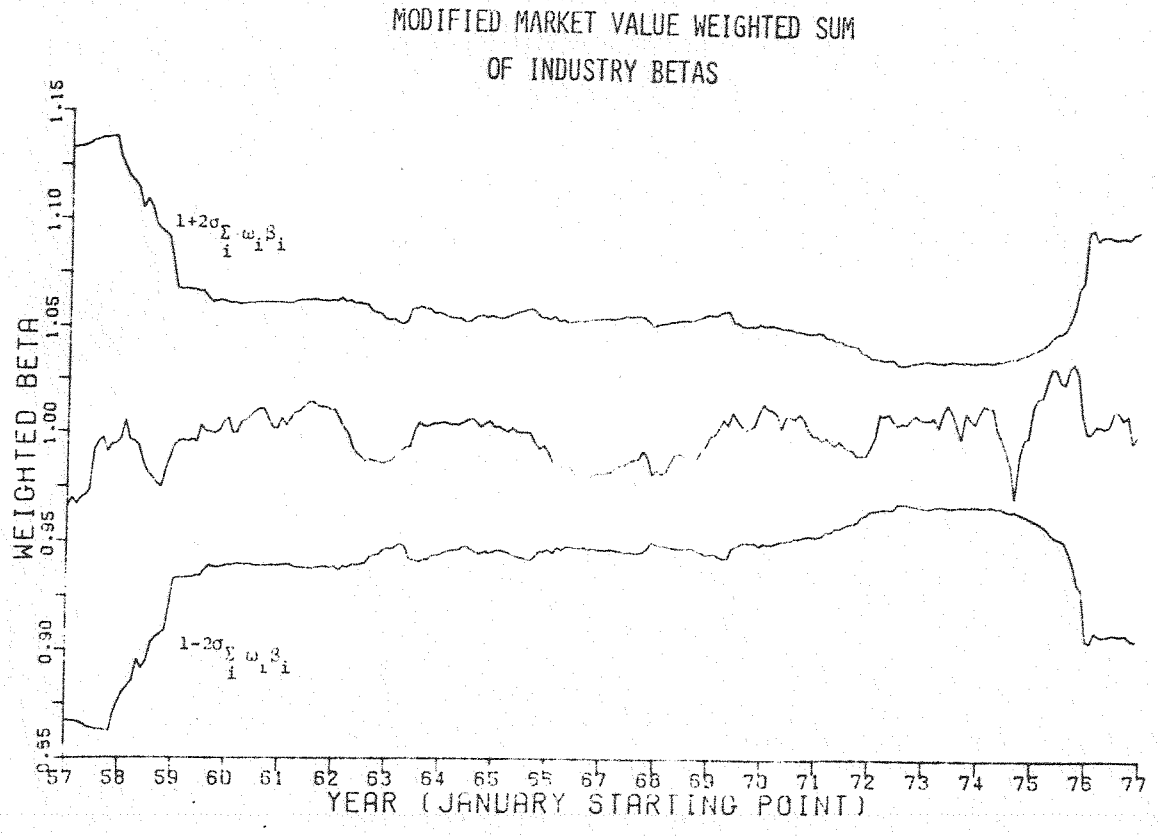


FIGURE 5B



While these results provide startling evidence of the impact of major and sudden structural change when estimating systematic risk, they also suggest the desirability of excluding the mining industry and BHP from the market portfolio in order to clarify the analysis of banking regulation. Moreover it eliminates systematic bias from the industry betas.

4.4 Bank Holding Companies and Banking Regulation

A problem which arises in utilising share market data to study the impact of banking regulation on the banking industry is that what we refer to as the "banking industry" is in fact a sample of bank "holding" companies. Their interests include hire purchase, savings banks, unit trusts, development and merchant banks, superannuation funds, and credit cards in addition to the traditional trading bank activities (see Arndt and Stammer [1]). Developments in each of these areas affect earnings of the "holding" company and thereby returns to shareholders. Between 1953 and 1958 all the major private trading banks acquired interests in the hire purchase field; equity holdings in many of these finance company subsidiaries were increased in the late 1960s and early 1970s. With respect to savings banks, the Wales, ANZ and CBCs began operations in 1956 while the CBA, National and Adelaide formed savings banks in 1961 and 1962. The move into development and merchant banking began in the late 1950s but increased significantly in the late 1960s and early 1970s.

The prospect of incorrectly associating risk or wealth effect with banking regulation when the effect was due to activities of bank holding companies beyond traditional banking is a real one. For this reason, the empirical sections which follow provide, wherever relevant, information on risk and abnormal returns of a sample of finance companies. If the risk and abnormal returns of finance companies move in the opposite direction to those for the banking industry, then the view that the banking industry behaviour was due to the finance subsidiary oeprations may be rejected.

5 Estimates of Banking Industry Risk

Figures 6A and 6B depict the centred moving betas and the associated 95 per cent confidence intervals of the banking industry and finance companies respectively. Each was estimated with the modified market portfolio excluding the mining industry and BHP. The banking industry return is the value-weighted return of the shares of six of the seven private banks traded on the Sydney Stock Exchange.[2]

FIGURE 6A

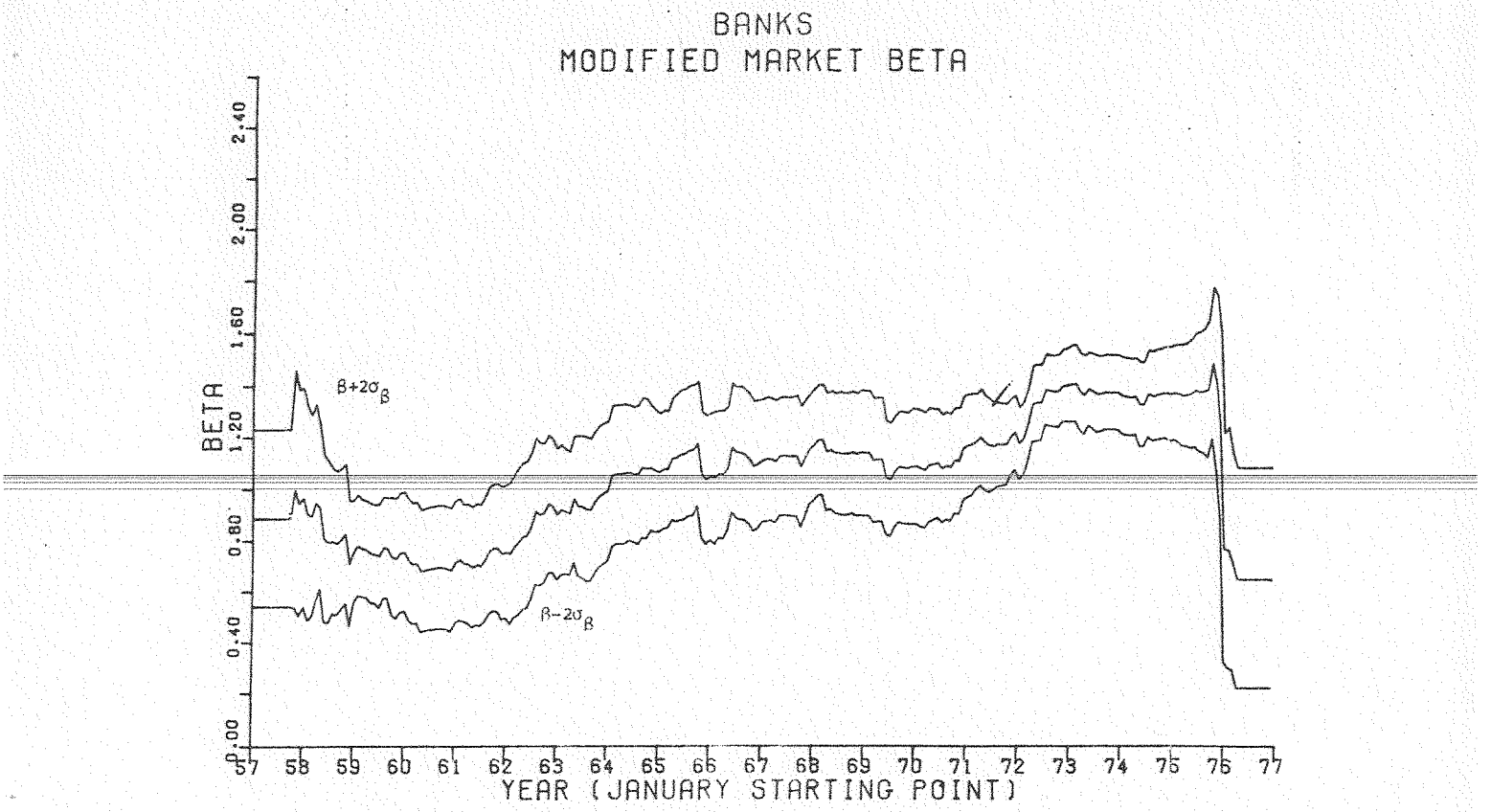
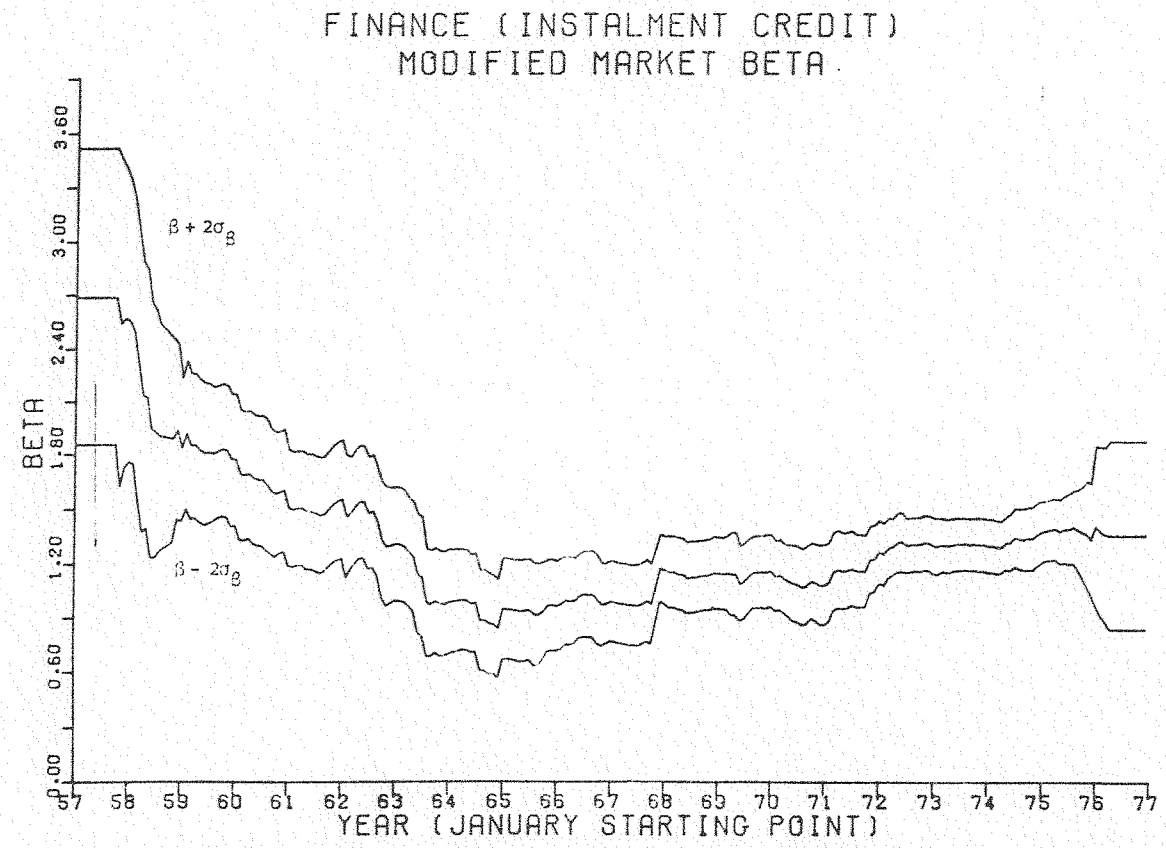


FIGURE 6B



A startling aspect of the beta plots is the decline of the finance company beta in the period from 1957 to 1963. The major finance company developments in this period have been summarised by Fletcher [10] and Runcie [23]. In the early 1950s, the finance industry was highly concentrated with the participants enjoying rapid growth and large profits on funds employed. However the entry of new firms into the industry in late 1950s and the increased competition from the banking industry eroded profit rates in the finance industry in the late 1950s and early 1960s.[3] Additionally, the finance companies modified the composition of their assets and liabilities. From an almost exclusive reliance on instalment credit loans for retail sales the finance companies have diversified into business lending. Also Scott [25] notes that they have shortened the maturity of their assets to such an extent that the average maturity of their borrowings exceeds that of their lending. With an assured source of funds from repayments to cover maturities of liabilities, an effective diversification programme, and reduced return on funds employed due to increased competition, the decline in finance company betas in the late 1950s is not surprising.

It is also interesting to note the similarity in the betas of banks and finance companies in the period from 1965 to 1975. Not only are the finance company betas insignificantly different from that of the banks but they each increase in the period from 1972 to 1975, a period of severe instability in Australian monetary and financial markets.

Turning to the question of the impact of banking regulation on banking industry risk, 1959-60 and late 1975-76 were identified as periods when direct or selective banking regulations and controls were strongly applied. From Figure 6A it is clear that in each of these periods the banking industry beta declined. Furthermore, the banking industry beta rose substantially in the period from 1961 to 1964, subsequent to the regulatory change from an exclusive reliance on direct banking controls to a general market-oriented monetary strategy.

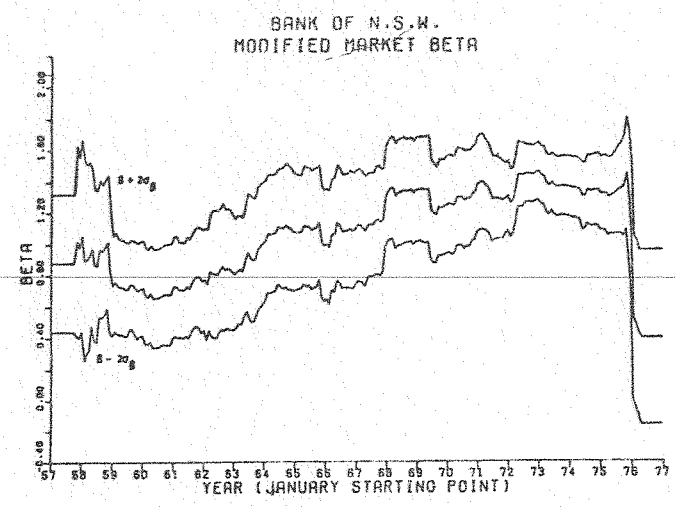
It is also significant that in two of these three periods, the finance company beta was either stationary or moved in the opposite direction to that of the banking industry beta, the exception being the 1959 to 1960 period. However, as mentioned earlier, this was a period of substantial structural adaptation, declining profits and reduced growth for the finance companies. Thus the evidence examined convincingly supports the Peltzman hypothesis about risk varying inversely with the intensity or degree of regulation.

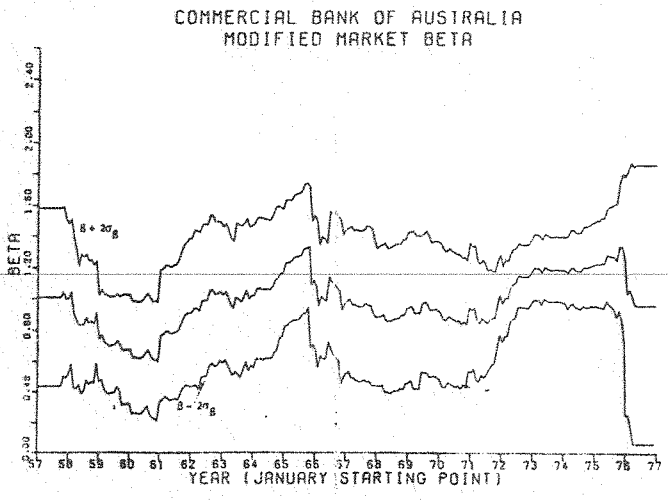
The use of a value-weighted index to compute banking industry returns and beta implies that the risk measure could be dominated by the behaviour of the betas of the two largest banks, the Bank of New South Wales and the ANZ Banking Corporation. However, an examination of the six bank betas in Figure 7 indicates that the Peltzman hypothesis is supported in five cases, the exception being the Bank of Adelaide. This is the smallest of the banks in the sample, so small in fact that the banking operations of the company are dwarfed in size by the activities of its finance company "subsidiary", Finance Corporation of Australia Limited (FCA). In 1958 the Bank of Adelaide acquired a 40 per cent interest in FCA while the remaining 60 per cent was acquired in 1969. By 1962 the market value of the 40 per cent holding in F.C.A. was approximately one third of the total market capitalisation of the Bank of Adelaide while at the close of 1964 the proportion had risen to one half. The rise in the Bank of Adelaide beta in 1958 and its subsequent decline in 1962-63 seem attributable to the significance of the finance "subsidiary".

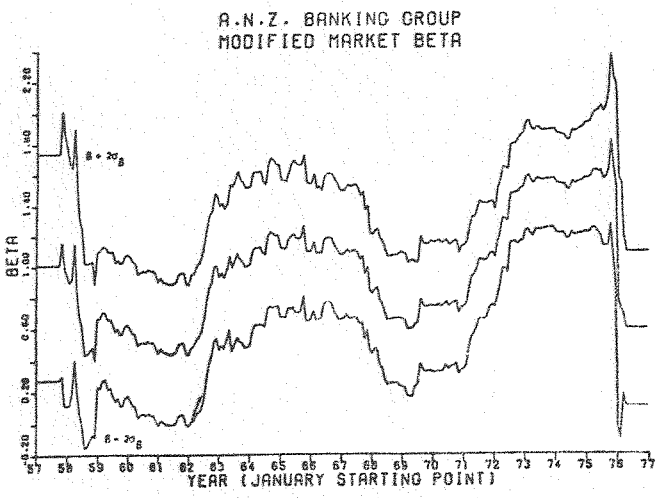
6 Wealth Effects of Australian Banking Regulation

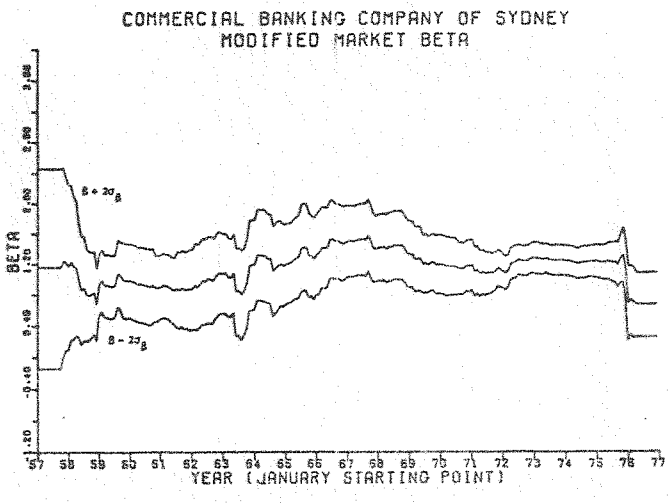
For each of the approaches outlined in Section 4, abnormal returns (error terms in equation 21 and 22 and deviations of the industry return from the matched portfolio return) were cumulated over time and plotted in Figures 8A and 8B. Care must be taken when interpreting these figures as it is possible to generate cycles or patterns in data cumulated from random drawings (see Roberts [21]). Consequently attention is paid to those periods of interest from the viewpoint of changes in banking regulation. Two quite distinct periods are revealed when the performance of the banking industry departed markedly from the rate of return predicted from each of the three approaches; in effect when the banking industry was affected by the workings of monetary and financial policies which had sharp and specific impacts. The first of these was in the period 1959 to 1963 and then at the end of the series with the impact of credit restraints and debt management problems from mid 1975. While the large decline in the banking industry cumulative abnormal returns in 1959-60 is also common to the finance companies at that time, this is not so for the 1961-62 and 1975-76 experiences. Thus the evidence is consistent with the hypothesis that the implicit tax associated with changes in Australian banking regulation is borne in part by the banks. However in one of the three periods examined, 1959-60, the data is also consistent with the hypothesis that the activities of finance company subsidiaries of banks contributed significantly to movements in banking industry abnormal returns.

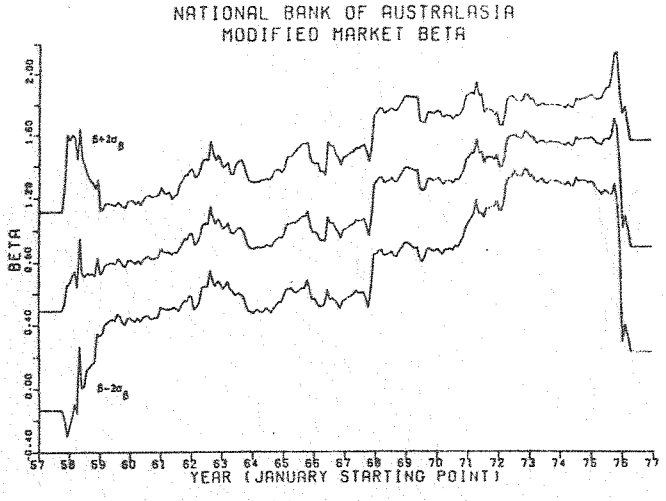
FIGURE 7


BANK OF N.S.W.
MODIFIED MARKET BETA
BETA
YEAR (JANUARY STARTING POINT)


COMMERCIAL BANK OF AUSTRALIA
MODIFIED MARKET BETA
BETA
YEAR (JANUARY STARTING POINT)


A.N.Z. BANKING GROUP
MODIFIED MARKET BETA
BETA
YEAR (JANUARY STARTING POINT)


COMMERCIAL BANKING COMPANY OF SYDNEY
MODIFIED MARKET BETA
BETA
YEAR (JANUARY STARTING POINT)


NATIONAL BANK OF AUSTRALASIA
MODIFIED MARKET BETA
BETA
YEAR (JANUARY STARTING POINT)

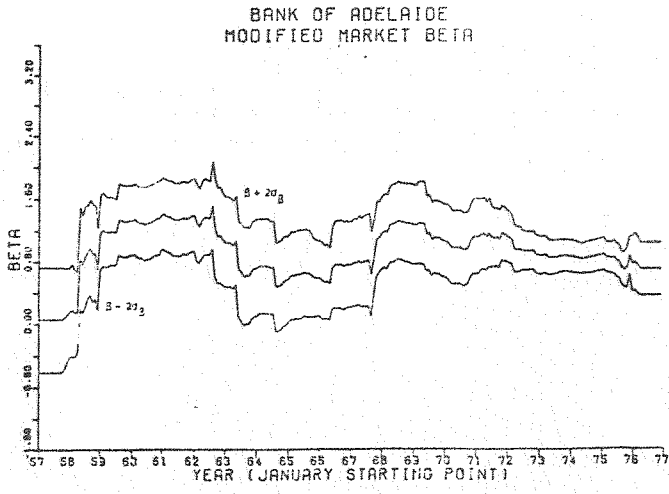

BANK OF ADELAIDE
MODIFIED MARKET BETA
BETA
YEAR (JANUARY STARTING POINT)

FIGURE 8A

BANKS

CUMMULATIVE RESIDUALS

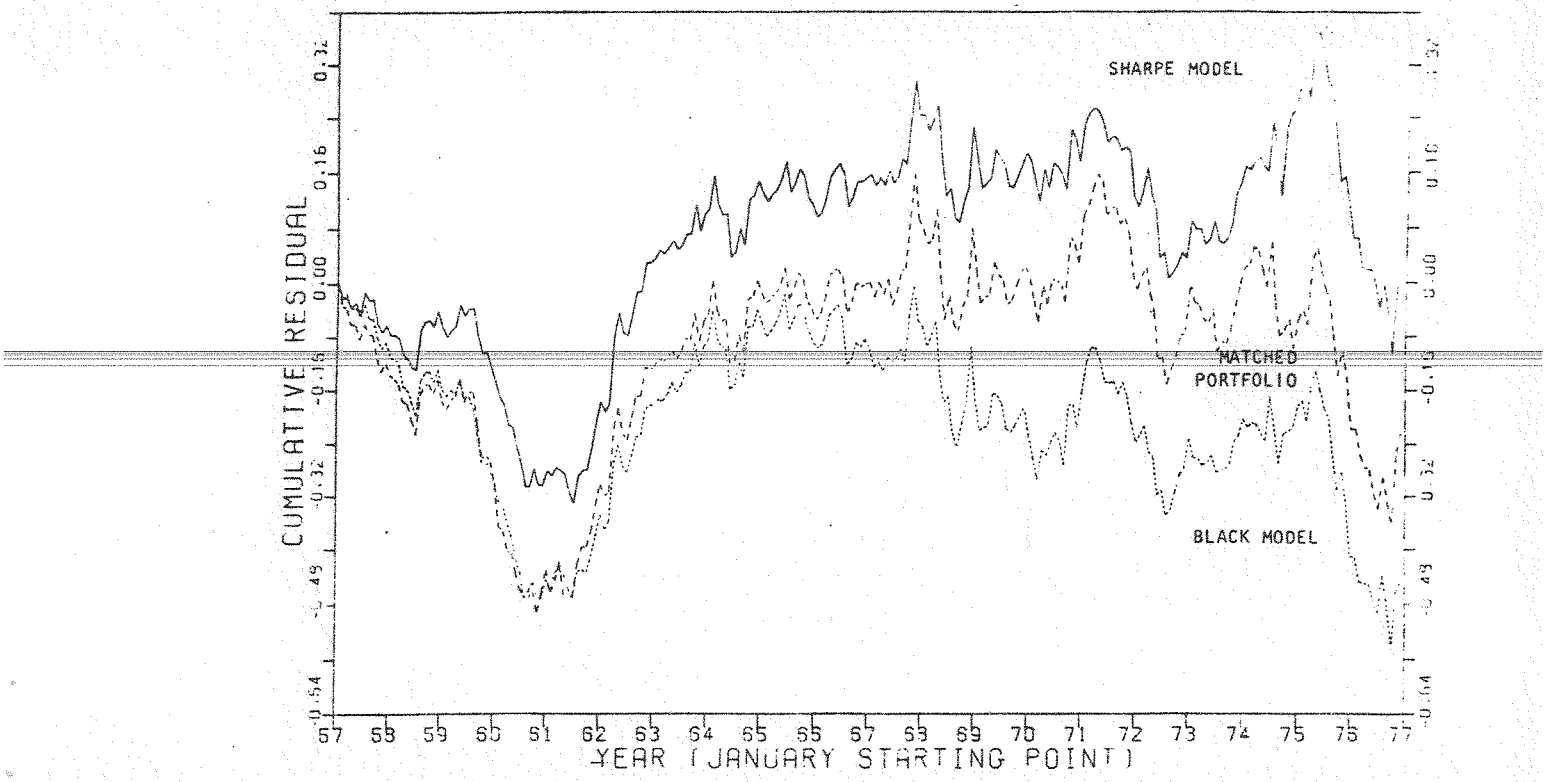
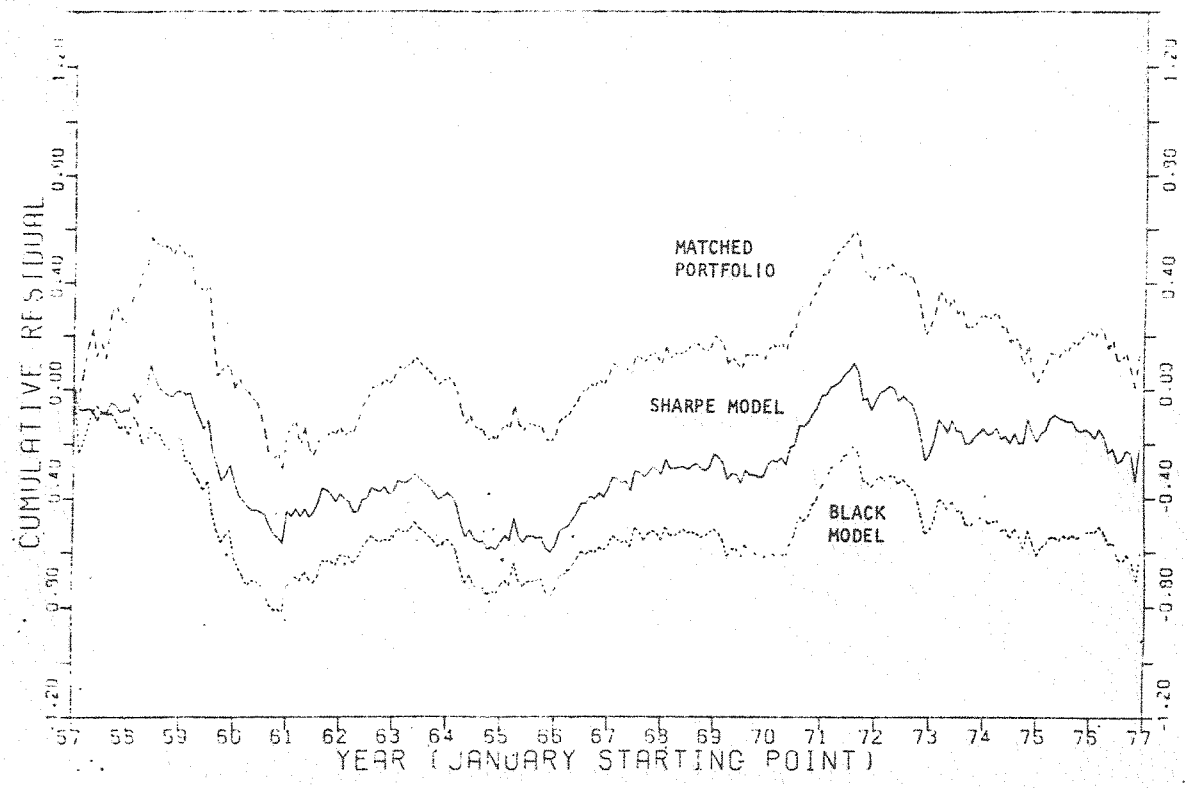


FIGURE 8B

FINANCE (INSTALMENT CREDIT)

CUMMULATIVE RESIDUALS



In Figure 9 the cumulative residuals for individual banks, computed from the Sharpe model, are shown. In all six cases the cumulative residual series fell in 1959-60, rose in 1961-62, and fell in 1975-76 providing further indication of the wealth effects of banking regulatory changes.

7 Wealth Effects of SRD Changes

Controls on Australian banks include entry restrictions, statutory reserve deposit (SRD) requirements, interest rate controls, liquidity conventions and other portfolio restrictions. To the extent that banks are unable to shift the burden of such controls to their customers, regulatory changes are likely to have a wealth effect on bank shareholders. In this section banking industry abnormal returns in months surrounding changes in the statutory reserve deposit requirements are analysed. Specifically, the hypothesis is that increases (decreases) in SRD requirements are associated with negative (positive) abnormal banking industry returns.

SRD policy is examined because of:

(1) the ease of establishing the announcement date of the policy change; and

(2) the large number of SRD changes over the sample period.

However some alterations in SRD requirements are associated with transfers of reserves to Term and Farm Development Loan Funds. While these transfers increase earning capacity, the requirement that banks also allocate an amount to these Funds from their otherwise free reserves offsets, at least in part, the earnings advantage. Because the changes in SRD requirements associated with such transfers are relatively small, with their impact on bank profitability unclear, changes in SRD ratios reflecting this arrangement have been ignored. Also, the 2.5 per cent reduction in SRDs in December 1960 and the 2.5 per cent increase in January 1961 were deleted because it was clearly acknowledged that the original reduction was temporary. The 1961 Annual Report of the Reserve Bank of Australia describes the changes:

> "to help banks meet the usual pre-Christmas withdrawal of cash by the public; the SRD ratio was in mid-December temporarily reduced in two steps to 15 per cent. The ratio was restored by two increases to 17.5 per cent early in January".

The sample of SRD changes and respective announcement dates are shown in Table 2.

FIGURE 9

CUMULATIVE RESIDUALS FOR INDIVIDUAL BANKS

From W.F. Sharpe Model

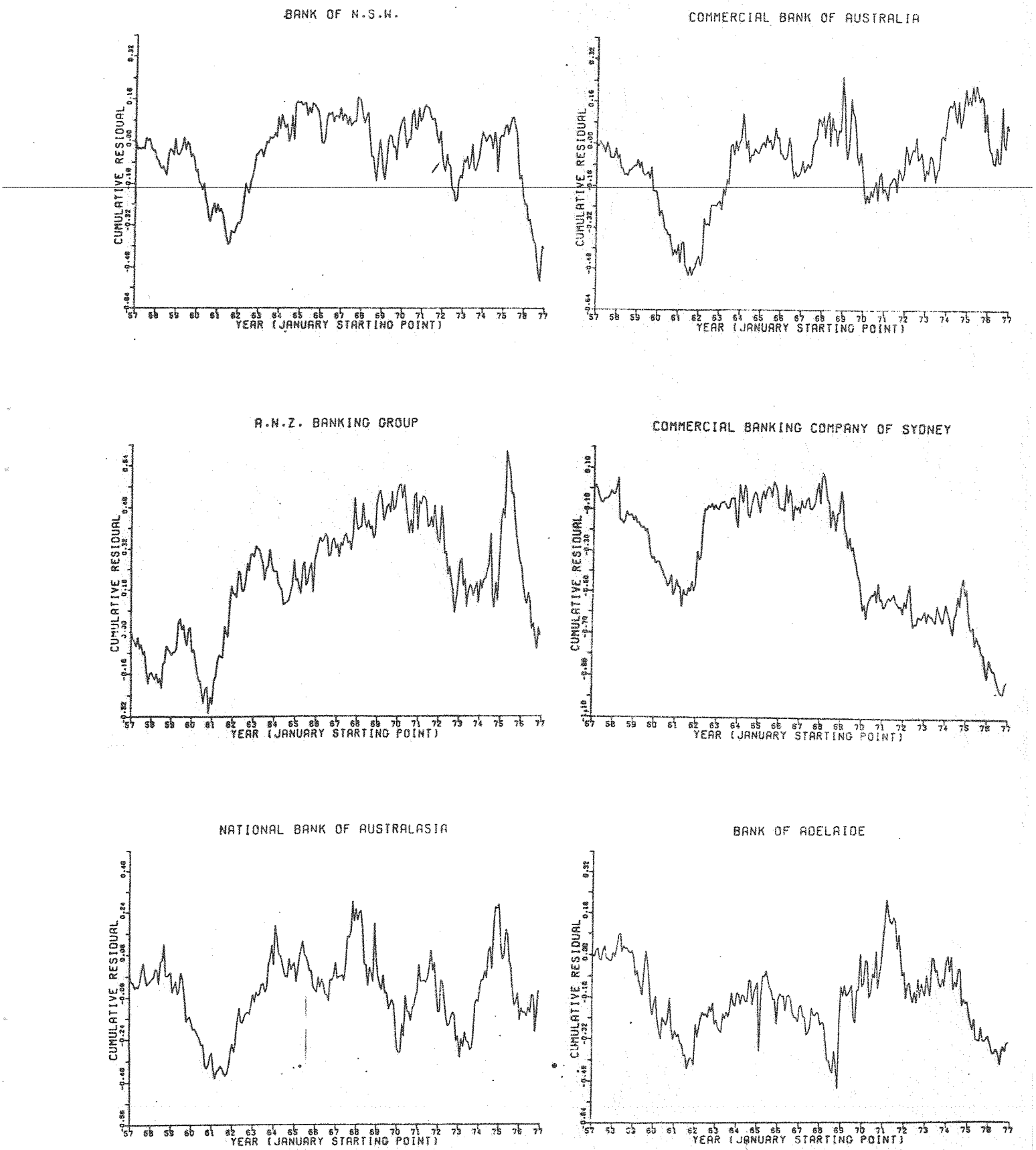


TABLE 2

Sample of SRD Changes

Announcement Month	SRD Change	Announcement Month	SRD Change
1957(1)	+1.6	1965(5)	-0.6
1957(2)	+1.6	1965(12)	-1.0
1957(3)	+1.2	1966(4)	-2.5
1958(2)	-0.9	1968(10)	+1.0
1958(4)	-1.2	1969(7)	+1.0
1958(5)	-1.0	1971(4)	-0.5
1958(6)	-1.0	1971(12)	-1.0
1958(7)	-0.6	1973(4)	+1.0
1959(2)	-0.9	1973(7)	+2.0
1959(10)	+0.9	1974(6)	-1.5
1959(11)	+1.2	1974(7)	-1.4
1960(2)	+1.0	1974(8)	-0.5
1961(4)	-1.0	1974(9)	-1.0
1961(5)	-1.0	1974(10)	-1.0
1961(6)	-2.0	1975(7)	+2.0
1961(7)	-1.0	1975(9)	+1.0
1962(10)	+1.0	1975(10)	+1.0
1964(1)	+1.2	1976(1)	+1.0
1964(2)	+3.5	1976(4)	-2.0
1964(10)	+1.0	1976(11)	+1.0
1965(3)	-1.0	1976(12)	+1.0

Table 3 summarises various regression results examining the relationship between banking industry abnormal returns (not cumulated) and SRD changes. Because of the similarity in results and for space reasons only those for the Sharpe model regressions are included. Conceivably the stock market anticipates SRD changes, so leading as well as lagged SRD changes are included as explanatory variables. Significance at the 95 per cent confidence level is indicated by an asterisk. Only the coefficient of changes in SRD with a lag of three months is significant in the first regression while the insignificance of the F statistic for the regression suggests the lack of a relationship between SRD changes and the banking industry residuals. The SRD change variable was then split into SRD increases, denoted ISRD, and SRD decreases, DSRD. The second regression suggests that increases in SRD do have a negative wealth effect. Only SRD increases with a lead of four months and a lag of three months are significant. Given the implicit assumption underlying this research of an efficient capital market, the lag of three months is disconcerting. However the insignificant coefficients for the first two lags suggests the possibility of the result being spurious. Finally, the third regression fails to indicate any relationship between SRD decreases and banking industry abnormal returns. The coefficient corresponding to a lead of one month is significant but has the incorrect sign.

Thus evidence is consistent with the hypothesis that SRD increases involve an implicit tax and that some proportion of this tax is borne by bank shareholders. Nonetheless the SRD reduction result suggests that the wealth effect of SRD reductions may be transferred to bank depositors and/or borrowers in the form of favourable lending and/or borrowing rates. There may be alternative explanations. The downward trend in the SRD ratio over the sample period may have been anticipated by investors and captured in the increased beta of the banking industry during this period. Alternatively, it has been suggested that many of the SRD reductions listed in Table 2 are associated with the seasonal run-down of liquidity in the Australian economy between April and June of each year. These adjustments to SRD requirements could be regarded by the market as being temporary with every possibility of being anticipated well in advance.[4]

The final test relates to the announcement effect on banking industry returns of the increase in interest payable on statutory cash reserve deposits maintained by banks at the Reserve Bank of Australia from 0.75 per cent to 2.5 per cent as from 10 November 1976[5]. Each of the regressions reported in Table 3 also contains a dummy variable, D, which takes the value of unity in November 1976 and zero elsewhere. In all cases, the coefficient of the dummy

TABLE 3

Regression Analysis of Relationship between SRD Policy and Banking Industry Residuals from Sharpe Model

	Const.	SRD_{t+4}	SRD_{t+3}	SRD_{t+2}	SRD_{t+1}	SRD_{t}	SRD_{t-1}	SRD_{t-2}	SRD_{t-3}	D = 1 Nov 76	R^{-2}	F-Stat.
all SRD	-.0005	-.0059	.0023	-.0029	.0058	-.0031	-.0022	.0010	-.0101*	.0996*	.051	2.421
	(-.2424)	(1.4283)	(.5353)	(-.6572)	(1.3360)	(-.6989)	(-.4882)	(.2379)	(-2.4475)	(3.1315)		
+VE SRD	.0034	-.0156*	.0044	-.0034	.0007	-.0081	-.0003	-.0021	-.0143*	.1047*	.075	3.153*
	(1.5048)	(-2.6616)	(.7164)	(-.5305)	(.1130)	(-1.2428)	(-.0445)	(-.3415)	(-2.440)	(3.1950)		
-VE SRD	-.0005	.0033	.0008	-.0060	.0115*	-.0007	-.0061	.0040	-.0070	.0988*	.029	1.766
	(-.2034)	(.5396)	(.1193)	(-.9480)	(1.8265)	(-.1179)	(-.9694)	(.6333)	(-1.1638)	(3.1959)		

't' statistics in parentheses

variable is positive, statistically significant, and consistent with the hypothesis that non-payment of interest on statutory cash reserve deposits involves an implicit tax on banking operations.

A problem with the regression results is that the significant coefficient on the dummy variable may be attributable to the publication of alternative relevant information. For example, on 28 November 1976 the Australian dollar was devalued by 17.5 per cent. In an attempt to differentiate the impact of alternative sources of information in November 1976, daily rates of return were computed for a three month period from the Melbourne Stock Exchange index for banks and the all ordinaries index (excluding mining). Assuming a beta of banks of unity, the difference between the daily rates of return from the two indices was computed, cumulated over time, and plotted in Figure 10.[6] While the cumulative residual rose by .024 on 3 November and a further .017 on 10 November, the first trading day after the announcement, 8 November, it fell by .006 contrary to our expectation. Furthermore the steady rise in the cumulative residual from 3 November to 7 December prevents a clear differentiation of the interest rate effect from the effects of devaluation and other sources of relevant pricing information.

8 Conclusion

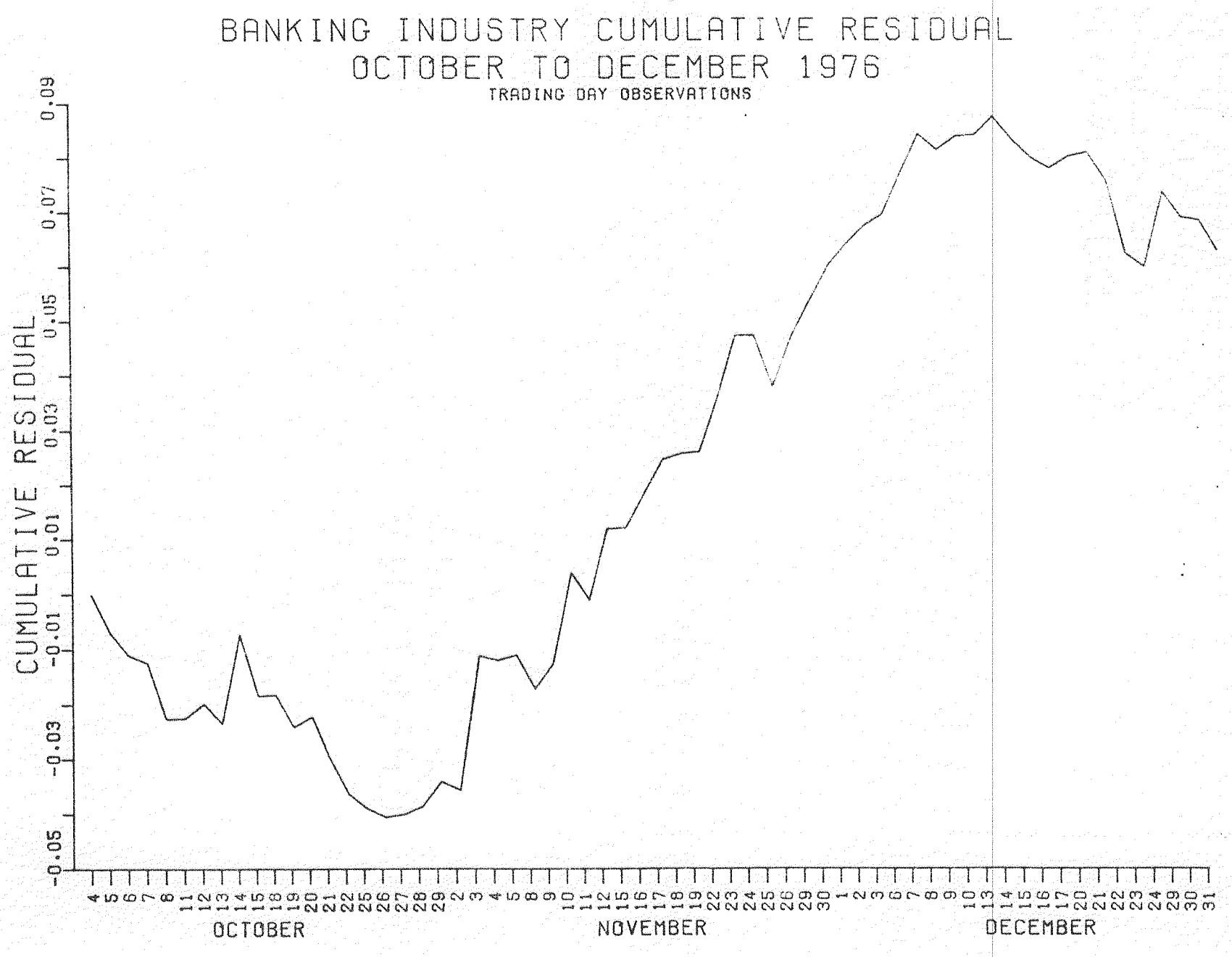
The theory of regulation developed by Stigler and Peltzman predicts that major changes in regulation, within an institutional context characteristic of the Australian financial and banking system, will have risk and wealth effects. This paper has examined:

(1) the risk and wealth effects associated with major changes in the emphasis of banking regulation in 1959-60, 1961-63 and 1975-76; and

(2) wealth effects associated with changes in SRD policy over a twenty year period.

In the former case the evidence examined was consistent with the hypotheses that industry risk varies inversely with the intensity of industry specific regulation and that a portion of the burden of the implicit tax emanating from Australian banking regulation resides with shareholders of banks. However, in the latter case of SRD policy, the evidence is somewhat inconclusive because of:

FIGURE 10


BANKING INDUSTRY CUMULATIVE RESIDUAL
OCTOBER TO DECEMBER 1976
TRADING DAY OBSERVATIONS
CUMULATIVE RESIDUAL
0.09
0.07
0.05
0.03
0.01
-0.01
-0.03
-0.05
OCTOBER
NOVEMBER
DECEMBER

(1) the long leads and lags observed between SRD changes and banking industry abnormal returns;

(2) the asymmetry in response to increases and decreases in SRD requirements; and

(3) the difficulty of differentiating the effect of changes in the interest rate on statutory reserve deposits from the effects of devaluation and other sources of relevant pricing information.

A startling aspect of the results is the influence of structural changes in the economy on relative measures of risk. The huge expansion of the Australian mining industry during the sixties bears witness to this phenomenon and emphasises the need for adapting empirical studies to allow for such sweeping changes.

APPENDIX

Data Base for the Industry Study

The work reported in this paper is part of a larger study which examines the risk and pricing performances of some twenty industry groups. These groups comprise 329 individual company shares listed for trading on the Sydney Stock Exchange. The basis for compiling the data is summarised to show the ways in which information has been used.

Names of companies listed in the Sydney share price index at any time during the period January 1957 - December 1976 inclusive were obtained from the Sydney Stock Exchange. These companies, included from date of first listing on the Exchange rather than date of inclusion in the Index, comprise the basis of the sample. However, some minor changes were made; for example, three companies were deleted where records were imperfect. Moreover, the number of companies varied over the period, because of the entry of new listings and removals due to liquidation, receivership, merger and takeover.

The industry classification used has been adapted from the present scheme adopted by The Australian Associated Stock Exchanges. An inspection of classifications of companies throughout the period and analysis of their main activities led to some adaptation of the stock exchange coding for some companies. The industry groups are shown in Table A.

Monthly rates of return, including dividends, were computed from last sale prices and dividend information published in the Sydney Stock Exchange Official Gazette, the Australian Associated Stock Exchanges' Australian Stock Exchange Journal, and company reviews issued by the Sydney Stock Exchange Research Service. Adjustments were made for rights issues, issues for purchase of properties and companies, takeovers, mergers and similar activities. Where necessary further checks were made from company balance sheets and reports and from The Australian Financial Review. In those instances where dividends had been remitted from overseas, appropriate adjustments were made to bring such dividends to a comparable basis with local dividends gross before tax.

TABLE A INDUSTRY GROUPS IN THE SURVEY

Industry Group	Total Companies in Group
Banks	6
Insurance and Trustees	9
Finance: Instalment Credit	11
Finance	13
Pastoral	16
Transport	14
Retailers and Merchants	27
Media and Other Services	14
Food, Drink and Tobacco	28
Breweries	6
Textiles and Clothing	26
Chemicals and Petroleum	16
Paper and Paper Products	10
Steel and Engineering	27
Builders' Supplies	30
Developers and Contractors	17
Electrical and Durables	17
Automotive Distributors, Assembly and Equipment	20
Metals and Minerals	18
Gas	4
TOTAL	329

FOOTNOTES

1 The data base is described in the Appendix.

2 Because of thinness of trading, the Bank of Queensland was excluded from the sample.

3 Runcie and Burke (1969, p.110) compute the ratio of the after tax profits to shareholders' funds for fifty-one Australian finance companies for each of ten years from 1953 to 1962 inclusive: 17.8, 20.1, 18.9, 15.4, 15.2, 15.1, 12.6, 12.0, 8.3 and 6.1 per cent.

4 We are grateful to Robert Brown for this point.

5 The ammouncement of the change was made on 7 November.

6 The results are not strictly comparable to the monthly results reported earlier because of the different basis of computation.

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