# Chapter 1

# Overview

## 1.1 Introduction

In the early 1970s Ronald McKinnon (1973) and Edward Shaw (1973) attributed the poor performance of investment and growth in developing countries to financial repression. Interest rate ceilings, high reserve ratios and directed credit programs were viewed as sources of financial repression. The main symptoms of which were low savings, credit rationing and low investment. Investment suffered not only in quantity but also in quality terms since bankers did not ration the available funds according to the marginal productivity of investment projects, but according to their own discretion. Liberalisation of financial markets was suggested, so that with the real rate of interest adjusting to its equilibrium level, saving and total real supply of credit would expand. Thus inducing a higher volume of investment. Low-yielding investment projects would also be eliminated. Economic growth would, therefore, be stimulated not only through the increased investment but also due to an increase in the average productivity of capital.

Resulting from work on the McKinnon / Shaw analysis has been the conclusion that to achieve efficient resource allocation, credit markets need to be supplemented by a well functioning equity market (Cho, 1986a). This is because, unlike bank borrowings, equity finance is not subject to adverse selection and moral hazard effects under the conditions assumed. It was thus concluded that substantial development of equity markets is essential for successful financial liberalisation.

However, recent research conducted on developing countries stock markets shows that these markets did not complement the effects of credit market reforms but rather, in important respects, subverted them. Many developing countries have implemented credit market liberalisation and raised real interest

rates. However this increased only the price of debt capital, not all capital (Singh, 1995). There was thus a share price boom in many of those countries. The consequent sharp fall in the price of equity capital seriously undermined and indeed allowed large private corporations to bypass altogether the main channel of high real interest rates through which the M-S effects are supposed to operate.

This study using time series cointegration analysis examines the impact of stock market development on South Africa's industrialisation and long term economic growth. Thus the thesis that stock markets lead to faster economic growth (Fry, 1997b) is tested.

## 1.2        **Importance of the Study**

The study is particularly important for a number of reasons:

- Recently several financial participants have been arguing for the introduction of provincial stock exchanges with the belief that it would give provincial corporations, who would otherwise encounter high transaction costs in seeking listings in Johannesburg, easier and cheaper access to capital (Lascaris & Hunt, 1998). The effect of the stock market on national economic development would serve as a yardstick in estimating what the effect would be on provincial economies if such an expansion were to be approved.

- Furthermore, the JSE Securities Exchange has introduced the initial stages of an internet based primary market that aims to give small and medium enterprises alternative access to capital[1]. The usual sources of these funds, banking institutions, have recently been under the spotlight for monopolistic abuses, inadequate government regulations, collusion and the problems associated with moral hazard and adverse selection. However, current international research suggests that countries are potentially better off reforming and expanding their existent group-banking systems rather than

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[1] The Alternative Exchange (AltX) opened on Monday 27 October 2003 with a total membership of nil. This followed a similar failure by the Development Capital and Venture Capital submarkets to attract many companies.

expanding stock markets (Somel, 1992). Reforming the existing system not only absorbs less resources directly, it also is an easier option in terms of institutional capacity compared with the infrastructure required for well-functioning stock markets (Akyuz, 1993).

- Finally, South Africa frequently weathers the storms of emerging market contagion and the effects of such volatility are important to be studied, especially as South Africa wishes to engage in high level leadership surrounding the reform of the international financial system.

## 1.3        **Problem Formulation**

Ever since the pioneering contributions of Goldsmith (1969), McKinnon (1973) and Shaw (1973), the relationship between financial development and economic growth has been an important area of debate. Different aspects of the relationship between financial development and economic growth have been studied at both theoretical and empirical levels. These studies have been primarily concerned with whether financial deepening leads to improved growth performance and have attempted to analyse the strength of that relationship. More recently, prompted by interest in the endogenous growth school of thought, a few have tried to focus on identifying the channels of transmission from financial intermediation to growth.

Growth in per capita income arises from two sources: accumulation of physical capital and, the more efficient use of resources. The efficiency of resource use may be driven by superior techniques but may also arise out of policies and institutions. Financial factors such as the development of the stock market and the deepening of the banking system have potentially been argued to exert an influence through both channels. They affect the availability of savings but also affect the intermediation of those savings to the highest return opportunities.

Financial repression as an impediment to economic development has been a central feature of discussion in most growth literature. If growth requires investment then three conditions must be met:

- firms (and/or the government) must be willing to invest,

- savings must be available, and

- these savings must be channelled to those who can invest them at the most attractive rates of return.

The financial structure and institutions can support or disrupt this process. In a repressed system (especially in the presence of high and unstable inflation) a number of development channels are affected:

- saving vehicles are underdeveloped and/or the return on saving is negative and unstable,

- financial intermediaries who collect savings do not allocate these savings at their most competitive uses, and

- firms are discouraged from investing because poor financial policies reduce returns or make them unstable (Dornbusch & Reynoso, 1989)

Perhaps the most frequently cited example of successful elimination of financial repression is Korea's stabilisation of 1965. Korea shifted from repressed financial markets to financial reform, a shift that was instrumental in bringing about a dramatic change in her economic development. After experiencing low growth and increasing financial instability in the post-war period of 1963-64, her performance deteriorated further. Much higher inflation, together with a ceiling on interest rates, reduced real asset returns. Then, following the recommendations of the Stanford School, a broad-based fiscal, financial and externally balanced reform was introduced. Much of the credit is commonly attributed to a shift toward positive real deposit rates (see Table 1.1)

**Table 1.1:    The 1965 Korean Financial Reform**

|                       | 1960-64 | 1965-69 |
|-----------------------|---------|---------|
| **Real Deposit Rate** | -0.7    | 14.3    |
| **National Savings Rate** | 4.9 | 12.9    |
| **Growth**            | 5.5     | 10.0    |

**Source:** Cole & Park (1983)

The improvement in Korean economic performance aside, the question remains whether financial reform was the chief or essential agent of change. Scepticism focuses on the assertion that high real deposit rates, to some extent at least, simply moved resources from the curb market to the formal banking system. That resource allocation was improved as a result, or that saving increased in response to higher bank deposit yields has not been shown. Dornbusch & Reynoso (1989) contend that the increased savings may also reflect the fiscal correction and real depreciation which promoted export growth and guarantee programs on foreign borrowing and their resulting capital inflows. Simply, they argue "the correlation of growth and financial deepening is not tight ... t is apparent that by judicious choice of sample any partial correlation can be generated".

This contradicts sharply the original contributions to the literature which all suggest that a strong positive correlation between the extent of financial development and economic growth exists. Granted, there are different channels of transmission. Goldsmith (1969) emphasised the relationship between financial development and the efficiency of investment, while McKinnon (1973) and Shaw (1973) held, to the financial liberalisation / increased savings (and hence investment) argument.

By focusing on cases where the marginal product of capital is always positive, endogenous growth literature provides a natural framework where financial markets affect, not just transitional, but long run growth. Models in this vain by Bencivenga & Smith (1991) and Greenwood & Jovanovic (1990) for instance, emphasise how the creation and growth of banking institutions lead to a positive

relationship between financial intermediation and economic growth. Most of these studies highlight the role financial intermediation plays in improving the efficiency, rather than the volume, of investment.

Still, although empirical studies often find indicators of financial development and growth positively related, there is much controversy about what these relationships actually mean. There are two main problem areas:

- First, there is debate over how the extent of financial intermediation should be empirically measured. Typically a proxy indicator of the level of real interest rates or monetary aggregates has been used, all with significant interpretation problems. A brief review of these issues will be made in Chapter 4.

- The second area of disagreement concerns the channel of transmission from financial development to growth, thus making this study timely. While some studies find support for the McKinnon-Shaw thesis, others argue that no clear relationship between measures of financial development and savings or interest rates exists.

Financial development, it has been argued, has a dual effect on economic growth. Not only does the development of domestic financial markets enhance the efficiency of capital accumulation, it also contributes to raising the savings rate and, thus, the investment rate. The former effect was first posited by Goldsmith (1969), who also found some positive correlation between financial development and the level of real per capita GNP. He attributed this correlation to the positive effect that financial development had, in encouraging more efficient use of capital stock: "Irrespective of whether or not the existence and development of a financial superstructure increases the aggregate volume of saving and investment and thus accelerates the rate of economic growth beyond what would have otherwise been, there is no doubt that it results in a different allocation of capital expenditures among and within sectors, types of tangible assets and regions".

Also, Goldsmith (1969) argued that the process of growth had feedback effects on financial markets by creating incentives for further financial development. McKinnon (1973) and Shaw (1973) extended this earlier argument by noting that financial deepening implies not only higher productivity of capital but also a higher savings rate and, therefore, a higher volume of investment. Unlike Goldsmith (1969) however, where both growth and intermediation were seen as endogenous, McKinnon (1973) and Shaw (1973) focused on the effects of public policy regarding financial markets on savings and investment. In particular they argued that policies that lead to financial repression (for instance, controls that lead to negative real interest rates) reduce the incentives to save. Thus lower savings result in lower investment which in turn leads to lower growth. Hence they concluded, that higher interest rates resulting from financial liberalisation prompt households to increase savings. As will be discussed in more detail in Chapter 3, the validity of the McKinnon-Shaw analysis has been challenged by various authors.

However, it can be mentioned here that, Diaz-Alejandro (1985), for instance, names Latin America as an example where banking sector development is unlikely to increase savings. Rather, the main contribution of financial deepening to growth should be seen as increasing the marginal productivity of capital, rather than the volume of savings and investment.

Recent theoretical work has included the role of financial factors in models of endogenous growth in an attempt to see formally the interactions between financial markets and long-run economic growth. Greenwood & Jovanovic (1990) created a model where both financial intermediation and growth were endogenous (*c.f.,* Greenwood & Smith, 1997). In this framework, financial institutions were charged with collecting and analysing information to channel investible funds to those activities yielding the highest returns. Since this activity involves costs, Greenwood & Jovanovic (1990) showed that there was a positive two-way causal relationship between economic growth and financial development. On one hand, the process of growth stimulates higher participation

in financial markets thereby facilitating the creation and expansion of financial institutions. On the other, financial institutions, by their collection and analysis of data about many potential investors, were able to allow investment projects to be undertaken more efficiently and thus, stimulated investment and growth.

Bencivenga & Smith's (1991) model had individuals facing uncertainty about their future liquidity needs. They could choose to invest in a liquid asset – which was safe but had low productivity. Or in an illiquid asset – which was riskier but had higher productivity. In this framework, the presence of financial intermediation increases economic growth by channelling savings into the activity with high productivity, while at the same time allowing individuals to reduce risk associated with their liquidity needs. Thus, while individuals face uncertain liquidity needs, banks, by the law of large numbers, face a predictable demand for liquidity and were therefore able to allocate investment funds more efficiently.

In the absence of financial intermediaries, individuals would have to liquidate their investment (*i.e.,* their savings held in illiquid assets) when liquidity needs arose. Thus, the presence of banks also provides the benefit of eliminating unnecessary liquidations. Interestingly, Bencivenga & Smith (1991) show by their model that growth increases even when aggregate savings are reduced as a result of financial development, simply because of the dominant effect financial development has on the efficiency of investment.

Along a similar vain, Levine (1992) studied the effects of alternative financial structures on economic growth. In his model, financial institutions raise the fraction of all savings devoted to investment and avoid premature liquidations of capital. Banks, stock markets, unit trusts and investment houses he contented, enhanced growth by promoting the efficient allocation of investment through various channels.

Saint-Paul (1992) developed a model showing the interaction between financial markets and technological choice. In his model, agents could choose between

two technologies: The first was highly flexible and allowed product diversification but had low productivity. While the second was rigid, more specialised and more productive. The economy was exposed to shocks to consumer preferences, which could result in a lack of demand for some products. Thus in the absence of financial markets, risk-averse individuals (consumer-producers) could prefer technological flexibility over high productivity. Financial markets in contrast, allow individuals to hold a diversified portfolio, which insures them against negative demand shocks and, at the same time, allows them to choose the more productive technology.

In a somewhat different approach, Roubini & Sala-i-Martin (1992) studied the relationship between financial intermediation and growth by highlighting the role of government policy. Their model, in particular, allowed government to use financial repression to broaden the base of inflation tax. Financial repression thus yielded higher seigniorage to finance government expenditures. In an optimal taxation framework, where government had inflation tax and income tax (although subject to evasion) at its disposal, Roubini & Sala-i-Martin (1992) showed that high income tax evasion induces policy makers to repress the financial system and set a high inflation rate, in an attempt to generate compensatory revenue from inflation tax. Since financial repression reduces the productivity of capital and lowers savings, it hampers growth.

Taking a different view, De Gregorio (1993) and Jappelli & Pagano (1994) investigated the effects of financial market development on the savings rate. They focused on the effect of borrowing constraints (*i.e.,* the inability of individuals to borrow freely against future income) on economic growth. Thus they shifted the focus from the effects of financial markets on the production side of the economy to their effects on household behaviour. A result common to both studies was that full or partial inability of individuals to borrow against future income induced them to increase savings. This is because; when individuals are unable to borrow they must build up financial wealth by increasing savings in order to finance current consumption. Taken together, these studies suggest that

in general, financial deepening on the side of consumer credit is unlikely to increase savings and indeed the reverse is necessary. This may be able to explain the casual observation in Latin America where episodes of financial liberalisation have not increased the savings rate.

The conclusion from De Gregorio (1993) and Jappelli & Pagano (1994) that the relaxation of borrowing constraints was unlikely to stimulate savings does not necessarily imply that such a form of financial deepening will result in lower growth. De Gregorio (1993), in fact, held that the relationship between borrowing constraints and growth will ultimately depend on the importance of the effect of borrowing constraints on the marginal productivity of capital relative to their effect on the volume of savings. In particular, De Gregorio & Guidotti (1995) showed that a relaxation of borrowing constraints increases the incentives for human capital accumulation. This is then likely to increase the marginal productivity of capital and hence lead to higher growth indirectly, despite a reduction in savings.

### 1.3.1 <u>Sub-Problem</u>

During the 1980's and 1990's many developing countries have engaged in far reaching reforms of their financial systems, liberalising them and making them more market orientated. This liberalisation, which has been described as involving *inter alia* 'financial de-repression' has been inspired in large part by the work of the McKinnon and Shaw school. In addition to de-repression has been the movement toward the establishment and fast expansion of stock markets. For example, between 1982 and 1992, the total market capitalisation of companies quoted on the stock exchanges in a number of countries increased by a factor of twenty (Feldman & Kumar, 1994).

These markets have played a key role in the internal as well as the external financial liberalisation process in leading developing countries. However, recent opinion suggests that the actual behaviour of these markets in many countries has led to outcomes which undermine the effects of the higher interest rates

arising from 'financial de-repression'. Several scholars have held that, in general, financial liberalisation and the associated expansion of stock markets, in developing countries, is likely to hinder rather than assist their development. This, they argue, is for several reasons:

- First, the inherent volatility and arbitrariness of the stock market pricing process under developing country conditions make it a poor guide to efficient investment allocation.

- Second, the interactions between the stock and currency markets, in the wake of unfavourable economic shocks may exacerbate macroeconomic instability and reduce long-term growth.

- Third, stock market development is likely to undermine the existing group-banking systems in developing countries, which, despite their many difficulties, have not been without merit in several countries (Singh, 1997).

This contention, that stock market development hinders rather than promotes economic growth, being rather controversial, needs to be tested empirically. The current study attempts to achieve this by building a model that represents the association between financial deepening (both bank and market led) on the one hand and growth on the other. This is done so that the relationship between stock market development and growth may be isolated and interpreted. The goal of the effort being to determine what effect expansion of the JSE Securities Exchange, between 1989 and 2001, has had on the economic growth of South Africa.

## 1.4 Research Objectives

The objectives of this study are to:

- build a model that augments the relationship between economic growth and banking development with inclusion of indicators for stock market development and volatility.

- test empirically the hypothesis that stock market development in South Africa has lead to faster economic growth. This is accomplished, following Arestis & Demetriades (1997), by the use of Johansen Cointegration Analysis.

- investigate causality and accept or reject the hypothesis.

## 1.5        **Methodology**

## 1.5.1        **Research Design**

Although there has been some attempt at using simultaneous equations (*c.f.,* Fry, 1997b) the empirical literature on this issue utilises primarily two different econometric methodologies: cross country regressions (*c.f.,* Barro, 1991) and time series regressions.

Many investigators share a great deal of scepticism in relation to cross-country regressions. The users of the technique acknowledge the sensitivity of the results themselves (Levine & Renelt, 1992; Levine & Zervos, 1996). There are problems which stem from heterogeneity of slope coefficients across countries (Evans, 1995). Convergence tests obtained from cross-country regressions are likely to be misleading because the estimated coefficient on the convergence term contains asymptotic bias (Lee *et al.,* 1996). The technique is predicated on the existence of stable growth paths and, recent research (Quah, 1993) shows that long-run growth patterns are unstable, making variations in results difficult to interpret. Moreover, cross-country regressions can only refer to the "average effect" of a variable across countries. In the context of the causality testing being proposed here, this limitation is particularly severe as the differences in causality patterns across countries is likely (Arestis & Demetriades, 1996), and this study is concerned with South Africa only.

These criticisms also apply to the use of simultaneous equations because systems are normally estimated by pooling data across countries. Moreover,

such systems may suffer from the problem of dynamic heterogeneity (Pesaran & Smith, 1995) inevitably leading to inconsistent parameter estimates.

This study contends therefore, that a time series analysis may yield deeper insights into the relationship between financial development and real output than either of the other methods.

### 1.5.2      <u>Model Specification</u>

The discussion thus far suggests that a general empirical model explaining the relationship between financial development and real output could have the following form:

$$Y = f(BC, SMV, MDEV) + error \hspace{3cm} (1.1)$$

The system will make use of four explanatory variables. Real GDP per capita (denoted Y) will measure growth. The other explanatory variables will be, first, the development of the banking system, taken as the ratio of bank credit to the private sector to GDP (denoted BC). This indicator, as argued in more detail in Chapter 4, has a clear advantage over measures of interest rates or monetary aggregates such as M1, M2 or M3, in that it more accurately represents the actual volume of funds channelled to the private sector (De Gregorio & Guidotti, 1995). This ratio is thus more directly linked to investment and economic growth.

Aware of the possible speculative pressures that are generated in the market, and as the next explanatory variable, it is important that an index of stock market volatility be included. This is measured by the sixteen quarter moving standard deviation of the end-of-quarter change of stock market prices and will be represented by SMV. See Pagan (1986) for a discussion of the limitations of these sorts of volatility measures however.

As the final explanatory variable it was important that a defendable indicator be chosen to represent stock market development. Theory does not suggest that

there is one particular measure that uniquely points to stock market development. However it does suggest that stock market size, liquidity and integration with world capital markets may effect economic growth. Thus a conglomerate index (equally weighted) of overall stock market development, such as that used by Demirguc-Kunt & Levine (1996b) will be constructed. It will be symbolized by MDEV.

### 1.5.3         Data Collection and Time Frame

Stock market data (end-of-quarter price indexes and capitalization) will be obtained from the computerized information system BFA-McGregor. GDP and bank credit figures will be obtained from IMF publications of *International Financial Statistics* as well as from the Reserve Bank's *Quarterly Bulletins*. The conglomerate stock market development index will be measured by including, at equal weighting, the:

- ratio of market capitalisation to nominal GDP (size);
- mean ratio of total value of trades to nominal GDP as well as to market capitalisation (liquidity); and
- ratio of foreign portfolio investments to nominal GDP (integration)

Stock market volatility will be calculated by first working out the logarithmic first differences of the end-of-quarter stock market price index. The 16-term moving standard deviations can then be computed from these quarter price changes, using as the mean the average rate of price change over a centred 4-year period.

The period under review will be from the first quarter of 1989 to the last quarter of 2001, a total of thirteen years of data. The computer software Easy Regression International (Bierens, 2001), which in its latest version is able to handle data in both Metric and Imperial format (*i.e.,* is non-specific regarding the use of decimal commas or decimal points), will be employed to handle the data manipulation.

## 1.6      <u>Data Analysis</u>

According to the strategy first proposed by Box & Jenkins (1970), a time series analysis contains three major components: pre-analysis of the data to help with model specification (sometimes called 'pre-testing'), model estimation and possibly a re-specification and finally evaluating the model. [Because cross-section and panel data analysis typically excludes this third step, an argument that this consequently produces a weaker methodology may be made].

Thus, the time series analysis to be presented in Chapter 5 will proceed along the following lines:

- Each of the series will be plotted against time.

- The series will be plotted against each other in pairs with $BC_t$, $SMV_t$ and $MDEV_t$ on one axis and $Y_t$ on another, once any appropriate Box-Cox transformations have been performed.

- Appropriate model-selection criterion will be used to determine the optimal lag length [*c.f.,* Granger & Teràsvirta (1994)].

- Stationarity will be tested for by investigating the autocorrelation coefficients of the levels of variables as well as the residual if that is parsimonious.

- The degree of augmentation in the unit roots at both the variable levels and their first differences will be arrived at automatically following the Campbell & Perron (1991) process.

- The Engle-Granger (1987) two-step procedure will be utilised to look for evidence of simple cointegrations.

- The Johansen (1988) maximum likelihood procedure will also be employed to find cointegrations.

- The requirement, that a time series model not just be specified and estimated but that some test be applied to it, remains equally important when causality tests are being undertaken. Thus, given the results from the cointegration tests, Error Correction Model (ECM) based causality tests using both the Engle-Granger and Johansen cointegrating vectors will be executed and their results compared.

- Finally, following Cochrane (1988), the variance of long-differences will be calculated to determine the persistence of volatility shocks to stock market development.

Because the study begins with a predetermined number of explanatory variables and included lags, a general to specific modelling strategy will be followed. Insignificant coefficients will be dropped and the equations re-estimated. This technique requires that in a set of $k$ variables, cointegrating relationships (r) be found such that $0 \leq r \leq k$-1. This results in a $k$- dimensional vector autoregression (VAR):

$$z_t = A_1 z_{t-1} + \dots + A_m Z_{t-m} + m + d \qquad (1.2)$$

where $m$ denotes lag length and $d$ is a Gaussian error term. While in general $z_t$ may contain $I$ (0) elements, as long as non-stationary variables are present, the formulation is exclusively restricted to $I$ (1) elements. Reparameterisation provides the vector error correction model (VECM) specification as:

$$\Delta z_t = {}^{k-1}\Sigma_{i=1} \Gamma_i \Delta z_{t-i} + \prod z_{t+k-1} + m + d \qquad (1.3)$$

The existence of $r$ cointegrating relationships quantifies the hypothesis as being:

$$H_1 (r) : \Pi = ab \qquad (1.4)$$

where $\prod$ is p x p and $a$, $b$ are p x $r$ matrices of full rank. $H_1$ (r) is thus the hypothesis of reduced rank of $\Pi$. Where $r>1$ issues of identification arise, requiring the most parsimonious specification be adopted. [The implications of Johansen's (1988) influential paper for the current study will be discussed in detail in Chapter 4 for those less familiar with this approach].

Although such a resulting model will be an approximation to the generating function it can still be used for causality testing, subject to the general limitations outlined in Chapter 4.

## 1.7       <u>Plan of the Report</u>

In Clem Sunter's (1994) highly acclaimed book *A Casino Model* he took the view that life is a gamble and that we are all born risk-takers. He argued that channelling our inherent gambling instinct constructively into the process of wealth creation gave the best chance of general upliftment. He wanted to see the conversion of South Africa's economy from an exclusive club into a casino open to all. Although stock market development is a common feature of financial and economic development, many analysts contend that it is indeed "a casino" that has little positive and a potentially large negative impact on a country's growth. This is the crux of the present study, of which the remaining chapters are structured as follows:

Chapter 2 will discuss "Financial Repression and Liberalisation". It will survey the literature regarding the real effects of financial repression and de-repression. The Mckinnon-Shaw analysis will be documented here.

Chapter 3 will examine "Intermediation and the Stock Market". It begins first with a discussion of the co-evolution of the real and financial sectors in the growth process and goes on to examine the current critique of de-repression programs, especially with regard to Stock Markets as intermediation channels. The research problem is thus elucidated.

Chapter 4 presents "Research Methodology". Taking the research problem that has been outlined in the previous chapter into perspective, it begins by showing how the null and alternative hypotheses were selected. It will also discuss in detail the rationale behind each of the steps undertaken to estimate and evaluate the time series model, emphasising why they, in particular, are relevant to the current study. Finally, it will also, importantly provide justification for the various variables employed in the model specification.

Chapter 5 presents "Analysis and Results". In this chapter each of the nine analytical approaches described in Chapter 4 will be executed and documented. An interpretation of the results obtained at each step will be made.

Chapter 6 will be the "Conclusion and Recommendations" chapter. Here the study will be summarised and the conclusions will show how the objectives were answered. The study will end with appropriate recommendations regarding financial sector reorganisation with a developmental focus.