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Financial Policies, Growth, and Efficiency

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Severely repressive financial measures typically result in slower growth and less efficiency. Growth affects profitability and thus interest rates—but the reverse may also be true: interest rates and the degree of investment may affect efficiency and growth. The evidence supports the need for financial liberalization.

For a variety of reasons, most developing countries intervene extensively in financial markets. In the industrial countries, interest rates have been liberalized in the last two decades and restraints on competition between different types of financial institutions have been relaxed, but many developing countries still set ceilings on interest rates and spreads and most allocate much (often between half and all) of formal credit to "priority" uses.

The impact of interest rate controls and other repressive financial policies on investment, efficiency, and growth has been debated for some time. In this study, Alan Gelb reviews theories on both sides of the debate and investigates such relationships using a cross-section analysis of 34 countries between 1965 and 1985. He divides this 21-year period into two periods, breaking at the year 1973 to take into account the substantial change in growth relationships evident in many countries from about that time.

Real (deposit) interest rates in developing countries were lower on average than world (dollar) levels, especially after 1973—despite these countries' supposed status as capital-scarce.

Gelb finds a significant positive correlation between growth rates and interest rates as well as between efficiency (the incremental output/capital ratio) and interest rates—but little relationship between interest rates and investment levels and no relationship between interest rates and the current account.

These relationships partly reflect the influence of growth on profitability and thus interest rates—but there also appears to be a causal link in the other direction: interest rates and the degree of financialization of savings flows (in terms of both flow and stock) affect efficiency and growth.

The average growth difference between the 17 higher-growth countries and the 17 lower-growth countries was 3 percent. About half of one percentage point of that difference might have been due to the differential of 6 percent in the real interest rates of the two groups.

The evidence supports the need for liberalized financial markets, Gelb concludes—or at least supports an argument against severe financial repression.

That is not to say that abrupt liberalization is desirable or that certain interventions in financial markets may not be beneficial—at least until measures to improve information, supervision, regulation, and macrostability have become effective.

This paper is a product of the Financial Policy and Systems Division, Country Economics Department. Copies are available free from the World Bank, 1818 H Street, NW, Washington DC 20433. Please contact Maria Raggambi, room N9-031, extension 61696 (34 pages with tables).

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1. Introduction

For a variety of reasons, most developing countries intervene very extensively in financial markets. Interest rates have been liberalized in the industrial countries over the last two decades and restraints on competition between financial institutions of various types have been relaxed. However, despite some moves towards liberalization of financial markets, many developing countries still set interest rate ceilings and spreads, and most allocate a high percentage of formal credit (often between 50% and 100%) to "priority" uses.

The impact of such controls on the financial system on overall savings, investment and growth, has been debated for some time. This study investigates some cross-section relationships between interest rates, inflation, financial depth and resource mobilization, investment, its efficiency, and growth rates, across a sample of 34 developing countries over a 21 year span. This is a more extensive data base than used in most prior studies. It tries to address the question: how much, if at all, do broad financial variables seem to matter, and if they do, through which channels?

A cross-section approach is used because the regulatory environment and characteristics of the financial system are seen as structural features of economic policy, and the focus is on broad, long-term relationships, rather than on lags and the dynamics of adjustment. Accordingly, regressions are estimated on simple averages of variables over the entire time period. But because of concern over the stability of certain important relationships, they are also estimated for a pooled sample of averages across two sub-periods, 1965-73 and 1974-85. The choice of 1973 as a break point is suggested by the large global fall in the ratio of incremental output to investment which began about that time and which appears to relate to factors other than financial markets.[1]

For broad, long-run relationships, it is especially difficult to infer causal chains from statistical relationships, and this is a serious problem for studies of the present topic. In virtually all previous studies

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1 For discussions of this deterioration in the efficiency of investment, see Fischer, 1988, Bruno and Sachs, 1985, Gelb, 1988.

involving interest rate policy, the interest rate regime (which is taken as a simple proxy for the degree of financial repression) is invariably taken as exogenous. But, as discussed below, it is very unlikely that real interest rate policies can be considered as exogenous even if rates are controlled rather than market-determined. Feedbacks should be expected from natural growth rates to acceptable interest rate levels, and these should cause an upward bias in the coefficients of any simple reduced-form relationship between interest rates and growth. For this reason, any such relationships should be interpreted with caution.

The next section briefly reviews theoretical arguments in favor of market-determined financial policies and against them, and the endogeneity of interest rates. Section 3 summarizes some related studies. Section 4 outlines the data base, and discusses some cross-country averages. Section 5 reports on results, and attempts to estimate some causal chains. Conclusions are in Section 6.

2. Financial Markets, Efficiency and Growth: Some Theories

2.1 Arguments for Liberalized Financial Markets

At least since the seminal works of McKinnon, 1973, and Shaw, 1973, the relationship between the financialization of economic activity, financial sector policies and economic performance has been debated. Before these studies, financial assets were commonly held to be competitive with real assets, because savers could hold wealth in either form. This argued for repressing the returns on financial assets, to encourage capital formation and growth. However, this view, which also finds an echo in Keynesian theory, neglects the other side of the balance sheet of those entities with financial liabilities. If they are to remain solvent, they must invest the corresponding resources in real assets yielding at least as much as they pay on their liabilities. It also skates over the problem that savings might be diverted into foreign assets, gold, consumer durables and land rather than into domestic capital formation.

Repressing the returns on financial assets, either through inflationary confiscation of real money holdings or through holding interest rates at below-market-clearing levels, is now quite widely held to affect growth negatively through two main channels:

(1)   The first involves the use of resources derived from the sale of financial assets to fund productive real assets--either fixed or working capital--and therefore with capital formation and the level of capacity use. From the perspective of households, the ultimate net savers in most economies, financial assets are substitutable with fixed assets of other kinds,

especially consumer durables and real property, notably land. Alternatively, foreign and domestic financial assets might substitute, with financial repression causing capital flight; either way, domestic investment is reduced.[2] If substitution effects dominate in households' choice functions, repressing returns on financial assets could also raise consumption. Real interest rates held well below market clearing levels therefore reduce productive capital formation.

(2)   The second channel--capital market fragmentation--involves the constraining of investment opportunities by the possibilities of self-finance. Fragmentation may be on an agent-by agent basis, between savings surplus and savings deficit units. In addition, the absence of an asset with reasonable liquidity attributes and capable of providing a store of value prevents period-by-period budget constraints from being replaced by a single longer-run intertemporal constraint. If there are scale economies in investments, this may prevent investments from being made at their appropriate scale, because there is no efficient way of accumulating saving for sustained periods to make lumpy--and productive--investments. In addition, rationing schemes introduced to allocate the limited volume of formal credit usually direct funds to less productive uses in repressed systems. The outcome is slower growth, and perhaps also a deterioration in the quality of the portfolio of financial intermediaries. The latter are less accountable for their lending decisions and have fewer incentives and less scope for screening borrowers according to risk. Such deterioration of loan procedures is evident in many cases.

Thus, the availability of a limited volume of low-cost funds can result in poor-quality projects, especially those financed by formal lenders. Meanwhile, interest rates in the informal sector remain far higher, squeezing out better investments. In addition, substantially negative real interest rates in the formal sector can bias choice of technique against labor-using activities which further reduces the efficiency of investment, especially for larger projects. And the absence of financial contracts which offer a wide spectrum of risk-return characteristics, a situation which is common in repressed systems, further constrains choice and lowers efficiency. For example, such systems fail to provide facilities to firms to hedge against

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2 Interestingly, McKinnon, 1973, considers manufactured products as the main alternative to financial assets, despite the dominant role of property, and, especially land, in household portfolios in most developing countries. This choice leads him to select the wholesale price index as the measure of inflation, whereas consideration of property might suggest a different index. Considering foreign assets would suggest another index involving the exchange rate: low returns on financial assets have encouraged capital flight from many countries, notably in Latin America where Deppler and Williamson, 1987, estimated cumulative capital outflows at $107 billion in 1975-85.

interest rate or foreign exchange risk, or to share the risks of large projects. This may be especially problematical in developing economies which are typically more volatile than industrial countries.

All of these reasons argue that:

"Whether the authorities decided to nourish and expand the "real" stock of money...or allow it to remain shrunken and heavily taxed, has critically affected the relation between savings and income and the efficiency of investment in a number of countries.."

McKinnon, 1973, pp. 3.

2.2 Arguments for Repressed or Directed Financial Markets

Against these points, a number of arguments can be made to the effect that an inflationary process and measures to reduce interest charges can be beneficial to sustained growth. According to some theories of income distribution, inflation redistributes wage income from low-saving workers to high-saving owners of capital and this can raise growth.[3] Some argue that the promotion of high priority "productive" investment, with longer gestation periods and possible externalities, justifies suppressing their financial costs and so lowering their cost of capital. Another, "structuralist" view argues that higher interest rates on working capital are, anyway, simply passed through into costs and prices and hence are themselves inflationary.[4] In addition, times of economic crisis, which reduce the real value of much fixed capital, are often marked by accelerating inflation. A common response of governments is to attempt to protect equity-holders from cash-flow problems, or from the erosion of net worth (due to the crisis), by holding interest rates below inflation. Such considerations, together with the ethical aversion to interest which is prevalent in many major value systems, have influenced interest rate policies in many developing and industrialized

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3 This "Cambridge" savings function, and the macroeconomic closing rules which follow from it, are discussed by Taylor, 1986.

4 For a model of Korea with these characteristics see van Wijnbergen, 1985.

countries.[5]

The wisdom of financial liberalization has also been questioned following the results of sudden decontrol in the Southern Cone countries.[6]

A more recent argument in favor of interest rate controls derives from the work of Stiglitz and Weiss, 1981. Financial markets are unlike "real" markets in that information imparfections are far more important. In this situation, the interest rate which a borrower is ready to pay is more than a "price"; it is also a signal of the riskiness of the venture (with limited liability, the probability of not having to repay the loan rises with the degree of risk and so does the expected return to the borrower, assuming constant expected returns to the project). The degree of debt finance also biases the borrower towards more risky investments. Under these conditions, it may be shown that a market based financial system could ration credit away from the most productive borrowers. This, in turn, could reduce the efficiency of the economy relative to a situation where credit is directed through financial intermediaries (development or commercial banks) even if the latter make a loss.[7]

2.3 Portfolio Quality, Distortions and Economic Efficiency

Interest ceilings and restraints on competition between financial institutions are also sometimes imposed for prudential reasons. There is some

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5 Long-standing usury laws have sometimes been at the origin of regulations setting interest rate ceilings, for example, on rural credit in Brazil. Sometimes they can be approached through changing the form of financial contract; thus the Islamization of banking in Pakistan resulted in more flexible returns to financial asset-holders. Usury laws sought to prevent unanticipated wealth transfers from poor to rich. These can result from a lender with some monopoly power systematically undervaluing collateral and imposing high, and eventually unsustainable, interest burdens on the borrower. In pre-industrial societies without financial intermediaries and with rich lenders and poor borrowers tied also by a variety of feudal controls and with the borrower's body as ultimate collateral (serfdom, slavery) these concerns may have considerable validity. In modern financialised economies the distributional effects of low interest rate ceilings are likely to be the opposite. The poor are more likely to be small financial savers and the rich (the only ones with collateral since the demise of chattel slavery) are the dominant borrowers. Ethical systems have not kept pace with the evolution of economic institutions.

6 Corbo and de Melo, 1985, Diaz-Alejandro, 1985. McKinnon, 1988, compares these episodes with more measured decontrol in Asian countries.

7 This argument is in Cho, 1986.

evidence from the US that restraint can reduce risk-taking, but this is not an argument for interest rates held far below market levels or for extensive regulations on credit allocation.[8]

The relationship between financial saving and real capital formation is made more complex by the possibility of financial distress. The use made of borrowed resources is an important question in the developing country context, not only for the government (which is usually a major borrower), but also for debt issued by the private sector. One factor is the use made by government of the resources which it can generate by issuing liabilities. Government ought to be able to counter a strong preference for financial assets by the private sector by issuing paper and using the proceeds to fund productive investments, but it may also borrow to finance unproductive spending.[9] Because of the general weakness of portfolio audits and correspondingly poor information on the financial condition of intermediaries and debtors, the private sector may do the same. Resources raised by borrowing may then go to support consumption or poor investments, and yet the holders of the corresponding financial assets will view their claims as net wealth. It is therefore conceivable that for rather short periods financial deepening proceeds apace with declining real investment or unproductive capital formation.

In the end, of course, such a process will collapse. If government borrowing was excessive, the collapse will involve a fiscal crisis and inflation provoked by rising government debt service costs which are unsustainable in the face of low output and fiscal revenue growth.[10] Alternatively, there may be a financial crisis involving widespread insolvency of private borrowers and intermediaries. The recent experience of many developing countries and the prevalence of distress borrowing at escalating real interest rates suggests that this process of financial asset values becoming "unlinked" from the underlying value of real assets is not too unusual.[11]

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8 Increased competition and the phasing out of protected markets for banks have been partly responsible for the substantial increase in the losses of US banks since the 1950s: see Silverberg, 1989.

9 The alternative, to accumulate foreign reserves, is illustrated by the case of Botswana, where the government acts as deposit-taker of the last resort and had accumulated reserves equivalent to 23 months' imports by 1988.

10 Brazil in 1984 and Mexico in the mid-1980s appear to have been close to this point. Sargent and Wallace, 1981, analyse the inflationary potential of excessive debt issue.

11 For discussion of financial distress and crisis, see Hinds, 1988, Atiyas, 1989. The corollary to this argument is that financial liberalization should be preceded by, or be accompanied by, reform of prudential regulation and supervision.

Combining the distress borrowing phenomenon at high interest rates with the portfolio problems noted above which often emerge when lending is highly directed, suggests a relationship between portfolio quality and the level of returns on financial assets as shown in Figure 1. For a given economy, the interest rate at point A corresponds to a market-determined level, assuming effective prudential supervision and regulation. Points to the left of A correspond to repressed systems, with severe distortions in credit allocation, little freedom for banks to select creditworthy borrowers and weakened portfolios.[12] Points well to the right of A involve interest rates far above the returns on investment, and are sustained essentially as Ponzi schemes.

Another way in which real and financial asset values can become unlinked is through distortionary taxation. Debt may be sought, not to finance good investments, but because it gives rise to large tax write-offs. One such case occurs when inflation is high and nominal interest payments are deductible as costs from pretax profits.[13] Alternatively, one sector, such as industry, may be heavily and unjustifiably protected relative to another (agriculture), so that the impact on growth and efficiency of a rural financial system which siphons off rural savings to urban areas is negative.

Nevertheless, most analyses abstract from distress borrowing effects, taxation and second-best concerns, and assume that on the opposite side of the balance sheet to a financial liability is a real asset with productivity set by the need to service debt fully.

2.4 The Endogeneity of Real Interest Rates

There are powerful forces making for the endogeneity of returns to financial assets with respect to the rate of economic growth:

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12 To the left of A, as financial markets are more and more repressed and the supply of loanable funds shrinks, it is assumed that lending becomes more heavily directed. In these conditions, prudential supervision and regulation concentrates on fulfillment of rules rather than portfolio quality, and banks, with little lending discretion anyway, have less interest in the creditworthiness of their clients.

13 A recent study of this effect for Colombia confirms the substantial impact of eliminating such deductability of the inflationary component of interest payments on the cost of capital: Dailami, 1989. In principle, an offsetting effect of tax changes might come on the savings side, but in practice taxes are often avoided on interest receipts, so that the tax system confers a subsidy wedge via debt. In China, amortisation of principle is also deductible, a substantial incentive to acquire debt.

1.   Wealth portfolios include capital goods, financial assets and other assets, notably real estate and land. Large real increases in property prices--spurred perhaps by repressing returns on other assets--may indeed impact adversely on domestic savings rates, essentially because of consumption out of capital gains; see Tobin, 1966.[14] This introduces a relationship between interest rates, savings and investment (as measured in the national accounts) and growth. But another "stylized fact" of development is that, over the long term, real prices of fixed factors such as land also tend to increase at least as rapidly as the rate of economic growth and sometimes more rapidly. Such a process can be represented in a Cobb-Douglas or CES growth model with land entering into production and fixed in total quantity: land rent then represents a constant or rising percentage of GDP. This suggests that, in a rapidly growing economy, interest rates would need to be higher for financial assets to compete wit land and real estate in wealth portfolios than in one which grew slowly for other reasons.

2.   Growth models provide further arguments for the long-run endogeneity of the interest rate. Abstracting from the additional liquidity and convenience attributes of financial assets (and from distress borrowing), their return should be closely related to the rate of profit from owning physical capital. Over a range of growth models, the steady-state growth model which maximizes consumption per head (the "golden rule") is characterized by the identity of the rates of growth and profit; for discussion, see Hahn and Matthews, 1969. This holds regardless of the number of commodities in the model and the savings assumptions made, and a similar feature is characteristic of more recent optimum growth models. Higher growth would therefore be expected to be reflected in higher interest rates and, given the extra convenience and liquidity yields of financial assets, a situation where interest rates on these exceeded growth rates would probably be unsustainable over the long run.

        Economies with favorable preconditions for growth (including other aspects of the policy framework such as the trade regime) will therefore tend to have higher profit and interest rates. This, indeed, is the mechanism which would be expected to reallocate global fina towards the more rapidly growing economies. Rapidly growing economies would, on this view, tend to run

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14 For one example of the relationship between cheap credit availability and real land prices see World Bank, 1985, pp. 126-127. The impact of higher capital gains on residential property on falling levels of household savings in the early 1970s was a concern for the US in the 1970s. See also Summers, 1981.

On the other hand, the relationship between property prices and financial resource mobilization may itself depend on financial market structure. If mortgage finance is not easily available, it is sometimes argued (as in the case of Japan) that increasing property prices may stimulate savings towards downpayments for the purchase of property.

larger international deficits than slow-growing ones, where rates of profit are low and this constrains the sustainable level of long-term rates. Slow-growing economies would be expected to need periodic episodes of debt relief, for example, through inflating and holding interest rates below price level increases, to restore profits and growth. This may lower financial savings, yet spur growth:

"[M]ere abstinence is not enough by itself...It is enterprise which builds and improves the world's possessions...Thrift may be the handmaid and nurse of enterprise. Bu: equally, she may not....For enterprise is connected with thrift not directly but at one remove; and the link which should join them is frequently missing. For the engine which drives Enterprise is not Thrift but Profit.

Keynes, 1930, pp. 148-149.

A view that departs from the assumption that developing country rates are exogenously administered, would imply that low-interest countries with rationed credit and lending out of scarce domestic resources, would tend to run the largest foreign deficits. In contrast, a market-driven view suggests that foreign finance is attracted by higher yields and growth. Figure 2 depicts these different cases. Reality may be a blend of the two extremes, with one effect dominating for a range of countries where interest rates are more market-determined and the other dominant for a number of seriously repressed countries.

In a further complication, slow growth is not necessarily indicative of a low marginal product of investment. Existing capital stocks may have been rendered obsolete by large relative price changes, such as that for energy, but there may be high returns to new investments. In this situation, high interest rates will support structural change and, from the perspective of adjustment at the margin, will be helpful. However, they might also provoke widespread bankruptcies of existing firms, and this may make government reluctant to pursue a tight monetary policy.

For all the above reasons, simple relationships between interest rates and growth rates, such as have been found in a number of studies, must be treated with caution. The level of returns which a fast-growing country, such as Korea, is able to sustain without distress borrowing probably far exceeds the corresponding level in a country such as Argentina, where the growth process has been impeded by a variety of political factors and the general thrust of economic policy as well as its notable lack of stability. Liberalizing returns on financial assets, while maintaining asset quality through improved prudential supervision and regulation, might be a major step forward, but it would not transform an Argentina into a Korea.

3. Some Existing Studies

In putting forth his theory, McKinnon, 1973, investigated a number of interactions between the size of the financial sector (expressed, for example, relative to GDP) and rates of output growth for specific phases in the development of eight countries, using a case-study approach. He concluded that periods of high growth were associated with expansion, or recovery, of real monetary aggregates, and that it was within the capabilities of fiscal, monetary and interest rate policies to promote such expansion. Further, at least if inflation is moderate, a policy of high interest rates could offset much of the adverse effect on financial aggregates. These results should, of course, be interpreted as applying to countries on the left of A in Figure 1.

McKinnon's empirical work offered only limited statistical support for his hypotheses.[15] Later studies have estimated relationships between growth and financial policies for a wider selection of countries and time periods. This section briefly reviews a few of the most relevant studies.

Fry, 1978, tests the McKinnon-Shaw hypotheses that financial market conditions do influence saving and growth rates, using data for 7 Asian countries over 7-11 year periods, and estimating with pooled time-series cross-section data and country dummy variables. The real interest rate was found to exert a significant influence on domestic savings, and also on rates of growth. In a second paper, Fry, 1980, estimates the cost of financial repression using a three-equation model based on savings and growth functions estimated on a similar data set. He concludes that the cost of financial repression appears to be around half a percentage point in economic growth foregone for every one percentage point by which the real deposit rate is below a market equilibrium rate. A pooled time-series cross-section study of the interdependence of saving, investment and growth for 61 countries over an average of 11 years (without including the interest rate in the analysis) indicates that growth, income per head, terms of trade, relative size of the mining sector and lagged savings rates affect savings positively, while foreign savings and the predictability of inflation from a three-year trend reduce it. Investment rates respond to output growth, terms of trade, "unexpected" inflation, lagged investment, domestic credit availability relative to GDP and changes in this ratio. The latter two variables can be considered as proxies for the influence of interest rate policies and/or inflation rates which affect the holding of real financial assets and thus determine the availability of credit.

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15 In addition to the number of countries and periods being small, these were chosen to include episodes of wide-ranging economic reform of which financial sector reforms comprised only one component.

Using a sample of 21 countries, a study by the **International Monetary Fund, 1983**, analyses the cross-section relationship between average real interest rates, GDP growth and growth of broad money over the decade 1971-80. As expected, there is a close relationship between output and money growth, but, as output growth would be expected to promote growth of financial assets just as the latter might raise output growth, causation is not clear. However, the paper also finds significant association between the real interest rate regime and the growth of output and money, where the interest rate regime is a dummy variable, taking the values 1, 0 and -1, depending on whether the average real interest rate were positive, slightly negative or strongly negative over the period. Under the assumption that the interest rate regime so defined represents an exogenous policy variable, this suggests that output growth rates are indeed influenced by interest rate policies, in the direction suggested by McKinnon and Shaw. The paper does not address the question of the transmission mechanism between interest rates and growth in more detail; neither does it directly consider the role of interest rate policy as opposed to inflation.

Using a sample of 31 developing countries, **Agarwala, 1983**, examines the relationship between two performance variables, growth and equity, and seven distortions in product, factor and foreign exchange markets for the decade of the 1970s. The level of real interest rates was included as one of the seven distortions. Only a weak relationship was found between interest rates and growth, but this may have been due to the ranges chosen to classify the countries: only two were classified as having low interest rate distortions. A composite distortion index, formed by arithmetic averaging of the seven distortions, explains 34% of the cross-country variation in growth rates.

Hanson and Neal, 1987, estimate the demand for broadly defined money, estimating a partial adjustment model of asset demand for 36 countries over periods of approximately 20 years. Inflation was a powerful determinant of financial asset holdings, while nominal term deposit rates, though generally positive in impact, had a less clearly identifiable role. Part of the reason for this may have been that nominal rates were typically administered, and adjusted too little and too late to compensate for inflation and other corrosive influences. In fact cross-section regression of the average nominal interest rate on average inflation showed that rates were adjusted by only 65% of inflation, so that the more inflationary countries typically had lower real interest rates. Cross-section regressions of financial asset holding that included as explanatory variables both average inflation and the average nominal interest rate produced a negative, though insignificant, sign for the latter, probably because of this interrelationship. Although the study did not go on to investigate the consequences of financial repression, it raises the question of whether the emphasis should be on interest rate policies or on the fiscal, monetary and

other policies which affect the inflation rate, when considering financial disintermediation. Is any observed cross-section relationship between real interest rates, efficiency and growth simply due to the negative correlation between real interest rates and inflation, and the impact of the latter? Or, given the importance of the means of payment M1 relative to quasi money in the financial systems of most developing countries, is it realistic to expect a large role for interest rate policies in the face of high and volatile inflation rates? These issues are further investigated by Neal, 1989's study of the determinants of financial depth in 117 countries for 1985.

Khatkhate, 1988, tests cross-country relationships between economic variables such as growth and investment and the level of interest rates for a sample of 64 LDCs during the period 1971-80 using a nonparametric Mann-Whitney test. No statistically significant difference was found between countries above and those below the mean real interest rate. The study concluded that the interest rate level itself had little or no impact on macroeconomic variables, at least when considered in isolation from other policy variables.[16]

Fry, 1988 and Gonzalez Arrieta, 1988, summarize existing studies in this area. While the former is inclined to support a positive association, the latter argues that the evidence is far from clear. In our view, despite considerable doubt on the extent to which liberalized interest rate or financial sector policies can, on their own, contribute to efficiency and growth, the weight of evidence of the above and similar studies supports a positive association. No known studies present strong evidence in favor of repressing financial systems.

4. Some Cross-Section Relationships for 34 Countries

4.1 Data.

The data base for the present study covers 34 countries over a period of 21 years, 1965-85. The countries chosen are in the Hanson-Neal, 1987, data set and the interest rate data are based on their study which tried to include only countries with meaningful interest rates. The interest rates are generally rates on deposits of around 3-6 months. These are complemented by data on output and population growth, investment and savings rates, narrow and broad money aggregates, current account and 1975 income per head, from International Financial Statistics World Bank sources and, in some cases,

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16 The difference between the high and the low-interest rate country groups in this study is only 3.5%, so that much of any statistical power in the "tails" of the distribution is eliminated. Also, the rank ordering between real interest rates, growth and incremental capital-output ratios is as predicted by the McKinnon-Shaw view. The results of the study are therefore not so much against this view as providing little support.

country sources.   All time-averaging is done by taking simple averages of annual variables, rates or ratios.   All real interest rates are ex post, that is, deflated by inflation over the same year.

For 11 of the countries it is also possible to obtain local stock market price indices from the IFC data base for an average of 8 years up to 1985, and these are also included in the data base.

Figure 3 shows the average real interest rate for the 34 countries relative to the rate on real 3-month US T-Bills for the period 1965-85.   Real rates in the developing countries have usually been below the real T-Bill rate by a considerable margin, and this widened in the second half of the period. US interest rates rose after 1979, and rates in many developing countries increased sharply but fell behind accelerating inflation after 1971.   Only by 1985 were there signs that the average rate in developing countries was approaching the US rate.   The mean real rate for the 34 countries declined from -2% over 1965-73 to -5% in 1973-85.   But the median fell less sharply, from -1% to -2% because rates declined precipitously in a few countries.

Some of the changes in averages between these two periods are indicated in Tables 1a to 1d.   Table 1a includes the whole sample.   Table 1b shows cross-country averages for the higher and lower-growers over the whole period.   Table 1c shows averages for the higher-growing halves of the sample in the two sub-periods, and Table 1d averages for the lower-growing halves.

Table 1a shows that after 1973, although investment rates increased from 21% to 24% of GDP, performance deteriorated sharply.   The average incremental output-capital ratio (IOCR) fell by over 50%, and growth slumped from 6% to only 3.6%.   Inflation soared from 18% to 34%, and the mean real interest rate fell from -2% to -5%.   Nevertheless, as countries continued to develop and financialise, the mean ratio of M3 to GDP rose from 28% to 35%. The Tables also show a notable increase in the cross-country variability of performance in the second period.   The gap between good and poor performers widened, especially for inflation (which rose little for the high growers). Tables 1c and 1d show large differences in the level of real interest rates between the higher and lower-growth countries, and that these widened in the second period.   Before 1973, nominal interest rates in the high-growth countries equalled inflation and in the low growers real rates were negative 4%; after 1973 these real rates fell to -1% and -9% respectively.   For the overall period, the low growers' real rates were 6 percentage points below those of the high growers and their ratio of M3/GDP was one third lower; their investment rate was somewhat lower (19% versus 26% of GDP) and their efficiency of investment (as measured by the IOCR) only 16% as opposed to 27%.

Tables la -ld also show averages for two other variables, RFSTS indicates the ratio of increases in real broad money balances to savings (Ratio of Financial Savings to Total Savings); it will be discussed further below, but it should be noted that RFSTS is lower for the slow growers, especially after 1973. An index of the volatility of inflation is constructed as the average absolute deviation of inflation from its value of the previous year. Volatility rose somewhat after 1973 for the sample as a whole, and was nearly twice as large for the low growers as shown in Table lb. This raises the question of whether deteriorated performance can be attributed to such instability, rather than just to the levels of inflation, interest rates, investment and so on.[17]

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[17] The increased uncertainty of the global economy appears to have been an important factor in the poor performance of the oil exporting developing countries: see Gelb, 1988, and the changes in energy prices, which relate to volatility, are assigned a considerable weight in explaining the OECD productivity slow-down: Fischer, 1988.

Table 1a

Cross-Country Averages: All Countries: for 1965-73 and 1974-85

Period	Early		Late	
	Mean	Std Dev	Mean	Std Dev
GDP growth	.06	.03	.04	.03
Real Int Rate	-.02	.07	-.05	.08
IncOut/CapRatio	.32	.13	.14	.12
Invest Rate	.21	.06	.24	.08
Inflation	.18	.34	.34	.47
M3/GDP	.28	.15	.35	.18
RFSTS[18]	.14	.10	.07	.13
Volatility[19]	.13	.28	.16	.23

Table 1b

Cross-Country Averages for Overall Period 1965-85

	High Growth Countries		Low Growth Countries	
	Mean	Std Dev	Mean	Std Dev
GDP growth	.06	.02	.03	.01
Real Int Rate	-.01	.04	-.07	.06
IncOut/CapRatio	.27	.08	.16	.07
Invest Rate	.26	.07	.19	.05
Inflation	.20	.23	.34	.41
M3/GDP	.39	.20	.26	.07
RFSTS	.15	.09	.05	.07
Volatility	.10	.16	.19	.21

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18 RFSTS measures the extent to which savings flows are reflected in increases in real broad money, and thus the extent to which they can be said to be "financialized." It is defined below.

19 Volatility is measured by the absolute deviation of inflation rates from their previous year's level.

Table 1c

Cross-Country Averages: High Growth Countries: for 1965-73 and 1974-85

Period	Early		Late	
	Mean	Std Dev	Mean	Std Dev
GDP growth	.08	.02	.06	.01
Real Int Rate	.00	.06	-.01	.04
IncOut/CapRatio	.39	.12	.22	.06
Invest Rate	.22	.07	.27	.07
Inflation	.19	.41	.20	.23
M3/GDP	.31	.18	.42	.20
RFSTS	.16	.10	.15	.13
Volatility	.10	.36	.08	.05

Table 1d

Cross-Country Averages: Low Growth Countries: for 1965-73 and 1974-85

Period	Early		Late	
	Mean	Std Dev	Mean	Std Dev
GDP growth	.04	.01	.01	.02
Real Int Rate	-.04	.08	-.09	.09
IncOut/CapRatio	.24	.10	.07	.13
Invest Rate	.19	.06	.21	.08
Inflation	.17	.26	.48	.60
M3/GDP	.25	.09	.28	.13
RFSTS	.12	.10	.00	.09
Volatility	.12	.18	.23	.30

Another feature of the data is the degree to which the performance of individual countries differs between the two sub-periods. The R^2 adjusted for degrees of freedom (RSqAdj) for the real interest rate (RR) between early and late periods is only 0.09.[20] For other variables, such as GDP growth, the IOCR, and RFSTS they are also very low (RsqAdj ranges from -0.02 to 0.26), so that the experience of countries is largely independent across the two sub-periods. This raises questions as to the value of selecting so long a period for cross-section analysis, especially given the size of the mid-point structural shift noted above. However, some averaging is necessary to bring out longer-run relationships.

Another point in considering cross-section analyses is how to interpret results when some variables, such as the real money stock, adjust to equilibrium values over a number of years. A country which successfully stabilizes very high inflation (such as Indonesia after 1967) might have a low average ratio of money to GDP for a considerable time because of a very low starting point; conversely, it might take some time for the impact of shrinking financial balances to be reflected in an average measure for a country with an initially deep financial system.

There seems to be no simple answer of how long sub-periods should be for an exercise of the present type, but the magnitude of the decline in IOCRs after 1973 does argue for splitting the period. Regressions have been run for both a pooled set of sub-period averages (that is, two observations for each country) and for the overall period averages. All regressions for the pooled sub-period averages include a time-shift dummy, GROUP, which is zero for 1965-73 and 1 for 1974-85.

As in Hanson and Neal, 1987, the inflation rate, INF, is a significant determinant of nominal and real interest rates, RN and RR respectively, but the linear relationship is less strong than might be expected: for the pooled sample over the two sub-periods:

$$RR = 1.08 \quad - \;.071 \; INF \quad - \;.024 \; GROUP \qquad RsqAdj = .15 \qquad\qquad (1)$$
$$\;\;(29.3) \quad\quad (-5.53) \quad\quad\;\; (-1.076)$$

T-values are shown in brackets below coefficients.

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20 Letting RRE and RRL be the early and late-period real interest rates:
$$RRL = 0.537 + 0.410 \; RRE \qquad\qquad RsqAdj = 0.088$$
$$\quad\;\;(2.7) \quad\;\; (2.0)$$

Do interest rates ever exceed growth rates? Figure 4 shows a scattergram of 1965-85 averages of output growth and real interest rates. For this period, average interest rates are below growth rates for all countries. However, over shorter periods averaged interest rates exceed averaged growth rates in a few cases. One such case is Chile: in 1974-85, a period marked by massive financial crisis and costly debt relief, interest rates averaged 4.5% and growth only 2.5%. Chile seems to have been on the right hand side of A in Figure 1 in this period. But growth rates for the slowest-growing countries are well below the average real interest rates which are sustained in the fastest growing countries. Unless liberalizing interest rates is itself assumed to sharply raise the growth rate, attempts to hold interest rates at world market levels in the slowest growers or in countries experiencing growth crises could therefore result in periodic episodes during which their governments seek to write down the real value of debt to restore profits.[21]

Figure 4 suggests that real interest rates and growth rates are quite strongly correlated. Table 2 shows the pattern of cross-correlation between average growth rates (DYY) RR, RFSTS, IOCR and the investment rate, IGDP pooling the averages over the two sub-periods. All coefficients are positive and significant at the 5% level except those between IGDP and RFSTS and IGDP and IOCR which are not (and were not expected to be) significantly different from zero; the relationship between RR and IGDP is also not significant at the 5% level.

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21 An example of such a strategy was Brazil in 1982-83. As output fell and the country entered severe recession, monetary correction was held below inflation and real interest rates fell on a wide spectrum of financial assets and loans. Together with measures to insulate the private sector from losses on foreign exchange denominated debts, this policy allowed private firms to markedly strengthen their balance sheets over 1981-84.

Table 2

Correlation Table

(Correlation Coefficients/ Prob > R under HO: Rho=0)

	RR	RFSTS	DYY	IOCR	IGDP
RR	1.0000 0.0000				
RFSTS	0.5196 0.0001	1.0000 0.0000			
DYY	0.6193 0.0001	0.5668 0.0001	1.0000 0.0000		
IOCR	0.6175 0.0001	0.3714 0.0020	0.8249 0.0001	1.0000 0.0000	
IGDP	0.2130 0.0812	0.1916 0.1203	0.2997 0.0130	-0.1223 0.3203	1.0000 0.0000

4.2 Cross-Country Regressions.

4.2.1 Interest Rates, Growth and Efficiency

The first question is the relationship between interest rates and growth, and whether this is effected more through investment effects (that is, changes in the relationship of investment to GDP) or efficiency effects (as indicated by the incremental output capital ratio or IOCR). A range of regressions has been run on the overall averages and on the pooled set of two-period averages, for a set of "models" which progress from the simplest relationships to more complex ones. The latter include, as additional explanatory variables, GDP per head (GDPPE), inflation (INF), and population growth (POPGP). All pooled-sample regressions include the post 1973 shift dummy, GROUP. In some, the index of volatility was included.[22]

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22 Following IMF, 1983, some regressions were also run using interest rate ranges, with countries divided into three groups: interest rates positive, negative but more than -5% and less than -5%, but these did not add more to the analysis and will not be discussed further. Volatility usually entered with the "expected" sign, but was not significant.

Interest rates are indeed well-correlated with growth. For the overall period and the pooled set of averages respectively:

DYY = c + .256 RR   RsqAdj = .489   (2)
         (5.72)

DYY = c + .197 RR   - .018 GROUP   RsqAdj = .464   (3)
         (5.96)   (-3.47)

and these results are robust as other variables are included on the right hand side. Regressions shown below will be mainly for the pooled sub-period averages.

Interest rates are also a significant explanator of the IOCR:

IOCR = c + .989 RR -.139 GROUP   RsqAdj = .563   (4)
         (5.90)   (-5.39)

As the model for this relationship is made more complex the coefficient on RR tends, if anything, to increase. For the investment rate, results are far weaker and are also less stable:

IGDP = c + .248 RR + .042 GROUP   RsqAdj = .090   (5)
         (2.21)   (2.43)

As this relationship is expanded to include more variables on the right hand side, the coefficient of RR falls and it loses significance.

We can now begin to assess the relative strengths of the efficiency and investment effects in "explaining" the growth rate. Since, by construction, DYY = IOCR.IGDP, to a first approximation:

d(DYY)/d(RR)   = d(IOCR)/d(RR).IGDP + d(IGDP)/d(RR).IOCR

where underlined variables are cross-country averages. The results differ depending on whether a simple model or the more complex ones are used, because the coefficients on RR in equations (4) and (5) change as additional variables are added on the right hand side of the equations.[23] The results of simple and more complex models, estimated over the period 1965-85 and over the two pooled sub-periods are summarized in Table 3. In the simplest model estimated over the overall period, the efficiency effect is over twice as large as the

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23 The purpose here is not to estimate a specific investment or efficiency function, but assess the relationship between RR and the dependent variables and its robustness. Therefore a range of possible independent variables (or "models") has been used.

investment effect, and as additional independent variables are introduced on
the right hand side of the equations the former rises more and the latter
falls. The results for the pooled subperiod averages are quite similar, and
also the investment effect loses significance.[24]

TABLE 3

<u>EFFICIENCY EFFECTS AND INVESTMENT EFFECTS</u>

	<u>dYY/</u> dRR	<u>dIOCR</u> dRR	Efficiency Effect	<u>dIGDP</u> dRR	Investment Effect
<u>Overall Period</u> 1965-85					
Simple Model[25]	.26*	.96*	.22	.39*	.09
Complex Model[26]	.26*	.1.21*	.28	.24	.05
<u>Pooled Periods</u> 1965-73,74-1985					
Simple Model	.20*	.99*	.22	.25*	.06
Complex Model	.19*	1.11*	.25	.17	.04

* Significant coefficient at 5% level.

We may conclude that most of the estimated relationship between
growth and interest rates is effected through the output-investment component,
and that, once the influence of other variables, notably the level of income
per head, is taken into account, interest rates have little relationship with
the overall rate of investment.[27]

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24 It will be seen that the sum of the investment and efficiency effects exceeds ·
the total effect of RR on DYY. This is because of the negative correlation
between IOCR and IGDP which is evident in Table 2. The weakening of the investment
effect is mainly due to the inclusion of GDP per head as an explanatory variable.

25 Simple Model — right hand side variables — RR and shift
    group for pooled regression.

26 Complex Model — right hand side variables — RR, INF, POPGP
GNPPE.

27 Balassa, 1989, reviews evidence on the relationship between interest rates
and saving.

4.2.2 Interest Rates and Other Distortions

There is the possibility that an observed relationship between interest rates and growth merely reflects the effect of other policies which are correlated with financial market policies. It could be expected that countries with tight controls on interest rates and high inflation might also have tight, import-biased trade restrictions and other distortionary policies. Twenty three countries are common to the present sample and that of Agarwala, 1983, which specified distortion indices for a range of policies. For these countries, a modified distortion index, ODI, was formed from Agarwala's data, by subtracting from his aggregate distortion index, DI, the component due to interest rates, RI. The results of including ODI together with RR in the regression for the second sub-period are:

$$DYY = c + .192 \; RR \qquad RsqAdj = .423 \qquad (6)$$
$$(4.23)$$

$$DYY = c + .139 \; RR - .019 \; ODI \qquad RsqAdj = .493 \qquad (7)$$
$$(2.78) \quad (-2.00)$$

The inclusion of ODI does not raise the overall explanatory power much, but it does reduce the coefficient of RR. There may therefore be something in the suggestion that part of the coefficient of RR in simple equations really reflects other policies, but these do not dominate the regression and a strong relationship with interest rates remains. The weakness of the relationship between interest rates and growth found in Agarwala's study appears to have been due to the loss of information caused by uneven country grouping into ranges.

4.2.3 Financialization and Efficiency

The next step is to specify and estimate a "causal chain", defined as a set of structural equations with more plausible one-way causality. One such chain consists of two hypotheses:

1) the degree to which savings flows are intermediated through the financial system is related to the real rate of return available on financial assets;

2) the efficiency of investment, and the growth rate, are related to the degree of savings intermediation rather than just to the level of saving.

The first relationship departs from the portfolio choice of savers, who can choose to accumulate real wealth in the form of financial or real assets. There is no obvious theory to explain reverse causality. Indeed, a strong propensity to save in financial asset form should, if anything, reduce returns on financial assets by expanding the supply of loanable funds. There is also no obvious reason for the degree of savings intermediation to depend on the growth rate or IOCR. Although, as discussed above, returns on assets could be expected to be higher in fast-growing economies, this would apply to all assets (including land) and not only to those held in financial form. It is true that the ratio of monetary aggregates to GDP rises with higher income per head, but so does the rate of savings, so that the degree to which the latter are financialised does not obviously depend on income levels.[28] Estimates derived from chaining these relationships will therefore be more likely to indicate a causal relationship between interest rates and growth than a simple, one-stage regression.

The degree of savings intermediation, RFSTS, is defined as:

RFSTS — Real increase in M3/Gross domestic savings

where the numerator and denominator are deflated to allow for the fact that savings is a flow at average-year prices and monetary aggregates are measured at end-years.[29] In each period the economy is seen as setting aside a certain part of its total resources as savings. Part of this is used to invest directly in real owned assets (i.e., equity built up through retained earnings), and part is used to build up real financial assets. RFSTS measures the ratio between these. Averaged over the entire period, it ranges in value

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28 Such theories could be constructed. For example, fast-growing countries are likely to have a larger component of transient income than slow-growing ones, and savings out of transient income might be attracted to financial assets because of their greater liquidity. Transient components should be quite small in averaged data as used here.

29 The average-year price deflator p of the savings flow S during year t is taken to be the arithmetic average of the initial and end-year prices, p_{t-1} and p_t. Then,

RFSTS — $[M3_t/p_t - M3_{t-1}/p_{t-1}]/[S/p]$.

If the real savings flow and real money accumulation are constant within periods, this measure is invariant to inflation.

from 0.45 (for the most rapidly monetising economy) to -0.18 (for a rapidly demonetising economy with low savings rates). For the average country, 14% of the savings flow is financialized as measured here.

Using the pooled set of averages over 1965-73 and 1974-85, some equations for the two hypotheses are:

RFSTS = c + .817 RR   RsqAdj = .259
        (4.90)   (8)

RFSTS = c + .694 RR -.150 TSGD -.044 INF +.00003 GNPPE -.031 GROUP
        (3.82)   (-1.02)   (-1.27)   (1.29)   (-1.13)
                                          RsqAdj = .271   (9)

DYY = c + .113 RFSTS + .058 TSGD -.019 GROUP
        (4.98)   (2.026)   (-3.46)
                                  RsqAdj = .430   (10)

IOCR = c + .280 RFSTS -.098 TSGD - .160 GROUP
        (2.17)   (-.61)   (-5.21)
                                  RsqAdj = .367   (11)

From equations (8) and (9), the rate of savings intermediation, RFSTS, does respond to real interest rates, but the ratio of total savings to GDP, TSGD, inflation, and the level of GDP per head are not significant. This is especially surprising for inflation considering the large M1 component in broad money in most developing countries. The reason seems to be that only some of the low-inflation countries succeed in increasing financial depth, while in the higher inflation countries financial balances have usually already been drawn down to minimum levels so that the degree of further intermediation is zero rather than strongly negative (note that RFSTS measures incremental financial deepening not financial depth). Equations (10) and (11) suggest that the rate of savings intermediation influences the efficiency effect and, indeed, that it is more important than the volume of domestic savings in determining the growth rate. These results seem to be fairly stable to the inclusion or exclusion of other variables.

If we express growth as a function of savings intermediation (a proxy for efficiency or the IOCR) and other variables and then express intermediation itself as a function of the real interest rate and other variables:

DYY (RFSTS (RR,....),.....).

From the regression coefficients,

$$d(DYY)/d(RR) = d(DYY)/d(RFSTS) \cdot d(RFSTS)/d(RR) = 0.08.$$

Therefore, these regressions suggest that a rise in the real interest rate of one percentage point will translate, through an increase in the intermediation of savings of about 0.7 percentage points, into an increase of somewhat under one tenth of a percent in the growth rate. This is about 40 percent of the increase suggested by the coefficients of the equations between growth and the real interest rate estimated previously. Much of the previous relationship may therefore be due to reverse causality (from growth to interest rates), but the causal effect from real rates to growth is still considerable, and indicates an important role for financial sector policy in the growth process. In Table 1d, the growth difference between the high and low growth countries was 3 percentage points and the average interest rate difference was 6 percentage points; the latter might therefore have accounted for about 0.5 percentage points of the growth rate difference. Over 21 years this is not negligible.

4.2.4 Financial Depth and Growth

Another indication of the influence of the financial sector on growth could be provided by using the ratio of broad money to GDP (M3GDP) and its determinants as explanatory variables.[30] As noted above, the average of M3GDP over a period reflects the initial conditions as well as policies during the period, and thus could relate more to *average* productivity than to *incremental* productivity and growth during the period. M3GDP does appear to be related to growth rates, but it does not seem to weaken the association between interest rates and growth:

$$DYY = c + .180 \, RR + .034 \, M3GDP - .021 \, GROUP \qquad RsqAdj = .486 \qquad (12)$$
$$(5.22) \qquad (2.13) \qquad (-3.91)$$

Real interest rates are a significant explanator of M3GDP, but lose significance once inflation is included in an equation:

$$M3GDP = c + .251 \, RR + .0002 \, GNPPE - .141 \, INF + .099 \, GROUP \qquad (13)$$
$$(1.13) \qquad (5.92) \qquad (-3.36) \qquad (3.31) \qquad RsqAdj = .416$$

Equation (13) confirms the conclusion of Hanson and Neal that inflation has had a stronger influence on the level of monetisation than has the interest rate regime. At the same time, it seems that interest rates relate to growth independently of their effect on financial depth, and it was shown above that including inflation did not influence their impact on the financialization of savings flows. There is room for further research in these areas.

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30 M3GDP is computed as the average of M3 at the start and at the end of the year divided by the GDP flow during the year.

4.2.5 Interest Rates and the Current Account

Finally we note the results of regressions for the current account. With interest rates mainly demand-driven, the more rapidly growing countries with higher returns on investment and higher real rates would be expected to attract foreign savings and so be able to run larger current account deficits. On the other hand, countries with "regulation-driven" interest rates held at well below market-clearing levels might become more dependent on inflows of foreign funds to supplement shrunken volumes of domestic loanable funds.

The regressions above suggest that observed interest rate levels reflect a mixture of these two effects. It is therefore not too surprising that there seems to be little systematic cross-country relationship between interest rate levels and the current account.

4.2.6 Growth and Stock Market Performance

A number of developing countries have encouraged the development of equity markets. These markets are typically thin (with some exceptions; in relation to GDP the equity market of Malaysia is deeper than that of most developed economies). They are also usually very volatile, both because of more volatile macroeconomies and because of generally weaker information and prudential regulation. The question of whether the performance of stock markets relates systematically to macroeconomic variables or whether they are simply "casinos" is important for understanding the role of equities in absorbing risk in developing countries. The reverse question, whether the possession and performance of a stock market influences economic performance, is beyond the present scope.[31]

An extensive test of the characteristics of developing country stock markets is outside the scope of this paper. However, three simple questions may be addressed:
1) Do equity markets offer a hedge against inflation?
2) Does market performance, in terms of real appreciation of the stock price index, bear any systematic relationship to rates of economic growth?
3) Is there evidence that buoyant equity markets result from repressing the rate of return on other financial assets?

Annual local indices of equity prices were obtained for 11 developing markets covering an average of 9 years up to 1975. These were deflated by the price index to obtain RINC, the real increase in equity prices

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31 The role of the equity market in raising resources for investment is still negligible in most developing countries. For this reason, this study discounts the possibility of a strong causal link from the stock price index to growth.

over 8 years.[32]   RINC represents a minimum yield on the corresponding
portfolio of stocks, in that dividend payments are not included.   The 11
countries encompass a wide range of inflation and growth experiences.

As would be expected, the distribution of RINC is positively
skewed, and approximately loglinear. While there are more cases of negative
values of RINC, its average across countries and over time is 1.06 and its
standard deviation is 0.43.   There is thus a very wide dispersion in annual
real returns to holding equity but, unlike interest-bearing deposits, equity
appears to be, on average, a satisfactory hedge against inflation.

The relationship between growth, real interest rates, inflation and
RINC may be summarized in the following equation, which is estimated on the
pooled sample of annual data for all countries:

$$RINC = c + 3.84\ DYY + 1.25\ RR + 0.19\ INF$$
$$\quad\quad (4.6)\quad\quad (2.7)\quad\quad (3.5)\quad\quad\quad RsqAdj = 0.24.$$

The degree of explanatory power of this equation is not high, but it suggests
some relationship between growth rates and the performance of real equity
prices.   It also suggests that equity prices relate positively, rather than
negatively, to the levels of real interest rates and to inflation.

Another test of the growth-stock index relationship is provided by
the distribution of the 11 regression coefficients estimated for the set of
countries. Eight are positive (four significant at 5% level) and three
negative (one at 5% level). Finally, a scattergram of RINC against DYY has
the following distribution:

Table 4

Distribution of RINC versus DYY

No. of Observations		DYY	
		Negative	Positive
RINC Positive		3	38
Negative		15	32

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32   The markets are those of: Argentina, Brazil, Chile, India, Korea, Mexico,
Philippines, Pakistan, Thailand, Taiwan and Venezuela .

ChiSquare (1) = 8.1, significant at 0.01.

These results are very preliminary. There is need for further research on the performance of equity markets in developing countries, and its determinants and impact.

5. Conclusion

This study has used simple cross-country regressions to address the relationships between financial policies and growth. For several reasons, notably the poor proxies for financial policy (financial depth and interest rates), the diffused nature of any relationship, and reverse causality, these effects are difficult to isolate with confidence. With this caveat, the results of this study support the following propositions:

Despite their supposed status as capital-short countries, interest rates in developing countries have, on average, fallen below dollar rates, especially after 1973. This suggests a serious and widespread problem of mispricing financial savings.

Real interest rates and growth are associated positively, within the historical experience of the sample;

Most of this association relates to the efficiency effect (as measured by the IOCR) rather than the level of investment: the latter relates only weakly to interest rates;

Much of the interest-rate/growth relationship reflects reverse causality, from growth and efficiency to higher yields on all assets to higher interest rates. But at least part reflects the causal chain from interest rate levels to growth rates via the degree of financialization of savings.

The observed interest-rate/growth relationship may partly reflect the influence of other, related, distortionary policies, but the former is still powerful when the latter are included.

Financial depth does explain part of cross-country variation in growth rates but does not weaken the interest-rate growth association.

There is little relationship between interest rate levels and the current account.

A very preliminary analysis suggests that equity market performance in developing countries relates systematically and positively to growth rates, and that interest rate repression is not a cause of increases in stock prices.

These results therefore argue in favor of liberalized financial markets, or at least against policies which severely repress finance. This is not to say, of course, that abrupt liberalization is desirable, or that certain interventions which act to compensate for observed deficiencies in financial markets may not be beneficial, at least until measures to improve information, prudential supervision and regulation and macro-stability are effective.

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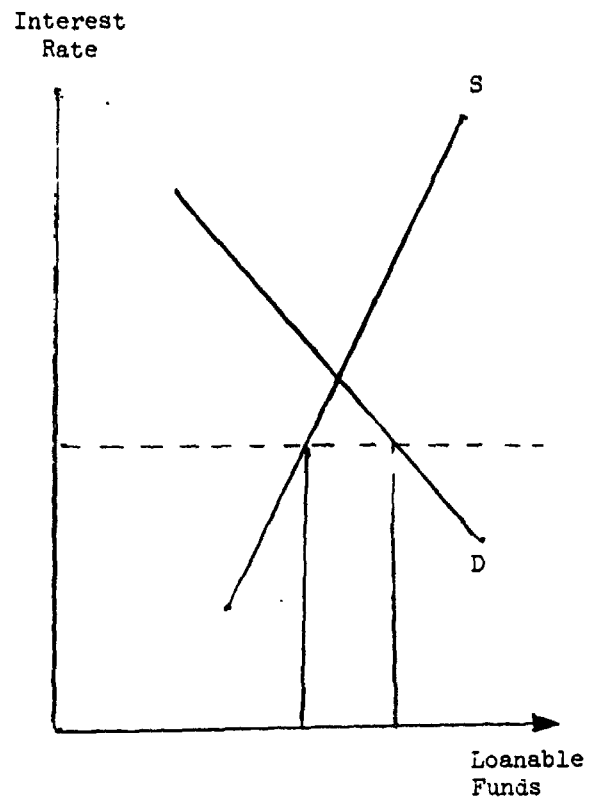World Bank, 1985, Brazil: Analize dos Sistemas Financieros, IBMEC, Rio de Janeiro.
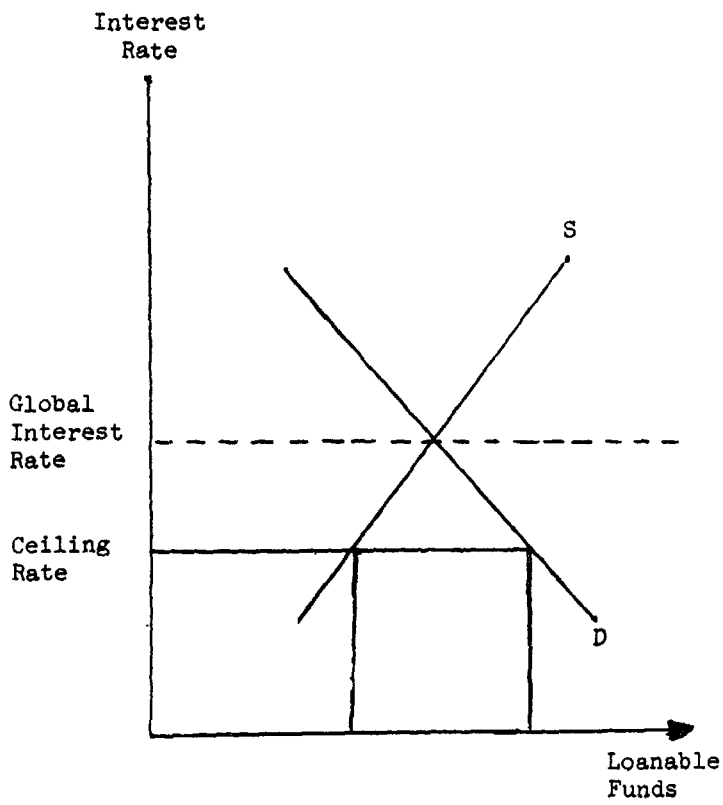
Figure 1

INTEREST RATES AND PORTFOLIO QUALITY

Figure 2
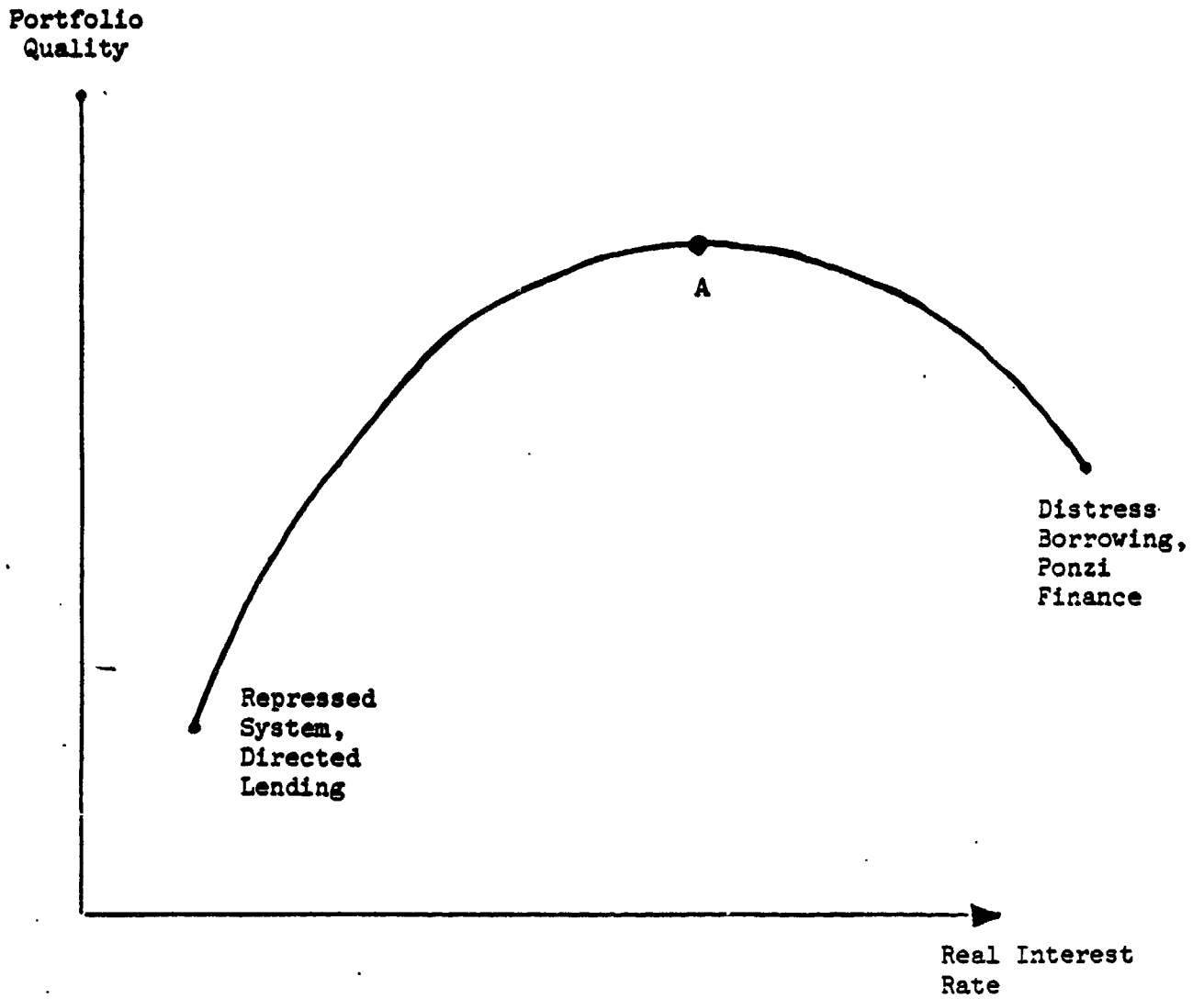
FOREIGN BORROWING

Repressed Financial System	High-Profit Economy

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