Financial Liberalisation and Domestic Saving in Economic Development: An Empirical Test for Six Countries

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Despite a voluminous literature stressing the importance of financial development in the process of economic growth, a convincing theoretical framework was lacking until the recent publications of McKinnon [19] and Shaw [25]. Indeed, neoclassical growth theories provide, in the main, a negative role to the monetary process. Here, a reduction rather than an increase in real returns on financial wealth stimulates saving and investment. McKinnon and Shaw both take direct issue with the neoclassical proposition, showing that crucial assumptions in this paradigm are erroneous in the context of less developed countries. McKinnon produces an alternative model in which real money balances are complements rather than substitutes to tangible investment. Shaw rejects neoclassical growth models in favour of the debt-intermediation view which he himself pioneered in the 1950's.

In this paper, we test the common aspects of the McKinnon-Shaw model for Japan, the Republic of China, the Republic of Korea, Pakistan, Thailand and Turkey. Our choice of countries was determined by the fact that they constitute either our own home countries or countries in which we have resided and worked.

The first section outlines the McKinnon-Shaw model of financial liberalisation. One crucial element is an identifiable saving function in which the real return on financial assets exerts a positive influence on domestic saving. Both saving and investment rise as the real rate of interest is increased. The second section presents a pooled time series estimate of the McKinnon-Shaw saving function using 116 annual observations from the sample of six countries. The

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results support this part of the McKinnon-Shaw model—saving is affected positively by the 12 month deposit rate of interest, used as a proxy for nominal interest rates on all financial assets, and negatively by the expected rate of inflation.

THE McKINNON-SHAW MODEL OF FINANCIAL LIBERALISATION

The essential common elements of the McKinnon-Shaw model of financial liberalisation are shown in Figure 1. Saving, $S(Y_o)$, at income level Y_o is a function of the real interest rate [19, p. 67; 25, pp. 73, 77-78]. F represents the financial constraint, taken here to consist simply of an administratively determined institutional nominal interest rate, which holds the real rate below its equilibrium level [19, pp. 71-77; 25, pp. 81-87]. Actual investment is limited to I_o, the amount of saving forthcoming at the fixed real interest rate, r_o.[1]

Nonprice rationing of investible funds must occur. This typically takes place on the basis of quality of collateral, political pressures, "name", loan size, and covert benefits to the responsible loan officers. These criteria can be counted on to discriminate inefficiently between investment opportunities. Indeed, there will be a preference for traditional, low yielding investments because these appear safe and simple to finance. Interest rate ceilings discourage risk taking by the financial institutions; risk premia cannot be charged when ceilings are binding. This itself rations out a large proportion of potential investors.

Relaxing (raising) the financial constraint from F to F' in Figure 1 increases saving and investment. It also rations out all those low yielding investments, illustrated by the dots in the shaded area, which were financed before. Hence, the average efficiency of investment increases. The level of income rises in this process and shifts the saving function to $S(Y_1)$. Thus, the real rate of interest as the major component in the return to savers is the key to a higher level of investment, and acts as a rationing device to promote efficiency. The impacts on growth are multiplicative. The policy prescription is to raise institutional interest rates and/or reduce the rate of inflation. Investment opportunities abound in the postulated economy [19, pp. 59-61; 25, p. 81]. Abolishing interest rate ceilings altogether produces the optimal result of maximising investment and raising still further investment's average efficiency. This is shown in Figure 1 by the equilibrium at I_2, r_2, and a higher income level, Y_2. Clearly, changes in the real interest rate trace out the saving function.

McKinnon's explanation of how the real rate of interest affects saving, investment and growth rests on two assumptions: (a) All economic units are confined to self-finance; (b) Indivisibilities in investment are of considerable importance, i.e. investment expenditures are lumpier than consumption expenditures. Potential investors must accumulate money balances prior to their investment. The more attractive the process of accumulating money, i.e. the higher the real deposit rate of interest, the greater the incentive to invest. The relative lumpiness of investment expenditures implies, in this situation, that aggregate demand for money will be greater, the larger the proportion of investment in total expenditures. This is McKinnon's complementarity hypothesis, "the basic complementarity between money and physical capital" [19, p. 59].

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[1]Here hoarding of tangible, unproductive assets is not included in the definition of either investment or saving.

Shaw maintains that expanded financial intermediation between savers and investors resulting from financial liberalisation, i.e. higher real institutional interest rates, increases incentives to save and invest, and raises the average efficiency of investment. Financial intermediaries raise real returns to savers and, at the same time, lower real costs to investors by accommodating liquidity preference, reducing risk through diversification, reaping economies of scale in lending, increasing operational efficiency and lowering information costs to both savers and investors through specialisation and division of labour. Financial intermediation is repressed when interest rates are administratively fixed below their equilibrium levels. When interest rates are employed as rationing devices, i.e., are allowed to find their equilibrium levels, financial intermediaries can use their expertise to allocate efficiently the larger volume of investible funds which is then forthcoming.[2]

The empirical test presented in this paper focuses on a saving function consistent with the one illustrated in Figure 1:

$$\frac{Sd}{Y} = f\left(\frac{Y}{PN}, d, i^*, \frac{Sf}{Y}\right) \qquad .. \qquad .. \qquad (1)$$

where Sd represents domestic saving, Y gross national product (GNP), P the implicit GNP deflator, N population, d the nominal rate of interest on 12 month time deposits, i^* the expected rate of inflation, and Sf foreign saving. The time deposit rate is used here as a proxy for nominal rates of interest on all financial assets; nominal institutional interest rates are highly correlated since they are virtually all fixed by administrative decisions in our six countries.

We decompose the real rate of interest in Figure 1 into its components, d and i^*. Since d is the nominal rate of return on time deposits only, saving may respond differently to a change in this variable than to a change in the expected rate of inflation. Because d and i^* generally move in roughly the same direction, the problem of multicollinearity arises. Predictably, this is more serious in individual country estimates than in the pooled time series analysis reported below.

The level of real per capita income has been included as an independent variable in numerous studies of savings behaviour, e.g. [5; 17; 24; 26]. Theoretical justifications range from static Keynesian consumption function analysis to risk avoidance as a luxury good, and rising incremental capital/output ratios as the marginal efficiency of investment declines. Foreign saving is included because it constitutes a substitute for domestic saving. There has, however, been considerable debate, started by Papanek [23], over the direction of causality. Here, we make the usual assumption e.g. [5; 8, p. 38; 14; 15; 20, pp. 12-15; 30] that foreign saving is exogenous.

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[2]Elsewhere, one of the present authors has tested alternative theories of McKinnon and Shaw concerning the transmission mechanism [13]. McKinnon loses and Shaw wins their disagreement over the way in which financial conditions affect saving and economic growth in empirical tests for ten Asian less developed countries. Saving and growth functions estimated for seven of these ten LDCs exhibited significant positive coefficients of the real interest rate variable [12]. Other econometric tests of models in which financial development influences saving, investment and/or the rate of growth can be found in [1; 2; 7; 27; 28].

The identification problem here was recognised and explored by Modigliani [22]. In a recent study, Leff and Sato [18] confront this problem by specifying explicitly and then estimating both a saving and an invstment function. The usefulness of this simultaneous equation approach in the case of most less developed countries might well be questioned. The problem of identification would arise if saving and investment were determined jointly under free market conditions. However, in all our countries institutional interest rates have been set by administrative decisions. These rates have been below their free market levels. This means that the marginal efficiency of investment exceeds the interest rate and, hence, more investment would take place at that rate were more funds, i.e., saving, available. In other words, it seems plausible to assume that these countries have been on their saving functions but not on their investment functions, as already illustrated in Figure 1.
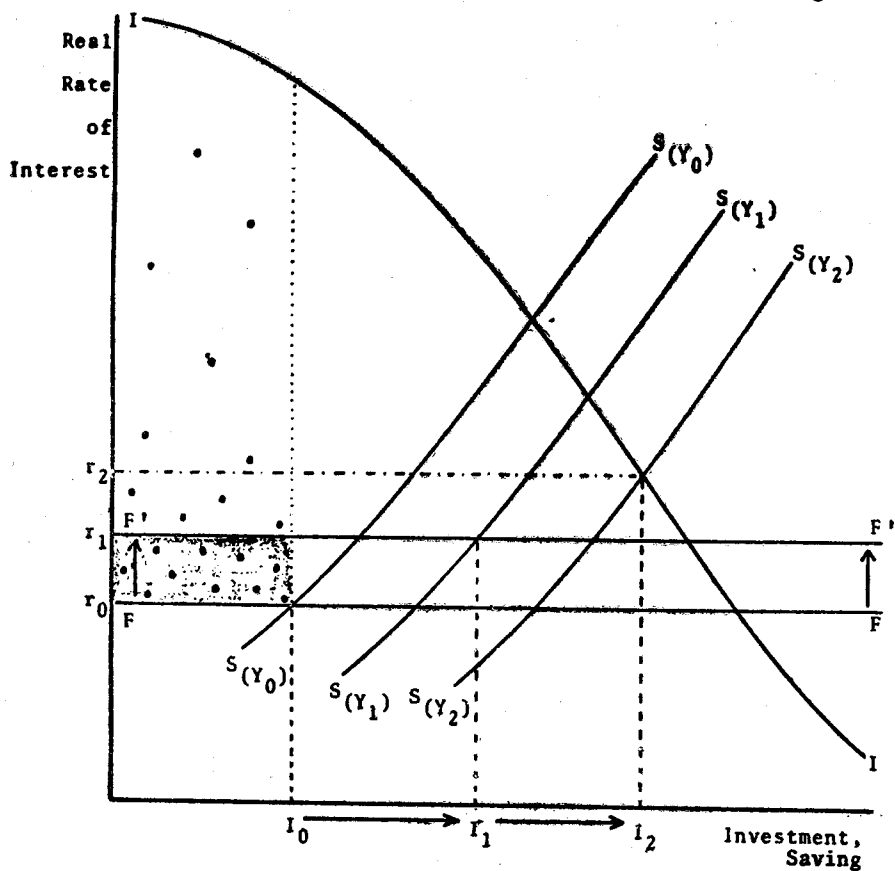

Fig. 1 Saving and Investment under a Financial Constraint

EMPIRICAL RESULTS

To pool the time series data from our six countries, per capita income at constant prices was converted into U.S. dollars with the exchange rates shown in Table 1. Since these are the rates which prevailed in 1967, implicit GNP deflators for all countries were adjusted to equal one in that year. Balassa [4] has shown that the cost of living is generally higher in countries with higher levels of per capita income, even under conditions of free trade and equilibrium exchange rates. The explanation lies in disparate levels of productivity and the existence of non-traded goods. Balassa reports:

$$Y = 49.34 + 0.025X$$

[4, p. 590] where X is per capita income converted through the official exchange rate into dollars and Y is purchasing power parity expressed as a percentage of the exchange rate. This equation is applied here to the 1967 levels of per capita income in dollars calculated from the exchange rates in Table 1 to obtain "real" per capita income comparisons for our six countries.

Table 1

Exchange Rates Used for Pooled Time Series Analysis 1967

(Domestic currency to the U.S. dollar)		
Japan (Yen)	..	361.9
Korea (Won)	..	274.0
Pakistan (Rupee)	..	9.0
China (NT Dollar)	..	40.1
Thailand (Baht)	..	20.8
Turkey (Turkish Lira)	..	15.0

Source: *International Financial Statistics,* 27 (2), February 1974.

Note: Official exchange rates were used except in the case of Pakistan and Turkey where clear indication of substantial overvaluation existed. Therefore, approximate allowance has been made for this by assuming 90 percent overvaluation in the case of Pakistan and 67 percent for Turkey. For more detailed justification for the use of these conversion factors, see M.J. Fry, "Manipulating Demand for Money" in *Essays in Modern Economics* edited by M. Parkin with A.R. Nobay (London: Longman, 1973), pp. 371-85.

The period covered in this analysis is from 1951 to 1973, but data availability necessitated somewhat shorter periods for all countries except Turkey. The expected rates of inflation were calculated on the basis of Almon lag procedure [3] estimated separately for each country.[3]

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[3] The regression periods for each country are as follows:

Japan	...	1955-1971
Republic of China	...	1955-1972
Republic of Korea	...	1955-1972
Pakistan	...	1951-1969
Thailand	...	1952-1972
Turkey	...	1951-1973

To estimate the expected rate of inflation using the Almon lag procedure, data on inflation rates in up to six years preceding the regression periods were needed. Expected rates of inflation were estimated in this way for Korea, Pakistan and Turkey. The current rate of inflation yielded better results for Japan, China and Thailand; it was assumed to be the expected rate for these countries.

In preliminary estimates for each individual country, appropriate tests were performed for heteroskedasticity and autocorrelation. Neither was found, thus allowing us to proceed to pooled time series estimation. Here, however, there is the additional problem of different variances of the error terms for each country. We, therefore, employed the generalised least squares (GLS) procedure using the estimated variances to correct for this.[4] The GLS estimate of our saving function with country dummy variables is:[5]

$$\frac{Sd}{Y} = \underset{(-19.493)}{-0.636} + \underset{(25.413)}{0.154} \ln \left(\frac{Y}{PN}\right) + \underset{(1.382)}{0.112} d - \underset{(-2.077)}{0.064 i *}$$

$$\underset{(-6.173)}{-0.556} \left(\frac{Sf}{Y}\right) - \underset{(-8.405)}{0.914} Dj - \underset{(-9.498)}{0.667} Dc - \underset{(-7.548)}{0.933} Dk$$

$$\underset{(4.806)}{+0.484} Dp - \underset{(-15.964)}{1.165} Dt \qquad .. \qquad .. \qquad (2)$$

$$R^2 = 0.982$$

Note: Figures in Parantheses are the t-values of the coefficients.

The deposit rate of interest exerts a positive and expected inflation a negative influence on the domestic savings ratio. An increase in the time deposit rate of interest (and, by assumption, all other institutional interest rates) by one percentage point raises the savings rate by 0.112 of a percentage point, e.g., from 12.000 to 12.112 percent of GNP. A decrease in the expected rate of inflation by, say, 10 percentage points raises the savings rate by 0.64 of a percentage point, e.g. from 12.00 to 12.64 percent of GNP. Similarly, a 10 percent rise in per capita real income increases the domestic savings ratio by 1.54 percentage points. On the other hand, a rise in the foreign savings ratio by one percentage point reduces the domestic savings ratio by 0.556 of a percentage point.

The coefficient of the foreign savings ratio is comparable to that reported by Chenery, Elkington and Sims [6] in their 90 country study but is somewhat lower than those estimated by Gupta [15, p. 363] in his 40 country study. The negative sign indicates that foreign saving has been substituted for domestic saving. Papanek [23] has criticised this interpretation of the regression results on the ground that causality can by no means be inferred from them. Indeed, he cites China, Korea and Pakistan as examples of countries for which such an interpretation is highly questionable [23, pp. 941-42, 949]. Instead, Papanek suggests that the relationship observed is caused by other exogenous factors

[4]For an excellent survey of econometric problems specific to pooled time series regression, see [16].

[5]The dummies are as follows:

Dj	...	Japan
Dc	...	Republic of China
Dk	...	Republic of Korea
Dp	...	Pakistan
Dt	...	Turkey

exerting opposite influences on domestic and foreign savings ratios. Gupta's estimates, however, provide support for the substitutability hypothesis in that all components of foreign saving (aid, foreign private investment, and other foreign inflows) exhibit negative coefficients. Papanek's main argument holds only for the foreign aid component and would, in fact, suggest positive coefficients on the other two. Weisskopf is also careful to avoid spurious correlation yet finds substitution of foreign for domestic saving in all 17 countries for which he identifies a saving function [30, Table 2, p. 36].

The coefficients of the dummy variables are inversely correlated with per capita income in the six countries. The coefficient tends to be higher the lower the per capita income. The negative correlation might be explained by differences in cost of living due to disparate levels of productivity and the presence of non-traded goods, had we not already adjusted per capita incomes for this. One possible explanation is that relative as well as absolute income levels affect saving. The negative correlation is consistent with the relative income hypothesis because changes in per capita income over time within each country are small relative to differences in per capita income between countries. This is represented in Figure 2. In fact, Turkey has the lowest dummy coefficient. This might reflect Turkey's proximity to Europe and a strong demonstration effect therefrom.
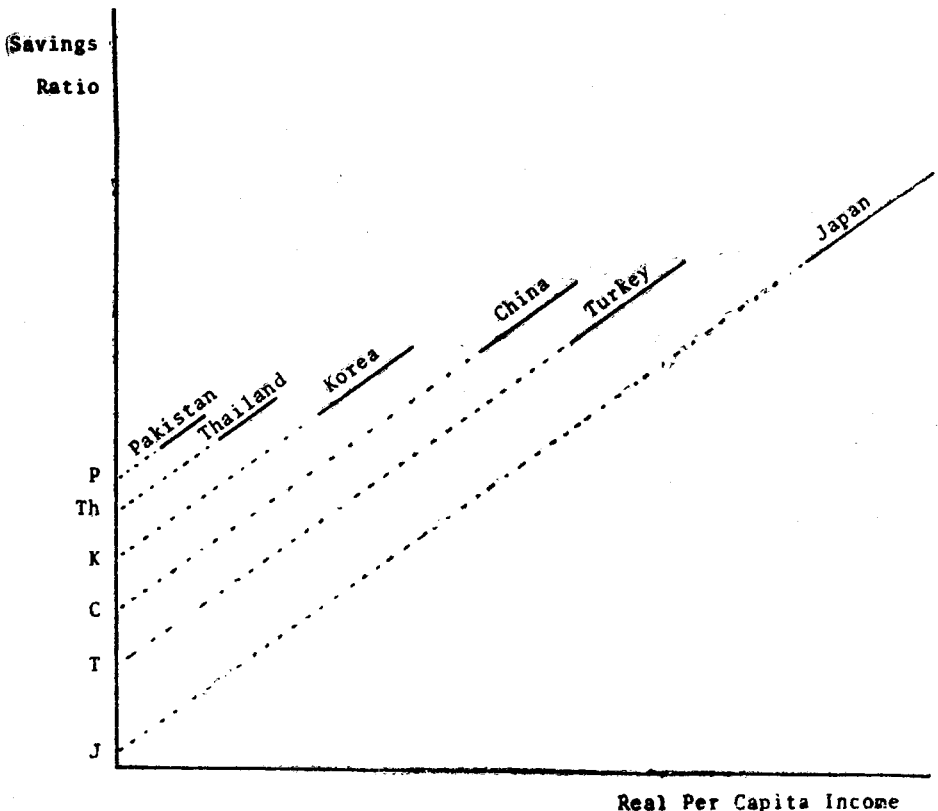

Fig. 2 Relative Income Effect on the Domestic Savings Ratio

Our six countries are far from homogeneous. Pakistan's per capita income was $130, Japan's $2,130 in 1971. Superficially, the financial regimes of these countries also appear to have been very different over the period of our analysis. McKinnon cites Japan, China, and Korea as examples of countries which have pursued liberal financial policies, whereas Pakistan and Turkey are produced as examples of financially repressed economies. On closer examination, however, we find that all our countries have followed, to greater or lesser extent, policies of financial restriction.

Financial repression is defined as indiscriminate "distortions of financial prices including interest rates and foreign-exchange rates", which reduce "the real rate of growth and the real size of the financial system relative to non-financial magnitudes" [25,p. 3]. Financial restriction, on the other hand, encourages financial institutions and instruments which can be made to provide a large seigniorage to the pbulic sector, officially approved or plan-dictated activities, and discourages those which cannot [10,p. 372]. Repression is usually a result of erroneous beliefs about the effects of interest rates on investment and/or inflation, restriction of attempts to finance public sector deficits as cheaply as possible and/or to implement selective/sectoral credit policies. Selective or sectoral credit policies involving special subsidised interest rates for priority sectors or activities are a common component of financial restriction. Indeed, the former necessitates the latter, since financial liberalisation would enable financial channels to develop expressly for rerouting subsidised credit. For selective credit policies to work, financial markets must be kept segmented and restricted.

Financial restriction has been pursued in all our countries, perhaps most strongly in Pakistan and Turkey. Contrary to McKinnon's assertion, financial repression and economic stagnation do not characterise the post-war experience of either Pakistan or Turkey. Since 1950 the growth of banking in both countries has been spectacular. However, financial restriction was pursued [10]. One of the results of financial restriction has been to keep money the dominant financial asset in these countries; it provides the highest seigniorage. Assets of central and commercial banks as a percentage of assets of all the financial institutions in Pakistan and Turkey were 78 and 71 percent, respectively, in 1963 [9, Table 1, p. 38; 11, Table 5.5, p. 97]. Rapid growth in banking is perfectly consistent with financial restriction.

A detailed investigation of the Korean experience has been undertaken by one of the present authors [21]. The results indicate that much of Korea's post-1965 financial policy resembles financial restriction of the kind found in Pakistan and Turkey. Interest rate policy in Korea has undoubtedly led to a rapid increase in demand for real balances. However, institutional credit has continued to be rationed on a non-price basis frequently to subsidise inefficient, large scale, private industry. Of most significance here has been the growth of the non-institutional money market, expected to wither away under conditions of financial liberalisation. Japan, China and Thailand have likewise followed policies of financial restriction, in which institutional interest rates have been manipulated by administrative decisions and were deliberately held below their equilibrium levels.

CONCLUSION

We have tested one element of the McKinnon-Shaw model of financial liberalisation in this paper. Our empirical result supports the view that financial restriction holds domestic saving below the level which would occur under a policy of financial liberalisation. There may, however, be a trade-off between the level of domestic saving and the efficiency with which saving is allocated to investment. One of the present authors has examined the relative efficiency of public versus domestic resource mobilisation [29]. The presumption of greater efficiency through public sector resource mobilisation is not supported. Another of the present authors has estimated the influence of real interest rates in a reduced form growth model [12; 13]. The finding is that financial liberalisation, i.e. higher real interest rates, increases economic growth.

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