

**FINANCIAL LIBERALIZATION VS FINANCIAL REPRESSION:
A SURVEY ON THEORETICAL LITERATURE
AND EMPIRICAL EVIDENCE**

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ABSTRAK

Makalah ini menyajikan analisis mengenai liberalisasi dan represi finansial dengan melakukan tinjauan menyeluruh pada berbagai literatur teoretis dan empiris yang pernah dikembangkan. Sampai dengan tahun 1970, sistem represi finansial telah banyak diterapkan pada banyak negara berkembang, terutama dalam bentuk ceiling suku bunga. Namun demikian; kebijakan represi ini telah ditantang oleh kaum liberalis finansial yang dipelopori oleh McKinnon (1973) dan Shaw (1973), yang berpendapat bahwa suku bunga riil yang tinggi akan meningkatkan tabungan dan ketersediaan dana yang dapat dipinjamkan. Liberalisasi finansial, yang bercirikan penghilangan campur tangan pemerintah dalam penentuan tingkat suku bunga ekuilibrium, merupakan syarat yang diperlukan bagi adanya pembangunan ekonomi yang cepat. Banyak studi yang telah dilakukan untuk menguji hipotesis liberalisasi finansial ini, baik yang hanya meliputi satu negara maupun banyak negara. Namun demikian, hasil yang diperoleh tidak selalu berhasil mendukung hipotesis yang diajukan

BACKGROUND

There are two contrasting schools of thought regarding the role of financial institutions in economic development with respect to government control: financial repression and financial liberalization. In a financially repressed economy, the government, typically through the central bank, controls certain aspects of the operation of the financial markets. Examples include controls over interest rates, reserve requirements, and compulsory credit allocation (Warman and Thirwall, 1994). Other controls might involve restrictions on the scope of permissible bank branching. Financial repressionists claim that controlling interest rates at "low" levels

will promote the country's investment spending, and hence, economic growth (Morisset, 1993).

Under financial liberalization, the government removes controls, allowing the market mechanism to work. According to the financial liberalists, the removal of interest rate ceilings allows banks to establish the deposit rates at market levels. Allowing widespread branching will make it more convenient to save, which should provide additional funds for investment spending.

The case for financial liberalization was started initially by McKinnon and Shaw in the early 1970s. McKinnon (1973) argues that markets will yield a positive real interest rate and consequently attract savings. He emphasizes that, in a repressed system, government controls on nominal interest rates often result in negative real interest rates. This is a major impediment to savings, capital formation, and hence, economic growth.

Shaw (1973) has a similar view to McKinnon's, though with a somewhat different emphasis. He focuses on liberalization's role in promoting financial deepening which, in general, indicates the size of the financial sector (Gupta, 1984).

Morisset (1993) contends there is some validity to the McKinnon-Shaw hypothesis. In fact, establishing high real interest rates has become standard policy advice to the less-developed countries by the experts from the World Bank and the International Monetary Fund (IMF). There is a distinct trend towards financial liberalization in many countries in recent years, especially developing countries [see, for instance, Gupta (1987) and Sussman (1992)].

The results of empirical studies do not always support the financial liberalization hypothesis, however. Results vary across the sample countries. Some research supports the financial liberalization hypothesis [for instance, Fry (1978, 1980), Rittenberg (1991), Warman and Thirwall (1994)]. In contrast, other empirical research does not support the superiority of a financial liberalization policy [see, for instance, Dornbusch and Reynoso (1989), Sussman (1992), Park (1993)].

FINANCE AND ECONOMIC DEVELOPMENT

It is widely believed that economic growth is driven mainly by the acquisition of commercial and technical knowledge, the diffusion of innovations, and the

accumulation of physical and human capital. The role of finance in economic growth also has been an interesting topic of discussion among economists. As noted by Galetovic (1996), some might look with skepticism at the proposition that financial conditions could explain part of the crosscountry differences in levels of development. However, it is interesting to note the findings of Goldsmith (1969). Goldsmith investigates the role of finance by focusing his work on national balance sheets; he examines the financial development of many different countries since the industrial revolution. For each country in the sample, he computed a financial interrelations ratio (FIR), which is the ratio of all financial assets issued by financial and non-financial institutions to real "national income, as a proxy for financial system activities. There are several important points in Goldsmith's findings that highlight the relevance of finance in explaining economic growth. He observes that the FIR increases with economic development as measured by the level of per capita income and its growth. In general, there is a significant difference between the pre- and post-industrialization FIR's. The evolution of the FIR suggests that external finance was an integral part of the industrialization process. Goldsmith also observes that modern financial systems developed during the early stages of industrialization, indicating that financial intermediaries are needed as soon as the industrialization process begins.

Galetovic further observes that the FIR has not been computed for countries that industrialized during this century. However, since banks are by far the most important issuer of financial assets in most economies, he uses the ratio of broad money (M_2)-to-GDP as a measure of the evolution of a country's financial system. He presents the ratios for five Asian countries (Indonesia, Korea, Malaysia, Singapore and Taiwan) that industrialized during the last four decades, and for Japan and Germany, who successfully rebuilt their economies after the second World War. Galetovic, like Goldsmith, observes that financial systems grow quickly during the initial period of sustained growth. The M_2 -to-GDP ratio for Indonesia, for instance, was 0.10 in 1970. In the 1980's, once the industrialization process .was underway, the M_2 -to-GDP ratio increased to 0.25 in 1985 and to 0.43 in 1990. These findings support the view that development must be supported by adequate financial systems. In market economies, all activities that enhance economic development must be

financed for the most part with external funds, which make financial intermediaries and the development of financial system essential for long-run economic growth. Since the government typically has an important role in the industrialization process, the issue of the optimum degree of government intervention in the development of the financial sector is a critical policy question.

FINANCIAL REPRESSION AND FINANCIAL LIBERALIZATION

Since the early 1970s, the relationship between the degree of government intervention and the performance of financial markets, along with their role in enhancing economic development, has been an increasingly active research area. These issues have been debated at least since McKinnon (1973) and Shaw (1973) claimed that higher real interest rates in less-developed economies would raise savings, increase the volume of domestic credit extended by the financial system, and accordingly, increase the rate of investment. They emphasize that savings and investment depend significantly upon the intermediation efficiency of the monetary system through which individuals hold money, purchase monetary assets, and finance their productive needs. They note that money holdings can be complementary to, rather than a substitute for, physical capital, contrary to the "conventional wisdom" of Keynesian and neo-classical monetary theories.

According to the influential models of McKinnon and Shaw, reduced government control, of the financial system is a necessary condition for faster economic growth. Under financial liberalization, the real interest rate will be positive, which promotes increased savings and investment and facilitates economic growth. In the McKinnon view, government intervention in the financial markets should be minimized in order to accelerate economic growth.

Even though McKinnon and Shaw have similar interests in liberalization, they present somewhat different arguments. McKinnon's theory is based on the assumptions of the lumpiness of investment expenditure and reliance on self finance, which force investors to accumulate money balances before investment can take place. In order to encourage agents to accumulate money balances, positive real interest rates are necessary. He claims that money holdings and capital accumulation are complementary in the development process. Shaw, on the other hand, underlines

the importance of financial liberalization for financial deepening and the effects of increased interest rates on the incentive to save and on the efficiency of investment.

Both McKinnon and Shaw oppose the implementation of financial repression in the economy. Financial repression can be defined as a situation in which government intentionally distorts the operation of financial markets. For the most part, financial repression includes holding interest rates (particularly deposit rates) below their free-market equilibrium levels (Fry, 1982). Other financial repression techniques include controls on credit ceilings. Financial repression might also appear in the form of compulsory credit allocation.

Financial liberalization is defined as a situation in which the government does not tightly control financial market operations. The most common form of financial liberalization is the removal of control over both interest rates and credit ceilings and/or allocation requirements.

Financial liberals claim that the development of a country's economy must be supported by the spreading of financial institutions and greater diversification in financial instruments. Huh (1995) contends that a well-functioning financial system assures a continuous and predictable flow of funds to the economy in order to guarantee the continuation of economic development. McKinnon (1973) and Shaw (1973), who are considered the first two proponents of financial liberalization, suggest that the higher real interest rates resulting from financial liberalization (in the form of decontrol of interest rate ceilings) will raise savings, increase the volume of domestic credits extended by the financial system and increase the rate of investment. Thus, financial liberalization is a necessary condition for faster economic growth in their view.

According to Gelb (1989), financial repression (especially in the form of interest rate ceiling controls) will negatively affect economic growth through two channels. First, below-market interest rates, as a result of controlling the interest rate ceilings, reduce incentives to save and, hence, reduce domestic capital formation. Second, control over credit allocation might prevent investments from being made at their optimum scale. In addition, rationing schemes introduced to allocate the limited volume of credit might direct funds to less productive investments.

McKinnon (1973) and Shaw (1973) identify several negative effects of financial repression on economic development. First, financial repression, as has been mentioned above, causes low (or even negative) real interest rates and high interest rate-uncertainty. As a result, savings and investment remain at artificially low levels. Second, in a financially-repressed economy, the flow of loanable funds to the banking system is reduced, forcing "Business firms to rely more on self-finance. Interest rates on bank loans can vary arbitrarily among politically-favored and unflavored borrowers. Third, financial repression can lead to premature liquidation of illiquid assets due to limited alternatives for meeting cash needs, can cause higher inflation rates (since the real deposit rate is negative, people will use their money for consumption) and can require credit rationing, all of which have negative impacts on economic development. Given the negative effects of financial repression, the financial liberalists believe that the only way to solve those problems is to remove the onerous legal restrictions.

Other economists do not agree with the liberalization prescription, however. They claim that market-based credit allocation through financial intermediaries does not necessarily increase efficiency and promote economic growth. According to one view, there are always possibilities for agents to circumvent the legal restrictions in a repressed system via transactions in the black market or in informal markets. These markets may be more efficient in allocating credits than unfettered markets because, in general, they exploit a closer lender-borrower relationship, so they can better utilize information about borrower characteristics. This view is known as a Neostructuralism.

These financial repressionists view deliberate distortion of financial markets as a component of economic policy. They argue that such a system offers at least two advantages: (1) more effective control over the money supply and inflation; (2) a "better" allocation of credit. They claim that the government is more efficient than the private sector in allocating funds, at least in the early stages of development.

Another argument in favor of government controls over the financial market comes from Hellmann, Murdock and Stiglitz (1995). They propose a specific financial policy called financial restraint, which requires government controls over the financial markets in order to create "rents" (returns in excess of those generated

by a competitive market) in the private sector. The government controls are in the forms of artificially low limits on interest rates and through regulating entry and direct competition in financial sectors.

Hellmann et al. claim that their concept of financial restraint is fundamentally different from financial repression since its focal point is government's role in rent creation. Under a financial repression regime, the government extracts rent from the private sector by holding the nominal interest rate lower than the inflation rate. Under the financial restraint system, the government is not the recipient of rents as a substitute for tax revenues. Instead, government controls on deposit rates create rents that are captured by the private sector (financial intermediaries and firms).

Even though Hellmann et al. make a distinction between the financial restraint and financial repression, both systems rationalize a need for government control over the financial system. While financial repressionists believe that government controls are needed to promote savings and investment, Hellmann et al. argue that government intervention in financial markets can promote financial deepening in several ways. First, rents might create "franchise value" for banks, creating stronger incentives for banks to better monitor borrowing firms and to improve management of the risk in their loan portfolios. Second, rents also provide incentives for banks to expand their deposit base and increase the extent of formal intermediation. Third, the government might even target rents for some specific bank activities to compensate for market deficiencies, such as the lack of long-term loan contracts. Finally, together with a government policy of directed credit, financial restraint might create competition among firms. According to Hellmann et al., if the competition is well structured, then financial restraint can provide even stronger incentives than competitive markets.

Hellmann et al. argue that the franchise value created by government control over deposit rates and restrictions on competition in the financial markets can reduce moral hazard behavior among financial intermediaries because banks have an ongoing interest to stay in business. They emphasize that when financial restraint creates franchise value for banks, most of their equity value is derived from their continued operation in the future. Consequently, franchise value creates commitment for the banks to act as long-run agents. Government control over lending rates might increase the efficiency of intermediation by reducing agency costs in loan markets.

Hellmann and Murdock (1995) conduct another study to support their view about the importance of government control over the financial system. They begin with a review of market failures and government failures and argue that in the debate over government versus markets, neither extreme position is tenable. They argue that comparing market failures with government failures is important as a basic consideration in designing optimal policies.

Hellmann and Murdock repeat their argument in the previous study that interest rate controls by the government can create beneficial effects on banks' behavior. They offer some reasons in favor of government control of interest rates. First, from a moral point of view, there is a recurrent notion in less-developed economies that taking interest represents exploitation. In this case, government regulation in the form of interest rate ceilings is viewed as a protective device for borrowers against potential exploitation. Second, from a macroeconomic point of view, interest rate controls are needed in order to provide low-cost funds required to finance the country's budget deficits. Finally, interest rate controls are needed to provide low-cost funds required for stimulating investment.

Hellmann and Murdock underline their conclusion about financial liberalization. They argue that complete financial liberalization is not an appropriate policy recommendation, especially for those countries which are in an early stage of financial development. The reason is that, in this stage, they need to invest more resources to build appropriate "reputation capital" and governance mechanisms. Government can play a very important role in promoting these outcomes, in their view.

Espinosa and Hunter (1994) also contend that financial repression can prove superior to a financial liberalization strategy, especially when the government budget deficit is significantly high. There are two broad strategies in government finance. The first strategy relies on tax revenues. However, many developing countries do not have effective tax structures and consequently tax revenues are insufficient to finance intended government spending. When explicit taxes are not sufficient, the government can follow a second alternative by creating seigniorage. Seigniorage represents government revenue extracted from an increase in the supply of fiat money. Fiat money is money created legally by government decree, but not backed

by silver or gold. A common technique for seigniorage creation is the imposition of a large reserve requirement on commercial banks, which essentially forces these banks to hold government liabilities (such as currency or government bonds) in excess of the optimal level. In other words, the commercial banks are forced to hold "excess" fiat money. Since these liabilities pay below-market (or even zero) interest rates, the higher the reserve requirement, the greater the ability of the government to create seigniorage. Seigniorage can be viewed as a specific type of "tax" on financial intermediaries and the public at large. Since it is related to the inflation rate, it is also called an inflationary tax. The need for seigniorage can become one of the main reasons for the adoption of financial repression measures.

There is evidence that supports the financial liberalization view. Fry (1978, 1980) conducts an empirical test of finance models in economic development developed by McKinnon (1973) and Shaw (1973). He finds that the financial liberalization, proxied by a higher real rate of interest, has a positive impact on domestic savings and economic growth in seven Asian countries. A similar conclusion is reached by Leite and Makonnen (1986) for the case of six African countries. They find that financial liberalization indeed increases gross private savings in all countries under study, which is consistent with the McKinnon-Shaw propositions.

On the other hand, there is also evidence which does not support the superiority of a liberalization policy. Park (1993), for instance, finds that the gross domestic product (GDP) of South Korea and Taiwan in the 1980s would not have grown more under a financially-liberalized system than a repressed one. His findings are consistent with the arguments of Dornbusch and Reynoso (1989), who claim that the success of South Korea's economic development was caused by something "other than financial liberalization". DeMelo and Tybout (1986) find similar evidence for the case of Uruguay, a country that implemented financial deregulation in 1973. They find no evidence of any significant positive effect of real interest rates on aggregate saving after financial reforms. Still other evidence shows that the results of liberalization are inconclusive. Sussman (1992), for instance, finds that when liberalization was implemented in Israel, there were no significant effects on savings and investment.

SOME EMPIRICAL EVIDENCE

A number of empirical studies have been conducted involving LDCs which address the responsiveness of savings and investment to the financial liberalization process. The conclusions concerning relationships between interest rates (a widely-used measure of financial liberalization), savings, and investment vary widely across studies.

In general, the savings functions hypothesized for econometric estimation include some "basic" variables such as real income, the previous period's savings (lagged savings), and the real interest rate. The real interest rate is the difference between the nominal interest rate and the expected rate of inflation. Since income is, by definition, either consumed or saved, the level of income clearly influences the volume of savings. The previous period's savings is commonly included in such models since savings may adjust gradually to an optimal or desired level. Finally, the real interest rate is included because it is the reward for saving. Most studies use the actual inflation rate as a proxy for anticipated inflation in calculating the real rate of interest. This procedure, which ignores the distinction between the ex ante and ex post real rate, allows the inflation forecast error to influence savings. In all of the studies referenced in what follows, savings, investment, and income are in real terms, unless otherwise stated.

Fry (1978) conducts a study of seven Asian countries (Burma, India, Korea, Malaysia, Philippines, Singapore and Taiwan). The study tests the hypothesis of a positive relationship between the domestic savings rate and the real interest rate.

On the basis of a pooled time series, the domestic savings rate function is expressed as follows:

$$S^d/Y = f[g,y,r,S^f/Y,(S^d/Y)_{t-1}] \quad (1)$$

where

S^d/Y = domestic savings rate or the ratio of domestic savings to GNP,

g = real GNP growth rate,

y = real per capita income,

r = real deposit interest rate,

S^f/y = foreign savings rate or the ratio of foreign savings to GNP, and

$(S^d/Y)_{t-1}$ = the lagged savings rate.

Fry assumes that real per capita income (y), the real deposit interest rate (r), and the ratio of foreign savings to GNP (S_f/Y) are exogenous variables. To deal with the possibility of an endogeneity problem, which can cause bias and inconsistency of the estimates, Fry adopts the instrumental variable technique. He uses a two-stage least squares (2SLS) technique with country dummy variables. On the basis of his estimated savings function, Fry concludes that the real rate of interest positively and significantly affects the domestic savings rate. At least for these seven countries, the study shows that the real interest rate has a positive impact on savings.

Fry published another study in 1980 which explored the cost of financial repression in developing countries. In the first part, he replicates his previous work. Based on the assumption that in a financially-repressed economy the volume of investment is determined solely by the level of savings, Fry hypothesizes that lower real deposit interest rates reduce real money demand. *Ceteris paribus*, a fall in real money demand (where money is defined broadly to include savings and time deposits) will itself cause a decline in real credit supply, since domestic credit is the primary asset backing the monetary liabilities of the banking system. A decrease in credit availability, in turn, lowers both the rate of new fixed investment and also investment in working capital.

Then, in order to determine whether higher deposit rates could reduce the investment rate by raising the cost of funds, Fry ran a simple ordinary least-squares regression of real GNP growth on the real deposit interest rate. The results show that growth rate is positively and significantly related to the real interest rate. The estimates are consistent with the Mc-Kinnon-Shaw model of financial intermediation. Financial liberalization, in this case proxied by higher real deposit rates, increases both savings and investment rates. Higher net yields to savers do not necessarily raise gross costs to investors.

In 1985, Giovannini conducted a study that provides empirical evidence on the question on whether savings respond positively to changes in the real interest rate in less-developed countries, by exploiting some of the implications of the neoclassical theory of consumption. His study is structured in two parts. In the first part, he reports some results of experiments with aggregate saving equations of the Keynesian type.

The second part of Giovannini's study offers empirical analysis of the responsiveness of aggregate consumption-saving decisions to the expected real interest rate.

In the first part of his study, Giovannini estimates a savings equation identical to the one used by Fry (1978). The data involve a cross-section time-series sample, including the countries which are also used in Fry's study: Burma, India, Korea, Malaysia, Philippines, Singapore, and Taiwan. He applies a two-stage least squares method in estimating the equation. The dependent variable is the domestic savings rate or the ratio of domestic savings to GNP. The independent variables are country dummies, the growth rate of real GNP, the log of per capita GNP in 1970 US dollars or the same variable to the powers -2 and -4, the real interest rate on time deposits, the ratio of the trade balance deficit-to-GNP, and the lagged dependent variable. The instruments are: the growth rate of population, real exports, real investment, the ratio of foreign savings-to-GNP, the ratio of exports to GNP, the real deposit interest rate, the black-market exchange rate premium, lagged per capita money balances, the lagged dependent variable, the log of constant dollar per capita income and its powers -2 and -4, and country dummy variables.

The results of estimation in Giovannini's study show that the estimates of the coefficients of the real interest rate in the various specifications are positive and significant at acceptable levels, indicating that the real interest rate positively and significantly influences the savings rate.

Up to this point, the estimates reported in Giovannini's study confirm the results reported by Fry (1978). However, this is not the case when Giovannini estimates his model using different samples. Giovannini finds that the robustness of the results decreases when the time period is changed. When he re-estimates the model by excluding two observations corresponding to the years immediately following the Korean financial reform (1965), Giovannini finds that the coefficient of the real interest rate is still positive, but less significant. He also finds that the coefficient of the real interest rate is negative, but insignificant, in the larger sample. According to Giovannini, "one alternative approach to analyzing the interest elasticity hypothesis is to concentrate on long-run averages, thus bypassing problems related to short-run dynamics. He then introduces the following model:

$$S/Y = (a_1(y'/y) + (1-a_1)(POP'/POP))(b_0 + b_1RRATE + b_2DR) + u \quad (2.a)$$

where S/Y = the ratio of domestic savings to GNP, y'/y = the rate of growth of per capita income, POP'/POP = the rate of growth of population, $RRATE$ = realized interest rate, DR = dependency ratio, which is included as a factor influencing both the age-income and the age-consumption profiles. The data used in the study is grouped into two periods: 1965-1972 and 1973-1980. The samples include 18 countries. Giovannini applies two methods of estimation: non-linear least squares (NLS) and three-stage least squares (3SLS), where the instruments include the growth rate of population, the dependency ratio, the growth rate of real exports, the growth rate of money, and foreign aid. Using such models, Giovannini finds evidence against the hypothesis that savings responds positively to the real interest rate.

In the second part of his study, Giovannini presents an empirical analysis of the responsiveness of aggregate consumption-saving decisions to the real interest rate. He specifies the following equation:

$$\ln(C_{t+1}/C_t) = k_0 + (1/\theta)\ln(1+r_t) + \quad (2.b)$$

where

C_t = individual consumption at period t ,

r_t = real interest rate at period t , and

θ = elasticity of marginal utility.

Consumption is in per capita terms and is deflated by the consumer price index (CPI) as a measure of inflation. The real interest rate is measured as the real rate on time deposits, which is the difference between nominal deposit interest rates and the inflation rate. Besides OLS estimates, Giovannini also reports instrumental variables estimates using two sets of instruments. In the first case, the instruments are: lagged consumption growth, two lagged inflation rates, a time trend, and a constant term. In the second instrumental variable estimation, the instruments are the same as in the first one, plus lagged one and lagged two money growth.

In general, the results seem to indicate that for many countries the model does not fit the data well. Out of 18 countries in the sample, the estimates of the coefficient of the real interest rate are positive and significant only in 5 countries (Jamaica, Burma, India, Greece, and Turkey). In other words, he finds that only in five out of

18 countries does the expected path of consumption change at all with changes in the real interest rate.

Gupta (1984) performs a similar study for 12 Asian countries on the basis of annual data from 1960 to 1977. The countries included in the sample of the study are: Burma, India, Indonesia, Korea, Malaysia, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan and Thailand. Ordinary least squares was used as the method of estimation in the study. For aggregate savings, Gupta sets up the following model:

$$S = S(YP, YT, PE, PU, NI, FIR, VE) \quad (3.a)$$

where S = aggregate real savings, YP = permanent real income, YT = transitory real income, PE = the expected inflation rate which is measured by a three-year moving average of the actual rate of inflation, PU = the unanticipated inflation rate, NI = the nominal interest rate (12-month deposit), FIR = financial intermediation ratio (i.e., ratio of financial assets to GNP), and VE = uncertainty with respect to inflation which is calculated by

the formula: $VE_t = 2 \sum_{i=3}^3 |P_{t-1} \sim P_{t-i-1}|$

Gupta also develops a model for investment, which is in the following form:

$$IPR = f(YR, NI, PE, IGR, FS) \quad (3.b)$$

where IPR = real private investment, YR = gross national product, NI = the nominal interest rate (12-month deposit), PE = the expected inflation rate, IGR = government gross fixed investment, and FS = private savings in financial assets.

Gupta includes the nominal interest rate in the models in order to identify the effects of the real interest rate and the expected inflation rate separately. Gupta argues that the same percentage change in the real interest rate caused by a given change in the nominal rate may not have the same effect as the one caused by the same proportional change in the expected inflation rate. The unanticipated inflation rate (PU) and the uncertainty with respect to inflation (VE) are included in the savings function in order to capture the effect of the uncertainty caused by high and variable inflation rates in the sample countries.

Again, the results tend to differ from one country to another. The hypothesis of a positive interest responsiveness of savings is rejected in all but four countries: Pakistan, Philippines, Sri Lanka and Thailand. In other countries, the effect is either negative or insignificant. The complementarity hypothesis (positive relationship between investment and savings) is rejected in the full sample, but not if the sample is divided into groups according to the inflation rate. The hypothesis is then confirmed for the low-inflation countries and it is rejected for the medium- and high-inflation countries.

A similar study is conducted for six African countries (members of BCEAO or Banque Centrale des Etats de l'Afrique de l'Quest) by Leite and Makonnen (1986). However, it is concentrated strictly on the factors that determine savings and ignores investment behavior. Using annual data, the study covers the period of 1967-1980. Since the focus of the study is the responsiveness of savings to changes in real interest rates, they adopt several different models of saving behavior. The first model is based on the Keynesian absolute income hypothesis which states that saving is simply a function of disposable income:

$$\text{GPS} = f(\text{YD}, \text{SR}) \quad (4.a)$$

where GPS = real gross private savings, YD = real disposable income and SR = the real interest rate, which is computed using the interest rate on savings deposits and subtracting observed consumer price inflation. The second model uses a lagged saving hypothesis, which states that the past period's savings determines the present savings.

$$\text{GPS} = f(\text{YD}, \text{GPS}_{t-1}, \text{SR}) \quad (4.b)$$

where GPS_{t-1} = lagged gross private savings. Finally, the third model takes into account the possible effect of changes in income on savings, and is expressed in the following form:

$$\text{GPS} = f(\text{YD}, \Delta \text{YD}, \text{GPS}_{t-1}, \text{SR}) \quad (4.c)$$

where ΔYD = change in disposable income.

Leite and Makonnen also modify these models by including the share of exports in GDP (X/GDP) in order to capture the "distributional effect" arising from the difference in the propensity to save between the export and other sectors of the economy. The results of the study show that the signs of all coefficients are consistent with the a priori expectations. In all the models, the real interest rate has a positive relationship with the gross private savings. In fact, the effect of the interest rate is strongly positive and significant in the "lagged saving model", but the effect is much reduced and becomes statistically insignificant in the "dynamic adjustment model" which includes the change in income as an explanatory variable. They claim that this is mainly the consequence of the significantly positive correlation between real interest rates and real growth in many of the BCEAO countries.

The level of disposable income, changes in disposable income, and past savings are found to be the main determinants of saving behavior. In all their models, the introduction of the share of exports in GDP significantly improves the statistical significance of estimated equations. This suggests that the propensity to save in the export sector in sample countries is different from the rest of the economy. As a result, savings tend to rise in years when the ratio of exports-to-GDP increases.

Yoo (1977), in his attempt to test explicitly the significance of money's role in LDC's investment and savings functions, develops a simultaneous equation model. Using the definition of net investment at period t (I_{Nt}) as capital stock at t (K_t) less capital stock in the previous period (K_{t-1}), the investment function is presented in the following form:

$$I_{Nt}=f(Y_t,K_{t-1},M_{t-1}) \quad (5.a)$$

where I_{Nt} = net investment at period t , Y_t = national income, K_{t-1} = capital stock at period $t-1$, and M_{t-1} = broad money (M_2) at period $t-1$.

The savings function is the following:

$$S_t=f(Y_t,Y_{t-1},M_{t-1}) \quad (5.b)$$

In the study, Yoo includes five developing countries (Philippines, South Korea, Taiwan, Israel, and Brazil) and three industrial countries (Norway, New Zealand, and USA). These countries are chosen in order to encompass a variety of development experiences and country sizes. Using two-stage least squares as a method of

estimation, Yoo finds that national income (Y_t) and the lagged capital stock (K_{t-1}) positively and significantly affect net investment in all five LDCs. The lagged broad money supply (M_{t-1}) positively and significantly affects net investment of all LDCs but South Korea. All three variables (Y_t , Y_{t-1} , and M_{t-1}) have a positive and significant impact on savings of all LDCs in the sample.

Besides the cross-country studies above, there are a number of studies devoted to the testing of the financial liberalization hypothesis in a single country [e.g., DeMelo and Tybout (1986), Rittenberg (1991), Warman and Thirwall (1994)].

DeMelo and Tybout (1986) conduct a study which explores the impact of financial liberalization in Uruguay. As a point of departure, they estimate a savings model for the period from 1960-1983. Because the real interest rate and/or real income may be endogenous with respect to the savings rate, they report estimates with instrumental variables. They estimate two savings functions, which are in the following forms:

$$S_t = f(y', r_t, f_t, S_{t-1}) \quad (6.a)$$

$$S_t^p = f(y', r_t, e, D, S_{t-1}) \quad (6.b)$$

where S = real total savings rate, which is total savings/real GDP, S^p = real private savings rate, y' = real GDP growth, r = real ex-post deposit rate, f = foreign saving/GDP, e = real exchange rate, D = a dummy for two regimes, zero through 1974 (the year when liberalization-occurred) and one thereafter, and S_{t-1} = lagged saving rate. The real ex-post deposit rate is calculated by the formula: $r = (i-p)/(1+p) \times 100$, where i is the nominal interest rate and p is the percentage change in the consumer price index. The real exchange rate is computed as: $e = ER \times CPI_{US} / CPI_{Uruguay}$, where ER is the commercial exchange rate (Uruguayan peso/US dollar).

The investment function is expressed as follows:

$$i_t = f(y'_t, y'_{t-1}, m'_t, m'_{t-1}, e_t, r_t, D_t, i_{t-1}) \quad (6.c)$$

where i = real private investment rate, which is private investment/real GDP, y' = real GDP growth, m' = real money growth, e = real peso/dollar exchange rate, r = real ex-post interest rate, D = a regime dummy which is zero through 1974 and one thereafter.

By applying the savings models in separate periods, DeMelo and Tybout find that savings behavior exhibited a shift with financial liberalization, particularly with respect to responsiveness to the interest rate. They find a positive response of the savings rate to the real interest rate in the pre-liberalization period, but no such response after financial liberalization. These findings are contradictory to the McKinnon-Shaw theories, but DeMelo and Tybout note that neither of them seems to be free of measurement problems. They find that standard accelerator effects on investment are significant throughout the period under study. The results suggest that investment activities are "non-savings constrained," even though the responsiveness of investment to the interest rate and exchange rate tends to increase in later years.

Rittenberg (1991) selects the case of financial liberalization in Turkey and analyzes the impact of interest rate policy on investment spending. He hypothesizes that investment and growth are positively correlated with below-equilibrium interest rates and negatively correlated with above-equilibrium interest rates. In his study, Rittenberg uses annual data for 23 years (1964-1986). The investment model used in the study is somewhat similar to the model of De Melo and Tybout (1986), with a few exceptions. First, instead of the real investment rate (real investment/GNP), Rittenberg selects the level of real investment as the dependent variable. Second, the level of real GNP (in log form) is included in the model as an additional explanatory variable. Third, besides the dummy variable for liberalization, another dummy for 1980 is also included in his model. This year receives special attention since it is considered as a year of transition. Annual inflation reached an extremely high level (110%) and most of the inflation occurred in the first half of the year. Interest rate controls were relaxed in the latter part of the year. Finally, he includes the difference between the market interest rate and the equilibrium rate as another explanatory variable. Thus, the investment function is as follows:

$$I = f [g, e, r, (r-r_0)D_r, D_{80}, D_L, GNP_{t-1}, I_{t-1}] \quad (7)$$

where I = real private investment, g = real income growth, e — real exchange rate, defined as $ER \times CPI_{world}/CPI_{Turkey}$, r = real deposit interest rate, calculated as $[[1+i]/(1+p)]-1 \times 100$, where i is nominal deposit rate and p is rate of increase of the CPI, r_0 = equilibrium rate of interest, estimated as the interest rate that minimizes the sum of squared residuals, D_r = dummy variable which is one if r is greater than r_0 and

zero otherwise, D_{80} = dummy variable which is equal to one for 1980, zero otherwise, D_L = post-liberalization dummy variable which is equal to one for 1981-1986 and zero otherwise, GNP_{t-1} = natural log of lagged real income, and I_{t-1} = natural log of lagged real private investment.

Rittenberg applies three estimation methods. The first method is OLS. The second and the third methods are instrumental variable methods. In the second case, he assumes that real deposit rate is an endogenous variable, and in the third case he assumes that real interest rate, real GNP growth rate, and the real exchange rate are endogenous. The instruments used were real income growth lagged one and two periods (g_{t-1} and g_{t-2}), the 1980 dummy variable (D_{80}), the post-liberalization dummy variable (D_L), and the lagged values of the real exchange rate (et_{t-1}), real deposit rate (r_{t-1}), the logarithm of real income ($GNPM$) and the logarithm of real investment (It_{t-1}).

Rittenberg ran the model for three different sectors: non-housing, manufacturing, and transportation sectors. The results show that real income growth positively and significantly affects private investment, except in the OLS model of the transportation sector. Real exchange rate declines have negative effects on private investment. The dummy variable for 1980 is positive and significant for all private non-housing investment and for the large manufacturing component.

The post-liberalization dummy variable is found to be negative and significant in most versions of the model. Rittenberg notes that there are two possible explanations for this finding. First, it is possible that the government uses private savings to finance the growing public interest repayment burden, which might crowd out private investment. The second possible reason is an increase in investment uncertainty associated with the period of liberalization. His empirical results also suggest that investment in all three sectors and all versions of the model is positively and significantly affected by the real deposit interest rate. Warman and Thirwall (1994) focus their study on Mexico, a country that experienced financial liberalization during the 1980s. They are interested in examining the determinants of financial savings, private savings, total savings, investment and economic growth in Mexico over the period 1960-1990, with a special reference to the role of real interest

rates. There are three savings functions developed in the study, including financial savings, domestic savings and private savings.

Financial saving is defined as the amount of total savings that is channeled via financial assets. It is measured by the change in the stock of monetary assets, where monetary assets are defined broadly to include short-term banking instruments, non-bank financial instruments (Treasury bills and other government bonds and commercial paper), and long-term banking instruments and government bonds. Domestic (total) savings consists of public and private savings. The savings functions are as follow:

$$FS = f[GDP, r, (r-r_{us}-e), P_v] \quad (8.a)$$

$$DS = f[GDP, r, (r-r_{us}-e), P_v, D_{86}] \quad (8.b)$$

$$PS = f[GDP, r, (r-r_{us}-e), P_v, DS_6] \quad (8x)$$

where FS = nominal financial savings, DS = nominal domestic savings, PS = nominal private savings, GDP = real national income, r = Mexican real interest rate, r_{us} = real return on US government bonds, e = expected rate of dollar depreciation/appreciation, and P_v = uncertainty associated with volatile inflation as measured by the standard deviation of the monthly inflation rate in Mexico (year-by-year). The third variable ($r-r_{us}-e$) measures the capital flight to and from Mexico and the US. The last variable in the second and third models (D_{86}) is a dummy variable for the year 1986, when the level of total domestic saving fell sharply as a consequence of a 50% fall in oil prices in 1985.

They find that the equation is well determined with all variables showing the expected sign and statistically significant at 95% confidence level or above. The coefficient of r is positive, indicating that, holding constant the differential between the real return on Mexican and US financial assets, financial savings increases as the real interest rate in Mexico increases. The coefficient of the capital flight variable is also positive, indicating that there is significant capital flight to and from Mexico. More specifically, a one percentage point change in the differential return leads to a 1.41 billion peso change in the level of financial saving in Mexico. Finally, inflation volatility is also shown to affect financial savings adversely.

The investment function in Warman and Thirlwall's study is expressed as follows:

$$I = f[r, (r-r^e)D, C, GDP_{-1}, D_{81}, D_{83}] \quad (9)$$

where r = real interest rate, r^e = equilibrium interest rate, D = dummy variable which is one if $r > r^e$ and zero otherwise, C = supply of credit, GDP_{-1} = lagged change in GDP as a measure of the accelerator effect on investment, D_{81} = dummy for the year 1981, when there was exceptionally high investment associated with the oil boom, and D_{83} is for 1983 when the investment level suffered a structural break following the debt crisis. The final results show that real investment is negatively affected by the rate of interest, and that both the supply-side determinant (credit) and demand-side determinant (the lagged accelerator) are positive and significant.

In summary, Warman and Thirlwall conclude that for the case of Mexico, financial saving is positively related to financial liberalization (proxied by the real interest rate), partly through capital flows and partly through domestic asset substitution. However, total saving is found to be invariant with respect to real interest rates. They also find that financial liberalization does not positively affect investment.

SUMMARY

Until the early 1970s, systems of financial repression (especially in the form of interest rate ceilings) were implemented in many less-developed economies. This policy can be rationalized from a macroeconomic viewpoint if the impact of interest rates on saving is ambiguous (depending on the opposing influences of substitution and wealth effects), but the relationship between interest rate and investment is unambiguously negative. Low interest rates would promote investment spending, and hence, economic growth.

This policy of repression is challenged by "financial liberalists", pioneered by McKinnon (1973) and Shaw (1973). They claim that higher real interest rates increase savings and the availability of loanable funds. Investment consequently increases, as does economic growth. In other words, savings may serve as a "conduit" for capital formation, making deposits and physical capital complementary

assets. In addition, high deposit rates may "crowd-out" low-yielding investment proposals and increase overall investment efficiency. Financial liberalization, characterized by the elimination of government regulation to allow the interest rate to move to an equilibrium level, is a necessary condition for rapid economic development.

The concept of financial liberalization is backed by an extensive theoretical literature. The essence of arguments for liberalization is the need for the market mechanism to work. Under a repression system, government controls over the interest rate force the market to remain at a disequilibrium level, where savings cannot provide sufficient funds for investment. When the interest rate ceiling is removed, the interest rate will increase until it reaches a point at which the market is in equilibrium and savings can generate provide funds needed for investment.

Many studies have been conducted, involving either single country or multiple countries, to test the financial liberalization hypothesis. However, the results do not always support the hypothesis. In some multiple-country studies, the impacts of financial liberalization programs tend to vary across the sample countries [for example, the studies of Giovannini (1983) and Gupta (1984)]. Some other cross-country studies [i.e. Fry (1978), Leite and Makonnen (1986), and Yoo (1977)] show that the impacts of financial liberalization are similar among the sample countries. In single-country studies, the majority of the studies we have evaluated tend to support the financial liberalization hypothesis [for instance, Rittenberg (1991), Warman and Thirwall (1994)].

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