

Financial Intermediation Under Information Asymmetry: Implications for Capital Market Efficiency in Selected Developing Countries

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Abstract

The paper examines two channels of financial intermediation in a sample of developing countries with imperfect information. Empirical results support the supply-leading intermediation for the majority of these economies, and also suggest that financial structure variables provide a better explanation of income growth than investment variables. Policy implications are drawn for rationalizing the financial structures of the emerging developing market economies.

I. Research Problem

International development literature sees inadequate supply of credit as one of the major constraints on growth in developing economies. Consequently, large scale direction of public funds to selected areas of the economy and groups of individuals have prevailed in many of these countries. Until recently, most developing country governments had viewed financial development in terms of increasing the number of specialized financial institutions, such as agricultural and industrial development banks, while at the same time encouraging conventional banks to lend to priority sectors. However, more than four decades of international development efforts have produced little, if any, structural changes, or raised the standard of living of the populations of the developing economies. Despite often divergent views as to how growth of an economy should proceed, development economists and planners seem to agree that successful development requires availability of capital in a sufficient amount. Many have correctly pointed out that these countries are less developed precisely because they lack adequate capital. Consequently, international development places considerable emphasis on domestic capital accumulation as well as on capital imports. But external capital flow is very volatile, and sensitive to political developments in both the receiving and donor countries. Within this context, financial intermediation becomes a significant factor in the equation for economic growth and development in generating increased supply of domestic savings and investment.

The primary objective of the paper is to determine the link between financial intermediation and economic growth. The proposition that financial intermediation enhances the saving-investment process has been studied and analyzed in detail by various researchers, including Goldsmith (1969), Gurley and Shaw (1955, 1956, 1960, 1967), Patrick (1966), Bhatia and Khathate (1975) and Galbis (1977, 1979). The present study extends this line of research. The remainder of the paper is organized as follows.: Section (II) formulates two models which link the real and financial sectors of the economy, and based on these models, section (III) specifies and estimates two empirical equations of financial intermediation for each of the

countries in our sample, and presents the results. Section (IV) contains the summary and policy implications.

In their study, Greenwood and Jovanovic (1990) present a model in which both the extent of financial intermediation and the rate of economic development are endogenously determined. They argue that financial intermediation promotes growth, because it allows a higher rate of return to be earned on capital. Income growth, in turn, provides the resources to finance costly financial structures. Greenwood and Jovanovic conclude that financial intermediation and economic growth are inextricably linked. Other studies on the macroeconomic implications of financial intermediation incorporate many of the earlier ideas of Gurley-Shaw and others, and stress the role of these institutions in overcoming imperfections in markets which transfer funds between savers and investors. While these models capture the basic features of intermediation, they suffer from lack of detail.

Diamond (1984) provides an early example of how it is possible to formally explain intermediary-like institutions. He considers a setting with an information structure similar to Townsend's (1978) costly state verification model, in which lenders cannot freely observe the returns to borrowers's projects. As with Townsend, the optimal bilateral financial arrangement is a risky debt contract under which the lender monitors the borrower in the event of default. Diamond then shows that, in order to economize on monitoring costs, it is optimal for a competitive financial institution to channel funds between savers and borrowers. Furthermore, the structure of the financial intermediaries which arise endogenously, does share basic features of a conventional financial intermediary. They write loan contracts with individual borrowers, and monitor borrowers who default; hold a diversified portfolio; and transform assets for savers. Diamond goes on to show that the latter two characteristics arise to solve a potential incentive problem between the financial institutions and their depositors.

Williamson (1986) uses a similar environment to illustrate how intermediation and credit rationing may be interrelated phenomenon. Rationing emerges in his framework because costly state verification adds a premium to loan rates, intermediation arises simultaneously as a way to minimize this premium, and thus, minimize rationing by economizing on monitoring costs. One striking feature of the behavioral theories presented thus far, is that intermediation works well, in fact so well, that taking the models literally, a laissez-faire policy toward financial intermediaries is optimal. On the other hand, Bhattacharya and Gale (1987) make a case for government intervention to insure smooth flow of liquidity without appealing to arbitrary restrictions on private contracts. Implicit assumption of their paper is that any case for government credit market intervention, probably rests on the absence of well functioning secondary markets for the assets of the relevant financial institutions.

II. Intermediation Models

Major institutional features of financial markets in these countries reflect market imperfections. There are limitations on the kind of collateral that can be used. Moreover, most individuals have few assets that can be collateralized. Conventional banks and government-run credit programs, which have found it difficult to screen

and monitor borrowers directly, tend to rely heavily on collateral such as land. But because land ownership is correlated with income, borrowers with above-average income have greater access to credit. A second feature is the lack of complementary infrastructure, such as credit insurance in these markets. The flow of information between lenders is also more restricted and reputational mechanisms can function only on a local basis, and thus making financial intermediation across large areas more difficult. Finally, credit markets in these countries tend to be segmented geographically, in which case funds do not readily flow across areas that are far apart, or across individuals living in geographic proximity.

There are traditional moneylenders who are often criticized for charging usurious rates. The popular view is that these rates are exploitative, and implicitly assumes that competition is limited. But Hoff and Stiglitz (1990) have questioned the extent of exploitation, suggesting instead, that the high rates are a result of the high rates of default, high cost of screening loan applicants and of pursuing delinquent borrowers. Because of the importance of local information, moneylenders' loans are generally concentrated within a narrow geographic area. Inability to diversify means that the risks they bear are higher, and the lending market carries high risk premia. Thus, both in the rates charged and the institutional arrangements by which loans are extended, traditional moneylending differs markedly from conventional banking institutions. The policy response arising from the exploitative view of moneylenders was to provide subsidized institutional credit as an alternative to the moneylender.

Many governments, supported by multilateral and bilateral aid agencies have devoted considerable resources to supplying credit in a myriad of institutional settings. This intervention which has taken various forms, including outright government ownership of financial institutions; the setting up of specific institutions (development banks) to allocate credit to specific sectors; the lack of independence of the central bank, so that it is used to implement development policy; regulation of reserve requirements, forced investment, directed credit, below-market interest rates and other instruments. For more details on credit market interventions in developing countries, see Besley (1992) and Fry (1990).

Intervention in credit markets via development banks or other means, has also been justified on the grounds that the more efficient modern financial institutions would improve income distribution and increase output by making credit more widely available. The impact of credit market intervention on employment, growth and income distribution have been studied extensively. See, for example, World Bank (1989) and Fry (1990). This would be true whether the high interest rates charged by moneylenders reflected monopolistic markets or whether they reflected compensation for the undiversified risks that the local moneylenders had to bear. They often serve as lenders of last resort to those unable to obtain finance in the formal sector. The local moneylenders have an important advantage over conventional financial institutions in that they have detailed knowledge of borrowers, can separate out high and low-risk borrowers and charge them appropriate interest rates, and are able to monitor borrowers more effectively. In other words, they are able to reduce the moral hazard and adverse selection problems often associated with credit and loan markets.

There is a long history of enforcement problems in credit programs in low-income countries. In particular, a major problem for conventional lenders has been to ensure that borrowers exercise prudence in the use of funds, so that the likelihood of repayment is enhanced. This reflects poorly developed property rights and other difficulties of foreclosing on delinquent borrowers. In addition, governments in some countries have failed to sanction borrowers, because of political constraints.

The present study draws on earlier studies of financial intermediation in developing countries, which include Gurley and Shaw (1955, 1956, 1960, 1967) Goldsmith (1969), Abdi (1977), and Galbis (1977, 1979). For the first time, the pioneering work of Gurley and Shaw (1955) drew attention to the relationship between real economic activity and developments in financial systems, especially in terms of the role of financial intermediation, monetization, and capital formation in determining the rate of economic development in developing economies.

On theoretical basis, one can discern two primary levels of abstraction in determining the role of financial intermediation on income growth. These are demand following and supply-leading financial linkages. The former model represents the creation of conventional financial institutions, financial assets, liabilities, and related financial services, in response to the demand for them by lenders and borrowers in the economy. The nature of the demand for financial products and services in turn, depends on income growth. In this case, the more rapid the growth of income, the greater the demand by firms for external funding, and therefore, financial intermediation. This channel would have the economy decide the desired amount of savings which can be said to be positively related to both real income (y) and real interest rates (r), and may be formally stated as:

$$s = \phi_0 y + \phi_1 r \quad (1.1)$$

When total level of savings is determined, it is then a matter of portfolio choice as to the proportion to be held in financial form, and is expected to be positively related to total savings i.e.,

$$\Omega = \theta s \quad (1.2)$$

Investment is assumed to be determined exogenously. This means that investment is independent of interest rates, partly because in most developing countries, public sector investment is determined by financial and political authorities in accordance with future development and political goals, and not based on past or current economic events. Furthermore, in these countries, credit rationing is the rule rather than the exception. The availability of resources rather than the rate of interest determines the level of private investment. Furthermore, it is assumed that income is determined by productivity of past and present investments, which is proxied by output-investment ratio:

$$y = \lambda I \quad (1.3)$$

where

S = Total savings

Ω = Financial savings (i.e., increase in financial assets)

I = Investment

A = Output-investment ratio

σ = Proportion of total savings held in financial form

φ_0 = Average saving rate

φ_1 = Average induced interest sensitive savings

r = Real interest rate

According to equation (1.3), the level of financial intermediation in a demand-following model depends on the financial structure growing at the same rate as the growth of investment according to the parameters σ , φ_0 and λ , and rate sensitive savings.

The supply-leading intermediation emphasizes creation of financial intermediaries; the supply of financial assets, liabilities, and related financial services in advance of the demand for these products and services. According to this view, financial intermediation would enable financial institutions to collect financial savings, which are directed toward increased investments and increased income. The supply-leading intermediation can be represented as:

$$s = \mu\Omega \quad (2.1)$$

where total financial savings is a function of real income and interest rates; i.e.,

$$\Omega = \beta_0 y + \beta_1 r \quad (2.3)$$

According to the above specification, income affects financial savings first, and total savings are determined only through the financial multiplier. And assuming that the financial structure has a positive effect on economic growth, then one would consider the role of intermediation in improving productivity of investment as well as mobilization of financial savings. Improved productivity of investments can be captured by a domestic credit variable measured in constant value, or by the increase in real domestic assets (ΔD) of the financial system, which will then depend on real financial savings. Formally stated,

$$\Delta D = \delta\Omega \quad (2.3)$$

The efficiency of the financial structure in improving investment productivity can be represented by ω in the output equation as follows:

$$y = \lambda I + \omega\Delta D \quad (2.4)$$

where

β_0 = Average rate of financial savings

β_1 = Saving rate of interest rate induced saving

δ = Credit-saving multiplier

μ = Savings-financial savings ratio

ω = Efficiency of financial structure in improving investment productivity

ΔD = Domestic credit

According to equation (2.4), real output is affected not only by the output-investment ratio (λ), but also by the efficiency of the financial structure (ω), the financial savings multiplier (δ), and the responsiveness of financial savings to interest rates (β_1). Improvements in these parameters will have positive impact on income. In the demand-following model, the nature of demand for financial services depends on the growth of real output. The more rapid the growth of income, the greater the demand for financial services and products. These institutions would transfer funds from slow growing sectors to more rapidly growing industries. In this case, the financial system supports the leading sectors in the growth process. In the supply-leading model, financial resources are transferred from traditional sectors to stimulate entrepreneurship in the modern sectors of the economy. In this sense, financial intermediation is both supply-leading and demand-following; financial intermediation enhances and is, in turn, enhanced by the growth process. Financial intermediation may encourage the saving-investment process and thus, foster development without serious balance of payments disturbances.

III. Estimation & Results

Based on a sample of nine countries, eighteen empirical equations relating measures of financial intermediation to economic growth were estimated using annual data covering the period 1969 - 1992. The data were obtained from various issues of the World Bank's *World Tables*, and the IMF's *International Financial Statistics*. Financial assets held by government are excluded from the list of financial assets used in defining the index of financial intermediation (fir). The volume of such assets exclusive of those held or issued by government institutions and enterprises can be altered with little or no difficulty. Consequently, the only meaningful financial assets in the economy is that held by the nonfinancial sector other than the government.

The following equations, were subjected to least squares estimation:

$$\log y = \alpha_1 + \beta_1 \log gni_q + \epsilon \quad (3)$$

$$\log y = \alpha_2 + \beta_2 \log fir_q + \epsilon \quad (4)$$

In equations (3) and (4), y is real gross domestic product in 1980 prices, gni_q is real gross domestic investment in constant 1980 prices, and fir_q is real domestic assets of the financial system at 1980 prices, and ϵ is the random error term. The two equations were estimated using ordinary least squares, and the results presented in tables 1 and 2 below.

We compare the performance of the two equations to determine whether real investment or real financial structure provides a better explanation of real output. According to these results, the coefficients of the included variables are significant at the five percent level or better, and the adjusted R^2 shows that substantial variations in real income have been explained. Furthermore, in all the regressions, the t -test statistics were significant.

The explanatory power of the demand-following model for the nine countries averaged around eighty-nine percent with standard error of 12 percent compared to the average of ninety-three percent and 5.5 percent respectively. Furthermore, a two-sample test with unequal variances supports a significant difference between the explanatory power of the two models (t -value = 2.272, $prob=0.04$). In general, these results suggest that financial structure variables provide a better explanation of income growth than investment variables in Burundi, Cyprus, Malawi, Thailand, and Zambia. In Ecuador and Mexico where demand-following intermediation appears to be the predominant channel, the investment equation performed marginally better. On the other hand, the supply-leading model was more suitable for Burundi, Malawi, and Zambia where financial intermediation tends to follow the supply-leading channel. Both demand-following and supply-leading intermediation processes appear to prevail in Cyprus, Indonesia, Thailand and Venezuela. On the whole, these results provide some support for supply-leading financial intermediation in majority of these economies.

IV. Conclusions

An important challenge to financial economists is to explain how financial contracts and institutions affect economic growth and development while simultaneously explaining how economic development elicits the creation and modification of financial arrangements. This study represents a modest step in that direction, by estimating the link between economic growth and financial intermediation in a sample of developing countries, using two models of intermediation. Empirical results tend to show that, despite substantial intervention in the capital and credit markets, several of the countries have used financial intermediaries to mobilize domestic resources for economic development.

From a policy standpoint, much remains to be done. For example, in order to improve the intermediation process, financial authorities in these economies have the responsibility to promote financial development generally, and to ensure that channels exist whereby the supply and the demand for credit are met. Although informal finance, pervasive in many of the developing countries makes it difficult to chart financial flows in fine detail, a flow-of-funds framework can provide a coherent view of financial interrelationships and thereby prevent financial authorities from slipping into inconsistent policy choices. Even the most basic flow-of-funds estimates can

throw inter-sectoral financial relationships into a sharper focus, and help identify financial surplus or deficit areas. Also to the extent that saving is interest rate sensitive, a review of all rigidities in rate structure must be undertaken to make them compatible with achieving the optimal effects of financial intermediation on economic growth.

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Table 1.
Estimates of Demand-following Model of Financial Intermediation

Country	α_1	β_1	R^2	DW
Burundi	1.55 (6.02)	1.07 (8.80)*	0.79	1.77
Cyprus	2.66 (10.51)	0.74 (3.59)*	0.93	1.30
Ecuador	4.13 (3.35)	0.35 (3.46)*	0.99	1.35
Indonesia	6.17 (4.17)	0.48 (8.97)*	0.98	1.29
Malawi	3.49 (8.30)	0.58 (7.45)*	0.81	1.21
Mexico	2.95 (4.04)	0.77 (3.79)*	0.97	1.55
Thailand	4.11 (6.59)	0.47 (3.4.3)*	0.98	1.35
Venezuela	4.17 (7.82)*	0.32 (2.50)*	0.96	1.55
Zambia	6.59 (2.71)	0.20 (5.40)*	0.62	1.23

* Means coefficient is significant at 5 percent level or better. Figures in parentheses are t-ratios.

Table 2.
Estimates of Supply-Leading Model of Financial Intermediation

Country	α_1	β_1	R^2	DW
Burundi	0.73 (3.68)	0.65 (5.46)*	0.93	1.20
Cyprus	3.54 (3.29)	0.44 (6.62)	0.95	1.39
Ecuador	0.86 (3.82)	0.56 (9.44)*	0.97	1.09
Indonesia	7.55 (2.27)	0.38 (6.74)*	0.96	1.22
Malawi	4.36 (3.26)	0.50 (9.81)*	0.96	1.47
Mexico	3.68 (5.26)	0.67 (8.01)*	0.94	1.86
Thailand	3.82 (5.27)	0.48 (4.35)*	0.99	1.14
Venezuela	4.26 (6.51)	0.25 (7.18)*	0.96	1.55
Zambia	6.14 (2.14)	0.20 (9.19)*	0.62	1.23

Notes: *Means coefficient is significant at 5 percent level or better. Figures in parentheses are t-ratios.