Economic Development and Financial Deepening:
A Study of Causation and Dynamics

Dr. Richard G. Fritz
University of Central Florida

ABSTRACT

The direction of causality between financial deepening and economic development is tested. Using factor analysis, two indexes are developed to represent the two economic phenomena for the Philippines. Time series causality tests are used to evaluate the direction of causality. The results indicate the causal pattern reverses over the history of the sample. Reversal is viewed as the result of financial repression. The structural dynamics implied by the empirical time series test is evaluated using a system dynamics model. The growth promoting and growth inhibiting roles of the financial sector are simulated in the dynamic structure of a dynamic economic development model.

INTRODUCTION

The role financial institutions and new credit creation plays in determining the rate of economic development continues to be debated. Most modern treaties on the subject refer to Schumpeter's Theory of Economic Development as the basis for the growth-inducing character of improved financial institutions. This "Schumpeterian" logic of capitalist economic development has been supported with modern analysis, which attempts to estimate the relative impact of the degree of improvement in financial institutions on the economy's development potential (Abdi).

The positive growth-inducing aspect of "supply-leading" financial development is attributed to its allocative efficiency and to its encouragement of enterprise (Goldsmith; Patrick). This activity transfers resources from non-growth producting sectors to sectors of an economy with higher growth potential. It is also possible that financial development is "demand-following." As the economy moves from traditional subsistence production, grows more complex, and generally becomes monetized, certain demands are generated for the services of financial institutions. The financial repression hypothesis advocated the efficacy of financial development in contributing to real growth (Cameron; McKinnon; Shaw). They contend that financial institutions are invariable growth-inducing and that only when they are repressed would they fail to make a positive contribution or act as an obstacle to real growth. Following Gerschenkron, the structuralist hypotheses is derived from historical interpretations of the role of banks in the capital formation processes of industrialization. This thesis allows banks a primary role in differentiating among patterns of development. Gerschenkron attributes to these institutions a greater influence in the period and process of industrialization of some countries than any other economic institution.

The policy implications are critically different depending upon the causal direction implied by both sides of the debate. Recently a few studies

have concluded that the contributions of the entrepreneural character of financial institutions may follow a cyclical path (Drake.) The life cycle of financial deepening implied protrays the process as having a supply leading role in the early stages of development followed by a demand following stage later when the country has reached a more industrialized production process. In order to determine the characteristics of the causal process which may result in this directional shift, a system dynamics approach has been explored in this study. Such a modeling procedure can aid in capturing the interactions between economic development and the maturation process of the financial sector in the less developed economy. Revealing the components of the switching points in the direction of causation is critical to establishing policy guidelines for using financial deepening as an economic development instrument. Sensitivity to policy changes can be tested through the feedback analysis of the system dynamics model.

This paper will test the direction of causality between financial development and economic development. Using factor analysis, two indexes will be developed to represent the two economic phenomena for the Philippines between 1947 and 1982. Time-series causality test (Granger, 1980) will be used to evaluate the direction of causality. The structural dynamics implied by the empirical time series test will be evaluated using a system dynamics model. The impact of financial deepening on economic development in the modern Philippine economy will be simulated.

ECONOMIC BACKGROUND ON DEVELOPMENT AND FINANCIAL DEEPENING

Throughout the world, less developed countries (LDC's) are facing financial crisis (Silk). Major financial institutions throughout the world, as well as the World Bank have extended credit to these countries expecting the resulting economic development to yield the necessary dividends for repayment. However the most expeditious road to economic development has never been a certain one for LDC's. One controversy deals with the degree and timing of maturity of the financial institutions and financial markets. Previous published research polarizes the role of financial institutions in the process of economic development between the supply-leading position and the demand-following hypothesis. However, the large proportion of researchers in the field believe in the affirmation effect of financial maturity on the economic development process.

The statistical evidence is compelling. Raymond Goldsmith (1969) attempted to measure the degree of institutional maturity in the financial market using the ratio of total financial assets to national wealth. He showed that the higher the financial interrelations ratio (FIR) value, the greater a nation's level of financial development. This and several other instruments have been used to denote the relative dimensions of financial structure in different countries over long periods of time in order to identify the association between financial development and real economic growth (Adelman and Morris, 1967; Cameron, et al, 1972; Patrick, 1966; Shaw, 1973; Gurley, 1967; Viksnins, 1980; Drake, 1980; Von Pischke, Adams and Donald, 1983; Ayres, 1983).

Drake summarizes this literature by identifying three focal points. Financial institution development: (1) augments the quantities of real saving and capital formation from any given national income, (2) increases

net capital inflow from abroad, and (3) raises the productivity of aggregate investment by improving its allocation (p. 35). Porter has added (4) improved macroeconomic stabilization, arguing that "greater stabilization of the economy through monetary controls is attainable when the banking system is more widespread" (1966, p. 356). Cameron goes a step further. Banks provide a basic intermediary function between savers and investors, or surplus and deficit spending units, but they are unique in being able to (5) supply liquidity to the economy by creating money. "They are in a position not merely to serve as the custodians of the stock of money but also to increase or decrease that stock. The consequence of this power for society at large can be considerable—and either favorable or unfavorable" (1972, p. 7). Cameron further suggests that the banking system may function as (6) the provider of entrepreneurial talent and guidance for the economy as a whole. As potential entrepreneurs, they may set their country on the road to continuing growth, or they may waste its resources in uneconomical or fraudulent activities (Cameron, p. 8).

The direct role of money in economic growth has been discussed at some length in the modern literature since Tobin constructed a neoclassical macro model combining the aggregate production function and the monetary sector in 1955. This work was modified by Levhari and Patinkin and others to include the use value of money more explicitly and the inter-temporal utility maximization of saving behavior.

However, the direction of causality has not been resolved. Some who have criticized the foundational propositions of these "monetary" growth models concede that there are important "financial breakthroughs" which provide efficiency and utility (Pierson). These breakthroughs have tremendous effects when they occur, but thereafter contribute little. Their marginal products are significant and initially large but thereafter they rapidly decrease. Pierson holds that the establishment of a credit system and the establishment of an intermediary system are two critical growth promoting breakthroughs, both of which can exist without a medium of exchange. The introduction of a medium of exchange is a third great financial breakthrough, saving time, effort, and physical resources in the process of exchange. Pierson and others believe that with few exceptions, financial institutions and markets develop following the lead of general economic development.

This "demand-following" type of financial development is viewed as somehow accommodating or reacting passively to the growth of the real economy. As the economy moves from traditional subsistence production, grows more complex, and generally becomes monetized, certain demands are generated for the services of financial institutions. Such demands are created by the growing needs of firms for external finance, as their retained profits fall short of their investment expansion needs. In this approach to financial development, emphasis is placed on the demand for financial assets, and the responsiveness of existing or new financial institutions is taken for granted. The case of demand creating its own supply. A distinction of the demand-following type of financial development is that its contribution to economic development is minimal.

Much of the dispute over the role of financial deepening as it relates to LDC's is concerned with the difference between theoretical benefits

associated with monetization and the growth of financial intermediaries and
the actual realized benefits. Viksnins points out that in the bulk of the
less developed world the population will be found in rural areas engaged pri-
marily in subsistence farming. For the average peasant farmer, income and
consumption are usually closely matched. Most farm surplus income is used to
buy additional consumer goods (or used to enhance ceremonial-religious
activities) rather that saved or transformed into productive investments.
Viksnins notes several additional inhibitions to a growth promoting financial
sector in LDC's. With a large surplus, the farmer is likely to buy more
land, farm animals or agricultural implements. With supply of these items
relatively fixed during the period of surplus, prices of land and investment
goods are bid up and real investment remains about constant. Cultural and
physical barriers may be a significant problem. Traveling to the provincial
capital and depositing funds in a financial institution, filling out forms
and dealing with clerks from different social groups would probably not even
be considered by the rural farmer.

Not only are financial institutions generally unavailable and inacces-
sible, but markets in LDC's may often allocate the scarce funds to less
efficient project uses due to "financial repression". Both Shaw and McKinnon
(1973) discuss this phenomenon, which results in the average saver being
consistently offered a negative real rate of return on financial assets. In
such markets the expected inflation rate is above the interest rate paid on
deposits and securities. The real rate of interest becomes negative, the
demand for loanable funds increases while the supply declines resulting in
many borrowers and no willing lenders. The fragmented money and capital
markets of LDC's that result are inefficient.

Market fragmentation reinforces the urban-rural split. An organized
financial market in an LDC's in the past has meant the urban financial
market. Nisbet (1973) found in rural Chile that only about 30 percent of the
population had any dealings with financial institutions with the remainder
having access only to money lenders or shopkeepers. Such imperfections
stimulate average high interest rates in the unorganized rural sector. The
fragmentation also results in a consistent bias for export of domestic
savings. Economic agents who are active in the export sector will seldom
convert their foreign exchange back to local currency, either because nega-
tive real interest rates are offered on assets in the organized money market
or because they anticipate future convertibility limitations. Financially
repressed economies also tend to develop a propensity to issue short-term
instruments rather that long-term. The planning horizon of savers becomes
logically short. Asset holders try to maximize their liquidity, avoiding
being locked in at a very low or negative real rate for a long time period.
This results in investors attempting to finance capital projects by borrowing
large amounts in the short-term money market.

While the supply-leading approach has much to suggest a more prosperous
overall economy resulting from financial deepening; improved savings mobili-
zation as lenders offer positive interest rates, average rates charged to
borrowers falling as the organized money market is merged with "curb finance",
and perhaps an improved distribution of income, there is one final restraint
retarding short-run financial reform. Owens and Shaw (1974) and Viksnins
hold that politically powerful elites generally benefit from the existing
conditions of financial repression. The elite groups support the dual

society government which encourages large-scale, capital-intensive indus- tries. Politically favored entrepreneurs are offered subsidized credit to mass their empires in land or large industries. Foreign exchange has been over valued so the rich can import at artificially low prices their capital goods and luxury consumables.

The example selected for this study, the Philippines, remains an essen- tially dualistic economy, with low income levels in the agriculture sector in contrast to the more progressive industrial and export sectors. The Philippines have had the consistently slowest GNP growth rates among the ASEAN countries (Singapore, Malaysia, Philippines, Thailand and Indonesia) throughout the post war decades. Narasimham and Sabater (1974) report that in the post war period between 1947 and 1969, agriculture experienced a growth of 4.8 percent, while industrial production recorded an 8.4 percent annual growth rate. The early post war stimulus for industrialization favored industries in assembling and packaging. These industries rely heavily on imported raw materials which helped keep the growth in imports ahead of the moderate export expansion. The depletion of foreign reserves and the heavy debt burden resulting from a nearly unbroken annual trade deficit, resulted in severe economic problems for the country by the mid 1970's.

In order to judge the causal impact of financial deepening, if indeed one exists, there must be a suitable definition of financial deepening. The following section attempts to specify the primary characteristics of this process.

DEFINING THE FINANCIAL DEEPENING PROCESS

As is often the case with other socio-economic processes, financial deepening involves a combination of several activities and institutions. From at least the time of the German Historical School, economists have attempted to evaluate the developmental impact of increasing the amount of financing of production and investment through specialized and organized markets. In the last twenty-five years this study has been referenced as financial deepening. Recently some economists have attempted to improve on the use of the term by careful attention to the definition and application. Cheng (1980) notes that in developing economies, the term is associated with increases in the activity of financial intermediaries, like commercial banks and savings institutions. In developed economies, financial intermediation is often dominated by direct placement or capital markets. For the Pacific Basin countries, Cheng suggests the degree of financial intermediation be measured by the proportion of national wealth held through financial inter- mediaries. This is measured by the ratio of the consolidated assets of each nation's financial intermediaries to national output. The ratio is also calculated on the basis of domestically held assets and foreign held assets. This follows the tradition of Goldsmith of searching for a single ratio to identify "financial interrelation".

Viksnins avoids the single ratio methodology by reporting "Selected Measures of Monetization", (p. 17). These include; Money Supply (MI), GNP/Money Supply, Quasi-money (M2), GNP/Quasi-money, Real Money (M1/P), Real Quasi-money (M2/P), M2/M1 (real terms), Currency Outside Banks (C), C/M1, and Monetization (SDRs per capita). While these variables are not used in a

ratio, nor are they combined in any composite index weighted for their relative importance. A combined index, with each variable weighted according to its relative importance would constitute a robust measure of financial deepening. Such an index would be superior to a single ratio of financial assets as well as reduce the selectivity associated with a tabular data report. Following Cheng, there is no reason why the index of financial variables need use the same set of weights for any two countries. Nor for that matter, the relative weights may logically change over a sufficiently long period of the nation's economic history, as a developing nation reaches higher levels of economic development. Such an index was developed for the Philippines using the eigen value approach of factor analysis (Fritz, 1984).

From the factor loadings, indexes were developed for both financial deepening and economic development for the Philippines. Table 1 summarizes the components of each index with the relative weight associated with each.

Table 1: Indexes and Weights for Philippines Development

Financial Deepening		Economic Development	
Variables	Weights	Variables	Weights
SDR	2.94	Cement	2.41
Currency	1.83	Electrical Production	3.62
Demand Deposits	1.98	Manufactured Gas	-2.47
Time & Saving Deposits	1.34	Exports	3.63
Bonds	0.17	GNP	3.33
Domestic Credit	1.49	Shipping	2.70
Money (MI)	1.84	Copper Ore	3.21
Development Bank Deposits	1.45		
Consumer Prices	1.89		
Monetization	1.71		
Proportion of Commonality = .947		Proportion of Commonality = .822	

When these indexes were tested for causation, the Granger (1980) time series method indicated that over the early period (1969-1975), financial deepening caused economic development while the latter period (1975-1981) reversed the order of causation. The entire time series when taken as a whole did not meet the statistical requirements for Granger time series causality (Fritz, 1984). Graph 1 plots the relationship of the two indexes over time.

The switching of causal pattern indicates the probable presence of a structural feedback within the LDC which transformed the economy into a new set of development conditions. The nature of these feedbacks is explored in the following section.

FINANCIALLY AUGMENTED DEVELOPMENT

One possible explanation for the apparent switch in causation may be the effect that negative feedback loops have on regulating positive feedback loops. A suggested interpretation of the empirical analysis of LDC's development pattern, as viewed from a system dynamic perspective, begins with the

Graph 1

Financial Deepening and Economic Development
The Philippines, 1969-1981
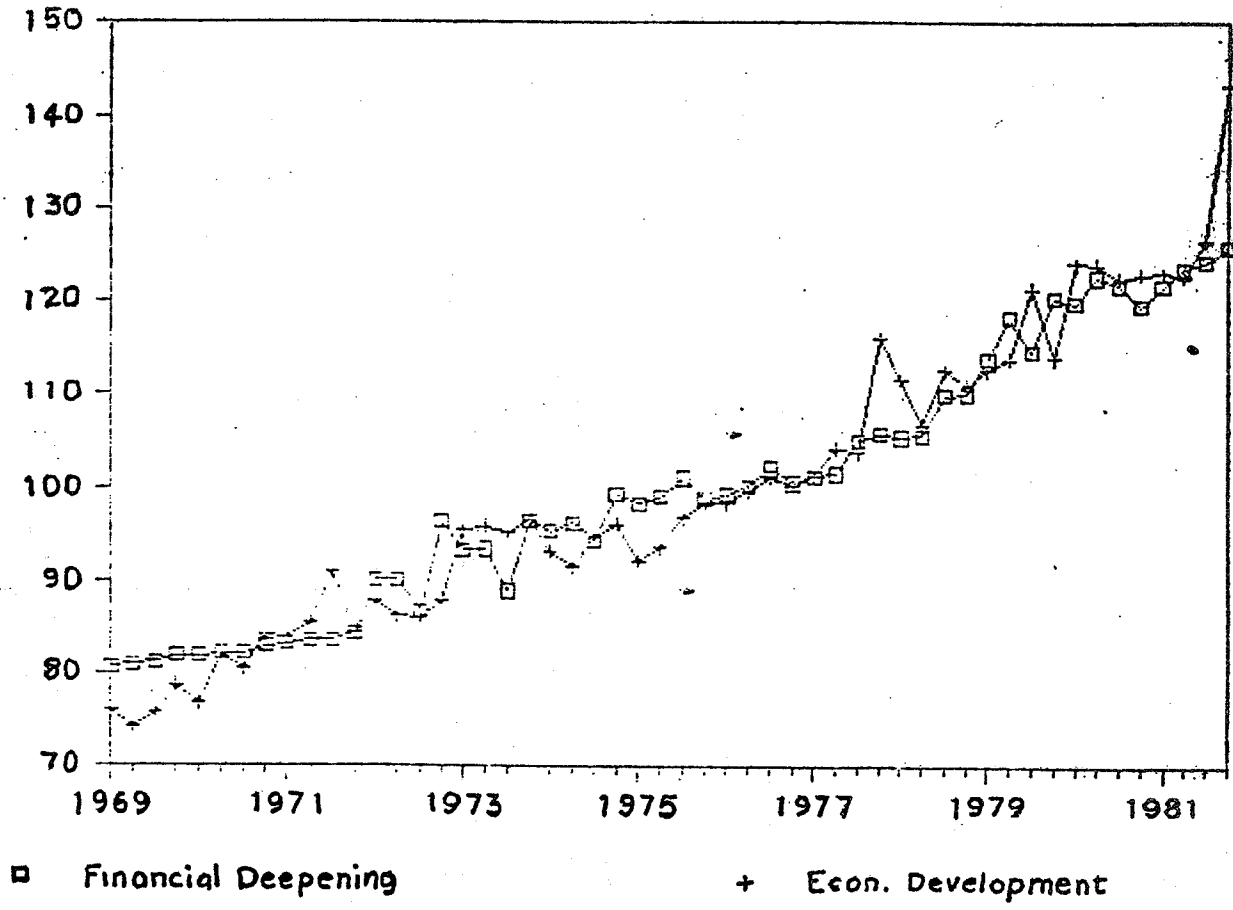
positive loops associated with capital accumulation in the capital and resource sectors. Following the basic model structure of N. Forrester's (1973) "life cycle of economic development," financial deepening may be seen as a factor that reduces the fraction of labor time that is nonproductive. The relation between the fraction of labor time nonproductive and the need for additional nonproductive time is determined to be negative. As the fraction of labor time nonproductive increases, there are diminishing returns to nonproductive time. If the fraction of labor time nonproductive only allows eating and sleeping, then the need for additional nonproductive time is very high.

Reducing the fraction of labor time which is nonproductive may be accomplished through a technological innovation. Lopez (1982) argues that financial intermediation follows the sequential process of technological innovation, which involves introduction, diffusion, and institutionalization.

> This process conveys the notion that the contributions of an innovation is defined not only in terms of the initial application (introduction) of the new technique, knowledge or institution but in that (it) brings about other uses (diffusion) beyond its original application and how well it becomes integrated (institutionalized), improved upon, or aborted to generate other technological innovations;... (Lopez, pp.131-32)

Financial intermediation is introduced into the Forrester development life cycle model in the service sector and the demographic sector. Thereby the innovations which constitute financial deepening may augment the development process. Consider the flow diagram of desired expenditures, Figure 1.

Figure 1: Computer Model of Desired Expenditures (*Demographic Sector and Services Sector are adjusted for Financial Deepening effect.)
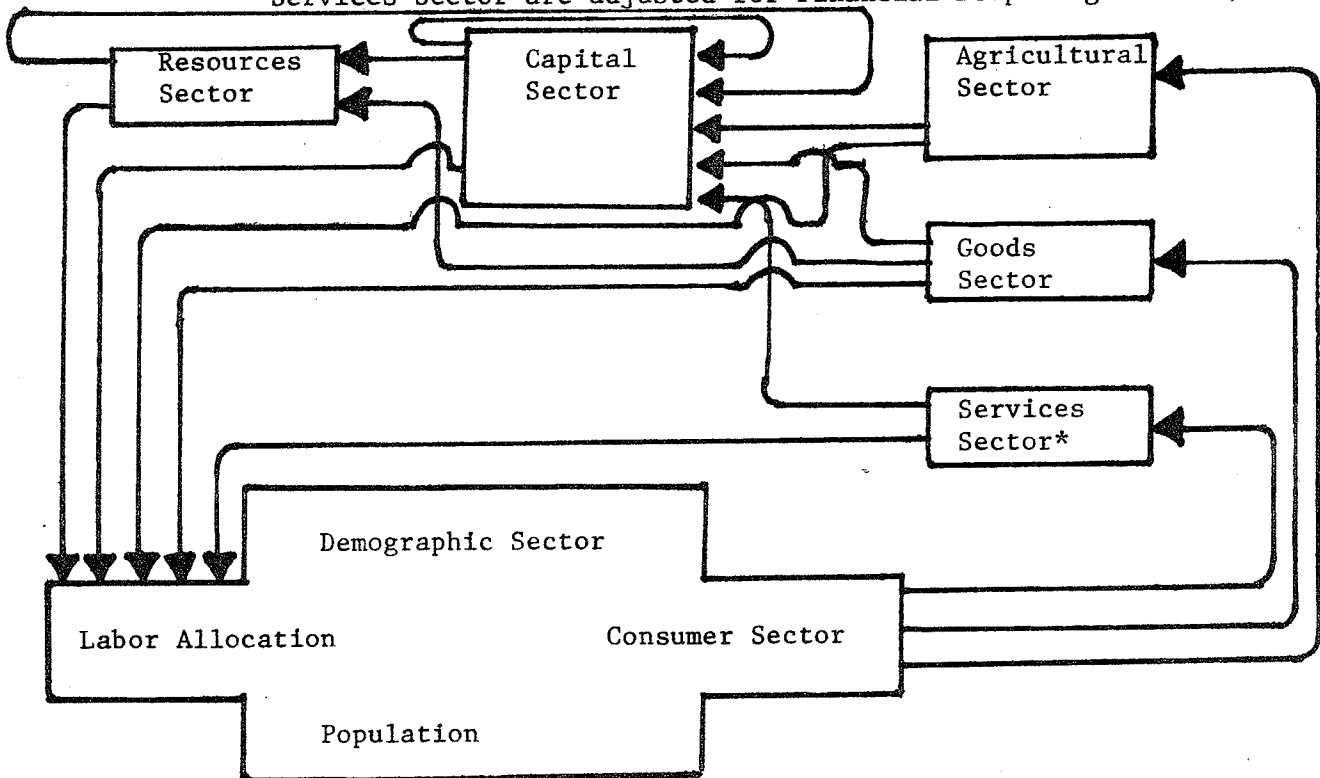
In order for the supply of financial instruments and institutions to be development augmenting, the retarding effect of financial repression must be overcome. The assumption made here is that the expansion of the economy attributable to financial deepening can be introduced into the life cycle model with a positive loop added to the Services Sector. Without a constraint, this would always result in a more rapid path of economic expansion. However, the effect of financial repression will constrain this growth promoting process. Consequently a negative loop representing the constraint from cultural, social and technological conditions is added to the Demographic Sector. The supply-leading effect of financial deepening is considered first.

EFFECT OF FINANCIAL DEEPENING ON SERVICE SECTOR

The introduction of money for transactions purposes is a clear example of the introduction of an innovation. The applications of an innovation by a business firm depends upon the marginal benefit-marginal cost decision process. In the case of money transactions, a firm should be willing to pay for the use of it because it releases labor and capital from barter activities, resulting in higher output and higher profits (Moreney, 1972). However, in developing countries it is possible that both the private marginal benefit-cost ratio and the social marginal benefit-cost ratio may not exceed unity for the innovation of financial intermediation (Lopez p.132 and Porter).

The diffusion phase of a financial innovation is characterized by the reduction of risk. Establishment of a bank reduces the risk of specialization of credit by pooling and spreading risk among borrowers. Both introduction and diffusion of a financial innovation may result in rejection. Introduction may be rejected on the decision that marginal benefit-cost ratios are not high enough. Diffusion may be rejected because of excessive government regulation, lack of entreprenurial skills, lack of sufficiently large markets to sustain the needed economies of scale, or corruption (Bhatia and Khatkhati, 1975). If the innovation becomes an integrated part of society, other technological changes are likely to occur. The final stage is characterized by institutionalization of the innovation. What had been new becomes common throughout the system. As the system's dynamics evolve, the previous "innovations" come to dominate the status quo and thus act as constraints to further innovation. The institutionalized components of the financial system become potential sources of financial repression.

A logical hypothesis would be that financial deepening can be a positive source for economic development as long as the constraint of financial repression is weak or removed. Further, there are numerous sources of financial repression including political instability (Saeed, 1983), institutional retrenchment within the financial market, social mores and others. These sources are the result of a continuous interaction between the sectors of the economy throughout the life cycle of economic development. Figure 2 represents the systems behavior used to introduce the dynamic effects of financial deepening into the Forrester model.

The Index of Financial Deepening (IFD) is a level which is controlled by two rates. The Rate of Institutional Adoption (RIA) may operate to accelerate financial deepening or it may be turned off through the feedback from the Propensity for Financial Repression (PFR). The Rate of Rejection (RFR) may

deplete the accumulating effect of financial deepening, resulting in greater use of naive institutions and instruments; Self Finance and Barter (SFB). The Propensity for Financial Repression is an auxiliary, which receives information from the capital sector and services sector of the economy and the demographic sector and sends information to the rates controlling financial deepening as well as the auxiliary, Innovation Introduction (II).

Figure 2: Financial Deepening and Financial Repression Causal Loops
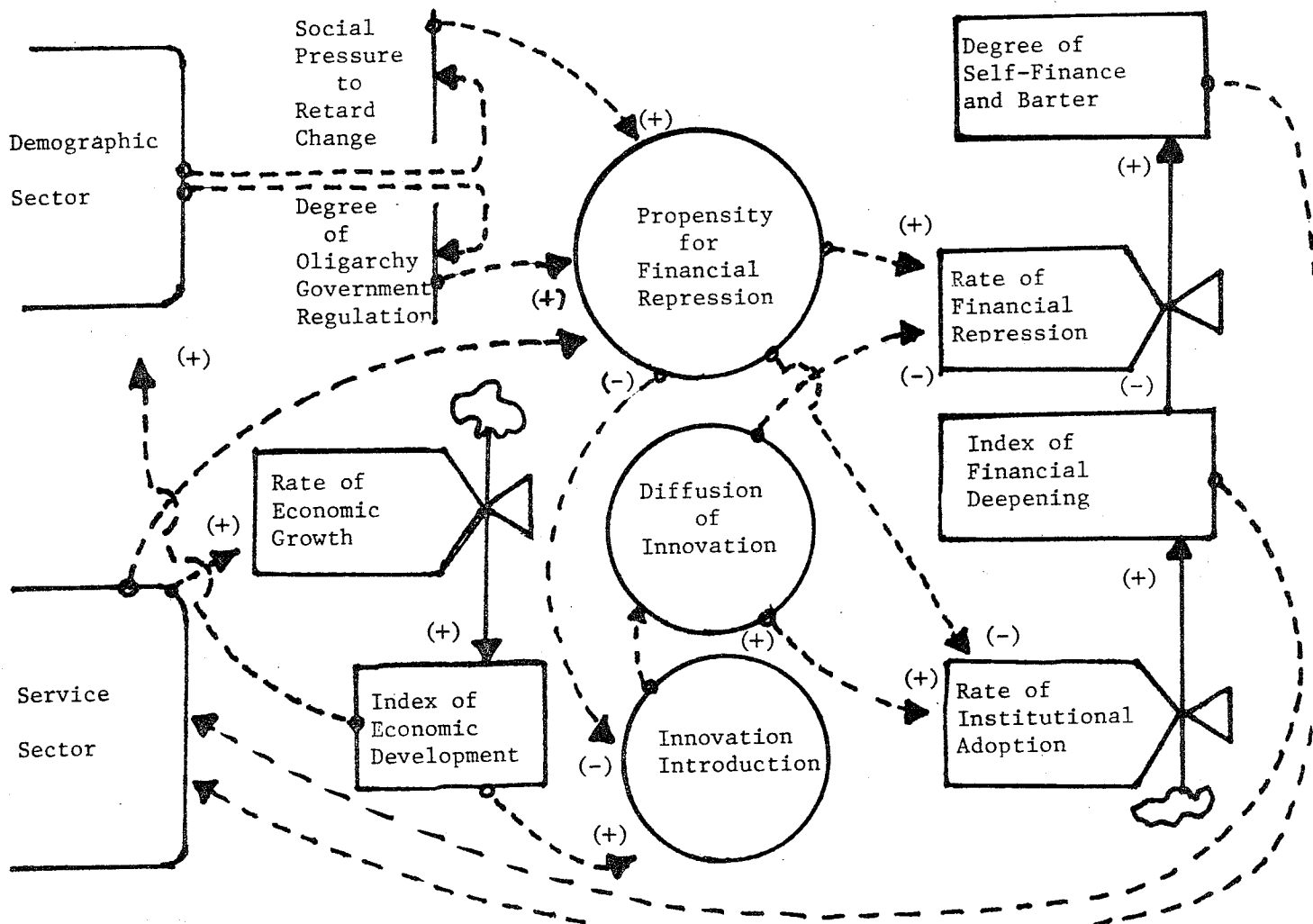
The financial repression auxiliary is the key to understanding the switch in the direction of causation between financial deepening and economic development. The Index of Economic Development (IED) is an accumulation process which is part of the positive causal loop linking the technological innovations in finance through the Index of Financial Deepening to the service sector of the economy. The net effect will be to reduce the level of the Fraction of Labor Time Nonproductive (FLN), augmenting the Rate of Economic Growth (REG). This positive feedback characteristic within the closed loop causes further change in the same direction in an unending process (Richardson and Pugh, 1981). The Propensity for Financial Repression is a component of the negative feedback loop which constrains the development

oriented positive loop. Negative feedback is characterized by goal-directed or goal-oriented behavior. Such terms as self-governing, self-regulating, self-equilibriating, homeostatic, or adaptive, all implying the presence of a goal, define negative feedback systems (Richardson and Pugh, 1981).

Figure 3 represents the positive loop associated with financial deepening.

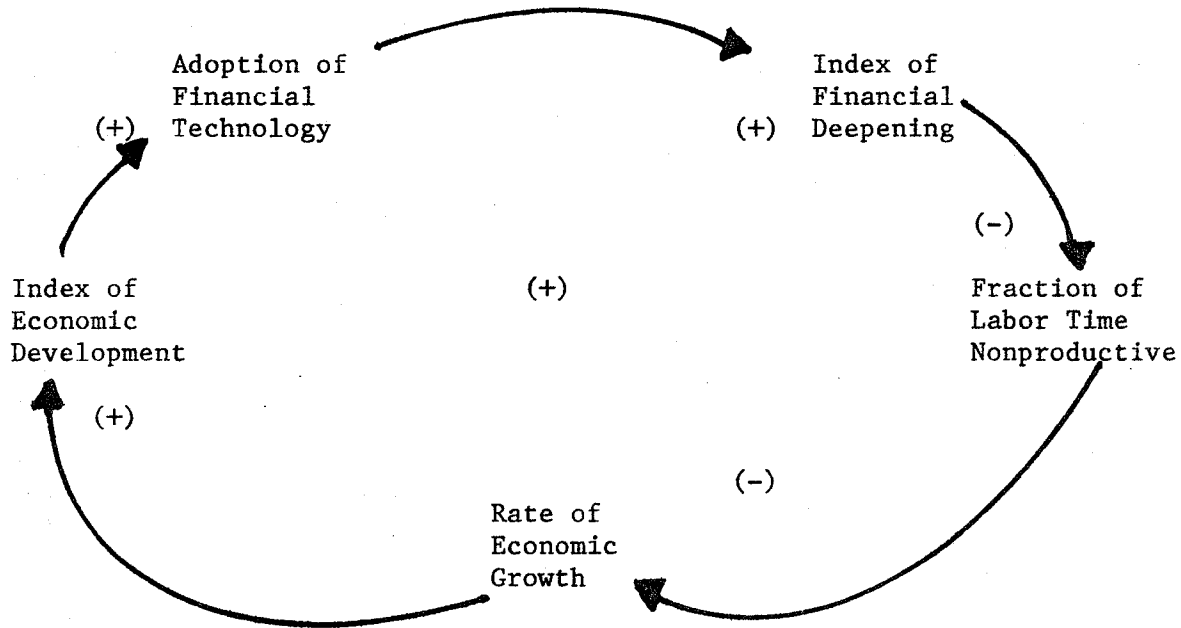Figure 3: Positive Financial Deepening/Economic Development Loop

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        Adoption of                          Index of
        Financial                            Financial
   (+)  Technology                      (+)  Deepening

                                                     (-)
   Index of                (+)                   Fraction of
   Economic                                      Labor Time
   Development                                   Nonproductive
       (+)
                                    (-)
                           Rate of
                           Economic
                           Growth
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Figure 4 represents the negative loops associated with financial repression.

Figure 4: Negative Financial Repression Loop

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                                        (+)
   (-)    Index of                      (-)   Fraction of
          Financial                           Labor Time
     (-)  Deepening                           Nonproductive

                                                      (-)
   Self-Finance,                               Index of
   Barter, etc.                                Economic
      (+)             (-)                      Development
   Rate of
   Financial
   Rejection
       (+)
                 Propensity for      (+)
                 Financial
                 Repression
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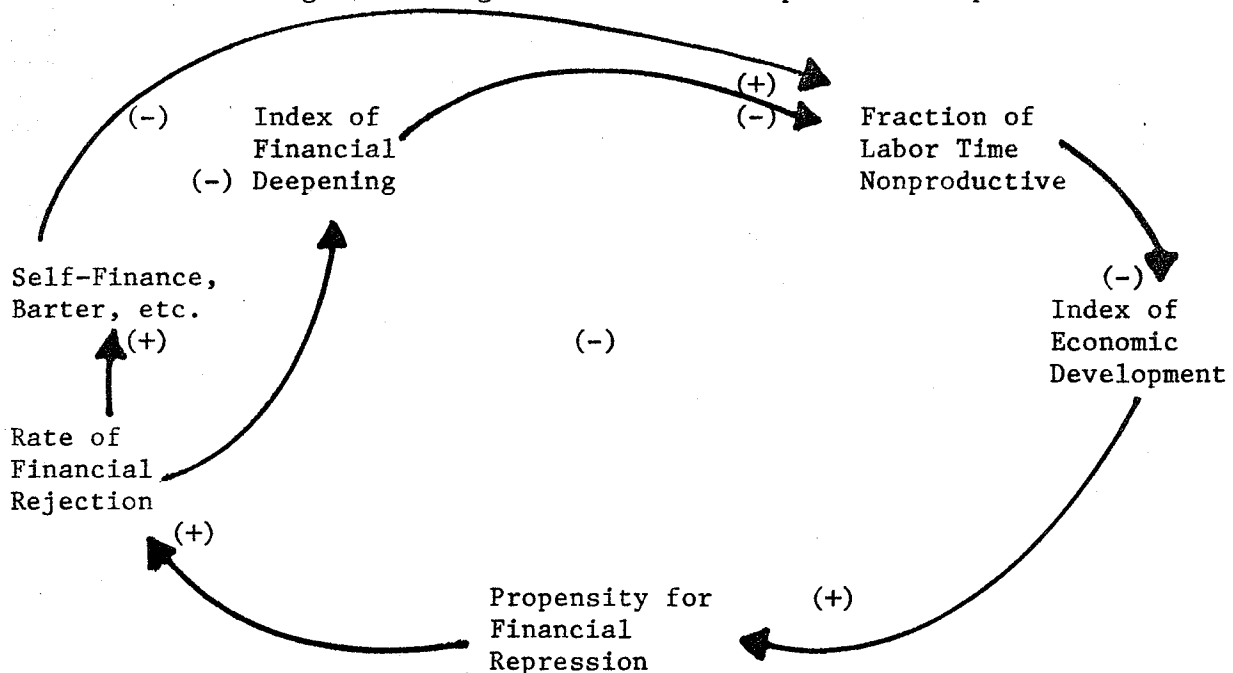
The interaction of these two forces represent the problem of interpreting the causal relationship between financial deepening and economic development.

CONCLUSION

Public policies for fostering economic growth in developing countries has focused on finding ways and means to alleviate the condition responsible. Over the last four decades much has been done in the developing countries to accelerate economic growth, through increasing savings and encouraging investment, through foreign aid, through employment of resources in regions and sectors of the country considered more efficient, and through exploitation and export of natural resources. These efforts appear fruitful when collective growth performance of the developing countries over the past thirty years are considered. The GNP per capita of the developing countries as a group grew at an average rate of 3.4% per year during 1950-75 (Saeed, p. 455). This growth rate, however, obscures the variance in performances, both among the developing countries in the group and over different points in time in a single country.

One explanation for this phenomena lies in an understanding of the role financial deepening plays in the development process. There is debate over the direction of causation between financial deepening and economic development. Using the transfer function approach, Fritz has shown that, in the case of the Philippines, the causal pattern shifts from financial deepening leading economic development to economic development causing increases in financial deepening. This paper develops the first stage of using the nonlinear technique of system dynamics to evaluate the positive and negative feedbacks associated with the financial deepening process within the framework of the life cycle of economic development.

The logic is developed for the "supply-leading" hypothesis and is illustrated in Figure III. The positive closed loop outlines the development promoting nature of financial deepening. Figure IV describes the negative loops associated with the "demand-pull" hypothesis. Financial repression is the key to the logic of reversing the direction of causation. If the conditions from the economy, political environment, or social environment reinforce the propensity for financial repression, then the negative loop can dominate the development promoting positive loop. The next step is to run the complete development life cycle system dynamics model, testing for the sensitivity of each loop.

REFERENCES

Abdi, Ali Issa. Commercial Banks and Economic Development (New York: Praeger Publishers, 1977).

Adelman, Irma and Cynthia Morris. Society, Politics, and Economic Development: A Quantitative Approach (baltimore: John Hopkins Press, 1967).

Ang, James, Jess H. Chuaa and Ali M. Fatemi. "How to Use the Akaike Criterion to Automatically Specify and Construct Box-Jenkins Models," Journal of Business Forecasting, Spring 1982, pp. 38-42.

Ayres, Robert L. Banking on the Poor (Cambridge, MA: MIT Press, 1983), Published for the Overseas Development Council.

Bhatia, R. J. and Khatkhate. "Financial Intermediation, Savings Mobilization and Entrepreneurial Development: The African Experience," IMF, Staff Papers, Vol. 22, 1, March 1975.

Box, G.E.P. and D. A. Pierce, "Distribution of Residual Autocorrelations in Autogressive-Integrated Moving Average Time Series Models," Journal of the American Statistical Association, Vol. 65, December 1970.

Cameron, Rondo, ed., Banking and Economic Development: Some Lessons of History (New York: Oxford University Press, 1972).

Cheng, Hang-Sheng, "Financial Deepening in Pacific Basin Countries," San Francisco Federal Reserve Bulletin, Summer, 1980, pp. 43-56.

Drake, P. J. Money, Finance and Development (New York: Halsted Press, 1980).

Forrester, Nathan. The Life Cycle of Economic Development (Cambridge, MA: Wright-Allen Press, 1973).

Fritz, Richard. "Time Series Evidence of the Causal Relationship Between Financial Deepening and Economic Development," Journal of Economic Development, Vol. 9, (1), July 1984, pp. 91-111.

George, Edward Y. "New Economic Indicators for El Paso," Southwest Business and Economic Review, Vol. 18, No. 2, November 1980, pp. 1-44.

Gershenkron, Alexander. Economic Backwardness in Historical Perspective: A Book of Essays (New York: Praeger Publishers, 1965).

Goldsmith, R. W. Financial Structure and Development (New Haven, Conn.: Yale University Press, 1969).

Granger, C.W.J. "Investigating Causal Relations by Econometric Models and Cross-Spectial Methods," Econometrics, Vol. 37, July 1969, pp. 424-38.

Granger, C.W.J. "Testing for Causality," Journal of Economic Dynamics and Control Vol. 2, (#4 No., 1980) pp. 329-352.

Gurley, J. "Financial Structures in Developing Economics," in <u>Fiscal and Monetary Problems in Developing States</u>, ed. D. Krivine (New York: Praeger Publishers, 1967).

_____, and Shaw, E. S. "Financial Structure and Development," <u>Economic Development and Culture Change</u>, April 1967.

Isard, Walter. <u>Methods of Regional Analysis</u> (Cambridge, Mass.: MIT Press, 1960).

Keleher, Robert and Charles J. Haulk. "Money-Income Causality at the State-Regional Level," Working Paper Series, Federal Reserve Bank of Atlanta, November 1979.

Kendall, Maurice. <u>Multinational Analysis</u> (New York: Hafner Press, 1975).

Levhari, David and Donald Patinkin. "The Role of Money in a Monetary Economy," <u>American Economic Review</u> (Vol. 68, (Sept. 1968), pp. 713-53.

Lopez, Franklin. "Financial Intermediation and Economic Development: A Conceptual Framework," <u>Journal of Economic Development</u> Vol. 7 (2), December 1982, pp. 129-40.

McKinnon, Ronald. <u>Money and Capital in Economic Development</u> (Washington, D.C.: Brookings Institution, 1973).

Makridakis, S., S. C. Wheelwright and V. E. McGee. <u>Forecasting: Methods and Applications</u> (New York: John Wiley & Sons, 1983).

Moroney, J. R. "The Current State of Money and Production Theory," <u>American Economic Review</u>, Vol. 42 (2), May 1972.

Narasimham, Gorti V. L. and Luisa E. Sabater. "An Econometric Model of the Philippines," <u>The Philippine Economic Journal</u>, Vol. 13, (1), Number 24, First Trimester 1974, pp. 12-26.

Nisbet, Charles. "Interest Rates and Imperfect Competition in the Informal Credit Market of Rural Chile," in J. McKinnon (ed.), Chapter 7.

Owens, Edgar and Robert Shaw. <u>Development Reconsidered</u> (Lexington, Mass.: D. C. Heath and Co., 1974).

Patrick, Hugh. "Financial Development and Economic Growth in Underdeveloped Countries," <u>Economic Development and Cultural Change</u> Vol. 14, No. 2 (January 1966), pp. 101-14.

Pierce, D. A., and L. D. Haugh. "Causality in Temporal Systems: Characterization and a Survey," <u>Journal of Econometrics</u>, Vol. 5 (1977), pp. 265-293.

Pierson, Gail. "The Role of Money in Economic Growth," <u>Quarterly Journal of Economics</u> Vol. 86 (3), August, 1972, pp. 383-95.

Porter, Richard. "The Promotion of the 'Banking Habit' and Economic Development," Journal of Development Studies July 1966, pp. 346-366.

Rummel, R. J. Applied Factor Analysis (Evanston, Ill.: Northwestern University Press, 1970).

_____. Dimensions of Nations (Beverly Hills: Sage Publications, 1972).

Saeed, Khalid. "Economic Growth and Political Instability in the Developing Countries: A Systems View," The 1983 International System Dynamics Conference: Session Papers (Chestnut Hill, MA: 1983, Volume II, pp. 455-68.

Schumpeter, Joseph. The Theory of Economic Development (Cambridge, MA: Harvard University Press, 1949).

Shaw, E. S. Financial Deepening in Economic Development (New York: Oxford University Press, 1973)

Silk, Leonard. "Debts of the Few Prompt Global Fears," The New York Times, Section 2, p. 3, October 2, 1983.

Sims, Christopher. "Money, Income and Causality," American Economic Review, Vol. 62, No. 4, September 1972, pp. 540-552.

Tobin, James. "A Dynamic Aggregate Model," Journal of Political Economy Vol. 63, (April 1955), pp. 103-115.

Viksnins, George. Financial Deepening in ASEAN Countries (Honolulu: The University of Hawaii Press, 1980)

Von Pischke, J. D., Dale W. Adams and Gordon Donald. Rural Financial Markets in Developing Countries (Baltimore, MD: The Johns Hopkins University Press, 1983), Published for The World Bank.

Zialcita, E. P., R. Blancas and P. Lucas. "Economic Modelling in the Philippines," Central Bank Macroeconomic Modeling in Pacific Basin Countries (San Francisco: Federal Reserve Bank of San Francisco, 1976), pp. 223-237.