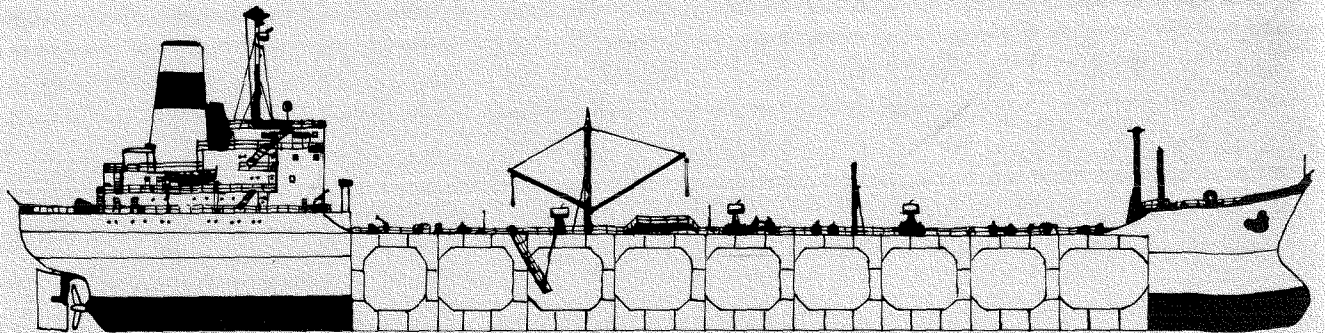# FEDERAL RESERVE BANK OF SAN FRANCISCO ECONOMIC REVIEW

RESPONSES TO INTERNATIONAL INFLATION

SUMMER 1980

Financial Deepening
In Pacific Basin Countries

Hang-Sheng Cheng*

This paper presents an overview of the financial-deepening process in eleven Pacific Basin countries during the past two decades. For any nation, financial deepening represents an increased amount of financing of production and investment through specialized, organized markets. The economic literature has expanded its coverage of this subject in the last twenty-five years,[1] stressing financial deepening as an important factor in determining the course of a nation's economic growth[2] and welfare. This review of Pacific Basin experience should help us see what generalizations (if any) can be made about the factors promoting or retarding the financial-deepening process.

Economists traditionally examine this process within the context of *developing,* rather than developed economies. In developing economies, financial deepening is associated with increases in the activity of financial intermediaries—such as commercial banks, savings institutions, insurance companies and the like—because direct placement or capital markets generally are unimportant. In developed economies, financial intermediation is less predominant as capital markets develop. While this paper maintains the focus on financial intermediation characteristic of developing nations, it also examines the experience of the developed Pacific Basin countries. We include them in the analysis in order to highlight the changing role of financial intermediaries in the development process and also to highlight those processes that are common to both types of economies.

Section I presents a simple conceptual framework for analyzing the role of financial markets in economic growth. Drawing on the existing literature, it distinguishes between various modes of finance in relation to economic growth. In addition, it analyzes the effects on economic growth of "repressed finance"—that is, a policy of rigid nominal interest rates in the face of general price inflation. This section may be skipped by those who are familiar with the economic principles underlying this study.

Section II presents a comparative study of the experiences of eleven Pacific Basin countries—Australia, Indonesia, Japan, Korea, Malaysia, New Zealand, the Philippines, Singapore, Taiwan, Thailand, and the United States. The observation period varies from country to country depending on data availability, but generally covers the 1960–78 period. In this analysis, we use the degree of financial intermediation as a proxy for overall financial development. We present two views of financial deepening—first, a cross-section view of the *degree* of financial intermediation in each country in 1978, and second, a comparison of the eleven countries' financial-growth processes over the entire observation period.

Relative to per capita income, Japan, Singapore, and Taiwan had the highest financial-intermediation ratios of all eleven countries in 1978. This finding does not imply that Japan, Singapore, and Taiwan have achieved a higher degree of financial development than such fully-developed countries as the United States, but merely shows that they have given a greater role to financial intermediaries in their activities.

The study identifies the real deposit-interest rate—i.e., the nominal deposit rate deflated by

*Assistant Vice President and Economist, Federal Reserve Bank of San Francisco. Benny Yu provided research assistance for this paper.

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a consumer-price inflation rate—as a critical factor in setting the pace of each nation's financial growth over time. Positive real deposit rates maintained over a number of years invariably lead to financial deepening, and negative real deposit rates even for a year or two tend to result in sharp financial disintermediation against a strongly upward trend. The finding reinforces the view that inflation is directly and indirectly detrimental to economic growth—assuming a positive relationship between financial intermediation and growth. It also suggests that, where inflation cannot be brought quickly under control, interest rates ought to be left flexible enough to cover more than the inflation premium, and thus allow a positive return which would encourage saving through financial intermediaries.

I. Financial Deepening and Economic Growth

Economic growth depends on capital formation; capital formation requires financing. The functioning of a financial system to generate savings and allocate savings among different types of productive activities is obviously relevant to a nation's economic growth. Broadly speaking, a nation can choose among three alternative ways of channeling national savings to investment (Figure 1):[3] (1) self-finance by entities undertaking the investment, (2) external finance through capital markets (direct finance), and (3) external finance through financial intermediation (indirect finance).

Self-finance by entities undertaking the investment may occur in either of two forms—government investment in economic infrastructure (such as roads, harbors, schools, or irrigation facilities) through government-budget appropriations, or capital formation by private or government enterprises through retained earnings. Self-finance is widely used in both developed and less-developed countries. However, in countries with well-developed financial markets and institutions, both government and private enterprises may finance either through their own resources or by borrowing from the market, whereas in countries with under-developed financial markets, investing entities must accumulate savings from within.

This difference is important for two reasons. First, when self-finance is the only available approach, a highly productive investment project may have to be postponed or scrapped because of its size relative to the investing entity's internal financial resources. This limitation applies whenever economies of scale are important, or whenever the adoption of modern technology requires substantial initial investment in human and physical capital.[4]

This difference is also important because an efficiently functioning financial market signals to each investing entity the opportunity cost of self-finance, thus helping to weed out investment projects which promise lower returns than the market cost of capital. For instance, an enterprise in a country with limited financial markets often has little choice but to plow back its earnings regardless of potentialities elsewhere. In contrast, an enterprise in a country with well-developed financial markets has other alternatives—debt retirement, repurchase of its own stock, or investment in securities of other enterprises—and can choose among the various alternatives depending on the risks and the relative returns of the alternative uses of funds. A well-developed financial market helps insure that the funds generated from within each firm are channeled to the most efficient uses from the viewpoint of society. Thus, self-finance itself is not necessarily inefficient finance—but when self-finance is coupled with an absence of market discipline, the result may be arbitrary and wasteful allocation of capital.

The second channel, direct finance, may take the form of the issuance of stocks, bonds, notes, commercial paper, or other types of debentures by investing entities on open, organized capital markets under various degrees of government supervision and regulation. Alternatively, as in many less-developed countries, it may take the form of advances of seeds, fertilizers, food, or money by landlords or

merchants to peasants; or direct personal loans from friends, relatives, and the general public to business firms; or the discounting and trading of business firms' post-dated checks among the public outside regulated markets. The form may vary, but the essence is the same: Direct finance consists of the ultimate borrower issuing a liability against itself, and selling it either directly to the ultimate lender or through dealers and brokers.

Direct finance is characterized by (a) the separation of saving and investment, and (b) the bearing of the lending risk by the saver. Typically, the saver is not himself a professional lender, and has neither the time nor the expertise for the continued monitoring of the borrower's financial soundness. With direct finance, therefore, the government and well-established large enterprises have a distinct advantage in raising funds from the market; others must pay a higher cost of capital to compensate for the higher risk arising out of lenders' lack of knowledge about borrowers' financial capacity. In this environment, innovation-generating venture capital is especially liable to suffer because of the public's lack of expertise in risk assessment.

Moreover, borrowers typically prefer long-term, and lenders short-term, financing. Without a secondary market of considerable "depth, breadth and resilience," borrowers have to pay higher costs for capital in order to overcome lenders' liquidity preferences. However, a well-developed secondary market presupposes a high degree of financial sophistication, based on generally accepted accounting standards, knowledgeable investment-advisory services, efficient communication networks, and reasonable regulatory authorities to enforce the rules of the game. Generally speaking, such preconditions do not exist in developing nations. Not surprisingly then, developing nations strive mightily—but usually in vain—to develop a domestic capital market, in their eagerness to mobilize national savings for economic growth. In many instances, it is a policy of chasing the will'-o'-the-wisp.

The third channel of investment finance, financial intermediation, is characterized by a flow of funds through financial institutions, which specialize in intermediating between ultimate savers on the one hand and ultimate users of funds on the other. These institutions conduct their business by issuing liabilities against themselves, and directly or indirectly investing the proceeds in the financial instruments of ultimate fund users. In general, the more financially sophisticated a national economy, the wider is the variety of its financial institutions—central banks,[5] commercial

Figure 1
Channels of Savings-Investment Flows

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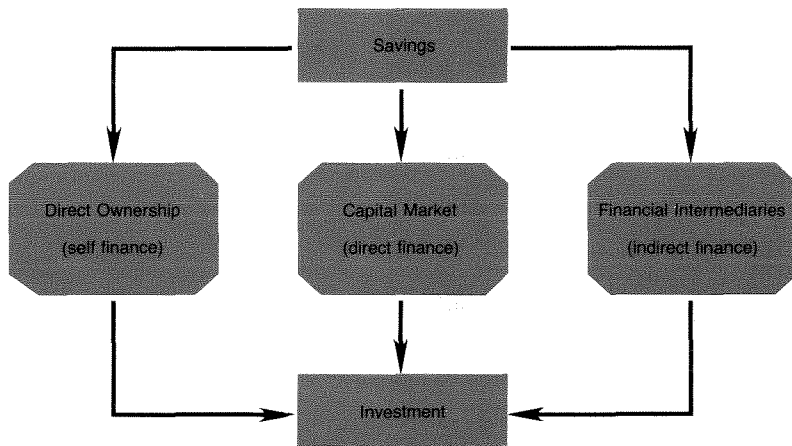
(checking-deposit) banks, investment (merchant, development) banks, savings institutions, insurance companies, mutual funds, pension funds, finance companies, and so on. Also, the more sophisticated the economy, the more varied is the menu of financial instruments offered by these institutions—with diverse maturity, liquidity, riskiness, and auxiliary services (such as insurance, investment counseling, and data processing) tailored to the preferences of ultimate savers.

Financial intermediation enhances economic growth through the promotion of savings and investment. By borrowing short and lending long, financial intermediaries cater to the liquidity preferences of both borrowers and savers. By specializing in the provision of financial services, they reduce the riskiness of each individual loan through their expertise in assessing the creditworthiness of each borrower. By pooling savings and diversifying lending, they diminish the aggregate risk of investment for the nation as a whole. And by realizing economies of scale in financing, they reduce the cost of capital to ultimate borrowers and thereby encourage capital formation.[6]

Compared to self-finance, financial intermediation also facilitates capital formation by enlarging the scope of financing, thereby making it possible for enterprises to adopt modern technology and realize economies of scale. Moreover, it enhances the productivity of capital, by developing investment expertise and instilling market discipline in the allocation of capital. Compared to direct finance, financial intermediation promotes saving, by more closely satisfying savers' liquidity preferences, by reducing risks of investment, and by packaging auxiliary services desired by savers. The consequent increase in savings and enhancement of productivity of capital combine to raise the nation's rate of economic growth.[7]

Nonetheless, despite these advantages, indirect finance is not always superior to self-finance and direct finance, regardless of the extent of each mode of finance. On the contrary, countries with a full complement of financial markets, both direct and indirect, are more likely to provide superior financial services than countries that rely on indirect finance alone. Moreover, financial intermediation is not costless. Investment in human capital in finance represents a drain on society's scarce resources which have high alternative costs. Buildings, furnishings, and extensive communication facilities also involve a significant social-overhead investment. These costs are reflected in the spread between the deposit interest rates paid to savers and the loan interest rates charged to borrowers. A large spread reflects a high cost of operation[8]— or a high degree of monopoly profit—for financial institutions.

The benefits and costs of financial intermediation may be shown graphically (Figure 2), by relating the volume of national savings or investment at various real interest rates. The curve I_{DF} is a demand-for-capital curve under conditions of direct financing. It is based on the economy's aggregate production function, and depicts the marginal productivity of capital for the economy as a whole in the absence of financial intermediation.[9] The curve I_{FI} stands

Figure 2
Benefit and Cost of
Financial Intermediation
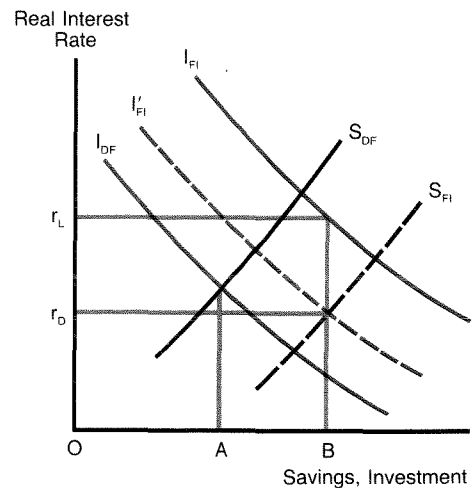
for the economy's demand for capital under conditions of financial intermediation. It lies above the I_{DF} curve to reflect the higher return to capital under financial intermediation.[10] The curve I_{FI}' lies below the curve I_{FI} by the real factor costs of financial intermediation per unit of capital.

The curve S_{DF} depicts the amount of savings forthcoming at various real interest rates when savings must be placed directly by savers with ultimate borrowers. It includes the desired retained earnings of business firms for their self-finance of investment, as well as direct purchases by savers of the securities of ultimate fund users. The curve S_{FI} stands for the economy's total savings when there is financial intermediation, which increases national savings at given real interest rates.

The equilbrium amount of savings under conditions of self-finance and direct placement is shown as OA, and that under financial intermediation is shown as OB. At OB, the real loan-interest rate charged by financial intermediaries is r_L, and the real deposit-interest rate paid by them is r_D, the difference being the real financing cost plus the institutions' profit.

Free competition in financial markets is shown in Figure 2, where the deposit rate (r_D) and the loan rate (r_L) are both determined by market demand-and-supply forces. In most Pacific Basin countries, however, interest rates are set by the monetary authorities at levels below market-clearing levels, in the belief that low interest rates help stimulate investment and hence promote economic development. In order to insure financial institutions' profitability, deposit rates are set even lower. The situation is depicted in Figure 3, which reproduces the curves I_{FI}, I_{FI}', and S_{FI} from Figure 2, and adds the assumption that the authorities set a ceiling deposit rate at r_D. The amount of savings provided to the financial system would be OA. Given the limited amount of savings, enterprises would be willing to pay at least a loan rate of r_1. Subtracting the cost of financial intermediation, financial institutions could then earn at least a profit of $r_D r_2$ per unit of capital.

But since interest-rate ceilings have been imposed in order to lower the cost of borrowing to business firms, financial intermediaries probably would not be allowed to charge the market interest rate. Instead, they would be limited to a loan rate which would allow just enough margin to cover their operating costs. The ceiling loan rate will be r_L ($r_D r_L = r_2 r_1$), at which there will be an unsatisfied excess demand for funds of EF ($= AB$). Instead of financial institutions enjoying an excess profit of $r_D DH r_2$, borrowers would receive an excess profit of $r_L EK r_1$ ($= r_D DH r_2$).

Because of the unsatisfied demand for capital, an unorganized (black) market could arise. Since the lenders in this market would tend to be small lenders operating under unfavorable conditions, their costs of operation would normally be higher than those of financial institutions operating in the organized market. The higher cost of black-market operations is shown as DG ($>$DE), and that market's supply curve is shown as S_{BM}. The intersection of I_{FI} and S_{BM} determines the total

Figure 3

Financial Repression

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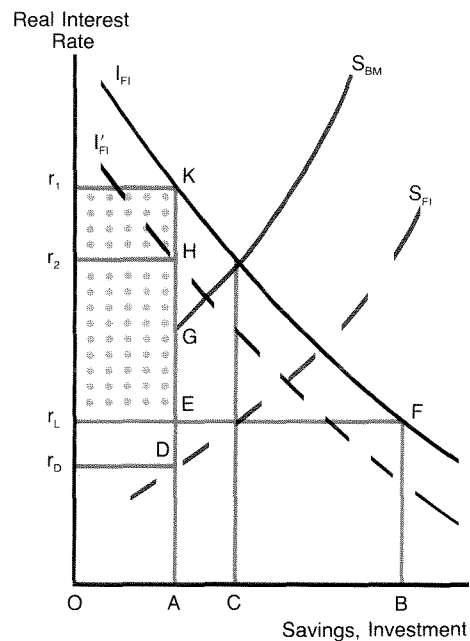
amount of financing effected through both regulated and unregulated markets. Total savings and investment will be OC, of which OA is channeled through the organized market and AC through the unorganized (black) market.[11]

Under the conditions of "financial repression" depicted in Figure 3, the size of the financial-intermediary sector will be smaller than in Figure 2, the difference depending on the vigor with which the unorganized market is suppressed by the monetary authorities. In the extreme case where the unorganized market is openly tolerated by the authorities— where the costs of the unorganized market are not significantly higher than those of the organized market—there might be little difference between OA and OC[12]. However, we must consider not only the impact on the volume of savings and investment, but also the efficiency of investment. I_{FI} in Figure 3 is drawn on the assumption that savings OA will be allocated by financial institutions to the most efficient borrowers in the market, although there is no assurance that this will indeed be the case. Under arbitrary allocative rules, financial institutions may distribute funds to enterprises which are less efficient, so

long as they are able to pay the loan rate of r_L. This is depicted by the dots in Figure 3 in the box $r_L EKr_1$.[13] Paradoxically, under this condition, bribery of bank officials for favorable consideration of loan applications, though a social evil, could be an economic virtue. In other words, bribery might supplement a price mechanism thwarted by official repression, and thus help ensure the allocation of capital to the most efficient users.

The condition of "repressed finance" arises from a real deposit rate below market-clearing levels. The low real interest rate may be the result of a nominal rate deliberately set low in order to encourage investment, or a failure to adjust the nominal rate in keeping with rising inflation. In either case, the volume of capital formation is limited by the volume of savings forthcoming at the given real deposit rate. The lower the real deposit rate, the lower would be the degree of the economy's financial intermediation. But interest-rate liberalization, by allowing nominal interest rates to be determined by market forces, would free financial institutions to offer positive real deposit rates and thereby stimulate the growth of the financial-intermediation sector.

II. Financial Deepening in Pacific Basin Countries

We turn now to compare the financial-deepening experiences of eleven Pacific Basin countries during the 1960–78 period. Although it would be preferable to use the broadest possible measures of financial-market development, it is difficult with existing data bases[14] to devise comparable measures in a cross-country sample. Thus, this analysis focuses only on financial intermediation, since comparable data are available only on that basis. As our earlier discussion suggests, direct finance markets (despite their obvious uses) are unlikely to be important in developing economies.

Our survey has been designed to see what generalizations (if any) can be derived about the factors promoting or retarding financial deepening in countries at different stages of economic development. In terms of per capita income, the eleven countries range from less

than $400 in Indonesia to more than $9,700 in the United States (1978 data). Overall, during the past two decades, this region has grown faster than any other region in the world. However, individual growth rates have varied from an average of about 3½ percent per year in the United States and New Zealand to more than 9 percent per year in Korea and Singapore. In terms of inflation, the range has also been considerable, from an annual-average rate of a little over 3 percent in Malaysia and Singapore to about 14 percent in Korea and 30 percent in Indonesia.[15].

The eleven countries also exhibit a variety of banking structures. Banks in Indonesia, Korea, and Taiwan are predominantly owned by the government. Malaysia, New Zealand, the Philippines, and Thailand each has a mixed banking system, with one or two large state-

owned banks competing with a large number of private banks. Banks in Australia, Japan, Singapore, and the United States are all privately-owned, with the government owning and operating only development and export-credit institutions.

Finally, all of these countries have experimented with a variety of interest-rate policies. Most of them, including the United States, have maintained rigid controls on bank deposit-interest rates for small savers. However, New Zealand since March 1976 and Singapore since July 1975 have lifted such interest-rate ceilings. Some countries, because of regulated interest rates and inflation, have exhibited negative real deposit-interest rates—but others have shown very high positive rates. We will later examine how these variations have affected financial growth in these countries.

The degree of financial intermediation of a nation might be measured by the proportion of national wealth held through financial intermediaries. Lacking adequate data on national wealth, we may assume that national output is proportionate to national wealth, so that financial intermediation can be measured instead by the ratio of the *consolidated* assets of each nation's financial intermediaries to national output.

We may distinguish three types of financial intermediaries: the monetary authorities, the deposit-money banks, and non-bank financial institutions (savings institutions, credit unions, insurance companies, etc.). Banks are differentiated by their ability to accept demand (i.e., checkable) deposits and thus to expand the money supply by creating demand deposits against themselves, whereas non-bank financial institutions must discharge their liabilities by drawing on their demand deposits at banks.

In measuring the magnitude of a nation's financial sector, what is relevant is the total claims of financial intermediaries on non-financial sectors: government, business, households, and the rest of the world. Claims of financial institutions on each other thus should be netted out. This means not only inter-bank claims, but also the monetary authorities' claims on banks and non-bank financial insti-

tutions, bank reserves held at the central bank, and cash reserves of banks and non-bank financial institutions.

Financial Intermediation, 1978

The degree of financial intermediation is shown by the total consolidated assets of each country's financial sector and their distribution between foreign and domestic assets—all expressed as ratios to national output (Table 1). In each category, the eleven countries are ranked according to the magnitude of the ratio into four groups: (I) High, (II) Medium-High, (III) Medium-Low, and (IV) Low, degrees of financial intermediation.

Most (but not all) of these countries showed about the same rankings in terms of total assets (TA/Y) as in terms of domestic assets (DA/Y). By both criteria, Japan, Singapore, Taiwan, and the United States exhibited the highest degree of financial intermediation in 1978. New Zealand stood by itself in a second group; then followed Australia, Korea, Malaysia, the Philippines, and Thailand; and lastly, Indonesia fell far behind the others in financial intermediation.

It is tempting to seek some explanations for these rankings. For example, one might hypothesize that financial development is a "luxury" good in the process of economic development.[16] This would suggest that income levels can explain observed differences in financial intermediation. However, the extent of financial intermediation is itself a determinant of income levels through its effect on growth. Thus, to isolate the effects of income on financial development would require a simultaneous-equation model describing growth processes and their two-way relationship to financial development—a difficult task given the notorious difficulty of modelling growth processes.

More importantly, however, there are hazards in constructing a practical, cross-country measure of the extent of financial development even if the income/financial-deepening relationship is well understood. It may surprise some, for example, to see that Japan, Singapore, and Taiwan had higher financial-inter-

mediation ratios in 1978 than the United States (Column 1 of Table 1). Generally we assume that the United States has the world's best-developed and most innovative financial markets, and that New Zealand and Australia are also well advanced. In contrast, financial markets and institutions in Japan, Singapore, and Taiwan are considered to be much less developed and shackled by official restrictions.

How can the observed financial-intermediation ratios square with this general impression? Part of the answer may lie in the composition of financial assets. In 1978, foreign assets as a ratio to national output were several times larger in Singapore and Taiwan than in the United States (Column 3). This reflects the fact that financial institutions in these highly open economies engage in international financial intermediation—i.e., borrowing and lending abroad—to a much larger relative extent than do U.S. institutions. This is particularly true for Singapore, where international assets accounted for nearly one-half of the total assets of financial institutions in 1978. But when we exclude foreign assets, the degree of domestic financial intermediation in 1978 was higher in the United States than in either Singapore or Taiwan.

More importantly, the financial-intermediation ratios, TA/Y or DA/Y, describe only the indirect-finance portion of a nation's financial activities. As we have seen, despite the many advantages of indirect finance, a financial system dominated by such a system may reflect stunted growth in capital markets. There is a great deal of complementarity among self-finance, direct finance, and indirect finance, so that a well-developed financial system may combine aspects from each of these modes of finance. Just because one country boasts a higher financial-intermediation ratio than another does not mean that it has a more advanced financial system than the other country.

Financial Deepening, 1960–78

While international comparisons of financial-intermediation ratios might be misleading indicators of financial development, we may gain much useful information from an intertemporal study of the growth of the appropriate ratios within each nation (Table 2). In terms of growth of total-asset ratios, Indonesia and Taiwan ranked at the top in the 1960–78 period, with very high annual growth rates, 9.4 and 7.0 percent respectively. These ratios reflected in part their low degree of financial in-

Table 1
Assets/Output Ratios, 1978
(percent)

Total Assets/Output (TA/Y)			Domestic Assets/Output (DA/Y)			Foreign Assets/Output (FA/Y)		
(I)	Japan	194	(I)	Japan	188	(I)	Singapore	93
	Singapore	189		United States	101			
	Taiwan	121		Singapore	96	(II)	Taiwan	35
	United States	108		Taiwan	86		Malaysia	24
(II)	New Zealand	82	(II)	New Zealand	78	(III)	Philippines	15
	Malaysia	79					Thailand	12
			(III)	Australia	61		Indonesia	11
(III)	Korea	67		Korea	56		Korea	10
	Thailand	67		Malaysia	55			
	Australia	65		Thailand	55	(IV)	Japan	6
	Philippines	63		Philippines	47		United States	6
							Australia	4
(IV)	Indonesia	41	(IV)	Indonesia	29		New Zealand	4

Y = Gross national (or domestic) product.
TA = Total consolidated assets of the financial sector (= DA + FA).
DA = Consolidated domestic assets of the financial sector .
FA = Foreign assets of the financial sector.

Source: Based on data in International Monetary Fund, *International Financial Statistics*, various issues.

termediation at the beginning of the 1960–78 period. Next came Malaysia, Singapore, the Philippines, Korea, Thailand, and Japan, with financial-growth rates ranging from 2.6 percent to 4.7 percent. Most of these countries, except Japan and Singapore, started out with relatively low financial-intermediation ratios. The United States stood alone in the third rank with a modest financial growth rate of only 0.7 percent per year. Lastly, both New Zealand and Australia sustained net declines in financial intermediation during the 1960–78 period, with average annual declines of 0.3 and 0.5 percent respectively.

We see then that the rate of financial deepening tends to be negatively related to the initial value of the total-asset ratio. One may assume that, as a rule, opportunities of financial growth abound at an early stage of financial development, and then diminish as the market becomes saturated with financial institutions. In order to isolate the effects of the initial ratio, we can fit a downward-sloping logarithmic curve to the financial-growth rates and the initial total-asset ratios in Chart 1.[17] By this standard, which measures growth in relation to each country's initial total-asset ratio, Singapore and Taiwan stood out with the most rapid financial growth, and Australia and New Zealand with the slowest growth. In between, Japan and Malaysia had above-average growth, while Thailand and the United States had below-average growth.

Chart 1

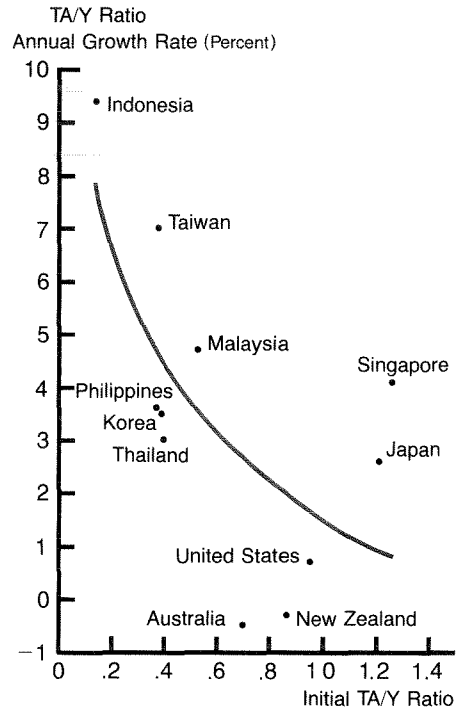### Financial Growth Rates and Initial Financial-Intermediation Ratios

Table 2

Financial Deepening: Growth of Total Assets/Output Ratio (TA/Y)

	Country	Initial Year	Initial Ratio	Ratio in 1978	Average Annual Growth (%)
(I)	Indonesia	1966	0.14	0.41	9.4
	Taiwan	1961	0.38	1.21	7.0
(II)	Malaysia	1969	0.53	0.79	4.7
	Singapore	1968	1.26	1.89	4.1
	Philippines	1963	0.37	0.63	3.6
	Korea	1962	0.39	0.67	3.5
	Thailand	1961	0.40	0.67	3.0
	Japan	1960	1.21	1.94	2.6
(III)	United States	1960	0.95	1.08	0.7
(IV)	New Zealand	1960	0.86	0.82	−0.3
	Australia	1960	0.70	0.65	−0.5

Source: Based on data in International Monetary Fund, *International Financial Statistics*, various issues.

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tween, Japan and Malaysia had above-average growth, while Thailand and the United States had below-average growth.

Average financial-growth rates indicate the long-run trend of financial deepening. But it may also be of interest to examine how financial deepening evolved over time in each country (Chart 2). Three countries—Malaysia, Singapore and Taiwan—showed nearly uninterrupted growth in the TA/Y ratio (Panel a). Two countries—Australia and New Zealand—both attained a high level of financial intermediation by the 1960's but sustained

sharp declines in the TA/Y ratio in the following decade (Panel b). The other six countries all achieved net financial growth, but their growth was marked by prolonged periods (two years or more) of zero growth or declines in the TA/Y ratio (Panels c and d).

To help explain these diverse patterns, we should seek to determine what might account for the broad changes in the trend of financial growth in the various countries. For public policy, short-term fluctuations in the financial-intermediation ratio are hardly of interest. On the other hand, it would be desirable to find

Chart 2

Growth of Financial Intermediation Ratios (TA/Y), 1960–78
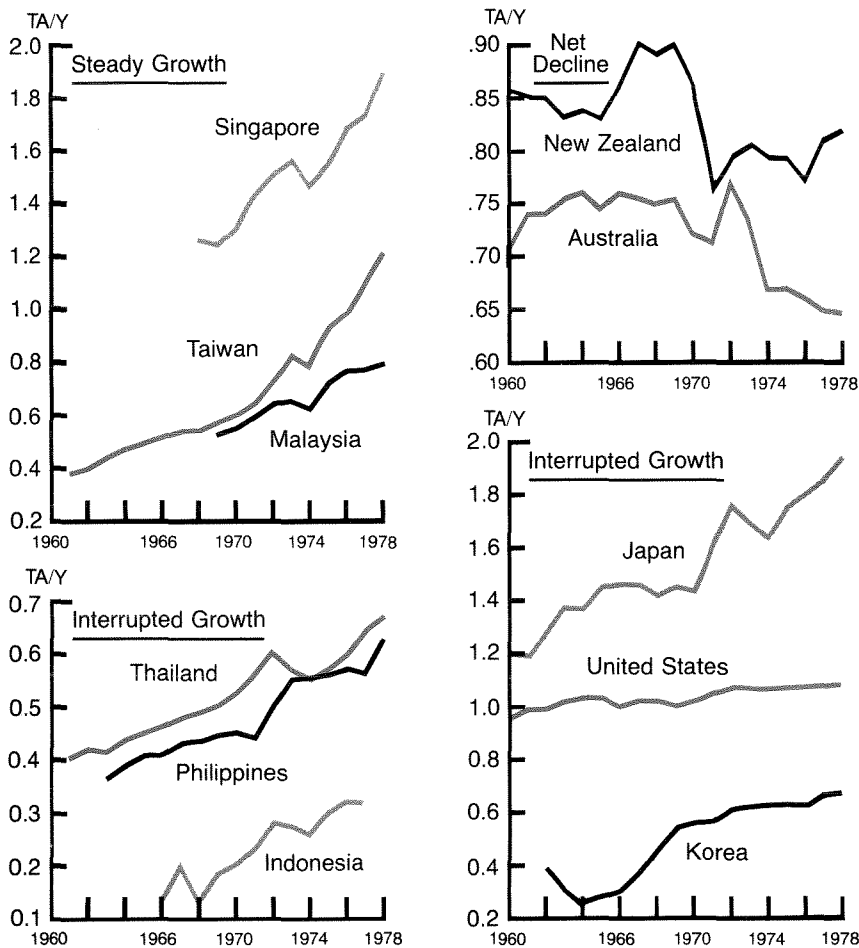
out if changes in financial-growth trends are subject to any systematic influences under policy control.

This can be done by examining the movement of the financial-intermediation ratio in 27 different episodes, comparing it with the corresponding average real-deposit rate, i.e. the nominal deposit rate minus the consumer-price inflation rate (Table 3). According to our theoretical analysis, the real deposit rate plays a key role in determining the extent of financial intermediation, especially under conditions of "repressed finance." The condition describes well the financial markets in most of the countries studied, with the nominal deposit rate fixed inflexibly in the face of consumer price inflation.

All the episodes with falling financial-intermediation ratios were associated with negative real deposit rates, some as large as minus 34 percent in Taiwan in 1974 and minus 19 percent in Indonesia in 1972–74. All of these episodes reflected attempts to maintain stable nominal deposit rates in the face of high domestic inflation rates. On the other hand, all the episodes with rising financial-intermediation ratios were associated with positive real deposit rates—or, if negative (Indonesia in 1974–78, Japan in 1974–78, and Korea in 1976–78), with a significant increase in the real deposit rate from the

Table 3
Relationship Between Financial Deepening and Real Deposit Rate

	Period	Total Assets/Output (TA/Y)	Real Deposit Rate (%)
Australia	1960–64	Rising (from 0.70 to 0.76)	3.10
	1964–69	Flat (from 0.76 to 0.75)	1.37
	1969–78	Falling (from 0.75 to 0.65)	−2.94
Indonesia	1968–72	Rising (from 0.13 to 0.28)	14.2
	1972–74	Falling (from 0.28 to 0.26)	−18.8
	1974–78	Rising (from 0.26 to 0.41)	−1.9
Japan	1960–72	Rising (from 1.21 to 1.76)	−0.14
	1972–74	Falling (from 1.76 to 1.64)	−11.08
	1974–78	Rising (from 1.64 to 1.94)	−2.69
Korea	1962–64	Falling (from 0.39 to 0.25)	−11.03
	1964–72	Rising (from 0.25 to 0.61)	10.75
	1972–76	Flat (from 0.61 to 0.62)	−7.17
	1976–78	Rising (from 0.62 to 0.67)	−1.99
Malaysia	1969–78	Rising (from 0.53 to 0.79) except for dip in 1974	3.87: except −5.5 in 1973–74
New Zealand	1960–67	Rising (from 0.86 to 0.90)	0.30
	1967–76	Falling (from 0.90 to 0.77)	−3.81
	1976–78	Rising (from 0.77 to 0.82)	0.79
Philippines	1963–78	Rising (from 0.37 to 0.63) except flat in 1973–75	2.83: except −8.7 in 1970–74
Singapore	1968–78	Rising (from 1.26 to 1.89) except for dip in 1974	4.3: except −16.2 in 1973–74
Taiwan	1961–78	Rising (from 0.38 to 1.21) except for dip in 1974	6.67: except −34.0 in 1974
Thailand	1961–72	Rising (from 0.40 to 0.60)	5.6
	1972–74	Falling (from 0.60 to 0.55)	−8.5
	1974–78	Rising (from 0.55 to 0.67)	3.1
United States	1960–72	Rising (from 0.95 to 1.07)	1.2
	1972–78	Flat (from 1.07 to 1.08)	−2.0

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preceding period. The only exception was Japan during 1960–72, when a substantial rise in the TA/Y ratio took place in spite of a small negative real deposit rate. This case may have reflected a very strong propensity to save through financial institutions, coupled with a vigorously growing national economy. However, Japan's TA/Y ratio fell sharply in 1972–74, when the real deposit rate dropped to a negative 11 percent.

Sustained positive real deposit rates have meant rising financial intermediation in all cases except one: Australia in 1964–69, when the TA/Y ratio remained virtually unchanged instead of rising. But Malaysia, Singapore, and Taiwan, the only countries with nearly uninterrupted financial growth, were also the only countries that consistently maintained high real deposit rates. In all three cases, the only decline in the financial-intermediation ratio occurred in 1973–74, when high inflation rates turned their real deposit rates briefly negative. The Philippines also showed steady financial growth, except for a two-year period (1973–75) when the TA/Y ratio remained flat, in line with a sharp decline in the real deposit rate.

In sum, the real deposit rate appears to play a significant role in financial deepening. A positive rate sustained over a number of years all but assured financial growth, whereas a sustained negative real deposit rate nearly always brought about financial stagnation or decline. There were some exceptions to this rule, but in each case, financial growth accompanied a significant rise in the real deposit rate, even when the rate itself remained negative.

We do not claim that the real deposit rate was the only factor determining the financial growth rate. Rapid economic growth and a high savings propensity helped offset the effects of a negative real deposit rate during several periods of vigorous financial growth—Indonesia during 1974–78, Japan during 1960–72, and Korea during 1976–78. Yet despite these exceptions, the real deposit rate consistently played a key role in stimulating financial growth in most of the episodes analyzed here.

III. Summary and Conclusions

The economic literature suggests that organized financial markets, and financial intermediation in particular, possess certain advantages over self-finance in terms of promoting savings and efficiency of investment. The analysis in this paper focusses on financial intermediation for reasons of data consistency, but it is important to remember that direct finance also plays a major development role in countries with fully developed financial markets.

Financial intermediation ratios in 1978 were significantly higher in Japan, Singapore, and Taiwan than in Australia, New Zealand, and the United States. The explanation lies partly in Singapore and Taiwan's high degree of international intermediation, and partly in Japan, Singapore and Taiwan's relative lack of alternative channels of financing, compared with the other developed economies.

In terms of growth over time, Malaysia, Singapore, and Taiwan achieved nearly uninterrupted financial growth during the data period. In contrast, Australia and New Zealand sustained net declines in their degree of financial intermediation. The other six nations all recorded growth in financial intermediation, but with varying periods of stagnation or setback.

The real deposit interest rate played a critical role in setting the pace of each nation's financial growth. Positive real deposit rates maintained over a number of years invariably led to financial deepening, while negative real deposit rates (even over brief periods) could result in sharp financial disintermediation against an otherwise strongly upward trend. Other factors, such as a vigorously growing economy with a high propensity to save, occasionally offset the adverse effects of a negative real deposit rate—for instance, in Japan during 1960–72. However, such reversals were relatively rare, and failed to contradict the hypothesis that a negative real deposit rate is detrimental to financial deepening.

Because of the importance of financial deepening for economic growth, economic policy should be aimed at reducing inflation, which by definition lowers the real deposit rate. Where inflation cannot be brought down quickly, interest rates should be allowed to adjust with sufficient flexibility to permit a positive real rate of return to savings.

FOOTNOTES

1. See for instance, John G. Gurley and Edward S. Shaw, "Financial Intermediaries and the Savings-Investment Process," **Journal of Finance,** May 1956, pp. 257–77. Hugh T. Patrick, "Financial Development and Economic Growth in Underdeveloped Countries," **Economic Development and Cultural Change,** January 1966, pp. 174–89; Edward S. Shaw, **Financial Deepening in Economic Development,** Oxford, 1973; Ronald I. McKinnon, **Money and Capital in Economic Development,** Brookings, 1973; Ronald I. McKinnon, ed., **Money and Finance in Economic Growth and Development,** Marcel Dekker, 1976; Donald J. Mathieson, "Financial Reform and Capital Flows in a Developing Economy," **International Monetary Fund Staff Papers,** September 1979, pp. 450–489.

2. By economic growth is meant an increase in per capita real income over time. The relevant economic literature generally regards increases in the savings rate resulting from financial deepening as growth enhancing in the short run. It does not deal with the long-run question of whether the growth-enhancing effect would eventually be offset by declining marginal productivity of capital as capital accumulates, so that in the "steady-state" the growth rate is independent of the savings rate. This paper follows the tradition of the financial-deepening literature by considering only the short-run effects on economic growth, excluding the "steady state" considerations.

3. No consideration is given in this paper to financing by foreign capital. However, as a rule, foreign capital is attracted by the nation's growth prospects, which in turn depend critically on how well the nation is able to mobilize and utilize its own national savings. Thus, ultimately, national capital formation must depend on the efficiency of its financial system.

4. See McKinnon, **Money and Capital in Economic Development,** Brookings, 1973, ch. 2, pp. 5–21, for an analysis of this point.

5. Central banks are also financial intermediaries, because their currency creation channels a portion of the nation's private savings to the Government. Also, central banks often lend directly to the Government and businesses.

6. For a succinct statement of the economic benefits of financial intermediation, see James C. Van Horne, **Function and Analysis of Capital Market Rates,** Prentice-Hall, 1970, pp. 6–7.

7. These propositions can be built into a simple Harrod-Domar model of economic growth:

$$Y = Y(K, F) \tag{1}$$

and

$$S = S(Y, F) \tag{2}$$

where Y, K, and F designate real national output, real capital stock, real savings, and a measure of the nation's degree of financial intermediation. Differentiate (1) with respect to time to obtain

$$\dot{Y} = Y_K\dot{K} + Y_F\dot{F} \tag{3}$$

where Y_K and Y_F are partial derivatives of Y with respect to K and F, and a dot over a variable indicates its rate of change over time. Now, assume that the savings function is homogeneous of first degree with respect to Y, such that (2) may be rewritten as

$$S = S(F)Y \tag{2'}$$

Then, by equating savings with net investment,

$$S = \dot{K} = S(F)Y \tag{4}$$

and substituting (4) into (3) we obtain

$$\dot{Y} = Y_KS(F)Y + Y_F\dot{F} \tag{5}$$

Now, by definition, economic-growth rate

$$g \equiv \dot{Y}/Y \tag{6}$$

Substitute (5) into (6) to obtain

$$g \equiv Y_KS(F) + Y_F\dot{F}/Y \tag{7}$$

Equation (7) states that the **degree** of financial intermediation affects a nation's economic growth rate through its impacts on the marginal productivity of capital (Y_K) and the savings rate (S); moreover, financial **growth** ($\dot{F}$) directly enhances economic growth in proportion to the marginal productivity of financial intermediation relative to the national product (Y_F/Y).

Note that this analysis excludes considerations of the "steady state" growth path (see note 2 above).

8. Including the cost of government regulation, such as that which arises from requiring financial intermediaries to hold interest-free reserves against either assets or deposits. McKinnon shows that the real reserve cost rises geometrically with the rate of inflation in the economy. See Ronald I. McKinnon, "Financial Repression and the Liberalization Problem within Less-Developed Countries" in **The Past and Prospects for World Economic Order,** edited by A. Lindbeck and E. Lundberg (forthcoming).

9. The benefits and costs of financial intermediation give rise to the question of the optimal size of a nation's financial sector. For an analysis of the problem, see U Tun Wai, "The Optimal Size and Ideal Structure of Financial Markets in Developing Countries," **International Monetary Fund,** DM/78/74, August 1978.

10. For a more formal analysis of the role of financial intermediation in economic growth, see Lewis J. Spellman, "Economic Growth and Financial Intermediation," in **Money and Finance in Economic Growth and Development,** edited by Ronald I. McKinnon, 1976, pp. 11–22.

11. The addition of the unorganized market to the diagrammatic analysis is due to Sho-Chieh Tsiang, "Fashions and Misconceptions in Monetary Theory and Their Influences on Financial and Banking Policies," **Zeitschrift fur die Gesamte Staatswissenschaft,** December 1979, pp. 584–604.

12. This factor partially accounts for the frequent failure to find significant effects of real interest rates in empirical studies of national savings. See Vincente Galbis, "Theoretical Aspects of Interest Rate Policies in Less Developed Countries," **International Monetary Fund,** DM/79/7, February 1979.

13. This form of diagrammatic presentation is due to Maxwell Fry, "Money and Capital or Financial Deepening in Economic Development?" **Journal of Money, Credit, and Banking,** November 1978, pp. 464–475.

14. The only available source of internationally comparable data is the International Financial Statistics (IFS) database. The financial intermediation measure developed here is the broadest indicator of financial-market development calculable with that data.

15. For Indonesia, the data refer to the period from 1966 to 1978.

16. Goldsmith found that the income elasticity of demand for financial assets was greater than unity for both developed and less-developed countries. See Raymond W. Goldsmith, **Financial Structure and Development,** Yale, 1969, Table 4–11, p. 204.

17. The regression equation is $r_{FG} = 1.52 - 3.22 \ln(TA/Y)_0$, $R^2 = 0.44$, where r_{FG} is the average annual rate of growth of the TA/Y ratio, and $(TA/Y)_0$ is the initial ratio of total assets to national output.

P.O. Box 7702
San Francisco, California 94120