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MEASURING FINANCIAL SECTOR DEVELOPMENT: A STUDY OF SELECTED ASIA-PACIFIC COUNTRIES

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I. INTRODUCTION

TRADITIONAL measures of financial deepening, those based on monetary and credit aggregates, may not enable to assess accurately a country's financial development. For example, China has a higher ratio of broad money to GDP than Australia, and around the same level as Japan. Yet no one would consider China's financial system to be anywhere near as well developed as either of these two. Alternative measures are required to improve the evaluation of levels of financial development. This is of practical importance. Financial sector development is promoted as a means to generate economic efficiency by national governments and multinational agencies, like the International Monetary Fund and Asian Development Bank. A well-defined set of measures of financial development is required for effective policy formulation, implementation, and evaluation. Indicators of financial development suggested in this paper may contribute to achieving this objective.

Section II briefly examines the theoretical foundations of financial development. Based on this discussion, Section III presents a range of indicators of financial development for selected Asia-Pacific countries. Financial development is concerned with the unification of fragmented financial markets and these indicators can be used for this purpose. Thus, they extend beyond traditional indicators and, taken as a set, can trace financial development from less developed financial systems, like those of China, to highly advanced systems, like those of Australia. Section IV presents some conclusions.

II. THEORETICAL BACKGROUND

In the past, economic growth theorists, like Ricardo, focussed on shortages of real

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factors, like land and capital, as constraints on economic growth and did not consider the role of financial markets. Schumpeter asserted the importance of financial intermediary services to innovation and economic growth [51]. Later, development theorists largely ignored the financial system. For example, Chenery and Strout linked poor economic growth performance to resource shortages, particularly foreign exchange and domestic savings [21]. In a significant advance, the importance of an effective financial system to economic development was substantiated in influential works by McKinnon [43] and Shaw [52].[1]

A. *The McKinnon and Shaw Paradigm*

McKinnon [43] and Shaw [52] outlined the constraints placed on economic development by an ineffective financial sector and the benefits that accrue from financial liberalization in developing or "lagging" economies.[2] In general, the deep-seated problems of the lagging economy are related to all the economy, not only to the financial sector. Thus, financial sector liberalization is part of a wider set of reforms and is not mutually exclusive to those reforms. Emphasis is placed on fragmentation imposed on economies by centralized decision making, especially in financial markets.[3] Prices diverge across markets, or market segments, and equilibrating resource flows do not occur, or are prevented. Government intervention in financial markets, usually in the form of interest rate controls, high bank reserve requirements, or strict credit allocation directives, is the main source of "financial repression."[4] Uncertainty arising from resulting fragmentation reduces entrepreneurial leverage capacity and narrows maturity horizons, leading to an inferior savings and investment climate, from which it is impossible to generate vigorous economic growth.

The analyses of McKinnon and Shaw afford valuable insights into the role of the financial sector in developing economies. These hinge on the fragmented nature of the economies, which is a considerable advance compared with traditional neoclas-

[1] They significantly expanded earlier work by Goldsmith [31] and Gurley and Shaw [33].

[2] Shaw defines a lagging economy as one that "confines itself to poverty partly by imposing upon its markets patterns of financial, fiscal, and international economic policy that, in effect, instruct market participants to keep aggregate levels of income and wealth where they are. It depends on the plan, mandate, ration, license, and privilege to optimize resource allocation and use" [52, p. vii]. Cavello provides a short description of practical mechanisms by which this policy can suppress economic growth [16].

[3] McKinnon defined economic development as narrowing of great dispersion in the social rate of return to existing and new investment [43, p. 9]. Financial markets cover all product markets and as such are an important means of closing gaps of this nature.

[4] There are many reasons put forward to justify interventionist financial measures, such as market failure, control of usury, and protection of the national interest. However, frequently financial repression arises precisely from policy failure. The market fails because it is controlled and national interest gets confused with privilege. Thus, there is opposition to financial reform despite its economic advantages.

sical models, built on assumptions of perfect information and zero transaction costs. Financial sectors evolve around the minimization of information asymmetry and transaction costs, and lagging economies are least developed in this regard mainly due to divisive regulation, inadequate infrastructure, and macroeconomic control and low performance.[5]

The McKinnon-Shaw analysis injected life into the financial development debate, spawning contributions from many other theorists, most of whom supported their thesis.[6] For example, Burkett and Vogel reassessed the McKinnon model and adapted it to examine the role of liquidity management in the smooth operation of a firm and to demonstrate the importance of transaction costs [14]. The relationship between the quantity of investment and financial market liberalization was examined by Kapur [39] and Mathieson [4]. The issue of investment quality was taken up by Galbis [28]. More recently, authors like Greenwood and Jovanovic [32] and King and Levine [40] have developed formal models in which financial sector services (especially efficient management of information asymmetry, risk diversification, and liquidity management) endogenously contribute to economic growth. It would be wrong to suggest that there is universal consensus about the benefit of financial sector reform to the economic development process. Most theorists, including McKinnon [44], emphasize the dangers of financial sector liberalization under inappropriate conditions. However, some, like Dornbusch and Reynoso [25], are skeptical of the benefit from financial liberalization and others, like the neostructuralists (for example, van Wijnbergen [57] and Taylor [55]), suggest that it can actually inhibit economic development.

B. *Development of the Financial System*

The key to financial sector development in lagging economies is the reduction of fragmentation in financial markets, so that they gradually set more accurate (and therefore consistent) prices that reflect resource scarcity. McKinnon and Shaw consider that the establishment of positive real interest rates is a first step in this direction, providing a base from which the financial system can be developed to produce more refined prices.

In lagging economies, returns are widely dispersed because of market fragmentation, with many projects yielding negative returns in real terms. As initial liberalization leads to positive real interest rates, only projects with positive real returns are undertaken. Positive real interest rates stimulate greater financial saving, sig-

[5] Significant theoretical advances in the analysis of information asymmetry have taken place, beginning with Stiglitz and Weiss [54]. Emphasis is placed on credit rationing in economies with liberalized interest rates and the fact that any "mis-pricing" that occurs is a failure in interest rate refinement, not an incorrect broad setting of interest rates. However, the latter is most problematical in financially repressed economies.

[6] See Fry [27], Gertler [30], and McKinnon [44] for useful surveys.

nificantly increasing monetization of the economy, and financial intermediation. However, real returns may still experience significant dispersion because of information asymmetry and high transaction costs, a symptom of poor physical, technical, tax, and regulatory infrastructure.

The range of price dispersion decreases as the financial system develops. Development of mechanisms (like effective company and securities industry laws and regulations) to eliminate information asymmetry, creation of new institutions (like credit-rating agencies) to produce higher quality information, use of technology to improve the processing and dissemination of information (including prices), adoption of efficient business practices, and market organization in the financial sector, together with ongoing deregulation, facilitate further development over time. Markets for complex financial instruments, like derivatives, that require a sophisticated infrastructure base emerge as the development process progresses.

Banks are the fulcrum of the financial system, but over time the relative importance of financial markets for instruments, like bonds, equity, and commercial bills, rises.[7] Financial sector deregulation forms part of a wider set of economic reforms in lagging economies. Elimination of centralized controls over prices, resource distribution, and trade flows and the freeing of nominal interest rates and exchange rates fundamentally alter the economic and financial risk exposures of financial institutions and companies, generating a demand for effective risk management products that cover liquidity and price risk. Only advanced financial systems have the infrastructure to provide them. These risk management products also reduce price dispersion by linking markets across space and time.[8]

III. MEASURING FINANCIAL SECTOR DEVELOPMENT AGAINST THIS BACKGROUND

A complete set of financial sector development indicators should cover credit intermediation, liquidity management, and risk management characteristics of the financial system. In addition, financial pricing mechanisms need to be considered in detail, including price setting and price flexibility aspects, to assess the development of the financial system, that is, the extent of progress on unification of fragmented financial markets.

This section examines a range of indicators, for a selection of countries in the Asia-Pacific region, based on the above discussion. Countries chosen for detailed analysis are Australia, China, Indonesia, Japan, the Republic of Korea, Malaysia,

[7] Asian Development Bank [2, 1993 edition] and Lynch and Norton [42] describe financial market development in Asia.

[8] For example, arbitrage in forward foreign exchange markets ensures consistency between interest rates in domestic and foreign money markets, given the spot exchange rate. Similarly, financial futures link interest rates across the yield curve.

Philippines, Taiwan, and Thailand. These provide a cross section of financial systems from highly advanced to less developed. Information on other countries is reported on an ad hoc basis. There are five categories of financial development indicators: quantity measures, structural measures, financial prices, product range, and transaction costs. The rationale and interpretation of each is based on the discussion in Section II and is explained in our discussion of the data.[9]

A. *Quantity Measures*

Quantity indicators based on monetary and credit aggregates are the traditional measures of financial development and deepening. They are proxy measures of savings and credit intermediation in an economy and are expected to increase in response to improved price signalling, represented primarily by the establishment of positive real interest rates.

The simplest indicator is the money/GDP ratio, which measures the degree of monetization in the economy. Money provides valuable payment and saving services. The "narrow money" stock best reflects the former and "broad money" the latter.[10] Narrow money balances should rise in line with economic transactions (ignoring technical developments), but broad money should rise at a faster pace, if financial deepening is occurring. As bank deposits finance credit, they can serve as an indicator of the level of financial intermediation in an economy. However, it is preferable to directly measure credit intermediation. "Private sector credit," which focuses on credit given to the "productive" sector, is used in this study.[11]

Analysis of these aggregates in the selected countries over the last fifteen years may be summarized as follows (relevant charts are presented in Appendix Figure):

(1) In general, narrow money was stable, or increased moderately, as a proportion of GDP. China and Taiwan were notable exceptions;
(2) Broad money (in terms of GDP) increased rapidly in all countries, except Australia, Japan, and Korea, where growth was still impressive; and
(3) Private sector credit grew rapidly in all countries, except the Philippines, where it fell.

[9] Other measures could be included here. For example, international integration is not covered, but was important in Japan during the 1980s. Easing of capital controls generated large international portfolio investment flows, which closed the gap between (or unified) domestic yen and Euroyen interest rates. All of the countries in the sample experienced international integration to some extent during the last decade.

[10] Broad money comprises the sum of quasi money and narrow money. Quasi money is often a more direct measure of pure savings balances. However, since a clear division cannot be made, broad money is used. Barnett provides a useful discussion on the issues in calculating monetary aggregates [10].

[11] Government credit from banks in countries with highly regulated financial systems is frequently captive and banks have no control over its use. Consequently, the important credit allocation role of banks is best represented by their lending to the private sector, though in repressed systems even this provision is tightly controlled. Government credit was examined, but did not contain any valuable insights for the selected countries.

TABLE I

MONEY AND CREDIT AGGREGATES, 1991–92

(% of GDP)

	Narrow Money	Broad Money	Private Sector Credit	1990 Per Capita GNP (U.S.$)
Australia	15	61	71	16,670
China	47	98	99	370
Indonesia	12	45	50	560
Japan	29	111	122	25,840
Korea	11	41	59	5,440
Malaysia	23	70	76	2,340
Philippines	9	36	20	730
Taiwan	47	164	120	7,950
Thailand	9	76	72	1,410

Source: See Appendix for data sources and methods for all tables.

This analysis suggests that financial deepening was significant in most countries. Private sector credit expanded rapidly, especially from the mid-1980s, while transaction-based money was stable. Surprisingly, there is no clear pattern to distinguish advanced countries from developing countries, except perhaps for more moderate growth in broad money. As all the countries in the sample undertook significant financial liberalization measures, which affected retail and wholesale banking services, during the period under consideration, these may partly account for the widespread financial deepening (see Appendix Table for a brief outline).

Comparison of relative country levels, shown in Table I, provides some surprising results. First, it appears that China and Taiwan have well-developed financial sectors. This fits with neither the analysis of McKinnon and Shaw nor reality. In China's case, official GDP data significantly understate its true level and bias its indicators upwards. The high level of transaction balances supports this assumption. There is also a significant monetary overhang, or forced savings, which reflects the inefficiencies in the goods markets.[12] A high level of transaction balances is also evident for Taiwan, where the high broad money ratio reflects successful mobilization of savings through banks since the 1960s (see Shea [53]). Second, it would appear that Australia has a low level of financial development. Again, this does not corresponds to the reality.[13]

The problem is that these measures do not consider the full extent of financial intermediation (or indeed liquidity and risk management services), as securities

[12] See Caprio and Honohan [15] for a discussion on these issues.

[13] A qualification to this analysis, as recognized by McKinnon [43], is that an optimal level of monetization exists, beyond which the costs of monetary deepening exceed the benefits. Excessive debt levels are harmful at the corporate, government, and country levels. These optimal levels are difficult to evaluate practically; though the mix of assets and instruments (as discussed below) may be useful in distinguishing significant deviations from the optimal position.

markets and nonbank financial institutions, like insurance companies, are ignored.[14] For example, Australia's broad money stock excludes a bank bill market and nonbank financial institutions that offer deposit-type facilities, which alone account for financial liabilities (and assets) equivalent to 36 per cent of GDP.[15] Similarly, "other banking institutions" in Korea took advantage of a less restrictive regulatory environment than that faced by deposit money banks and grew rapidly from the 1970s to hold liquid liabilities equivalent to 20 per cent of GDP.[16]

Nonbank financial institutions and financial markets tend to be more important in developed countries, implying that bank money and credit-based measures of development are associated with a downward bias as the financial sector matures. A broader definition of financial assets—that includes securities like government bonds and company shares as well as claims on nonbank institutions like pension funds—should be a better indicator of development.

Measurement of financial assets in an economy is surprisingly difficult. Simple addition of financial institution balance sheets is incorrect, as it does not take account of complexities like interinstitutional claims. For example, interbank liabilities are large, but represent a liability of the banking system to itself and so should be netted out of the aggregate balance sheet. Similarly, while amounts outstanding in equity, bond, and money markets are part of financial assets, it is not appropriate to add the total amounts outstanding to the consolidated balance sheet of financial institutions. This is because financial institutions hold large securities portfolios. Therefore, the addition of the total results in double counting. Again, cross-holdings must be netted out. Appendix contains full details of adjustments that are required.

Financial assets for the selected countries are calculated on a net basis that takes account of financial cross-holdings, and the ratios of financial assets to GDP are shown in Figure 1, which provides a better measure of domestic financial savings than the above money and credit aggregates.[17] Figure 1 indicates that financial deepening occurred during the 1980s in the economies surveyed.[18] Cross-country relationships are more realistic than indicated in Table I; for example, China has a

[14] The data do not take account of informal financial markets either. This is not a problem for measuring financial development; substitution of formal financial market products for informal products represents development.

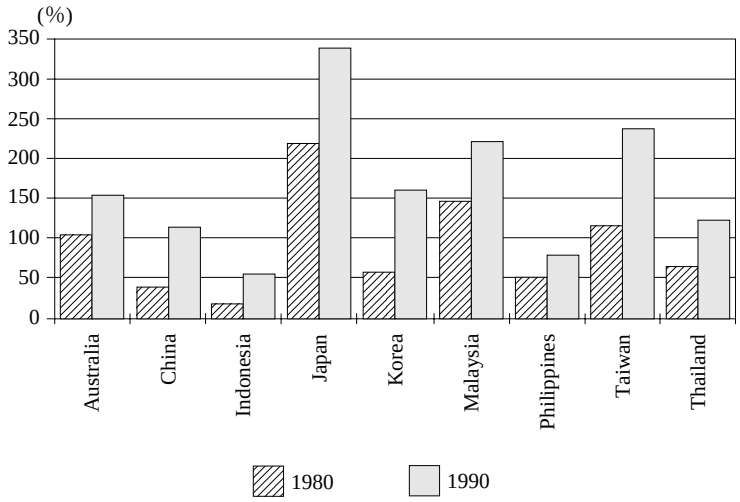
[15] The Reserve Bank of Australia includes funds raised from the public by nonbank financial institutions in its published measure of broad money.

[16] Bank-like institutions not covered in the broad money and private sector credit aggregates published in the IMF's *International Financial Statistics* [37].

[17] Money and credit aggregates, or measures based on them, are commonly used in econometric studies as a measure of financial development: for example, King and Levine [40], De Gregorio and Guidotti [24], and Levine and Renelt [41]. Financial assets should provide greater empirical insights, as they better accommodate the changing structure of the financial sector, as it develops.

[18] This is not too surprising; for many countries broad money is the principal financial asset. This is evident from data presented in Table II.

Fig. 1. Financial Assets (Per Cent of GDP)



Note: Calculated from the liability side; see Appendix Table.

below average financial depth. However, Australia apparently still has a lower relative level of financial development than might be expected, presumably because the relative openness of the Australian economy permits larger foreign investment overseas by residents and larger inward investment (including loans). This situation biases downward domestic asset holdings and credit intermediation.

On balance, with respect to quantitative measures, the broader the measures implemented, the better. In addition to being more comprehensive, problems from developments that have an impact on the allocation of financial assets, rather than affecting the level of savings, can be avoided. For example, a tax-induced switch from bank deposits to commercial paper will not affect aggregate financial savings, but would reduce the money stock. Given individual country characteristics and idiosyncrasies, quantity measures may be considered more reliable as financial development indicators across time in a country than across countries.

B. *Structural Measures*

The measures considered in this section are designed to help analyze the structure of the financial system and determine the importance of its different elements. Three measures are proposed. First, the ratio of broad money to narrow money (BM/NM) is used. This ratio should be positively related to a country's level of financial development; savings deposits increase more rapidly than transaction balances as the financial system expands. Second, the ratio of securities market outstandings to broad money (SEC/BM) is used as an indicator of the balance be-

TABLE II

RATIO INDICATORS OF FINANCIAL STRUCTURE

	BM/NM		SEC/BM		DT/UT	
	1980	1990	1980	1990	1980	1990
Australia	3.2	4.7	1.5	1.9	0.1	3.5
China	1.5	2.1	–	0.1	–	–
Indonesia	1.5	3.6	0.0	0.2	–	–
Japan	3.0	4.1	0.9	1.3	–	1.8
Korea	3.3	4.3	0.6	1.7	–	–
Malaysia	2.6	3.0	2.4	2.5	–	–
Philippines	2.5	3.9	1.0	1.6	–	0.0
Taiwan	2.7	3.2	0.4	0.8	–	–
Thailand	3.5	7.8	0.5	0.5	–	–

Notes: 1. – indicates the absence of a market.
2. BM/NM = the ratio of broad money to narrow money; SEC/BM = the ratio of marketable debt and equity securities outstanding to broad money; and DT/UT = the ratio of turnover on derivatives markets to the turnover on the physical market.

tween intermediaries and securities markets in the financial system. SEC is the total amount outstanding in the equity, bond, and short-term debt securities markets.[19] Again, a positive relationship with financial deepening is anticipated; as discussed in Section II, financial markets increase in importance relative to banks as the financial system matures.

Finally, the ratio of derivatives turnover to turnover in underlying instrument markets (DT/UT) is considered. This ratio measures the importance of "off balance sheet" risk management products, relative to cash (or physical) trading in the instruments upon which the derivatives are based. Derivatives require stable, efficient markets in their underlying instruments and increase in importance as the underlying markets develop to meet these criteria. Therefore, a positive trend indicates financial development. Derivatives turnover is measured by the notional turnover of exchange-traded interest rate and equity futures and options contracts.[20] Table II gives a summary of trends in these indicators.[21]

The BM/NM indicator suggests that Australia, Japan, and Korea are most devel-

[19] SEC is the total amount of securities outstanding, excluding bank debt securities (debentures and CDs).

[20] Derivatives turnover includes only local exchange-traded futures and options contracts on domestic instruments. Notional turnover is the face value of each contract multiplied by the number of contracts traded. A broad interpretation of underlying instruments is used. Japan's data cover government bond and equity markets, Australia's data cover the money market as well as these.

[21] The ratios discussed in this section are partial; for example, they do not adequately measure liquidity management services. Liquidity is discussed in Section E in the limited context of financial markets.

oped while Thailand is treated as an outlier.[22] China and Taiwan have low BM/NM ratios, suggesting a less important role for savings deposits relative to transaction balances. On the basis of the BM/NM ratio, although all countries experienced financial deepening over the decade, Indonesia and China achieved most. The SEC/BM ratio shows that there is a clear tendency for advanced countries to rely more heavily on financial markets. Surprisingly, the ratio is the highest for Malaysia, which has well-established securities markets compared with other developing countries. Korea's markets developed most during the 1980s by this measure. Taiwan's measure is biased down by its exceptionally high BM. The high ratio for the Philippines, to some extent, reflects severe disruption of its banking sector during the 1980s. The initial rise in importance of broad money, and then of securities markets, demonstrate a widening of the financial asset maturity spectrum, as financial systems develop.

The DT/UT ratio demonstrates the low availability of risk management instruments in the selected countries. Clearly, Australia and Japan have the most advanced financial systems by this measure. Australia shows a higher ratio because of its very active interest rate futures. Although the inclusion of derivatives traded over-the-counter (that is, traded off exchange) accentuates the difference between Australia and Japan, the overall situation does not change.

C. *Financial Prices*

Developed financial systems should produce positive real interest rates that reflect peoples' positive rate of time preference and growth opportunities in an economy. This is an outcome of both neoclassical growth models and of more recent financial sector endogenous growth models. It is also a key argument of financial sector protagonists, like McKinnon and Shaw. In addition to being positive in real terms, interest rates should adequately reflect economic expectations. For example, nominal interest rates should be able to accommodate changes in expected inflation. Thus, both the level and flexibility of interest rates are essential.

1. *Interest rate levels*

The real deposit interest rate is the most important financial price. A fundamental precondition for substantial financial deepening is that it should be positive. Fragmented markets in lagging economies often produce negative real deposit rates, which discourage savings in financial assets. Although empirical evidence on the relationship between real interest rates and total savings is uncertain, there is a positive relationship between real interest rates and financial savings.[23] Positive real lending rates are crucial too, as they sustain deposit rates and only support

[22] In Thailand, savings deposits are included in broad money (28 per cent of broad money in 1990) but are increasingly used as transaction balances, which bias upwards the BM/NM measure.

[23] See Fry [27] and Dornbusch and Reynoso [25] for a summary of empirical findings.

TABLE III

REAL DEPOSIT AND LENDING RATES

(Average annual rate, %)

	Inflation (1980–91)	Real Deposit Rates		Real Lending Rates	
		1980–85	1986–91	1980–85	1986–91
Selected economies:					
Australia	7.9	1.7	5.6	4.8	11.5
China	7.3	1.0	–1.4	1.8	–0.4
Indonesia	9.4	–1.1	9.7	0.1	13.6
Japan	2.6	0.5	0.8	3.7	4.3
Korea	8.5	1.3	5.5	3.0	3.9
Malaysia	3.6	3.6	3.7	4.7	5.8
Philippines	15.3	–3.5	3.9	0.6	10.3
Taiwan	4.5	3.4	4.7	5.2	5.8
Thailand	5.8	5.3	6.3	10.8	11.8
Other economies:					
Bhutan	9.4	–3.1	–2.8	5.9	5.0
Myanmar	12.6	–2.3	–14.3	4.0	–10.5
Nepal	11.0	–5.2	–3.1	5.3	2.8

Note: Real interest rates are calculated as nominal interest rates less consumer price inflation.

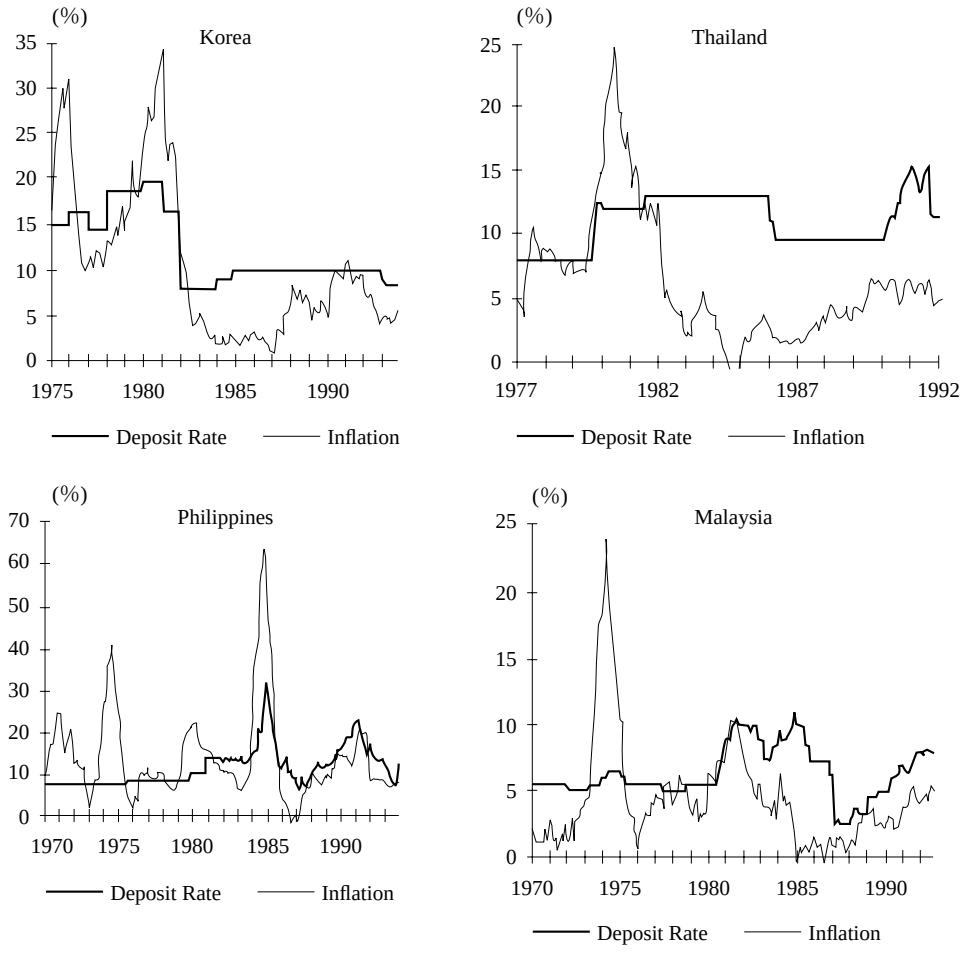
projects with positive real rates of return, as discussed in Section II. Unified financial markets are built upon expectations, not regulation, and produce positive real interest rates. Table III outlines the level and trend of real deposit and lending interest rates.[24]

Significantly positive real interest rates predominate. China, Indonesia, and the Philippines are exceptions and could not generate efficient prices occasionally. The conditions improved in the Philippines in the second half of the 1980s, while they deteriorated in China, both largely reflecting inflation movements. Indonesian interest rate determination improved considerably following liberalization of rates in 1983. Taiwan and Thailand had the highest real deposit rates in the region over the full period.[25] Real deposit rates in Bhutan, Myanmar, and Nepal, which are countries with severe mis-pricing, are given for comparison. Real lending rates are more uniformly positive across countries, except for China and Myanmar. Lending rates are set at a margin above deposit rates, though exceptions have occurred elsewhere. The implied spreads between deposit and lending rates here reflect only a part of

[24] Real interest rates can be too high as well as too low, if the financial system malfunctions. McKinnon provides a useful discussion of Chile's experience in this regard over the decade from the mid-1970s, when inadequate financial supervision led to excessively high real interest rates [44].

[25] More detailed analysis of these and other countries in the region shows that real deposit interest rates are low, or negative, in highly regulated financial systems and significantly positive in liberalized systems.

Fig. 2. Examples of Nominal Deposit Rate Rigidity and Flexibility



bank business. More comprehensive bank spread data are presented in Section E.

2. *Interest rate flexibility*

An important issue to consider is the responsiveness of prices to changing economic conditions. Efficient financial markets facilitate adjustment to changing expectations about economic conditions, but this adjustment is hindered by interest rate controls. For example, in Korea and in Thailand before 1989 deposit interest rates did not change for years on end, despite appreciable shifts in the level of inflation. In contrast, interest rates are more flexible and respond to expectations in liberalized financial systems as in the case of the Philippines after 1980 and Malay-

TABLE IV

INTEREST RATE VOLATILITY, 1981–91

	Inflation Volatility	Deposit Rate Volatility		Lending Rate Volatility		Nominal Less Real Volatility	
		Nominal Rate (1)	Real Rate (2)	Nominal Rate (3)	Real Rate (4)	Deposit Rate (1) – (2)	Lending Rate (3) – (4)
Selected economies:							
Australia	2.4	1.9	2.4	3.0	3.8	–0.5	–0.8
China	6.5	1.9	5.1	1.6	5.5	–3.2	–3.9
Indonesia	2.4	5.9	7.0	5.6	6.4	–1.1	–0.8
Japan	1.4	1.0	0.7	1.0	0.8	0.3	0.2
Korea	5.5	2.2	3.6	2.4	3.4	–1.4	–1.0
Malaysia	2.7	2.5	2.5	1.8	3.5	0.0	–1.7
Philippines	13.2	4.1	7.5	5.1	7.6	–3.4	–2.5
Taiwan	4.7	2.4	3.0	2.5	2.8	–0.6	–0.3
Thailand	3.2	1.8	3.3	1.7	3.3	–1.5	–1.6
Other economies:							
Bhutan	3.9	0.5	3.6	0.0	4.2	–3.1	–4.2
Myanmar	10.6	2.5	7.2	0.0	8.6	–4.7	–8.6
Nepal	4.2	2.1	3.8	1.1	4.4	–1.7	–3.3

Note: Volatility is measured by the standard deviation, using annual data.

sia after 1978 (Figure 2).[26] Strict interest rate controls provide nominal interest rate stability, but only at the "expense" of real interest rate instability, if inflation is variable. The only way to achieve low nominal interest rate stability, without creating damaging real interest rate volatility, is to achieve a low stable rate of inflation.

Market-oriented financial systems should exhibit lower real interest rate volatility and higher nominal rate volatility than systems with controlled rates, ceteris paribus. In practice, inflation varies considerably across countries and time, making comparisons difficult. However, in taking account of these limitations, it is likely that nominal interest rate variability will exceed real interest rate variability to some extent, as financial pricing efficiency is improved. Estimates of the unconditional volatility of real and nominal interest rates, and the difference between them are presented in Table IV.

A few trends emerge from the analysis of Table IV.[27] First, real interest rate volatility is higher than nominal interest rate volatility. Second, real lending rate volatility tends to be higher than real deposit rate volatility, though the nominal/

[26] Thailand, the Philippines, and Malaysia eliminated key interest rate controls in 1989/90, 1980/81, and 1978, respectively.

[27] These conclusions are supported by analysis of data from a wider set of countries in the region, based on "conditional" measures of volatility, estimated using monthly data. Estimation of nominal deposit interest rate, sensitivity to inflation, or the pass-through rate of inflation into interest rates also gives the same result.

real rate volatility differential varies between deposit and loan rates. Third, and most importantly, the difference between nominal and real interest rate volatility is smallest in the most developed countries. The less developed of the selected countries, like China and the Philippines, along with the "other" countries (those with large negative real interest rate levels) show much higher real volatility and differentials. It must be emphasized that only sizeable differences in results can be used to distinguish between country performances, given the imperfect nature of the data.

These findings support the price efficiency arguments outlined in Section II. Excessive real interest rate volatility makes project evaluation more difficult and increases risks of financial investment. The countries with the strictest financial market regulations and high inflation level show the largest differential between real interest rate and nominal interest rate volatility.

D. *Product Range*

The sophistication of financial products increases as the financial system develops and market fragmentation is reduced, mainly because financial risks are more accurately evaluated, partly due to the reduction of information asymmetry. Another implication is that borrower and investor choice is widened and products that better match their specific requirements are likely to be found, encouraging greater use of the financial sector. In addition, financial products, like instruments with market-determined returns (for example, government bonds), derivatives (for example, financial futures), and foreign exchange products facilitate arbitrage that links prices across time, markets, and countries. Therefore, the range of products traded in a country can provide a useful insight into the level of price consistency (or level of dispersion) and its financial development, especially where "true" market prices are unobservable.[28]

Three categories of financial products are considered: business-financing products, investment products, and foreign exchange and risk management products. These cover the broad spectrum of credit intermediation, savings, and risk management products from the most basic to the most advanced. Tables V, VI, and VII provide an overview of the situation in the selected group of countries in 1993. In such cross-country comparisons, minute details on the product range of each country are sacrificed for broader insights into the structure of overall product markets.

Table V outlines the availability of business-financing products in the selected group of countries. Products covered include basic bank loans, direct market finance, and foreign sources of funds. Product availability is considered to be subject to normal market criteria. Thus, for example, although a corporate bond market is listed as being available for finance in Australia, in practice it is small and re-

[28] Note a qualification; product development based purely on regulatory avoidance is not financial deepening.

TABLE V

BUSINESS-FINANCING PRODUCTS

	Bank Loans	Commercial Bills	Commercial Paper	Corporate Bonds	Listed Equity	Foreign Capital Markets
Australia	*	*	*	s	*	*
China	*	r	R	R	R	R
Indonesia	*	s	×	s	*	*
Japan	*	s	*	*	*	*
Korea	*	*	*	*	*	r
Malaysia	*	*	s	s	*	*
Philippines	*	*	*	×	*	r
Taiwan	*	s	*	s	*	r
Thailand	*	s	×	s	*	*

Source: See data sources and methods in Appendix.
Notes: * denotes readily available, subject to normal market criteria. s denotes existence of a small market; the market is unrestricted, but has not developed. r denotes moderately restricted availability; the market exists but participation is restricted. R denotes highly restricted availability; the market is tightly controlled. × denotes not available, or theoretically available but not actively traded.

stricted to high-quality issuers. On this basis, a reasonable representation of the product range in practical terms is provided for each country.

Australia and Japan trade the widest range of products from bank loans to active commercial paper and bond markets, and domestic borrowers are well established on international capital markets. Companies select the most advantageous financing method in terms of price and other instrument characteristics like maturity, marketability, and financial exposure. By borrowing from a range of markets, based on interest rate charges and other conditions, company borrowing activities help to unify financial markets. Markets which are not competitive are ignored until their prices adjust to match those in other markets, domestic or overseas. In this manner, bank finance costs are controlled by the market.

At the other extreme, China offers a narrow product range to its emerging business sector, with highly restricted access to nonbank and foreign finance. Taiwan and Korea generally have well-developed equity markets, less developed (but still sizeable) debt finance markets, and give some business access to international capital markets. In general, corporate bond markets are poorly developed, often relying on bank guarantees. Equity markets are the most widely developed sources of nonbank finance.

Many of the company finance instruments offer direct investment opportunities to domestic savers. Table VI gives an outline of the range of savings investment opportunities. Emphasis is placed on instruments that pay market returns and, thus, suffer few of the problems associated with captive markets. A similar pattern emerges across countries, as indicated in Table V. Australia, Japan, and Malaysia

TABLE VI

SAVINGS PRODUCTS WITH MARKET-DETERMINED RETURNS

	Bank Deposits		Government Paper		Foreign Markets
	Small	Large	Short Term	Long Term	
Australia	*	*	*	*	*
China	×	×	r	r	×
Indonesia	*	*	×	×	*
Japan	R	*	*	*	*
Korea	R	R	*	×	r
Malaysia	*	*	*	s	*
Philippines	*	*	*	s	r
Taiwan	*	*	*	*	*
Thailand	*	*	R	R	r

Note: For key and sources, see Table V.

have the most developed financial systems while China, Indonesia, and Thailand offer the narrowest product range.

Tables V and VI indicate the range of credit and savings instruments available and the quantitative indicators, presented in Section A, give some measure of their use. However, they do not fully capture the "quality" of borrowing and savings products available. In particular, derivatives instruments can enhance credit and investment facilities; for example, a bank variable interest rate loan can be combined with an interest rate option to reduce interest rate risk. Similarly, risk posed by volatility of foreign currency cash flows and investment returns can be reduced by use of derivatives. A complete range of derivatives requires strong price consistency checks across all financial markets and contributes to the formation of a fully integrated (or unified) financial system. It must be emphasized that the introduction of derivatives before the necessary infrastructure is in place can be counterproductive.[29]

Only Australia and Japan have financial systems that come close to achieving this requirement as illustrated in Table VII.[30] The other countries uniformly lack the sophisticated markets required to provide this level of financial services and market security. Table IV above indicates that interest rate volatility is an impor-

[29] An example is the introduction of bond futures on the Shanghai Stock Exchange in December 1992. The market was suspended in March 1995, after speculation destabilized the market. Such an event was inevitable, because essential market infrastructure, like a deep physical market in bonds and natural interest rate exposures, did not exist since interest rates are predominantly controlled. Derivatives markets are built upon deep, liquid markets for the underlying instruments, amongst other things. The latter do not exist in most countries in the Asia-Pacific region; see Asian Development Bank [2, 1993 edition].

[30] The Philippines has a financial futures exchange that trades interest rate, exchange rate, and equity futures, but the turnover is minimal. Malaysia plans to open a financial futures exchange, while other countries (including Korea and Thailand) are considering the feasibility of financial futures.

TABLE VII

RISK MANAGEMENT PRODUCTS

	Foreign Exchange			Interest Rate			Equity		
	Spot	Forward	Futures	Futures	FRAs	Options	Swaps	Futures	Options
Australia	*	*	×	*	*	*	*	*	*
China	R	×	×	*	×	×	×	×	×
Indonesia	*	*	×	×	×	×	×	×	×
Japan	*	*	*	*	×	*	*	*	*
Korea	*	r	×	×	×	×	×	×	×
Malaysia	*	*	×	×	×	×	×	×	s
Philippines	*	R	×	s	×	×	×	×	×
Taiwan	*	r	×	×	×	×	×	×	×
Thailand	*	r	×	×	×	×	×	×	s

Note: For key and sources, see Table V.

tant issue to business and financial institutions in all the countries. Therefore, there is potential to improve financial risk management in the other countries, once preconditions for derivatives market development are met.

Foreign exchange markets are generally better developed than interest rate and equity derivatives across this set of countries, though regulations vary. Spot transactions predominate in less developed markets, like Taiwan. Outright forwards and swaps become more important as the market develops, as in the case of Indonesia. Only in mature markets, like those of Australia and Japan, are options and other complex derivatives traded.[31]

In Section II, financial deepening was defined as the unification of financial markets which takes place across cities and regions in a national economy, across different financial markets, across countries, and across time. Tables V, VI, and VII suggest that development of the financial sector tends to take place in a sequence similar to that outlined above. International integration and development of derivatives are slowest to occur. Analysis in this section implies that Australia and Japan have the most developed financial systems among the selected countries. China's financial system is least developed, with restricted product range and sophistication, suggesting significant fragmentation. Other countries take intermediate positions, with Malaysia, Taiwan, and Korea showing the highest development.

E. *Transaction Costs*

The traditional neoclassical framework assumes that exchange mechanisms are free of cost, which is not applicable practically, as discussed above. North gives a useful analysis of the various costs of exchange in an economy [46]. These are reflected in preconditions for efficient financial markets, which include a strong institutional foundation. Financial systems require low transaction costs (especially low credit intermediation costs) to support the optimal financial deepening and minimize the amount of scarce economic resources absorbed by the financial sector. This is implicit in the discussion in Section II.

Therefore, an important objective of financial sector development is the minimization of the cost of collecting savers' deposits and transferring them to bank loan recipients, willing to pay a required return, with an acceptably low probability of default. Financial intermediation transaction costs cannot be easily evaluated accurately in individual countries and especially cannot be compared across countries, due to the differences in variables ranging from financial sector design to population dispersion. Bank interest rate margins are often used to estimate them. Ideally, intermediation costs should take full account of interactions between bank operating costs and interest rate spreads, amongst other factors. This is a complex issue that requires a large amount of data and in-depth analysis. However, it is possible

[31] References to individual countries are related to their position in 1991, as outlined by Lynch and Norton [42].

TABLE VIII

COMMERCIAL BANK INTEREST RATE SPREADS

	Australia	China	Indonesia	Japan	Korea	Malaysia	Philippines	Taiwan	Thailand
1980	4.0[a]	n.a.	3.6[a]	2.0[b]	7.0	4.0	0.8	6.2	3.5
1990	3.3	2.5	2.2	1.6	4.5	4.5	4.1	4.5	3.2

Note: Cross-country spreads are a mixture of *ex post* and *ex ante* interest rate spreads. See Appendix for details.

[a] 1982.

[b] 1981.

to give a coarse outline of intermediation costs over time, using interest rate spread data that are available from the World Bank and other organizations. These are presented in Table VIII.

There was a downward trend of interest rate margins in most countries during the 1980s, which was most significant in Korea and Taiwan. The reduction in Korea was affected by three factors: a reduction in required reserves, a contraction in the gap between preferential lending rates and general loans, and an accumulation of nonperforming loans.[32] In the Philippines, the margin increased dramatically, reflecting the adjustment from regulated to market-determined interest rates along with changes in taxation and required reserves in the early 1980s. In Indonesia, spreads narrowed as competition intensified, but also nonperforming loans increased following financial deregulation in 1983. In Malaysia, spreads increased slightly after deregulation. Debate continues in Australia about the trend of interest rate margins after deregulation, though data here indicate a small decline in spreads.[33]

Spreads can be too low to sustain profitable banking (the Philippines in 1980), as well as too high to minimize transaction costs (Korea in 1980). They must take account of the risks involved in banking. Therefore, the optimal spread depends on the characteristics of individual countries. Risks for banks may be reduced by government backing of banks as in China where the government carries the risk. This situation makes cross-country comparisons difficult. Measurement problems do not help; for example, data reported in Table VIII are a mixture of *ex ante* quoted interest rate spreads and *ex post* spreads achieved. However, it can be reasonably concluded that the range of spreads across countries narrowed during the 1980s.

Transaction costs in financial markets, which differ from financial intermediaries, are now being examined. This is particularly useful because active financial

[32] Statements related to bank interest rate spreads in Korea, the Philippines, and Malaysia draw upon analysis by Cho and Khatkhate [22] to some extent. Hanna provides useful material on Indonesia [34].

[33] See Phelps [49] and Commonwealth of Australia [23] for discussion. These also neatly illustrate the problems encountered in measuring spreads and transaction costs.

TABLE IX

FINANCIAL MARKET SPREADS AND EQUITY COMMISSIONS

	Money Market (Spread Basis Points)	Government Bond Market (Spread Basis Points)	Foreign Exchange Market (Spread, %)	Equity Market (Commission, %)
Australia	5	3	0.07	< 0.50
China	n.a.	≧50	1.50	> 1.10
Indonesia	≧50	–	0.49	1.00
Japan	5	2	0.04	> 0.08
Korea	n.a.	–	0.01	> 0.40
Malaysia	30	2	0.04	> 1.00
Philippines	50	n.a.	n.a.	1.50
Taiwan	25	≧5	0.12	0.14
Thailand	75	≧150	0.59	0.50

Note: Quotes apply to mid-February 1993. China's data are based on official market spreads; more active informal markets have much higher spreads. n.a. = no market quotes were available. – = the absence of sizeable market.

markets are at the advanced end of the financial development spectrum, that part where bank intermediation is close to its optimal level. This limits the partial nature of the analysis here. Furthermore, financial market spreads show a greater cross-country comparability than bank interest rate spreads.

The overall cost of executing a transaction is represented by the sum of commissions (often implicit in the bid-offer spread) and the price impact of the trade.[34] Although commission costs are easily observed, the price impact cost (the difference between the transacted price and the price in the absence of the trade) is unobservable, but is large in thin markets. The spread quoted by market makers is indicative of the cost of trading, but is not an entirely accurate measure.[35] A simple measure of transaction costs is as follows (see for example Bodurtha [12]):

Transaction cost = 1/2 bid-offer spread + price impact.

Price impact is negatively correlated with market liquidity. Therefore, a reasonable indication of market trading costs may be gained by determining both the bid-offer spread and market liquidity. A cross-country comparison of spreads and liquidity is given in Tables IX and X respectively. Efficient markets should have low bid-offer spreads and high liquidity.

[34] The price impact of a transaction is the amount by which a securities price moves solely due to the execution of the transaction. For example, a bank may purchase a U.S.$100 million tranche of bonds at the market price of 100, but has to pay 110 to purchase a second U.S.$100 million tranche; the first deal having moved the market price. Thus, the price at which U.S.$200 million is dealt is not the initial quoted market price of 100, but that plus the price impact, or 105 in total. See Arnott and Wagner [1] for a discussion.

[35] Braas and Bralver provide evidence that market makers do not always capture the full amount of their bid-offer quote spread [13].

TABLE X

FINANCIAL MARKET TURNOVER
(Annual Turnover Measured in Per Cent Terms of GDP)

	Money Market (1993)	Government Bond Market (1993)	Foreign Exchange Market (1991)	Equity Market (1992/93)
Australia	1,097	234	26,400	20
China	10	2	7	6
Indonesia	34	–	170	5
Japan	970	127	1,200	20
Korea	350	2	130	51
Malaysia	420	4	227	137
Philippines	193	41	n.a.	9
Taiwan	650	229	140	137
Thailand	90	18	130	70

Note: Turnover is the sum of transactions (one side only) on the physical market, measured as a percentage of GDP. It is preferred to the stock/turnover ratio because it captures the same information but has fewer interpretative problems. See Appendix for sources and methods.

There is a strong correlation between turnover and the size of bid-offer spreads across countries as expected. The two parameters are in many ways a composite measure of financial market development including the efficiency of information dissemination systems, regulations, and technical operations. Turnover is also a useful measure of liquidity management facilities for financial institutions and companies. As expected, in interest rate markets, Australia and Japan have low bid-offer spreads and high liquidity and vice versa for countries with highly regulated systems like China and Thailand. Debt markets in the latter cases are largely primary markets only.

Equity commission is the brokerage cost of linking buyers and sellers. Although it is an important transaction cost, it is different from strict bid-offer spreads as brokers do not face the market risks of traders and market makers. Thus, regulation and competition determine the size of the commission and price volatility is not a factor. Amongst this set of countries, commissions are the lowest in the markets with highest capitalization and turnover, which are also technically the most advanced. Australia and Japan have equity derivatives markets that substantially lower the cost of portfolio share trading.[36]

Foreign exchange market spreads are the lowest in liberalized regimes with developed domestic interest rate markets, reflecting the close operational link between the markets. Korea is an interesting exception, recording the lowest spread. Here, the market is regulated in a manner that reduces daily exchange rate volatil-

[36] Gastineau refers to this aspect for Japan [29], and application of his methodology to Australia produces the same result. Lowering of transaction costs is a significant advantage of derivatives in general.

ity. As a result, low spreads are encouraged but at a cost of slower exchange rate adjustment to economic forces. The authorities believe that the balance between the two is positive, with the corporate sector benefiting from greater exchange rate stability.[37] It can also be seen as an interim step toward a free-floating exchange rate. Actually, as the market develops and participants become more experienced, the balance will shift toward the benefits from exchange rate flexibility.

This is a rather cursory look at one aspect of financial market transaction costs. Other factors need to be examined: for example, taxation, derivatives markets, and technology affect physical market bid-offer spreads. Non-price factors that require study include trading and settlement systems, legal and regulatory controls, and product innovation. These are beyond the scope of this paper.

IV. CONCLUDING COMMENTS

Financial sector development, defined as the unification of fragmented financial markets, is an ongoing process for both developing and developed countries. Unification is ultimately represented in a set of internally consistent prices across all financial markets. Price discrepancies are large in the early stages of financial development. The first objective of financial development in a financially repressed economy is to set financial prices at broadly the correct level; that is, real deposit and loan interest rates should be significantly positive. This is the most important mechanism through which financial sector development can promote economic growth in a repressed economy. From this base, it is possible to develop a range of financial markets that gradually fine-tune financial prices, including the development of products with valuable liquidity and risk management features that enhance the contribution of the financial sector to the performance of the economy.

The set of measures proposed in this paper facilitates the assessment of financial sector development in this context unlike traditional quantity measures. It is difficult to measure price distortions as the true underlying price is often unobservable. Similarly, quality improvements are difficult to quantify. However, taken as a set, measures presented in Section III may provide a good indication of progress on these fronts. Through them, it is possible to trace financial development from less developed financial systems, like those of China and Indonesia, to highly advanced systems, like those of Australia and Japan. They can contribute to the design of policy to generate financial sector development, help construct a set of perfor-

[37] This is another example of trade-offs encountered in financial system design. It also demonstrates the folly of focussing on too narrow a set of financial development indicators. In this instance, exchange rate certainty reduces price flexibility. Low transaction costs suggest development while price flexibility suggests otherwise. Like squeezing a balloon as it is compressed at one point it expands at another. In a regulated system, tightening of controls to improve performance in one area (for example, reduce price volatility) results in greater inefficiency in another (for example, prices do not absorb economic expectations).

mance measures to evaluate the policy, and serve as a useful indicator of progress over time.

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APPENDIX

DATA SOURCES AND METHODS

Table I and Appendix Figure

Data on private sector credit, narrow money, and broad money are cited from the monetary survey in IMF [38], updated from the monthly editions. In general, private sector credit corresponds to line 32d, narrow money corresponds to line 34 and broad money to the sum of lines 34 and 35. Gross domestic product data used in calculations correspond to line 99b of IMF [38]. Per capita GNP data are cited from the World Bank [59]. Narrow and broad money aggregates and private sector credit data for Taiwan are cited from the Asian Development Bank [3, 1992 edition].

Figure 1

Financial assets can be measured by focusing on either financial savings or financial borrowing. The table below summarizes both approaches. Starting with the primary accounting aggregate, monetary liabilities (or claims), other financial intermediary liabilities (claims), and securities market outstandings are added, and then adjustment is made for double counting across institutions and markets. The table includes an adjustment to exclude nonresident investments in domestic financial assets; thus, net domestic financial assets of the public remain. As the table does not include foreign financial assets held by residents total financial asset holdings attributable to residents are not represented. Data in Figure 1 of the paper are computed using the liability approach.

This looks complex, but preliminary analysis demonstrated that many of the adjustments are small in practice, especially in developing countries which have small life assurance and pension fund business. As a result, where perfect adjust-

MEASURING FINANCIAL ASSETS

Liability Approach	Asset Approach
Broad money	Bank private sector credit
plus:	plus:
—Liabilities of other financial institutions (OFI)	—Lending by other financial institutions
plus amounts outstanding in:	plus amounts outstanding in:
—Money market	—Money market
—Government bond market	—Government bond market
—Other bond markets	—Other bond markets
—Equity market	—Equity market
less:	less:
—Interbank funds	—Interbank funds
—Bank liabilities to OFI	—Bank lending to OFI
—Bank market issues (included above)	—Bank holdings of securities, nei
—Inter-OFI borrowing	—Inter-OFI lending
—OFI bank borrowing	—OFI lending to banks
—OFI market issues	—OFI securities holdings, nei
—Bank securities holdings, nei	—Bank securities market issues
—OFI securities holdings, nei	—OFI securities market issues
—Financial liabilities to nonresident included above	—Financial claims on nonresidents included above

Note: nei = not elsewhere included.

ment data are not available, the overall results are not appreciably affected. Bank capital is excluded, except for that part traded on the stock exchange, which represents a financial asset.

Data sources are the same as those for Table I, supplemented by Bank of Japan [5], Reserve Bank of Australia [50], Central Bank of Malaysia [18], Bank of Korea [7], Central Bank of China [17], Bank of Thailand [9], Bank Indonesia [4], Central Bank of the Philippines [19], and People's China Publishing House [48]. The International Finance Corporation [35] provides data on nonresident fund investments into emerging stock markets. In some cases, data on financial markets are provided directly by the monetary authorities (this was collected in the preparation of Lynch and Norton [42]). Financial assets data for Thailand and the Philippines cover 1981, not 1980. Indonesia's financial assets are estimated by the sum of broad money and nonbank securities market outstandings. Philippine data exclude nonbank promissory notes.

Table II

Securities market outstandings are the sum of equity market capitalization, government and corporate bond market outstandings, and money market securities outstandings. Bank debt securities are excluded, but securities holdings by financial institutions have not been netted out. Data sources are the same as for Figure 1.

Table III and Figure 2

In general, deposit and lending rates are derived from IMF [37, lines 60l and 60p]. Taiwan is an exception; data for it are cited from the Asian Development Bank [3]. Lending rates are the average of rates on short-term secured and unsecured loans prior to 1990 and bank prime rates for 1990/91. Data are derived from Central Bank of China [17]. Data for Bhutan cover the period 1982–91 for deposit rates and 1983–91 for lending rates. Real interest rates are calculated as the difference between annual average interest rates and current annual inflation: real rate = 1 − (1 + nominal rate) / (1 + inflation). Consumer price inflation data are cited from IMF [38, line 64]. Data in Figure 2 are monthly and are cited from IMF [37] (corresponding to Table III), except for Australia, where data are cited from the *Bulletin* database [50].

Table IV

Volatility is calculated as the standard deviation of annual data for interest rates and inflation. Same sources for real interest rates as in Table III.

Tables V, VI, and VII

Information to complete these tables was derived from Asian Development Bank [2, 1992 and 1993 editions], IMF [36], annual reports of monetary authorities, Chang [20], Binhadi [11], Bank of Korea [6], Bank of Thailand [8], Lynch and Norton [42], and financial press.

Table VIII

For Australia, net interest rate income as a proportion of average total assets for the four major banks; for China, net interest income as a proportion of total assets of specialized banks; for Indonesia, the difference between interest earned and interest expense of public and private commercial bank; for Japan, the difference between the yield on working assets and the interest rate cost of deposits and debentures for city banks; for Korea, the difference between average lending rates and average deposit rates; for Malaysia, the difference between average lending rates and average cost of funds; for the Philippines, the difference between weighted average lending and deposit rates of ten sample commercial banks; for Taiwan, the difference between interest revenue as a percentage of total loans and interest cost as a percentage of total deposits; and for Thailand, the difference between average interest rate paid on funding liabilities and average paid on all interest earning assets. World Bank [58], Phelps [49], Peoples' China Publishing House [48], Yang [60], and data provided by the Bank of Japan and the Central Bank of the Philippines.

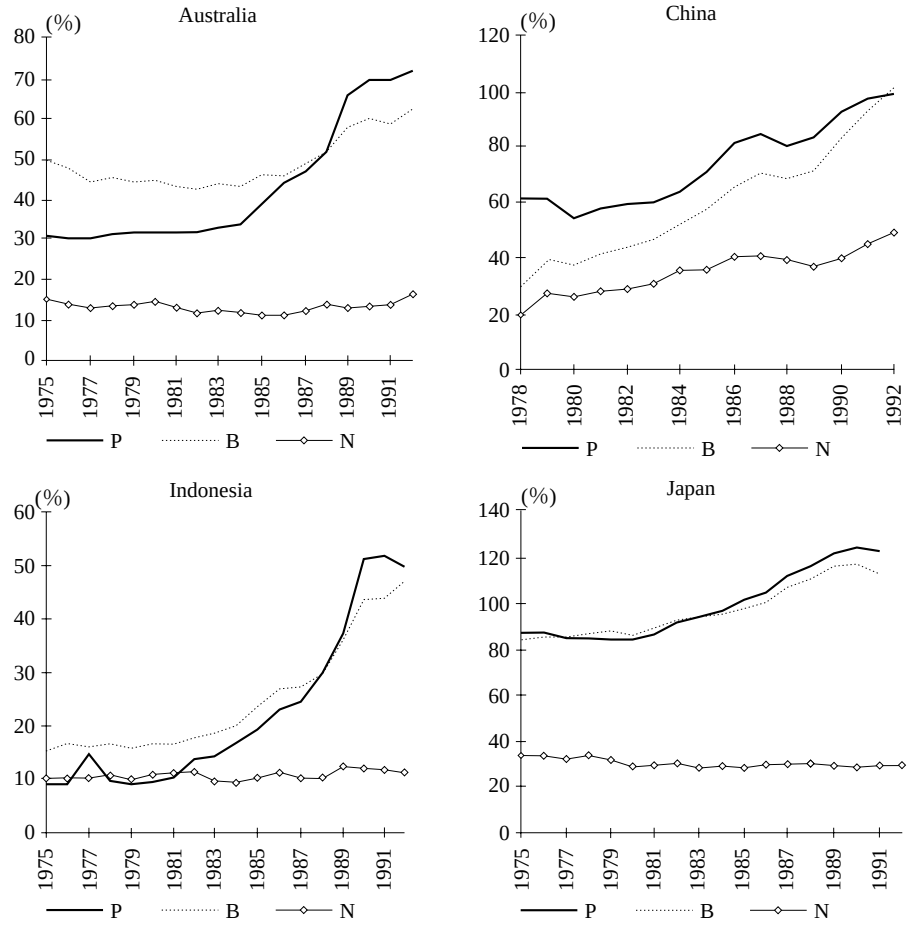
Table IX

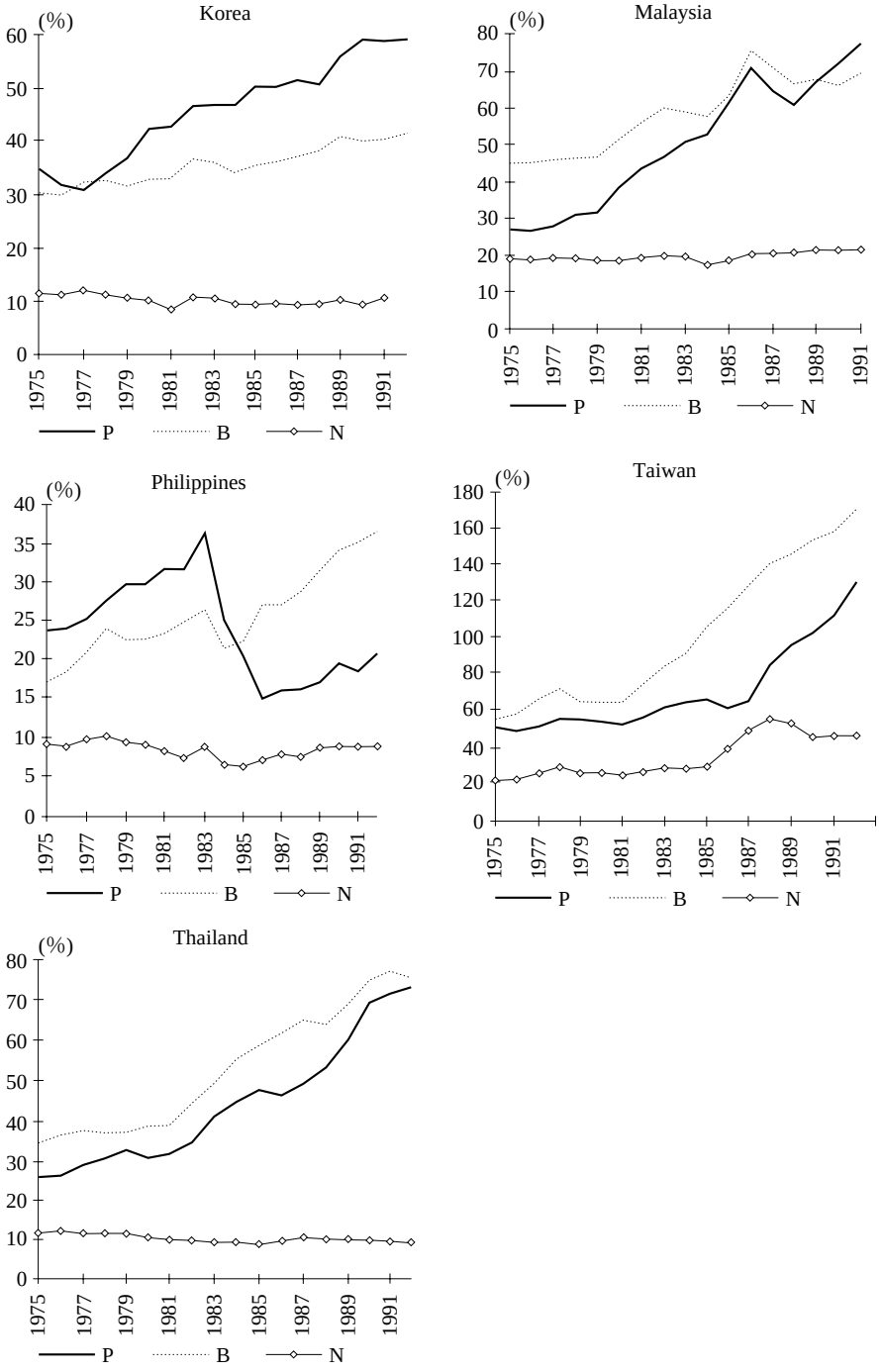
Data were mainly provided by relevant central banks. Foreign exchange spreads are based on U.S.$ / local currency quotes. Equity market commissions, which cover large transactions, are cited from *Euromoney* [26]. Taiwan's government bond price spreads and Indonesia's money market spreads are cited from the financial press.

Table X

Data are largely derived from material provided by the monetary authorities in the preparation of Lynch and Norton [42]. In all cases, turnover is measured on one side only and does not include derivatives, except for the foreign exchange market. Foreign exchange data for Indonesia and Malaysia cover interbank business only and data for Thailand cover nonbank business only. China's foreign exchange turnover data cover official trading through state swap centers.

App. Fig. Trends in Monetary and Credit Aggregates (Per Cent of GDP)





Note: See Appendix for details. P＝private sector credit. B＝broad money. N＝narrow money.

APPENDIX TABLE

SUMMARY OF FINANCE REGULATORY STRUCTURES IN 1991

Country	Bank Interest Rate Controls	Credit Controls
Australia	Ceilings substantially removed in 1980; liberalization completed in 1984.	Credit directives discontinued after 1981.
China	Deposit and lending rates regulated (including margin limits).	Credit plan determines allocation of bank resources.
Indonesia	Interest rate controls on state banks eliminated in 1983.	Largely lifted as part of 1983 reforms. State influence on banking system is extensive. Swap rates liberalized in 1988.
Japan	Gradual easing of deposit rate controls during the 1980s; lending rates more sensitive to market conditions from 1989.	Window guidance halted in 1991, as usefulness declined with international integration.
Korea	Liberalization measures in 1980 and more significantly in 1988; still significant controls.	Reliance on directed credit declined but still significant (31% of total loans in 1990/91).
Malaysia	Commercial bank deposit and lending controls lifted in October 1978. Occasional backtracking. Ceilings on loans to priority sectors.	Guidelines to achieve economic and social goals. Generally competitive financial sector.
Philippines	Controls lifted in the early 1980s and completed with abolition of a ceiling on short-term lending rates in 1983.	Credit allocations to priority sectors.
Taiwan	Interest rate categories consolidated from 13 to 4 in 1986 and interest rates effectively liberalized. Near complete deregulation in August 1989.	Selective credit controls employed.
Thailand	Ceilings, more frequent adjustments in the 1980s. Commercial bank time deposit controls lifted in 1989/90.	Some credit rationing toward agriculture, related industry, and to small business.
Other countries:		
Bhutan	Royal Monetary Authority controls interest rate structure.	Credit directed toward priority sectors.
Myanmar	Controlled; rates rarely changed.	Credit plan determines allocations. Government owns formal financial sector.
Nepal	Controls eased in 1986 and 1988/89, but sector is not competitive.	Credit controls until 1988/89. Banking sector is entirely government owned.

Sources: Cho and Khatkhate [22], Tseng and Corker [56], Park [47], and Asian Development Bank [2, 1992 and 1993 editions].