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7 Asia Pacific Capital Markets: Integration and Implications for Economic Activity

Menzie D. Chinn and Michael Dooley

7.1 Introduction

The measurement of capital market integration in the Pacific Basin typically takes the form of tests of interest rate parity conditions, the extent of interest rate covariations, or estimates of the savings retention coefficient of the Feldstein-Horioka type. Unfortunately, the conclusions derived from differing approaches typically do not agree. For instance, Chinn and Frankel (1994) and Dooley and Mathieson (1994) concluded that capital mobility is relatively high, although not complete, in most East Asian countries. Glick and Hutchison (1990) concluded, on the basis of real interest differentials, that capital mobility is increasing over time, although parity does not hold. On the other hand, Kim (1993) found that the savings retention coefficient indicates relatively low capital mobility for a number of these countries.

In this paper, we attempt to reconcile these seemingly contradictory results by arguing that for some questions, the wrong asset returns have been examined. We appeal to the stylized fact that most firms in both developed countries and less developed countries (LDCs) rely on *bank* credit, rather than some type of tradable debt instrument such as commercial paper. Even in the United States, the share of business borrowing accounted for by commercial paper is only about 15 percent (Becketti and Morris 1993, 73). Moreover, recent work has demonstrated that access to this market is largely restricted to larger firms.

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Small firms rely much more heavily on bank loans (Gertler and Gilchrist 1994).

Consequently, capital market integration depends on the extent to which bank credit is highly substitutable across different countries. Tests of covered interest parity using highly tradable money market returns will capture some relevant measure of capital market integration only to the degree that either (1) commercial paper supplies a large proportion of total business borrowing or (2) bank loans are highly substitutable for these assets. To the extent that bank loans constitute a large portion of borrowing, and neither of the above conditions holds, this type of asset nontradableness may explain an observed high savings retention coefficient (Dooley, Frankel, and Mathieson 1987).

The issue of whether capital is effectively mobile or immobile has recently taken on increased prominence in light of recent debates regarding the optimal response to capital inflows. Calvo, Leiderman, and Reinhart (1993) have argued that sterilization of capital inflows is difficult because of high capital mobility. Reisen (1993) has argued, on the basis of East Asian experience, to the contrary. We argue that sterilization is possible because capital is not completely mobile (in contrast to Reisen), because the market in bank lending is not well integrated with either other domestic or international capital markets.[1]

The paper is organized as follows. In section 7.2 we update and review the evidence regarding capital market integration in East Asia. This assessment includes updated calculations of covered interest and interest differentials. We contrast and compare these results over time. In section 7.3, we describe the behavior of bank lending rates in these countries, especially as they compare to those in developed countries. Section 7.4 outlines a simple model in which to analyze the effect of capital inflows on bank lending. Empirical testing of this model is implemented, and the relationship between bank lending and economic activity (as compared to the role of money) is evaluated. The fact that credit has a greater effect than money provides a reason why capital mobility has been mismeasured in the past—the wrong interest rate has been examined. Section 7.5 assesses the role of capital inflows in inducing rapid expansion of bank lending and consequent financial fragility. Section 7.6 concludes.

7.2 What the Conventional Measures Imply

The most common measure of capital market integration is the magnitude of the covered interest differential. For the case where political risk is zero and assets are exactly alike in default, liquidity, and maturity characteristics, covered interest rate parity should hold:

1. Frankel (1994) has suggested the nontraded aspect of bank loans as a possible reason why countries that have not liberalized their financial systems can sterilize.

Table 7.1 **Covered Interest Differentials (percentage points)**

	1982:09–1988:04		1988:05–1994:11	
Country	Mean	Mean Absolute	Mean	Mean Absolute
Australia	−0.20	0.88	0.27	0.29
Canada	−0.01	0.16	0.10	0.22
Hong Kong	0.11	0.20	0.14	0.17
Japan[a]	0.08	0.14	0.01	0.05
Malaysia	−1.41	1.51	−0.01	1.28
New Zealand	−0.49	1.63	0.27	0.30
Singapore	−0.47	0.49	−0.91	0.91

Note: Figures in percentage points, estimated by regressing the end-of-month covered interest differential on a constant.

[a]CD-Euroyen differential. Data up to 1986:09 is Gensaki rate. Estimate is from a regression with a dummy for Gensaki series, so that the differential is interpretable as that pertaining to a CD rate.

$$(1) \qquad f_t^k - s_t = i_t^{k,\ell} - i_t^{k*},$$

where s_t is the log spot exchange rate, f_t^k is the forward rate at time t for a trade k periods hence, i_t^k is the k-period interest rate, and a superscript $\ell(*)$ denotes a local (foreign) variable. In table 7.1, the mean and mean absolute covered interest differentials for seven Pacific Rim countries are reported for two subsamples: 1982:09–1988:04 and 1988:05–1994:11. (The first subsample corresponds to that examined by Frankel 1990). The mean differentials indicate that the extent of political risk, assessed using money market rates,[2] is quite low, and hence financial capital mobility is high but not complete. Since averages can mask deviations of opposite sign, we also report mean absolute deviations. Particularly in the early period, there are substantial differentials for Australia, Malaysia, and New Zealand. In the latter period, most of these figures are approximately the same or smaller. The exceptions are notable. Malaysia still appears somewhat insulated. Even more surprising, Singapore, typically thought of as well integrated into world markets via the Asian dollar market, evinces an *increased* absolute differential of approximately 1.25 percent.[3]

Since forward markets are usually well developed in cases where the extent of capital and exchange controls are minimal (and political risk, observable or unobservable, is low), the use of the covered interest parity criterion begs the question of capital mobility. In principle, one could try to assess the degree to which *uncovered* interest parity holds, using the rational expectations methodology of substituting the ex post values of depreciation for the ex ante. Such a

2. See appendix A for a description of the money market rates examined.

3. See Woo and Hirayama (1995) for a discussion of imperfect capital mobility in the cases of Malaysia, Singapore, and Indonesia.

Table 7.2 **Interest Differentials (percentage points)**

Country	1982:09–1988:04		1988:05–1994:11	
	Mean	Mean Absolute	Mean	Mean Absolute
Australia	5.40	5.47	4.20	4.20
Canada	1.16	1.27	2.57	2.57
Hong Kong	−0.64	1.57	0.28	0.38
Indonesia	9.24	9.24	10.94	10.94
Japan[a]	−2.90	2.90	−1.17	1.80
Korea[b]	6.27	6.27	7.97	7.97
Malaysia	−0.51	2.13	0.20	2.99
New Zealand	9.63	9.64	3.90	3.90
Philippines	10.47	10.47	11.08	11.08
Singapore	−2.62	2.62	−2.02	2.02
Taiwan	−2.64	2.69	1.04	2.74
Thailand[c]	2.05	2.51	2.85	3.01

Note: Figures in percentage points, obtained by regressing the local minus O.S. Eurodollar interest differentials on a constant.

[a]CD-Euroyen differential. Data up to 1986:09 is Gensaki rate. Estimate is from a regression with a dummy for Gensaki series, so that the differential is interpretable as that pertaining to a CD rate.

[b]Monetary Stabilization Board (MSB) rate until 1991:12; call money rate thereafter. Estimate is from a regression with a dummy for call money series, so that the differential is interpretable as that pertaining to an MSB rate.

[c]Call money rate until 1991:12; Bangkok Interbank Offer Rate (BIBOR) thereafter. Estimate is from a regression with a dummy for BIBOR series, so that the differential is interpretable as that pertaining to a call money rate.

procedure yields implausibly negative estimates of the response of the domestic interest rate to the foreign plus expected depreciation (excepting the pegged case of Hong Kong). This result obtains because most variation in spot exchange rates is unanticipated. A different issue arises when the expected spot rate is proxied by a forecast from a rolling ARIMA. This procedure results in very small estimates of the coefficient, so that uncovered interest rate parity does not hold.[4]

One alternative is to adopt the assumption that the exchange rate is a driftless random walk (as in Faruqee 1992), so that expected depreciation is zero. Inspection of the local minus Eurodollar interest rate differentials, reported in table 7.2, indicates that there is scant evidence of convergence. Certain countries, notably Korea, Taiwan, and Malaysia, continue to show marked deviations.

Other studies, also using money market rates, have shown increasing capital

4. An alternative approach is to use survey data to measure expected depreciation. In Chinn and Frankel (1994), uncovered interest rate parity was statistically rejected for all the Pacific Basin currencies examined.

Table 7.3 **Sources of Credit, 1989**

Country	Commercial Paper (A)	Money Market (B)	Total Credit (C)	(A)/(B) (%)	(A)/(C) (%)
Hong Kong	93	673	–	14	–
Indonesia[a]	1,475	–	51,942	–	3
Japan[b]	157.6	965.4	524,380	16	0.2
Korea	12,237	36,734	80,795	33	15
Malaysia	0	31	68,219	0	0
Philippines[c]	[21]	[905]	1,988	[2]	n.a.
Singapore	0	22.7	48.8	0	0
Taiwan	135	581	3,723	23	4
Thailand	1[d]	29.7[d]	926	3	0
United States[e]	525.8	–	2,715.3	–	19

Notes: End-of-year outstanding stocks, in billions of domestic currency units. Commercial paper and money market figures from Emery (1991). Total credit to private sector is from International Monetary Fund, *International Financial Statistics* (line 32d).

[a]Data for 1989.III.

[b]1990 figures for commercial paper and money market from Takagi (1993).

[c]Commercial paper and money market figures are volume.

[d]Estimate from Emery (1991).

[e]Total (financial and nonfinancial) credit from Post (1992).

mobility. Dooley and Mathieson (1994) demonstrated that foreign interest rates have had an increasing role in affecting various Pacific Basin interest rates. Jwa (1994) and Reisen and Yèches (1993) have applied similar methodologies to Korea and Taiwan and found episodic openings and closings.[5]

A more fundamental question arises from the possibility that these interest rates are not representative of those that govern the economy, particularly investment behavior. These rates, typically interbank deposit or CD rates, are highly tradable and may obtain in extremely thin markets. Nonfinancial firms must borrow either through the commercial paper market or from the banking system. The commercial paper rate is likely to closely follow these interbank rates, *if* that market exists. However, in these countries most enterprise or firm borrowing is typically through the banking sector. As indicated in table 7.3, commercial paper constitutes a small fraction of total credit extended in most of these countries.

Commercial paper is most visible in Korea and Taiwan (as measured by ratio to total credit extended by the consolidated banking system to the private sector). Perhaps this is because of the highly regulated nature of the banking sector in these two countries. Still, even the commercial paper market is regulated; data for Taiwanese commercial paper rates are not available, so the ex-

5. In contrast, Chinn and Maloney (1996) found individual and sustained breaks in the relationship between domestic interest rates and domestic determinants in these countries.

tent of intervention is difficult to assess. However, in Korea, the three-month investment and finance bill/commercial paper rate shows barely any variation over time. In most of the other countries, the commercial paper ratios are substantially smaller.

We proceed under the assumption that most borrowing will be conducted through local banking systems. Foreign banking has some role, but by and large, in those countries with high proportions of foreign bank lending to nonbanks, most of that lending appears to be directed toward the public sector.[6]

7.3 Interbank Rates versus Bank Loan Rates

A natural procedure would be to consider lending rate differentials, adjusted by the forward rate or expected depreciation, as the measure of capital mobility. Alternatively, one could examine how movements in offshore rates induce comovements in bank lending rates. Something like this approach was adopted in Browne and McNelis (1990) for the case of Ireland. They showed that bank rates are not very sensitive to changes in offshore rates, thereby suggesting that bank credit is an asset that is not very tradable.

There are two key difficulties with this approach. First, LDC banking systems are usually highly regulated, thereby making the market-determined lending rate unobservable. Second, even in the absence of government intervention, bank loan rates are "sticky" due to the special functions performed by banks, specifically the screening and monitoring of projects (Stiglitz and Weiss 1981). Thus, even in the absence of banking sector liberalization, one would expect time variation in the spread between the riskless rate and the bank lending rate due to the agency costs of external finance (e.g., Gertler, Hubbard, and Kashyap 1991).

This variation in "stickiness" is confirmed by visual inspection of time-series plots of interbank and loan rates (see figs. 7.1–7.13). In the United States, the prime rate follows the Fed Funds rate, by and large. At the opposite pole is the Korean loan rate, which barely moves even as the interbank rate moves widely. In this latter case, the bank rate is obviously highly regulated and hence appeal to market-determined (although not necessarily market clearing) rates is clearly uncalled for.[7] The same is true of the Taiwanese rate, while the Thai

6. Indonesia, Malaysia, Korea, Australia, and New Zealand all exhibit *declining* ratios of foreign bank lending to the sum of domestic bank credit and foreign bank lending to nonbanks. For these countries, the presence of foreign bank lending represents about 30, 15, 5, 15, and 10 percent, respectively, of total lending. Part of this pattern is due to the changing value of the dollar. Indonesia (at the end of 1992), in particular, exhibits an especially high ratio due to the large amount of borrowing by the state-owned oil enterprise. At the end of the Marcos regime the Philippines had a ratio of 60 percent (presumably mostly government borrowing). The ratio has since come down to under 20 percent. For purposes of comparison, the U.S. ratio is 8 percent.

7. Although Korea has implemented several banking reform efforts, they have been of a hesitant nature. See the discussion in Park (1994, esp. 147–54). The Taiwanese banking system has remained dominated by government-owned banks, so that despite interest rate decontrol, rates remain largely insulated from market pressures (Shea 1994, 259).

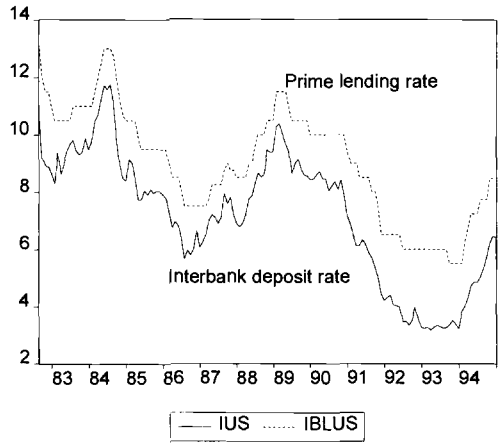

Fig. 7.1 United States: interbank and loan rates (percent)
Note: See appendix A for key to abbreviations.

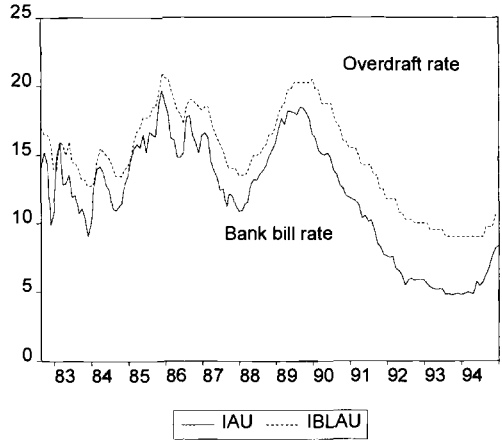

Fig. 7.2 Australia: interbank and loan rates (percent)
Note: See appendix A for key to abbreviations.

rate is a less extreme version. Between these two polar cases are the Singaporean, Indonesian, Malaysian, and Japanese series.

Recently, Cottarelli and Kourelis (1994) have provided a measure of rate stickiness estimated from a regression of changes in bank lending rates on the change in the discount rate, on a distributed lag of changes in the money market rate, and on the changes in lagged bank rates. De Brouwer (1995) estimated a similar specification to several Pacific Basin countries. Using our data set

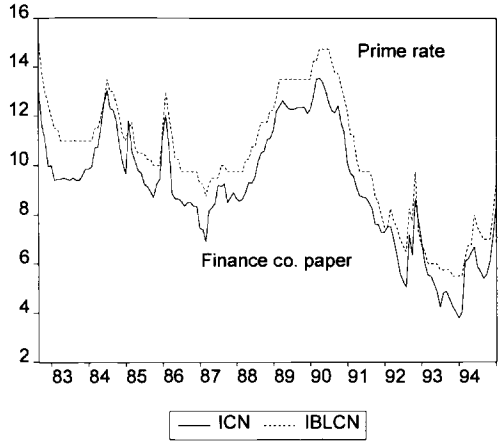

Fig. 7.3 Canada: interbank and loan rates (percent)
Note: See appendix A for key to abbreviations.

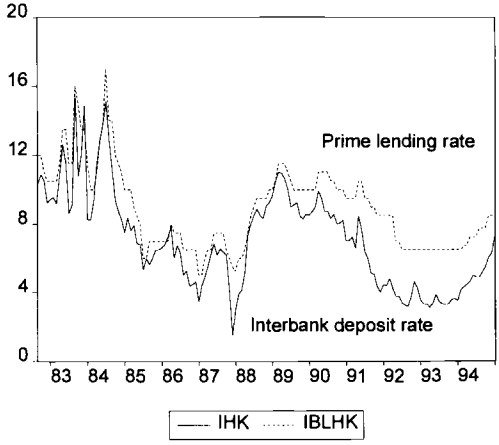

Fig. 7.4 Hong Kong: interbank and loan rates (percent)
Note: See appendix A for key to abbreviations.

(which differs in sample period from the others), we estimate the following equation:

$$(2) \quad \Delta\rho_t = \psi_0 + \sum_{i=1}^{k}\psi_i\Delta\rho_{t-i} + \sum_{i=1}^{k}\sigma_i\Delta i_{t-i} + \gamma_i\Delta i^{d}_{t-1} + \delta_1\rho_{t-k} + \delta_2 i_{t-k} + \varepsilon_t,$$

where ρ is the bank loan rate and i^d is the discount rate.

Table 7.4 presents the results, as well as those reported by de Brouwer. While the estimates differ somewhat, they show the same general pattern. Using these estimates, a reasonable categorization of covariability would be:

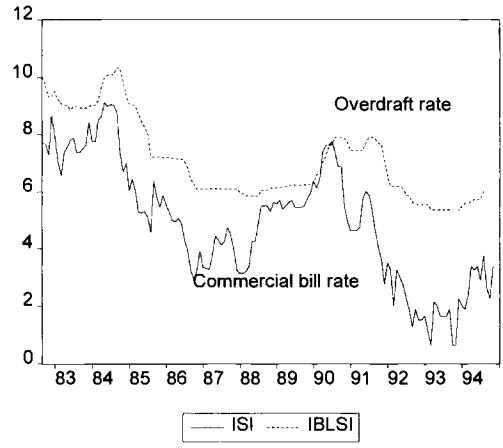

Fig. 7.5 Singapore: interbank and loan rates (percent)
Note: See appendix A for key to abbreviations.

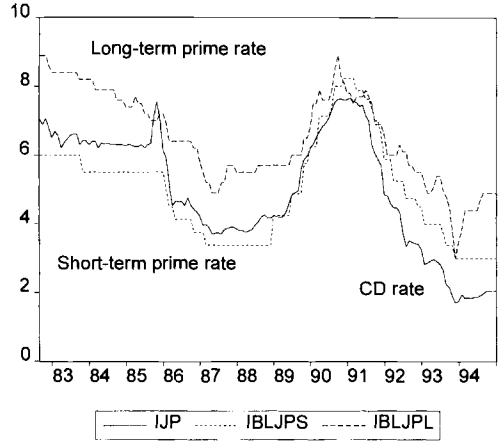

Fig. 7.6 Japan: interbank and loan rates (percent)
Note: See appendix A for key to abbreviations.

Group 1 High covariability	Group 2 Medium covariability	Group 3 No covariability
Australia	Japan	Indonesia
Canada	Malaysia	Korea
Hong Kong	New Zealand	Taiwan
Singapore	Philippines	Thailand
United States		

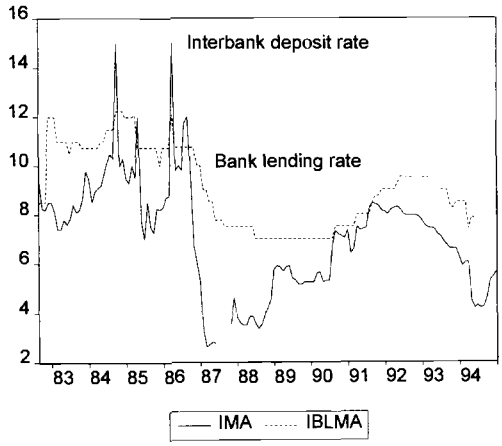

Fig. 7.7 Malaysia: interbank and loan rates (percent)
Note: See appendix A for key to abbreviations.

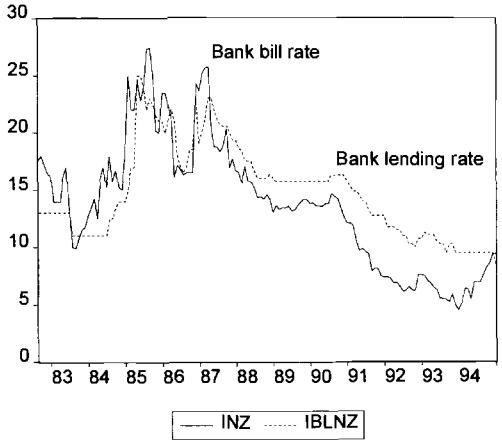

Fig. 7.8 New Zealand: interbank and loan rates (percent)
Note: See appendix A for key to abbreviations.

The group 1 countries appear to coincide with countries believed to have small covered interest differentials and high capital mobility. Consequently, one might be tempted to deduce that the same conclusions would be obtained regardless of whether money market or bank lending rates were used. However, the group 2 countries of New Zealand and Japan also fall into the small covered differential camp. The stickiness in bank loan rates could be driven

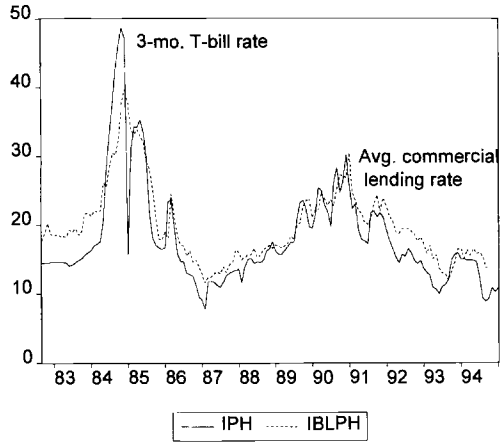

Fig. 7.9 Philippines: interbank and loan rates (percent)
Note: See appendix A for key to abbreviations.

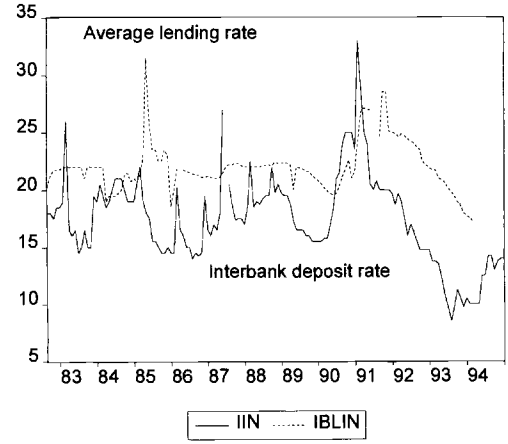

Fig. 7.10 Indonesia: interbank and loan rates (percent)
Note: See appendix A for key to abbreviations.

by differences in the portfolio of projects facing banks in these countries, by differences in monitoring technologies, as well as by bank rate regulations, none of which are factors typically identified with capital mobility. Hence, it is not possible to determine whether these markets are integrated by inspecting the correlations among lending rates. In fact, we take as our prior that these portions of the capital market are *not* well integrated with offshore markets

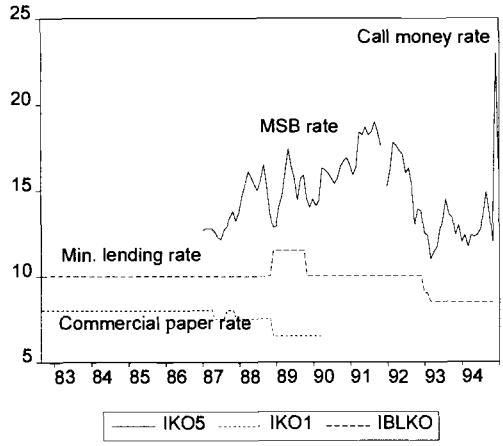

Fig. 7.11 Korea: interbank and loan rates (percent)
Note: See appendix A for key to abbreviations.

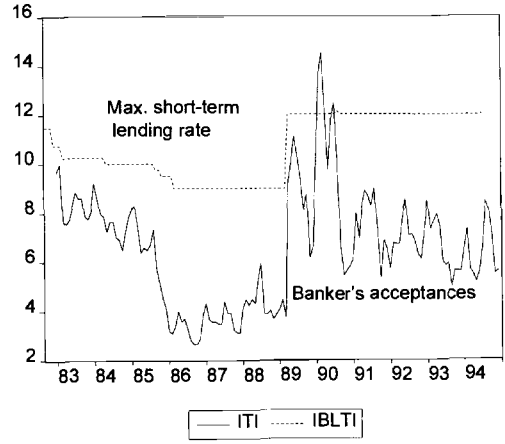

Fig. 7.12 Taiwan: interbank and loan rates (percent)
Note: See appendix A for key to abbreviations.

(and the rest of the economy). Recent work by Reisen (1993) has suggested that exactly because several East Asian countries have reversed the order of liberalization to put external reform before internal financial reform, sterilization is fairly easy. Frankel (1994) has pointed out that this result relies on assumptions about the nature of the disturbance affecting the country of interest.

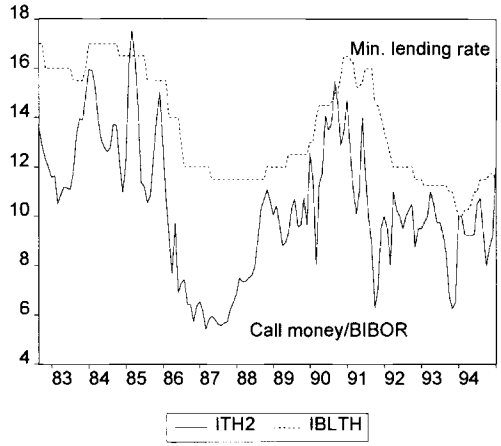

Fig. 7.13 Thailand: interbank and loan rate (percent)
Note: See appendix A for key to abbreviations.

Table 7.4 Estimates of Bank Loan Rate Stickiness

				de Brouwer	
Country	ψ_i	$\sum_i \psi_i$	Long Run	Impact	Long Run
Australia	0.17	1.10	0.91	0.59	0.95
Canada	0.48		1.04	0.69	0.94
Hong Kong	0.50		0.86	0.57	0.87
Indonesia	0.03		0.50	0.06	1.25
Japan (s)	0.08	0.41	1.09	–	–
Japan				0.63	0.75
Japan (l)	0.22		0.68		
Korea	0.01	−.05	0.05	–	–
Malaysia	0.15		0.82	0.10	0.66
New Zealand	0.26	0.37	0.76	–	–
Philippines	0.13	0.54	0.80	0.64	0.84
Singapore	0.41		0.69	0.13	0.63
Taiwan	0.10	0.08	0.44	0.18	0.55
Thailand	0.05	0.01	0.72	0.10	0.63
United States	0.35		0.85	0.78	0.97

Notes: Coefficients can be interpreted as elasticities. "Impact" is the within-quarter coefficient. "Long run" is the estimate obtained from δ_2/δ_1. The de Brouwer estimates are averages for the subsamples that most closely conform to that used in the estimates in the left-hand columns. Estimates for Japan are short-term (s), unspecified, and long-term (l).

7.4 Application of a Simple Model

7.4.1 Derivation of a Model with Credit

Consider an economy where bank credit is imperfectly substitutable for bond finance, as in Bernanke and Blinder (1988), augmented by allowing the credit supply to depend on a shift variable, the "riskiness" of the marginal investment project. Banks hold liabilities of deposits. On the asset side, banks hold loans, reserves, and domestic government debt.

Loan demand is given by

$$L^d = \underset{- + +}{L(\rho, i, y)}. \tag{3}$$

Loan supply is given by

$$L^s = \underset{+ - -}{\lambda(\rho, i, Z)} D(1 - \tau), \tag{4}$$

where Z is a measure of the riskiness of the marginal investment project. The data-generating process of Z is not modeled explicitly. The credit market equilibrium is given by equating loan supply and demand.

The money market equilibrium is given by equating the demand for deposits with the supply; hence the *LM* schedule is

$$\underset{- +}{D(i, y)} = mR, \tag{5}$$

where m is the money multiplier and R is the stock of reserves. (Excess reserves are ignored in this analysis.) The money multiplier is assumed constant. Allowing it to depend positively on the interest rate does not change the qualitative conclusions.

The open economy *IS* curve is conventional, except that it depends on the bank lending rate as well as the interest rate:

$$y = \underset{- - +}{Y(i, \rho, q)}, \tag{6}$$

where q is the real exchange rate. Substituting money market equilibrium into the loan market equilibrium yields

$$L(\rho, i, y) = \lambda(\rho, i, z) mR(1 - \tau). \tag{7}$$

Solving for the equilibrium loan rate, ρ, one obtains

$$\rho = \underset{+ + - +}{\varphi(i, y, R, Z)}. \tag{8}$$

In this formulation, the spread between the bank loan rate and the risk-free rate (proxied by a tradable interest rate), $\rho - i$, is a positive function of Z, the riskiness of the marginal project. The *CC* schedule is obtained by substituting equation (8) into equation (6):

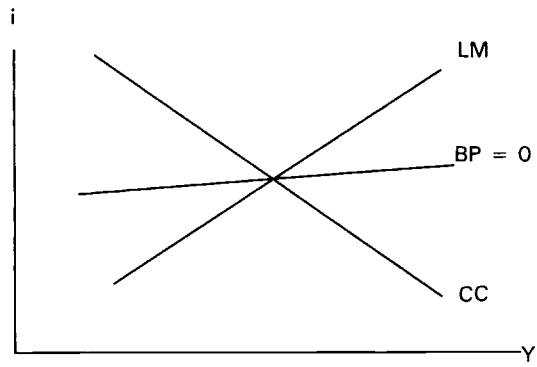

Fig. 7.14 ***CC-LM-BP* model**

$$y = \tilde{Y}(i, \varphi(i, y, R, Z), q). \tag{9}$$

The external equilibrium condition is conventional:

$$BP = KA(i - i^* - \Delta s^e, \mathbf{X}) + TB(q, y) = 0, \tag{10}$$

where **X** is a vector of exogenous variables, such as default risk and so forth, which may shift the *KA* function. Assuming that the responsiveness of capital flows to the interest differential is not infinite, then the $BP = 0$ schedule is upward sloping, and domestic interest rates may deviate from the world interest rate.

Such a model yields figure 7.14.

This model resembles the conventional Mundell-Fleming model, except that unsterilized capital inflows cause increases in deposits, which in turn shift out both the *LM* and the *CC* schedules. The extent to which they shift out depends on the magnitudes of the parameters. (The solution to this model is presented in app. B.)[8] Also, the *CC* curve is drawn fairly steep, to reflect the presumption that economic activity is relatively insensitive to the interest rate on tradable assets.

7.4.2 Implications of a Capital Inflow for Bank Lending

Assume an exogenous shock lowers the rate of return in the rest of the world (i^*). Ceteris paribus, the $BP = 0$ schedule shifts down, and foreign capital will tend to flow into the country. The capital inflows take the form of a deposit in the home-country bank. Deposits rise, as do reserves. Since excess reserves yield zero interest, the bank will not hold any excess reserves. This means that bank loans increase, and both the *CC* and *LM* curves shift out. Interest rates

8. For a slightly different treatment, see Spiegel (1995).

and lending rates may rise or fall depending on the parameters of the model. If expansion causes banks to undertake lending to riskier projects, this must drive up lending rates or drive down deposit rates. The second tendency will reestablish interest parity in the deposit market with perhaps small changes in domestic lending.

The central bank can sterilize the capital inflow, but in this case the increase in the commercial banks' assets consist of claims on the government rather than bank loans to the private sector. Since the government liability is riskless there is no change in the wedge between interbank deposit and loan rates. Thus, all the adjustment must come in the risk premium on domestic deposits, which is, of course, zero if domestic and foreign deposits are perfect substitutes. This is the risk premium that most research has been unable to find—hence the belief that capital is mobile. The implication is that the central bank will give up since sterilization is not effective. In the typical model, domestic credit expands and domestic deposit and loan rates will fall to match foreign interest rates. In our model, the domestic deposit rate is driven down, but the domestic loan rate might rise with only a very small expansion of domestic bank loans. Thus, if we are interested in the effects of capital mobility, we should look directly at changes in bank credit rather than interest rates. Notice also that if the government does "sterilize," the domestic money supply might rise with no change in bank credit to the private sector. If the view that bank credit is special is right, then there might be no impact on investment.

We test two predictions of the model. First, in countries that have not undertaken sterilization policies the response of domestic lending to the capital inflow should be positive. Second, economic activity responds more strongly to bank lending than to money in countries where bank loans are not highly substitutable with other lending.

The response of bank lending to the private sector is evaluated first. The change in bank credit to the private sector is regressed on current and lagged capital inflows (not including direct investment):

$$(11) \qquad \Delta(BC/Y)_t = \mu + \sum_{i=0}^{4} \Gamma_i (KA/Y)_{t-i} + \text{quarterly dummies} + u_t,$$

where BC is bank credit extended to the private sector, Y is gross domestic product, and KA is capital inflows minus direct investment.

The results are reported in table 7.5. Impact parameters are reported in column (1). Column (2) is the sum of the inflow parameters. "Wald" denotes a chi-squared test statistic for the null hypothesis that the sum of coefficients on the inflows is zero. Notice that the proportion of variance explained is quite low in certain cases, notably Indonesia.

The results confirm Glick and Moreno's (1994) conclusion that Indonesia and Malaysia engaged in large-scale sterilization of capital inflows. That is, in response to capital inflows, some of the reduction of bank credit was manifested in a reduction in bank lending to the private sector. Taiwan, Korea, and

Table 7.5 Response of Bank Credit to Capital Inflows

Country	Γ_0 (1)	$\sum_i \Gamma_i$ (2)	$\bar{R}^2$ (3)	D-W (4)	N (5)	Wald[a] (6)
Australia	−0.584	0.744	−0.01	1.49	54	1.148 [.284]
Canada	0.186	1.311	0.22	1.53	53	11.054 [.001]
Indonesia	−0.061	−0.790	−0.07	1.03	49	3.357 [.067]
Japan	1.474	−0.115	0.15	2.20	53	0.013 [.908]
Korea	−0.788	0.311	0.95	2.13	53	0.980 [.322]
Malaysia[b]	0.175	−0.109	0.17	1.69	51	0.225 [.635]
New Zealand	1.200	2.277	0.18	2.51	33	4.749 [.029]
Singapore	1.805	0.214	0.58	1.93	33	0.280 [.597]
Taiwan	−0.092	0.077	0.33	1.36	52	0.067 [.796]
Thailand[b]	0.090	0.511	0.30	1.14	47	11.483 [.001]

Note: Coefficients can be interpreted as elasticities.

[a]Wald is an F-test for the null hypothesis that $\sum_i \Gamma_i = 0$ (p-values in brackets).

[b]Bank credit data not available. Estimates for total domestic credit.

Malaysia evidenced short-run (within-quarter) reductions. Indonesia and Malaysia have negative long-run estimated impacts.

These estimates of nonstructural relationships are seldom statistically significant. Only in a few cases are the positive parameters statistically significant (Canada, New Zealand, and Thailand). The negative effects are always statistically insignificant, except in the case of Indonesia, where something else appears to be going on. Certain accounts indicate that domestic banking crises caused rapid reductions in bank lending. To a certain extent, one would not expect statistically significant coefficient estimates because the change in bank lending to capital inflows depends on the intervention response function of the central bank, which is unlikely to be constant over time.

7.4.3 Bank Credit and Economic Activity

Previous analyses have implicitly assumed that money and bonds are the only two domestic assets of importance in LDCs. Consequently, money market interest rates were the appropriate variables of analysis. In the framework adopted in this paper, there are three domestic assets of interest—money, bonds, and bank credit. We find that financial indicators of risk do seem to respond to capital inflows. We now investigate whether credit has significant effects on the economy, above and beyond the effect of money. Hence, we ask whether omitting the banking sector's behavior misses a crucial aspect of capital market integration.

The role of credit has enjoyed a revival in the recent literature pioneered by Lown (1988) and extended by Romer and Romer (1990), Friedman and Kuttner (1993), and Loungani and Rush (1995). These researchers implemented nonstructural regressions, often in the tradition of the St. Louis monetary equations. Romer and Romer found that bank credit was a significant determinant

of U.S. industrial output.[9] Friedman and Kuttner concurred, although they argued that relative prices (in particular the T-bill/commercial paper spread) matter as much as the credit quantities. More recent work involving structural VARs has been implemented by, among others, Fackler and Rogers (1993). They also have concluded that "credit is at least as important as any other variable in explaining movements in output, prices and interest rates" (223).

To assess whether this conclusion also applies to Pacific Basin countries, we estimate the following regressions of changes in income on lagged changes in real bank credit or narrow money (M1), real exchange rates, and income:

$$\begin{aligned}\Delta y_t &= \alpha_0 + \sum_{i=1}^{k}\alpha_i \Delta bc_{t-i} + \sum_{i=1}^{k}\beta_i \Delta q_{t-i} + \sum_{i=1}^{k}\gamma_i \Delta y_{t-i} + e_t, \\ \Delta y_t &= \tau_0 + \sum_{i=1}^{k}\tau_i \Delta m1_{t-i} + \sum_{i=1}^{k}\beta \Delta q_{t-i} + \sum_{i=1}^{k}\gamma_i \Delta y_{t-i} + e_t.\end{aligned} \tag{12}$$

The results are reported in table 7.6 for those countries for which data are available.

The results indicate that for Australia, Canada, New Zealand, Singapore, and Taiwan, money is more positively correlated with output than bank credit (although the sum of the coefficients is seldom statistically significantly different from zero). Of these countries, all have low degrees of bank rate stickiness, excepting Taiwan. Japan, Korea, and the Philippines show the reverse pattern and at the same time exhibit relatively high rates of stickiness. Unfortunately, three of the most interesting countries—Indonesia, Malaysia, and Thailand—are missing either quarterly bank credit data for a sufficiently long period or quarterly GDP data, thereby making comparisons for these countries impossible.

Since savings-investment correlations have long occupied economists' interest, we decided also to investigate the effects of money and credit on investment. Adequate data were available only for Australia, Canada, Japan, and Korea. Of these, two have low stickiness (Australia and Canada), one has intermediate (Japan), and one has a very high degree (Korea). Our prior expectations are therefore that Australia and Canada would have a higher association between money and investment than between bank credit and investment; on the other hand, Korea, and to a lesser extent Japan, should evidence the reverse.

Regressions of changes of investment on lagged changes in narrow money or bank credit, GDP, and the real exchange rate were estimated:

$$\begin{aligned}\Delta \text{inv}_t &= \theta_0 + \sum_{i=1}^{k}\theta_i \Delta bc_{t-i} + \sum_{i=1}^{k}\phi_i \Delta y_{t-i} + \sum_{i=1}^{k}\eta_i \Delta q_{t-i} + w_t, \\ \Delta \text{inv}_t &= \Theta_0 + \sum_{i=1}^{k}\Theta_i \Delta m1_{t-i} + \sum_{i=1}^{k}\phi_i \Delta y_{t-i} + \sum_{i=1}^{k}\eta_i \Delta q_{t-i} + w_t,\end{aligned} \tag{13}$$

where inv is log real investment in plant and equipment.

9. In more recent work, however, Romer and Romer (1993) argued that due to decreased Fed reliance on credit controls, the influence of credit on economic activity has decreased.

Table 7.6 **Response of Output to Bank Credit or Money**

Country	$\sum_i \alpha_i$	$\sum_i \tau_i$	k^a	$\bar{R}^2$	$LM(4)^b$	N	Sample
Australia	−0.087		6	−0.02	0.851	52	1981.IV–1994.III
	[.356]				[0.095]		
Australia		0.173*	4	0.11	4.028	54	1982.I–1994.III
		[0.525]			[0.402]		
Canada	−0.462***		4	0.26	1.052	53	1981.II–1994.II
	[0.000]				[0.902]		
Canada		0.224***	4	0.09	1.889	54	1981.II–1994.II
		[0.000]			[0.756]		
Japan	0.487***		4	0.25	2.983	51	1981.II–1993.IV
	[0.003]				[0.561]		
Japan		0.110	4	0.10	1.703	51	1981.II–1993.IV
		[0.420]			[0.770]		
Korea[c]	0.090		4	0.41	6.643	47	1983.I–1994.III
	[0.867]				[0.156]		
Korea[c]		0.028	4	0.38	8.986	47	1983.I–1994.III
		[0.869]			[0.062]		
New Zealand	−0.121		2	0.20	4.409	36	1985.IV–1994.III
	[0.370]				[0.354]		
New Zealand		0.022	2	0.20	4.290	36	1985.IV–1994.III
		[0.780]			[0.368]		
Philippines	0.088		2	0.98	0.628	29	1987.III–1994.III
	[0.331]				[0.428]		
Philippines		0.060	4	0.98	2.814	27	1988.I–1994.III
		[0.859]			[0.589]		
Singapore	−0.164		3	0.93	6.822	35	1985.III–1994.I
	[0.254]				[0.146]		
Singapore		0.035	1	0.87	2.814	37	1985.I–1994.I
		[0.654]			[0.589]		
Taiwan[d]	−0.025		2	0.61	7.601	36	1983.III–1992.II
	[0.499]				[0.107]		
Taiwan[d]		0.045	4	0.79	7.076	34	1984.I–1992.II
		[0.448]			[0.132]		

Note: Coefficients can be interpreted as elasticities.

[a]Number of lags in the regression.

[b]Breusch-Godfrey *LM* test for serial correlation of order 4 (p-values in brackets).

[c]Estimated using a filter of $(1 - L^4)(1 - L)$.

[d]Estimated using a filter of $(1 - L^4)$.

*Significant at the 10 percent marginal significance level according to an F-test for the null hypothesis that $\sum_i \alpha_i = 0$ or $\sum_i \tau_i = 0$ (p-values in brackets).

**Significant at the 5 percent marginal significance level.

***Significant at the 1 percent marginal significance level.

Table 7.7 **Response of Investment to Bank Credit or Money**

Country	$\sum_i \theta_i$	$\sum_i \Theta_i$	k^a	$\bar{R}^2$	$LM(4)^b$	N	Sample
Australia	−0.267		4	0.04	6.679	54	1981.II–1994.III
	[.356]				[0.154]		
Australia		0.438*	4	0.27	7.478	54	1981.II–1994.III
		[0.060]			[0.113]		
Canada	−0.499		4	0.22	5.339	53	1981.II–1994.II
	[0.169]				[0.254]		
Canada		0.509**	4	0.29	7.987	54	1981.II–1994.II
		[0.016]			[0.092]		
Japan	1.505***		4	0.46	2.168	51	1981.II–1993.IV
	[0.000]				[0.705]		
Japan		0.452	4	0.18	7.537	51	1981.II–1993.IV
		[0.109]			[0.110]		
Korea[c]	0.269		4	−0.02	6.635	46	1983.I–1994.II
	[0.796]				[0.157]		
Korea[c]		−0.048	4	0.09	3.697	46	1983.I–1994.II
		[0.869]			[0.449]		

Note: Coefficients can be interpreted as elasticities.

[a]Number of lags in the regression.

[b]Breusch-Godfrey *LM* test for serial correlation of order 4 (p-values in brackets).

*Significant at the 10 percent marginal significance level according to an F-test for the null hypothesis that $\sum_i \theta_i = 0$ or $\sum_i \Theta_i = 0$ (p-values in brackets).

**Significant at the 5 percent marginal significance level.

***Significant at the 1 percent marginal significance level.

The results are presented in table 7.7. They conform to expectations: for Australia and Canada, the money coefficients are jointly statistically significant, while the bank credit coefficients sum to a negative number and are not significant. For both Japan and Korea, bank credit is positively associated with investment, while money is not. However, it is important to note that only the Japanese bank credit coefficients are jointly significant.

7.5 Bank Lending and Increasing Financial Fragility

A common view is that countries that rapidly expand their domestic lending to the private sector will tend to have riskier portfolios of investment projects. Thailand has large shares of bank credit extended to risky construction and real estate sectors, while both Indonesia and Malaysia have experienced problems with large amounts of nonperforming loans (see Folkerts-Landau et al. 1995, 37–39).

Another means of assessing the riskiness of bank loan portfolios is to examine the spread between the lending rate and the risk-free rate. In this model, in the absence of bank rate regulation, the spread between the bank lending rate and the risk-free rate ($\rho - i$) is an increasing function of the riskiness of the

Table 7.8 Response of Spread to Growth of Bank Credit to Private Sector

Country	κ_0	κ_1	$\bar{R}^2$	D-W	N
Australia	0.038**	−0.053	−.04	0.76	49
	(0.019)	(0.121)			
Canada	0.009	0.166**	0.24	0.66	48
	(0.007)	(0.066)			
Indonesia	0.043**	−0.135	0.03	1.14	44
	(0.022)	(0.156)			
Japan	−0.043**	0.035	−.08	1.13	48
	(0.016)	(0.087)			
New Zealand	0.019**	0.064**	0.25	0.69	31
	(0.008)	(0.029)			
Philippines	0.012	0.030	−.09	1.23	26
	(0.022)	(0.073)			
Singapore	0.090**	0.190**	0.31	0.62	31
	(0.009)	(0.084)			

Notes: Dependent variable is the spread between the bank lending and money market rates, in decimal form. All standard errors estimated assuming $N/3$ independent observations.

*Significant at the 10 percent marginal significance level.

**Significant at the 5 percent marginal significance level.

marginal investment project, Z. We posit that rapid expansion of bank credit is associated with riskier and riskier projects. This suggests that a regression of the spread on lagged bank lending will yield a positive coefficient (for countries where the bank lending rate is not regulated; hence Korea and Taiwan are omitted):

$$(14) \quad (\rho - i)_t = \kappa_0 + \kappa_1 [(BC/Y)_{t-1} - (BC/Y)_{t-9}] + \text{quarterly dummies} + v_t.$$

The results of these regressions are reported in table 7.8. Because there is evidence of serial correlation in almost all the regressions, the standard errors are calculated assuming $N/3$ independent observations. Adoption of this procedure means that we have been extremely conservative in our inferences.

For Australia, the estimate is negative but not statistically significant. For Canada, New Zealand, and Singapore, the estimates are statistically significant and positive. This pattern of results is reassuring because these are banking systems relatively free from rate regulation. In the cases of Indonesia, Japan, and the Philippines, the estimates are not statistically significant, although for the latter two they are positive.

These results suggest that the rapid expansion of lending, in the absence of government regulation of bank lending rates, leads to increases in the spread between the lending rate and the interbank deposit rate. Since the results are not statistically significant, one would not wish to overinterpret the numbers; in fact, in many countries with more highly regulated banking sectors, the spread may depend more critically on differing money and nonmoney deposit

reserve requirements. As is well known, manipulation of reserve requirements has been a favorite means of effecting sterilization in several of these economies. Dooley and Chinn (1995) have examined this issue.

7.6 Concluding Remarks

The policy implications of opening capital markets continue to attract attention and debate primarily because we do not understand much about the transmission process for monetary policy in developing countries. It seems to us plausible that the "bank credit is special" argument, which has received considerable attention in the United States in recent years, is quite likely to be relevant in this transmission process. Moreover, developing countries that engage in large amounts of sterilized intervention provide a natural way to test the relative importance of money and credit. The model developed also provides a plausible reason why interest differentials on traded bank deposits are a largely uninformative indicator of the degree of dependence of bank credit and in turn investment on foreign interest rates.

Appendix A
Data

Interest Rates

Eurocurrency Deposit Rates

The U.S., U.K., and Japanese three-month Eurocurrency deposit rates were the arithmetic average of the bid and offer rates in London at close of market, as reported by Bank of America up to 6 October 1986, and Reuters' Information Service thereafter, and recorded by Data Resources, Inc. (DRI) in the DRI-FACS database.

Local Market Rates

See table 7A.1.

Local Bank Lending Rates

See table 7A.2.

Exchange Rates

End-of-period exchange rates (except those indicated below) are London 3 P.M., arithmetic average of bid and offer rates as reported by Barclay's until

Table 7A.1 Local Market Rates

Country	Source[a]	DRI Code	Description	Variable Name
United States	DRI	FIP90Y	Financial paper, industrial firms, 90 days	IUS
United States	DRI	USD03	3-month Eurodollar rate	IEUS
Australia	WFM,DRI	ADBBL90Q	90-day bank bill, quote	IAU
Canada	WFM,DRI	CACP90B,A	3-month prime finance company paper	ICN
Hong Kong	WFM,DRI	HKM03B,A	3-month interbank deposit rate corrected by FEER data	IHK
Indonesia	WFMr		1-month interbank deposit rate	IIN
Japan	WFM,DRI	JAGBDS03	3-month Gensaki bond rate	IJP
		JACD03B,A	3-month CD rate	IJP2
			IJP to 1986:09; IJP2 thereafter	IJP3
Japan	DRI	JAD03	3-month Euroyen rate	IEJP
Korea	WFMr		3-month finance and investment bill rate; later same as commercial paper rate	IKO1
Korea	WFMr		MSB until 1991:12; call money thereafter	IKO5
Malaysia	WFMr		3-month interbank deposit rate	IMA
New Zealand	WFM,WFMr		3-month commercial bills to 1987:12; 90-day bank bills thereafter	INZ
Philippines	WFMr (IFS)		3-month T-bill at tender	IPH
Singapore	WFM,WFMr		3-month banker's acceptances to 1987:08; 3-month commercial bills thereafter	ISI
Taiwan	WFMr		90-day banker's acceptances	ITI
Thailand			Call money rate until 1991:12; BIBOR thereafter	ITH2

Sources: DRI, Data Resources, Inc.; WFM, *World Financial Markets*, published by Morgan Guaranty; WFMr, Morgan Guaranty data, as provided by Carlton Strong; IFS, *International Financial Statistics*, published by the International Monetary Fund; FEER, *Far Eastern Economic Review*.

[a]Where source is both WFM and DRI, then WFM is source until 1989:10, at which time DRIFACS is source.

end of March 1990, at which time the series is no longer recorded by DRIFACS. Thereafter, the London close rate is used, as reported by Reuters Information Services. A consistent series is not used (i.e., the London close all the way) because these series only begin in 1986. The Taiwanese exchange rate series is from Ramon Moreno at the Federal Reserve Bank of San Francisco until 1991:12, and from DRIFACS thereafter. The market exchange rates for Indonesia, Korea, the Philippines, and Thailand were obtained from the International Monetary Fund's *International Financial Statistics* (*IFS*). (The Thai series is an official rate.) For conversion of dollar values to domestic currency, period average exchange rates from *IFS* (line rf) are used.

Table 7A.2 Local Bank Lending Rates

Country	Source[a]	Description	Variable Name
United States	WFMr	Prime rate, JP Morgan	IBLUS
Australia	WFMr (Reserve Bank of Australia, via Telerate)	Overdraft rate of major trading banks	IBLAU
Canada	WFMr (Telerate)	Chartered bank prime rate	IBLCN
Hong Kong	WFMr	Prime lending rate	IBLHK
Indonesia	WFMr (IFS)	Weighted average lending rate working capital of nonproprietary sector	IBLIN
Japan	WFMr (Bank of Japan)	Short-term prime rate	IBLJPS
Japan	WFMr (Bank of Japan)	Long-term prime rate	IBLJPL
Korea	WFMr (Bank of Korea)	Minimum lending rate charged to general enterprises by deposit banks	IBLKO
Malaysia	WFMr (Bank Negara)	Base lending rate	IBLMA
New Zealand	WFMr (Reserve Bank of New Zealand)	Overdraft rate, prime borrowers	IBLNZ
Philippines	WFMr (IFS)	Average commercial lending rate	IBLPH
Singapore	WFMr (Monetary Authority of Singapore)	Overdraft rate of major banks	IBLSI
Taiwan	WFMr (Central Bank of China)	Short-term lending rate; max. for up to one year	IBLTI
Thailand	WFMr (Bank of Thailand)	Minimum loan rate (MLR)	IBLTH

Sources: See note to table 7A.1.

[a]Where source is both WFM and DRI, then WFM is source until 1989:10, at which time DRIFACS is source.

Output

Quarterly gross domestic product (output) in nominal and real terms are from *IFS* (March 1995 CD-ROM). Nominal Malaysia, New Zealand, and Singapore GDP figures estimated via regression on real output and CPI. Indonesia and Thailand figures estimated via a four-quarter moving average of annual rates. Hong Kong GDP data from Census and Statistics Department, *Revised Estimates of GDP, 1961 to First Quarter, 1994* (Hong Kong, August 1994). Taiwan data from Directorate-General of Budget, Accounting and Statistics, Executive Yuan, Republic of China, *Quarterly National Economics Trends* (Taipei, various issues).

Credit and International Banking Statistics

Bank credit to private sector is from *IFS* (line 52d, if available; line 22d otherwise). Domestic credit to the private sector is from *IFS* (line 32d). Foreign

credit to nonbanks (reported in n. 6) is from *IFS* (table 7yrd), converted to domestic currency using the average market exchange rate.

Capital Flows

All figures are from *IFS*, except those for Taiwan, which are obtained from the Central Bank of China, *Financial Statistics* (Taipei, various issues). The codes (in both cases) are

Current account	line 77a.d IFS
Direct investment	line 77bad IFS
Portfolio investment	line 77bbd IFS
Net errors and omissions	line 77e.d IFS
Other capital, nie	line 77g.d IFS

The inflow measure used in the paper is constructed using the following formula:

$$\text{INFLOW\#\#1} = \text{XR} \times (\text{PI} + \text{ER} + \text{OC})/\text{GDP},$$

where PI, ER, and OC are portfolio investment, net errors, and other capital, respectively. XR is the period average exchange rate expressed as foreign currency units per U.S. dollar (*IFS*, line rf). Note that this definition excludes direct investment.

Appendix B
Derivation of the Open Economy CC-LM *Model*

Set $dZ = 0$. The semireduced form equation representing the *CC* equation is

$$y = Y(i, \rho, q). \tag{6'}$$

Taking the total differential yields

$$dY = Y_i\, di + Y_\rho(\rho_i\, di + \rho_Y\, dY + \rho_R dR) + Y_q dq. \tag{A1}$$

Rearranging,

$$dY(1 - Y_\rho \rho_Y) = (Y_\rho \rho_i + Y_i)di + Y_\rho \rho_R dR + Y_q dq. \tag{A2}$$

The *LM* curve is obtained by differentiating equation (5):

$$dD = m(dR) = D_i\, di + D_y dY, \tag{A3}$$

$$m \equiv D_R.$$

Solving for the deposit interest rate,

$$di = \frac{m(dR) - D_Y dY}{D_i}. \tag{A4}$$

Substituting equation (A4) into equation (A2),

(A5)

$$dY\left[1 - Y_\rho\rho_Y + \frac{(Y_\rho\rho_i + Y_i)D_Y}{D_i}\right] = \left[\frac{(Y_\rho\rho_i + Y_i)m}{D_i} + Y_\rho\rho_R\right]dR + Y_q dq.$$

Solving for income,

$$dY = \frac{1}{\Delta}\left\{\left[\frac{(Y_\rho\rho_i + Y_i)m}{D_i} + Y_\rho\rho_R\right]dR + Y_q dq\right\}, \tag{A6}$$

$$\Delta \equiv [1 - Y_\rho\rho_Y + (Y_\rho\rho_i + Y_i)D_Y/D_i].$$

Rather than solving the system including the $BP = 0$ schedule, assume capital flows and *real* exchange rates to be exogenous. Then in the absence of sterilization, $dR = dKA$, so that the effect of an exogenous capital inflow on income is given by

$$\frac{dY}{dKA} = \frac{1}{\Delta}\left[\frac{(Y_\rho\rho_i + Y_i)m}{D_i}\right] > 0. \tag{A7}$$

As indicated in the text, both curves shift to the right in response to an unsterilized capital inflow:

$$\left.\frac{dY}{dKA}\right|_{CC} = \frac{Y_\rho\rho_R}{1 - Y_\rho\rho_Y} > 0, \qquad \left.\frac{dY}{dKA}\right|_{LM} = \frac{m}{D_Y} > 0.$$

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Comment Koichi Hamada

It is a pleasure to comment on this paper because I think the authors are at least moving in the right direction with their approach to the Feldstein-Horioka (F-H) puzzle. The puzzle is that the correlation between national savings and investment is much higher than the value that the assumption of free capital mobility would imply. What I mean by the right direction is the way the authors try to decompose structurally capital movements into several components and the way they examine the economic mechanisms relating to each component. In addition, this paper relates the discussion of the F-H puzzle to two controversies, the effect of sterilized intervention in the exchange market and whether money or credit is more important as the determinant of national investment.

Visualize the structure of the F-H puzzle as in the picture in figure 7C.1. Imagine two (or more) tanks full of water (savings) that are connected by various horizontal pipes. The inside of each tank is invisible from the outside. Some of the connecting pipes are transparent as channels of "covered interest parity," where perfect arbitrage takes place in the absence of capital control, and some of the pipes are not so transparent. Even in the case of *un*covered interest parity, the equalization of rates of return is much less obvious than for covered interest parity. In the case of foreign direct investment, we know little about the exact process of equalization of returns among direct investment projects that differ much in the degree of risks.

If there are no obstacles or complications to prevent the movement of water in each tank, the water levels will be equalized if one complete pipe exists. Water flowing into one tank (increased savings in one country) will cause a substantial shift of water from another (capital movements to the other country). This ideal situation was contradicted by the evidence provided by Feldstein and Horioka.

Many conventional analyses that have followed the F-H article have maintained the assumption of perfect capital mobility and have asked under what circumstances this paradox would occur in a world under perfect information and perfect individual rationality. The original F-H article stressed the imperfection of an international capital market, but followers have tried to show that the paradox can occur even under perfect mobility. They have argued that because of the intertemporal recurrence of shocks and international correlation of shocks, paradoxical observations could occur, or that because of the imperfection of econometric methodology, a paradox could emerge. I do not know how far these approaches can reach.

On the other hand, the approach taken in this paper is to decompose the structure within one tank and to examine what happens inside these obscure pipes. I consider this is to be the right direction. This decomposition approach

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This comment is based on the version of the paper that was presented at the conference.

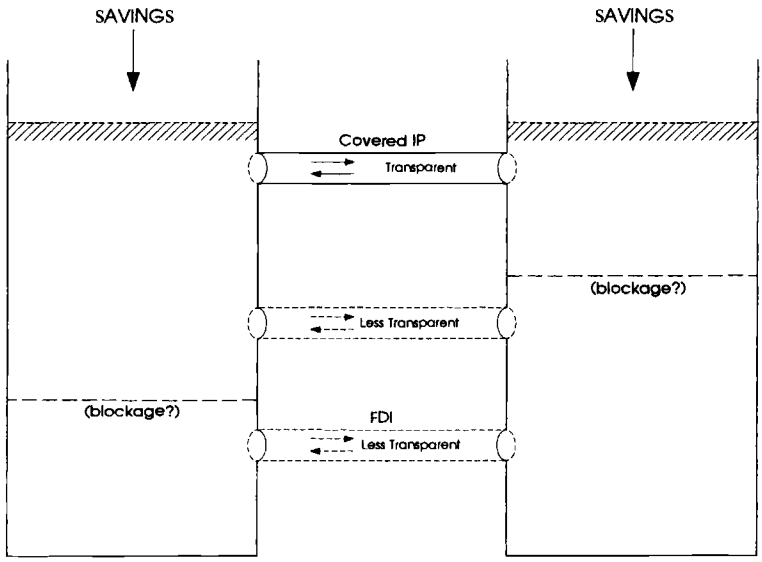

Fig. 7C.1 Visible or invisible flow of funds

checks quantity variables of financial linkage of various kinds as well as the prices (rates of returns) of assets. The particular decomposition used in this paper is, of course, one among many alternative decompositions.

Thus, I agree with the authors' major methodology because, considering separately the linkages in different markets, one can detect where the equalization process of rates of return is blocked.

Though I am sympathetic with the authors' overall approach, I had many difficulties following the details of this paper.

Data

I wonder whether enough care was taken in acquiring the data. The long-term prime rate in Japan (fig. 7.6) is far higher than the actual value. (Japanese banks would have obtained enormous profits if the graph had been true.) According to my statistics at hand, the short-term rates fluctuated between 4.1 and 7.2 percent during the 1980s. The call rate, which is equivalent to the federal funds rate, fluctuated more. I wish this were the problem only with the Japanese data.

Concepts and Institutional Considerations

The decomposition used by the authors is a distinction between commercial paper or market instruments and bank loans. This decomposition is meaningful by itself, but dwelling on this classification narrows the scope of the paper. There are many important dimensions in the classification of financial assets

and markets not covered by their decomposition. There are at least three types of distinctions.

In general, one can classify a market according to whether it is *regulated* by the government or *unregulated* with respect to assets and with respect to the price formation of the assets. An asset is transferrable in the market from one individual to another (*market-oriented asset*) or created only between two or more related parties (*negotiable asset*). Equities, bonds, and commercial paper are in the first category. Bank loans are in the second category. There is also a distinction between an asset that has a *short-term maturity* and an asset that has a *long-term maturity*. Some prices are volatile, and others are sluggish. In the paper most of these characteristics, in particular regulated or deregulated aspects, were neglected in the consideration of disaggregation of assets.

Probably, the authors are comparing market-oriented, but regulated commercial paper with negotiable, nonregulated bank loans. But this cross-characterization changes over time and across countries. (E.g., the interbank market in Japan was the *least* regulated market in terms of interest rates until the late 1970s, though it was a restricted one in the sense that only banks could participate.)

Theory

The problem is containing a disequilibrium phenomenon within an equilibrium (equality) framework in equations (2) and (3). Since i and ρ are regulated, the notional demand and the notional supply are not equal. As Ito's rigorous work on market disequilibrium indicates, for example, the analysis is difficult. But the authors should take account of disequilibria in a proper framework rather than compressing equations as if they were equilibriating equalities. Since i and ρ are regulated, the money market as well as the credit market should be credit rationed.

Empirical Results

The paper argues that capital inflow will increase funds of banks and will increase bank lending. Consider, however, the case where domestic saving increases. Then, bank lending as well as capital *outflow* will increase. Thus, depending on where the exogenous shock is, the directions of movements are not obvious. Therefore, it is not surprising that "these estimates of nonstructural relationships are seldom significant"—although I admire the authors' honesty.

The paper also maintains that the spread between the bank lending rate and the commercial paper rate is an increasing function of the bank lending because riskier and riskier projects are undertaken. Again, one might argue that with modernization of the financial market, $\rho - i$ declines along with the observation of increasing amount of present and past lending.

Finally, I would like to comment on the last estimates on the validity of the money or credit paradigm in various countries. I view the controversy over the macroeconomic significance of money and credit as merely the difference in

looking at the different sides of the balance sheet of the central bank. Thus, money and credit should give similar results in normal situations. If constraints are strongly binding on one side, then the constraint and, accordingly, the variable under the constraint should matter more. For example, if credit availability is under tight control, the credit paradigm will prevail.

Because the asset side and the liability side often move together, it is expected again that the coefficients of estimated equations are not so significant, because of multicollinearity.

In short, I would like to express my potential appreciation for this paper. If proper disaggregation is adopted upon a firm theoretical foundation, this kind of approach will contribute much to demystifying the Feldstein-Horioka puzzle. In its present form, though this paper gives some helpful insights, it leaves the reader with many doubts and mysteries.

Comment Aaron Tornell

This paper attempts to reconcile two contradicting stylized facts about international capital market integration in Southeast Asia. On the one hand, savings retention coefficients indicate low capital mobility for the majority of Southeast Asian countries. On the other hand, tests of interest rate parity conditions indicate high capital mobility among these same countries.

Typically, studies that test interest rate parity use tradable debt instruments such as commercial paper. In Southeast Asian countries, however, a majority of firms use bank credit. Therefore, these studies may not present an accurate picture of capital market integration, unless bank loans are perfect substitutes for commercial paper. The authors show that this is not the case for Southeast Asia on the whole. They find that the covariability of bank rates and the commercial paper rate is not perfect across all Southeast Asian countries. They identify three groups of countries: a group with high covariability (Australia, Canada, Hong Kong, Singapore, and the United States), a group with medium covariability (Japan, Malaysia, New Zealand, and the Philippines), and a group with no covariability (Indonesia, Korea, Taiwan, and Thailand).

An important implication of this analysis is the determination of the extent to which monetary authorities can sterilize capital inflows. To the extent that bank lending is an important link, sterilization is feasible, as shown by the cases of Indonesia and Malaysia, which engaged in large-scale sterilization of capital inflows.

The authors do not discuss the important issue of capital controls. Given that

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their evidence shows that there is not much medium- and long-term capital mobility in Southeast Asia, what is the optimal policy toward short-run capital flows? If capital inflows are short-lived by nature, should a country impose capital controls, and if so, would this be administratively feasible? In particular, given the importance of bank lending in these economies, what type of bank regulation would help stem short-run capital inflows?

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