This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Macroeconomic Linkage: Savings, Exchange Rates, and Capital Flows, NBER-EASE Volume 3

Volume Author/Editor: Takatoshi Ito and Anne Krueger, editors

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-38669-4

Volume URL: http://www.nber.org/books/ito_94-1

Conference Date: June 17-19, 1992

Publication Date: January 1994

Chapter Title: Capital Mobility in Korea since the Early 1980s: Comparison with Japan and Taiwan

Chapter Author: Sung Hee Jwa

Chapter URL: http://www.nber.org/chapters/c8530

Chapter pages in book: (p. 123 - 166)

5   Capital Mobility in Korea since the Early 1980s: Comparison with Japan and Taiwan

Sung Hee Jwa

5.1   Introduction

After two decades of rapid economic growth characterized by heavy regulatory intervention in the allocation of financial and physical resources, the Korean government in the early 1980s began to realize the limits of active government intervention and to introduce private sector initiatives in economic management. The active role of the private sector became inevitable for further, sustained economic development.

Government intervention in the 1970s culminated in the policy to promote heavy and chemical industry (HCI) by channeling almost all available resources into this sector. As a part of the HCI policy, the Korean financial sector was treated only as a means of allocating available financial resources to the priority sector. Toward the end of the 1970s, the Korean economy began to show structural weaknesses on many fronts: high inflation, real appreciation of the won, chronic balance of payments deficits, signs of overinvestment in the HCIs, and the dominance of large business groups over small- and medium-size enterprises (SMEs) due to the HCI drive. The second oil price shock further aggravated Korea's worsening economic situation.

Against this background, the government decided to reduce the degree of its intervention in the economy and launched a comprehensive program of economic liberalization and opening in the early 1980s. As a part of this reform plan, financial liberalization and internationalization policies were adopted to invite competition into the domestic financial sector and to improve its efficiency.

Since the early 1980s, the Korean government has tried to relax various controls on capital flows gradually and slowly, so as not to disturb the domestic equilibrium. The controls on inflows and outflows have depended on the balance of payments and debt situation and exchange rate movement and have been given emphasis alternately, consistent with domestic macroeconomic policies. At times, the short-run considerations of macroeconomic management have dominated consideration of the long-run benefits of free capital flows, making it appear that the process of liberalization had been reversed.

Recently, there have been many international as well as domestic discussions on the necessity of capital flow liberalization in Korea. Domestically, a consensus on the need for liberalizing capital flow seems to have been reached, not only to realize the potential gains from the free flow of capital but also to prepare for the Uruguay Round negotiation, to join the OECD in the near future, and to meet the pressure from the United States for further market opening. However, the speed of liberalization is still the subject of lively discussions. Domestic policymakers seem to favor a gradual financial liberalization approach once domestic markets are liberalized.

The purpose of this paper is to provide an overview of Korea's experience of capital control and decontrol since the early 1980s and to quantify the extent of Korea's capital mobility vis-à-vis that of Japan and Taiwan. The paper is structured as follows: In section 5.2, the pattern of Korea's capital account controls will be described, and in section 5.3 the impediments to capital account liberalization will be outlined. Sections 5.2 and 5.3 are meant to be a broad overview of Korea's capital flows and related policies as a preliminary discussion for the in-depth analysis in section 5.4. Section 5.4 will analyze and evaluate the extent of Korea's capital account openness, in comparison with Taiwan and Japan, utilizing various measures and techniques. Section 5.5 will conclude the paper with some observations.

5.2   Pattern of Korea's Capital Control

5.2.1   Development of Korea's Capital Account

The structure of Korea's capital account is illustrated in table 5.1. Concerning the long-term capital transaction on the liability side, public borrowing was the major source of capital inflow in the first half of the 1980s, but in the second half, it switched to become the major source of outflow. The same trend can be observed in commercial borrowings. This trend seems to reflect the stance of capital control policy, which encouraged an inflow during the current account deficit of the former period and an outflow during the current account surplus of the latter period, as will be discussed in the next section.

The role of foreign direct investment (FDI) in Korea increased gradually over the same period and is expected to play a bigger role in the future as further deregulations on FDI are forthcoming. Its role as a source of inflow,

Table 5.1   **Accounts of Korea's Capital Transactions (%)**

Transactions	1981	1985	1987	1991
Long-term capital transactions				
Liabilities	100	100	−100	100
Public loans	48.7	12.1	−25.3	−10.6
Commercial loans	9.0	−6.2	−18.8	−10.1
Direct investments	3.6	8.8	10.9	20.9
Portfolio investments	2.1	37.1	−2.1	55.4
Long-term trade credits	−0.4	−2.4	0.8	12.2
Bank loans by development institutions	37.8	36.2	−64.4	17.9
Long-term foreign currency borrowings by foreign exchange act				
Merchant banking corporation's borrowing				
Foreign military sales loans	−0.8	14.4	−1.2	14.4
Long-term foreign currency bills sold				
Import by lease under the condition of ownership transfer				
Assets	100	−100	−100	−100
Public loans	0	0	0	−0.4
Direct investments	−182.3	−2.2	−57.4	−89.1
Portfolio investments	0	0	0	−2.5
Medium- and long-term trade credits	404.3	−60.9	130.8	54.8
Subscriptions to international institutions	−84.4	−1.3	−8.9	−1.4
Long-term imports prepayments				
Long-term lending of development institutions and merchant banking corporations	−37.6	−35.6	−164.4	−61.3
Short-term capital transactions				
Liabilities	−100	−100	−100	100
Short-term trade credit	18.6	−61.5	−401.5	−19.3
Borrowings of crude oil import funds	4.6	−34.4	−92.6	−22.8
Advances under red-clause L/C				
Exports on simple remittance basis				
Domestic import usance sold				
Short-term foreign currency bill sold	−123.2	−4.1	394.1	142.1
Short-term foreign currency borrowings by foreign exchange act				
Short-term borrowings of development institutions and merchant banking corporations				
Assets	100	−100	−100	−100
Short-term export credits	90.7	−99.3	−300	−18.8
Short-term imports prepayments				
Short-term private foreign currency deposit				
Short-term lending of development institution	9.3	−0.7	200	−81.2
Short-term lending of merchant banking corporations				

Source: Bank of Korea, Monthly Balance of Payments (Seoul, various issues).
Note: Negative entries record outflow.

especially, increased in the second half of the 1980s. Opposite to this trend, the reliance on development institutions for bank loans declined and will be further reduced in the future, while portfolio investment, which has been another source of capital inflow, is expected to continue its rising trend into the next decade. Portfolio investment will become increasingly more important as the opening of the Korean stock market in January 1992 begins to take full effect.

On the asset side, direct overseas investment has been a major source of capital outflow and is currently on a rising trend. It reached 89.1 percent of the total net accumulation in 1991, and further increase is expected as Korea regains its current account balance. Therefore, it will continue to serve as a major source of outflow. However, overseas portfolio investments, which had been almost zero, have begun appearing in recent years. They too are expected to increase as capital flow liberalization proceeds. The repayment receipts of long- and medium-term trade credit has been a source of capital inflow. The long-term lending of development institutions will rise as Korea increases its efforts to supply funds to developing countries.

Concerning short-term capital transactions, short-term trade credit, which was once an important source of import financing, is now a major capital outflow item. In recent years, Korea has been repaying short-term trade credits. On the asset side, Korea has been providing substantial short-term credit to importers of Korean products.

5.2.2   Patterns of Korea's Capital Control

According to an OECD research paper (OECD 1990), the patterns of capital control for all OECD countries in the past 25 years were influenced by the balance of payments situation, exchange rate movements, and the development of monetary management. When countries experienced balance of payments deficits, they tended to rely on restrictions on capital outflow. Also, in the case of monetary management, capital inflows were restricted if they were perceived as making monetary management difficult. Depending on the behavior of these three factors, capital controls were sometimes placed on inflow and at other times on outflow.

The Korean case follows this example. During the 1980s, the pattern of capital control was determined by a consideration of the balance of payments, exchange rate, and monetary management. In the early 1980s, Korea faced balance of payments and foreign debt problems and, thus, restricted capital outflows. In the latter half of the 1980s, when it recorded current account surpluses, Korea had difficulty controlling the monetary aggregate. There were also very strong pressures for capital inflow to appreciate the exchange rate, which in turn would have adversely affected export competitiveness. Thus, Korea placed strong restrictions on capital inflow.

Policies dealing with decontrol of the capital account were strongly influenced by Korea's macroeconomic situation, especially by the current account

and debt situation in the first half of the 1980s and by the concern over mone-
tary controls and exchange rate movements in the latter half. In the early 1980s,
the government was strictly concerned about accumulating foreign debt and
increasing current account deficits, and therefore restricted capital outflow but
encouraged capital inflow. On the other hand, in the second half of the decade,
the government was concerned about controlling liquidity and avoiding ex-
change rate appreciation and so restricted capital inflow but encourage capital
outflow.

The following section will discuss and evaluate the pattern of Korea's capital
control, dividing the 1980s into the two periods of the early and late 1980s.

Early 1980s: Outflow Controlled and Inflow Encouraged

The early 1980s witnessed chronic current account deficits, capital account
surpluses, and a continued depreciation of the Korean won (see table 5.2). The
international debt crisis disproportionately affected Korea, which had accumu-
lated a large foreign debt (see table 5.3). This foreign debt continued to in-
crease at a rapid pace, reaching its peak, almost 40 percent of GNP, in 1985.
However, while the real interest rate differential was favorable to Korea for the
period 1981–85, the uncovered interest rate differential was negative on aver-
age (see fig. 5.1). Even when the real interest rate was higher, no real incentives
existed for foreign capital to come to Korea, because of exchange rate expecta-
tions. Despite this, Korea witnessed a large capital inflow during this period,
because it had placed very strong regulations on capital outflow, thus leading
to the eventual net capital inflow.

Korea has been a net capital importer ever since its economic development
process began. The country has relied mainly on foreign borrowing rather than
on foreign direct or portfolio investment as a method of financing. During the
first half of the 1980s, public borrowing financed more than 50 percent of the
total capital account surplus on average. In addition, however, foreign direct
investment was also given a fair amount of emphasis as a financing source. In
July 1984, the regulators of foreign direct investment adopted a negative list
system, which greatly helped activate direct investment by nonresidents. (See
app. B for changes in capital flow regulation).

However, the policy mix during this period was very inconsistent. If Korea
had really wanted to induce a large capital inflow, the domestic interest rate
should have been maintained at a higher level. At the time, the uncovered inter-
est rate parity was unfavorable to Korea. Although the real interest rate was
positive, it was smaller than in the latter part of the 1980s. This pattern of real
interest rate and uncovered interest rate differentials did not fully match the
Korean government's intention to control capital at that time.

Late 1980s: Inflow Controlled and Outflow Decontrolled

From 1986 to 1989, Korea enjoyed the so-called three lows: low interna-
tional interest rates, low oil prices, and low dollar and won exchange rates vis-

Table 5.2   **Korea's Capital Account and Other Economic Indicators**

	1980	1981	1982	1983	1984	1985	Average 1981–85
Current account balance (million $)	−5,320.70	−4,646.00	−2,649.60	−1,606.00	−1,372.60	−887.40	−2,232.32
(% of GNP)	(−8.8)	(−6.95)	(−3.71)	(−2.02)	(−1.58)	(−0.99)	
Capital account balance	3,801.00	2,759.60	1,233.90	2,163.90	1,309.50	513.30	1,596.04
(% of GNP)	(6.29)	(4.13)	(1.73)	(2.72)	(1.51)	(0.57)	
Long-term capital balance	1,856.50	2,841.90	1,230.30	1,270.40	2,067.40	1,100.80	1,702.16
Liabilities	2,164.30	2,827.80	1,726.70	2,087.50	1,964.70	2,644.20	2,250.18
Public loans	1,261.40	1,378.40	1,493.40	950.40	764.20	319.60	981.20
Commercial loans	588.00	253.30	−128.00	−155.20	−250.00	−163.30	−80.64
Assets[a]	−307.80	14.10	−496.40	−817.10	102.70	−1,543.40	−540.02
Short-term capital balance	1,944.50	−82.30	3.60	893.50	−757.90	−587.50	−106.12
Liabilities	2,033.80	−94.10	−45.00	815.60	−858.60	−485.90	−133.60
Assets[a]	−89.30	11.80	48.60	77.90	100.70	−101.60	27.48
Won/dollar exchange rate	607.40	681.00	731.10	775.80	806.00	870.00	772.78
(rate of depreciation; %)	(25.50)	(12.10)	(7.40)	(6.10)	(3.90)	(7.90)	(7.48)
Real effective exchange rate[b]	82.20	79.40	78.90	84.20	86.90	92.40	84.36
(rate of depreciation; %)	(2.20)	(−3.40)	(−0.70)	(6.80)	(3.10)	(6.40)	(2.44)
Yield to corporate bonds (%)	30.10	24.40	17.30	14.20	14.10	14.20	16.84
Inflation in GNP deflator (%)	24.08	17.38	7.50	5.16	3.64	3.97	7.53
Real interest rate differentials (%)[c]	0.68	−3.65	3.10	4.30	5.19	6.93	3.17
Uncovered interest rate differentials (%)[d]	−15.59	1.69	−3.71	−2.06	0.10	−2.70	−1.34
Capital flows as a percentage of trade (%)[e]							
Overall capital account	21.45	12.88	13.76	7.80	6.50	9.61	10.11

Portfolio investment	0.10	0.14	0.03	0.39	0.62	1.86	0.61
Foreign direct investment	0.05	0.32	0.48	0.41	0.27	0.51	0.40
M_2 (averages; billion won)	10,764.10	13,714.80	17,575.20	21,005.00	23,262.20	26,015.30	20,314.50
Change (%)	25.80	27.40	28.10	19.50	10.70	11.80	19.50
MSBs issued (billion won)	529.70	1,660.40	927.30	3,360.00	4,458.50	1,899.90	2,461.22
(% of M_2)	(4.92)	(12.11)	(5.28)	(16.00)	(19.17)	(7.30)	(12.12)
Net foreign assets (billion won)	−597.10	−2,277.70	−4,326.40	−5,082.30	−6,094.70	−7,696.02	−5,095.46
(% of M_2)	(−5.55)	(−16.61)	(−24.62)	(−24.20)	(−26.20)	(−29.58)	(−25.08)
Real GNP growth rate (%)	−3.70	5.90	7.20	12.60	9.30	7.00	8.40

	1986	1987	1988	1989	1990	Average 1986–90	1991
Current account balance (million $)	4,617.00	9,853.90	14,160.70	5,054.60	−2,179.40	6,301.36	−8,827.2
(% of GNP)	(4.49)	(7.64)	(8.20)	(2.39)	(−0.9)		−3.14
Capital account balance	−2,374.00	−5,842.80	−1,396.50	−3,302.20	3,881.20	−1,806.86	4,711.6
(% of GNP)	(−2.31)	(−4.53)	(−0.81)	(−1.56)	(1.60)		(1.68)
Long-term capital balance	−1,981.90	−5,835.80	−2,732.80	−3,362.50	547.50	−2,673.10	4,185.8
Liabilities	−336.20	−5,517.10	−2,354.80	−1,958.00	1,311.40	−1,770.94	5,708.8
Public loan	−126.30	−1,397.00	−1,129.40	−1,067.30	−816.60	−907.32	−621.4
Commercial loan	94.40	−1,036.20	−1,172.50	−824.70	−764.60	−740.72	−557.6
Assets[a]	−1,645.70	−318.70	−378.00	−1,404.50	−763.90	−902.16	−1,523.0
Short-term capital balance	−392.10	−7.00	1,336.30	60.30	3,333.70	866.24	41.2
Liabilities	−402.60	−6.80	1,544.10	413.40	3,665.40	1,042.70	532.2
Assets[a]	10.50	−0.20	−207.80	−353.10	−331.70	−176.46	−491.0
Won/dollar exchange rate	881.50	822.60	731.50	671.50	707.80	762.98	733.4
(rate of depreciation; %)	(1.30)	(−6.60)	(−11.10)	(−8.20)	(5.40)	(−3.84)	(3.62)
Real effective exchange rate[b]	105.80	106.10	98.80	89.60	93.80	98.82	95.20
(rate of depreciation; %)	(14.40)	(0.40)	(−6.90)	(−9.30)	(4.70)	(0.66)	(1.49)

(*continued*)

Table 5.2   (continued)

	1980	1981	1982	1983	1984	1985	Average 1981–85
Yield to corporate bonds (%)	12.80	12.80	14.50	15.20	16.40	14.34	18.8
Inflation in GNP deflator (%)	2.83	3.38	5.85	5.12	10.68	5.58	11.23
Real interest rate differentials (%)[c]	5.08	6.25	3.46	5.08	4.93	4.95	7.39
Uncovered interest rate differentials (%)[d]	8.37	12.98	20.12	9.24	1.94	10.73	7.66
Capital flows as a percentage of trade (%)[e]							
Overall capital account	6.40	13.01	12.58	4.86	6.82	8.73	—
Portfolio investment	0.47	0.13	0.45	0.07	0.77	0.38	—
Foreign direct investment	0.86	0.92	0.95	0.90	1.20	0.97	—
M_2 (averages; billion won)	30,396.20	36,119.60	42,893.00	50,793.10	61,576.10	44,355.60	73,024.0
Change (%)	16.80	18.80	18.80	18.40	21.20	18.80	18.6
MSBs issued (billion won)	4,285.20	9,006.70	16,297.20	18,003.10	15,611.50	12,640.74	13,862.3
(% of M_2)	(14.10)	(24.94)	(38.00)	(35.44)	(25.35)	(28.50)	(31.25)
Net foreign assets (billion won)	−6,127.70	−1,605.10	7,251.20	9,104.00	10,139.70	3,752.42	8,075.8
(% of M_2)	(−20.16)	(−4.44)	(16.91)	(17.92)	(16.47)	(8.46)	(11.06)
Real GNP growth rate (%)	12.90	13.00	12.40	6.80	9.30	10.88	8.4

Sources: IMF, *International Financial Statistics* (Washington, D.C.); IMF, *Balance of Payments Statistics Yearbook* (Washington, D.C.); Korea Development Institute database (Seoul).

[a]Negative entry records increase.

[b]Calculated based on a trade-weighted currency basket of Korea's seven major trading partners (United States, Japan, Germany, United Kingdom, France, the Netherlands, Canada) deflated by the wholesale price indices. The base period is 1985:3–86:2. The data is period average.

[c]Real yield to corporate bond minus real LIBOR-on-dollar deposit (deflator: GNP deflator).

[d]Domestic yield to corporate bond minus LIBOR-on-dollar deposit minus actual won depreciation rate.

[e](|outflow| + |inflow|)/(|export| + |import|).

Table 5.3   **Outstanding Foreign Debt and Assets (million $)**

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	November 1991
Total foreign debt	32,433	37,083	40,378	43,053	46,762	44,510	35,568	31,169	29,373	31,701	39,054.7
	(5,263)	(4,650)	(3,295)	(2,675)	(3,709)	(−2,252)	(8,942)	(−4,399)	(−1,796)	(2,328)	(7,353.7)
Long-term debt	21,145	23,685	26,353	29,612	33,859	33,568	24,884	20,038	16,421	14,459	16,972.8
(more than 3-year)	(4,105)	(2,540)	(2,668)	(3,259)	(4,247)	(−291)	(−8,684)	(−4,846)	(−3,617)	(−1,962)	(2,513.8)
Medium-term debt	1,061	971	1,910	2,016	2,171	1,686	1,393	1,335	2,004	2,900	4,477.0
(1–3-year)	(307)	(−90)	(939)	(106)	(155)	(−485)	(−293)	(−58)	(669)	(896)	(1,577)
Short-term debt	10,227	12,427	12,115	11,425	10,732	9,256	9,291	9,796	10,948	14,342	17,604.9
(less than 1-year)	(851)	(2,200)	(−312)	(−690)	(−693)	(−1,476)	(35)	(505)	(1,152)	(3,394)	(3,262.9)
Foreign assets	7,963	8,778	9,504	10,108	11,222	12,008	13,155	23,874	26,356	26,845	26,372.5
	(425)	(815)	(726)	(604)	(1,142)	(786)	(1,147)	(10,719)	(2,482)	(489)	(−472.5)
Long-term assets	723	1,101	2,010	1,886	2,839	3,381	2,915	2,735	2,943	2,724	2,596.2
	(32)	(378)	(909)	(−124)	(953)	(542)	(−466)	(−180)	(208)	(−219)	(−127.8)
Short-term assets	7,240	7,677	7,494	8,222	8,383	8,627	10,240	21,139	23,413	24,121	23,776.3
	(393)	(437)	(−183)	(728)	(161)	(244)	(1,613)	(10,899)	(2,274)	(708)	(−344.7)
Net foreign debt	24,470	28,305	30,874	32,945	35,540	32,502	22,413	7,295	3,015	4,856	12,682.2
	(4,839)	(3,835)	(2,569)	(2,071)	(2,595)	(−3,038)	(−10,089)	(−15,118)	(−4,280)	(1,841)	(7,826.2)
Total foreign debt/											
GNP	48.6	52.0	50.8	49.5	52.1	43.3	27.6	17.8	13.8	13.2	—
Foreign asset/GNP	11.9	12.3	12.0	11.6	12.5	11.7	10.2	13.6	12.4	11.2	—
Net foreign debt/											
GNP	36.6	39.7	38.8	37.9	39.6	31.6	17.4	4.2	1.4	2.0	—

Source: Ministry of Finance (Seoul).

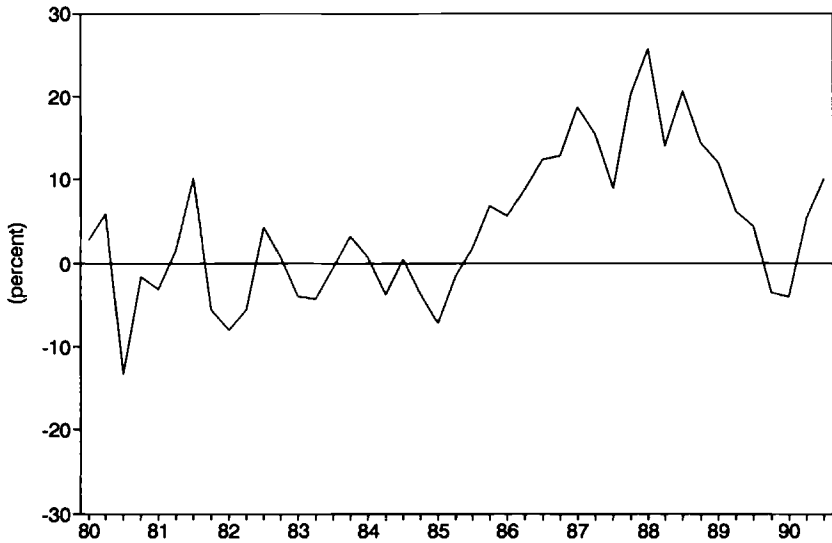*Note:* Numbers in parentheses record change from previous year.

Fig. 5.1   Korea's uncovered interest rate differentials

à-vis the yen. Given this environment and the successful stabilization plan in the first half of the 1980s, Korea was in a position to take full advantage of these conditions. Starting in the latter half of 1986, Korea started recording current account surpluses.

The Korean government then became concerned about the effectiveness of its monetary policy because the current account surplus had automatically brought more liquidity to the economy. With this increased liquidity in the economy, Korea had to sterilize the current account surplus, which peaked at 8.2 percent of GNP in 1988.

Historically, Korea had relied heavily on direct monetary control, instead of indirect monetary management, because the interest rate had been regulated and the short-term money market had not been well developed. Given these structural problems, Korea was not in a position to utilize maximally open market operations. The Korean government issued large stocks of monetary stabilization bonds (MSBs) to sterilize the current account surplus. Instead of selling in the open market at the free market rate, the government allocated certain amounts of MSBs to banks and other nonfinancial institutions. Especially during 1986–89, a huge stock of MSBs was accumulated.

A second concern for the government was the real possibility of further appreciation of the won due to capital inflow in addition to the current account surplus. Strong sentiment existed to continue the current account surpluses, which were the first in Korean history, to resolve the foreign debt problem. To maintain export competitiveness, the Korean won had to remain at a relatively competitive level. Moreover, during this period, international pressure mounted to liberalize imports. This also required a competitive exchange rate

to compensate for the adverse impact of import liberalization on the current account. In general, capital account liberalization could be expected to lead to the inflow of capital and the appreciation of the won, given the relatively high Korean interest rates compared with the international rate. The stronger won vis-à-vis other major currencies would have weakened the competitiveness of exports, the driving engine behind Korea's economic growth. This, from the government's viewpoint, has been the main counterargument against the liberalization of the capital account, especially capital inflow. The appreciation of the won has been one of the biggest concerns of the Korean government.

Given the economic situation in the early 1980s, the government pushed very strongly for a policy oriented toward capital outflow during the second half of the 1980s. Regulations governing capital flows were reversed from the early 1980s, during which the Korean government had actively sought to keep capital within the country. The regulations instead were changed to induce capital outflow actively. The deregulations on capital flow during this period seem to have been concentrated on overseas direct and portfolio investments (see appendix B). The Korean government even allowed such transactions as real estate investments in foreign countries, which had been regarded as taboo for a long time.

Analyzing the figures in table 5.2, we find large capital outflows during the 1980s; the largest component was long-term capital outflow, including repayments of commercial as well as public borrowings and accumulation of foreign assets. However, Korea during this period enjoyed a very favorable interest rate differential, much higher than in the early 1980s. The uncovered interest rate differential was also very favorable to Korea, the opposite of the situation in the early 1980s. This interest rate situation provided strong incentives for capital inflow—at a time when the government was actively trying to ship money abroad—and was thus inconsistent with the government intention to encourage capital outflow. Probably as a reflection of this, short-term capital balance, contrary to the case of long-term capital balance, recorded a large surplus led by a huge inflow, through an accumulation of short-term liabilities.

Contrasts with Japan

This pattern of capital control, which is especially conditional on exchange rate movements, is not confined to Korea. It is also interesting to observe that Japan's experience with capital control during the 1970s closely follows this pattern. Fukao (1990, 136) concludes, after a lengthy overview of Japan's pattern of capital control during 1970s that, "foreign exchange controls in the period of the expected appreciation of the yen before mid-1973 worked toward suppressing capital inflows and encouraging capital outflows. But, once the oil crisis occurred, the controls turned 180 degrees toward suppressing capital outflows and encouraging capital inflows. Another volte-face occurred once the yen began to strengthen suddenly in 1977 and 1978 and the direction turned once again toward suppressing capital inflows and encouraging outflows."

Ito (1990, 317) also makes the same observation, noting that, "capital controls were relaxed in several steps during the 1970s. The history of deregulation coincides with the roller-coaster path of the yen/dollar exchange rate. The Japanese monetary authority clearly had the objective of exchange-rate stabilization, so the restrictions on outflow (inflow) were lifted when the monetary authority desired to prevent rapid yen appreciation (depreciation)." In addition, as already mentioned in the beginning of this section, other OECD countries were observed to follow a similar pattern during the period of capital flow liberalization (OECD 1990).

It may be that the effect of government capital control, which works against the economic incentives, tends to be limited concerning private capital flows. The policies to encourage capital inflow against the unfavorable uncovered interest differential during the early 1980s and to encourage capital outflow against the favorable interest rate incentive during the late 1980s both turned out to be ineffective in influencing short-term capital movement in the intended direction. It is also interesting to observe the same phenomenon in Japanese capital control. Fukao (1990, 136) states, "these effects of changing foreign exchange controls can be separated into defensive ones (suppressing capital inflows when the yen was high, and outflows when low) and active ones (such as encouraging capital outflows when the yen was high, and capital inflows when low). The defensive effects were perhaps effective to an extent. . . . However, the active effects are likely to have been limited. Although effective sometimes such as in the expansion of capital outflows in 1972–73, the active effects attempted to work contrary to economic incentives for capital flows on the whole."

Looking at the indicators of interest rate differentials and the importance of capital flow as percentage of total trade in table 5.2, one cannot easily establish any definitive trend for the 1980s. In 1980 the uncovered interest rate differentials exhibited negative values which imply unfavorable conditions for Korea. The value of the differential remained at a relatively low level until 1985, then turned positive in 1986. The differential recorded large positive values for 1987–89 but has gradually declined since then. If one takes the absolute size of the uncovered interest rate differential as the measure of the degree of capital control, it may be concluded that capital flow mobility in the second half of the 1980s was less than in the first half of the 1980s. However, capital flows as a percentage of trade, which could also be taken as a measure of the degree of capital movement, recorded a double digit ratio during the years 1987–88. The years of high interest rate differentials tend to show a high degree of capital movement.

This rather contradictory observation reflects what seems to be an inconsistent capital control policy—policy leaning against the wind—inducing capital outflow under a favorable interest rate condition mainly by repaying public borrowing, but being unsuccessful in reducing the interest rate differentials and, therefore, the pressure on the exchange rate. This case seems to imply that

active controls (in this case, encouraging outflow when the won was high and the uncovered interest rate differential was favorable to Korea) were not only ineffective in accomplishing the intended goals, as suggested by Fukao, but rather aggravated the existing real incentives by increasing interest rate differentials, causing private short-term flows in a direction opposite to policy intention. Exporting capital through the early repayment of public borrowing—in the presence of appreciation pressure on the won and defensive controls on capital inflow—have aggravated excess demand for the won, widened interest rate differentials, and produced further pressure for won appreciation, thereby generating further incentive for private short-term capital inflow.

However, it is noteworthy that foreign direct investment led by private investment increased continuously as a percentage of trade during the 1980s, and portfolio investment followed suit, though a little less clearly. Therefore, it seems difficult to come to a conclusion on the trend of capital mobility in Korea by analyzing only traditional indicators. In section 5.4, this issue will be addressed again with additional measurements and also some comparisons with Japan and Taiwan.

5.3   Impediments to Capital Flow Decontrol in Korea

It would be absurd to assume that capital decontrol can be carried out without any financial problems. However, such problems can be minimized by implementing the deregulation in an orderly fashion. As pointed out by the literature on the sequencing of economic liberalization (Fischer and Reisen 1992; Hanson 1992), macroeconomic stability, interest rate deregulation, and flexible exchange rates are the crucial preconditions to a relatively crisis-free transition.

Two different approaches to the liberalization of capital flow were observed among the OECD countries: the rapid and drastic (United Kingdom, Australia, and New Zealand) versus the gradual (Japan, Denmark, and Finland) approach (OECD 1990). Japan, especially, having taken the gradual approach that Korea is taking now, is a possible model for countries newly seeking capital flow deregulation. Starting in 1964 when it joined the OECD, Japan removed its capital controls gradually until 1980. First, foreign direct investment, inward and outward securities investment, and personal capital movement began to be liberalized at the end of 1970. Then, the liberalization of real estate operations and overseas direct investment was initiated in 1971. Restrictions on securities transactions and commercial lending were removed during the period 1975–76. All remaining restrictions were finally lifted in 1980 with the introduction of the new Foreign Exchange and Foreign Trade Control Law (OECD 1990; Fukao 1990; Ito 1991; Fischer and Reisen 1992).

Judging from the experiences of those forerunners, foreign direct investment and trade-related finance seem to be the first areas that could be liberalized since their reform will probably not cause serious problems for the stability and management of the financial sector. Before continuing with liberalization,

however, it must be assumed that macroeconomic stabilization will bring down the sustained interest rate differentials, and this drop will probably generate "hot money" or capital flight after capital flow liberalization. Then, deregulation of the domestic interest rate, along with flexible exchange rates, ensures the development of the domestic money market and provides a buffer against hot money flow. Once domestic financial markets deepen and the opportunities for domestic portfolio investment are enlarged, control on capital outflows can be removed.

Following these steps will help lead to interest rates that match international rates. With these mechanisms in place, controls on short-term borrowing for banks and nonbanks and restrictions on nonresident investment in the domestic securities market should be abolished, since the deepened money market enables the authorities to absorb liquidity shocks more effectively and more smoothly.

In Korea, foreign direct investment and trade-related finance have already been mostly liberalized, as discussed in the previous section (see also table 5.1 and app. B). However, it has been observed that Korea has been very slow in liberalizing the flow of portfolio investment and also short-term capital flow. This slowness has been due mainly to concerns about possible disturbances caused by capital flow into the domestic economy induced by financial incentives. Especially in the early 1980s, the Korean government was worried about capital flight because of the negative uncovered interest parity and other factors, both economic and non-economic. However, in the late 1980s, given a regulated interest rate above the international level and an inflexible exchange rate subject to the old double-basket peg regime, rapid capital flow liberalization was thought to induce too large an inflow, which would have made managing domestic monetary policies difficult. Of course, as already mentioned, pressure for won appreciation itself was also one of the government's main concerns.

Therefore, one could argue that the major impediments to capital flow decontrol in Korea are interest rate regulation—which prevents the domestic interest rate from moving consistently with the international rate—the inflexible exchange rate regime based on a basket peg system, and the inefficient monetary control system—which relies on a direct domestic credit control policy that significantly limits the economy's ability to absorb the excess liquidity caused by capital inflow.

5.3.1   The Slow Pace of Interest Rate Deregulation

Before capital account liberalization can be smoothly executed, the domestic interest rate must be liberalized to absorb the shocks from capital flow. However, in Korea, interest rate deregulation has been extremely difficult, and this difficulty has proved a huge hurdle to capital account liberalization.

The Korean government has defended its policy stance of opposing quick interest rate deregulation for several reasons. It has contended that interest rate

deregulation will increase funding costs for firms. Korean business firms are characterized by huge debt to equity ratios, and any increase in the interest rate will greatly impact the financial costs of these firms. Second, domestic banks have been burdened by a large portion of nonperforming and policy loans. Interest rate deregulation and more competition in the financial market would put banks in a critically disadvantaged position vis-à-vis nonbank financial intermediaries and foreign banks. The banks, burdened with nonperforming loans, could not compete with other financial institutions that do not have to worry about these bad loans. Deposit rate deregulation in particular would seriously jeopardize the soundness of the banking sector. Therefore, the amount of nonperforming loans makes it extremely difficult to open the banking sector to market competition. Also, policy loans by commercial banks, which are directed by the government, still account for almost half of domestic credit. These include loans to the housing and agricultural sectors, loans to small and medium-sized firms, and foreign currency loans mainly for capital goods imports. Until commercial banks are freed from the obligation of extending policy loans, financial liberalization will be limited.

However, those reasons tell only part of the story. Concerning the problem of funding cost, businesses already pay the market rate because banks, in an effort to evade regulations, employ such techniques as the compensating balance, which asks for a deposit for the loan that is given out, a sort of forced deposit. It has been generally accepted that only a small portion of businesses, mainly big businesses, enjoy access to regulated interest rates, while small and medium-sized firms are exposed to the market rate. Even those businesses that have access to regulated interest rate loans have been known to pay an effective rate near the market rate because of schemes such as the compensating balance. Therefore, the possibility of higher funding costs should not be a great barrier to interest rate deregulation.

On the other hand, the concern has surfaced that the market interest rate itself will rise after interest rate deregulation, so that the industrial sector will be hard hit. However, it is difficult to find a solid and convincing theoretical basis for this argument.

Also, the weight of nonperforming loans has been reduced recently, because the capital base of the banks has been increasing. The Korean banking industry enjoys a deposit and lending rate spread that is very high in comparison to that in Japan or the United States. For all commercial banks in Korea, the spread was 4.53 percent in 1990 and 4.66 percent in 1991, while for Japan it was 1.21 percent in 1989, and for the United States it was 2.38 percent in 1990. This large deposit and lending rate spread has allowed domestic Korean banks bigger profit margins.

The prolonged control of interest rates would result in a vicious circle of interest rate regulation and financial retardation. In spite of the widening gap between regulated and market interest rates in recent years, regulated rates have been adjusted minimally. Because the government hopes to see strong

corporate investment that would accelerate the structural adjustment of the Korean industries, it has been reluctant to raise interest rates. The government's desire to borrow cheaply when it issues public debentures must have also affected its interest rate policy.

Therefore, the difficulties outlined by the government do not seem to fully reflect the true nature of the issues at hand. Banks enjoy a large spread buffer, and businesses have already been paying an interest cost that is near the market rate. Therefore, in addition to some of these problems, there seems to be another, deep-rooted reason why a strong push for interest rate deregulation has not been achieved—the political economy of interest rate reform.

In general, during a process of interest rate deregulation, there are always gainers and losers. In the Korean case, the business and banking sectors are likely to be the losers. The business sector, especially big businesses, will lose its privileged position of access to regulated interest rate loans. And the banking sector will lose its monopolistic position protected by the government and the quiet business environment created by interest rate and financial regulation. The Korean banking sector has enjoyed an existence without competition and with high profit margins. Also, interest rate deregulation means that the government or the Central Bank will lose control over the financial sector. If the interdependent relationship between the regulators and the financial sector is scrutinized, it becomes apparent not only that the regulators are concerned about losing their regulatory power but that both are quietly enjoying a mutually beneficial relationship. Moreover, although the major beneficiary of the liberalization is the general public, according to the public choice theory, they are not in a position to effectively mobilize the resources needed to influence current government interest rate policy.[1]

For these reasons, it has been difficult to change the current regulatory environment. In 1988, the Korean government launched an ambitious interest rate deregulation. However, after only about six months, the government reversed its policy when the jumps in the previously regulated interest rate were politically unacceptable. Interest deregulation was tried again for the second time in 1991. The government has tended to back away from its stance when the business sector complains of the higher interest rates. In early 1992, the government intervened again, influencing the interest rate indirectly through moral suasion. The prospect for capital account deregulation in Korea still remains very glum, because without interest rate liberalization, capital account liberalization will remain too difficult for Korea to digest. Continued government intervention in interest rate determination will remain a major impediment.

1. It has been shown that the influence of interest group politics on policymaking is clearly evident in Korea's import liberalization policy during the 1980s. See Jwa (1988). With political democratization after 1986, this force has been reinforced in every area of economic reform including interest rate deregulation.

5.3.2 Exchange Rate Appreciation and an Inflexible Exchange Rate System

Although a system of flexible exchange rates could generate high exchange rate volatility when taken together with the deregulated interest rate, it would be an important buffer against shocks from volatile capital flows and protect, to a large extent, domestic monetary independence.

Korea, especially during the late 1980s, faced the two inconsistent tasks of liberalizing the exchange market and exchange rate systems and avoiding real exchange appreciation—all in the midst of a very favorable interest rate parity. During this period, Korea had been pressed by the United States to liberalize its import regime and exchange rate system, but Korea also saw a strong need for maintaining its current account surpluses and, therefore, a competitive exchange rate level. But at the same time, the won was subject to strong appreciation pressure from market forces, *because* of the current account surplus and favorable interest rate differential, as well as from the U.S. government. However, Korea's exchange rate system during the 1980s, a double-basket system, turned out to be relatively rigid in managing these factors. After all, Korea allowed a gradual appreciation of the won during this period but with strict regulations on capital inflow and encouragement of capital outflow. And finally in 1990, Korea adopted a market-average exchange rate system with the objective of introducing a more flexible exchange rate system in the end.

Korea's exchange rate had been subject to the so-called double-basket system during the 1980s, in which the won/dollar exchange rate was determined as a weighted average of two different nominal effective rates, based on Korea's own basket and the IMF currency basket, respectively. Under this system, ample room existed for the government to influence the exchange rate. But when the won began to appreciate vis-à-vis the U.S. dollar after 1987, because of the current account surplus, and was subject to strong appreciation pressure from capital inflow, the government could not effectively work against the market forces. U.S. pressure to appreciate the won also mounted during the second half of the 1980s. The Korean won appreciated at rates larger that 9 percent in real terms in 1989 and by as much as 11 percent in nominal terms in 1988 (see table 5.2). In the end, Korea adopted the market-average exchange rate system in March 1990, under which the won/dollar exchange rate floats according to market forces within a given narrow band. The central rate under this new system is determined by the quantity-weighted average exchange rate of the previous market day. This is an improvement upon the old double-basket system and is being improved further by gradually widening the band (the band is now ±0.8 percent, which was set in July 1992).

In retrospect, concern over a possible exchange rate appreciation, especially during the late 1980s, turned out to be one of the main impediments to the liberalization of capital flow, especially capital inflow, but with the introduction of a market-average exchange rate system, a more conducive environment has been created for capital flow liberalization.

5.3.3   Monetary Control and the Lack of an Indirect Control Method

The loss of monetary independence, especially the inflationary pressure that will be generated by free capital flow (as in the Korean case), has been a major source of concern for countries implementing capital account liberalization.

Korea has suffered from chronic inflation except for a few years in the mid-1980s. To control inflation, the Korean government employs a direct monetary control method because Korea lacks the environment for market-based monetary management, such as open market operation. The inflow that would result from capital account liberalization may easily lead to inflation, a source of concern for the government. Without effective means to manage the money supply, the Central Bank will experience difficulties in efforts to sterilize the large inflow of capital. An indirect monetary control system allows higher efficiency in absorbing liquidity shocks brought by capital inflow, which would otherwise jeopardize domestic macroeconomic stability. So, unless Korea can develop an indirect management system, it will be difficult to allow large capital inflow.

Currently, Korea is trying to develop an efficient short-term money market by reducing limitations on the operational mechanism of the market and deregulating short-term interest rates, thereby paving the way for efficient open market operation. However, as has already been discussed, the slow pace of interest rate deregulation will hinder rapid financial deepening in the money market. In particular, the reluctance of the government and the Central Bank to deregulate the interest rates of government and monetary stabilization bonds will continue to be a stumbling block to the introduction of an indirect monetary control mechanism and to further capital flow liberalization.

5.4   The Extent of Capital Account Opening: Intercountry Comparison

5.4.1   Capital Flow as a Percentage of Trade

One of the indicators that measure the openness of the capital account is the volume of capital flow as a percentage of trade, measured as exports plus imports. If a country, over time and in comparison with other countries, has an increasing and large volume of capital flow relative to trade volume, it may be stated that this country has increasingly and relatively mobile capital transactions (Gros 1992). Even if a country, in appearance, has numerous regulatory measures against capital flows, the country may be regarded as having a relatively open capital account, depending on the size of the capital flow as a percentage of trade.

When overall capital flows are analyzed as shown in table 5.4 (data for Taiwan were not available), the performance of Korea is poor in comparison with the total flows of Asian developing countries as well as with Japan. We find the same result when we compare foreign direct investment and portfolio in-

Table 5.4   **Capital Flows as a Percentage of Trade (%; period average)**

Country	Overall Capital Account			Portfolio Investment			Foreign Direct Investment			Other		
	1981–85	1986–90	1981–90	1981–85	1986–90	1981–90	1981–85	1986–90	1981–90	1981–85	1986–90	1981–90
Industrial countries[a]	27.29	46.52	36.91	5.76	9.80	7.78	3.23	7.29	5.26	15.18	24.52	19.85
United States	33.34	38.97	36.16	6.25	8.24	7.24	5.14	10.57	7.85	21.01	17.02	19.02
Japan	31.75	117.45	74.60	13.52	28.36	20.94	1.96	7.69	4.83	11.87	71.91	41.89
Germany	13.86	25.18	19.52	4.55	7.22	5.88	1.51	2.87	2.19	5.48	10.78	8.13
Asia (developing countries)[b]	20.10	15.44	17.77	0.73	0.27	0.50	1.34	2.42	1.88	11.93	8.21	10.07
Korea	10.11	8.73	9.42	0.61[c]	0.38	0.49	0.40	0.97	0.68	5.30	4.60	4.95
Singapore	15.12	13.92	14.52	0.69	0.59	0.64	2.92	4.85	3.89	9.20	7.80	8.50
Indonesia	12.51	13.03	12.77	0.42	0.41	0.42	0.67	1.55	1.11	1.34	1.98	1.66

Source: IMF, *Balance of Payments Statistics Yearbook* (Washington, D.C.).

[a]Includes 22 countries: Australia, Austria, Belgium-Luxembourg, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

[b]Includes 24 countries: Afghanistan, Bangladesh, China (People's Republic), Fiji, India, Indonesia, Kiribati, Korea, Laos (People's Democratic Republic), Malaysia, Maldives, Myanmar, Nepal, Pakistan, Papua New Guinea, the Philippines, Singapore, the Solomon Islands, Sri Lanka, Thailand, Tonga, Vanuatu, Western Samoa, and Asia not specified.

[c]Includes an extraordinarily high number, 1.86 in 1985. Excluding this gives an average of 0.3 percent.

vestment flows. During the 1980s, while the indices for overall capital and portfolio investment flows seem to suggest a downward trend of capital mobility from the first to the second half of the 1980s, the numbers are slightly misleading because foreign direct investment in 1985 shows an extraordinarily high number, 1.86 percent, which seems to distort the overall picture (see also table 5.2).[2] If 1985 is excluded, the trend for portfolio investment indicates a rise. On the other hand, the index for direct investment, even if still relatively low, suggests a rapidly rising trend of capital mobility. Therefore, it could be the case that the openness of Korea's capital account increased gradually during the 1980s, though it is still very low if the size of the capital account as a percentage of the trade account is taken as a measure of capital mobility.

For Japan, all the indices of capital flow (as a percentage of trade) during the 1980s show a rapidly rising trend over time. And, with the exception of the foreign direct investment index, Japan's indices are higher than those of total flows for industrial countries as well as the flows for the United States and Germany individually. Therefore, one can conclude that the openness of Japan's capital account, according to this measurement, rose rapidly during the 1980s and maintains a very high level.

5.4.2 Interest Rate Differentials

Uncovered as well as covered interest rate differentials have been used as indicators of the extent of capital mobility. The uncovered interest rate differentials, if any, will reflect the exchange risk premium and/or country risk, while the covered interest rate differentials reflect only country risks such as transaction costs, capital controls, taxes, and default risks, since the covered differentials are free of exchange risk by definition. Therefore, one can not definitely know where uncovered interest rate differentials come from, since those differentials could be due to exchange risks, country risks including capital controls, or both. In this sense, covered interest rate differentials could be a better indicator of whether and how strongly capital flows are controlled.[3]

However, for the case of Korea and Taiwan without forward currency markets, only the uncovered interest rate differential can be examined, and it is given as follows:

(1) $UD_t = R_t - R_t^f - ER_t,$

where UD_t represents the uncovered interest differential, R_t and R_t^f are the domestic and foreign interest rates measured by the LIBOR-on-dollar deposit,

---

2. The high percentage of portfolio investment in 1985 seems to reflect the effects of the once-and-for-all nature of such capital decontrol measures as the establishment of the Korea Fund for nonresidents in 1984 and the permission for domestic firms to issue convertible bonds and bonds with subscription warrants or stock depository receipts in 1985. (See app. B for these changes).

3. A lengthy and informative discussion of the usefulness of various concepts of interest rate differentials in quantifying capital mobility can be found in Frankel (1989). Also see Ito (1986) for discussions of the usefulness of covered differentials as an indicator of the degree of capital control.

Table 5.5		Uncovered Interest Rate Differentials for Korea, Taiwan, and Japan (annualized quarterly average; %)		
	Year	Korea	Taiwan	Japan[a]
	1981	1.69	−9.6	−0.30
	1982	−3.71	−9.62	−0.05
	1983	−2.06	−2.44	−0.18
	1984	0.10	−1.73	−0.34
	1985	−2.70	−3.85	−0.22
	1986	8.37	7.42	−0.32
	1987	13.98	17.34	−0.75
	1988	20.12	0.54	−0.89
	1989	9.24	5.74	−0.60
	1990	1.94	−6.42	−0.52

[a]Covered interest rate differential.

and ER_t is the expected exchange rate depreciation measured by the actual depreciation rate under the assumption of perfect foresight. On the other hand, for Japan with a well-developed forward yen market, the covered interest rate differential is examined and is defined as follows:

$$(2) \qquad CD_t = R_t - R_t^f - fd_t,$$

where CD_t and fd_t represent the covered interest rate differential and forward discount on the yen, respectively, and other variables are the same as in equation (1). However, CD_t is actually measured by utilizing the LIBOR-on-yen deposit as a substitute for $R_t^f + fd_t$ as the covered interest parity rate in equation (2).[4] These data on interest rate differentials are reported in table 5.5 as annual averages and depicted quarterly in figures 5.1, 5.2, and 5.3, for Korea, Taiwan, and Japan, respectively.

For Korea, as illustrated in figure 5.1, the uncovered interest rate differential in the first half of the 1980s was, on average, slightly negative, while in the second half of the 1980s, it was highly positive. Korea faced outflow pressure in the early 1980s, while it faced strong inflow pressure in the second half of the 1980s. In Taiwan, as illustrated in figure 5.2, the pattern of uncovered rate differential was very similar to but more volatile than Korea's. But, on average, Taiwan's differentials are lower than Korea's, especially for the latter half of the 1980s. For Japan in figure 5.3, the covered interest rate differential was very close to zero, denoting almost a full degree of capital mobility. This finding is very similar to what Ito (1986) found by analyzing many different forms of covered interest rate differentials, among which the current form was also ana-

4. One can, instead, use the data on forward discount rate on the yen actually observed in the forward market as fd_t and the data on R_t^f and calculate $R_t^f + fd_t$ as the covered interest parity rate. However, this method is destined to produce larger measurement errors than the method used in this paper.
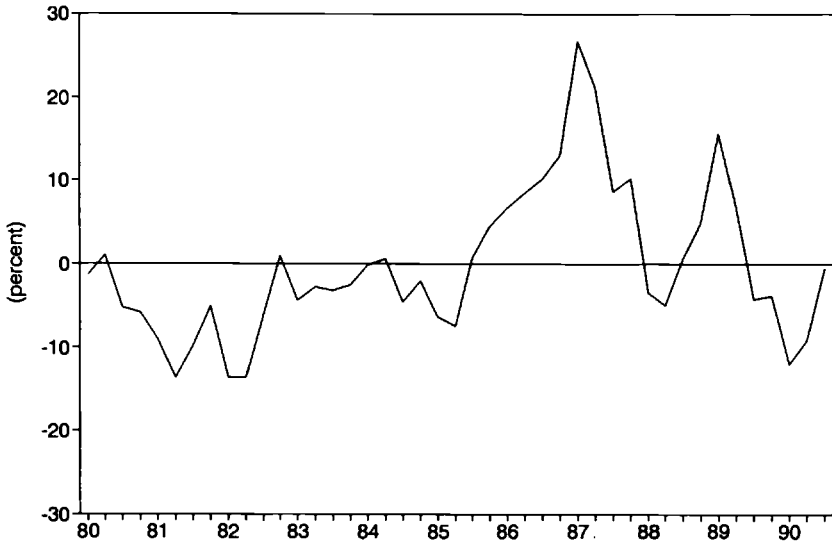
Fig. 5.2   Taiwan's uncovered interest rate differentials
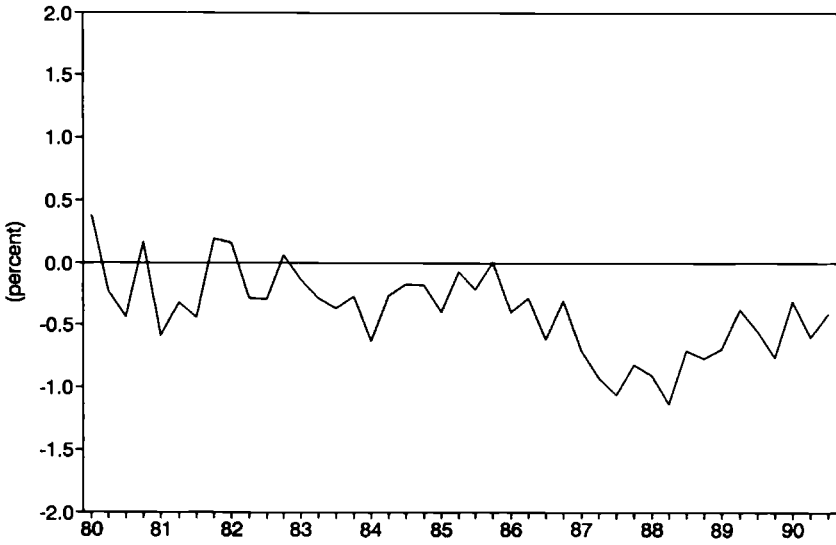

Fig. 5.3   Japan's covered interest rate differentials

lyzed, though he covered the period from the 1970s to the first half of the 1980s. He concluded that Japan's capital controls were almost all lifted in 1980, and the covered interest rate parity was almost perfectly held since then. According to these results, one may conclude that the highest mobility of capital is observed in Japan, while Korea and Taiwan maintain a reasonable, but lower, degree of capital mobility.

5.4.3   Linkages between Domestic and International Interest Rates

Recently, Reisen and Yèches (1991) applied Haque and Montiel's (1990) extended version of Edwards and Khan's (1985) model to Korea and Taiwan and showed an empirical measurement of capital account openness for those countries. In this subsection, Reisen and Yèches's approach is applied to Korea, Taiwan, and Japan. However, for Korea and Taiwan, the data utilized here for money stocks and interest rates are different from those used by Reisen and Yèches (see app. A for the list and sources of variables used in this section).[5]

First, a constant measure of capital account openness is derived, estimating the following equation:

$$(3) \qquad R_t - R_t' = \alpha + \psi\,(R_t^* - R_t'),\ 0 \le \psi \le 1,$$

where R_t is the domestic nominal market interest rate and R_t^* is the uncovered (covered) interest parity rate defined as international market interest rate plus expected exchange rate depreciation (forward discount rate). Using notation from equations (1) and (2), R_t^* can be written as follows: $R_t^* = R_t^f + ER_t$ for the uncovered parity rate, and $R_t^* = R_t^f + fd_t$ for the covered parity rate. R_t' is defined as the domestic nominal market interest rate that would be observed if the private capital account were completely closed and is derived as follows.[6]

---

5. The broader concept of money (M_2) is used here instead of the narrow concept (M_1) used by Reisen and Yèches, and the yield to corporate bond for Korea and discount rate for Taiwan are used here as the market interest rate, while they used the curb market rate for Korea and the curb market rate and interbank rate for Taiwan. For Korea, Reisen and Yèches preferred the curb market rate, which is relatively inaccurately measured, to the bond yield because they thought the bond yield—especially the government bond yield in the primary market—was regulated. However, the yield to corporate bonds in the secondary market was pretty much liberalized during the 1980s and so is picked up as an opportunity cost for money holding as well as the market rate. For Taiwan, the discount rate by the central bank was the only available data. In addition, we tried a different measurement for the uncovered interest parity rate by utilizing an univariate ARIMA model for exchange rate forecasting, as will be seen later, in addition to the actual depreciation rate used by Reisen and Yèches for the expected depreciation rate.

6. Equation (3) is derived from Edwards and Khan's (1985) argument that a domestic market-clearing interest rate can be expressed in general as a weighted average of foreign interest rate, i.e., interest rate in a fully open economy, and a domestic interest rate in a completely closed economy, with the weight given to the foreign interest rate being interpreted as the extent of capital mobility: in our notation, "$R_t = \psi R_t^* + (1 - \psi)\,R_t'$" where ψ measures the extent of capital mobility. Then, Haque and Montiel (1990) transformed this form into "$R_t - R_t' = \psi(R_t^* - R_t')$," and Reisen and Yèches (1991) added a constant term, α, to this, as in equation (3) in the text, with the constant term being interpreted as reflecting the interest differential due to the difference in asset quality between foreign and domestic financial assets.

As a first step, a domestic money demand function is estimated in the following simple standard form:

(4) $\ln(M/P)_t = \alpha_0 + \alpha_1 \ln y_t + \alpha_2 R_t + \alpha_3 \ln(M/P)_{t-1} + \varepsilon_t$,

where M_t, P_t, and y_t are money stock, price level, and real GNP, respectively. Then, estimated equation (4) is solved for R_t, and we introduce $M'_t = M_t - CAP_t$, where CAP_t is private capital movements, as follows:

(5) $R'_t = (\alpha_0/\alpha_2) - (\alpha_1/\alpha_2) \ln y_t - (\alpha_3/\alpha_2) \ln (M/P)_{t-1}$
                $+ (1/\alpha_2) \ln (M'/P)_t$.

Now, estimated equation (3) will give ψ as the degree of influence of uncovered or covered interest parity rate on the domestic interest rate, which is to be interpreted as the openness of the capital account.

In addition, for the case of the uncovered parity rate, we measured R^*_t in two different ways alternatively by proxying the expected exchange rate depreciation with the actual depreciation rate under the assumption of perfect foresight (case A) and by forecasting the expected depreciation rate with an univariate ARIMA (1,1,0) exchange rate forecasting model (case B)[7] for Korea and Taiwan, both of which lack a forward currency market. On the other hand, for Japan, with a forward currency market, the LIBOR-on-yen deposit is used as R^*_t, i.e., covered parity rate in this case, as in equation (2) in section 5.4.2.

The estimated results of equations (3) and (4) for Korea, Taiwan, and Japan are reported as follows. Equations (3a) and (3b) are the estimated results of equation (3) cases A and B of R^*_t measurement, respectively. The t-values are in parentheses. The estimated ψ's for these countries are also summarized in table 5.6.

Korea: Sample period, 1980:2–1990:4

(3a) $R_t - R'_t = 4.371 + 0.889(R^*_t - R'_t)$,
                        (1.155) (22.014)
            $\bar{R}^2 = 0.912$, RH01 = 0.759, D-W = 2.33.
                        (7.237)

---

7. Estimation results are as follows with E_t denoting logarithm of exchange rate per dollar at time t and t-value in parentheses:
Korea: Sample period, 1980:1–1990:4

    $E_t - E_{t-1} - 0.584 (E_{t-1} - E_{t-2})$,
                (4.716)
        $\bar{R}^2 - 0.959$, $Q(18) = 7.295$.

Taiwan: Sample period, 1980:2–1990:4

    $E_t - E_{t-1} - 0.788 (E_{t-1} - E_{t-2})$,
                (8.290)
        $\bar{R}^2 - 0.992$, $Q(18) - 11.319$.

Table 5.6   **Measurement of Capital Account Openness: Constant Measure**

Country and Measure	Ψ	t-value	Period
Korea			
Case A	0.89	22.01	1980–90
Case B	0.85	22.23	1980–90
Reisen and Yèches	0.59	7.95	1980–90
Taiwan			
Case A	0.92	17.31	1981–90
Case B	0.96	17.97	1981–90
Reisen and Yèches	0.35	10.20	1980–90
Japan	0.99	315.93	1980–90
Indonesia			
Haque and Montiel	0.87	8.54	1969–87
Malaysia			
Haque and Montiel	0.64	2.93	1967–87

Sources: Reisen and Yèches (1991); Haque and Montiel (1990).

(3b)
$$R_t - R_t' = 5.038 + 0.845(R_t^* - R_t'),$$
$$(5.310)\ (22.234)$$
$$\bar{R}^2 = 0.921,\ \text{D-W} = 1.639.$$

(4)
$$\ln(M/P)_t = -0.29 + 0.086 \ln y_t - 0.002\ R_t + 0.913 \ln (M/P)_{t-1}$$
$$(-2.12)\quad (3.44)\qquad (-3.12)\qquad (36.79)$$
$$\bar{R}^2 = 0.996 \qquad h = -0.302.$$

Taiwan: Sample period, 1981:2–1990:3

(3a)
$$R_t - R_t' = 0.258 + 0.915(R_t^* - R_t'),$$
$$(0.072)\ (17.31)$$
$$\bar{R}^2 = 0.91,\ \text{RH01} = 0.727,\ \text{D-W} = 1.88.$$
$$(6.279)$$

(3b)
$$R_t - R_t' = -3.040 + 0.959\ (R_t^* - R_t'),$$
$$(-2.815)\ (17.974)$$
$$\bar{R}^2 = 0.897,\ \text{D-W} = 1.567.$$

(4)
$$\ln(M/P)_t = 0.215 + 0.374 \ln y_t - 0.022\ R_t + 0.763 \ln (M/P)_{t-1},$$
$$(6.84)\quad (2.36)\qquad (-4.96)\qquad (9.04)$$
$$\bar{R}^2 = 0.99,\ \text{RH01} = -0.25,\ h = -0.324.$$
$$(-2.01)$$

Japan: Sample period, 1980:2–1990:2

(3)
$$R_t - R_t' = -0.348 + 0.993\ (R_t^* - R_t'),$$
$$(-4.528)(315.928)$$

$$\bar{R}^2 = 0.99, \text{RH01} = 0.366, \text{D-W} = 1.46.$$
$$(2.674)$$

(4) $\ln(M/P)_t = -2.195 + 0.272 \ln y_t - 0.002 R_t + 0.848 \ln (M/P)_{t-1}$
$\quad\quad\quad (-2.403) \quad (2.365) \quad\quad (-1.382) \quad\quad (12.213)$

$$\bar{R}^2 = 0.994, \text{RH01} = -0.583, h = 0.143.$$
$$(-4.268)$$

If the estimated ψ value from this model turns out to be large, it will be interpreted as implying a high degree of capital account openness. From these results (also see table 5.6), it becomes clear that Korea and Taiwan, both, have relatively high levels of openness. Korea's ψ value is 0.889 for case A and 0.845 for case B, both significantly different from 1. Taiwan's ψ value is 0.915 for case A and 0.959 for case B, which are, however, not all significantly different from 1. These estimates of ψ for Korea and Taiwan are all higher than Reisen and Yèches's estimates of 0.594 and 0.353, respectively. Japan's ψ value is 0.993, implying almost perfectly mobile capital flows, which is, however, significantly different from a value of 1.[8] According to these results, Korea seems to be maintaining a reasonably high openness of capital flows, but to a degree lower than Japan and Taiwan.

On the other hand, the constant term in equation (3) is interpreted as the difference in interest rates due to the difference in asset quality between domestic and international financial assets, but the results are diversified, depending on the different measurement methods of expected exchange depreciation: case A (eqq. [3a]) implies insignificant constant terms, but case B (eqq. [3b]) offers significant terms, both for Korea and Taiwan, even if identical interest rate data are utilized, i.e., asset qualities are not changed for the two cases. For Japan, the constant term turns out to be significant. These results seem to contradict expectations since London interbank yen deposits and Japan's domestic interbank deposits should be more identical in terms of asset quality than London interbank dollar deposits and Korea's corporate bonds or Taiwan's discount lending. Therefore, one must be careful in interpreting the constant term as a measurement of difference in asset quality.

Second, the Kalman filter technique is applied to equation (3), and the time-varying estimates of ψ are derived for the three countries and are plotted in figures 5.4–5.6.[9] To check if the time variation of ψ is significant, i.e., that

8. The estimation result of Japan's money demand equation (4) suggests that interest rate elasticity is relatively less precisely estimated and this may cause larger errors-in-variables problems with the estimated R_t', which could in turn produce a downward bias of the estimated ψ. However, Japan's estimated ψ value seems high enough, and the precision of the estimate is fairly high with a t-value of 315.9. On the other hand, the result that Taiwan's ψ is not significantly different from 1, but that Japan's ψ is, seems inconsistent with the implication of other observations that Japan's openness seems to be higher than Taiwan's, as already seen concerning the degree of capital mobility of these countries. This stems from the fact that the estimate of Taiwan's ψ is least precise among the three countries.

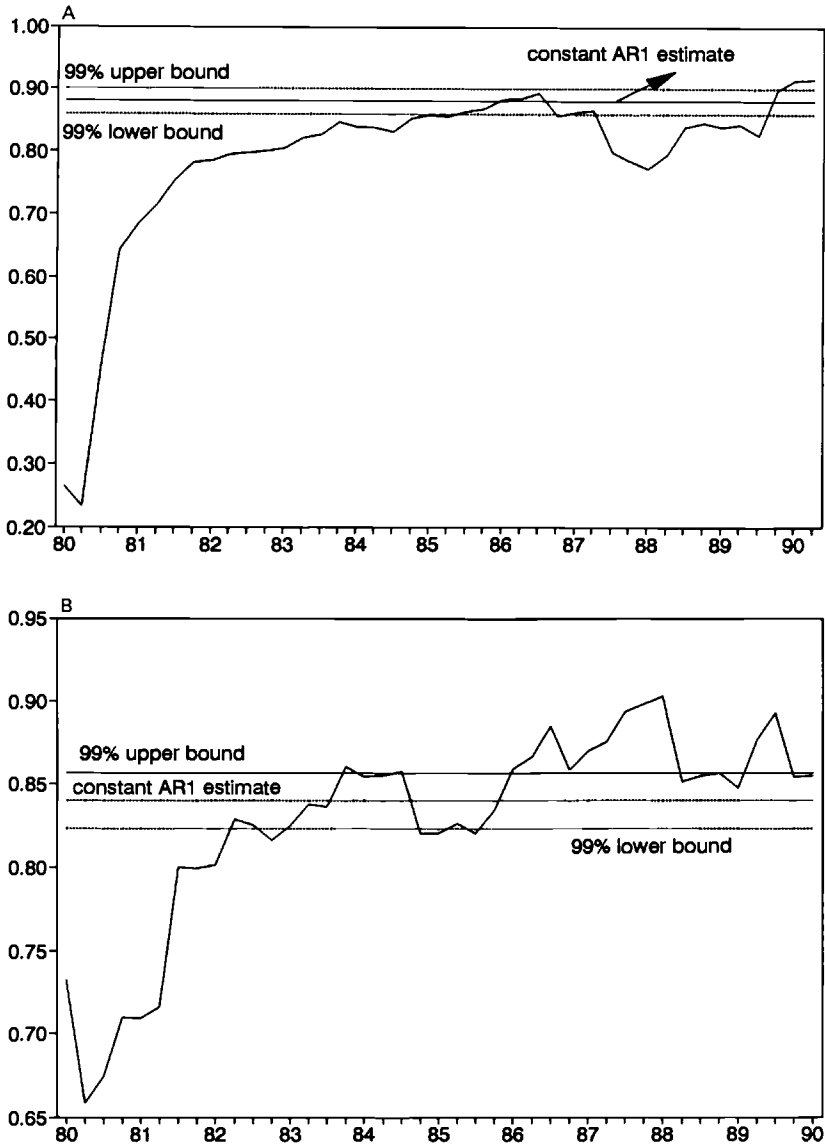9. See Reisen and Yèches (1991) for the details of this procedure applied specifically to equation (3).

Fig. 5.4   Korea's time-varying estimate of capital account openness (A, Kalman filter, case A; B, Kalman filter, case B)

time-varying estimates of ψ are statistically different from constant estimates of ψ, we also draw the 99 percent confidence interval of the constant estimate. If the time-varying estimate falls outside of this interval, it is significantly different from the constant estimate, and vice versa. First, for case A, Korea's openness has gradually increased from the early 1980s but with a little stagnation during the short interval of late 1987 to early 1988, and time variation
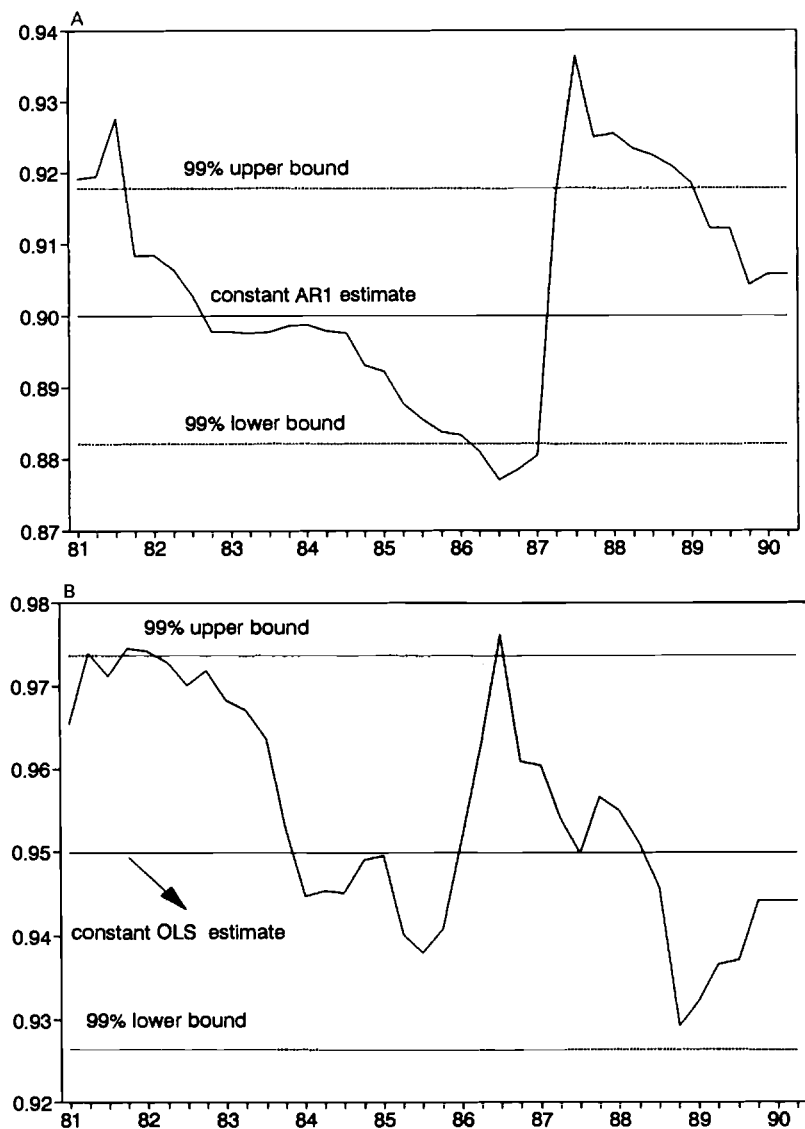
Fig. 5.5   Taiwan's time-varying estimate of capital account openness (A, Kalman filter, case A; B, Kalman filter, case B)

turns out to be significant, implying that Korea achieved a statistically significant improvement in capital account openness. This finding is opposite to the findings of Reisen and Yèches. Their results imply that, in general, Korea's openness gradually declined from the first half to the second half of the 1980s. Taiwan's openness, after staying at low levels until 1986, increased sharply to reach a high level of openness in 1987 but with a slightly declining trend from
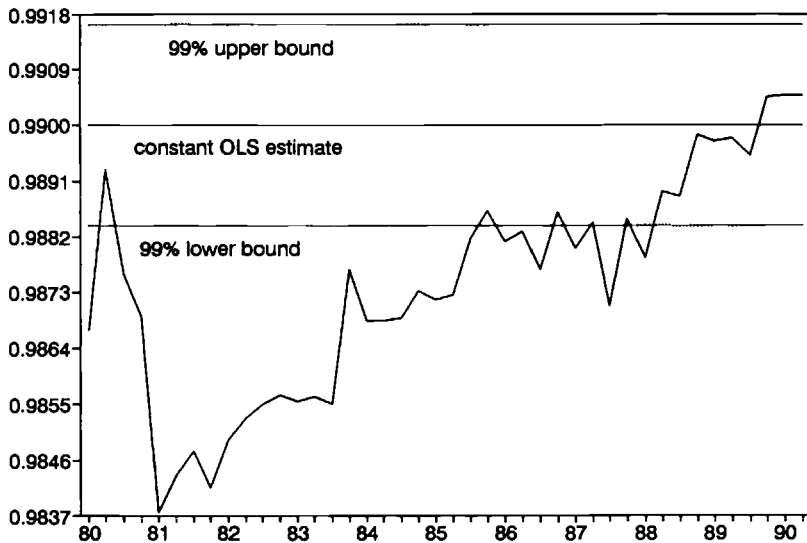
Fig. 5.6   Japan's time-varying estimate of capital account openness (Kalman filter)

then on, and this variation seems significant but much less than for the case of Korea. Second, for case B, Korea's openness has been gradually increasing and the variation is still significant; Taiwan's openness has been fluctuating around a relatively high level but within a narrow band, and so the variation turns out to be mostly insignificant. For Japan, time-varying estimates of ψ, after a short drop in the first quarter of 1981, have been rising continuously, and these changes turn out to be significant, with time-varying estimates of ψ being significantly different from constant estimates.

Finally, to obtain an additional series of time-varying estimates for ψ, a rolling-over regression is applied to equation (3) by adding one more data point at each time, starting from the base regression which utilizes the first 10 data points from the data set used for the estimation of equation (3). The resulting time-varying estimates of ψ are plotted in figures 5.7–5.9 for each country. However, in this case, only case A is reported for Korea and Taiwan. According to this result, Korea displays almost the same trend (illustrated in fig. 5.7) as in the Kalman filter method. In figure 5.8, Taiwan also displays a trend similar to the result of the Kalman filter method. After a sharp rise in openness in the mid-1980s, there was a trend of gradual decrease in the latter part of the 1980s.[10] Japan, in figure 5.9, also shows a trend similar to the result of the Kalman filter estimates.

The evidence presented in this section suggests that Korea has achieved a reasonably high degree of openness, measured by constant estimates. The Kal-

10. Case B both for Korea and Taiwan, not reported here, shows a pattern similar to case A, i.e., that rolling-over regression produces a trend very similar to the Kalman filter method.
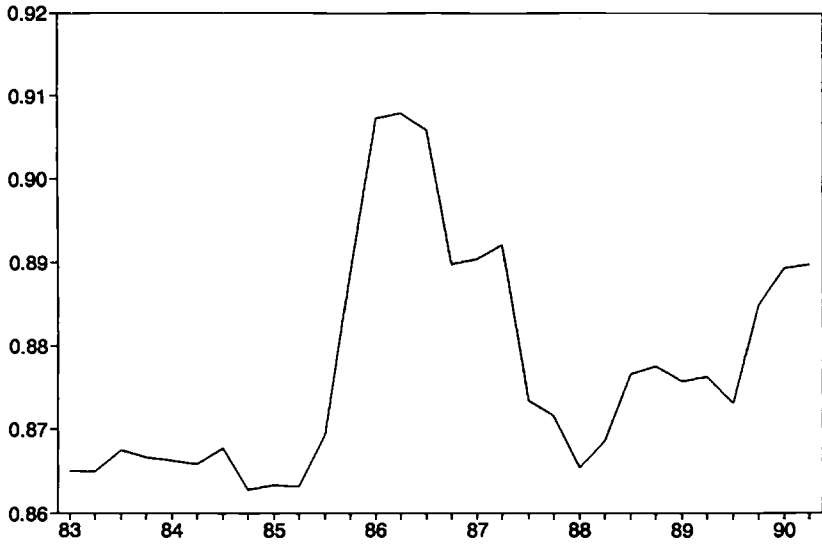
Fig. 5.7   Korea's time-varying estimate of capital account openness (rolling-over, case A)
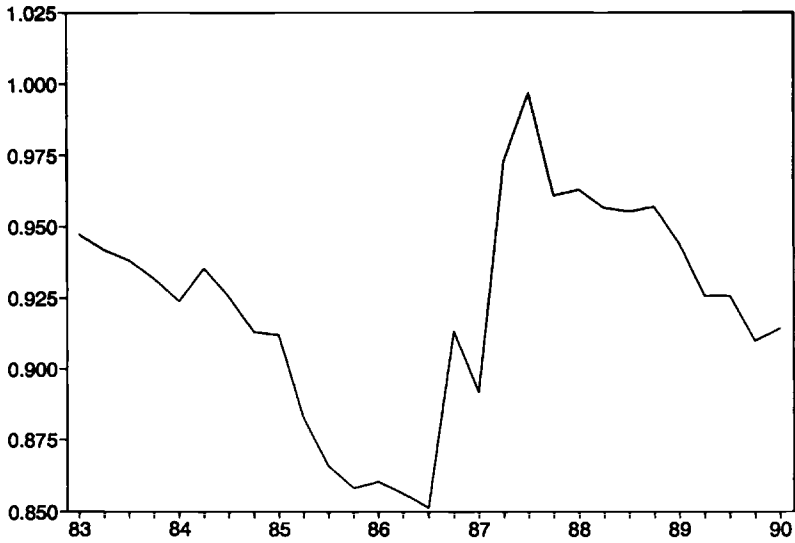

Fig. 5.8   Taiwan's time-varying estimate of capital account openness (rolling-over, case A)
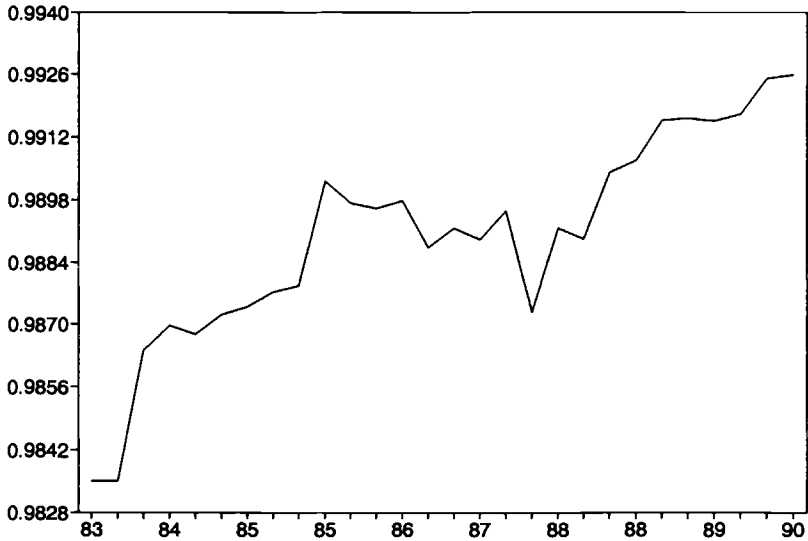
Fig. 5.9   Japan's time-varying estimate of capital account openness (rolling-over)

man filter and the rolling regression show a steady increase in the level of openness during the 1980s, and this increase turns out to be statistically significant. However, it is also interesting to note that time-varying estimates for case A and rolling-over regression both show a relative stagnation of openness during 1987–88, a period which coincides with favorable uncovered interest rate differentials and the rising importance of capital flow as percentage of trade as observed in table 5.2. Again, we find some inconsistency among the implications of various measurements of openness during 1987–88, and it seems still to be the case that the capital control policy of leaning against the wind might have created this situation, as discussed in section 5.2.2. Note that time-varying estimates of ψ in equation (3) crucially depend on and tend to reflect the trend of the data on the uncovered interest parity rate (R_t^*) which are the same data used for the calculation of uncovered interest rate differentials. Therefore, we come to the same situation as in section 5.2.2, where measurements related to uncovered rate differentials suggest a slight stagnation of openness but capital flow as percentage of trade suggests the opposite.[11] However, after this short interval, the extent of openness seems to have returned to its rising trend.

11. This seems to suggest that the time-varying ψ in equation (3) tends to reflect mainly information contained in the data on (un)covered interest rate differentials. In other words, the parameter ψ mirrors mainly the image of (un)covered differentials and, therefore, is somewhat limited in providing additional information on the openness of capital flow. The relationships between the movements of ψ and (un)covered differentials observed for the cases of Japan and Taiwan also lead to the same implication.

On the other hand, Taiwan experienced a sharp increase in openness around 1986, then the trend seems to have declined slightly in the late 1980s, but according to case B, Taiwan's openness turns out to be highly fluctuating even within a narrow band. However, the time variation of openness is not statistically significant, implying that during the 1980s, Taiwan's openness, even if reasonably high, remained stable. In the case of Japan, the openness of the capital account is not only very high but increased during the 1980s, and these changes turn out to be statistically significant.

5.4.4   A Gross Flow Index for Capital Flow

Trading in risky assets contributes to portfolio diversification and leads to a reduction of risk for the overall portfolio. There are gains to be achieved from trading in international financial assets if the prices for bearing certain risks differ for different countries. That is to say, the price differences among financial assets of similar risk for different countries can yield trade gains, as in the international trade of commodities.

"Bringing in the element of risk is thus a major shift from the traditional analysis of capital flows, because it delinks the welfare implications of an open capital account from its effect on investment. Even if saving and investment are unaffected by allowing capital flows, i.e., even if the private capital account were exactly balanced by inflow and outflows of capital, the individual agents of the economy would benefit from trade in risky assets. Moreover, the argument that individuals should be allowed to trade assets internationally, based on differences in preferences, production and evaluation of risk, is, analogously to the trading of commodities, perhaps the strongest argument for open capital markets" (Hanson 1992).

Suppose there could be two types of capital flows as implied in the discussion above: one is a capital flow traditionally perceived to supplement excess savings or investment, and the other exists to take advantage of gains from trade in risky assets. To put the discussion in a simple context, if capital flow is assumed to consist of only the former type, there is no need for two-way trade in capital. Deficient savings compared to investment will require only one-way capital inflow, while excess saving over investment requires only capital outflow. However, once the second type of capital flow is added, the total volume of capital inflow and outflow will tend to increase for a given net flow that will eventually reflect excess savings or investment. Therefore, a relatively larger volume of two-way capital flow, ceteris paribus, could be taken as evidence that capital flow of the second type is more active than otherwise.

Along this line of reasoning, we introduce the concept of the gross flow index for capital flow to measure the degree of capital mobility of this two-way nature. This index measures the importance of two-way trade in capital flow similarly to the so-called intraindustry trade index and is defined as follows:

$$1 - \frac{|\text{ net capital balance }|}{|\text{ capital inflow }| + |\text{ capital outflow }|}.$$

If the index is close to 1, the volume of total capital flow in both directions is very large compared to the net balance required for savings and investment equalization. In this case, we interpret it as saying that capital flow reflects relatively more of the incentive to trade in risky assets. The capital account is more than the simple mirror image of the current account in this situation. If, on the other hand, the index is close to 0, indicating a more one-way flow, capital flow mirrors the current account to a relatively large extent, supplementing deficient domestic savings for investment or encouraging the investment of excess savings abroad.[12]

These gross flow indices for overall capital account, portfolio and direct investment, and other flows for various countries are reported in table 5.7. According to this index, Korea is performing poorly for overall capital and portfolio investment flows, much lower than the Asian (developing) countries' total. But the index shows that Korea has a very high degree of gross flow for foreign direct investment, much higher than the Asian total. However, it is interesting to observe that Japan's indices for all forms of capital flow are lower than the industrial countries' total (recall that Japan's capital flows as a percentage of trade were in all cases higher than the total; table 5.4). In particular, Japan's index for foreign direct investment is much lower than Korea's.

In sum, the openness of Korea's capital flows appears low, whether measured as the importance of capital account in foreign transactions, as in table 5.4, or as intraindustry trade in capital flows. However, the intraindustry trade index, especially for foreign direct investment, is higher vis-à-vis the Asian total than is flow as a percentage of trade. And the trade index, even the one for portfolio investment, rises over time, contrary to the case of the percentage of trade. Therefore, one may conclude that the openness of Korea's capital account is rising and registers higher on the intraindustry trade index than on capital flow as a percentage of trade.

However, in the case of Japan, one can see the reverse: the intraindustry trade indices for portfolio and foreign direct investments declined during the 1980s and were much lower than that of industrial countries' total, while the opposite trend is observed for capital flows as a percentage of trade, as seen in table 5.4. This implies that even if Japan shows a relatively large volume of total capital flow in foreign transactions, the nature of the capital flow is more counteractive, in response to current account surpluses, and less capital flow for its own sake, independent of the current account trend. According to this interpretation, Japan's openness of capital flow, very high by almost all measures, seems to be rather limited.

5.4.5 Evaluation

One may conclude from this section that Korea's capital mobility rose gradually during the 1980s and remains reasonably high, comparable to Taiwan's

---

12. Gros (1992) also used this index for measuring the effectivenss of capital control in EC countries, but without fully recognizing the importance of this index as a measurement of capital mobility that reflects trade in risky assets.

Table 5.7 **Gross Flow Indices for Capital Flow**

Country	Overall Capital Account[a]			Portfolio Investment			Foreign Direct Investment			Other Long-term Capital			Other Short-term Capital		
	1981–85	1986–90	1981–90	1981–85	1986–90	1981–90	1981–85	1986–90	1981–90	1981–85	1986–90	1981–90	1981–85	1986–90	1981–90
Industrial countries[b]	0.87	0.89	0.88	0.92	0.97	0.94	0.89	0.85	0.87	0.09	0.59	0.34	0.90	0.90	0.90
United States	0.54	0.58	0.56	0.59	0.23	0.41	0.41	0.69	0.55	0.06	0.13	0.10	0.52	0.83	0.68
Japan	0.43	0.56	0.50	0.67	0.44	0.56	0.13	0.04	0.08	0.11	0.14	0.13	0.82	0.79	0.81
Germany	0.50	0.39	0.45	0.78	0.64	0.71	0.34	0.30	0.32	0.00	0.00	0.00	0.45	0.35	0.40
Asia (developing countries)[c]	0.71	0.57	0.64	0.12	0.26	0.19	0.17	0.49	0.33	0.16	0.70	0.51	0.86	0.72	0.79
Korea	0.38	0.29	0.34	0.00	0.17	0.09	0.54	0.53	0.54	0.55	0.33	0.44	0.18	0.23	0.20
Singapore	0.60	0.41	0.50	0.47	0.31	0.39	0.19	0.13	0.16	0.31	0.34	0.32	0.64	0.44	0.54
Indonesia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: IMF, *Balance of Payments Statistics Yearbook* (Washington, D.C.).

[a]A weighted average of individual indices of portfolio investment, foreign direct investment, and other long-term and short-term flows with the weight given by the relative size of each category of capital flow in the total capital flow.

[b]See table 5.4, note a.

[c]See table 5.4, note b. Data for Taiwan were not available.

but markedly lower than Japan's. While Taiwan has maintained a higher constant measure of capital mobility than Korea, this estimation is less precise, and time-varying measures show insignificant variations, implying that there has not been much improvement in Taiwan's capital mobility during the 1980s. For Japan, even with its very high degree of capital mobility during the 1980s by almost all measures, the intraindustry trade index for capital flows suggest a relatively limited degree of capital mobility when compared to other measures, such as capital flow as a percentage of trade.

5.5   Concluding Remarks

It has been suggested that stable macroeconomic conditions with low inflation, interest rate deregulation, and a flexible exchange rate system are the prerequisites to successful capital account liberalization. According to the optimal sequencing literature, these conditions should be satisfied before the capital account is opened to any substantial degree.

Korea is now at the threshold of stabilizing its domestic economy, which has been overheated since the late 1980s, and correcting its current account deficit. This is still creating some concern about the possibility that capital inflow may add to inflationary pressure, further aggravating the domestic macroeconomic situation. As mentioned earlier, although official interest rate deregulation policy has been in effect, the pace of deregulation has not developed well, instead becoming entangled with government interventions. The prospect for interest rate liberalization at the moment seems very gloomy. On the other hand, the exchange rate regime is very much liberalized and moving in the right direction.

Because of some of the impediments that still exist in Korea, it may be the case that rapid capital account liberalization is premature at this point. However, now the government as well as the private sector has recognized the need and the inevitability of opening the capital account sector. The business sector in Korea has been eager to expand its access to foreign credit, because the domestic supply of credit is tightly controlled. The government, for its part, is concerned about the effectiveness of its monetary policy and is against too active an inflow of capital initiated by the private sector, though it faces strong U.S. pressure to decontrol capital flow. The U.S. government has been one of the crucial factors in determining the speed of Korea's capital account opening. The United States is pressing the Korean government very hard to open its capital account to allow more freedom to U.S. banks, financial institutions, and businesses that want to invest in Korea. This international pressure will play an integral factor in determining the pace of capital liberalization.

The Korean government, despite the real possibility of rendering domestic monetary policy ineffective, is seriously debating opening the capital account to realize the potentials of free capital movement in the longer policy horizon. Now, the government is preparing a long-term, gradual plan for capital account

liberalization[13] and has already enacted a new Exchange Control Law that institutes the negative list system, a great improvement on the old positive list system.

In sum, one can safely say that Korea fares relatively well compared to Japan and Taiwan in terms of international capital mobility. Korea's absolute level of openness is still not very high, but it seems to be moving, even if a little slowly, toward liberalization and institutional and regulatory improvement.

Appendix A

Table 5A.1   Glossary of Variables Used and Their Sources

Variable	Definition and Measurement	Sources
M_t	Money stock (period average): M_2	1
P_t	Price level (period average): consumer price index	1
y_t	Real output: constant GNP	1
CAP_t	Private capital account: direct investment plus portfolio investment plus other capital, plus net errors and omissions	1
R_t	Money market rate: yield to corporate bonds for Korea, discount rate for Taiwan, and short-term interbank rate for Japan	1
R_t'	Domestic market-clearing interest rate that would be observed if private capital account were completely closed	1
R_t^*	Uncovered interest parity rate	1, 2, 3
	Case A for Korea and Taiwan: LIBOR on 3-month dollar deposits plus actual exchange depreciation rate	
	Case B for Korea and Taiwan: LIBOR on 3-month dollar deposit plus expected exchange depreciation rate forecasted by ARIMA (1,1,0) model	1, 2, 3
	Covered interest parity rate for Japan: LIBOR on 3-month yen deposit in Euro-market.	1

Data Sources:
1. IMF, *International Financial Statistics,* (Washington, D.C.).
2. Korea Development Institute data base (Seoul).
3. *Financial Statistics Monthly, Taiwan District* (Taipei).

13. In this context, Korea may learn many useful lessons from the gradualist approach to capital account liberalization taken by Japan, Denmark, and Finland. See OECD (1990) for the experience of these countries.

Appendix B

Regulatory Changes in Controls on Capital Transactions during the 1980s.

Direct Investment by Foreigners

84.7.1	• Regulation system transformed from a positive list system to a negative list system.
	• Automatic approval system for foreign direct investment adopted for foreign investment in manufacturing businesses with its share under 50 percent and the investment amount under $1 million dollars, unless tax exemption is applied.
87.7.1	• Responsibility of approval for direct investments subject to automatic approval transferred from the Minister of Finance to the Bank of Korea.
	The amount of foreign direct investment subject to automatic approval raised from $1 to $3 million dollars.
90.1.1	• The amount of foreign direct investment subject to automatic approval raised from $3 to $100 million dollars.
91.1.1	• Automatic approval system replaced by a simple reporting system.

Portfolio Investment by Foreigners

81.10.28	• Investment trust companies approved to issue matching funds to foreigners.
84.6.29	• Transaction of domestic securities by foreign investment companies approved. Korea Fund established on July 1, 1984.
85.11.25	• Issuance of convertible bonds and bonds with subscription warrants or stock depository receipts allowed for domestic firms.
87.3.24	• Korea Europe Fund established.
90.6.11	• Issuance of mixed form of matching fund allowed for investment trust companies.
92.1.1	• Portfolio investment in the domestic stock market allowed up to 3 percent of the outstanding shares by a single investor and 10 percent of the outstanding shares by a single company.

Direct Overseas Investment

81.7.21	• Evaluation Committee for Foreign Investment established in the Bank of Korea.
	• Prerequisites relaxed for investors from 3 years to 1 year for the experience requirement, and the capital prerequisite relaxed.
	• The withdrawal obligation for invested funds and prior approval system for foreign investment project plans abolished.

82.7.19
- The approval procedure simplified for foreign investments: requirement of opinion references of the related authorities abolished in cases of investments less than $100,000 dollars.
- The required ownership ratio for joint ventures alleviated: the required share reduced from over 50 percent to less than 50 percent when real management power can be secured.

83.12.21
- The limit for automatic profit reserve increased.

84.11.16
- Foreign investment prerequisite and evaluation criteria for foreign investments approval enacted.

85.5.24
- Amount of invested money for evaluation by the Inquiry Commission for Foreign Investment Projects adjusted upward from $500,000 dollars to more than $1 million dollars.

85.8.29
- Participation in cooperative projects added to the foreign investment category.

86.12.27
- A system introduced that substitutes authorization by confirmation only of the foreign investment requirements in cases of investments less than $200,000 dollars or an offer of technical service.

87.9.1
- The minimum amount subject to confirmation of foreign investment requirements increased from $200,000 to $500,000 dollars.
- The maximum reserved profit of overseas corporations increased from less than $100,000 dollars to $500,000 dollars.

87.12.28
- Investors' qualifications relaxed, and experience prerequisites abolished.
- A simple reporting system introduced for foreign investments of less than $1 million dollars and foreign investments by reserved profit of less than $1 million dollar.
- Categories of investments subject to approval by the Review Commission for Foreign Investment Projects reduced; the investment amount adjusted upwards from $3 to $5 million dollars, and investment for real estate and agriculture excluded from those categories.

88.3.25
- Export credit deleted from the foreign investment category.
- The limits for voluntary profit reservations abolished for overseas local corporations and an overall reporting system introduced for additional investment by the profit reserves.
    Investment qualification prerequisite relaxed: investment approval by main transaction banks abolished.
    The approval procedure simplified.
- Foreign investments of less than $1 million dollars by individuals liberalized.

88.7.1
- The own-capital requirement removed from the investor qualification.
- Foreign investments by debt-equity swap allowed.

88.9.15   • Providing technical service excluded from the foreign invest-
            ment category.
            • Category of investment expanded for real estate investments.
            • Regulation on types of preferred businesses in foreign invest-
            ment abolished.
            • Export-Import Bank of Korea allowed to accept the reporting
            for foreign investments when projects meet regulatory require-
            ment and are given financial support by the Bank.
88.11.1   • The category of investment subject to the simple reporting obli-
            gation expanded from less than $1 to $2 million dollars.
89.2.13   • The limit for foreign investments by individuals abolished. The
            previous limit was $1 million dollars.
            • Gratification requirements for investment relaxed. The owner-
            ship share reduced from 50 percent to 20 percent for security
            investment, and the minimum interest rate requirement (above
            6-month Libor rate) abolished.
89.8.10   • The category of investment in foreign real estate expanded.
                Corporations: real estate related to businesses such as facili-
                ties for research or training institutes.
                Individuals: overseas acquisition of real estate for business
                operation and residential houses for workers who work at a
                foreign branch for a long time period.
90.7.1   • The screening criteria strengthened for the prospect of business
            for large investments or investments exceeding self-financed
            capital.
                Large-scale projects: project is larger than $50 million dol-
                lars with Korea's share larger than 50 percent or Korea's
                share is larger than $30 million dollars.
                Projects exceeding own capital: the investment exceeds $5
                million dollars and is more than investor's own capital.

Overseas Portfolio Investment

Investment in Foreign Currency Securities by Institutional Investors

85.9.1   • Regulations related to participation in underwriting groups for
            foreign currency securities enacted.
                Underwriting securities: foreign currency bonds and stock
                depository receipts that are issued by domestic corporation
                in foreign markets.
                Scope of underwriting: underwriting limits for each security
                company set to within 1 percent of the total amount of issu-
                ance or less than $1 million dollars.
                Selling method: sell in foreign countries.

Financial funding for underwriting: the fund raised through selling securities in foreign countries.

87.9.1   • Regulations on investments in foreign currency securities by domestic security companies relaxed.

88.7.1   • Regulation on investments in foreign currency securities by institutional investors relaxed.

Category of investment institutions enlarged to include not only security companies but also investment trust companies and insurance companies.

Limits for investment amount increased to $30 million dollars for security companies and $10 million dollars for insurance companies and investment trust companies.

Investment category expanded to include not only participation in underwriting groups but also in purchasing foreign currency securities in secondary market, depositing foreign currencies, and purchasing certificates of foreign currency deposits issued by financial institutions.

Approval procedure overhauled to report to the Bank of Korea only when participating in underwriting groups, but approvals not required in other cases.

90.3.2   • The limit for investment in foreign currency securities by institutional investors extended.

Security companies: $50 million dollars for securities companies which acquired the dealing license for international businesses; $30 million dollars for others.

Investment trust companies: $30 million dollars for investment trust companies dealing with international businesses; $10 million dollars for others.

Insurance companies: $30 million dollars for insurance companies exceeding $5 trillion won in total assets; $10 million dollars for others.

Acquisition of Main Office Stocks by Korean Employees Who Work for Domestic Branch Offices of Foreign Companies

87.9.7   • Acquisition of main office stocks by Korean employees working for branch offices or offices of foreign banks allowed.

88.3.25   • Regulations on acquiring main office stocks relaxed. Stock acquisition approved for Korean employees who work for foreign direct investment companies or domestic branches of foreign companies in which stocks are allocated specially by the main office.

Short-term Borrowing

81.8.1   • Partial adjustment and relaxation of borrowing conditions.
           Borrowing conditions changed from repayment in equal in-
           stallments to repayment in installments.
           Integration of final repayment period from 2 years, 2½
           years, or under 3 years, starting on borrowing day to within
           3 years.
82.7.29   • Partial relaxation of borrowing conditions.
           Equal installment conditions abolished.
           Conditions on borrowing interest rates abolished.
           In the case of bridge loan, repayment by borrowing from
           the funds raised with the contract to issue foreign currency
           bonds allowed.
87.12.28   • The responsibility to review the application for bridge loan
           shifted from the Bank of Korea to the Minister of Finance.

Local Financing

87.9.1   • The category for local financing expanded to cases related to
           development of real estates by overseas local construction
           company.
87.12.28   • The beneficiary of trade related local financing expanded from
           importers from Korea to importers from Korea and exporters
           to Korea.
91.1.1   • Specific purpose regulation system replaced by general purpose
           regulation system.
           • Local financing for facility investment and mortgage loan al-
           lowed.
91.9.1   • Exemption limit from the procedure of prior approval expanded
           from less than $1 million to $5 million dollars.
           • Limitation of local financing expanded for trade related financ-
           ing from 30 percent to 50 percent of annual exports.

References

Edwards, Sebastian, and Mohsin S. Khan. 1985. Interest rate determination in devel-
    oping countries: A conceptual framework. *IMF Staff Papers* 32(3):377–403.
Fischer, Bernhard, and Helmut Reisen. 1992. *Towards capital account convertibility.*
    OECD Development Centre, Policy Brief no. 4. Paris: Organisation for Economic
    Cooperation and Development.
Frankel, Jeffrey A. 1989. *Quantifying international capital mobility in the 1990s.*
    NBER Working Paper no. 2856. Cambridge, Mass.: National Bureau of Economic
    Research, February.

Fukao, Mitsuhiro, 1990. Liberalization of Japan's foreign exchange controls and struc-
    tural changes in the balance of payments. *BOJ Monetary and Economic Studies*
    (Bank of Japan) 8, no. 2 (September).
Gros, Daniel. 1992. Capital controls and capital market liberalization in southern Eu-
    rope. Paper presented at a joint seminar on Monetary and Financial Policy Reform
    held by KDI and Friedrich Ebert Stiftung, May 27–28.
Hanson, James A. 1992. An open capital account: A brief survey of the issues and the
    results. Paper presented at the Conference on the Impact of Financial Reform held
    at the World Bank, Washington, D.C., April 2–3.
Haque, Nadeem U., and Peter Montiel. 1990. *Capital mobility in developing coun-
    tries—Some empirical tests.* IMF Working Paper, WP/90/117. Washington, D.C.: In-
    ternational Monetary Fund.
Ito, Takatoshi. 1986. *Capital controls and covered interest parity between the yen and
    the dollar.* NBER Reprint no. 897. Cambridge, Mass.: National Bureau of Eco-
    nomic Research.
————. 1991. *The Japanese economy.* Cambridge: MIT Press.
Jwa, Sung Hee. 1988. The political economy of market-opening pressure and response:
    Theory and evidence for the case of Korea and the United States. *Seoul Journal of
    Economics* 1(4).
OECD (Organisation for Economic Cooperation and Development). 1990. *Liberaliza-
    tion of capital movements and financial services in the OECD area.* Paris: Organisa-
    tion for Economic Cooperation and Development.
Reisen, Helmut, and Helen Yèches. 1991. *Time-varying estimates on the openness of
    the capital account in Korea and Taiwan.* Technical Papers no. 42. Paris: Organisa-
    tion for Economic Cooperation and Development.

Comment   Kazuo Ueda

This paper provides a neat summary of Korean capital controls in the 1980s
and an interesting econometric analysis of the degree of openness of Korean
money and capital markets. In the following, I organize my comments from
the perspective of a comparison between the Japanese and Korean experiences.

I was struck by the similarity between the Japanese and Korean experiences
with controls on cross-border capital flows. Korean capital controls have re-
sponded significantly to balance of payments situations; the same thing hap-
pened in Japan in the 1970s. A balance of payments deficit led to more restric-
tions on capital controls, which were then relaxed as the deficit turned into
a surplus.

It may also be interesting to comment on the background of the liberaliza-
tion of controls in Japan that took place in the early 1980s. First, huge budget
deficits in the late 1970s created a need for developing the market for govern-
ment bonds, which in turn led to the liberalization of the movements of many
other interest rates—a precondition for free international capital movements.
Second, with the exception of brief periods following the two oil shocks in the

Kazuo Ueda is professor of economics at the University of Tokyo.

1970s, Japan was starting to record large structural current account surpluses, thus relieving the government of its concern about the effects of capital account opening on the balance of payments. Third, there were pressures from the United States to open Japanese markets. These points may provide some interesting lessons for understanding the process of capital account liberalization in Korea.

Jwa also refers to concerns about exchange rate appreciation and the loss of monetary control as impediments to liberalization. These concerns are obviously the two sides of the same coin. If a country wants free capital movements and independent monetary policy, it needs a flexible exchange rate and must forget about exchange rate changes. Japan has moved to a flexible exchange rate since 1973 but has not abandoned exchange rate targets completely, for various reasons. Hence, there have been serious constraints on domestic monetary policy—one good example being the excessive monetary expansion of the late 1980s and the resultant asset price inflation.

I have some reservations about the more technical aspects of the paper. Looking at the ratio of net to gross capital flows as a measure of capital account openness is interesting. Japan is on the liberal side according to this standard. However, this is due to the presence of regulations in the domestic market which have forced Japanese firms to raise funds in foreign markets.

In another test of capital account openness, the estimation of equation (1), Jwa uses actual exchange rate changes in the R^* variable, which creates an errors-in-variables problem, biasing the coefficient estimate toward zero. In the same test, the difference between R and R' depends on the size of private capital movements relative to money supply. This should be small for a country like Japan, which tends to make the coefficient on R' close to zero. A more natural test, though difficult because of the unavailability of data, would be a comparison of Euro-market and domestic interest rates.

Comment   Pochih Chen

1. Part of capital flow may hide in trade by reporting false prices and by the practice of lead and lag. Therefore, in addition to the fact that the ratio of trade to GNP may differ from country to country, using the ratio of reported capital flow to trade as an indicator of capital mobility may induce significant measurement errors.

2. Capital flow itself may be a factor affecting money demand, especially in a temporary equilibrium. When someone shifts his money from currency A to currency B in expectation of the future appreciation of currency B, he would keep the funds in the form of money for a while and therefore increase his

Pochih Chen is professor of economics at National Taiwan University.

demand for money in currency B. This is a demand for money similar to the speculative demand for money pointed out by Keynes. If equation (2) of this paper could include this factor the results would be even more convincing.

3. Capital flow may be sterilized by the monetary authority. Capital flow may also influence the credit creation ability of domestic financial institutions. Therefore, the effect of capital flow on money supply may not be as simple as the relation $M' = M - CAP$ used in this paper.

4. Under a floating exchange rate system, money supply will not be affected by capital flow directly. Its indirect effects through exchange rate variations would be very different from what is assumed in this paper.

5. From an econometric point of view, there would be a notable problem caused by measurement error in R_t'. As pointed out above, the method to estimate R_t' is not very delicate, so there would be significant measurement error in R_t'. Because R_t' appears on both sides of equation (1), the estimated value of the coefficient of $(R_t^* - R_t')$ in equation (1) would have a tendency to come closer to one when the measurement error of R_t' increases. This would explain some part of the unacceptable results of the estimations in section 5.4.3.

6. Using the intraindustry trade index to measure the degree of capital mobility induced by the differences in the risk nature of financial assets is an interesting method. However, if the time period for measuring this index is too long, it is possible that there are significant changes in the economic situation so that the relative magnitude of capital inflow and outflow would change drastically within a single period. The direction of net flow may also change. In an extreme case, we may have only capital inflow in one part of the period and only capital outflow in another part. Consequently, intertemporal trade within a period would be misregarded as intraindustry trade, if the length of the period for measuring this index is too long.