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9 Evaluation of Korea's Exchange Rate Policy

Sang-Woo Nam and Se-Jong Kim

9.1 Korea's Exchange Rate Management, 1970–95

9.1.1 Exchange Rate Regimes

Korea maintained a de facto dollar peg regime until the end of the 1970s, although the system, started in 1965, was officially called a unified floating exchange rate system. The exchange rate of the Korean won against the U.S. dollar was fixed until it appreciated considerably in real (effective) terms, seriously deteriorating export competitiveness. There were relatively large nominal devaluations in 1971, 1974, and 1980.

Entering the 1980s, proper management of the exchange rate was considered all the more important for Korea since the government began to expand trade liberalization, phasing out various export subsidies and import protection measures. In early 1980, a new exchange rate system was adopted in which the Korean won was supposed to be pegged to a basket of currencies for major trading partners. The new exchange rate system was designed to maintain a more stable real effective exchange rate (REER) of the Korean won when there are large fluctuations in the exchange rates of major trading partners. The REER is considered the best indicator for assessing the competitiveness of exports in the world market.

However, in practice, Korea's currency basket system did not aim at a rigid peg. In actuality, the authorities did not disclose the weights applied to the currencies of major trading partners, and policy considerations seem to have played an important role in managing the exchange rate. In fact, the International Monetary Fund (IMF) classified the regime as managed floating, and the REER of the won had exhibited sizable fluctuations during the 1980s.

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In March 1990, a new exchange rate system known as the "market average rate" system replaced the former multicurrency basket peg system. Under this system, the basic exchange rate of the Korean won against the U.S. dollar was determined in the market within a specified range around the weighted average interbank rates of the previous day. The rates against other foreign currencies were then determined by the U.S. dollar rate of the currencies in international foreign exchange markets. An important feature of this new system was that it allowed market forces to play a part in determining exchange rates, thereby laying a basis for the market to become more efficient and moving toward a free-floating regime in the future.

The imposition of a limit on daily fluctuations of the exchange rate was designed to avoid exorbitant movements of the rate in the exchange market, which was still shallow and inefficient. However, the range of allowed daily fluctuations had steadily widened in several steps. At the start, the limit, in either direction, was set at 0.4 percent of the weighted average of the interbank rates of the previous day, but it was expanded in several steps to 2.25 percent in December 1995. The government plans to further widen the band of daily fluctuations and ultimately lift the band in accordance with the maturation of the exchange market. There was evidence that the volatility of the daily won-dollar rate had increased in accordance with the continued widening of the band allowed for daily fluctuation under the market average rate system (Kim 1993). This, however, did not mean that the exchange rate had been unstable in the long run. Actually, the REER had apparently been more stable in the 1990s under the market average rate system than in the 1980s.[1]

9.1.2   The Exchange Rate as an Instrument of Macroeconomic Management

In the early 1970s, the Korean won continued to depreciate against the U.S. dollar while the Japanese yen continued to appreciate under a floating exchange rate system introduced in 1971. As a result, the won showed substantial depreciation on a real effective basis, though this depreciation quickly disappeared because of Korea's high inflation rate.

During the latter half of the 1970s, the won remained fixed to the U.S. dollar in spite of Korea's fairly high inflation. Thus the won appreciated on a real effective basis even though the Japanese yen continued to gain strength against the U.S. dollar. Notwithstanding the adoption of the multicurrency basket peg system and a 20 percent devaluation in 1980, followed by a steady nominal depreciation of the won against the U.S. dollar, the won's REER moderately appreciated until 1982. Then the won depreciated relatively steeply on a real effective basis until mid-1986. This trend was due mainly to two factors. First,

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1. Oum and Cho (1995) report that the standard deviation of the REER (quarterly average) in the 1990s (up to the third quarter of 1995) was 0.025, while it was 0.113 in the 1980s. Their REER is based on data for Korea's 14 major trading partners with time-varying trade weights. Similar results have also been reported by Kim (1992) and Kim (1995).

although Korea's domestic prices showed relative stability, the won's nominal exchange value vis-à-vis the U.S. dollar depreciated continuously through 1986. Second, the strong performance of the Japanese yen against the U.S. currency since 1985 accelerated the effective depreciation of the Korean won.

As Korea's current account registered sizable surpluses (largely with the United States) as of 1986, the Korean won was under immense pressure from the United States to appreciate. The won showed an unprecedented appreciation against the U.S. currency, from an average of 881 won per dollar in 1986 to 671 won in 1989. The won's real effective exchange value also climbed, a result not only of the nominal appreciation but also of the renewed strength of the U.S. dollar. After 1989, Korea's international payments position deteriorated, reversing the upward trend in the won's nominal exchange value vis-à-vis the U.S. dollar to a downward slide. Meanwhile, the exchange value of the Japanese yen against the U.S. currency showed a rising trend from 1991. Consequently, the won depreciated substantially on a real effective basis, reaching in 1993–94 approximately the same level as in 1986–87, despite Korea's relatively higher rate of inflation (see table 9.1).

In real effective terms, the won's exchange rate had by and large maintained a relatively stable trend compared with those of most other currencies, yet it had nonetheless shown considerable fluctuations in one period or another. One major factor in these fluctuations was that the won's exchange rate had been so heavily biased toward the U.S. dollar that changes in the exchange rate between the U.S. currency and the currencies of other major countries, particularly Japan, had not been immediately reflected in the exchange rate of the won. It seems that there is approximately a one-year time lag before a change in the exchange rate between the U.S. dollar and other major currencies even partially affects the value of the won vis-à-vis the U.S. dollar. The decline in the won's REER in both the 1972–73 and the 1986–87 periods was thus largely due to the appreciation of the Japanese yen against the U.S. dollar (see fig. 9.1).

However, an analysis indicates that the differentials in the rates of inflation between Korea and its major trading partners have been relatively quickly reflected in the won's exchange rate against the U.S. dollar. This may very well have been inevitable if Korea's export prices were to remain competitive while its rate of inflation was relatively high. It was also shown that the won's exchange rate against the U.S. dollar was influenced by Korea's domestic macroeconomic conditions as well.

Evidence exists that adjustments of the exchange rate have frequently been aimed at ensuring an adequate level of foreign exchange reserves and correcting imbalances in the current account. For instance, a real depreciation was called for to improve the external balance when concern over the growing external debt heightened in 1985. However, as the current account showed a sizable surplus in the following years with improvements in the external terms of trade, the Korean won underwent substantial appreciation.

Table 9.1   **Trends in Exchange Rates**

	Nominal Exchange Rate		Nominal Effective Exchange Rate[a]	Relative Price[a]	Real Effective Exchange Rate[a]
Year	Won per U.S. Dollar	Won per 100 Yen			
1970	310.5	86.3	29.1	36.3	80.0
1971	347.1	99.4	33.0	38.4	86.0
1972	392.8	129.6	39.8	42.4	93.7
1973	398.3	146.6	42.6	40.3	105.8
1974	404.4	138.4	42.2	46.6	90.6
1975	484.0	163.1	50.3	54.8	91.9
1976	484.0	163.2	49.5	58.2	85.0
1977	484.0	221.5	55.4	60.4	91.8
1978	484.0	230.0	57.4	65.1	88.2
1979	484.0	220.9	57.6	70.6	81.6
1980	607.4	267.9	72.0	85.5	84.2
1981	681.0	308.8	78.8	96.9	81.3
1982	731.0	293.5	79.6	98.7	80.6
1983	775.7	326.6	84.7	98.6	85.9
1984	805.9	339.3	86.0	97.6	88.1
1985	870.0	364.8	92.2	98.5	93.6
1986	881.4	523.1	110.0	101.7	108.2
1987	822.5	569.2	111.4	102.3	109.0
1988	731.4	571.0	104.3	103.1	101.2
1989	671.4	486.9	92.0	100.6	91.4
1990	707.7	489.1	97.5	101.8	95.8
1991	733.3	544.4	103.3	106.4	97.1
1992	780.7	616.2	113.1	108.5	104.3
1993	802.7	721.9	119.6	110.5	108.2
1994	803.4	786.1	123.7	113.4	109.1

Sources: IMF, *International Financial Statistics* (Washington, D.C., various issues); Bank of Korea.

Note: Calculation of effective exchange rates was based on a trade-weighted currency basket of Korea's four major trading partners: the United States, Japan, Germany, and the United Kingdom. Relative price was calculated using the wholesale price index.

[a] 1985–86 = 100.

This tendency to use current account performance as an indicator of the need for exchange rate adjustments seemed to have resulted in notable swings in the REER due to the time lag between a change in the exchange rate and its impact on the current account balance (Kim 1994; Oum and Cho 1995). All other factors being equal, the won's exchange value against the U.S. dollar had also tended to appreciate when the rate of inflation was relatively high, as the government tried to stabilize domestic prices. Finally, there seem to have been attempts to promote exports by depreciating the won during periods of sluggish domestic economic activity (see tables 9.2 and 9.3; see also Nam 1988).
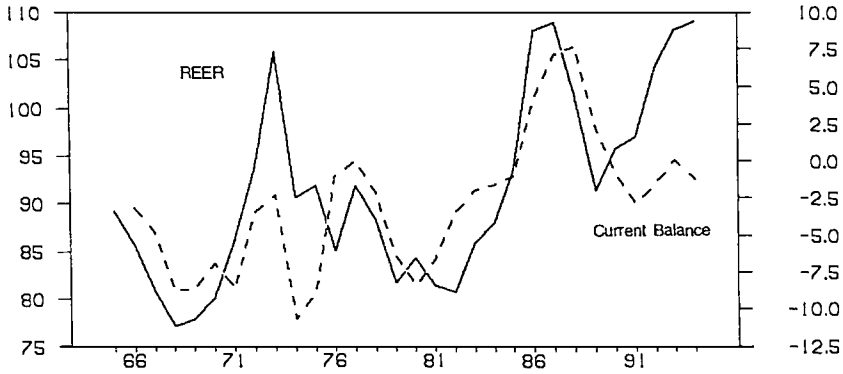
Fig. 9.1   Real effective exchange rate and current balance (percent of GDP)

Table 9.2   Estimation of Nominal Exchange Rate (e), 1968–94

	Dependent Variables	
Explanatory Variable[a]	ln e	Δln e
Constant	−0.58	0.013
(Δ)ln (P_w/P_w^*)	0.630 (2.60)	0.695 (4.00)
(Δ)ln $(P_w/P_w^*)_{-1}$	0.358 (1.56)	0.142 (0.80)
(Δ)ln e^*		0.008 (0.04)
(Δ)ln e^*_{-1}	0.589 (3.99)	0.736 (3.65)
$\bar{R}^2$	.969	.588
D.W.	0.55	1.93

[a]Explanatory variables are in differences in logarithms for the second (Δln e) equation.

The Korean government has continuously relaxed its foreign exchange re-
strictions, and it announced in December 1994 a foreign exchange reform plan
that will be implemented in three stages until 1999. While easing restrictions
helps the exchange market expand and become more efficient, it exposes the
market to greater shocks and potential instability. A particularly serious con-
cern during this transition period is the potentially large inflow of capital re-
sulting from full liberalization.

In order to cope with this situation in a noninflationary way, the Korean won
may have to be substantially appreciated. Sterilized intervention in the face of
a large capital influx is likely to raise the domestic interest rate, which will
further encourage foreign capital inflow. However, nonsterilized intervention
in the foreign exchange rate will soon result in real appreciation due to the
acceleration of inflation. Actually, in recent years the Korean won appreciated
moderately as the net inflow of capital grew much larger than the current ac-
count deficit. For the Korean economy, which has a relatively large trade sec-

Table 9.3   **Estimation of Real Effective Exchange Rate (REER)**

Explanatory Variable	Dependent Variable: ln REER	
	(1)	(2)
Constant	8.09	10.35
ln (p_w/p_w^*)	−0.248 (3.88)	−0.424 (4.97)
ln e^*	−0.571 (3.23)	−0.878 (4.61)
$\Delta \ln y_{-1}$	−0.878 (1.69)	−1.360 (2.81)
$\Delta \ln p_{y-1}$	−0.328 (1.77)	−0.823 (3.38)
CAP/Y	−0.027 (3.51)	−0.029 (4.42)
$(RES/M)_{-1}$	−0.216 (2.86)	−0.197 (2.99)
$(CB/Y)_{-1}$	−0.006 (1.06)	−0.009 (1.84)
ln TOT		−0.568 (2.71)
$\bar{R}^2$	.719	.789
D.W.	1.59	2.39

Note: e, e* = exchange rate of the won and the currency basket of Korea's major trading partners per U.S. dollar, respectively. p_w, p_w^* = wholesale prices for Korea and Korea's major trading partners, respectively. y, Y = GDP in real and nominal terms, respectively. p_y = GDP deflator. CAP, CB = balance of payments in the capital and current accounts, respectively. RES/M = the ratio of foreign exchange reserves to total commodity imports. TOT = external terms of trade.

tor, a sharp currency appreciation is likely to bring about a recession in the economy as well as growing deficits in the current account.[2]

9.2   Long-Run Behavior of the Exchange Rate

For a country like Korea, where the share of trade in the economy is significant, a two-sector model with tradable and nontradable sectors seems desirable for macroeconomic analysis of the exchange rate. Evidence indicates that relative price movements between tradables and nontradables have been substantial in most countries with a generally rising trend. However, the price ratios have shown differing trends (slopes) among countries, as well as divergences from the trend for individual countries.

The apparent lack of purchasing power parity (PPP) among countries is largely attributable to the existence of nontradables. As noted by Krueger (1983, 67), with the existence of nontradables, PPP would hold only if tradables and nontradables were close substitutes in production, or if trade led to factor price equalization and the technology for producing nontradables were identical across countries.

2. There is a claim that Korea's exchange rate management has been asymmetrical, moving closely with the dollar when the Japanese yen is strong and moving closely with the yen when it is weak. To examine this claim, we tried two different variables for e^*, one for the period when it appreciated over the previous year and the other when it depreciated. The coefficients were almost the same, strongly indicating that the claim of asymmetry is ill founded.

For tradables, we may assume that PPP holds at least in terms of rates of change:

$$(1) \qquad \hat{p}_t - \hat{e} = \hat{p}_t^* \quad \text{or} \quad \hat{e} = \hat{p}_t - \hat{p}_t^*,$$

where p_t and p_t^* are the domestic and world prices of tradables, respectively, e is the exchange rate expressed in units of domestic currency per U.S. dollar, and a hat indicates the rate of change. In this form, we may disregard arbitrage and transport costs, as long as these costs constitute a stable portion of the commodity price. If, for example, the currency is not fully depreciated to reflect domestic inflation over that of the world for tradables, the country would face an unsustainable backslide in export competitiveness and a deterioration of the trade balance.

As presented in figure 9.2, the long-run movements of Korea's exchange rate and tradable prices relative to the United States have been very similar, even though a substantial gap persisted in some periods. In the case of Japan, the yen has appreciated much faster than tradable prices have dropped relative to the United States. This divergence may be due to a large exchange rate misalignment at the beginning of the sample period or to the inappropriateness of the price indicator for tradables used in the analysis.[3]

On the other hand, given the internal mobility of resources in the long run, we may expect a roughly similar trend of profitability between tradables and nontradables in the domestic market. Otherwise, resources would shift from the sector for which profits are relatively squeezed to the other sector until profit prospects are more or less equalized between the two. Given that labor cost constitutes the major and fairly stable share of total value added even for tradables, not to mention nontradables, we may state the above equalization condition as follows:

$$(2) \qquad \hat{p}_t - \hat{l}_t = \hat{p}_n - \hat{l}_n,$$

where l_t and l_t and l_n are unit labor costs (wages per unit of production) for tradables and nontradables, respectively.

Using the observation that wage increases are more or less the same in the long run between the tradable and nontradable sectors, the above condition may be rewritten as

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3. Manufactured goods were taken as tradables for this purpose. Even though agricultural products can be classified as tradables in many countries, the Korean agricultural market is far from being closely linked with the world market. The agricultural sector, however, is not classified as nontradables either. The fact that the yen appreciated much faster than tradable prices declined compared with the U.S. counterparts seems to indicate that the tradables relevant for analysis of the exchange rate might be a segment of the manufacturing sector with realized or potential comparative advantages.
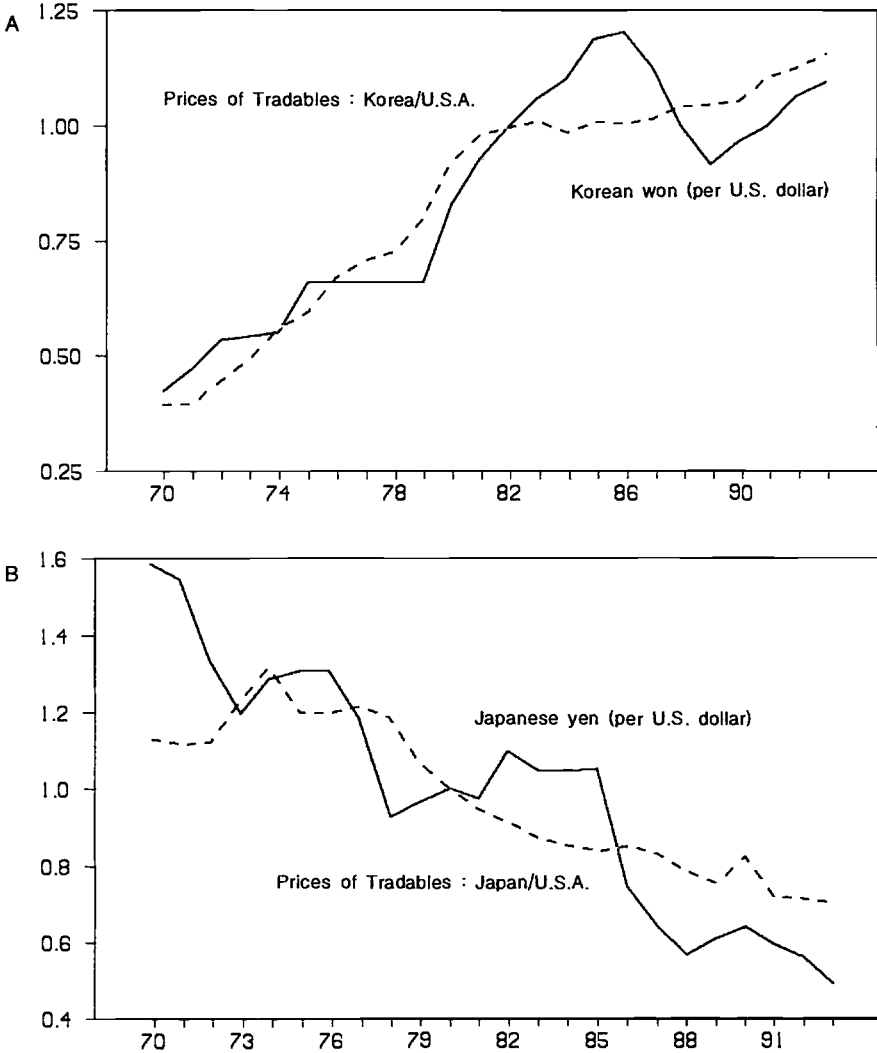
Fig. 9.2   Exchange rate and price of tradables
Note: A, Korea vis-à-vis the United States (1982 = 1.00). *B,* Japan vis-à-vis the United States (1980 = 1.00).

$$\hat{p}_n - \hat{p}_t = \hat{d}_t - \hat{d}_n,$$

(3)

$$\hat{p}_n^* - \hat{p}_t^* = \hat{d}_t^* - \hat{d}_n^*,$$

where d_t and d_n are labor productivities for tradables and nontradables, respectively, and an asterisk indicates the corresponding variable for the world economy. In the long run, we expect that the price increase for nontradables will be

higher than that for tradables to the same extent that labor productivity growth in the tradables sector is faster than that in the nontradables sector.[4]

Figure 9.3 shows that relative prices and the labor productivity gap between tradables and nontradables grew the fastest in Korea and at about the same rate over the 1970–93 period, as equation (3) predicts. For the United States, the relative price of nontradables rose at a slower rate than the gap in labor productivity indicated. This difference may be due to a relatively large increase in nonlabor costs for tradables, which was expected in the sector's extensive restructuring efforts for survival. For Japan, this phenomenon might have been offset by the downward pressure on the price of tradables that resulted from the gradual opening of the domestic market.

Now, the overall inflation rates of the domestic and world economies are given as the weighted average inflation of tradables and nontradables in the respective economies:

$$\hat{p} = \alpha \hat{p}_t + (1 - \alpha) \hat{p}_n,$$
(4)
$$\hat{p}^* = \beta p_t^* + (1 - \beta) \hat{p}_n^*,$$

where p and p^* are the composite prices of the domestic and the world economy, respectively, and α and β are the shares of the tradables sector in the domestic and the world economy, respectively.

Using the relationship of equations (3) and (4) in equation (1), we get the following equation for exchange rate change (see Balassa 1964; Hsieh 1982):

(5) $\hat{e} = (\hat{p} - \hat{p}^*) - [(1 - \alpha)\hat{g}(d) - (1 - \beta)\hat{g}(d^*)],$

where $\hat{g}(d)$ and $\hat{g}(d^*)$ are the gaps in labor productivity growth between tradables and nontradables for the domestic and the world economy, respectively $(\hat{d}_t - \hat{d}_n$ and $\hat{d}_t^* - \hat{d}_n^*)$. If we ignore the difference in the share of the tradables sector in the domestic and world economies and let the common share for nontradables be ϕ, equation (5) is rewritten as

(6) $\hat{e} = (\hat{p} - \hat{p}^*) - \phi[\hat{g}(d) - \hat{g}(d^*)].$

The above equation shows that the exchange rate movement departs from what PPP predicts to the extent that the gap in labor productivity growth

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4. If we also consider the share of nonlabor cost, eq. (3) may be rewritten as follows:

(3') $\hat{p}_n - \hat{p}_t = (\hat{d}_t - \hat{d}_n) + [s_n(\hat{n}_n - \hat{l}_n) - s_t(\hat{n}_t - \hat{l}_t)],$

where s_t and s_n are the shares of nonlabor cost for tradables and nontradables, respectively, and $\hat{n}_t$ and $\hat{n}_n$ are the increase rates of nonlabor cost for tradables and nontradables, respectively. In eq. (3'), the second term on the right-hand side is most likely negative, since the nonlabor share for tradables is typically larger than that for nontradables ($s_t > s_n$) and the difference in the increase rate of nonlabor cost between nontradables and tradables is not likely to be larger than that of unit labor cost ($\hat{n}_n - \hat{n}_t < \hat{l}_n - \hat{l}_t$). In other words, the difference in inflation rates between nontradables and tradables is likely to be a little smaller than the difference in productivity growth between the two sectors. For simplicity of analysis, however, we disregard this point.
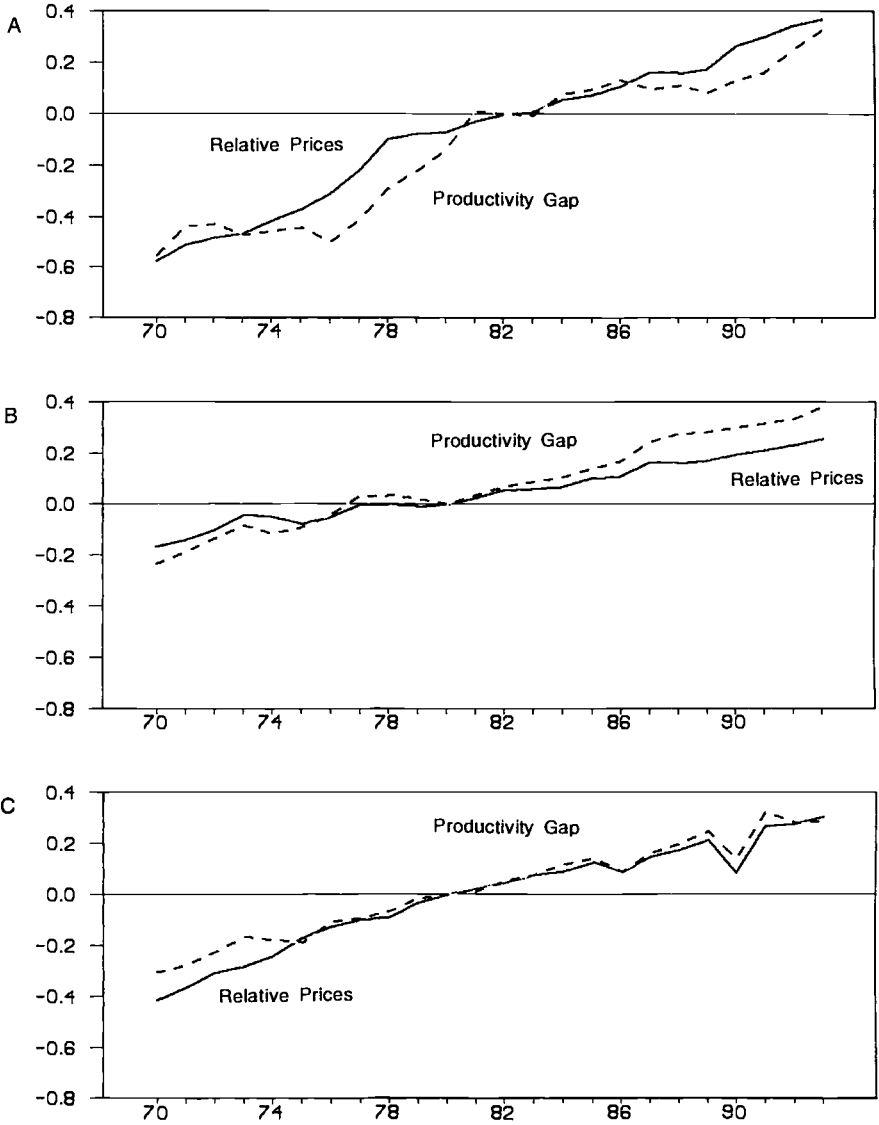
Fig. 9.3   Relative prices and productivity gap

Note: A, Korea (1982 = 1.00). B, United States (1980 = 1.00). C, Japan (1980 = 1.00). Relative prices are ln(prices of nontradables/tradables). Productivity gap is ln(productivity of nontradables/tradables).

between tradables and nontradables for the domestic economy is different from that for the world economy. In the process of rapid catch-up with industrialization efforts, a developing country will generally experience a fairly large gap in labor productivity growth, which tends to appreciate its currency. The degree of appreciation will be greater with a larger or increasing share of the nontradable sector in the economy.

Figure 9.4 shows the movements of labor productivity for tradables and nontradables in Korea, the United States, and Japan. As expected, labor productivity grew much faster in Korea than in the other two countries for both tradables and nontradables, but the growth for tradables was generally faster than that for nontradables after the mid-1970s. Between the United States and Japan, Japan's labor productivity grew faster, but the relative productivity trend between tradables and nontradables was roughly the same for the two countries.

In figure 9.5, the predicted exchange rate on the basis of equation (5) in a logarithmic form is presented together with the actual exchange rate. The equation is clearly a poor predictor of the exchange rate in the short run for both Korea and Japan. In the long run, the won has slightly appreciated given what was expected in light of the differences (between Korea and the United States) in overall inflation and in the productivity gap between tradables and nontradables. This seems to be due mainly to the relative stability, compared to productivity, in the prices of nontradables in the United States. For Japan, the predicted exchange rate is hardly different from that based on relative prices of tradables in figure 9.2.

In the above analysis, the exchange rate is viewed as being determined in the goods market. To the extent that the exchange rate is determined in the broader exchange market where both current and capital transactions are made, long-run exchange rate movements may deviate from predictions based on the above framework. In Korea, however, controls over external capital transactions have been fairly extensive, rigorously matching demand with supply in such a way as to keep capital transactions largely accommodative. Thus ignoring capital flows in the long-run analysis of exchange rate determination should not be too much of a problem for Korea.

9.3   An Econometric Model: The Exchange Rate and Adjustment Mechanisms

9.3.1   The Model

There are well-established alternative approaches explaining the adjustment mechanism through which an exchange rate change affects the trade balance. These approaches are not necessarily mutually inconsistent, but they are largely complementary to one another in understanding the effect of an exchange rate change.
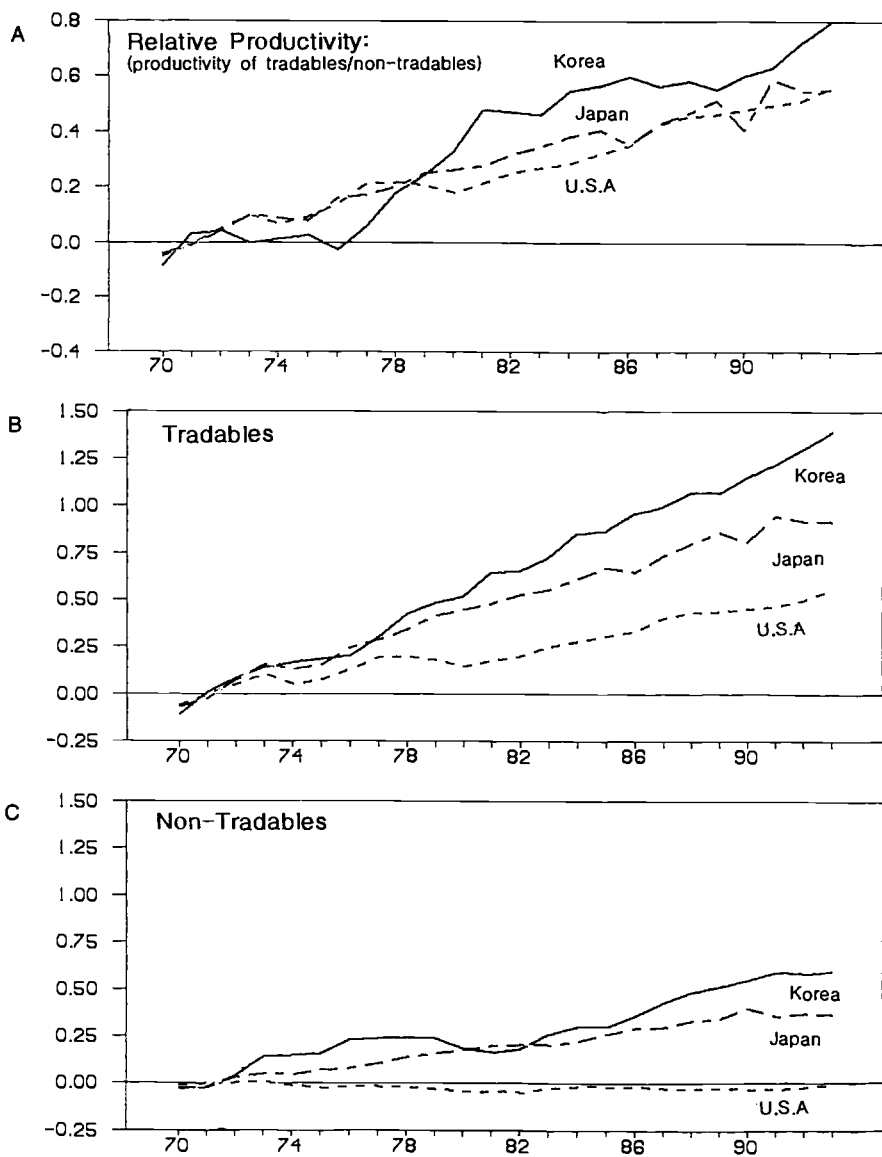
A Relative Productivity:
(productivity of tradables/non-tradables)

0.8
0.6
0.4
0.2
0.0
-0.2
-0.4

70 74 78 82 86 90

Korea
Japan
U.S.A

B Tradables

1.50
1.25
1.00
0.75
0.50
0.25
0.00
-0.25

70 74 78 82 86 90

Korea
Japan
U.S.A

C Non-Tradables

1.50
1.25
1.00
0.75
0.50
0.25
0.00
-0.25

70 74 78 82 86 90

Korea
Japan
U.S.A

Fig. 9.4   Labor productivity (1970–72 = 1.00)
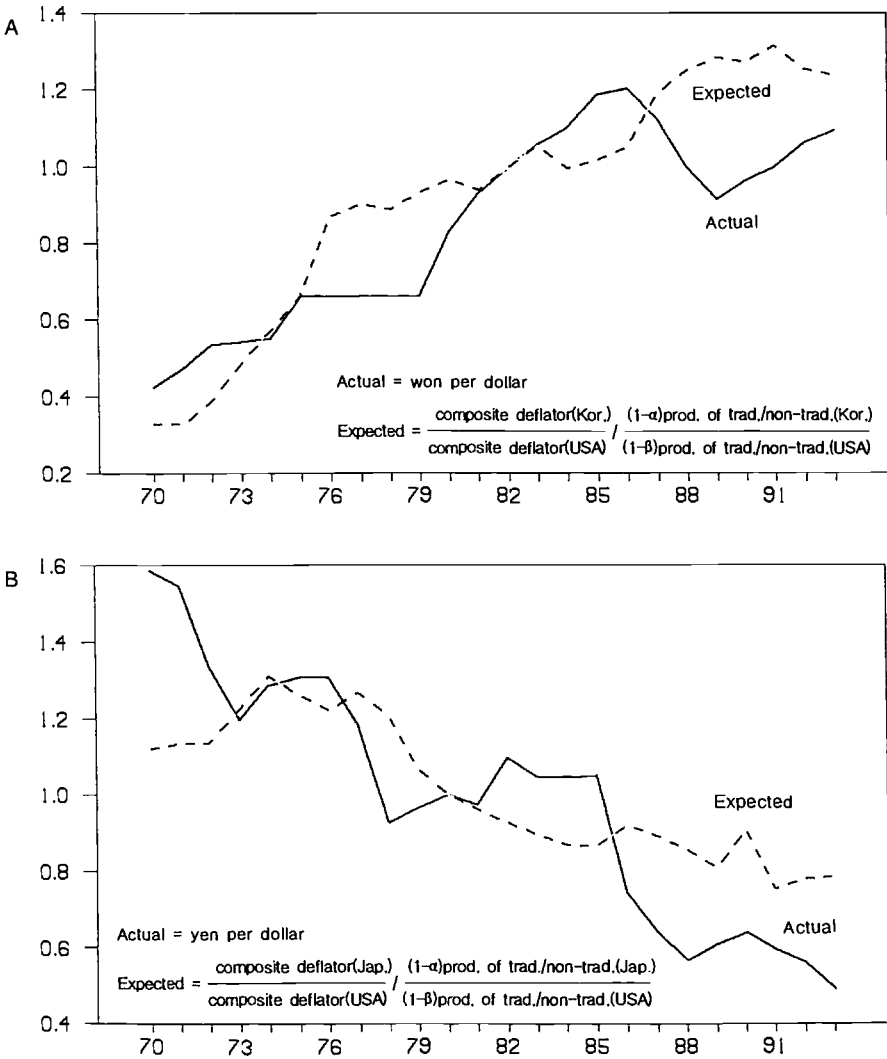*Note:* Productivity figures are in natural logarithms.

Fig. 9.5   Exchange rate movements: actual versus expected
Note: A, Korean won (1982 = 1.00). B, Japanese yen (1980 = 1.00).

The *elasticities approach* is concerned with how an exchange rate change affects the trade balance by concentrating its attention on price elasticities of exports and imports. While the elasticities approach sees the trade balance directly as the difference between exports and imports, the *absorption approach* pays attention to the trade balance as the difference between aggregate income and expenditure. Unlike the elasticities approach, which is solely concerned

with the price effects of an exchange rate change on exports and imports, the focus of the absorption approach is on the effects on income and expenditure (absorption). The immediate impact of an exchange rate change is on absorption, which at a given level of income determines the trade balance.

The *monetary approach* understands the adjustment mechanism of an exchange rate change as a monetary phenomenon. Devaluation raises domestic prices to reduce the real value of the money stock and induces people to cut expenditure below real income to replenish lost real balances. This excess supply of domestic goods is matched by net exports. Deficits in the balance of payments are considered to be a symptom of monetary disequilibrium, which is only transitory and self-correcting without sterilization. If this self-correcting process is to be accelerated, deliberate monetary contraction can be pursued, and devaluation is viewed as a substitute for monetary contraction. This basic monetary argument is based on the assumption of factor price flexibility, which allows an economy to maintain full employment.

The model estimated in this paper combines some features of the approaches sketched above. Export and import functions include both relative prices and income variables. The determination of absorption is an integral part of the model, along the lines of the absorption approach. The model, however, departs from the elasticities and absorption approaches in that it introduces essential dynamics. It does not depend on the critical role of the money stock. Still, as is the case for the monetary model, devaluation leads to a reduction in the real money stock and a change in the interest rate that tends to improve the trade balance by discouraging absorption. Though small, the model incorporates most of the essential dynamics of determining the current account. The complete model including identities is as follows.

Current balance and external debt

$$CB = x \cdot p_x - m \cdot p_m - i^* \cdot D_{-1} + CB_0,$$

$$D = D_{-1} - CB + D_0,$$

$$x = x(WT,\ p_m^*/p_x,\ e_j),$$

$$p_x = p_x(p_w/e,\ p_m,\ \hat{x},\ e_j),$$

$$m = m(y_a,\ x,\ p_m \cdot e/p_w,\ p_x/p_m,\ L_m).$$

Aggregate income

$$y = y_a + (x - m) \cdot \bar{e} - i^* \cdot D \cdot \bar{e}/p_x + y_0,$$

$$y_a = y_a(y,\ \Delta y,\ y_{a-1},\ \Delta m_r,\ r_r).$$

Inflation

$$\hat{p}_w = \hat{p}_w(\hat{p}_m + \hat{e}, \ \hat{y}, \ \hat{y}_{ag}, \ \hat{p}_{w-1}),$$

$$\hat{p}_y = \hat{p}_y(\hat{p}_m + \hat{e}, \ \hat{y}, \ \hat{y}_{ag}, \ \hat{p}_{y-1}).$$

Money and interest rate

$$m_r = M2/p_y,$$

$$r_r = r_r((m_r/y)_{-1}, \ \hat{y}, \ \Delta\hat{p}_y).$$

CB	current account balance
CB_0	net balance of invisible trade and unrequited transfers, except for interest payments on gross external debt
D	gross external debt
D_0	residual item in the external debt identity, which includes changes in both foreign asset holdings and the value of nondollar debts outstanding (due to their exchange rate changes against the dollar)
e	exchange rate per U.S. dollar
$\bar{e}$	average exchange rate per dollar in the base year of national income accounts
e_j	exchange rate of the Japanese yen per U.S. dollar
i^*	average interest rate on external debt
L_m	a measure of import liberalization
m	volume of commodity imports
M2	broadly defined money supply
m_r	real money supply (M2)
p_m	unit value of commodity imports in dollars
p_m^*	unit value of world imports in U.S. dollars
p_w	domestic wholesale prices
p_x	unit value of commodity exports in dollars
p_y	GDP deflator
r_r	real interest rate
WT	world trade volume
x	volume of commodity exports
y_0	residual item in the real GDP identity, which includes net services exports (except for interest payments on gross external debt) and statistical discrepancies
y_a	absorption in real terms
y_{ag}	agricultural value added in real terms

In an effort to keep the model as small as possible, the services balance is treated as exogenous except for the interest payment on the gross external debt. Endogenizing external debt and the interest payment is considered important since they constitute essential elements of the dynamics of the model. To the extent that services trade is also affected by relative prices between the domes-

tic and world markets, the model will underestimate the effect of an exchange rate change on the balance of payments.

Exports

The quantity and price of merchandise exports are viewed as being determined by the intersection of their demand and supply curves. For Korea's major exports the number of competitive suppliers is typically limited due to product differentiation or noncompetitive industrial organization, making the price-taker assumption of a small open economy unrealistic. Export demand is determined by foreign income or total world trade volume and the relative export price of the country compared to the rest of the world. The exchange rate affects demand only by changing the export price. To the extent that Korean exports compete closely with Japanese products, movements of the Japanese yen will also affect Korean exports.

Export supply depends mainly on the profit margin captured by the unit value of exports relative to the major costs represented by domestic wholesale prices and the unit value of (intermediate) imports, as well as the production capacity. The growth rate of export volume ($\hat{x}$) is included as a proxy for the export capacity utilization ratio. Moreover, if Korean exports have a particularly competitive relationship with those of Japan, the value of the yen may also affect the pricing of Korean exporters: for example, reducing prices to cut the profit margin as the yen weakens.

Imports

Contrary to the case of exports, Korea may be considered to be "small" as far as imports are concerned, so that the unit value of imports is assumed to be exogenously given. Real imports are a function of real income or output and the cost of imports relative to domestic wholesale prices. Since it is likely that (manufactured) exports are more dependent on imports of intermediate or capital goods than other components of aggregate demand, absorption and exports are entered separately as explanatory variables. Furthermore, import liberalization or external terms of trade (p_x/p_m) may have affected imports if import restrictions were binding or imports were compressed due to unfavorable terms-of-trade movements.

Absorption

Absorption is composed of private consumption and investment and public expenditure. Private consumption may be viewed as depending on permanent income and estimated by current income and lagged consumption. Public expenditure is budgeted on the basis of anticipated aggregate income. To the extent that current or anticipated income is not fully known to consumers or the government, absorption is expected to be negatively affected by changes in income. Finally, explaining private investment as a partial adjustment to the desired capital stock (which may be approximated by current income) and ignoring capital

depreciation, investment may be estimated by changes in income and lagged investment. Credit availability and interest rate variables are also included since they will certainly affect absorption by changing the degree of liquidity constraint, profit prospect of investment, or time preference of consumers.

Inflation

How domestic inflation is determined is critical to the dynamics of the whole system. Devaluation is believed to have no lasting effect because inflation accelerates such that the relative price of domestic goods tends to return to the predevaluation level. On the cost side, the major sources of inflation include import prices and labor and other factor costs, and the latter may be estimated as an expectation-augmented Phillips curve. Labor productivity improvement will have a role only to the extent that it is not fully reflected in current wages. Since labor productivity usually moves procyclically the Phillips curve relationship (captured here by the economic growth rate, $\hat{y}$) will be weakened by the offsetting effect of productivity change.

The lagged dependent variable is supposed to be closely related to the expected inflation rate. The growth rate of agricultural production ($\hat{y}_{ag}$) is also introduced, as it is often the major determinant of agricultural prices. The inflation rate in terms of the GDP deflator is added to the model, since wholesale prices are too narrow in their coverage to represent the whole economy. The effect of real money supply on absorption, for instance, should be better captured when the nominal money stock is deflated by the GDP deflator.

Real Interest Rates

The real market interest rate is believed to have a downward trend with the deepening of Korea's financial market. The M2-GDP ratio may serve as a measure of financial deepening. Along this trend, the real interest rate is supposed to fluctuate together with cyclical swings of investment or general economic activity. Furthermore, as inflation accelerates or decelerates the change in the inflation rate may not be fully and immediately reflected in the nominal interest rate. This is so because the market takes only a portion of the change as a shift in inflationary expectations and because the authorities are likely to intervene to stabilize the nominal interest rate.

9.3.2   Estimation Results

Real Exports

The demand elasticity of exports with respect to the world trade volume of manufactured goods was estimated to be 2.1 until the late 1980s. The elasticity was estimated as being lowered by 0.01 each year since 1988. The relative export price seems to affect exports with a mean lag of about one year, and the estimated price elasticity is 2.3. The exchange rate of the Japanese yen also turns out to be significant, which strongly indicates that Korean products com-

pete with Japanese products (or those produced in other East Asian countries by Japanese-invested corporations) in a wide range of commodities.

Unit Value of Exports

For a 1 percent increase in domestic wholesale prices or appreciation of the won, the unit value of exports rises by 0.50 percent in the same year, and about 1 percent in the long run. The unit value of imports and the lagged export growth rate (introduced as a proxy for the export capacity utilization rate) also turn out to be significant. A weakening of the Japanese yen by 1 percent is estimated to bring about a decline in Korea's export price by 0.2 percent or so in the short run. The 1973 dummy variable $D(73)$ reflects the prevalent price controls in 1973, which distorted the P_w/e variable.

Real Imports

The income elasticity of imports is estimated at 0.90 for absorption and 0.29 for exports. The impact of the relative price on imports is much smaller than that on exports, with the elasticity estimated at a little less than 0.5 and the mean lag at about six months. None of the other variables such as external terms of trade or measures of import liberalization (average import tariff or import liberalization ratio) seem to have any impact on imports.

Absorption

The long-run elasticity of absorption demand, with respect to income, is estimated at 1.0 with an impact elasticity of 0.38. The variable of change in income (Δy) was excluded since it was not significant and showed signs of multicollinearity with other income variables. The liquidity condition, measured as a change in the real balance of broadly defined money, has a rather strong impact on absorption with some time lag. The real interest rate (corporate bond yield) also turns out to be significant. The dummy variable $D(80.90–91)$ incorporates the recessionary effect of social and political turmoil in the wake of the assassination of President Park, as well as the strong boost of domestic demand (mainly housing construction) in 1990–91 in response to the stagnation of exports (due mainly to a drastic appreciation of the won).

Inflation

The short-run impact and the long-run effect of import cost on wholesale price inflation are estimated at 0.43 and about 0.85, respectively. The Phillips curve relationship (between inflation and recent economic growth) could be identified as well. As for inflation in terms of the GDP deflator, the short-run impact of import cost is much weaker, while the effect of economic growth is much stronger than it is for wholesale prices. The dummy variable $D(73.74)$ is introduced to reflect the wide-ranging price controls (-1) in 1973 particularly and the subsequent easing of controls ($+1$), as they were no longer sustainable due to the oil shock in 1974. The crop situation also turned out to be an important determinant of inflation.

Real Interest Rate

Though statistically not very significant, the real market interest rate turns out to decline with financial deepening and move procyclically. It is also shown that only about half the change in the inflation rate is reflected in the nominal interest rate in the short run. Finally, a dummy variable is introduced to reflect the government's monetary policy stance: a reflationary policy in connection with the 3 August 1972 measure of freezing the curb loan market (-1) and the contrasting policy response to the first and second oil shocks (-1 for 1974, $+1$ for 1979).

Estimated Equations (Sample: 1968–94)

1. Real exports

$$\ln x = -4.20 + 2.13 \ln \text{WT} - 0.010 \ t(88) * \ln \text{WT}$$

$$(8.16) \qquad\qquad (3.72)$$

$$+ \ 2.33 \sum_{i=0}^{2} (1/3) \ln(p_m^*/p_x)_{-i} - \ 0.364 \ln e_j,$$

$$(6.82) \qquad\qquad\qquad (2.41)$$

$$\rho = 0.58, \quad \overline{R}^2 = .997, \quad \text{D.W.} = 1.71.$$

2. Unit value of exports

$$\ln p_x = 3.19 + 0.489 \ \ln(p_w/e) + 0.419 \ \Delta \ \ln p_m$$

$$(4.44) \qquad\qquad (6.31)$$

$$+ \ 0.234 \ \Delta \ln x_{-1} - \ 0.205 \ \Delta \ln e_j + 0.48 \ D(73)$$

$$(2.83) \qquad\qquad (3.39) \qquad\qquad (2.12)$$

$$+ \ 0.525 \ln p_{x-1},$$

$$(4.37)$$

$$\overline{R}^2 = .995, \quad \text{D.W.} = 2.17.$$

3. Real imports

$$\ln m = -0.102 + 0.898 \ln y_a + 0.292 \ln x$$

$$(10.9) \qquad\qquad (6.70)$$

$$- \ 0.471 \ln \sum_{i=0}^{1} (1/2)(p_m \cdot e/p_w)_{-i},$$

$$(3.11)$$

$$\overline{R}^2 = .997, \quad \text{D.W.} = 1.42.$$

4. Real absorption

$$\ln y_a = 0.14 + 0.377 \ln y + 0.613 \ln y_{a-1}$$
$$ (4.98) \qquad (7.99)$$
$$+ 0.195 \; \Delta \ln m_r - 0.128 \ln(1.0 + r_r)$$
$$ (3.01) \qquad\qquad (1.34)$$
$$+ 0.054 \; D(80.90-91),$$
$$ (4.14)$$
$$\overline{R}^2 = .999, \quad \text{D.W.} = 1.41.$$

5. Inflation: wholesale prices

$$\Delta \ln p_w = -0.014 + 0.434 \; \Delta \ln(p_m \cdot e) + 0.374 \; \Delta \ln y$$
$$ (0.90) \quad (11.8) \qquad\qquad\qquad (2.26)$$
$$- 0.388(0.6 \; \Delta \ln y_{ag} + 0.4 \, \Delta \ln y_{ag-1})$$
$$ (3.67)$$
$$+ 0.117 \; D(73.74) + 0.476 \; \Delta \ln p_{w-1},$$
$$ (7.28) \qquad\qquad (8.19)$$
$$\overline{R}^2 = .951, \quad \text{D.W.} = 1.63.$$

6. Inflation: GDP deflator

$$\Delta \ln p_y = -0.035 + 0.217 \; \Delta \ln(p_m \cdot e) + 0.656 \; \Delta \ln y$$
$$ (1.78) \quad (5.02) \qquad\qquad\qquad (3.43)$$
$$- 0.262 \; \Delta \ln y_{ag} + 0.079 \; D(73.74)$$
$$ (3.35) \qquad\qquad (4.60)$$
$$+ 0.721 \; \Delta \ln p_{y-1},$$
$$ (8.87)$$
$$\overline{R}^2 = .884, \quad \text{D.W.} = 2.51$$

7. Real interest rate

$$r_r = -0.041 - 0.030 \ln(m_r/y)_{-2} + 0.182 \; \Delta \ln y_{-1}$$

$$ (1.64) \quad\;\; (1.57) (1.60)$$

$$ - 0.510 \; \Delta \ln(p_y/p_{y-1}) + 0.058 \; D(72.74.79)$$

$$ (5.31) (4.84)$$

$$ + 0.838 \; r_{r-1},$$

$$ (12.7)$$

$$\overline{R}^2 = .904, \quad \text{D.W.} = 2.05.$$

$t(88)$ time variable since 1988, 1 for 1988, 2 for 1989, . . . ,7 for 1994,
             0 otherwise
$D(73)$ 1 for 1973, 0 otherwise
$D(80.90\text{–}91)$ -1 for 1980, 1 for 1990–91, 0 otherwise
$D(73.74)$ -1 for 1973, 1 for 1974, 0 otherwise
$D(72.74.79)$ -1 for 1972 and 1974, 1 for 1979, 0 otherwise

9.4   Simulation Exercises under Alternative Exchange Rate Regimes

Before undertaking simulation exercises under alternative exchange rate regimes, an assessment of the effects of an exchange rate change is needed in order to check long-run stability and consistency with our expectations. Even though the proposed model has only several structural equations, this task cannot be achieved without running simulations because of the dynamic interactions among variables. To evaluate the long-run dynamics, the simulation exercises start in 1983 and continue to the end of the sample, 1994.[5]

In order to obtain the net effect of devaluation, the results of a simulation with the nominal exchange rate depreciated by 10 percent in 1983 and onward were compared with those of the base simulation. The results of this simulation are presented in figure 9.6. A notable result is that a devaluation quickly raises domestic prices, as much as 80 percent of the devaluation by the fourth year for wholesale prices, and between the fifth and sixth years in the case of the GDP deflator. As a consequence, exporters cannot reduce their unit export value very much (around 2.6 percent during the first two years, which declines to the 1.4 percent level between the fifth and sixth years), which limits export growth in real terms. The effect of a 10 percent nominal devaluation on real exports is the strongest in the third year with 5.5 percent more exports and gradually weakens to 2.8 percent more by the eighth year.

5. In order to correct any simultaneous equation biases, two-stage regressions with instrumental variables were used for the simulation exercises. The results, howeVer, were not significantly different from those based on ordinary least squares estimates.
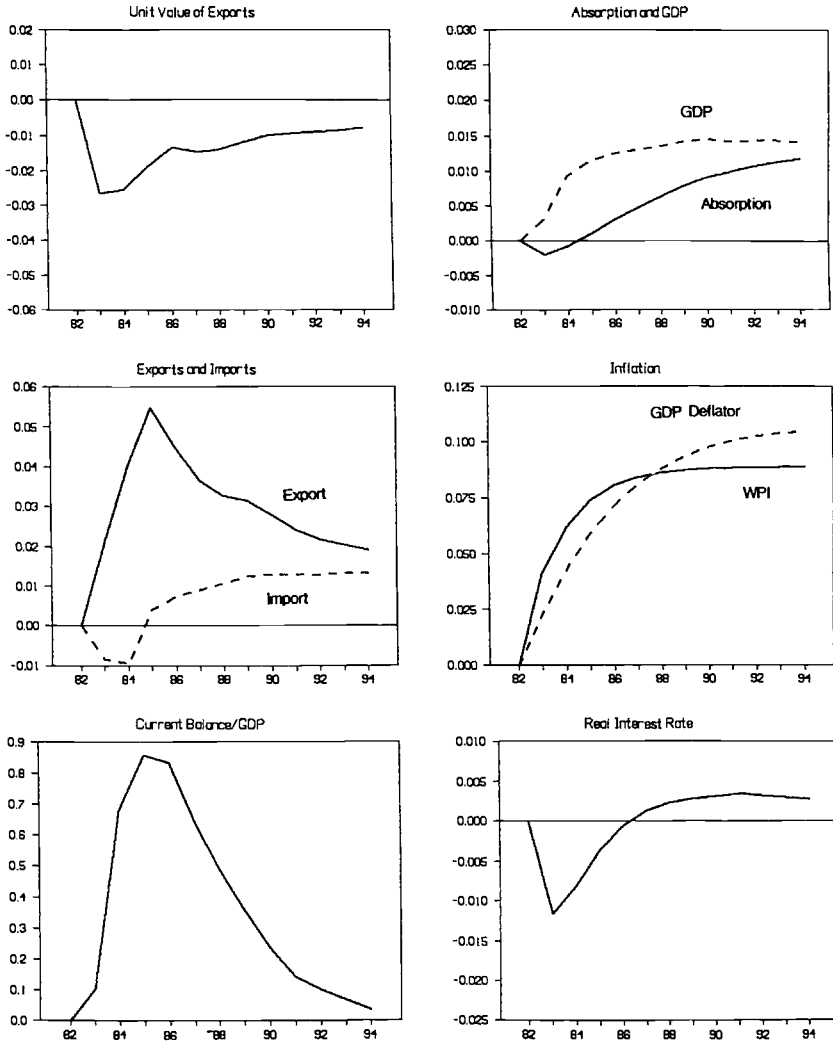
Fig. 9.6   Effects of 10 percent nominal devaluation in 1983

On the other hand, higher prices result in lower real balance of money, which has a negative impact on absorption, while the lower real interest rate during the first several years partially offsets this negative effect. The net effect on absorption is slightly negative from the second to the fourth year of devaluation, before it becomes positive and increases thereafter. The combined effect of the 10 percent nominal devaluation on net exports and absorption leads to a real GDP level that is higher by 0.3 and 1.3 percent by the first and the fourth years, respectively.

Real imports decrease due to higher import costs relative to domestic prices during the first two years after devaluation, but they are positively influenced as the long-run effect on GDP is positive. The effect on the current balance shows a J-curve pattern with little improvement in the short run, followed by the biggest improvement (about 1 percent of GDP) between the third and fourth years and smaller and declining improvements thereafter (around 0.4 percent of GDP between the seventh and eighth years). This pattern results mainly from (1) the time lag between the exchange rate, unit export value, and real exports, (2) continually rising prices that weaken the initial gain in export competitiveness, and (3) the slow reaction of absorption to devaluation-induced income growth, leading to a steady increase in imports.

9.4.1 Fixed Nominal Exchange Rate since 1982

Thanks to its strong anti-inflation policy in the early 1980s, Korea achieved remarkable success in stabilizing prices by 1982. The consumer inflation rate dropped from an annual average of 23 percent during 1979–81 to 7 percent in 1982 and 2.8 percent during 1983–87. As inflation decreased to a level more or less comparable to that of major trading partners, it must have been conceivable to have the Korean won fixed to the U.S. dollar.

Keeping the nominal exchange rate fixed at the 1982 level means that the won was much stronger than it actually was during 1983–87. The average exchange rate in 1986 was more than 20 percent weaker than it was in 1982. On the other hand, during 1989–90, the actual exchange rate was stronger (as much as 8 percent in 1989) than the 1982 rate. The result of this simulation is presented in figure 9.7.[6]

Under this exchange rate regime real exports were 7 to 8 percent lower than actual levels during 1985–87, but 3 to 6 percent higher during 1989–91. The current account balance deteriorated the most in 1987, by 1.7 percent of GDP, while it improved by 1.2 percent in 1990. As for GDP, a 1.8 to 2.0 percent cut occurred during both 1986–87 and 1993–94. Finally, prices in terms of the GDP deflator were lower by about 11 percent during 1986–87 and by 7 percent in 1994.

Overall, there seems to be little evidence that this regime of a fixed nominal exchange rate vis-à-vis the United States is any better than the actual exchange rate management. Since the big swing in the nominal exchange rate that we observed during the sample period is avoided under this regime there are some improvements in the stability of export growth and the current account balance. However, these improvements are offset by a wider range of GDP growth and inflation rates.

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6. The simulated values in the figure are obtained by adding the net effect (difference between the simulated values and the base simulation results) to the actual values.
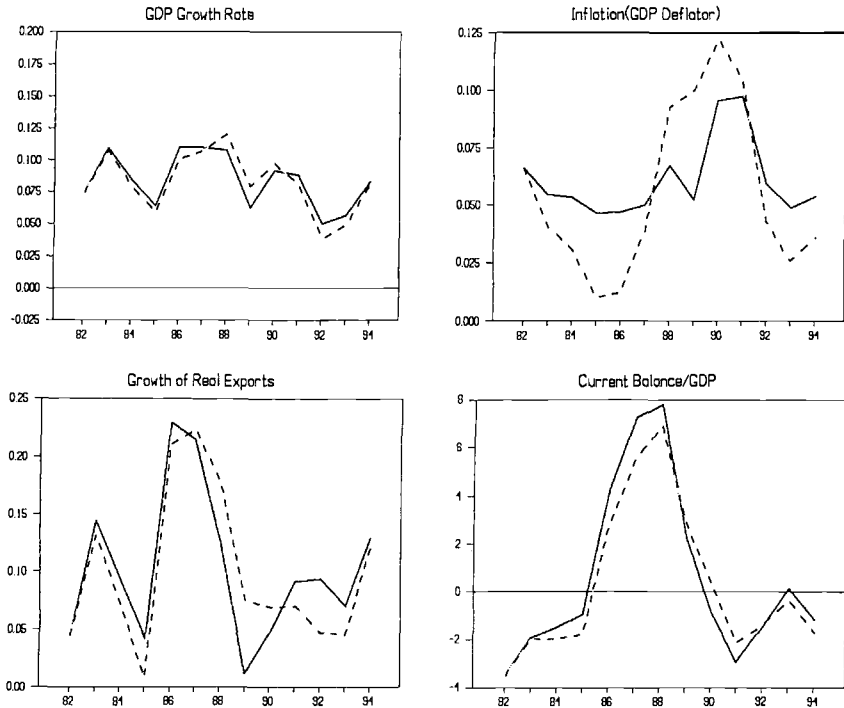
Fig. 9.7   Simulation results: fixed nominal exchange rate against the U.S. dollar since 1982
Note: Actual (*solid line*) and simulated (*dashed line*).

9.4.2   Fixed Real Effective Exchange Rate since 1982

Within the sample period, 1982 (the base year for our simulation exercises) was one of the years when the Korean won was most appreciated. By 1986–87 and again in 1993–94, the won depreciated as much as 35 percent from the 1982 level on a real effective basis. Thus keeping the won's REER at the 1982 level might have meant substantially appreciating the currency. Still, 1982 is used as the base year since our major interest is the evolution of economic profiles rather than absolute performance.

Under the regime of fixed REER, the won's nominal exchange rate per U.S. dollar declined from 731 won in 1982 to 550 won in 1994 (compared with the actual exchange rate of 803 won per dollar). The results presented in figure 9.8 show that real exports are much smaller than the actual volume, particularly during 1987–88 when the difference in exports was about 16 percent and deterioration in the current account balance was as large as 2.0 to 2.8 percent of GDP. Loss in GDP was about 4 percent during 1987–88 and over 5 percent during 1993–94, while the drop in the GDP deflator was 3.8 percent by 1988 and 4.3 percent by 1994.
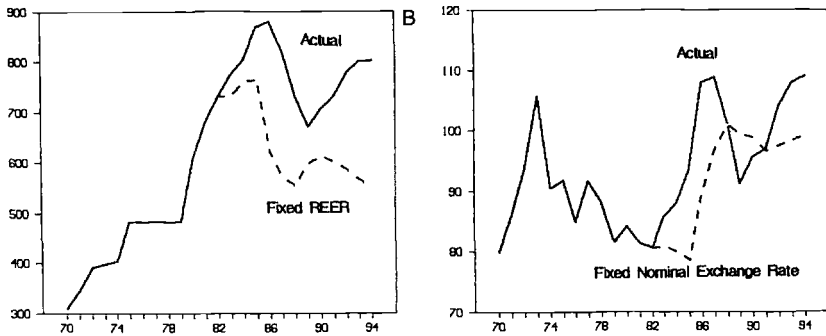
Fig. 9.8   Simulation results: fixed real effective exchange rate since 1982
Note: A, Nominal exchange rate under fixed REER since 1982. B, REER under fixed nominal exchange rate since 1982.

More significant for our present purpose is the path of macroeconomic performance. What is obvious from the simulation results is that export growth and the current account balance are relatively stable under the regime of fixed REER compared with their actual performance. For instance, between 1986 and 1989, the actual increase rate of real exports dropped from 23 to 1 percent, while it declined from 17 to only 9 percent under the fixed REER regime. As a result, the current account surplus, which amounted to 7 to 8 percent of GDP during 1987–88, could be reduced to 4 percent of GDP.

However, the simulation results also show that stability in export growth or reduced imbalance in the current account is sometimes achieved only at the sacrifice of other aspects of macroeconomic performance. As the nominal exchange rate immediately reflects the change in the exchange value of the currency basket, inflation is also likely to be unstable with such large fluctuations in the currency value of major trading partners as observed since the mid-1980s. Likewise, when domestic demand is very weak, as it was in 1992–93, keeping the REER mechanically fixed may not necessarily be rational.

The case of a constant yen-dollar rate. Figure 9.9 indicates that even when the won's REER is maintained constant, the current account surplus remains at about 3 percent of GDP during 1987–88. In order to identify the extent to which these surpluses are due to the strong yen, another simulation was run with both the yen-dollar rate and the won's REER fixed at their 1982 rates. In this case, the won's nominal exchange rate vis-à-vis the dollar was much weaker: 756 won in 1994, compared to 550 won when the actual yen-dollar rates were used.[7] The results presented in figure 9.10 show that the large current account surplus during 1987–88 more or less disappeared in this scenario,

7. With the constant yen-dollar rate Japan's prices must have been higher than actual levels, since the yen showed a clear trend of appreciation against the dollar during the sample period. This effect is ignored in our analysis, and to that extent, the simulation represents a slight depreciation of the won on a real effective basis.
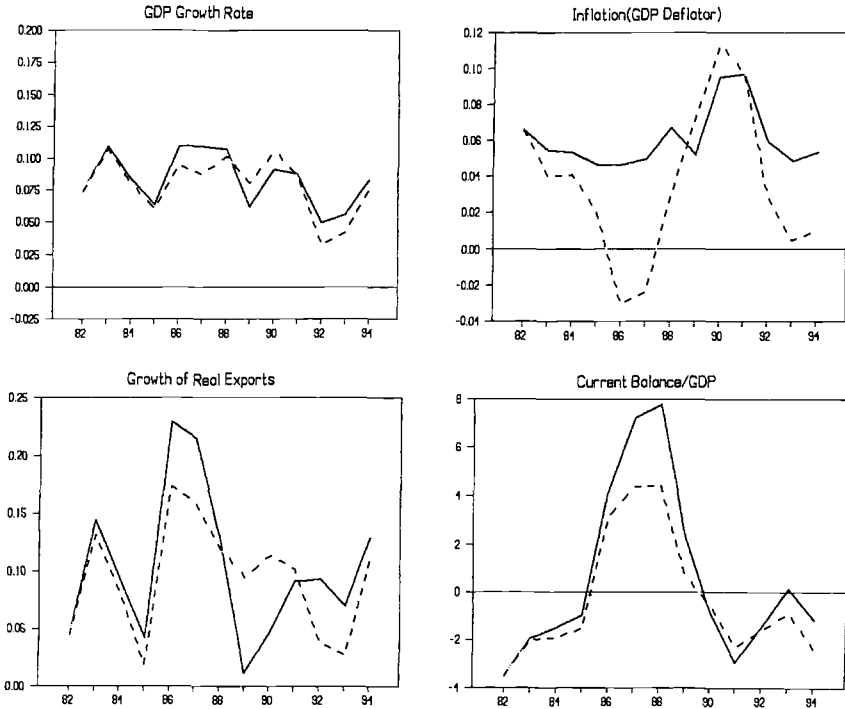
Fig. 9.9   Simulation results: fixed real effective exchange rate since 1982

Note: Actual (*solid line*) and simulated (*dashed line*).

indicating the importance of the yen's exchange rate in determining the competitiveness of Korean exports. One reason why the current account still showed a small surplus may be that the effect of an exchange rate change is somewhat underestimated by treating the services balance as exogenous except for the interest payment on the external debt.

9.5   Conclusion

In Korea, a deficit in the current account is a vice, reflecting weakness in industrial competitiveness. A parallel is found in a firm's capital structure: a low debt-equity ratio is considered good, while we all know that Korean firms could grow rapidly thanks to debt financing. As long as a firm has profitable projects (and the capacity to undertake them) whose expected return is in excess of opportunity (borrowing) cost, it is senseless to increase reserves (not borrow) and forgo the projects.

Despite Korea's high national savings rate, its capital accumulation is inadequate, so investment demand is still strong. It is certainly in Korea's interest to expand investment by borrowing cheaply from abroad rather than seeking a
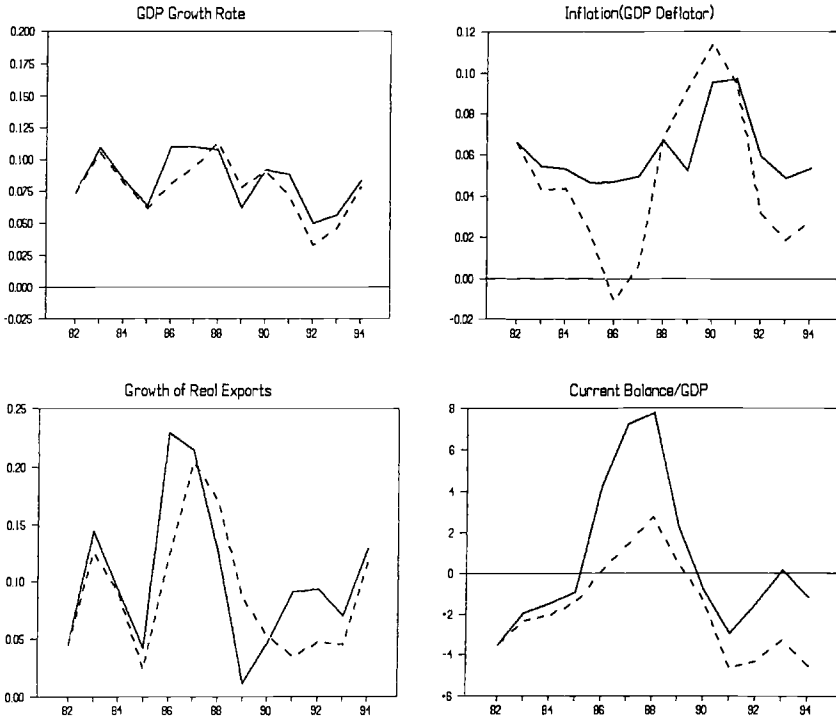
Fig. 9.10   Simulation results: fixed real effective exchange rate and unchanging yen-dollar rate since 1982

Note: Actual *(solid line)* and simulated *(dashed line).*

current account surplus, which accumulates foreign assets whose yield is low. Keeping the currency overly depreciated for the purpose of improving the current account balance has other costs to the economy. Not only is it inflationary, it also disrupts smooth structural adjustments of industries and exports in line with underlying shifts in comparative advantages.

During the period of "three blessings" in 1986–88, Korean firms expanded their capacities in labor-intensive products to exploit the enhanced competitiveness that resulted from the strong Japanese yen. Many of these investments turned out to be bad as their price competitiveness soon worsened with soaring domestic wages, along with the sharp appreciation of the Korean won.[8] The exchange rate policy should have given a signal consistent with underlying changes in comparative advantages so that wasteful investments could have been minimized and industries could have better prepared for the challenge of upgrading the industrial and export structure.

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8. For one thing, the export share of light manufactured goods, which has shown a steady decreasing trend, rose from 36.9 percent in 1985 to 41.6 percent in 1986–87.

It has also often been suggested that intergenerational equity might be better served in Korea by lowering the savings rate rather than by increasing the (already high) investment rate. However, older generation Korean parents, who have experienced a large improvement in their standards of living during their lifetimes, are likely to be satisfied with the current rate of consumption increase for the younger generation, who will certainly see much smaller economic advancement.

The current account balance is one of the key macroeconomic variables; it shows the extent to which investment exceeds national savings. In macroeconomic management, Korea always has a target for the current account that is considered as serious as that of economic growth or inflation, particularly when it is in deficit. As preceding analyses indicated, the Korean authorities have heavily utilized the exchange rate for the purpose of correcting large imbalances in the current account, as well as securing other macroeconomic objectives.

With essential tasks assigned to the exchange rate one can hardly expect it to be determined or managed according to a rigid rule. A fixed nominal or real exchange rate against the U.S. dollar, for instance, was out of the question because (1) the government wanted neither to subject other macroeconomic policies to the exchange rate nor to lose the exchange rate flexibility that is expected to soften the adjustment to real shocks and (2) it would result in large variations in the effective exchange rate (with Korea's trade share with the United States large but not dominating) when the dollar fluctuates against other major currencies.

If correcting the imbalance in the current account is the major goal of exchange rate policy, a country may peg the (real) value of its currency to a basket of currencies of major trading partners. This is actually what Korea claimed to have done throughout the 1980s, even though the pegging was fairly loose. Any rigid rule of exchange rate changes deprives the economy of an instrument for fine-tuning macroeconomic management while compromising among different policy goals. The results of our counterfactual simulation exercises clearly indicated that a rigid peg to a basket would have brought about larger fluctuations in inflation in exchange for a reduced imbalance in the current account during the latter half of the 1980s. Furthermore, the recession with stagnant absorption during 1992–93 would definitely have been much worse with a rigid basket peg.[9]

For Korea, the trade weights used for forming the basket of currencies may be better if they were replaced by the elasticities that measure the responsiveness of trade to exchange rate changes. Though it may not be easy to come

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9. If the authorities had actually chosen to keep the REER constant, other policy choices would have to have been different as well. E.g., when inflation dropped sharply due to a large nominal appreciation of the won against the dollar they could have let the repressed prices and fees adjust and repress again when the won depreciated, to make the actual fluctuations of inflation much smaller than the simulation exercises showed.

by reliable elasticities, we have seen in our analyses that Korea's current balance is substantially affected by a change in the value of the Japanese yen vis-à-vis the dollar even with the REER kept unchanged.

This may not be surprising given Korea's export structure, which has closely followed that of Japan with some lag. Currently, Korean exports such as cars, shipbuilding, and semiconductors and other electronics compete with Japanese products all over the world. Since the early 1980s, Korean exports have also been competing with products manufactured in East Asia by Japanese-invested firms whose competitiveness is substantially affected by the value of the yen. As such, the trade weight in the currency basket vastly underrepresents the Japanese yen if the REER is to be a correct reference for the competitiveness of Korean products.

In reality, when the yen fluctuates relative to the dollar, the Korean won has typically remained much closer to the dollar in the short run than keeping the effective exchange rate unchanged would allow. Noting a similar pattern of exchange rate movements in other East Asian newly industrialized countries (NICs), Williamson (1991, 1995) interpreted it as a classic collective action problem caused by the fear of their competitiveness being eroded against the others. He then proposed a joint floating exchange rate system for the East Asian NICs with their currencies pegged to a common basket. Williamson argued that this system would not only make the countries avoid competitive depreciation but also promote trade and financial interdependence among them.

The chance of this scheme's being adopted, however, seems rather low. As Black (1995) points out, these countries, though close competitors in the world market, have their own economic policy problems, unique and significantly different among them. Korea, Black says, is ill advised to have its exchange rate management seriously constrained, as it faces its own program of external capital liberalization and the prospect of reunification, which will require major restructuring of industries. Another problem, as pointed out by Park and Park (1991), is the lack of strong political leadership necessary for bringing the countries to an agreement.

Perhaps a more serious reason for skepticism is the increasingly differential export structure among the East Asian NICs. As these countries, some of them very small in size, move out of traditional labor-intensive exports, they have no other option than specializing in a limited number of industries where they find comparative advantages. Korea faces only limited competition with these countries in the markets for its major export items, such as cars, semiconductors, steel, and shipbuilding. The idea of a common basket peg does not seem to be very appealing to these countries, whose competitive structures have become increasingly divergent.

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Comment   Stanley W. Black

My job as a discussant is difficult because Nam and Kim's paper is a good one that I basically agree with, both in terms of its approach and its conclusions.

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As a discussant, however, it is my role to criticize, so I offer a few minor criticisms or suggestions.

Section 9.1 of the paper addresses the measurement of the exchange rate and its behavior over time. The choice of currencies of only four industrial countries (the United States, Japan, Germany, the United Kingdom) for the comparison basket to compare the internal and external purchasing power of the won excludes Korea's growing trade with East Asia. As previously shown by Oum and Cho (1995), this can overstate the movement of the real exchange rate. This also appears in comparison between Nam and Kim's figure 9.8*B* and figure 10.3 in my paper (Black, chap. 10 in this volume). The substantial real depreciation of the Chinese currency is omitted, for example. The paper needs to include a discussion of table 9.2 of the single-equation models of the exchange rate. What should we conclude from these results? It would be interesting to test for asymmetry in the adjustment of the won-dollar rate to the yen-dollar rate.

Section 9.2 discusses the long-run trends. Figure 9.2 gives a useful picture of the long-run trends in bilateral real exchange rates versus the U.S. dollar and the Japanese yen, traced to their roots in relative productivity trends in figure 9.3. Section 9.3 develops a structural model. While Nam and Kim's model, based on past Korean exchange rate behavior, is dominated by trade factors, the recent capital account liberalization suggests that capital flows may play a more important role in the future. This is suggested also by the empirical results in the paper by Cho and Koh (chap. 11 in this volume). The estimated results of the model seem quite reasonable to me. I was pleased to see that Nam and Kim's estimated elasticities are quite similar to those estimated 10 years ago by Sung Kwack (1986) and used in my paper. I do wonder whether correction for simultaneous equations bias would lead to any differences.

Section 9.4 offers simulations of the model showing that alternative exchange rate policies such as a fixed nominal or fixed real exchange rate would worsen the behavior of inflation and output. This supports my argument that *flexibility* in the exchange rate is the more important goal for Korea, since the *credibility* of Korean monetary policy has been fairly well established. I note that in a recent paper Oum and Cho (1995) argue that Korean exchange rate policy in the 1990s has approximately stabilized their measure of the real effective exchange rate, while figure 9.8*B* shows that is not the case for Nam and Kim's measure. It is interesting to observe that the simulation with a constant yen-dollar rate removes most but not all of the large current account surpluses of the 1986–88 period. Since the high yen was only one of the "three blessings," it would be interesting to see what effect a constant oil price and constant interest rate would produce.

References

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Comment   Leonard K. Cheng

Nam and Kim's paper provides a description of Korea's exchange rate regimes from 1970 to 1995 and analyzes the long-run behavior of the exchange rates of the Korean won, the U.S. dollar, and the Japanese yen by focusing on the role of the productivity gap between tradables and nontradables. It then goes on to estimate an econometric model that captures three different approaches to the balance of trade, namely, the elasticities approach, the absorption approach, and the monetary approach. Finally, the estimated model is used to generate predictions about the effect of two hypothetical exchange rate regimes: (1) a fixed nominal exchange rate since 1982 and (2) a fixed real effective exchange rate since 1982.

I would like to commend the authors for their informative and systematic description of the Korean exchange rate regimes and their interesting results about the deviation of exchange rate movements from changes in relative purchasing power. As for the estimation of the econometric model, I have only one minor query. Since the volume of imports is a function of "absorption," absorption is a function of total output, and output is in turn a function of exports, putting exports as a variable directly in the import demand function implies that exports have a higher import content than output used for domestic absorption (including domestic investment). What is the empirical evidence?

The simulation results obtained from the econometric model suggest that both hypothetical regimes under consideration are inferior to the actual exchange rate regime adopted in Korea. The intuition is that neither fixed exchange rate system has the flexibility to deal with external shocks and changes in comparative advantage.

While Nam and Kim's counterfactual results seem to make good sense, I would suggest that the authors explore alternatives other than the two they have considered. This is not only because it would have been unrealistic for Korea to adopt a fixed exchange rate since 1982 (the United States began to exert pressure on Korea beginning in the mid-1980s to bring about an appreciation of the won) but also because there might be regimes that could perform better than the one actually adopted. With an appropriate multiobjective criterion function for the policymakers (such as a loss function capturing the key policy variables), the authors may even be able to search for an optimal regime, which can be compared with the actual regime.

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It is interesting to note that many Koreans regard "a deficit in the current account as a vice." When many countries are competing for foreign capital (both portfolio investment and foreign direct investment) to benefit their domestic economies, I wonder whether Korea's preoccupation with a current account surplus has much economic justification, because any effective transfer of real resources to Korea must take the form of a current account deficit.

Overall, this is an excellent paper and I have learned a lot from it about Korea's exchange rate policy over the past two and a half decades.

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