

OVERVALUATION OF REAL EXCHANGE RATE AND INTERNATIONAL COMPETITIVENESS OF MANUFACTURED GOODS—EXPERIENCES OF KOREA, TAIWAN AND SINGAPORE

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1. INTRODUCTION

The current account of Korea showed chronic deficits until the period of three lows, 1986~1989, brought forth a substantial surplus. However the account has run a deficit again since 1990. It is generally accepted that the recent current account deficits in Korea originate from the world recession and the nation's rapid wage increases, which started in 1988.

This paper reveals that in addition to the above factors, the substantial overvaluation of the won and a rigid exchange rate system also were contribution factors in encouraging current deficits.

The real effective exchange rate (REER) is believed to be an important variable effecting the current account. Generally wholesale price indices or consumer price indices are used in calculation the REER. In this paper, we argue that the unit labor cost indices should be used in calculating the REER in order to reflect the international competitiveness of the export industries better in a very open economy undergoing rapid wage increases.

In the second chapter we want to explain why the Taiwanese economy experiences a continuous current account surplus in spite of its rapid wage increases and the appreciation of the NT dollar. In the third chapter we show that the current account deterioration and economic slowdown in the period of 1979 to 1986 in Singapore was due to the overvaluation of the real exchange rate and absence of industrial restructuring. The overvaluation of the real exchange rate originated from Singapore's rapid wage increases and its overvalued currency. From our investigation, we draw the conclusion that substantial depreciation of the Korean won and new exchange rate system coupled with continuous industrial restructuring would ameliorate the sluggishness of the Korean economy.

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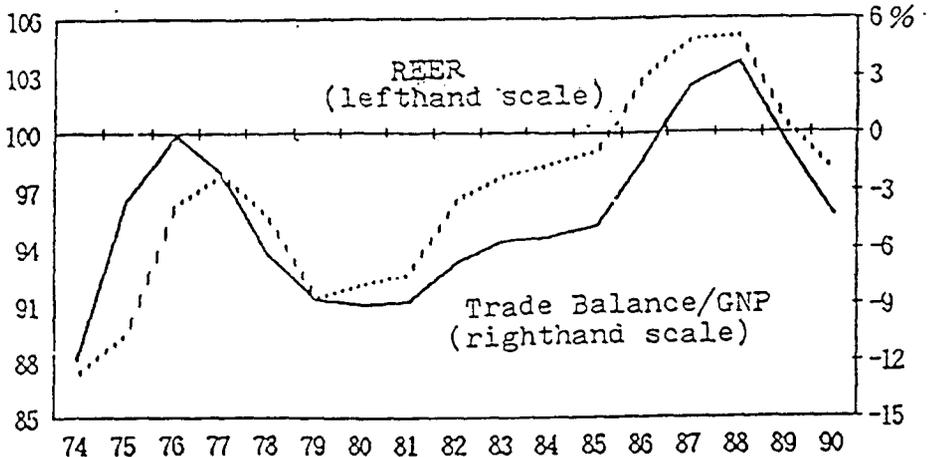
2. OVERVALUATION OF THE WON AND THE CURRENT ACCOUNT IN KOREA

Due to "three lows" in 1985, the nominal effective exchange rate (NEER) and the real effective exchange rate (REER) of the won depreciated substantially in 1985 and 1986. These events brought forth a substantial current account surplus in the period of 1986 to 1989. The U.S.A. designated Korea and Taiwan as exchange-rate-manipulating countries three times from October 1988 to October 1989, and pressured them to leave their exchange rate determination to the market mechanism. Korea introduced the market-average exchange rate system in March 1990, a system akin to the one used in Taiwan in the 1980s. The weighted average of exchange rates transacted among the banks in the previous day becomes the basic rate in the morning. The buying and selling rates among the banks are allowed to move within ± 1.0 percent around the basic rate.

The pattern of the REER movements is similar to that of the ratio of trade balance/GNP and current account/GNP (Graph 2-1) and (Graph 2-2)).

In graph 2 the REER of the t th period is shown together with the ratio of current account/GNP of the t th period. The inflows of foreign funds caused by the middle-East construction in the late 1970s, and by the high interest rates in the domestic economy and the rising value of the won in the late 1980s seem to cause a relatively large gap between the REER movements and current account/GNP movements. The close relationship between REER and current account/GNP can be seen in Taiwan also (Graph 2-3)). REER is also closely related to the U.S. share of the Taiwanese products (Graph 2-4)).

(Graph 2-1) REER⁽¹⁾ of the won and trade balance (1988=100)
(1988=100)



Notes : $REER_t = 1/3(REER_t + REER_{t-1} + REER_{t-2})$

(1) The REER index was constructed using the following formula.

$$REER = RER^{a_1} \times RER^{a_2} \times RER^{a_3} \times RER^{a_4} \times RER^{a_5}$$

$$R_i/R_0$$

$$REER_i = \frac{R_i/R_0}{XP_k/XP_i} \times 100 : \text{Real exchange rate of the } i\text{th currency}$$

REER : Real effective exchange rate of the won

a_i : the trade weight of the i th currency (base year = 100)

i : U.S.A., Japan, France, West Germany, UK

R_i : Exchange rate of the i th currency in terms of the won in the comparison year.

R_0 : Exchange rate of the i th currency in terms of the won in the base year.

XP_k : Export price index of Korea in the comparison year (in terms of the Korean currency, 1988=100)

XP_i : Export price index of the i th country in the comparison year (in term of the i th country in the comparison year (in terms of the i th currency, 1988=100))

The reason why 1988 was used as the base year is as follows : In 1989 the trade balance was near equilibrium. However, the 1989 trade performance was assumed to be affected by the exchange rate of 1988. (See Se Hyung Choi "A study of the effects of exchange rate management in the Choi "A study of the effects of exchange rate management in the internationalization of the Korean economy," Korean Trader's Association, August, 1991.)

Source : Se Hyung, Choi. "A study of the effects of exchange rate management in the internationalization of the Korean economy" Korean Trader's Association, August, 1991.

Table 2-1. Depreciation Rate of the Won

(unit : %, End of Year Comparison)

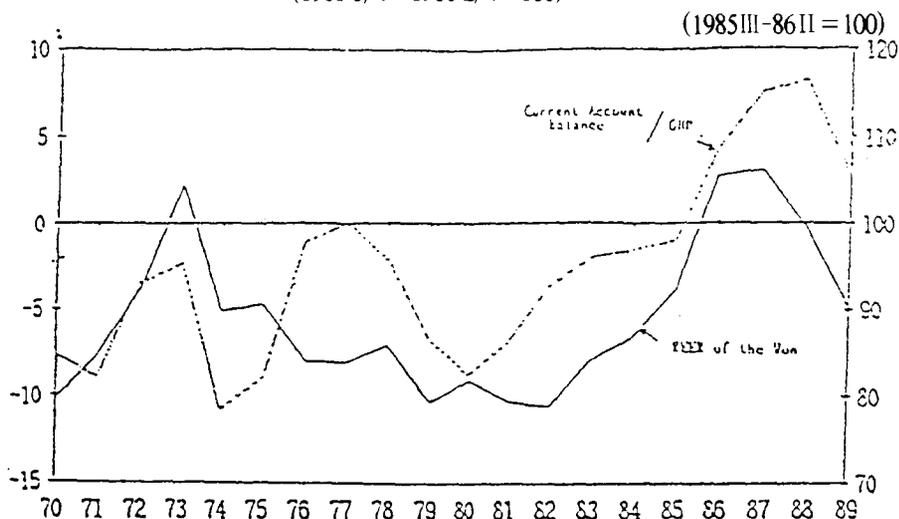
	1985	1986	1987	1988	1989	1990	1991	1992
W/\$	7.6	-3.2	-8.0	-13.7	-0.7	5.4	6.2	3.6
W/W	34.2	2.13	19.3	-14.7	-13.8	12.8	14.0	4.3
NEER	7.5	18.0	1.2	-6.1	-11.4	6.4	6.4	9.3
REER	6.5	14.6	0.4	-7.0	-9.4	4.9	1.5	6.5

Notes : 1) Minus sign signifies appreciation

2) WPI was used in calculating REER

Source : The Bank of Korea Monthly Statistics, Various issues IMF, International Financial Statistics

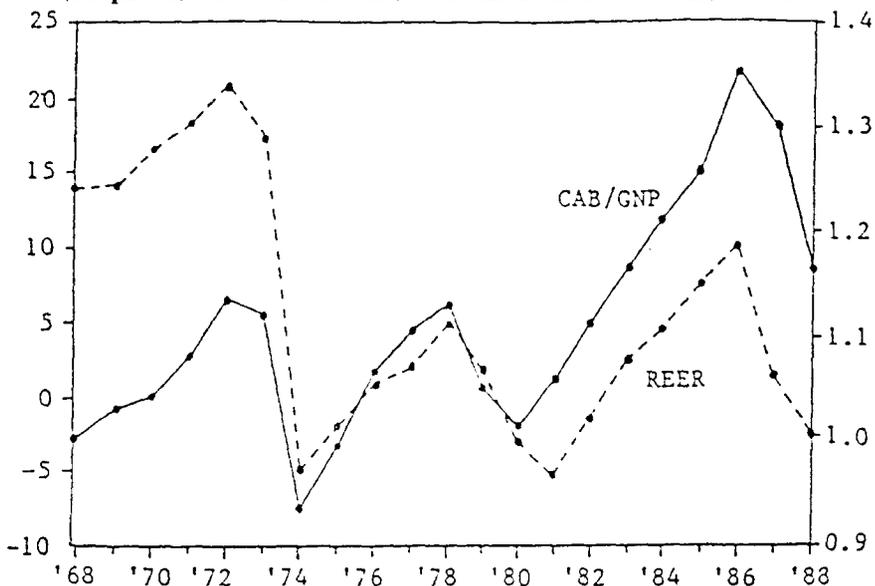
〈Graph 2-2〉 REER of the Won and Current Account
(1985 3/4-1986 2/4=100)



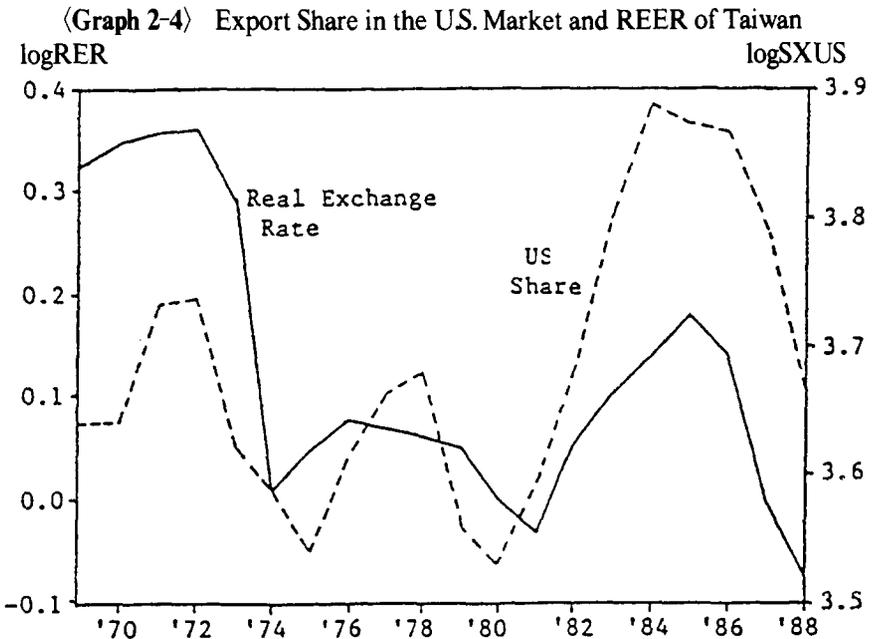
Notes : 1) REER is the REER of the corresponding year. The figure of 1989 is the figure of January to June, 1989.

Source : Bong Sung Oum, "Exchange rate policy of the 1980s," Macroeconomy and Financial policy in Korea, KDI, December, 1989.

〈Graph 2-3〉 Current Account/GNP and REER of Taiwan(1980=1.0)



Source : James Riedel, International Trade in Taiwan's Transition from Developing to Mature Economy, in G. Ranis, ed., Taiwan from Developing to Mature Economy Boulder, Westview Press, 1992



Source : Monthly Statistics of Exports and Imports, Taiwan Area, R.O.C. : I.M.F. International Financial Statistics, Various issues.

Korea's current account deficits, which resumed in 1990, have persisted due to the substantial overvaluation of REER in Korea since 1989 as shown in Table 2-2. REER shows some depreciation in recent years when the wholesale price indices (WPI) or consumer price indices (CPI) are used. However, when unit labor cost (ULC) is used in calculating REER, drastic overvaluation of the won is indicated since 1988. In 1991, the won was overvalued by about 35 percent if 1985 is used as the base year. This overvaluation is due to the fact that manufacturing wages increased by 20.5 percent per year during the period of 1985 to 1991. Even in 1992, REER did not show much difference considering that the manufacturing wage in Korea increased by 15.7 percent in the year.

In a highly open economy such as Korea, to show international competitiveness, unit labor cost is a more appropriate index to use in calculating REER than WPI or CPI. Using unit labor cost is superior because price increases due to wage increases will induce imports and the rates of price increase in tradable goods tend to be the same internationally, REER calculated by using WPI or CPI does not reflect changes in the profitability of the export industries : REER calculated by ULC shows the profitability more clearly.

Table 2-3 show the unit labor cost and the export price indices and their projections in a common currency for OECD countries and Asian NIC's. Korean ULC increased from 100 to 167 between 1987 and 1990. The latter number is compared with 138, 132 and 127 of Taiwan, Singapore and Hong Kong respectively during the same

period. On the other hand Korea's export prices have increased at about the same rate as those of other countries.

Export prices in terms of the Korea won increased only 24 percent per year during 1988 to 1992. This shows that the profitability of the export industries has declined substantially in the past years and is the main reason for the continuing trade deficits since 1990. Ordinary income to total assets and ordinary income to sales as the profitability indexes of the export industries declined by half in 1992 compared with those of 1987. Table 2-4

Table 2-2 Nominal and Real Effective Exchange Rates(NEER and REER)¹
(Base : 1985. 3/4 1986. 2/4=100. In the Case of ULC, 1985=100)

Year	NEER ⁽²⁾	REER(WPI) ⁽³⁾	REER(CPI) ⁽⁴⁾	REER(ULC) ⁽⁵⁾
1970	27.1	77.4	62.8	—
1971	31.3	82.6	66.8	—
1972	37.9	90.3	75.6	—
1973	39.9	103.1	85.0	—
1974	39.0	88.7	78.4	—
1975	48.0	89.6	84.1	—
1976	47.7	83.3	78.2	—
1977	49.8	83.6	79.3	—
1978	56.4	87.3	83.4	—
1979	56.3	80.2	75.3	—
1980	69.8	82.1	79.7	88.5
1981	77.0	79.3	78.1	97.4
1982	78.4	78.8	77.7	90.2
1983	83.3	84.2	82.3	91.9
1984	84.8	86.8	84.8	93.9
1985	91.2	92.4	91.9	100.0
1986	107.2	105.9	107.0	120.8
1987	108.9	106.3	107.2	109.2
1988	102.2	98.9	96.4	90.8
1989	90.6	89.6	83.8	65.6
1990	96.4	94.0	85.6	64.3
1991	102.6	95.4	86.2	67.6
1992	112.1	103.1	91.0	NA
1993	88.8	107.4	94.8	NA

Note : (1) weights : Trade weights of major trade partner countries(U.S.A., Japan, Germany, UK, France, Canada, Netherlands). Low value signifies appreciation

(2) NEER = won exchange rate per each currency \times trade weights. Relative price = Korean price(or ULC)/foreign price(or ULC) \times trade

weights

(3) REER(WPI) : NEER/Relative price \times 100.0. WPI is used in calculating relative price indices

(4) REER(CPI) : CPI is used in calculating relative price indices and REER.

(5) REER(ULC) : ULC is used in calculating relative price indices and REER.

Source : IMP, International Finance Statistics, Various issues Department of Labor, U.S.A., Monthly Labor Review, Various issues

Table 2-3. Competitiveness Index in the Manufacturing Sector : OECD and NIC's (1987=100)

	Relative unit labor cost index (common currency is used)					Relative export price index (common currency is used)				
	average 1987~89	1990	1991	1992	1993	average 1987~89	1990	1991	1992	1993
U.S.A.	94	85	81	78	78	96	90	87	86	85
Japan	98	80	86	87	85	101	97	104	105	105
W.Germany	99	99	98	100	102	98	100	99	100	101
France	94	92	89	86	85	98	99	96	96	96
Italy	101	110	111	114	115	100	108	109	110	111
U.K.	103	107	111	110	111	102	104	103	103	102
Canada	110	122	127	129	129	105	107	109	108	108
Austria	95	92	90	89	88	99	95	93	93	93
Belgium-Lux	97	97	95	95	95	101	106	104	105	104
Denmark	100	99	94	92	91	97	101	99	97	96
Finland	103	112	111	98	95	104	109	104	102	102
Netherlands	97	94	92	90	90	99	100	99	99	98
Norway	102	100	96	96	96	112	110	107	110	112
Portugal	105	117	125	133	137	98	96	99	100	99
Spain	107	121	122	123	125	105	111	111	111	111
Sweden	105	114	115	116	115	102	103	103	105	106
Switzerland	100	104	105	104	100	98	103	102	100	100
Australia	112	123	121	121	123	110	104	102	101	102
New Zealand	102	94	91	86	86	109	111	103	102	101
Singapore	106	132	142	148	155	99	104	106	103	100
Taiwan	116	138	140	144	149	107	109	112	113	112
Korea	130	167	165	165	171	109	107	109	108	111
Hong Kong	108	127	136	145	155	98	95	98	99	100
Malaysia	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thailand	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Source : OECE, Economic Outlook, 50, December 1991.

Table 2-4. Profitability of the Export Industries

(Unit : %)

	1987	1992
Ordinary income to total assets	4.8	2.1
Financial expenses and ordinary income to total assets	10.0	8.0
Ordinary income to Sales	3.8	2.1

Source : The Bank of Korea, Financial Statement Analysis for 1991, 1988, 1993.

3. REAL EFFECTIVE EXCHANGE RATES WAGE RATES, AND INDUSTRIAL ADJUSTMENT IN KOREA AND TAIWAN

3.1 Real effective exchange rates and wage rates in Korea and Taiwan

Taiwan has had continuous surpluses since the beginning of the 1970s and also has experienced continuous appreciation of the NT dollar. The country's wage rate has risen substantially. In this chapter we want to understand the causes of the continuous trade surplus in Taiwan.

Wages in terms of the U.S. dollar have increased to a similar extent in the two countries during the period of 1971 to 1991 Table 3-1. even though real wage rates and unit labor costs have increased faster in Korea than in Taiwan (Tables 3-2, 3-3, 3-4, 3-5, 3-6). This difference is due to the continuous appreciation of the NT dollars.

Table 3-7 shows REER using WPI as the relative price index. In the period of 1981 to 1991. Korean REER changed from 100.3 to 83.3 reflecting a 17 percent depreciation, while Taiwanese REER changed from 101.8 to 92.7 showing 8.9 percent depreciation. Based on the above REER, Korean competitiveness improved more than those of Taiwan and Hong Kong, while it deteriorated against those of Indonesia, Malaysia, Thailand and Mexico.

As in the case of Korea, REER should be calculated by using the unit labor cost for the other countries also to reflect the international competitiveness. Using ULC, REER in Taiwan appreciated rapidly from 1979 while in Korea it has appreciated since 1988. (Graph 3-1)

Table 3-1. Trends in Manufacturing Wage, Productivity, Prices, Exchange Rates in Korea and Taiwan

(unit : %, per year)

Year	Nominal(real) wage		CPI	Exchange rate ⁽¹⁾ depreciation	Manufacturing labor productivity ⁽²⁾
	Domestic currency	U.S. dollar			
Korea	Nominal(real)	Nominal			
1971~80	26.5(10.0)	19.0	16.5	7.3	10.7
1981~91	15.2(8.5)	13.7	6.7	2.0	13.2 ⁽³⁾
1981~85	13.0(5.6)	5.1	7.4	7.5	11.4
1986~91	17.1(10.9)	10.8	6.2	-2.6	14.9 ⁽³⁾
Taiwan	Nominal(real)	Nominal			
1971~80	17.7(6.6)	18.9	11.1	-1.0	5.8 ⁽⁴⁾
1981~91	10.8(8.5)	14.4	3.1	-2.8	6.2
1981~85	9.7(5.5)	7.5	4.1	2.1	3.4
1986~91	11.7(9.4)	20.2	2.3	-6.8	8.6

Note : (1) Won per US dollar. Minus sign signifies appreciation

(2) Korean Productivity is in terms nominal prices and Taiwanese one is in real prices.

(3) annual average of 1981 to 1990.

(4) annual average of 1974 to 1980.

Source : Bank of Korea, Economic Statistics yearbook, various issues.

Institute of Free China, Council of Economic Planning and Development, Executive Yuan, Republic of China, Taiwan Statistical Yearbook, April, 1992.

Table 3-2 Changes in the Unit Labor Costs in the Manufacturing Sector in Korea and Taiwan

(unit : %)

Year	Korea	Taiwan
1966~70	9.6	NA
1971~75	10.7	NA
1976~80	22.9	11.3
1981~85	4.7	9.9
1986~90	4.4	3.7
86	-8.8	0.5
87	-0.8	1.3
88	7.7	4.7
89	18.2	5.7
90	5.9	6.2

Source : The Bank of Korea, Quarterly Economic Review, March 1992.

Industry of Free China, Council of Economic Planning and Development, Executive Yuan, Republic of China, April, 1992.

Table 3-3. Changes in Employment Cost and Value Added per Worker
in the Korean Manufacturing Sector

(unit : %)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Employment cost	14.3	12.4	12.1	7.5	9.6	16.3	25.9	24.9	19.0	18.9
Value added	12.2	13.4	9.5	9.3	13.4	17.7	21.1	19.4	18.6	16.9

Source : The Bank of Korea, Quarterly Economic Review, p.29, September 1992.

Table 3-4. Change in Wage Rates and Labor Productivity
(1989~1992, annual average)

(unit : %)

Country	wage rate(A)	labor productivity(B)	(A-B)
Korea	19.4	10.4	9.0
Taiwan	12.3	8.2	4.1
Japan	3.9	1.8	2.1
Hong Kong	12.6	10.9	1.7
China	11.0	14.2	-2.3

Source : Korean Trade's Association, Export Competitiveness, 1993, KIET, Real Economy, August, 1993.

Table 3-5. Changes in Wage, Prices, Labor Productivity and Exchange Rates
in Taiwan

(unit : %, NT\$/US\$)

Year	Employee wage ⁽¹⁾		CPI	Labor Productivity ⁽¹⁾	Exchange Rate ⁽²⁾
	Nominal	Real			
1971	16.9	14.1	2.8	NA	40.05(0)
1972	7.5	4.5	3.0	NA	40.05(0)
1973	8.7	0.5	8.2	NA	40.05(0)
1974	33.7	-13.8	47.5	-3.7	38.00(-5.1)
1975	17.1	11.9	5.2	9.4	38.00(0)
1976	17.9	15.4	2.5	10.2	38.00(0)
1977	20.2	13.2	7.0	5.2	38.00(0)
1978	11.4	5.6	5.8	15.4	37.05(-2.5)
1979	21.1	11.3	9.8	1.9	36.05(-2.7)
1980	22.6	3.6	19.0	1.9	36.02(-0.1)
1981	18.7	2.4	16.3	6.9	36.85(2.3)
1982	9.7	6.7	3.0	0.7	39.12(6.2)

Year	Employee wage ⁽¹⁾		CPI	Labor Productivity ⁽¹⁾	Exchange Rate ⁽²⁾
	Nominal	Real			
1983	6.4	5.0	1.4	7.6	40.07(2.4)
1984	9.4	9.4	0	-0.4	39.60(-1.2)
1985	4.3	4.5	-0.2	2.1	39.85(0.6)
1996	10.1	9.4	0.7	7.1	37.84(-5.0)
1987	9.9	9.4	0.5	7.9	31.85(-15.8)
1988	10.9	10.4	0.5	7.3	28.59(-10.2)
1989	14.6	10.2	4.4	10.4	26.41(-7.6)
1990	13.5	9.4	4.1	7.8	27.16(2.8)
1991	11.0	7.3	3.6	10.9	25.78(-5.1)

Notes : (1) Manufacturing sector monthly wages(NT dollar basis). Labor productivity in the manufacturing sector

(2) During the year. Figures in the parentheses are those of appreciation. Minus sign signifies appreciation of the NT dollar.

Source : Council of Economic Planning and Development, Executive Yuan, Taiwan Statistical yearbook, Various issues.

Table 3-6. Changes in Wage, Prices, Labor Productivity, Exchange Rate
(unit : %, WON/US\$)

Year	Employee wage ⁽¹⁾		CPI	Labor Productivity ⁽¹⁾	Exchange Rate ⁽²⁾
	Nominal	Real			
1971	16.2	2.8	13.4	9.9	347.2(11.8)
1972	13.9	2.1	11.8	9.0	392.9(13.2)
1973	18.0	14.5	3.5	8.7	398.3(1.4)
1974	35.3	11.0	24.3	6.5	404.5(1.6)
1975	27.0	2.0	25.0	16.7	484.0(19.7)
1976	34.7	19.4	15.3	7.6	484.0(0)
1977	33.8	23.5	10.3	10.3	484.0(0)
1978	34.3	19.8	14.5	12.0	484.0(0)
1979	28.6	10.4	18.2	15.8	484.0(0)
1980	22.7	-6.0	28.7	10.6	607.4(25.5)
1981	20.1	-1.3	21.4	18.2	681.1(12.1)
1982	14.7	7.5	7.2	7.8	731.1(7.4)
1983	12.2	8.8	3.4	13.6	775.8(6.0)
1984	8.1	5.8	2.3	10.5	806.5(3.9)
1985	9.9	7.4	2.5	7.1	870.0(7.9)
1996	9.2	6.4	2.8	17.6	881.5(1.3)
1987	11.6	8.6	3.0	14.9	822.6(-6.7)
1988	19.6	12.5	7.1	14.1	731.6(-11.1)
1989	25.1	19.4	5.7	12.2	671.5(-8.2)
1990	20.2	11.6	8.6	15.6	707.8(5.4)
1991	16.9	7.2	9.7	NA	733.4(3.6)

Notes : (1) Manufacturing monthly wage, labor productivity (nominal prices basis)
 (2) During the year. Figures in the parentheses are those of depreciation.
 Minus sign signifies appreciation

Source : Bank of Korea, Economic Statistics yearbook, various issues.

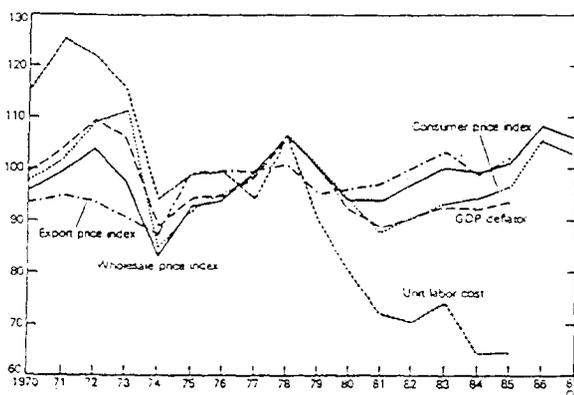
Table 3-7. Real Effective Exchange Rate
 (adjusted by relative WPI's 1980~82 average = 100)

Country	1981	1982	1983	1984	1985	1986	1978	1988	1989	1990	1991
Korea	100.3	101.9	97.6	96.5	89.2	76.4	75.7	82.1	92.2	84.9	83.3
Taiwan	101.8	96.6	94.5	97.1	94.6	86.4	91.8	95.3	100.8	93.9	92.7
Hong Kong	98.9	101.6	95.8	100.2	104.2	94.0	90.0	90.7	98.6	98.9	106.1
Singapore	102.0	100.8	101.8	102.4	95.7	81.0	74.6	73.0	78.1	80.5	83.0
Indonesia	99.8	111.7	96.3	96.0	94.8	73.6	56.1	54.1	55.3	54.5	54.4
Malaysia	99.4	105.6	113.9	119.7	116.4	95.5	89.6	80.5	79.4	75.8	75.6
Thailand	NA	74.2	77.1	74.6	79.5						
Philippine	106.2	106.7	96.1	107.9	114.6	91.0	87.7	89.6	95.4	88.5	87.2
Japan	104.8	92.4	96.8	97.8	96.6	120.3	123.6	129.1	121.6	107.6	114.6
U.S.A	100.8	109.3	112.7	119.6	122.5	108.3	98.3	92.9	96.8	92.5	91.9
Mexico	114.4	82.9	78.8	91.8	90.5	62.9	64.6	76.9	74.0	69.2	75.3

Notes : (1) RER against 18 OECD member and 22 LDC Currencies. Higher value signifies real appreciation

Source : Morgan Guarantee Trust Company, International Finance Statistics, Various issues.

〈Graph 3-1〉 REER of Taiwan
 (1976~1978=100 : annual average)



Note : (1) Weighted by trade volume with trade partner countries. Higher value signifies real appreciation.

Source : Bella Balassa and John Williamson. Adjusting to Success : Balance of Payments Policy in the East Asian NICs. Institute for International Economics, June 1987.

3.2 Industrial Adjustment and Trade Structure in Korea and Taiwan

The growth rates of the Korean economy are similar to those of the Taiwanese economy in the period of 1965 to 1990 (Table 3-8). The Taiwanese industrial adjustment to higher value added goods took place earlier than the Korean one. In 1970, as (Table 3-9) shows, the share of machinery and equipment exports in total exports from Taiwan was 16.7 percent which is far greater than 7.2 percent from Korea. In 1990, the ratios approached parity in the two countries. However the rate annual increase in exports of metal goods such as equipment, machinery parts, electrical products, etc was 24.5 percent in Taiwan in the period of 1985 to 1990 while it was 14.1 percent in Korea. In addition the rates of increase were faster in chemicals and basic metal in Taiwan than in Korea. Korea's growth rates are faster than Taiwan's in exports of light industry goods during the same period (Table 3-10).

In Taiwan, the production of the light industry goods declined and that of heavy and chemical goods increased substantially between 1985 and 1990. On the other hand, the production of the major manufacturing industries in Korea expanded in all areas during the same period without significant industrial adjustment even though heavy and chemical industries expanded faster (Table 3-11). This information shows that the Taiwanese industries experienced industrial restructuring earlier than the Korean counterparts. (Table 3-12) shows the changes in the composition of value added and employment by industry. In the sector of textile, clothing, leather and shoes industries (ISIC 321-324), employment declined by about ten percentage points in both Korea and Taiwan. Korean employment in the same sector was 24.3 percent and Taiwanese employment was 17.3 percent in 1988 to 1990. In the heavy and chemical industries Korean employment was 61.7 percent while Taiwanese employment was 68.3 percent during the same period. The shares and ranks of major manufacturing production sectors of Korea and Taiwan among 138 LDC's in 1980 and 1990 are shown in (Table 13). Except textile and industrial chemicals production Korean manufacturing production shares nearly doubled in most areas, and especially machinery and transport equipments increased three to six times during the same period and became the largest producer in the LDD group. On the other hand the Taiwanese shares show much less moderate increases than the Korean shares, and in textile clothing and papers they remain about the same.

Table 3-8. Growth Rates of GNP in Korea and Taiwan

(unit : %)

Country	1965~1973	1974~1979	1980~1985	1986~1990
Korea	9.4	9.1	6.4	10.8
Taiwan	11.0	8.7	7.2	8.9

Note : The Bank of Korea, Economic Statistics yearbook, 1991.

Council for Economic Planning and Development, Taiwan Statistical Yearbook, Republic of China, 1992.

Table 3-9. Shares of Machinery and Equipments Exports¹⁾ from Korea and Taiwan
(unit : billion US dollars. %)

Year	Total Exports and Imports (billion US dollar)		Exports and Imports of Machinery and Equipment(%)	
	Korea exports(imports)	Taiwan exports(imports)	Korea exports(imports)	Taiwan exports(imports)
1970	0.83(1.98)	1.43(1.53)	7.2(29.7)	16.7(35.1)
1975	5.07(7.27)	5.32(5.99)	13.8(26.3)	19.6(32.0)
1980	17.45(22.23)	19.84(19.79)	20.3(22.4)	24.7(27.6)
1985	30.28(31.12)	30.63(20.07)	37.6(34.5)	27.8(27.8)
1989	62.28(61.35)	66.18(50.52)	35.0(34.2)	35.6(36.8)
1990	65.016(69.84)	67.04(53.42)	36.9(34.3)	38.0(37.6)

Notes : (1) SITC 7 group

(2) Figures in the parentheses are those of imports

Source : UNCTAD, Handbook of International Trade and Development Statistics,
UN, New York, 1991.**Table 3-10.** Export Performance by Items of Korea and Taiwan, 1990
(unit : %)

	Korea				Taiwan			
	Millions dollar (1990)	Annual growth (1985~90)	Compo- sition	Share in the world	Millions dollar (1990)	Annual growth (1985~90)	Compo- sition	Share of the world
Total	65,016	14.9	100.0	1.7	67,909	17.2	100.0	1.9
Construction related material	865	18.4	1.33	1.8	1,049	10.5	1.54	2.3
Basic metal	4,454	15.9	6.85	2.3	1,645	17.9	2.42	0.9
Textile	20,070	16.0	30.87	6.9	13,946	9.6	20.54	5.1
Wood, pater	4,350	20.1	6.69	1.4	7,925	12.6	11.67	2.8
Metal Products ¹⁾	26,858	14.1	41.31	1.8	32,400	24.5	47.74	2.3
Chemical	4,291	16.7	6.60	1.1	7,061	21.6	10.40	1.9
Agriculture Food. nonbeverage	877.7	9.7	1.35	0.4	672	7.7	0.99	0.4
Tobacco	2,230	15.7	3.43	1.0	2,559	11.4	3.77	1.3

Note : (1) Equipment, machinery, machinery parts, electrical products and others

Source : World Economic Forum, The World Competitiveness Report, 1992, 12th
Edition, IMD, Lausanne, Switzerland.

Table 3-11. Annual Growth Rates of Major Manufacturing in Korea and Taiwan

(unit : %)

	Korea		Taiwan	
	1980~1985	1980~1985	1980~1985	1980~1985
Textile	4.0	5.3	2.8	-0.5
Clothing	8.2	4.6	5.9	-4.8
Footwear	5.3	8.9	23.1	0.1
Paper	19.2	13.8	6.4	-5.5
Industrial	5.8	13.3	9.9	5.9
Chemicals				
Other chemicals	12.5	16.7	7.8	9.9
Paper product	11.7	6.1	9.6	4.0
Iron, steel	11.2	10.3	7.6	8.6
Metal product	12.7	7.4	6.5	7.1
Nonelectric machinery	25.8	19.9	3.4	11.0
Electrical machinery	22.2	22.9	15.0	12.6
Transport equipment	21.3	20.8	3.8	12.9
Precision, science Equipment	5.8	19.1	9.7	11.8
Other manufactures	9.2	4.1	10.0	4.7

Note : (1) 1980 constant prices.

Source : UNIDO, Handbook of Industrial Statistics, Vienna, 1992.

Table 3-12. Composition of Value Added and Employment
by Manufacturing Sector

(unit : %)

ISIC	Korea						Taiwan					
	Value added ⁽¹⁾			Employment			Value added			Employment		
	1975 -77	1981 -88	1988 -90	1975 -77	1981 -88	1988 -90	1975 -77	1981 -88	1988 -90	1975 -77	1981 -88	1988 -90
311-314	18.7	16.1	11.4	9.3	8.3	7.0	16.7	13.1	11.0	7.2	5.8	5.6
321-324	21.2	17.9	14.6	35.1	31.4	24.3	16.8	17.1	12.7	26.9	22.6	17.3
331-332	2.5	1.7	1.6	3.5	2.9	2.6	3.1	2.6	1.8	5.7	4.9	4.1
341-342	4.0	4.5	4.6	4.4	4.5	4.3	4.0	4.2	4.8	3.8	4.0	4.6
351-356	20.0	19.0	17.5	12.9	12.9	13.8	20.0	21.0	23.2	16.6	17.6	17.5
361, 362 369	5.1	4.7	4.4	4.0	4.5	3.9	4.7	4.4	3.	4.8	4.8	4.0
371-372	5.8	8.3	7.3	3.4	4.3	3.8	4.0	5.7	6.7	2.8	3.4	3.2
381-385	20.7	25.6	36.4	23.1	27.4	36.5	22.8	24.9	27.4	26.7	32.0	38.3
390	1.9	2.0	2.2	4.3	3.9	3.7	8.1	6.9	8.3	4.5	5.1	5.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Light Industry (31-34)	46.5	40.2	32.2	52.3	47.1	38.2	40.6	37.0	30.3	43.6	37.3	31.6
Heavy chemical Industry (36-39)	53.5	59.6	67.8	47.7	53.0	61.7	59.6	62.9	69.5	56.4	62.9	68.3

Note : (1) Current prices basis

(2) 311-314 : foods, beverage, tobacco

(3) 321-332 : textile, clothing, leather, wool products, footwear

(4) 331-332 : wood, cork products, furniture

(5) 341-356 : paper, print, publishing

(6) 351-356 : industrial chemicals, other chemicals, oil refining, rubber, plastic products, oil coal products

(7) 361, 362, 369 : china, earthen ware, glass products, other nonmetal products

(8) 371-372 : iron and steel, other noniron metal

(9) 381-385 : metal products, nonelectrical machinery, electrical machinery, transport equipment, precision, science equipment

(10) 390 : other manufactures

Source : UNIDO, Handbook of Industrial Statistics, Vienna, 1992

Table 3-13. Shares and Ranks of Major Manufacturing Production of Korea and Taiwan in LDC's

(unit : %)

	Korea Share(rank)		Taiwanese Share(rank)	
	1980	1990	1980	1990
Textile	5.4(6)	7.6(94)	5.5(5)	5.2(6)
Clothing	5.5(6)	9.2(3)	2.6(9)	2.6(7)
Footwear	3.8(7)	7.5(5)	1.1(14)	2.8(8)
Paper	3.9(8)	7.2(5)	5.3(6)	6.1(6)
Industrial chemicals	8.1(4)	10.9(5)	4.6(8)	5.4(6)
Other chemicals	3.5(6)	8.6(4)	2.9(8)	4.5(6)
Paper products	6.9(4)	11.7(3)	3.7(9)	5.1(7)
Iron, steel	5.7(6)	10.6(5)	4.9(7)	6.5(7)
Metal products	2.5(9)	5.4(7)	3.7(5)	5.5(6)
Nonelectrical	3.7(6)	22.8(1)	2.6(8)	4.2(7)
Machinery				
Electrical machinery	7.3(6)	23.4(1)	9.0(3)	12.8(3)
Other manufactures	2.9(9)	16.0(1)	3.9(6)	6.5(7)

Note : (1) 138 LDC's are included. Figures in parentheses are ranks. Shares are based on value added in terms of 1980 prices.

Source : UNIDO, handbook of Industrial Statistics, Vienna, 1992.

The shares of value added in the manufacturing and construction sectors as a percentage of GDP in Korea and Taiwan are shown in (Table 3-14). The Taiwanese manufacturing sector has much higher ratios than its Korean counterpart in both the 1970's and 1980's. However in the construction sector the Korean ratio is about twice as large as the Taiwanese ratio in the 1980's. In 1991 the Korean share of the construction value added is three times as large as the Taiwanese ratio.

Table 3-14. Shares of Value Added in Manufacturing and Construction⁽¹⁾

	1970~79 average	1980~90 average	1985	1986	1987	1988	1989	1990	1991
Korea									
Manufacturing	25.3	30.6	30.3	31.7	32.2	32.5	31.2	28.9	28.1
Construction	5.5	8.4	7.7	7.1	7.4	8.1	9.7	13.2	15.5
Taiwan									
Manufacturing	35.5	36.8	37.6	39.7	39.5	37.8	35.6	34.4	34.2
Construction	5.0	4.7	4.1	3.9	3.9	4.3	4.6	4.9	4.9

Notes : (1) Shares are based on current prices

Source : The Bank of Korea, Economic Statistics Yearbook, various issues.

Council for Economic Planning and Development, Republic of China, Taiwan Statistical Yearbook, various issues.

High investment rates of Korea are mainly responsible for continuous trade deficits in Korea. From 1985 on the Korean investment rates are about ten percentage points higher than the Taiwanese rates. Taiwanese savings rates have been higher than the Korean savings rates until 1987. However from 1988 Korean savings rates are higher than the Taiwanese rates (Table 3-15), (Table 3-16).

Table 3-15. Total Savings Rate and Total Investment Rate of Korea and Taiwan
(unit : %)

	Korea		Taiwan	
	Domestic inv. ⁽¹⁾	Domestic saving	Domestic inv.	Domestic saving
	GDP	GDP	GDP	GDP
1970	28.3	17.0	26.2	25.6
1971	28.1	15.5	27.1	28.9
1972	24.1	16.0	26.6	32.1
1973	26.8	24.1	28.1	34.6
1974	30.5	21.2	36.8	31.7
1975	29.0	19.9	30.6	27.3
1976	27.4	23.6	30.8	33.0
1977	27.7	27.0	24.9	33.0
1978	33.3	28.8	24.8	34.5
1979	36.1	28.2	28.0	33.3
1980	29.5	23.8	28.4	32.4
1981	28.1	23.9	26.9	31.7
1982	28.3	25.0	23.8	30.0
1983	28.7	28.6	22.5	32.0
1984	30.2	30.5	21.4	33.0
1985	29.3	30.7	18.6	32.5
1986	28.8	34.0	17.5	36.9
1987	29.2	36.6	20.5	37.2
1988	29.8	38.3	23.3	32.8
1989	34.7	35.6	22.8	29.2
1990	38.1	35.6	22.2	27.9

Note : (1) Domestic Investment = total fixed investment + inventory investment

Source : Asian Development Bank, Key Indicators of Developing Asia and Pacific Countries, April, 1984, July 1991.

Table 3-16. Trade Account and Current Account

	Taiwan		Korea	
	Trade A/C(Mill. US\$, fob) ⁽¹⁾	Current A/C (Mill, US\$. fob)	Trade A/C(Mill. US\$, fob) ⁽¹⁾	Current A/C (Mill. US\$, fob)
1971	291	170	-1,046	-848
1972	648	513	-574	-371
1973	766	598	-566	-309
1974	-812	-1,094	-1,937	-2,023
1975	-255	-589	-1,671	-1,887
1976	700	292	-591	-313,6
1977	1,143	911	-477	12
1978	2,189	1,639	-1,780	-1,085
1979	1,320	181	-4,395	-4,151
1980	77	-913	-4,384	-5,321
1981	1,825	519	-3,628	-4,646
1982	3,646	2,248	-2,595	-2,650
1983	6,268	4,412	-1,764	-1,606
1984	9,232	6,976	-1,036	-1,373
1985	11,173	9,198	-19	-887
1986	16,917	16,277	4,206	4,617
1987	20,286	17,999	7,659	9,854
1988	13,834	10,117	11,445	14,161
1989	16,203	11,384	4,597	5,055
1990	11,076	8,428	-2,004	-2,051
1991	15,906 ⁽²⁾	NA	-6,980	-8,728

Note : (1) Current account

(2) Estimate

Source : Asian Development Bank, Key Indicators of Asia and Pacific Developing Countries, Various issues.

The high dependence on the borrowed capital and the high ratio of financial costs to sales for Korean firms in relation to Taiwanese firms are other factors contributing to the relatively weak international competitiveness of Korean firms (Table 3-17), (Table 3-18).

Table 3-17. International Comparison of Financial Structure of Firms

(unit : %)

	Korea(91)	U.S.A(91)	Taiwan(90)	Japan(90)
Stockholder's equity to total assets	24.4	40.4	54.5	30.6
Total borrowings to total assets	44.6	29.4	24.2	33.0

Source : Economic planning Bureau, Economic white paper, 1992, p. 236.

Table 3-18. Financial Costs to Sales in Manufacturing

(unit : %)

	1986	1987	1988	1989	1990	1991	1992
Korea	4.9	4.6	4.6	5.1	5.1	5.7	6.3
Taiwan	1.8	107	1.7	2.1	2.5	2.4	NA
Japan	2.3	1.9	1.7	1.8	1.9	2.2	NA

Source : The Bank of Korea, Financial Statement Analysis, Various issues.

4. REAL EFFECTIVE EXCHANGE RATE, CORRECTIVE WAGE POLICY AND 1985~86 RECESSION IN SINGAPORE

4.1 High wage rate policy

Singapore's experience with high wage increases and strong exchange rates in the 1979~85 period is a good example to show that the profitability and international competitiveness of the export firms are better described by REER indexes using unit labor cost indexes rather than REER indexes using WPIs or CPIs.

The severe recession of 1985~86 in Singapore was related to both demand and supply factors. Externally, oil and marine related sectors were sagging, coupled with the slowdown of the world economy. The collapse of oil and primary commodity prices dealt a severe blow to Singapore's neighbours in ASEAN, especially in Indonesia and Malaysia, and it had a negative impact on Singapore.

Internally, the construction boom was reversed and domestic savings were raised, partly by the increased rate of forced employer contributions to the Central Provident Fund(CPF) and Skill Development Fund(SDF) and payroll taxes. The rise in savings was not matched by a rise of productive domestic investment. Furthermore, labor costs rising faster than labor productivity and considerable appreciation of the Singaporean dollar brought the loss of international competitiveness and a profit squeeze in the manufacturing sector.

Labor costs, comprised of CPF contributions, SDF levies, payroll taxes and annual wage increases have been rising remarkably under the corrective wage policy.

In the 1960s wage restraint policy was adopted by the government with the support of trade union to create a conducive investment climate. During this period, this policy was effective because of wide-spread unemployment. The average nominal weekly earnings of production, transportation and manual workers rose by a nominal average of only 2 percent a year and only 1 percent a year in real terms in the 1960s. In the 1972~79 period with the attainment of full employment, nominal earnings rose rapidly, averaging 10 percent, and real earnings rose by 2 percent a year with an annual inflation rate of 8 percent and annual labor productivity increase rate of 2.8 percent.

The National Wages Council was set up in 1972 to formulate wage guideline for the economy. The NWC recommended high wage increases for 1972~74, partly to offset inflation and partly to encourage firms to use labor efficiently. Because of the recession in the 1975~78 period, the NWC recommended modest wage increases. In 1979, the government decided to shift to a high value-added and skill-intensive industrial strategy. The NWC recommended high wages to curb the demand for unskilled workers and to facilitate the restructuring of Singapore's economy. The NWC recommendation to raise wages resulted in about 20 percent annual increases in labor costs for employees between 1979 and 1981. In addition to the increases in wages and salaries, CPF contributions, SDF levies, payroll taxes increased substantially also.¹¹ This policy became a supply induced cause of the recession in the early 1980s, which was exacerbated by sluggish world demand. The infrastructure and manpower supports and R & D activities for the high technology industries were barely in place in the early 1980s. Labor intensive goods were too expensive and skill intensive goods were not internationally competitive because of their low quality.

The average hourly wage Singapore, including additional compensation, was 2.44 US dollars in 1985 which was much higher than 1.78, 1.45 and 1.41 US dollars in H.K., Taiwan and Korea respectively (Table 4-1) The real wage in the manufacturing sector increased 8.7 percent annually while annual real labor productivity increased on average by 4.6 percent (Table 4-2).

4.2 Strong Exchange Rate

Singapore moved to a managed floating regime for exchange rates in June 1973 from its previous target band system. The managed float has been operated by relating the dollar to an undisclosed trade-weighted basket of currencies and occasionally varying the weights. Meanwhile exchange controls were relaxed continuously until June 1978, when they were liberalized completely. However, the monetary authority has intervened in the foreign exchange market whenever market forces threatened to force the exchange rate out of an undisclosed target band, which was determined by policy considerations.

1) Peter S. J. Chen ed., *Singapore Development and Trends* Oxford Univ. Press, 1983.

Table 4-1. Hourly Earnings of Manufacturing Production Workers(1985)

Country	Exchange rate		Hourly earnings (US \$)	Additional payment (%)	Total hourly earnings (US \$)
	Unit	1US\$			
U.S.A.	\$	—	9.52	36.2	12.97
Hong Kong ⁽¹⁾	H.K.\$	7.79	1.61	11.0	1.78
Japan	Yen	238.50	5.53	16.8	6.45
Korea	Won	870.00	1.17	20.0	1.41
Taiwan	NT\$	39.89	1.38	5.0	1.45
Singapore	S\$	2.20	1.57	55.0	2.44
Swiss	S Fr	2.45	7.11	33.0	9.45
U.K.	Pound	0.77	4.75	32.1	6.27

Note : (1) Selected manufacturing industries.

Source : US Department of Labour, Bureau of Labour Statistics, Office of Productivity and Technology, June 1986.

Lim Chong Yah and Associates, Policy Options for the Singapore Economy, McGraw-Hill Book Co., p. 185, 1988.

Table 4-2. Changes in Wage Rate⁽¹⁾, Labor Productivity and CPI in Singapore
(unit : %)

Year	Real wage(nominal)	Real labor productivity	CPI
1973	-9.0 (10.6)	3.3	19.6
1974	-4.6 (17.7)	3.6	22.4
1975	11.2 (13.8)	2.8	2.6
1976	6.5 (4.6)	2.6	-1.8
1977	4.2 (7.4)	3.5	3.1
1978	1.7 (6.5)	3.9	4.7
1979	8.5 (12.5)	3.0	4.1
1980	6.3 (14.8)	6.0	8.5
1981	7.7 (15.9)	5.5	8.2
1982	12.7 (16.6)	1.1	3.9
1983	8.6 (9.8)	5.0	1.1
1984	8.4 (11.0)	6.7	2.6
average			
1973~78	1.7 (10.1)	3.3	8.4
1979~84	8.7 (13.4)	4.6	4.7

Note : 1) General wage+Contributions of employers to CPF and SDF+Payroll taxes

Source : Department of Statistics, Yearbook of Statistics, Various issues, Singapore, Lin Chong Yah and Associates, Policy Options for the Singapore Economy, McGraw-Hill Book Co., 1988.

In the early 1980s the exchange rate was used as an important anti-inflation instrument because price stability was the primary objective. The strong exchange rate was also intended to facilitate upgrading and restructuring the domestic economy. During the period of 1979 to 1985, the nominal effective exchange rate Singapore dollar appreciated 16.2 percent while Hong Kong's and Korea's currencies depreciated 32.5 percent, and 61.1 percent respectively and Taiwan appreciated 2.7 percent (Table 4-3).

Table 4-3. NEER of Asian NIC's(Using Trade Weights, 1976-78=100)⁽¹⁾

Year	Singapore	Hong Kong	Korea	Taiwan
1979	97.9	114.3	108.7	101.8
1980	95.7	113.3	134.9	100.8
1981	91.5	123.2	150.0	101.4
1982	85.9	125.6	150.2	101.5
1983	82.7	148.1	160.2	102.9
1984	81.3	155.3	164.3	100.0
1985	82.0	151.4	175.1	99.1
1986	94.4	172.7	211.9	107.4
average 1979~85	-16.2	32.5	61.1	-2.7

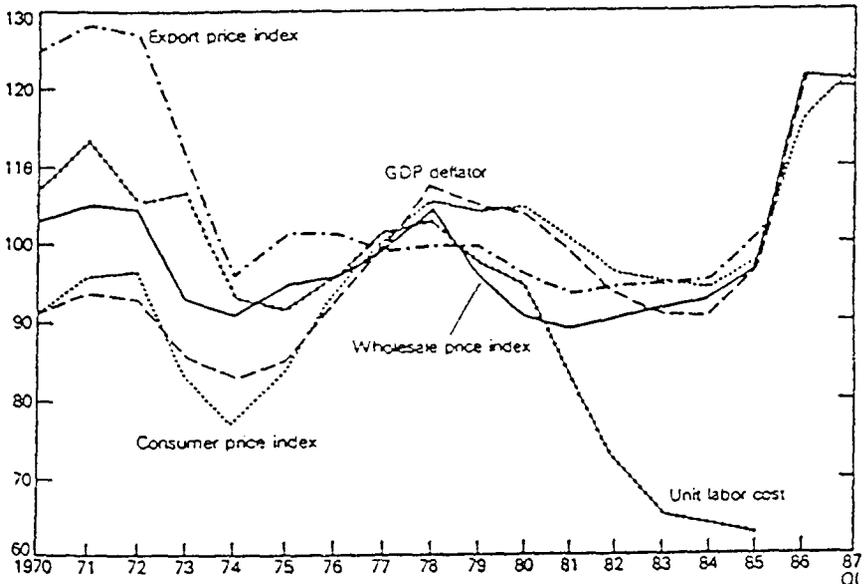
Note : (1) Higher value signifies depreciation.

Source : IMF. International Financial Statistics. Bela Balassa and John Williamson, *Adjusting to Success : Balance of Payments Policy in the East Asian NICs*, Institute for international Economics, June 1987.

As a result, expressed in the US dollars wage rate/exchange rate expressed in domestic currency (W/e) and unit labor cost(ULC) in US dollars, which are both productivity indicators, increased conspicuously.

Real effective exchange rate for Singapore using WPIs and CPIs show that Singapore appreciated 1.0% and depreciated 6.1 percent respectively from 1979 to 1985 (Table 4-4). These indexes do not reflect the profit squeeze or the loss of international competitiveness arising from rapid wage increases, since the domestic inflation rate tends to be the same as the world inflation rate. Real effective exchange rates using ULC indexes reflect the above problems more adequately. As Table 4-4 and Graph 4-1 show, REER using ULCs appreciated by 36.0 percent in the same period in Singapore, whereas Taiwan shows 28.5 percent appreciation and Korea and Hong Kong's REERs depreciated 16.4 percent and 4.4 percent respectively. The profit squeeze of Singapore's export firms seemed to accelerate in the period from 1979 to 1985, as Graph 4-1 shows.

〈Graph 4-1〉 REER of Singapore
(Using trade weights, 1979~78=100 : annual average)



Note : Higher value signifies depreciation

Source : Bela Balassa and John Williamson, *Adjusting to Success : Balance of Payments Policy in the East Asian NICs*, Institute for International Economics, June, 1987, p.52.

As a consequence of the strong effective exchange rates and rapid wage increases, manufacturing production in Singapore declined in 1982~1983 and 1985 and manufacturing employment fell from 1983 to 1986. Nominal exports also declined in 1985 and 1986 and the trade balance deficit increased substantially from 1980 to 1986 (Table 4-5). Negative net exports of goods and services through 1985 are reflected in the excess of investment ratios over the high savings ratios by 1985.

Singapore had negative 1.8 percent growth in 1985 when the other Asian NICs (Hong Kong, Taiwan and Korea) had positive growth rates : its GNP increased by 1.9 percent in 1986 while other Asian NICs had about 10 percent growth rates. From the middle of 1985 Singapore started to remedy the problem by cutting costs, raising flexibility and improving the business environment through tax cuts and financial incentives. Among the new policies were wage restraints, lowering rates of CPF and SDF contribution rates and payroll taxes, legislating tax cuts, offering cash grants for export promotion programs for small companies, lowering utility rates, setting up venture capital incentives and a venture capital funds and founding the small enterprises development bureau.²⁾

2) Lim Chong Yah and Associates, *Policy Options for the Singapore Economy*, McGrawhill Book Co., 1988, p.35.

Also various incentive schemes for production and exports for the labor intensive, low value added industries were mostly restored so that those industries were not discriminated against in favor of high value added industries.

Table 4-4. REERs (using WPI, CPI and ULC)
(trade weights used, 1976-78=100)

Year	WPI	CPI	ULC(S)	ULC(K)	ULC(T)	ULC(HK)
1979	95.7	104.1	97.7	83.4	90.1	106.1
1980	90.5	104.7	94.7	91.2	79.7	101.4
1981	89.1	100.8	82.8	103.3	71.9	108.4
1982	90.6	96.3	72.2	92.5	70.1	100.2
1983	91.9	95.1	65.1	92.9	74.3	124.3
1984	93.1	94.5	64.1	97.2	64.2	122.1
1985	96.7	97.8	62.5	97.1	64.4	110.8
1986	121.6	116.4	NA	NA	NA	NA
1979~1985 annual average	1.0	-6.1	36.0	-16.4	28.5	-4.4

Note : (1) ULC(S)=ULC in Singapore. ULC(K)=ULC in Korea
 ULC(T)=ULC in Taiwan, ULC(HK)=ULC in Hong Kong
 (2) Higher value signifies real appreciation.
 Minus sign signifies real depreciation.

Source : Bela Balassa and John Williamson, *Adjusting to Success : Balance of Payments Policy in the East Asian NICs*, Institute for International Economics, June, 1987.

5. CONCLUSION

The Korean economy needs substantial depreciation of the won in the near future to regain its international competitiveness, which has been eroded by the rapidly rising wage rates in recent years. On the other hand, the Korean economy needs to upgrade its industrial structure: diminishing the importance of low value-added sectors, expanding high value-added sectors and increasing the quality of its goods and technology.

Currently the interest gap between Korea and the Euro-currency market is about 8 to 10 percent while the won depreciates 3 to 4 percent per year. This induces large inflows of foreign capital.

As the interest rates and capital market are liberalized substantially in 1993 and 1994, much more foreign capital is expected to inflow. This will make the money supply control very difficult and the won is expected to appreciate in 1994. This rise will dampen export growth and the current account situation and lead to higher inflation in 1994. Considering the current size of the foreign ex-

change market—a transaction volume of 0.7 billion dollars in the spot market—some sort of sterilization scheme may not be enough to absorb large inflows of foreign capital. If large amounts of bonds are sold, interest rates will go up. The crawling peg system seem to be more appropriate than the current market-average exchange rate system. Under the crawling peg system the government can establish an interest parity situation by adjusting the exchange rate to the interest rate difference. This will prevent massive foreign capital from coming in. After the interest rates in the short-term funds are not readily available as the result of interest rate controls in the short-term money market, foreign exchange market participants tend to sell foreign exchange, driving the value of won higher. This, in turn, fosters stagnation in the export sector and the entire economy.

Table 4-5. Production, Trade Account, Current Account in Singapore

Year	GDP (1985 Prices %)	Manufacturing		Trade A/C (fob, Mill. US \$)	Net exports of goods and services (Mill. S \$ 1985 prices)
		Production (1985=100)	Employment (1000persons)		
1976	7.2	59.4	234.2	-2,224	-1,655
1977	7.8	64.8	246.0	-1,984	-656
1978	8.6	72.4	271.0	-2,503	-1,119
1979	9.3	83.3	294.7	-3,050	-1,319
1980	10.2	93.5	324.1	-4,201	-1,495
1981	9.9	102.6	326.1	-6,123	-1,089
1982	6.3	97.0	336.0	-6,762	-2,045
1983	7.9	99.0	324.0	-5,823	-1,670
1984	8.2	107.9	322.0	-4,071	-1,431
1985	-1.8	100.0	293.8	-2,829	-946
1986	1.9	108.6	290.1	-2,065	349
1987	9.4	127.5	318.9	-2,446	1,137
1988	11.1	150.9	352.6	-2,345	3,821
1989	9.4	166.0	369.9	-2,447	5,193
1990	8.2	182.3	383.2	-5,119	2,008
1991	9.6	192.1	NA	-4,118	NA

Source : Asian Development Bank, Key Indicators of Developing Asian and Pacific Countries, Various issues, IMF, International Statistics, Various issues.

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