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Chapter Title: Internal versus External Shocks

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1983. However, inflation rates remained low and the current account continued to improve. Korea's debt position also improved. Short-term debt, as a share of total debt, declined from 26 percent in 1981 to 19 percent in 1985, and the ratio of debt service to exports dropped from 57 percent in 1982 to 49 percent in 1985.

The government initiated further depreciation of the won in order to bolster Korea's competitiveness. In real terms, the won depreciated by 6 percent during 1985 and by an additional 15 percent in 1986.

Nineteen eighty-six was a banner year for the Korean economy. Real growth reached 12.5 percent, inflation remained at just 2.3 percent and the current account registered a $4.6 billion surplus (nearly 5 percent of GNP).[12] In stark contrast to most of the other debtor countries which experienced further deterioration in their debt indicators,[13] Korea's debt to GNP ratio fell from 56.3 to 46.8 percent as its debt stock was reduced by $2.25 billion. Strong growth in the industrial countries, lower interest rates, a dramatic terms of trade improvement (primarily from the drop in oil prices), and the substantial real depreciation all contributed to the impressive performance.

Korea's adjustment has been extremely successful on the macroeconomic stabilization front. The balance of payments, inflation, growth, and the debt burden have all improved dramatically since 1979–81. In the following chapters, we turn from a chronological analysis to an examination of individual pieces of the performance. These pieces are synthesized and our main conclusions are summarized in the final chapter.

5 Internal versus External Shocks

As described in chapter 4, Korea experienced large current account deficits, slowdowns in growth, and rapid accumulation of external debt during 1974–77 and again during 1979–83. In both periods, the poor performance coincided with internal as well as external developments. This chapter evaluates the relative importance of internal versus external factors in explaining the current account imbalances during each of these periods.

Our analysis draws from two approaches. The first begins with the current account identity and decomposes the change in the current account from a base year into price, income, interest rate, and other effects. This approach does not take into account shifts in behavior of domestic residents (importers, monetary authorities, etc.). Our second decomposition, based on the KDI Quarterly Macroeconomic model, incorporates a more fully specified set of behavioral relationships. The basic characteristics of the

model are summarized at the end of this chapter. The model is described in more detail in W. A. Park (1986).

5.1 Current Account Performance, 1974–77

During 1972–73, the average current account deficit was just 2.9 percent of GNP. In 1974 and 1975 this figure jumped to 10.8 percent and 9.1 percent, respectively (see table 4.2). As discussed in chapter 4, internal as well as external developments seem to have contributed to the deterioration. On the external side, there was the dramatic rise in oil and commodity prices. On the internal side, Korea was beginning the Big Push to develop HC industries. The massive investments called for increased imports of intermediates and capital goods. Thus, an interesting question is how much of the larger current account deficit can be attributed to the external terms of trade shock.

In a very provocative analysis of this question, Y. C. Park (1985c) argues that the terms of trade deterioration was not the most important factor. He finds that increased nonoil imports were almost twice as important. Because many of these imports are attributable to the Big Push, he concludes that the internal policy shift significantly outweighed external factors in explaining the poor current account outcome.

To support this view, Park decomposes the current account deterioration in each year, 1974 to 1977, using 1972–73 as a base. His components are world interest rates, import and export price changes, import and export volume changes, and a (domestic) aggregate demand component. Import price and volume are further decomposed into oil, capital goods, and other imports. His results are reproduced in table 5.1. He finds that

> the deterioration associated with the terms of trade loss . . . amounted to an increase of 5 percentage points in the current account/potential GNP ratio . . . however, the sum of the expansion of capital goods in relation to fixed investment, and other imports, excluding oil, relative to GNP was the main element producing imbalance in the current account. This jump, equivalent to a deterioration of 10 percentage points, was larger than the actual increase in the deficit ratio. A similar development took place during 1975. (302)

However, Park's results overestimate the contribution of increased nonoil import volume effects and underestimate the contribution of external price developments. The difficulty arises from the price-volume decomposition of imports. In particular, Park's analysis requires indices for unit value and volume for capital goods and "other" imports on a balance of payments basis. Proxies for these series are unreliable and potentially misleading.[1]

To make the point, we present an alternative decomposition. We follow Park's basic procedure, but divide imports into oil, nonoil goods, nonfactor services.[2] This decomposition enables us to use a more reliable data series,

Table 5.1 Current Account/Potential GNP Ratio, 1974–77 (base period 1972–73)

Item	1974	1975	1976	1977
1. Current account imbalances potential output (actual change)	7.258	5.351	−1.782	−3.478
2. Terms of trade effect	4.893	4.284	1.183	−0.254
Import price	−0.462	−1.573	−6.772	−11.495
Capital goods	−1.816	−1.621	−2.605	−3.048
Oil	3.064	3.302	2.954	2.608
Other	−1.710	−3.255	−7.121	−11.055
Export price	5.355	5.858	7.956	11.242
3. Interest rate effect	0.167	0.458	0.023	0.040
4. Accumulated debt effect	−0.142	0.134	0.210	0.170
5. Import replacement	9.528	7.621	10.727	14.769
Capital goods	3.385	2.150	2.742	1.907
Noncapital goods	6.358	6.312	7.546	12.364
Oil conservation efforts	−0.215	0.159	0.439	0.498
6. Export promotion	−7.883	−7.791	−15.932	−21.667
Construction services	−0.031	−0.098	−1.632	−3.954
7. Aggregate demand adjustment	1.183	1.123	2.532	4.067
Fixed investment	0.680	0.736	1.292	2.463
Domestic output	0.503	0.387	1.241	1.604
8. Total effect (2 to 7)	7.747	5.829	−1.256	−2.874
9. Interaction effects and adding-up errors [(1) through (8)]	−0.489	−0.478	−0.526	−0.602

Source: Y. C. Park (1985c, table 11.8).

Note: The decomposition factors were calculated by using an average of current year and base period weights. A negative sign indicates a balance of payments improvement.

the BOK's unit value index for commodity imports. We also use the Saudi Arabian petroleum price index reported by the IMF.

The results are shown in table 5.2. Because we have used revised National Accounts data, we obtain a somewhat different base deficit to potential GNP (row 1). However, our primary interest is in the share of the additional deficit attributable to terms of trade changes. Using our decomposition, it is clear that the terms of trade deterioration is the predominant factor explaining the 1974–75 current account imbalance. The rise in oil and commodity prices accounts for 90 percent of the imbalance in 1974 and over 100 percent of the imbalance in 1975. The impact of the import volume changes is quite small in 1974 (6 percent contribution) and in fact contributes to an improvement in the 1975 current account equivalent to 14 percent of the imbalance.

To further investigate the impact of the oil price rise and other external shocks, we turn next to the implications of the KDI Quarterly Macroeconomic model. Unlike the simple decompositions reported above, the model allows us to incorporate endogenous changes in behavior, e.g., changes in domestic prices, output, and investment as a result of exogenous shocks.

Table 5.2 **Current Account/Potential Nonagricultural GNP Ratio, 1974–77 (base period 1972–73)**

Item	1974	1975	1976	1977
1. Current account deficit/potential nonagricultural GNP	10.04	7.41	−2.29	−3.71
2. Terms of trade effect	7.01	10.05	4.77	1.85
Import Price	9.17	8.54	−0.54	−6.03
Oil	5.46	5.67	4.88	4.37
Nonoil goods	3.58	2.61	−5.27	−10.02
Nonfactor services	0.13	0.26	−0.15	−0.38
Export price	−2.16	1.52	5.31	7.89
3. Import replacement	0.64	−1.07	2.69	3.08
Oil	−0.41	−0.66	−0.48	−0.53
Nonoil goods	0.81	−1.56	2.00	1.94
Nonfactor services	0.23	1.15	1.18	1.67
4. Export promotion of goods and nonfactor services	−2.04	−4.07	−13.96	−18.27
5. Aggregate demand adjustment	2.79	1.57	4.42	9.16
Fixed investment	2.76	1.74	4.25	8.80
Domestic output	0.03	−0.17	0.17	0.36
6. Interest rate effect	1.52	−0.45	−0.71	1.00
7. Accumulated debt effect	−0.93	0.06	0.36	0.28
8. Exports of factor services	0.53	0.62	−0.33	−2.02
9. Net transfers	0.41	0.58	0.38	1.15
10. Total effect (2 to 9)	9.92	7.29	−2.40	−3.78
11. Interaction effects and adding-up errors	0.12	0.12	0.11	0.07

Source: Authors' calculations. See text.

Note: The decomposition factors were calculated by using an average of current year and base period weights. A negative sign indicates a balance of payments improvement.

The model allows us to simulate the behavior of the current account under alternative assumptions about the paths of exogenous variables. We then compare these counterfactual paths with the actual performance. Of course, our simulations cannot tell us what policymakers would have done in the absence of external shocks, or how the U.S. and Japanese economies might have performed differently. The exercises cannot fully disentangle the role of policy adjustment and "luck," however, they do provide measures of the effect of key external variables.

We begin with the following counterfactual exercise (exercise A). Taking the paths of other exogenous variables as given, how would Korean economic performance have been different from the actual experience if oil prices had remained fixed at their 1972–73 average level? The results are reported in tables 5.3 and 5.4. In table 5.3 we examine the current account imbalance, providing a similar decomposition to that in table 5.2. For each year, the table gives the estimated outcome and, in parenthesis, the difference between the actual and the counterfactual estimate. Additional

Table 5.3 **Current Account/Potential Nonagricultural GNP with Fixed Oil Prices**

Item	1974	1975	1976	1977
1. Current account deficit/potential nonagricultural GNP	6.04 (−4.00)	3.33 (−4.08)	−6.05 (−3.76)	−6.56 (−2.84)
2. Terms of trade effect	3.19 (−3.82)	6.25 (−3.80)	6.08 (−4.09)	−2.44 (−4.29)
Import price	2.74 (−6.43)	2.21 (−6.33)	−7.19 (−6.66)	−13.10 (−7.07)
Oil	−0.64 (−6.10)	−0.69 (−6.35)	−1.07 (−5.95)	−1.29 (−5.66)
Nonoil goods	3.57 (−0.00)	3.12 (0.51)	−5.44 (−0.17)	−10.76 (−0.74)
Nonfactor services	−0.19 (−0.33)	−0.22 (−0.48)	−0.69 (−0.54)	−1.06 (−0.67)
Export price	0.44 (2.60)	4.04 (2.52)	7.87 (2.57)	10.66 (2.77)
3. Import replacement	−1.10 (−1.73)	−4.00 (−2.93)	1.29 (−1.40)	3.07 (−0.01)
Oil	−0.22 (0.18)	−0.37 (0.30)	−0.31 (0.18)	−0.30 (0.23)
Nonoil goods	−1.36 (−2.17)	−5.28 (−3.71)	−0.41 (−2.40)	0.44 (−1.50)
Nonfactor services	0.49 (0.25)	1.64 (0.49)	2.00 (0.82)	2.93 (1.26)
4. Export promotion of goods and nonfactor services	−3.45 (−1.41)	−7.84 (−3.77)	−18.24 (−4.28)	−20.43 (−2.16)
5. Aggregate demand adjustment	5.74 (2.94)	7.90 (6.33)	10.25 (5.84)	12.70 (3.54)
Fixed investment	5.28 (2.52)	7.08 (5.34)	9.15 (4.90)	11.72 (2.92)
Domestic output	0.46 (0.43)	0.82 (0.99)	1.10 (0.94)	0.99 (0.62)
6. Interest rate effect	2.65 (1.13)	0.22 (0.67)	0.45 (1.16)	2.84 (1.85)
7. Accumulated debt effect	−0.60 (0.37)	0.45 (0.39)	−0.53 (−0.89)	−1.61 (−1.89)
8. Exports of factor services	0.53 (0.00)	0.62 (0.00)	−0.31 (0.04)	−1.84 (0.18)
9. Net transfers	0.41 (0.01)	0.59 (0.01)	0.43 (0.05)	1.20 (0.06)
10. Total effect (2 to 9)	7.42 (−2.50)	4.19 (−3.10)	−5.97 (−3.57)	−6.51 (−2.73)
11. Interaction, adding-up, and simulation errors	−1.38 (−1.50)	−0.86 (−0.98)	−0.08 (−0.18)	−0.05 (−0.11)

Note: Using the KDI Quarterly Macroeconomic model, the counterfactual fixes oil prices at their (average) 1972–73 level. The decomposition factors were calculated by using an average of current year and base period weights. A negative sign indicates a balance of payments improvement. Numbers in parentheses indicate the difference between the actual and counterfactual values.

Table 5.4 **Macroeconomic Performance: Fixed Oil Prices versus Actual**

Item	1974	1975	1976	1977
Real GNP growth	5.4	7.1	1.8	−2.0
Real fixed investment (IF) growth	9.4	11.8	0.7	−5.9
WPI inflation	−13.6	−7.0	0.8	2.4
CPI inflation	−8.6	−5.0	1.3	2.0
Exports	−0.1	0.3	0.7	0.7
Imports	−0.8	−0.6	−0.5	−0.7
Oil	−0.9	−1.0	−1.3	−1.5
Nonoil	0.1	0.4	0.8	0.8
Trade balance	0.7	0.9	1.2	1.4
Exports of nonfactor services	−0.1	−0.0	−0.0	−0.0
Imports of nonfactors services	0.0	0.1	0.2	0.3
Imports of factor services	0.0	0.1	0.1	0.2
Current balance	0.6	0.7	0.9	0.9

Note: These figures are deviations between the baseline path and a counterfactual in which oil prices are fixed at their (average) 1972–73 level. The top panel gives percentage deviations, while the bottom panel gives billions of U.S. dollars. The KDI Quarterly Macroeconomic model is used for simulations.

comparisons of the actual and the counterfactual performance are given in table 5.4. The top panel of that table shows the difference in GNP growth, investment growth, and inflation for each year. The bottom panel shows the absolute difference (in billions of U.S. dollars) for various components of the current account.

The tables imply that the 1974 current account deficit would have been only 60 percent as large as it actually was if oil prices had been fixed. The improvement amounts to $0.6 billion, or about 4 percent of potential nonagricultural GNP. In contrast, the simple accounting decomposition in table 5.2 estimates that the oil shock increased the current account deficit by 5.5 percent of potential GNP. In fact, the accounting decomposition suggests a larger role for the oil price rise for every year during 1974–77 than is suggested from the model simulations. The model estimates an impact of 4.1, 3.8, and 2.8 percent of potential GNP during 1975, 1976, and 1977, respectively, as compared to 5.7, 4.9, and 4.4 percent from the accounting decompositions. In the model the improvement from stronger terms of trade is partially offset by endogenous changes in growth, inflation, investment, and other domestic variables.

The key factors explaining the results from the model are as follows. Lower oil prices would have led to lower domestic inflation and lower prices of domestic exports. They would also have led to faster domestic growth, with especially strong effects on domestic investment (table 5.4). These factors have conflicting effects on the external balance. A decline in export prices decreases the dollar value of exports (holding export volumes fixed). This channel worsens the current account relative to the base by 2.6 percent of potential GNP. The lower oil prices would also have led to an increase in export volume, tending to improve the current account (table 5.3, row 4). The aggregate demand expansion is estimated to contribute an additional 3 percent of potential GNP to the current account deficit. This is partially offset by substitution effects from the decline in domestic prices on nonoil import demand (table 5.3, row 3).

The results from a second counterfactual exercise (exercise B) are reported in table 5.5. This exercise provides a rough measure of the overall impact from external shocks during 1974–77. Here the world interest rate is assumed to be fixed at its 1973 level. Oil prices, a weighted index of real GNP of Korea's major trading partners, and a weighted index of foreign prices are all assumed to increase at their three-year average rate of increase during 1970–73.

We compare the results in tables 5.4 and 5.5 so as to discuss the additional impact of external factors other than oil prices. The tables show that growth rates in 1974 would have been substantially higher under B than with just the fixed oil prices of A. However, there is little difference in the inflation rates in the two cases. Furthermore, the current account improves by only an additional 17 percent. (Recall that the fixed oil price in A led to a 40 percent

Table 5.5 Macroeconomic Performance: Fixed External Conditions versus Actual

Item	1974	1975	1976	1977
Real GNP growth	8.9	7.3	2.1	1.2
Real fixed investment (IF) growth	14.7	11.7	0.2	−1.6
WPI inflation	−13.2	−4.4	3.9	3.4
CPI inflation	−8.2	−2.4	4.1	3.3
Exports	0.3	1.0	2.5	3.9
Imports	−0.4	0.1	0.7	1.4
Oil	−0.7	−0.7	−0.7	−0.7
Nonoil	0.3	0.8	1.4	2.1
Trade balance	0.7	0.9	1.7	2.5
Exports of nonfactor services	−0.0	0.1	0.2	0.5
Imports of nonfactor services	0.0	0.1	0.2	0.5
Imports of factor services	−0.0	0.1	0.3	0.5
Current balance	0.7	0.8	1.4	2.0

Note: These figures are deviations between the baseline and a counterfactual in which oil prices, foreign GNP, and foreign prices are assumed to increase at the three-year average rate prior to the oil shock. The world interest rate is assumed fixed at the preshock level. The KDI Quarterly Macroeconomic model is used for simulations. Data in the top panel and percentages; in the bottom panel, billions of U.S. dollars.

current account improvement relative to the actual outcome.) By 1975 growth rates are nearly the same under the two scenarios, with B implying a somewhat higher inflation and a 14 percent current account improvement relative to A. While the additional external factors had a relatively small impact on the current account during 1974–75, the simulations suggest that there would have been strong benefits by 1976 from an external environment in which there was continued growth by Korea's trading partners. The simulations estimate substantial additional current account improvement in B compared to A during 1976–77

5.2 Current Account Performance, 1979–83

By 1977 the current account had improved substantially (see table 4.2). However, there was a renewed deterioration during the 1979–81 economic crisis. Again, our discussion in chapter 4 identified both internal and external factors which contributed to this outcome. External factors included the second oil price shock as well as increased world interest rates and a slowdown in world growth. Internal factors included the death of President Park, the associated social and political turmoil, and the disastrous agricultural harvests.

Again we begin with simple accounting decompositions of the current account. We present both the decompositions from Y. C. Park (1985c) and our revised version. The revision decomposes imports into oil, nonoil commodities, and nonfactor services instead of oil, capital goods, and other imports. As before, our decomposition enables us to use more reliable import value deflators to separate changes in value from changes in volume.

In contrast to the 1974–75 episode, Park concludes that external price developments were the most important cause of the current account deterioration after the second oil shock. As shown in table 5.6, he finds that the increased prices of oil and capital goods can more than explain the external deficits. The terms of trade effects worsen during 1981 before improving somewhat in 1982–83. In fact, Park finds that if oil prices, interest rates, and construction service exports had remained at their 1978 levels, Korea would have run a substantial current account deficit during 1979, a small deficit (less than 1 percent of potential output) during 1980, and surpluses during 1981–83.

Our results (table 5.7) also point to the critical role of terms of trade changes, particularly the oil price rise, in explaining the current account deterioration. However, our decomposition implies a smaller role for external price changes and a larger role, especially after 1981, for "import replacement" or the growing import volumes.

Both decompositions identify poor export performance as the primary reason for the external imbalance in 1979. Both decompositions attribute the

Table 5.6 **Current Account/Potential GNP Ratio, 1979–83 (base period 1977–78)**

Item	1979	1980	1981	1982	1983
1. Current account imbalances potential output (actual change)	4.838	6.099	4.398	1.675	0.607
2. Terms of trade effect	−1.581	6.186	8.014	4.860	4.015
Import price	−2.846	6.490	8.666	3.719	3.142
Capital goods	−1.507	−0.645	−0.331	−0.139	0.216
Oil	0.389	3.892	4.472	3.973	3.274
Other	−1.728	3.242	4.524	−0.114	−0.348
Export price	1.265	−0.303	−0.651	1.141	0.873
3. Interest rate effect	0.586	1.308	1.746	1.534	0.945
4. Accumulated debt effect	−0.324	0.082	0.457	0.653	0.886
5. Import replacement	2.143	−0.641	−1.192	−0.724	−0.842
Capital goods	1.003	−0.278	0.644	−0.246	0.061
Noncapital goods	1.666	−0.284	−1.095	0.310	0.271
Oil conservation efforts	−0.526	−0.079	−0.741	−0.788	−1.174
6. Export promotion	5.106	4.309	2.753	2.216	0.123
Construction services	0.789	1.464	1.272	0.986	1.674
7. Aggregate demand adjustment	−1.213	−5.269	−7.538	−7.012	−4.771
Fixed investment	0.228	−1.154	−2.281	−1.778	−0.981
Domestic output	−1.442	−4.114	−5.257	−5.234	−3.790
8. Total effect (2 to 7)	4.715	5.977	4.240	1.527	0.455
9. Interaction effects and adding-up errors [(1) through (8)]	0.123	0.122	0.158	0.148	0.152

Source: Y. C. Park (1985c, table 11.11).

Note: The decomposition factors were calculated by using an average of current year and base period weights. A negative sign indicates a balance of payments improvement.

Table 5.7 Current Account/Potential Nonagricultural GNP Ratio, 1979–83

Item	1979	1980	1981	1982	1983
1. Current account deficit/potential GNP	6.42	7.72	5.79	2.48	0.86
2. Terms of trade effect	−0.55	5.71	6.48	4.36	3.41
Import price	−2.32	5.45	6.41	2.92	1.25
Oil	0.13	4.24	5.03	5.01	3.88
Nonoil goods	−2.12	0.98	0.92	−2.45	−2.51
Nonfactor services	−0.32	0.23	0.47	0.36	−0.12
Export price	1.77	0.26	0.07	1.44	2.16
3. Import replacement	0.49	1.85	6.01	3.38	2.18
Oil	−0.20	0.43	0.11	−0.91	−1.40
Nonoil goods	0.20	0.32	4.01	2.91	2.16
Nonfactor services	0.49	1.10	1.89	1.38	1.42
4. Expert promotion of goods and nonfactor services	5.46	4.32	1.31	0.98	−1.20
5. Aggregate demand adjustment	0.98	−6.38	−10.16	−8.06	−4.83
Fixed investment	1.30	−4.69	−7.97	−5.95	−3.47
Domestic output	−0.32	−1.69	−2.18	−2.11	−1.37
6. Interest rate effect	0.49	0.47	−0.71	−1.79	−3.18
7. Accumulated debt effect	−1.30	0.09	1.42	2.22	2.71
8. Exports of factor services	0.46	1.21	1.00	0.85	1.34
9. Net transfers	0.16	0.22	0.21	0.26	0.16
10. Total effect (2 to 9)	6.18	7.48	5.56	2.20	0.59
11. Interaction effects and adding up errors	0.25	0.24	0.23	0.28	0.27

Source: Authors' calculations. See text.

Note: The decomposition factors were calculated by using an average of current year and base period weights. A negative sign indicates a balance of payments improvement.

outcome in 1980 to the terms of trade, poor export performance, and higher interest rates, partially offset by the drop in domestic aggregate demand. Our decomposition suggests that the terms of trade shock accounts for 74 percent of the added external imbalance, compared to over 100 percent in Park's decomposition. Similarly, the nonoil commodity price deflator (which we feel to be more reliable) does not show the same strong increase as the nonoil, non–capital goods deflator during 1981–83. Consequently, our decomposition suggests that growing import volumes contributed nearly as much to 1981–83 current account deficits as did high import prices.

It is interesting to compare the 1974–77 experience (table 5.2) with the 1979–83 experience (table 5.7). The major difference is that the current account deficit was more persistent in the latter period. The current account imbalance was reversed two years after the onset of large deficits in 1974, but only four to five years after the onset in 1979.

Two factors help to explain this difference. First the terms of trade shock was initially larger but less persistent in the first episode. Second, strong

export performance during 1974–77 contributed to current account improvement. In contrast, export volumes contributed to the external deficits during 1979–82. Reasons for the poor export performance include the deterioration in Korea's external competitiveness and weak world demand. However, these two factors were partially offset by the slow Korean growth (aggregate demand effect) and by the deceleration in the growth of fixed investment as the economy pulled back from the Big Push during the early 1980s.

Again, we use the KDI Quarterly Macroeconomic model to further examine the impact of the oil price increases. Tables 5.8 and 5.9 present the results from a counterfactual simulation holding oil prices fixed at their 1978 level (exercise A). As before, the figures in parentheses show the difference between the actual outcome and simulated value.

Table 5.8 shows the importance of the oil price path very clearly. Holding oil prices fixed would have resulted in a 14 percent improvement in the current account as a percentage of potential GNP in 1979, a 46 percent improvement in 1980, a 68 percent improvement in 1981, and small current account surpluses in 1982–83.

As before, the model suggests a smaller role for the price of oil when behavioral relationships are taken into account. The simulations imply that, as a percentage of potential GNP, oil price changes accounted for a 3.6 percent current account deficit during 1980, and 4.0, 2.6, and 1.6 percent deficits during 1981, 1982, and 1983, respectively. The comparable figures from the accounting decompositions were 4.2, 5.0, 5.0, and 3.9 percent. The reasons for this difference are precisely the same during 1980–83 as they were during 1974–76. Without the rise in oil prices, Korean growth would have been faster and investment would have been higher, tending to raise nonoil imports.

Finally, we use the model to simulate the economic performance assuming an unchanged overall external environment (exercise B). Interest rates are fixed, while the average growth rates of oil prices, foreign GNP, and foreign prices are assumed equal to the average growth rates during 1976–78.

Comparing the results from B (table 5.10) with those from A (table 5.9), and those from the 1974–77 experiments, it is clear that nonoil external factors were more important during 1979–82 than 1974–77. Over the 1979–81 period, B implied an improvement in the current account deficit of 34 percent more than A. The major reason for the improvement comes from the considerably stronger export performance that can occur when world demand continues to grow. Stronger exports also contribute to more rapid domestic growth rates.

5.3 The KDI Quarterly Macroeconomic Model

We would like to summarize here the key features of the KDI Quarterly Macroeconomic model developed by Won-Am Park. Additional information

Table 5.8 **Current Account/Potential Nonagricultural GNP with Fixed Oil Prices**

	1979	1980	1981	1982	1983
1. Current account deficit/potential nonagricultural GNP	5.50 (−0.93)	4.14 (−3.57)	1.85 (−3.94)	−0.08 (−2.55)	−0.72 (−1.58)
2. Terms of trade effect	−1.50 (−0.95)	2.42 (−3.29)	2.21 (−4.27)	−0.49 (−4.85	−0.15 (−4.46)
Import price	−3.84 (−1.52)	0.08 (−5.37)	0.28 (−6.13)	−4.15 (−7.08)	−5.74 (−6.99)
Oil	−1.43 (−1.55)	−1.35 (−5.59)	−1.45 (−6.47)	−1.46 (−6.47)	−1.46 (−5.34)
Nonoil goods	−1.98 (0.14)	1.71 (0.73)	1.94 (1.02)	−2.32 (0.13)	−3.26 (−0.75)
Nonfactor services	−0.43 (−0.11)	−0.28 (−0.51)	−0.21 (−0.68)	−0.37 (−0.73)	−1.02 (−0.90)
Export price	2.34 (0.57)	2.34 (2.08)	1.93 (1.86)	3.66 (2.23)	4.69 (2.53)
3. Import Replacement	0.37 (−0.12)	0.16 (−1.69)	3.73 (−2.08)	3.27 (−0.11)	3.99 (1.81)
Oil	−0.15 (0.05)	0.10 (−0.33)	−0.25 (−0.36)	−0.81 (0.10)	−1.06 (0.34)
Nonoil goods	−0.07 (−0.27)	−1.52 (−1.84)	1.28 (−2.73)	1.34 (−1.56)	1.71 (−0.45)
Nonfactor services	0.58 (0.09)	1.58 (0.48)	2.70 (0.82)	2.73 (1.36)	3.34 (1.92)
4. Export promotion of goods and nonfactor services	5.13 (−0.33)	1.95 (−2.37)	−3.37 (−4.68)	−2.71 (−3.69)	−3.12 (−1.92)
5. Aggregate demand adjustment	1.42 (0.44)	−3.00 (3.38)	−3.28 (6.88)	−2.17 (5.89)	−1.88 (2.95)
Fixed investment	1.60 (0.30)	−2.31 (2.38)	−3.07 (4.90)	−1.86 (4.08)	−1.50 (1.97)
Domestic output	−0.18 (0.14)	−0.69 (1.00)	−0.21 (1.98)	−0.30 (1.81)	−0.38 (0.98)
6. Interest rate effect	1.32 (0.84)	0.87 (0.39)	−0.09 (0.61)	−0.78 (1.00)	−1.93 (1.25)
7. Accumulated debt effect	−0.57 (0.73)	0.90 (0.81)	0.86 (−0.56)	0.67 (−1.55)	0.33 (−2.38)
8. Exports of factor services	0.45 (−0.01)	1.16 (−0.05)	0.96 (−0.04)	0.93 (0.08)	1.50 (0.16)
9. Net transfers	0.16 (−0.00)	0.20 (−0.02)	0.20 (−0.01)	0.28 (0.02)	0.22 (0.06)
10. Total effect (2 to 9)	6.77 (0.59)	4.65 (−2.83)	1.22 (−4.34)	−1.00 (−3.20)	−1.95 (−2.54)
11. Interaction, adding-up, and simulation errors	−1.27 (−1.52)	−0.51 (−0.75)	0.63 (0.40)	0.92 (0.64)	1.23 (0.96)

Note: Using the KDI Quarterly Macroeconomic model, the counterfactual fixes oil prices at their (average) 1977–78 level. The decomposition factors were calculated by using an average of current year and base period weights. A negative sign indicates a balance of payments improvement. Numbers in parentheses indicate the difference between the actual and counterfactual values.

Table 5.9 **Macroeconomic Performance: Fixed Oil Prices versus Actual**

	1979	1980	1981	1982
Real GNP growth	1.2	6.4	8.1	1.1
Real fixed investment (IF) growth	1.3	7.3	10.4	−0.7
WPI inflation	−2.7	−13.0	−6.3	1.0
CPI inflation	−2.0	−9.0	−4.2	1.7
Exports	−0.1	0.0	1.5	1.7
Imports	−0.7	−2.6	−1.8	−1.1
Oil	−0.7	−3.0	−3.6	−3.5
Nonoil	0.0	0.4	1.8	2.3
Trade balance	0.6	2.6	3.3	2.8
Exports of nonfactor services	−0.1	−0.2	−0.0	0.1
Imports of nonfactor services	0.0	0.1	0.5	1.0
Imports of factor services	0.0	0.1	0.2	0.2
Current balance	0.5	2.2	2.6	1.7

Note: These figures are deviations from the baseline path and a counterfactual in which oil prices are fixed at their (average) 1977–78 level. The top panel gives percentage deviations, while the bottom panel gives billions of U.S. dollars. The KDI Quarterly Macroeconomic model is used for simulations.

Table 5.10 **Counterfactual Analysis on External Shock**

	1979	1980	1981	1982
Real GNP growth	2.4	10.1	9.7	12.3
Real fixed investment (IF) growth	2.3	11.3	11.9	10.8
WPI inflation	−2.5	−13.7	−5.1	0.8
CPI inflation	−1.8	−9.3	−2.8	2.5
Exports	0.2	1.3	4.0	11.1
Imports	−0.3	−1.1	0.6	4.7
Oil	−0.6	−2.6	−2.9	−2.3
Nonoil	0.3	1.4	3.5	7.0
Trade balance	0.5	2.4	3.4	6.4
Exports of nonfactor services	−0.0	0.0	0.4	1.6
Imports of nonfactor services	0.0	0.2	0.7	1.7
Imports of factor services	−0.2	−0.5	−0.7	−0.0
Current balance	0.7	2.7	3.7	6.3

Note: These figures are deviations from the baseline and a counterfactual in which oil prices, foreign GNP, and foreign prices are assumed to increase at the three-year average rate prior to the oil shock. The world interest rate is assumed fixed at the preshock level. The KDI Quarterly Macroeconomic model is used for simulations. Data in the top panel are percentages; in the bottom panel, billions of U.S. dollars.

about the model, including the actual equations and the estimation results, are available on request.

A major focus of the model is to interrelate real and financial sectors of the Korean economy. Thus, the model incorporates credit availability to firms for investment, includes money as a determinant of consumption, and emphasizes links between the monetary sector and the balance of payments. The model has been estimated using quarterly data over 1972:I to 1985:IV. Seasonal dummies were included in the regressions and, where appropriate,

the estimation was corrected for serial correlation. The model consists of six blocks of equations: GNP, government sector, labor market, wages and prices, balance of payments, and financial sector.

Real gross national expenditure is composed of private consumption expenditure, private fixed investment, inventory investment, government expenditure, exports and imports of commodities and nonfactor services, and net factor income from abroad. Real GNP is divided into two components: production from agriculture, forestry, and fisheries, and other production.

The supply and demand for money are determined in the financial block, where interest rates in the unorganized money market adjust to equilibrate the market. The overall balance of payments and the government budget deficit are both linked to the money supply.

Prices are subject to both demand-push and cost-pull factors. Wholesale prices are determined by firm's production costs. The unit value index for exports in dollar terms is assumed to be influenced by world demand for Korean exports as well as by export production costs (wages and intermediate input costs). Import unit values are determined by the prices of capital goods imports and raw materials, including oil. The wage equation is an expectations-augmented Phillips curve.

Finally, the unemployment rate is determined by the gap between potential and actual output, a variant of Okun's law.

6 Introduction to Part Two

Korea's macroeconomic performance, with its three cycles of debt accumulation and recovery, presents a number of puzzles which will be examined in the remaining chapters. Thus, in summarizing the experience (particularly during 1979–85) described in the first part of our study, we will introduce part 2 (ch. 7–12).

The first puzzle is how Korea has managed to consistently maintain such high growth rates. Certainly its rapid growth rates for output and exports have helped to hold in check the burden of external debt. A related issue is how Korea was able to achieve a substantial improvement in the current account while output was growing strongly. In practice, most debtor countries have improved their current accounts through a domestic recession which cuts imports. Improvement with growth is a much more palatable option.

Another puzzle arises from the large fluctuations in domestic savings. How was Korea able to increase saving rates so dramatically from the