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7 The Role of Macroeconomic Policy in Export-Led Growth: The Experience of Taiwan and South Korea

Kenneth S. Lin, Hsiu-Yun Lee, and Bor-Yi Huang

7.1 Introduction

Inflation, unemployment, and budget deficits have long been the focus of macroeconomic policy. Recently, macroeconomists turned their attention to growth and development. One remarkable result in the new endogenous growth theory is that government policy can affect the steady state growth rate. Empirical analysis of the effect of macroeconomic policy on long-run growth has so far produced mixed results.

The purpose of this paper is to characterize the role of macroeconomic policy in the export-led growth experience of Taiwan and South Korea. Argentina, Chile, Taiwan, and South Korea all started their postwar economic development with an import-substitution approach in the 1950s. However, after three decades, Argentina and Chile, unlike Taiwan and South Korea, showed mediocre macroeconomic performance with erratic GDP growth and high inflation (Lin 1988). One fundamental difference is that Taiwan and South Korea switched to an export-led approach in the 1960s. What is the role of macroeconomic policy in successful export-led growth, a causal factor or an inevitable choice?

For a country adopting an export-led approach, we argue that international competition forces households, firms, and government in this country to react to external shocks optimally, and their decisions and policies are endogenous.

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It is natural that any pattern of correlation between macroeconomic policy and economic growth is possible, depending on the underlying external shocks. The correlation patterns under export-led regimes are also unlikely to dominate the outcomes of cross-country growth regressions, so the empirical results obtained in cross-country growth regressions may not be useful in revealing the role of macroeconomic policy in export-led growth.

Since the ultimate goal of any economic policy of export-led growth is maintaining and enhancing the international competitiveness of the country's export goods, this goal in turn disciplines macroeconomic policy that prevents the adoption of any measure hurting export growth. Even though there are many instruments available for implementing macroeconomic policy, not all of them are free instruments in achieving such a particular objective. For Taiwan and South Korea, we found that sound fiscal policy gives the set of available instruments the maximum degree of freedom. For example, suppose that government is under pressure to offer greater fiscal incentives to compensate exporting firms for profit losses caused by temporary external shocks. The governments that can offer such incentives by running a temporarily high level of budget deficits are those that have sound fiscal discipline.

It is through the conduct of monetary and exchange rate policies that the central bank has its most profound influence on inflation, interest rates, exchange rates, and the balance of payments. The central bank in developed countries has been designed as the monetary authority whose primary responsibility is to maintain price stability. However, the central bank in most developing countries has difficulty in achieving the goal of price stability because of the two roles it plays: First, its development bank role requires the central bank to use exchange rate management and to provide interest rate subsidies or preferential loans to promote growth. Second, its fiscal support role requires the central bank to generate inflation tax revenues for the government. Even though the central banks in Taiwan and South Korea are not independent compared to their counterparts in developed countries our case study indicates that sound fiscal policy allows these central banks to play a more active role in promoting exports without immediately jeopardizing price stability. However, as the importance of the export-led approach as a source of growth declines, it is more likely that government spending becomes an important fiscal instrument in stimulating economic growth. A less independent central bank will be a cause of concern since it makes inflationary finance easier. Therefore, designing an independent central bank could be crucial for both countries' future macroeconomic performance.

The remainder of the paper is organized as follows: In section 7.2, we present some stylized facts on macroeconomic policy and economic growth. When macroeconomic policy and aggregate variables such as inflation rate, investment, and exports all respond to external shocks, virtually any pattern of correlation between macroeconomic policy and economic variables can be obtained. This makes regression results difficult to interpret regarding the links between macroeconomic policy and aggregate variables. In section 7.3, we use

a case study to evaluate the role of macroeconomic policy in export-led growth. First, we construct two indexes of central bank independence for Taiwan; we do not find a negative association between inflation and central bank independence in Taiwan or South Korea. In searching for the explanation, we focus on the relation between fiscal discipline and moderate inflation. In section 7.4, we use the special loan policy to address the point that the macroeconomic policy adopted by a government is highly influenced by the structure of the domestic economy. In section 7.5, we look at current account and exchange rate management and argue that the export success of Taiwan and South Korea is not a product of aggressive devaluations. Section 7.6 offers some concluding remarks.

7.2 Macroeconomic Policy and Growth: Some Stylized Facts

In this section, we present some stylized facts on macroeconomic policy and growth. The most crucial link between macroeconomic policy and long-run growth is that a higher investment-GDP ratio leads to better GDP growth. Table 7.1 shows that the associations between them for both Taiwan and South Korea are not positive across all subperiods.¹ Taiwan had a sharp decrease in investment-GDP ratio without any negative impact on growth rate between the periods 1981–85 and 1986–90, while South Korea experienced a sharp increase in investment-GDP ratio without an increase in growth rate between the periods 1971–75 and 1976–80. This suggests that a higher (lower) investment-GDP ratio does not necessarily lead to rapid (slow) economic growth. Recently, Fischer (1991) found that a sharp increase in investment between the periods 1960–73 and 1973–80 did not lead to an increase in the growth rate in regions like Latin America, Asia, and Africa. Dervis and Petri (1987) also reported that investment is not well correlated with growth in their study of the seven most rapidly growing countries (Taiwan, South Korea, Brazil, Thailand, Portugal, Greece, and Yugoslavia) for the 1965–85 period. The evidence here confirms this cross-regional empirical regularity.

What are the factors that account for the less clear positive relationship? Taiwan decided to pursue an industrial targeting policy after the first oil shock. Since most private enterprises were uninterested in joining the heavy and chemical industry development plan, the government and state-owned enterprises had to carry out most of the plan. As a result, the ratio of investment by state-owned enterprises to GDP rose to 9.1 percent in the 1976–80 period (see table 7.1).² Those state-owned enterprises, however, are known for inefficiency and mass corruption in undertaking investment projects. As a result, higher investment spending did not lead to higher real capital stock and higher pro-

1. Here investment is measured by fixed capital formation.

2. An enterprise is state-owned if the government has more than half of the ownership. According to Young's (1993) calculation, Taiwan's state-owned enterprises accounted for, on average, 46 percent of machinery and equipment investment during the 1951–91 period.

Table 7.1

Basic Statistics of Taiwanese and South Korean Development

Period	Taiwan	South Korea
<i>Per Capita Real GDP Growth Rate</i>		
1961-65	6.7	3.5
1966-70	6.3	7.3
1971-75	6.6	6.7
1976-80	8.2	5.7
1981-85	4.9	6.7
1986-90	7.2	8.7
<i>Inflation Rate (Implicit GDP deflator/CPI)</i>		
1961-65	2.7/1.6	17.5/15.9
1966-70	4.6/3.9	14.7/11.8
1971-75	10.6/11.1	17.9/14.2
1976-80	8.5/8.6	19.1/15.9
1981-85	3.6/3.8	7.0/6.9
1986-90	2.3/2.2	5.4/5.3
<i>Ex Post Real Interest Rate</i>		
1961-65	3.3	-1.5
1966-70	1.5	12.2
1971-75	-3.4	-1.8
1976-80	-0.7	-1.2
1981-85	3.8	4.4
1986-90	3.4	4.6
<i>Investment-GDP Ratio</i>		
1961-65	15.6 (4.2)	13.1
1966-70	21.1 (6.0)	23.4
1971-75	26.3 (8.7)	22.9
1976-80	27.6 (9.1)	30.1
1981-85	23.5 (6.9)	28.5
1986-90	20.5 (4.4)	30.8
<i>Export-GDP Ratio</i>		
1961-65	17.0	6.0
1966-70	25.1	12.5
1971-75	41.7	23.9
1976-80	50.9	31.0
1981-85	53.1	35.4
1986-90	53.7	37.0
<i>Government Expenditure-GDP Ratio</i>		
1961-65	12.3	13.9
1966-70	13.0	17.1
1971-75	12.0	15.4
1976-80	12.9	16.3
1981-85	14.9	17.0
1986-90	14.2	16.1
<i>Deficit-GDP Ratio</i>		
1961-65	0.93	0.63
1966-70	0.69	0.72
1971-75	-1.20	1.76
1976-80	-1.19	1.66
1981-85	0.75	1.34
1986-90	-0.02	-0.30

Sources: *International Financial Statistics* 1994 (Washington, D.C.: International Monetary Fund, various issues); Taiwan, *Central Government Budget Yearbook* (Taipei: Directorate-General of Budget, Accounting, and Statistics, Executive Yuan, Republic of China, various issues).

Note: Numbers in parentheses are ratios of investment by state-owned enterprises to GDP.

ductivity, and many projects turned out to be failures because of poor decisions. In the first half of the 1980s, as the number of investment projects undertaken by the government and state-owned enterprises declined, the investment-GDP ratio decreased but had no negative impact on economic growth.

About the same time, the South Korean government adopted an industrial targeting policy with similar objectives. But it emphasized fostering large-scale firms in the private sector through extensive state support and close cooperation between large firms (*chaebols*) and the government. In the heavy and chemical industry (HCI) program, the government provided very generous industry-specific incentives, including tax breaks, preferential loans, interest rate subsidies for participating firms, and import restrictions on targeted industries. Targeted industries were overinvested and had a substantial level of idle capacity. The *chaebols* instructed to undertake the investment projects were never blamed for any poor performance. Further, whenever an investment project failed, state-owned banks assumed full responsibility and defrayed the loss with inflationary tax revenues.

Because an increasing number of investment projects in Taiwan and South Korea were decided on the basis of strategic considerations, those projects could no longer be evaluated according to the efficiency of investment fund allocation. Allocative inefficiency could explain the absence of a clear positive association for Taiwan and South Korea.³ Further, as displayed in figure 7.1, the peaks of investment-GDP ratio in Taiwan occurred in 1975 and 1980, which lagged behind the peak in South Korea about one year. To stay close to its chief rival, state-owned enterprises and government in Taiwan often rushed to undertake investment projects when Taiwan found itself lagging behind in the race. Finally, according to Dollar and Sokoloff (1989) and Lin and Chan (1992), although enormous effort and resources have been devoted to the industrial targeting policies, those policies failed to affect the aggregate performance of the two economies measured in terms of productivity growth, structural change, and aggregate performance of exports.

Concerning the relationship between macroeconomic policy and GDP growth, four findings are worth mentioning. First, unlike the cross-regional evidence for Latin America and Asia in table 7.2, a negative relationship does not exist between GDP growth and inflation for Taiwan and South Korea. In theory, higher inflation reduces the efficiency of exchange mechanism. Once more resources are devoted to transactions and cash management instead of to production in an inflationary environment, higher inflation increases the actual cost of capital goods and hence reduces investment.⁴

3. The Singaporean government has also pursued an active industrial targeting policy. This policy allowed the Singaporean economy to catch up and surpass Hong Kong's initial lead in manufacturing. However, Young (1992) argued that the massive investment rates under this industrial targeting policy have led to the low total factor productivity growth in Singapore.

4. This mechanism has been developed by Fischer (1983) in a neoclassical growth model and by De Gregorio (1992) in an endogenous growth model.

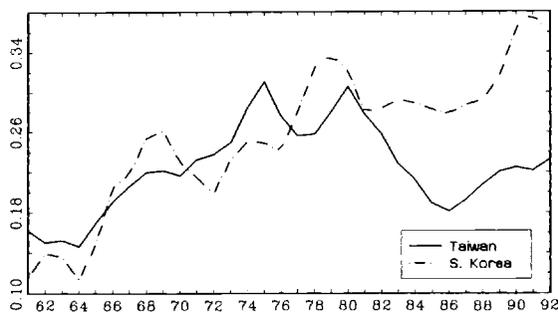


Fig. 7.1 Investment-GDP ratio

Sources: Taiwan, *Financial Statistics Monthly, Taiwan District, R.O.C.* (Taipei: Central Bank of China, various issues); South Korea, *International Financial Statistics* (Washington, D.C.: International Monetary Fund, various issues).

Table 7.2 Inflation and Growth

Period	Per Capita Real GDP Growth Rate	Inflation Rate
<i>Africa</i>		
1965-73	1.1	5.2
1974-80	0.4	15.8
1981-90	-1.0	18.9
<i>Asia</i>		
1965-73	3.2	14.8
1974-80	3.7	8.9
1981-90	4.9	6.9
<i>Latin America</i>		
1965-73	3.3	22.0
1974-80	2.5	53.0
1981-90	-0.9	249.0
<i>Taiwan</i>		
1965-73	8.0	4.3
1974-80	6.3	11.5
1981-90	6.1	3.0
<i>South Korea</i>		
1965-73	6.9	10.9
1974-80	5.6	17.7
1981-90	7.7	6.1

Source: Africa, Asia, and Latin America numbers are taken from Fischer (1993). Taiwan and South Korea numbers are authors' calculation.

Second, table 7.1 shows that a less clear positive association exists between ex post real interest rates and per capita GDP growth rates in Taiwan than in South Korea. Markets for primary securities are generally underdeveloped in developing countries. Therefore, private financial savings are mainly currency and deposits. If the real rates of return on these assets become significantly

negative as a consequence of inflationary finance or credit overexpansion, then private financial savings held in these claims will decrease and less saving can be channeled into productive investment through the formal banking system.⁵ This could hurt economic growth. Taiwan has a significant informal (or unregulated) financial sector, which has been a major supplier of funds for small and medium-sized firms in Taiwan.⁶ Although Taiwanese monetary authorities adopted a restrictive monetary policy, it is the informal financial sector that results in a less clear association. On the other hand, negative real interest rates in the periods 1961–65 and 1971–80 did not significantly hurt South Korean growth performance. When an economy has no access to international borrowing and lending, domestic saving becomes the only source of funds for investment. Negative real interest rates could hurt growth through a decrease in private financial saving. Since South Korea was able to borrow against its future trade surpluses in the international credit market, negative real interest rates had less impact on growth.

Third, a government that runs large budget deficits has bad macroeconomic policy if the budget deficits result from (1) an inefficient tax system and (2) out-of-control increases in government spending. According to table 7.1, GDP growth was negatively correlated with the budget deficit–GDP ratio for South Korea during the period 1961–80, while no such clear association exists for Taiwan during the period 1961–93. Taiwan's central government budget surpluses even stayed at the level of 1.2 percent of GDP in the 1970s, which provided cash reserves when the government ran huge deficits in the late 1980s (see fig. 7.2). The plots of the centered five-year moving averages of the GDP growth and budget deficit–GDP ratio in figure 7.3*D* suggest a positive association for Taiwan in the 1970s. That is, permanent low budget deficits do not necessarily lead to better growth performance, if they cause delays in the construction of infrastructure necessary for further growth.

Fourth, it is not the initial level of openness measured by the export–GDP ratio that accounts for the two-country difference in growth performance, a finding also supported by Dervis and Petri (1987). Further, the export–GDP ratios in Taiwan and South Korea rose sharply between 1963 and 1973, and then had a mild increase with volatile swings between 1974 and 1987. The subsequent decline made the two economies only slightly more open in 1991 than in 1973.

Both countries have encountered huge current account surpluses since the middle of 1980s. They were under pressure from the United States to reduce huge trade surpluses with the United States through structural adjustment. In response to this pressure, both countries adopted exchange rate appreciation

5. This mechanism was developed in the endogenous growth model by Roubini and Sala-i-Martin (1992).

6. According to Shea and Yang's (1990) estimate, private enterprises in Taiwan borrowed up to 34 percent of annual funds for investment and operations from the informal financial sector in the 1964–91 period.

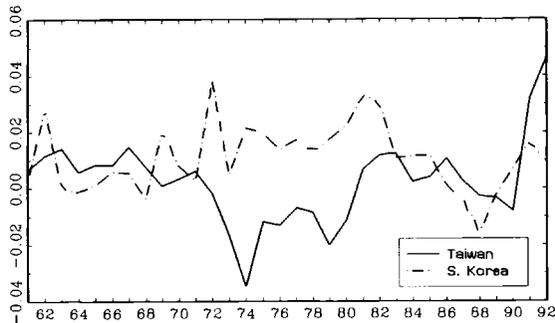


Fig. 7.2 Government deficit-GDP ratio

Sources: Taiwan, *Central Government Budget Yearbook* (Taipei: Directorate-General of Budget, Accounting, and Statistics, Executive Yuan, Republic of China, various issues); South Korea, *International Financial Statistics* (Washington, D.C.: International Monetary Fund, various issues).

and domestic spending expansion policies to downplay the importance of their export-led approaches. As displayed in figures 7.4 and 7.5, both export-GDP and current account-GDP ratios have steadily declined since 1987. When economic growth begins to rely more on domestic spending, the discipline on macroeconomic policy imposed by an export-led approach will be weaker. If our hypothesis is correct, then the decline in the export-GDP ratio will be a cause for concern about future macroeconomic performance because the government will lack external discipline in its policy making. Hence, imposing a sufficient set of constraints on both countries' policy making through the design of better institutions or the market mechanism will be crucial for their future growth.

Next we run the growth regressions for the period 1961–92. In general, the regression results in table 7.3 did not support the channels necessary to establish the link between macroeconomic policy and growth. The Durbin-Watson d -statistic has been argued to be a useful diagnostic tool for detecting misspecification in linear regression. According to the values of the Durbin-Watson d -statistics reported in table 7.3, it appears that most of the GDP growth regressions are not seriously misspecified. Several empirical findings emerged from the regression analysis.

First, unlike empirical results reported in Fischer (1991) and Levine and Renelt (1992), the investment-GDP ratio is not a significant factor in accounting for the per capita GDP growth rate over the past three decades in Taiwan and South Korea. Figures 7.3B and 7.6B plot the centered five-year moving averages of GDP growth rate and investment-GDP ratio since 1970. The plots exhibit a negative association between the two variables in each of the two decades, which is consistent with the assertion that a high investment-GDP ratio does not necessarily lead to better growth performance when investment does not have allocative efficiency.

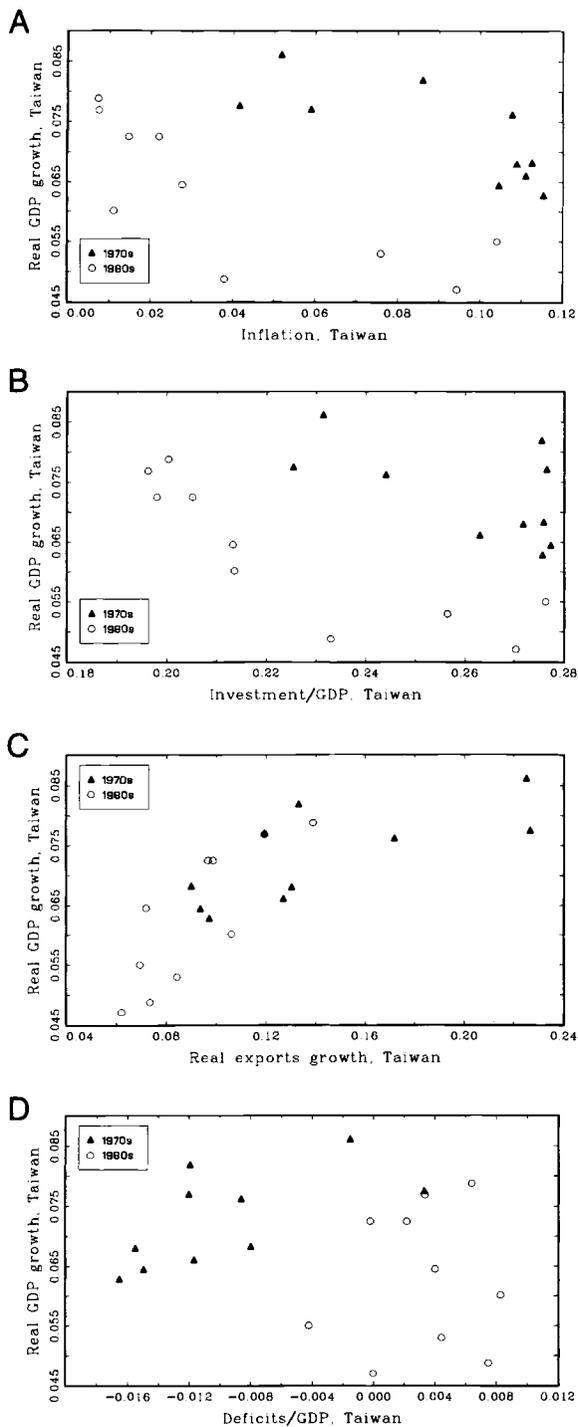


Fig. 7.3 Taiwan: (A) inflation and GDP growth; (B) investment-GDP ratio and GDP growth; (C) Export growth and GDP growth; (D) government deficit-GDP ratio and GDP growth

Sources: A-C, see sources for fig. 7.1; D, see sources for fig. 7.2.

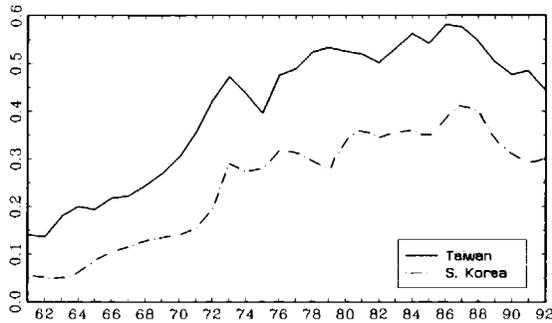


Fig. 7.4 Export-GDP ratio

Sources: See sources for fig. 7.1.

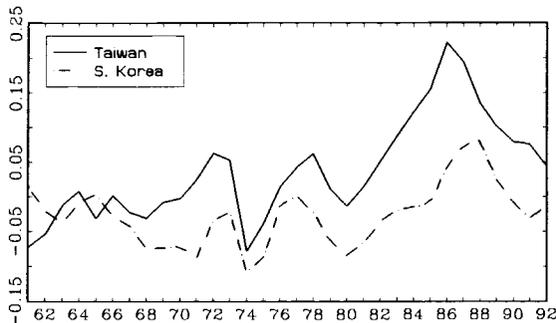


Fig. 7.5 Current account-GDP ratio

Sources: See sources for fig. 7.1.

Second, real export growth is the only consistently significant variable in all the GDP growth regressions. Exports played a key role in accelerating growth for the two countries. More precisely, both countries, like Hong Kong and Singapore, are fast-growing economies whose growth of exports outpaced that of GDP: Taiwan's (South Korea's) per capita real export growth rate of 14.9 percent (12.4 percent) accompanied an average annual growth rate of per capita real GDP of 6.5 percent (6.4 percent) over the 1961–92 period. Further, according to table 7.3, the statistical relationship between real export growth and GDP growth is more robust in Taiwan than it is in South Korea. As clearly indicated in the plots of the centered five-year moving averages of GDP growth and export growth in figures 7.3C and 7.6C, the fact that the relationship does not significantly shift over time generates a more robust statistical relationship for Taiwan. However, we cannot know how export growth led to such excellent growth performance without imposing and testing structural restrictions on export growth and GDP growth.

Table 7.3 Generalized Regressions of Per Capita GDP Growth Rates

Eq.	Constant	Inflation Rate	Investment/ GDP	Deficit/ GDP	Export/ GDP	Export Growth	Foreign Assets/GDP	D-W	\bar{R}^2
<i>Taiwan (Sample period: 1961-92)</i>									
1	0.08	-0.19						1.66	0.09
2	0.07	-0.19	0.01*					1.67	0.06
3	0.08	-0.24		-0.27*				1.76	0.08
4	0.07	-0.19			0.03*			1.65	0.08
5 ^a	0.04	-0.06*				0.26		1.26	0.73
6	0.08	-0.19					-0.004*	1.68	0.06
7	0.09	-0.22	-0.03*	-0.28*				1.75	0.05
8	0.07	-0.17*	-0.06*		0.03*			1.62	0.05
9 ^a	0.03*	-0.07*	0.04*			0.27		1.26	0.73
10	0.07	-0.20	0.02*				-0.004*	1.26	0.73
11	0.09	-0.20	-0.11*	-0.32*	-0.04*			1.41	0.04
12 ^a	0.04	-0.11	-0.005*	-0.39		0.27		1.41	0.73
13	0.08	-0.24	-0.03*	-0.34*			-0.002*	1.78	0.02
14 ^a	0.04	-0.11		-0.38		0.26		1.41	0.74
15	0.09		-0.10*					1.67	0.003
16	0.09		-0.12*	0.06*				1.64	-0.03
17	0.09		-0.18*		0.05*			1.65	0.02
18 ^a	0.04		-0.02*			0.27		1.28	0.72
19	0.09		-0.12*				0.002*	1.66	-0.03
20	0.07			0.23*				1.60	-0.03
21	0.06				0.02*			1.66	-0.03
22 ^a	0.03					0.27		1.28	0.73
23	0.07						-0.000*	1.67	-0.03
<i>South Korea (Sample period: 1961-92)</i>									
1	0.08	-0.14						1.90	0.04
2	0.06	-0.11*	0.07*					1.89	0.02
3	0.09	-0.09*		-0.82				1.80	0.11
4	0.06	-0.09*			0.07*			1.93	0.05
5 ^a	0.07	-0.13				0.10		2.09	0.14
6	0.09	-0.09*					0.02*	1.94	0.07
7	0.06	-0.05*	-0.10*	-0.95				1.83	0.12
8	0.06	-0.09*	-0.02*		0.08*			1.93	0.02
9 ^a	0.05*	-0.12*	0.05*			0.11		2.07	0.11
10	0.18	-0.08*	-0.28*				0.08	2.07	0.16
11	0.06	-0.02*	-0.02*	-1.04	0.10*			1.92	0.14
12 ^a	0.04*	-0.06*	0.12*	-1.00		0.12		2.05	0.17
13	0.16	-0.04*	-0.19*	-0.78*			0.06*	1.97	0.16
14 ^a	0.08	-0.09*		-0.85		0.09		2.09	0.18
15	0.04		0.10*					1.81	0.006
16	0.04		0.12*	-1.00				1.81	0.14
17	0.04		-0.02*		0.10*			1.88	0.03
18 ^a	0.03*		0.09*			0.12		1.85	0.08
19	0.18		-0.28*				0.08	2.01	0.12
20	0.07			-0.90				1.72	0.11
21	0.04				0.09			1.87	0.06
22 ^a	0.05					0.10		1.86	0.09
23	0.08						0.03	1.88	0.08

^aSample period is 1964-92.

*Not significant at 10 percent level.

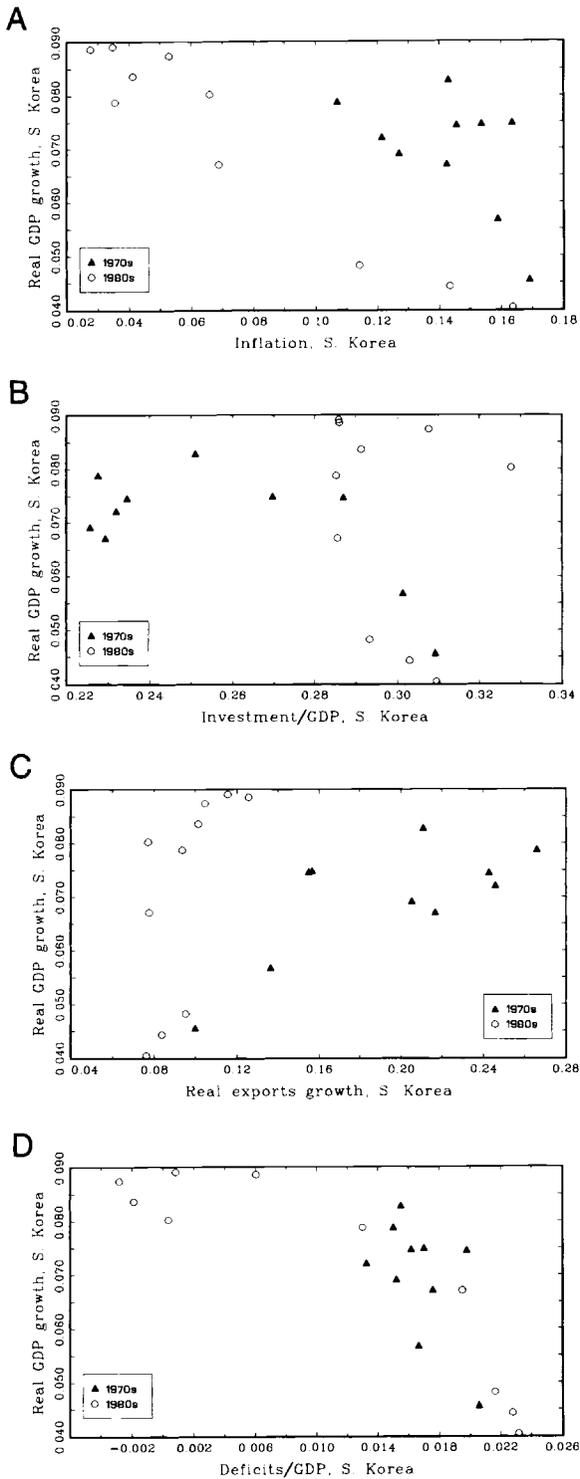


Fig. 7.6 South Korea: (A) inflation and GDP growth; (B) investment-GDP ratio and GDP growth; (C) Export growth and GDP growth; (D) government deficit-GDP ratio and GDP growth

Sources: A-C, see sources for fig. 7.1; D, see sources for fig. 7.2.

Third, the coefficient estimate for inflation rate has the expected sign in each GDP growth regression for both countries. However, the significance of inflation rate depends on the measurement of general price level used in the regressions. For example, suppose that the consumer price index was used to construct the inflation rate series. Then the coefficient estimate for inflation rate became insignificant when the per capita export growth rate was included in regressions. This suggests that export growth for Taiwan is a more significant factor in accounting for GDP growth than inflation rate is. This result does not hold for the implicit GDP deflator. While the use of the implicit GDP deflator has yielded less significant coefficient estimates in South Korea's regressions, the relationship between inflation and GDP growth is more robust, as displayed in figure 7.6A when the consumer price index was used to construct inflation rate. Recently, Fischer (1993) found that the high-inflation outliers in his cross-sectional growth regressions did not account for the overall negative relationship between inflation and growth. Rather, the negative relationship is stronger at low and moderate inflation than at high inflation. However, the two-country comparison between Taiwan and South Korea confirms Fischer's finding only when the implicit GDP deflator is used. Finally, the export-GDP ratio, which measures the openness of an economy, does not have a significant coefficient estimate in the whole period.

When international competition forces macroeconomic policy to be clearly set within the context of a commitment to growth through export promotion, it requires government to surrender its discretionary power in macroeconomic policy making. As a result, both macroeconomic policy variables and measures of growth performance become endogenous variables. The correlation between macroeconomic policy and GDP growth will not be stable across subperiods because such correlations merely reflect the predominance of some external shock in the period being considered. This explains why the regression outcomes fail to reveal any robust and significant statistical relationships. Recently, there have been disputes about the mechanism by which a causal factor affects the growth performance of the two countries. Some researchers emphasize macroeconomic policy as the mechanism, while others cite industrial policy. The unstable correlation patterns suggest that it would be difficult (if not impossible) to detect any meaningful causal factor using time-series data.

7.3 Fiscal Policy and Central Bank Independence

While the regression results indicate that export growth could account for GDP growth and that no clear correlation patterns exist between macroeconomic policy and growth performance, they do not tie down the channel of influence, nor the precise role of macroeconomic policy in export-led growth. One alternative approach would be imposing structural restrictions on growth and macroeconomic policy in econometric models. Then one can use those structural restrictions to identify the channel of influence. This approach also

resolves the difficulty that a never-ending array of alternative plausible variables can be entered in the growth regressions.

The case study approach presents another, though less formal, method of characterizing the role of macroeconomic policy in export-led growth. Here we adopt this approach to describe the role of fiscal policy and the central bank in successful export-led growth. According to table 7.4, the Taiwanese and South Korean central banks receive relatively high scores of average legal independence compared to those in 16 industrial countries. But their average inflation rates in the period 1973–87 were higher than the rates of those countries for the following reason. For most developing countries, even though the law is explicit as to central bank independence, it cannot be fully implemented

Table 7.4 Central Bank Independence and Aggregate Performance

Country	CBI Index ^a (LVAU)	Turnover Rate	Average Inflation (1973–88)	Standard Error Inflation (1973–88)	Per Capita Real GNP Growth Rate ^b (1973–87)
<i>Developed Countries</i>					
Switzerland	0.68	0.13	3.1	2.1	1.4
Germany	0.66	0.10	3.4	2.0	1.8
United States	0.51	0.13	6.4	3.3	1.6
Denmark	0.47	0.05	8.6	3.3	1.1
Canada	0.46	0.10	7.2	2.8	2.8
Netherlands	0.42	0.05	4.3	3.2	1.1
United Kingdom	0.31	0.10	6.7	4.8	2.0
Australia	0.28	n.a.	9.5	2.7	1.4
France	0.27	0.15	8.2	3.5	1.5
Sweden	0.27	0.15	8.3	2.8	1.5
New Zealand	0.27	0.15	12.2	3.2	0.7
Italy	0.22	0.08	12.5	5.4	2.9
Spain	0.21	0.20	12.4	4.7	1.2
Belgium	0.19	0.13	6.0	3.4	1.5
Japan	0.16	0.20	4.5	4.1	2.6
Norway	0.14	0.08	8.2	2.4	3.0
<i>Developing Countries</i>					
Chile	0.49	0.45	51.8	59.1	0.7
Argentina	0.44	0.93	356.7	253.5	-0.5
Venezuela	0.37	0.30	12.7	7.5	-0.3
Mexico	0.36	0.15	50.2	39.3	1.2
Taiwan	0.34	0.23	7.2	9.9	6.5
Malaysia	0.34	0.13	5.1	4.4	3.7
South Korea	0.32	0.43	10.9	9.3	7.2
Singapore	0.27	0.37	5.4	7.9	6.1
Brazil	0.26	n.a.	273.3	203.9	2.4
Thailand	0.26	0.20	8.0	6.9	4.9

^aLVAU = Unweighted aggregation of legal variables. Scores for central bank independence, except that for Taiwan, are from Cukierman (1992).

^bNumbers in developing countries are per capita real GDP growth rates.

because the government tends to do things that may not be in strict accordance with the law. To reduce such bias, we use the actual turnover rate of the bank president proposed by Cukierman (1992) as an alternative measure. The turnover rates in both Taiwan and South Korea are higher than in the developed countries on the list in table 7.4, a result consistent with their inflationary performance.

A single index cannot characterize the dynamic relationship between central bank independence and the export-led approach, such as the ways in which the central bank resolves its conflicts with the executive branch when export-promoting policy affects price stability. According to Taiwanese central bank law, the objectives of central bank operations are (1) promoting financial stability, (2) ensuring the health of the banking system, (3) maintaining the stable purchasing power of its currency, and (4) assisting economic development without compromising the above three goals. Price stability is not the only objective.

The board of directors of Taiwan's central bank is responsible for the review of monetary and exchange rate policies. The ministers of finance and economic affairs are both permanent and voting members of the board, and the bank's president must attend the weekly cabinet meeting. Requests for more cooperation from the central bank in promoting export growth are often raised in the meetings. Even though central bank law requires the board to have regular meetings, the bank's president usually convenes the board meeting after important decisions on monetary and exchange rate policies have been made. The central bank's president occasionally testifies before the parliament at the request of a member of the parliament. The parliament has no say in the formulation and conduct of monetary and exchange rate policies, and the central bank does not hold any regular public hearings. These facts taken together put the central bank under the control of the executive branch of government.

Although central bank law did not explicitly ban government and state-owned enterprises from soliciting loans or advances from the central bank in Taiwan, the central bank did not extend such loans or advances after the great 1945–49 inflation.⁷ However, the latest amendment of the central government bond issuance law in 1991 allows the central bank to directly purchase government bonds from their issuer, the Ministry of Finance (i.e., the monetization of public debts), with the parliament's approval.⁸ This amendment has attracted attention because budget deficits have increased dramatically during recent years. If massive corruption in Taiwan's infrastructure construction and public

7. In the 1970s, the central bank even held a huge number of shares of a private company, Hwa-Long Polyester Co., after it rescued the company from bankruptcy using inflationary tax revenues under directives from some very high level government officials.

8. Initially, the executive branch wanted the amendment that the central bank can directly purchase government bonds without any consent from the parliament. However, this met with strong resistance from the opposition party. Both sides eventually compromised on this issue by adding the parliamentary approval precondition.

investment projects and the surge in civil service salaries continue, any future accelerating increase in budget deficits will put more pressure on the central bank to monetize the public debt.⁹ In other words, fiscal policy is vital to the central bank's ability to maintain price stability.

On the other hand, South Korean central bank law explicitly states that one of the central bank's objectives is employing all feasible means to promote economic development. To assure this, the minister of finance not only presides over the monetary committee of the Bank of Korea, which is responsible for the design of monetary and credit policies, but also nominates the committee members. When a resolution of the committee is in conflict with the executive branch's position, the minister of finance can ask the committee to reconsider the resolution. Even if the committee refuses, the minister can bring the case to the country's president for the final decision. This puts the Bank of Korea under the direct control of the Ministry of Finance. The Bank of Korea is also allowed to directly purchase government bonds from the government, extend loans or advances to the government, and even hold government-guaranteed securities. The upper limit on the total balance of unpaid public debt, loans, and advances is set by the National Assembly.

Given that both central banks lack independence in operation, the most important factor that accounts for moderate and more stable inflation in both countries is the commitment to an export-led approach. For such an approach, the optimal policies are those maintaining and enhancing the international competitiveness of export goods. This commitment in turn imposes a set of constraints on macroeconomic policy that prevents the adoption of measures antithetical to export growth.¹⁰ Other factors include the following: (1) the objectives in policy making must be well defined and easy to measure, (2) the costs of wrong policy making must be visible fairly rapidly, and (3) the degree of freedom in the feasible set of instruments must be sufficient for achieving any policy objective. When a decline in export growth is caused by significant mistakes in policy making, it makes the costs of mistakes highly visible to policymakers and private agents and therefore quickly puts pressure on government authorities to promptly adjust policy.

9. For example, the construction of the second northern Taiwan highway started in 1986 and is planned to be completed in 1997, with four years' delay. The original budget for this 120-km highway was NT\$58.1 billion. However, the budget was inflated to an estimated NT\$176.8 billion in 1993. During the period 1986-93, Taiwan did not experience very serious inflation problems, so inflation was not the reason for the surge in the budget. Massive corruption in the KuoMingTang (KMT) regime may be the explanation. Another example is the Taipei Mass Rail Transit System. The original estimate of NT\$250 billion was nearly doubled to about NT\$480 billion in 1993. Civil service salaries are also a major item of budgetary expenditure; they amounted to 31.8 percent of the total budget at all levels of governments in FY 1993. It has been difficult to cut this budgetary expenditure since civil servants and military personnel have been strong supporters of the KMT regime over the past four decades.

10. It is not clear why the governments in both countries decided to switch to an export-led approach in the 1960s. Balassa (1988) describes Taiwan's decision to adopt an export-led approach as an experiment.

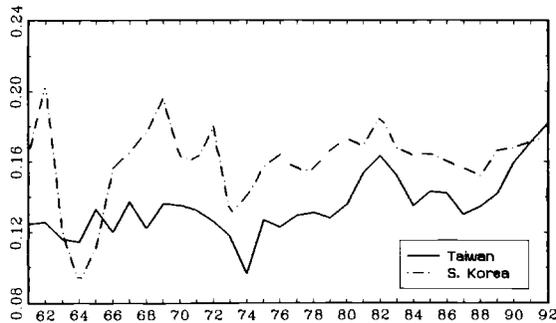


Fig. 7.7 Government spending-GDP ratio

Sources: See sources for fig. 7.2.

Figure 7.7 shows that government spending was kept under tight control in the period 1961–90, even with large budget surpluses in the 1970s for Taiwan.¹¹ South Korean budget deficits in the 1970s were mainly caused by generous tax breaks and fiscal incentives provided in its industrial targeting policy. The budget deficits returned to normal in the 1980s. On the other hand, both the six-year national development plan and the surge in civil service salaries contributed to huge budget deficits in Taiwan for FY 1990, 1991, and 1992. The government spending-GDP ratio began to climb in the 1980s, with a clearer upward trend in Taiwan. The upward trend shows that both countries began to use government spending as an instrument to stimulate the economy. Tight budgetary control means that governments do not have to resort to inflationary tax revenues as a source of funds.

For Taiwan and South Korea, sound fiscal discipline plays two roles in export-led growth: (1) It gives the set of instruments the maximum degree of freedom in achieving the export growth goal. (2) It allows the central bank to be more flexible in promoting exports without immediately jeopardizing price stability. The set of instruments for implementing macroeconomic policy includes monetary bases, interest rates, credit allocation, government spending, tax rates, and exchange rates. However, not all of them are free instruments in achieving any particular policy goal. The degree of freedom depends on the combination of monetary, fiscal, and exchange rate policies the government actually adopts. For example, if a government persistently runs budget deficits and the central bank collects inflationary tax revenues for the government, it is unlikely that government authorities can use export financing subsidies or fiscal incentives to maintain export profitability without generating higher gov-

11. Since both Taiwan and South Korea gave national security top priority in deciding their annual budgets, the national defense budgets occupied a significant portion of central government spending. Hence, the government expenditure-GDP ratio would not be as high as first thought once this factor is taken into account.

ernment deficits and inflation. That is, they cannot be free instruments in maintaining export profitability.

As argued in Sargent and Wallace (1981), for a given path of government budget deficits, tighter monetary policy lowers inflation today but at the cost of higher inflation in the future. That is, the central bank cannot effectively implement a tight monetary policy to bring inflation under control without considering the behavior of government budget deficits. On the other hand, Alesina (1989), Bade and Parkin (1985), and Parkin (1986) found that developed countries with independent central banks experience significantly lower inflation than developed countries whose central banks are under the control of the executive branch of government. As suggested in Alesina and Summers (1993), central bank independence might improve macroeconomic performance through two channels: (1) An independent central bank that is free from political pressure may behave more predictably, promoting economic stability and reducing risk premia in real interest rates. (2) To the extent that high inflation has adverse effects on economic performance either by creating distortions, encouraging rent-seeking activities, or raising risk premia, one would expect central bank independence to improve economic performance. The time inconsistency theory of inflation of the type developed in Kydland and Prescott (1977) also concludes that a more independent central bank could reduce the inflation rate.

Since the central bank has its most pervasive influence on inflation, interest rates, exchange rates, and the balance of payments, through the conduct of monetary and exchange rate policies, the main objective of most central banks in developed countries has been confined to maintaining price stability. As mentioned in the introduction, the two potentially conflicting roles of central banks in developing countries often make it difficult for them to maintain their independence. However, it is sound fiscal policy, not central bank independence, that accounted for moderate and more stable inflation in both Taiwan and South Korea.

As the export-GDP ratio continues to decline and the economy matures, government spending will become an important instrument because economic growth will rely more on domestic spending, and economic and social stability becomes the goal.¹² If higher government deficits are expected as a consequence of more aggressive government spending, a less independent central bank will be a cause of concern because a less independent central bank makes the monetization of public debt easier. Therefore, designing an independent central bank could be crucial for both countries' future economic performance.

12. Dervis and Petri (1987) also found that countries at the bottom end of the expenditure range in their cross-country sample generally increased their government spending, while countries at the top end decreased theirs.

7.4 Special Loan Policy

Although international competition imposes constraints on macroeconomic policy, optimal macroeconomic policy differs across the two countries, depending on the structure of the economy. The Taiwanese government has confined its role to providing infrastructure and other public goods. It used medium-term economic planning that set development targets, and those plans were generally indicative. The interactions between the economic bureaucracy and the private sector can be characterized as mutual adjustment rather than collaboration.

Even though small and medium-sized enterprises accounted for more than two-thirds of Taiwan's total exports, the government did not offer generous specific incentives to them. Since most of these firms cannot supply the information necessary to issue their own notes or publicly traded shares, the banking system and unregulated financial sector are their main sources of funds. Interest rate subsidies and preferential loans are probably the most important export-promoting instruments. The central bank offers export financing through state-owned commercial banks and specialized banks. Table 7.5 shows the significant difference between the rediscount rate on export loans and the regular rediscount rate. While export-financing policy increases the international competitiveness of exports by reducing borrowing costs, inflationary pressure is built up with export activities as long as funds for investment and business operations are scarce in the export sector and the export loan rate is lower than the market interest rate. As a result, a negative association exists between inflation rate and rediscount rate on export loans. When the economy encountered serious inflationary problems in 1974 and 1980, the central bank was forced to raise the rediscount rate on export loans. On the other hand, when the economy's export growth slows, the central bank lowers the rediscount rate on export loans to stimulate exports only if it will not immediately threaten price stability.

The central bank also set up a medium- and long-term credit special fund to finance infrastructure construction and investment projects in 1973. The source of funds is deposits of the postal saving system (PSS) at the central bank. Under the industrial targeting policy, the central bank extended preferential loans to qualified firms through commercial and specialized banks to promote machine imports. For example, it offered U.S.\$600 million in preferential loans for financing major strategic export industries and technology-intensive industries in 1978. After extending those special loans, banks can apply for special rediscounts at the window of the central bank.

In the late 1970s and 1980s, huge trade surpluses and inappropriate exchange rate management forced the central bank to hold huge foreign exchange reserves. The special loan policy was criticized for its inflationary effects. When this policy posed a threat to price stability, the central bank abandoned

Table 7.5 Principal Interest Rates on Central Bank Loans and Discounts
(% per annum)

Year	Taiwan		South Korea		
	Rediscounts	Rediscounts on Export Loans	Discounts for Commercial Bills ^a	Loans for Exports ^b	Loans to Government
1966	–	–	28.0	3.5	2.0
1967	–	–	28.0	3.5	2.0
1968	–	–	28.0–23.0	3.5	2.0
1969	–	–	23.0–22.0	3.5	2.0
1970	–	–	22.0–19.0	3.5	2.0
1971	9.25	–	19.0–16.0	3.5	2.0
1972	8.50	–	16.0–11.0	3.5	2.0
1973	10.75	8.75	9.0	3.5	2.0
1974	12.00	8.00	9.0	3.5	2.0
1975	10.75	6.00	9.0–13.0	3.5	2.0
1976	9.50	6.00	13.0	3.5	2.0
1977	8.25	5.50	9.0–14.0	3.5	2.0
1978	8.25	5.50	9.0–14.5	4.0	2.0
1979	11.00	9.50	14.5	4.0	2.0
1980	11.00	9.50	20.5–15.5	10.0	5.0
1981	11.75	10.00	14.5–10.5	10.0	5.0
1982	7.75	7.25	6.5–5.0	5.0	5.0
1983	7.25	7.00	5.0	5.0	5.0
1984	6.75	6.75	5.0	5.0	5.0
1985	5.25	5.25	5.0	5.0	5.0
1986	4.50	4.50	5.0–7.0	7.0	5.0
1987	4.50	4.50	7.0	7.0	5.0
1988	4.50	4.50	7.0–8.0	8.0	5.0
1989	7.75	7.75	8.0–7.0	7.0	5.0
1990	7.75	7.75	7.0	7.0	5.0
1991	6.25	6.25	7.0	7.0	5.0
1992	5.625	5.875	7.0	7.0	5.0
1993	5.50	–	5.0	5.0	5.0

Sources: *Monthly Statistical Bulletin* (Seoul: Bank of Korea, various issues); *Financial Statistics Monthly, Taiwan District, R.O.C.* (Taipei: Central Bank of China, various issues).

^aDiscounts on commercial bills from August 3, 1972, to March 29, 1982, are rates for prime enterprises.

^bIncludes loans for general exports and imports, loans for exports of construction and services, and loans for export preparation of agricultural and marine products.

it in the middle of 1989. Since a government budget deficit cannot have been a source of inflation during this period, export booms, together with this special loan policy, appear to account for moderate inflation in Taiwan.

On the other hand, South Korea established a powerful agency, the Korean Planning Board, that controls instruments for implementing economic planning and heavily intervened in the allocation of resources. The government provides domestic market protection, implements industrial targeting, issues permits of entry in many industries, and guarantees foreign loans for private

firms. In general, the government acted as a partner in industrial targeting. "Korea, Inc." is an adequate description of the relation between government and big private enterprises.

In the 1980s, five large state-owned banks accounted for nearly all formal commercial credit. The banking system and the central bank were used to channel domestic and foreign savings or supply credits to the *chaebols*. The composition of special loans and discounts of the Bank of Korea in table 7.6 suggests a close partnership between government and the *chaebols*. Unlike the

Table 7.6 Special Loans and Discounts of Central Banks

Year	Taiwan (million NT dollars)	South Korea (billion won)		
	Special Discounts ^a	Preferential Loans ^b	General Loans	Rediscounts on Commercial Bills
1966	4,458 (44.1)	4	0.3	–
1967	5,267 (45.2)	8	–	–
1968	6,866 (49.3)	14	–	1.2
1969	6,651 (46.1)	32	–	2
1970	7,173 (49.7)	48	21	16
1971	8,195 (49.9)	71	6	23
1972	7,298 (43.0)	100	34	39
1973	24,552 (57.8)	216	8	44
1974	40,258 (60.9)	308	214	90
1975	44,814 (57.2)	380	167	102
1976	35,605 (35.3)	461	127	73
1977	34,740 (21.6)	457	131	75
1978	37,218 (15.5)	775	153	82
1979	59,494 (21.1)	1,002	620	168
1980	82,252 (28.6)	1,533	396	297
1981	106,400 (55.7)	1,713	870	593
1982	166,683 (73.6)	1,750	1,210	960
1983	120,561 (66.5)	1,739	2,258	955
1984	89,330 (73.2)	1,786	3,976	1,063
1985	53,733 (93.7)	2,044	5,463	1,321
1986	39,895 (74.1)	1,927	6,116	1,292
1987	48,800 (84.6)	1,133	7,144	1,620
1988	8,500 (92.0)	527	6,417	1,862
1989	700 (0.6)	639	5,921	2,588
1990	–	892	5,968	3,820
1991	–	986	6,093	5,488
1992	–	1,031	6,138	5,873
1993	–	1,055	6,570	5,178

Sources: *Monthly Statistical Bulletin* (Seoul: Bank of Korea, various issues); *Financial Statistics Monthly, Taiwan District, R.O.C.* (Taipei: Central Bank of China, various issues).

^aSpecial discounts in Taiwan have been ceased in April 1989. Numbers in parentheses are special discounts as a percentage of total claims of the central bank on depository institutions.

^bPreferential loans consist of loans for foreign trade and loans on collateral of export bills.

case in Taiwan, general loans extended by the Bank of Korea constituted the major component of its special loans and discounts. Those loans were allocated to specific borrowers under the industrial targeting policy. Table 7.5 also shows that commercial bank credit was offered at very low interest rates. Since the funds were strictly rationed, households and small and medium-sized businesses were forced into the informal financial sector, where lending rates exceeded bank loan rates by 20 percent or more.

Like most countries in the early stages of economic development, the gap between investment and domestic saving had to be filled with international borrowing. Nearly three-quarters of investment in the late 1950s and about half in the 1960s was financed from abroad. Before 1965, U.S. aid constituted a significant external financing source, which was channeled into private investment through government saving. As U.S. aid began to decline, the South Korean government first attempted to generate domestic saving as a main source of funds for investment finance. The government decided to undertake an interest rate reform in 1965 that was designed to channel household saving into investment finance through the regulated financial sector by offering positive real interest rates on deposits. The M2-GDP ratio rose substantially during the period 1965–72, reflecting an increase in the supply of funds through depository institutions. When the HCI program was launched in the 1970s, the South Korean government was under constant pressure from *chaebols* to lower real interest rates, and the country entered the negative interest rate era on August 3, 1972. The idea of channeling household saving into investment finance through depository institutions was then abandoned. The enormous difference in real interest rates between the regulated financial sector and its unregulated counterpart induced most household saving into the unregulated sector. The limited loanable funds in the regulated financial sector were strictly rationed to selected *chaebols* at negative real interest rates. As a result, the South Korean M2-GDP ratio has not risen since the middle of 1970s, and South Korea had to rely on international borrowing to finance its investment projects. South Korea's foreign borrowing assumed equal importance with government saving. Even though South Korea borrowed more extensively than Taiwan and other Asian developing countries, it maintained good control over its foreign debt. As shown in figure 7.8, Taiwan became a creditor in the late 1970s, while South Korea has been a debtor over the past three decades. However, net foreign asset-GDP ratios in both countries share similar trend properties.

To maintain negative real interest rates, the South Korean central bank had to tightly control the regulated financial sector. In the early 1980s, when the cost of capital rose abroad and foreign debt threatened to grow out of control, the South Korean government lifted the market entry restriction on contractual saving institutions to stimulate household and corporate saving. Those institutions, offering higher and safer returns than the unregulated financial sector, drew new funds into the regulated financial sector and evidently also increased the net flow of funds.

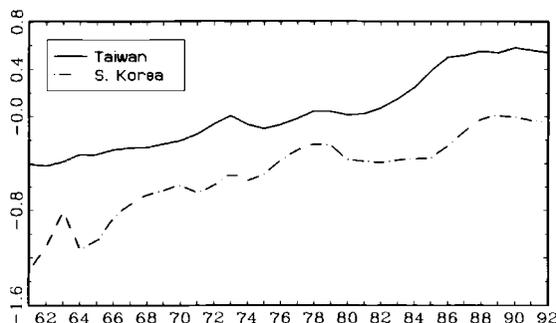


Fig. 7.8 Foreign asset-GDP ratio

Sources: See sources for fig. 7.1.

The special loan policies adopted by each of the two central banks reflects the difference in industrial organization between Taiwan and South Korea. Since firms in the Taiwanese export sector are small and medium-sized, the export financing policy, which was based solely on export activities, played an important role in the allocation of credit. Under this structure, direct intervention in allocating the funds for investment finance was not possible. This uniform incentive on the basis of export performance is a more efficient method of export promotion. Although Taiwan's planning agency cannot select technology with increasing returns, as its South Korean counterpart did, Taiwan's growth performance drew on a large pool of experienced entrepreneurs and human resources. For South Korea, the partnership between government and the *chaebols* created moral hazard problems. Under the industrial targeting in the 1970s, the *chaebols* were heavily leveraged with loan guarantees through state-owned banks, and the government in turn held responsibility for the failure of the *chaebols'* investment projects. The bailout certainty provided by the Bank of Korea through inflationary tax revenues induced excessive risk taking. Even after many efforts, the government has not been able to extricate itself from its relations with the *chaebols*.

7.5 Current Account and Exchange Rate Policy

The current account is the excess of saving over investment. Since saving and investment are outcomes of intertemporal decisions by households, firms, and government, current account behavior is best analyzed in an intertemporal macroeconomic model, and expectations of future events can be a decisive factor in determining its behavior.

Time-series data on saving, investment, and current account for Taiwan and South Korea are shown in Figures 7.9A and 7.9B. The current account-GDP ratio fluctuates around mean zero for South Korea, while it exhibits an upward trend for Taiwan. Different investment and saving behavior in the two countries

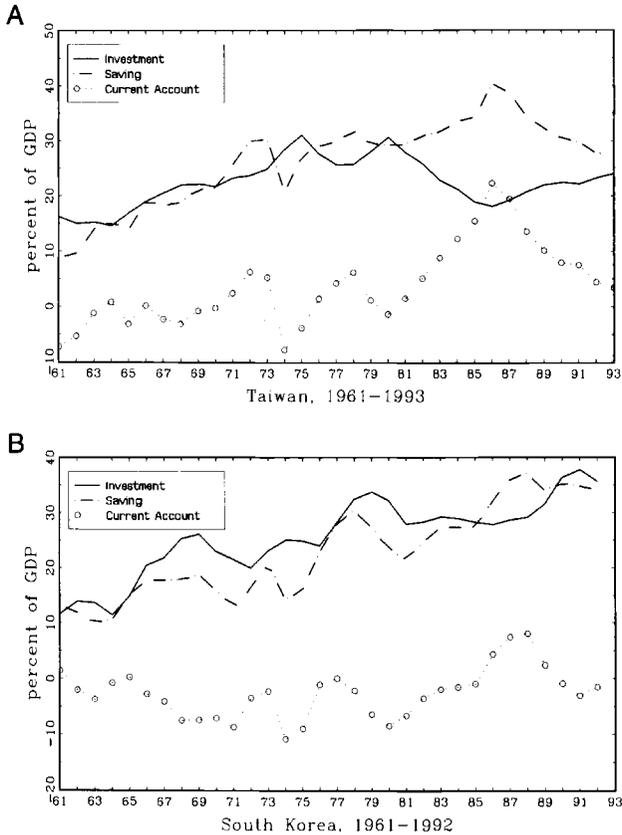


Fig. 7.9 Investment, saving, and current account: (A) Taiwan; (B) South Korea
Sources: See sources for fig. 7.1.

accounts for the difference: the investment-GDP and saving-GDP ratios move in concert for South Korea. But saving-GDP movement dominates current account-GDP movement for Taiwan.

Since most capital goods were imported in the early stages of economic development, domestic saving can be channeled into investment finance only to the extent that it can be translated into availability of foreign exchange. With limited capacity to repay their foreign debts, Taiwan and South Korea were forced to transform domestic saving into foreign exchange in the 1950s. But they demonstrated that rapid growth of manufactured exports was an alternative solution to the foreign exchange shortage in the early 1960s. Although the export-led approach emphasizes the importance of the “right” real exchange rate in promoting exports, the export success of these two countries was not a product of aggressive devaluations. That is, they performed well, not because they devalued aggressively to achieve the “right” real exchange rate, but rather

because international competition disciplined macroeconomic policy so that the real exchange rate was “right” for export-led growth.

Taiwan and South Korea had different exchange rate policies because they took different approaches to domestic monetary policy. In the 1960s and 1970s, South Korea experienced inflation as a consequence of an improved balance of payments and an expansionary monetary policy. Once more rapid inflation at home than abroad decreased the real exchange rate, the government was forced to adopt an aggressive devaluation policy to offset the effects of inflation on the real exchange rates during 1960–80 as displayed in figure 7.10B. That is, exchange rate adjustment is not a free instrument under an expansionary domestic monetary policy. As a result, the exchange rate of won per U.S. dollar increased from 124.8 in 1961 to 607.4 in 1980. On the other hand, Taiwan adopted a restrictive monetary policy in the 1960s and 1970s.

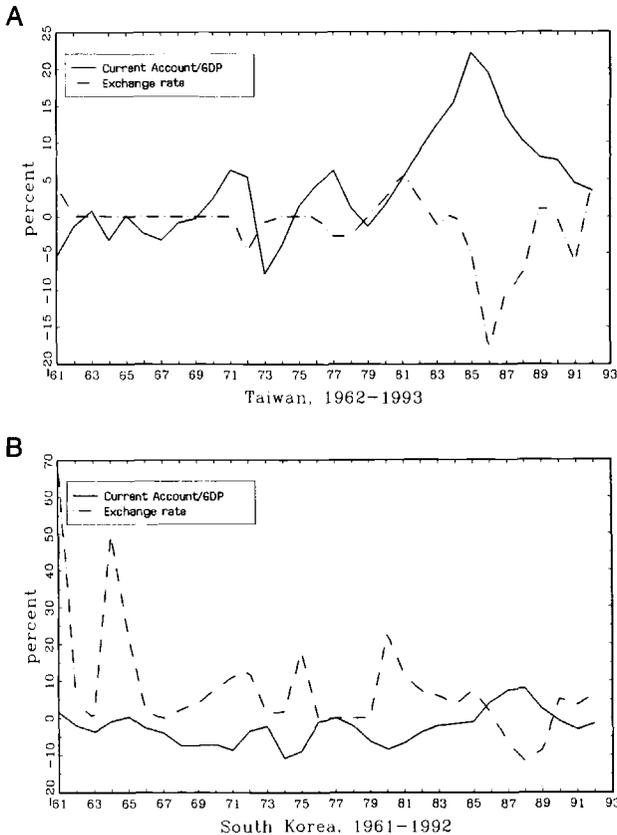


Fig. 7.10 Current account and exchange rate change: (A) Taiwan; (B) South Korea

Sources: See sources for fig. 7.1.

Figure 7.10A shows that when Taiwan encountered current account surplus problems in the period 1971–73 and 1976–79, only periodic adjustments of nominal exchange rates were necessary to maintain a realistic real exchange rate.

Even though the export-led approach takes advantage of opportunities for international trade, it also exposes the economy to external shocks. To insulate the domestic economy, most central banks hold foreign exchange reserves as an instrument to absorb the impact of external shocks on the economy. An appropriate level of foreign exchange reserves also enables the government to use better fiscal incentives to restore the external competitiveness of its exports when there is a temporary decrease in exports caused by external shocks.

For a small open economy with perfect mobility, investment, saving, and current account depend on the real interest rate in the world credit market. In theory, any pattern of correlation between investment and saving is possible, depending on shocks affecting the economy. However, this observation does not mean that investment is uncorrelated with saving over time. A prime instrument for a country to use in achieving its foreign reserve objectives is regulatory restriction of capital inflows and outflows. With imperfect capital mobility, a boom in investment opportunities will be financed less by foreign capital inflows and more by domestic saving induced by higher domestic interest rates. Hence, more imperfect capital mobility leads to a higher correlation between investment and saving. This may explain the positive correlation between investment and saving for South Korea, but offers no explanation for the almost zero correlation for Taiwan.

Overly large foreign reserves could cause a concern about the economy's long-run prospects when it results from imbalance between saving and investment. For example, when Taiwan's current account had huge surpluses in the 1980s, the central bank accumulated substantial foreign exchange reserves. As displayed in figures 7.5 and 7.11, the current account–GDP ratio increased from 1.5 percent in 1981 to 22.3 percent in 1986, while the foreign reserve–GDP ratio jumped from 17.0 percent in 1986 to 70.3 percent in 1987. Even the political uncertainties faced by Taiwan cannot justify the amount of foreign reserves held by the Taiwanese central bank in the 1980s (see fig. 7.11). Huge current account surpluses also signify serious misallocation of resources in the economy. Since private saving and private investment are outcomes of intertemporal decisions, the government can either change the decision environment in the private sector or use fiscal expansion to correct such misallocation.

The government in Taiwan began a series of adjustments, such as import liberalization, currency appreciation, government spending expansion, and the relaxation of outward exchange controls. Among them, currency appreciation is the most important adjustment measure taken by the government. Taiwan's central bank began to appreciate NT dollars in September 1985 under U.S. pressure. It ran a controlled crawling appreciation at a rate of NT\$0.01 per day (about 7.8 percent per year) until December 1986. Then the adjustment took a

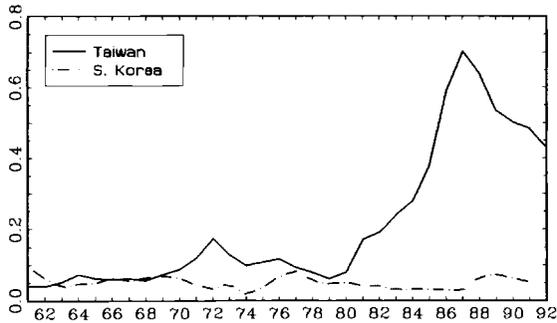


Fig. 7.11 Foreign reserve-GDP ratio

Sources: See sources for fig. 7.1.

less regular pace. Appreciation stopped for most of February 1987, but subsequent irregular appreciation brought the rate to NT\$33.53 to U.S.\$1 by the end of April 1987. Since the expected appreciation rate exceeded the 2 percent interest differentials in favor of the United States, the arbitrage opportunity attracted a flood of hot money despite tight controls still imposed on capital inflow. To maintain financial stability in Taiwan, the central bank imposed restrictions on the maximum amount of foreign liabilities that can be held by each bank in July 1987.¹³ By the fourth quarter of 1989 the extent of appreciation had reached 26 percent. The nominal NT-U.S. dollar exchange rate appreciated from 29.9 in 1985 to 25.4 in 1992. Taiwan's nominal exchange rate had appreciated 60 percent in seven years. Although the central bank defended its appreciation policy on the grounds that small and medium-sized firms need longer periods of time to make necessary adjustments, the central bank under this policy incurred a huge capital loss in foreign reserves. As displayed in table 7.7, the central bank was the most profitable state-owned enterprise in Taiwan before 1986. Under this appreciation policy, the annual before-tax profit of the central bank shrank from NT\$38.2 billion in FY 1986 to NT\$1.7 billion in FY 1987. It is easy to conclude that currency appreciation is not optimal because (1) it is not an effective policy in changing the decision environment of the private sector, and (2) the capital loss and opportunity costs incurred in holding such huge foreign reserves are significant.

This substantial capital inflow handicapped the central bank in its pursuit of price stability. As clearly shown in table 7.8, the sharp increase in foreign reserves during the period 1980-88 caused increases in the monetary base (reserve money). To insulate the money supply from this increase in the monetary base, the central bank raised the reserve requirement for the banking sys-

13. More seriously, as hot money poured into the Taiwanese stock market, the Taiwan stock price index rapidly increased from 839.73 (base year 1966 = 100) in January 1986 to 12,495.34 in February 1990. During this period, about one-tenth of the population in Taiwan participated in stock market activities.

Table 7.7 Before-Tax Net Profit of Taiwan Central Bank (million NT dollars)

Fiscal Year	Central Bank	CPC	TPC
1980	15.404	-685	11.627
1981	17.458	2.784	17.232
1982	31.961	5.504	19.235
1983	38,541	8,138	17.234
1984	38.240	22.580	22.118
1985	47.844	19.470	32.543
1986	38.184 (10.000)	30.668	27.987
1987	1.704 (43.560)	52.204	34,733
1988	2.263 (47.873)	59.954	35.964
1989	2.784 (64.774)	64.874	33.784
1990	2.434 (62.480)	33.822	29.263
1991	9.603 (41.367)	22.483	31.150
1992	13.352 (26,104)	23.367	33,741

Sources: *Yearbook of Financial Statistics, Taiwan District, R.O.C.* (Taipei: Central Bank of China, 1992); *Income Statement of Central Bank, Taiwan District, R.O.C.* (Taipei: Central Bank of China, 1993).

Notes: Numbers in parentheses are capital losses of foreign reserves. CPC: China Petroleum Co., Ltd. TPC: Taiwan Power Co., Ltd.

Table 7.8 Changes in Monetary Base (% per annum)

Year	Monetary Base	Net Foreign Asset	Net Domestic Asset
1981	22.4	88.3	-66.0
1982	8.5	16.6	-8.1
1983	16.0	54.6	-38.6
1984	13.4	53.9	-40.0
1985	14.7	77.7	-63.0
1986	28.9	234.9	-196.0
1987	27.1	192.1	-165.0
1988	26.5	5.3	21.2
1989	32.5	-1.8	34.2
1990	0.2	-10.1	10.3
1991	9.2	26.7	-15.5

Source: *Financial Statistics Monthly, Taiwan District, R.O.C.* (Taipei: Central Bank of China, various issues).

tem in 1988 (table 7.9), and it increased open market operations in order to stabilize the level of monetary base. Another instrument used by the central bank were the deposits replaced by the PSS. For example, the deposits replaced by the PSS accounted for the 80 percent of total deposits in the PSS. It is not surprising that depository institutions held a large portion of their required reserves in T-bills, saving bonds, and certificates of deposit. Tables 7.8 and 7.9 indicated that those policies kept the monetary base under control.

Import protection was reduced in late 1986. For example, the complex sys-

Table 7.9 Reserve Requirements for Commercial Banks

	Demand Deposits		Time Deposits	
	Taiwan	South Korea	Taiwan	South Korea
1971	30	18	17	12
1972	30	19	17	14
1973	30	22	17	18
1974	30	19	14	15
1975	23	24	13	17
1976	23	24	13	17
1977	23	24	13	17
1978	28	27	13	20
1979	23	27	11	20
1980	23	14	11	10
1981	23	3.5	11	3.5
1982	21	5.5	11	5.5
1983	21	5.5	10	5.5
1984	21	4.5	10	4.5
1985	21	4.5	10	4.5
1986	21	4.5	10	4.5
1987	21	7.0	10	7.0
1988	23	10.0	11	10.0
1989	27	10.0	13	10.0
1990	26.5	11.5	12	11.5
1991	25.25	11.5	11.25	11.5
1992	25.25	11.5	10.875	11.5
1993	24.25	11.5	10.125	11.5

Sources: *Monthly Statistical Bulletin* (Seoul: Bank of Korea, various issues); *Financial Statistics Monthly, Taiwan District, R.O.C.* (Taipei: Central Bank of China, various issues).

Note: In 1988, the marginal reserve ratio for both demand and time deposits is 30 percent for South Korea, which is the ratio applied to the increment of each half-monthly average deposits compared with the first half-monthly average deposits of April 1989.

tem by which imports were valued for the purpose of assessing customs duties was simplified in August 1986, and the average tariff rate fell to 13.0 percent in 1988 and 10.3 percent in 1989. The Taiwanese government has planned further reductions in tariffs with the following goals: average tariff rates between 0 and 5 percent for raw materials, maximum 10 percent tariff rate on intermediate products, and about 20 percent on final goods.

Like Taiwan, South Korea relied on U.S. aid and military procurement to fill most of its foreign exchange requirements until the late 1950s. Because some U.S. payments were tied to local services valued in local currency, there was a strong incentive to overvalue the won. The won is estimated to have been overvalued by a factor of two. After the South Korean government adopted an export-led approach in the early 1960s, there were two devaluations to solve the overvaluation problem. Most effects of the first devaluation were offset by inflation, and the second devaluation was followed by the adoption of a man-

aged float exchange system. This system remained in effect until 1974, when South Korea decided to undertake the HCI plan.

Unlike Taiwan, South Korean domestic saving was not sufficient to finance all investment projects, and hence extensive borrowing abroad was needed to accelerate Korea's development in the 1970s. In the first half of the 1980s, the international debt crisis raised the concern that South Korea might have overborrowed. Unlike the adjustment programs in most Latin American counterparts, the adjustment program implemented between 1980 and 1981 quickly restored growth, lowered the inflation rate, and reduced current account deficits. This adjustment program included a large devaluation and sharply contractionary monetary policy. The adjustment was successful because investment in the export sector generated the necessary capacity to repay foreign debt.

When a country experiences a temporary favorable external shock, the government of the country can choose between using current account surpluses to retire foreign debt or using the surpluses to acquire foreign reserves. Since Taiwan does not borrow extensively abroad or allow its citizens to hold foreign assets, the only option is to accumulate foreign reserves when a favorable temporary external shock occurs. On the other hand, since South Korea has a large foreign debt, it has the additional option of retiring foreign debt using current account surpluses. The South Korean government, under pressure, began to use exchange rate management to solve the problem of current account surpluses. The won appreciated only 5 percent against the U.S. dollar between the middle of 1986 and April 1987. But the won appreciated another 21 percent against the U.S. dollar before it depreciated again in 1989. Further, according to figure 7.10B, the exchange rate policy appears to partially account for current account–GDP movement in the 1980s. Other adjustments, such as import liberalization and expenditure expansion policies, also account for current account movement. For example, official figures indicate that the average tariff was lowered from 23.4 percent in 1983 to 19.3 percent in 1987, 18.1 percent in 1988, and 12.7 percent in 1989. The government planned further reductions in tariff rates by 1993. It also dismantled the import surveillance system that threatened protectionist action in the event that imports of certain commodities reached particular levels. As a result, the current account returned to deficit in 1990, while foreign exchange reserves stayed fairly stable without any significant trend.

7.6 Concluding Remarks

In this paper, we studied the role of macroeconomic policy in export-led growth. When a government adopts an export-led approach, international competition forces government policy to be clearly set within the context of a commitment to growth through exporting. Thus macroeconomic policy is forced to react optimally to any external shock. This may explain why regression re-

sults do not easily reveal any robust and significant statistical relationships between macroeconomic policy and growth for Taiwan and South Korea. Two issues remain to be resolved: first, the links between export growth and economic growth, and second, the mechanism under which a government is willing to fully commit itself to an export-led approach. One possible answer to the second issue is that once rapid growth begins, there is widespread acceptance of the export-led approach among private agents. This acceptance further enhances the credibility of the export-led approach.

In the case study, we argued that fiscal discipline not only gives macroeconomic policy instruments the maximum degree of freedom in achieving export growth goals but also allows the central bank to be more flexible in promoting exports without immediately jeopardizing its price stability goal. However, when the importance of the export-led approach as a source of growth begins to decline, government spending will become an important instrument because economic growth will depend more on domestic spending, and economic and social stability will become a social goal. A less independent central bank will be a cause of concern because it makes inflationary finance easier. Therefore, designing an independent central bank could be crucial for the future economic performance of both Taiwan and South Korea.

References

- Alesina, Alberto. 1989. Politics and business cycles in industrial democracies. *Economic Policy* 8 (Spring): 58–98.
- Alesina, Alberto, and Lawrence H. Summers. 1993. Central bank independence and macroeconomic performance: Some comparative evidence. *Journal of Money, Credit and Banking* 25 (2): 151–62.
- Bade, Robert, and Michael Parkin. 1985. Central bank laws and monetary policy. London: University of Western Ontario. Mimeograph.
- Balassa, Bela. 1988. The lessons of East Asian development: An overview. *Economic Development and Cultural Change* 36 (3): S273–S290.
- Cukierman, Alex. 1992. *Central bank strategy, credibility and independence: Theory and evidence*. Cambridge: MIT Press.
- De Gregorio, Jose. 1992. Economic growth in Latin America. *Journal of Development Economics* 39:59–84.
- Dervis, Kemal, and Peter Petri. 1987. The macroeconomics of successful development: What are the lessons? *NBER Macroeconomics Annual* 1:211–55.
- Dollar, David, and Kenneth Sokoloff. 1989. Industrial policy, productivity growth, and structural change in the manufacturing industries: A comparison of Taiwan and South Korea. Paper presented at conference on *State Policy and Economic Development in Taiwan* Dec. 4–5, Taipei, Taiwan.
- Fischer, Stanley. 1983. Inflation and growth. NBER Working Paper no. 1235. Cambridge, Mass.: National Bureau of Economic Research.
- . 1991. Macroeconomics, development and growth. *NBER Macroeconomics Annual* 5:329–64.

- . 1993. The role of macroeconomic factors in growth. *Journal of Monetary Economics* 32:485–512.
- Kydland, Finn E., and Edward Prescott. 1977. Rules rather than discretion: The inconsistency of optimal plans. *Journal of Political Economy* 85 (3): 473–93.
- Levine, Ross, and David Renelt. 1992. A sensitivity analysis of cross-country growth regressions. *American Economic Review* 82:942–63.
- Lin, Ching-Yuan. 1988. East Asia and Latin America as contrasting models. *Economic Development and Cultural Change* 36 (3): S153–S197.
- Lin, Kenneth S., and Vei-Lin Chan. 1992. Product quality, industrial organization and aggregate performance of exports. *Research in Asian Economic Studies* 4A:123–44.
- Parkin, Michael. 1986. Domestic monetary institutions and deficits. In *Deficits*, ed. James M. Buchanan, Charles K. Rowley, and Robert D. Tollison. Oxford: Blackwell.
- Roubini, Nouriel, and Xavier Sala-i-Martin. 1992. Financial repression and economic growth. *Journal of Development Economics* 39:5–30.
- Sargent, Thomas J., and Neil Wallace. 1981. Some unpleasant monetarist arithmetic. *Federal Reserve Bank of Minneapolis Quarterly Review* 10, no. 3 (Fall): 1–17.
- Shea, Jia-Dong, and Ya-Hwei Yang. 1990. Financial system and the allocation of investment funds. CIER Discussion Paper no. 9001. Taipei: Chung-Hua Institution for Economic Research.
- Young, Alwyn. 1992. A tale of two cities: Factor accumulation and technical change in Hong Kong and Singapore. *NBER Macroeconomics Annual* 6:13–63.
- . 1993. The tyranny of numbers: Confronting the statistical realities of the East Asian growth experience. Working paper. Cambridge, Mass.: Sloan School of Management, MIT.

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This paper examines the role of macroeconomic policy in the successful export-led growth of two first-tier East Asian newly industrialized economies (NIEs), namely, Taiwan and South Korea (hereafter Korea). The main thrust of the argument rests on the premise that in order to maintain export competitiveness, the economy and polity must make optimal policy choices that “discipline macroeconomic policy.” Sound fiscal policies, which are defined to include temporary budget deficits, are seen to be necessary because they permit the central bank to implement export-promoting policies without immediately jeopardizing price stability. Lin, Lee, and Huang also take up the issue of central bank independence and its link to inflation. The paper covers a broad range of issues, such as whether macroeconomic policies matter, which facets of these policies matter, and so on. My comments are organized according to the sections of the paper.

Section 7.2 presents some stylized facts on macroeconomic policy and growth in the two countries. Growth theories regard investment as a crucial link between macroeconomic policy and long-run growth. However, this asso-

ciation does not hold across subperiods for Taiwan and Korea. This is in conformity with the evidence reported in Fischer (1991) and Dervis and Petri (1987).

The authors attribute the above finding for Taiwan to increased investment by state-owned enterprises, well known for “inefficiency and massive corruption.” For Korea, they attribute it to government targeting of heavy chemical industries, which led to substantial idle capacity and subsequent bailing out by state-owned banks. However, the lack of positive association could also be due to changes in incremental capital output ratio (which would seem to be the case in Korea) and to other structural changes.

The authors regard the industrial targeting policies of the two countries as failures when measured in terms of exports, productivity performance, and structural change. Does this imply that winners are more difficult to pick at more advanced stages of economic development? To put it differently, are the results of government intervention related to the stage of economic development? Do the type, form, and degree of intervention matter at different stages?

In addition to the above, there are four other findings:

1. Contrary to theoretical expectations and empirical findings for Latin America and Asia, a negative relationship does not exist between growth and inflation in Korea and Taiwan. There is also no clear association between ex post real interest rates and per capita GDP growth rates in different subperiods. This is attributed to the availability of alternative sources of finance, from the informal sector in Taiwan and from external borrowing in Korea.

2. Large budget deficits can be expected to exert a negative impact on GDP. The data show that this was true for Korea during 1961–80, but not to the same extent for Taiwan. It should be noted, however, that for both countries, deficits/surpluses are extremely low. Thus their impact is unlikely to be significant. How do government expenditure–GDP ratios or deficit/surplus–GDP ratios compare internationally? What about the composition of government spending? Would this make a difference?

3. The paper argues that sound fiscal policy matters for economic growth, and soundness is defined to include low budget deficits. Yet the authors write, “That is, permanent low budget deficits do not lead to better growth performance, if they cause delays in the construction of infrastructure necessary for further growth.” It would seem, therefore, that it is not deficits per se, but rather the kind of government expenditure, that also matters.

4. The early fiscal discipline in these two countries has or is likely to weaken because of external pressure to reduce current account surpluses. The resultant currency appreciation, with its impact on exports, demands policy shifts to increase domestic spending, to be achieved through fiscal stimuli.

To verify the stylized facts, the writers run growth regressions for the period 1961–92. By and large the results are not very robust. This may be the consequence of model specification. The authors claim that a commitment to growth through exports endogenizes macropolicy variables and measures of economic

growth. This according to them explains the poor results. In addition, their empirical findings are at odds with those of others, such as Fischer (1991) and Levine and Renelt (1992), regarding the link between investment and per capita GDP growth.

While real export growth does matter, the writers note that “we cannot know how export growth led to such excellent growth performance without imposing and testing structural restrictions on export growth and GDP growth.” A non-rigorous mechanism is however explained in section 7.3 of the paper.

In section 7.3, macroeconomic policies, that is, fiscal and monetary policies, are examined in the context of central bank independence. On conceptual grounds it could be argued that central bank independence does have the potential to improve long-run inflationary performance. The empirical evidence, however, is far from compelling.

The authors, following Cukierman (1992), compute an index of central bank independence for Korea and Taiwan. While both received relatively high scores for average legal independence compared to 16 industrial countries (table 7.4), their average inflation rates in the period 1973–87 are among the highest for those countries. This they attribute to difficulty in implementing the relevant laws. As an alternative explanatory factor, they use the actual turnover rate of central bank presidents to explain the inflation rate. However, as can be observed from table 7.4, the evidence goes both ways.

Perhaps the real issue is not central bank independence per se, but rather the recognition of the need to coordinate fiscal and monetary policies if price level stability is to be preserved. There is an accompanying need to develop government securities markets as an alternative to financing from central banks.

Nevertheless, recent amendments to Taiwan’s central bank legislation allow debt monetization, which when viewed in the light of recent increases in budget deficits could result in higher inflation.

Section 7.4, on special loan policies, examines the measures used to stimulate exports in the two economies. In the main these took the form of preferential credit to targeted industries and activities. This in any event is not unique. The difference, however, is that such credit was and is specifically targeted to export activities, with more direct measures being employed in Korea. Also in both countries, the main channels were state-owned commercial banks, although there is no reason why such policy cannot be executed where banks are privately owned—the case in many developing economies.

Policies of this nature smack of financial repression, a subject of a rather long-standing but inconclusive debate in the development literature. In Korea and Taiwan, subsidized credit was directed to growth sectors, specifically exports. As firms producing for the export market are more efficient than those producing for sheltered domestic markets, subsidized credit enhanced economic growth. Or as Stiglitz would put it, the social returns from such regulations exceeded the private returns.

Section 7.5 of the paper is concerned with current account and exchange

rate policy. In the first part, it is argued that while the exports of manufactured goods yielded the necessary foreign exchange for economic growth, the robust export performance was not the result of aggressive devaluation. The second part is a chronology of policy changes and the problems of dealing with export success—current account surpluses. For Taiwan, the paper describes the monetary measures the country's central bank took to deal with the huge increase in foreign reserves. One of the measures cited is not very clear, "the deposits replaced by the PSS [postal saving system]." It would have been useful to explain this in greater detail and to compare it with other conventional measures.

In the early 1980s, together with other less-developed countries, Korea had a large external debt. Its success in dealing with that problem is attributed in this paper to devaluation and restrictive monetary policy. Undoubtedly, export orientation generated the necessary foreign exchange. However, fiscal policies which contribute to export and income growth also assist debt repayment. Since much of the focus of the paper is on the role of fiscal policy, it is surprising that the link is not explored here.

Since the mid-1980s both Taiwan and Korea have been under pressure to appreciate their currencies. Both have liberalized imports and employed other measures to stimulate domestic demand, both private and public. The paper does not mention the upsurge in their foreign direct investment to mitigate the dampening effects of the appreciation.

The first-tier East Asian NIEs, including Taiwan and Korea, relied on manufactured exports to fuel economic growth. This export promotion/orientation took place in a stable macroeconomic environment. By itself this would not have been enough. Nonmacroeconomic policies (which the paper does not mention), such as the trade and payments regime, labor market conditions and policies, infrastructure, the role and efficiency of the public sector, and human resource development, were equally important. All these nonmacroeconomic policies also involve government intervention. Where such intervention led to wealth creation instead of rent seeking and reduced distortions, its contribution was positive.

References

- Cukierman, Alex. 1992. *Central bank strategy, credibility and independence: Theory and evidence*. Cambridge: MIT Press.
- Dervis, Kemal, and Peter Petri. 1987. The macroeconomics of successful development: What are the lessons? *NBER Macroeconomics Annual* 2:211–55.
- Fischer, Stanley. 1991. Macroeconomics, development and growth. *NBER Macroeconomics Annual* 5:329–64.
- Levine, Ross, and David Renelt. 1992. A sensitivity analysis of cross-country growth regressions. *American Economic Review* 82:942–63.