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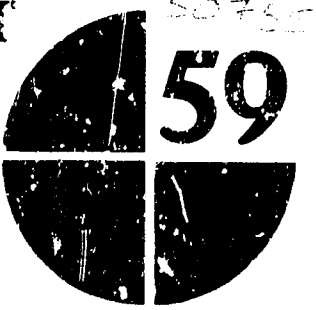

PRODUCTION INCENTIVES IN PHILIPPINE AGRICULTURE: EFFECTS OF TRADE AND EXCHANGE RATE POLICIES

Romeo M. Bautista

May 1987

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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FOREWORD

This report is another in the series undertaken by the International Food Trade and Food Security Program at IFPRI on trade and exchange rate regimes and how they affect agricultural incentives in developing countries.

Policymakers have become increasingly concerned about the effects of the global economic turbulence of the past decade on developing countries. In response to low real interest rates and a desire to encourage industrial sectors, many Third World countries borrowed extensively, which in turn led to overvalued exchange rates. This body of research has grown out of a new awareness that overvaluation discriminates against agriculture, particularly agricultural exports.

In addition to this study on the Philippines, other studies in this series include *The Effects of Exchange Rates and Commercial Policy on Agricultural Incentives in Colombia: 1953-78,* Research Report 24, by Jorge García García; *Agriculture and Economic Growth in an Open Economy: The Case of Argentina,* Research Report 36, by Domingo Cavallo and Yair Mundlak; *The Effects of Trade and Exchange Rate Policies on Agriculture in Nigeria,* Research Report 55, by T. Ademola Oyejide; and most recently *The Effects of Trade and Exchange Rate Policies on Agriculture in Zaire,* Research Report 56, by Tshikala B. Tshibaka. Research is under way for country studies on Chile, Peru, and Thailand.

Publication of this report coincides with an IFPRI policy workshop designed to provide a broad view of how trade and exchange rate policy influences agricultural growth in developing countries, supported by quantitative data on relative effects.

This research report examines the Philippine experience since 1950. In that year a comprehensive system of import and foreign exchange controls was imposed in response to a severe balance-of-payments problem. How such trade regime and the subsequent modifications, mostly aimed to promote industrial growth and macroeconomic stability, have affected agricultural production incentives is the focus of this study by Romeo M. Bautista. The empirical findings are analyzed in a broad policy context, and the author draws some implications for development strategy in the Philippines.

John W. Mellor

Washington, D.C.
May 1987

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SUMMARY

Although the relative importance of agriculture in the Philippine economy has declined measurably since the early 1950s, it still contributes directly about one-half of total employment and one-fourth of the gross domestic product. Also, some 40 percent of total export receipts is contributed by raw and simply processed agricultural products, while agricultural imports account for less than 10 percent of the total import bill.

This study investigates quantitatively the effects of trade and exchange rate policies on relative incentives in the Philippine economy, with special attention to the agricultural sector. One useful indicator of sectoral incentives provided by the foreign trade regime is the effective exchange rate for various types of external transactions, that is, the number of units of domestic currency actually paid by importers or received by exporters per unit of foreign exchange, including trade-related taxes and subsidies. The calculated changes in sectoral effective exchange rates from 1950 to 1980 indicate a persistent and significant bias in relative incentives against agricultural export production in favor of nontraditional (mainly industrial) exports and, most strongly, of import-competing industrial consumer goods. While understandable in the context of the development strategy based on import substitution in the 1950s and 1960s, it is inconsistent with the government's heavy emphasis on export promotion during the 1970s.

Among the major agricultural export crops, trade policy favored coconut in the 1970s, sugar in the 1960s, and pineapple in the 1950s. Compared with other import-competing essential consumer goods, rice benefited from a favorable trade regime in the 1960s but not in the 1970s. This does not seem consistent with government efforts to actively promote rice production in the latter decade, which was done through input subsidies. With corn, trade policy was discriminatory in the 1960s but became favorable in the 1970s.

Domestic currency overvaluation, or an "overvalued exchange rate," benefits the home goods (nontradable) sector, into which resources are pulled at the expense of tradable goods production. Within the tradable goods sector, protection of domestic industries producing import substitutes effectively discriminates against export production. The study finds that a 10 percent rise in the domestic price of importables (due to tariffs, for example) is associated with a 6.6 percent decline in the domestic price of agricultural export products relative to home goods. On the other hand, a 10 percent increase in the domestic price of nonagricultural export products (due to fiscal incentives to industrial export producers, for example) leads to a 4.1 percent fall in the relative price of agricultural export products to home goods.

The calculated price effects of trade policy on exportables and importables relative to home goods for 1950-80 indicate substantial disincentives to production of traditional agricultural export commodities, and to a lesser extent, of nontraditional export products. On the other hand, domestic production of import-competing goods was favored over home goods until the early 1970s, when the bias shifted slightly toward home goods production.

Restrictions on foreign trade distort the real exchange rate relative to its free trade value. An import tariff raises the domestic price of importables, which encourages their domestic production and induces lower domestic consumption, leading to a decrease in imports. Export subsidies have an analogous effect, leading to an increase in exports. Resources are reallocated toward the tradable goods sector and away from home goods production. Thus output of home goods is reduced, resulting in an in-

crease in their domestic price, which lowers the real exchange rate. Such overvaluation of the domestic currency cannot be eliminated by nominal exchange rate adjustment. It can be corrected only at its source, by removal of trade restrictions.

The degree of overvaluation of the Philippine peso due to trade restrictions is found in this study to have declined significantly from 1950 to 1980. The period of import and foreign exchange controls during the 1950s shows the largest deviation of the real exchange rate—by at least 100 percent on average—from the free trade value. After decontrol and peso devaluation in the early 1960s, a lowering of the real exchange rate overvaluation to 44-56 percent is observed during the decade. Finally, with nominal exchange rate flexibility and a less restrictive trade regime during the 1970s the peso overvaluation fell to 17-20 percent on average.

In addition to trade policy, two other influences on the real exchange rate are investigated: external terms-of-trade movements and trade imbalance. Based on the early 1970s as benchmark, the study finds that changes in the terms of trade significantly influenced the real exchange rate. In particular, the deterioration of the country's terms of trade from 1975 to 1984 effectively appreciated the Philippine peso by an average of 22 percent. Although unfavorable changes in the terms of trade cannot be attributed to domestic policy, they adversely affect price competitiveness in tradable goods production.

An existing imbalance in the external accounts that is not sustainable distorts the real exchange rate, artificially overvaluing or undervaluing the domestic currency. Therefore, past deficits in the current account, accommodated by drawing down international reserves or by foreign borrowing, served to defend an overvalued exchange rate, if only temporarily. Due to trade imbalance and the various aspects of macroeconomic policy that made it possible, the Philippine peso was overvalued by an average of 3.8 percent in the 1950s, by 2.1 percent during 1960-74, and by 8.0 percent during 1975-84. This disequilibrium overvaluation is in addition to the effects of trade restrictions and terms-of-trade changes on the real exchange rate.

The size of the combined exchange rate effects indicates that the price competitiveness of tradable goods production in the Philippines was severely impaired by the country's protectionist trade policy. This was particularly the case during 1950-61, when imports and foreign exchange controls existed, and since the mid-1970s because of large trade deficits and unfavorable external terms of trade. The country's ability to prevent a foreign exchange crisis has been significantly weakened by the real exchange rate misalignment. A highly overvalued exchange rate is bound to result, sooner or later, in a severe balance-of-payments problem. This was demonstrated by the foreign exchange crises of the late 1950s and late 1960s. The policy response in both cases proved adequate for only a short time. The real exchange rate returned to unsustainable levels after three or four years, and the balance-of-payments crisis recurred.

Trade liberalization measures were adopted by the Philippine government in the early 1980s as part of a wider program of policy reforms and industrial restructuring to improve the international competitiveness of domestic producers. However, the concurrent exchange rate effects arising from massive trade deficits and terms of trade deterioration were evidently not addressed. Although political developments undoubtedly precipitated the foreign exchange crisis that began in August 1983, the severity of the real exchange rate misalignment made inevitable the eventual recurrence of a balance-of-payments crisis. The adoption of expansionary macroeconomic policies in disregard of the balance of payments, which was also being battered by adverse external terms-of-trade movements during 1975-83, can only be viewed as a policy mistake.

Regression analysis is used to explain the observed changes in agricultural prices vis-à-vis home goods and nonagricultural products during 1950-84 in terms of the movements of the real exchange rate and implicit trade taxes. The findings indicate

that during 1950-61 the direct effect of the prevailing import and foreign exchange controls (associated with very high values of the implicit tariff rate) had the most influence on domestic agricultural price relative to nonagricultural products. At the same time, the indirect effect through the real exchange rate also contributed significantly to the decline in the relative price of agricultural products vis-à-vis home goods. As trade policy became less restrictive, the effects on the real exchange rate due to trade deficits and terms-of-trade movements assumed increasing importance. During 1975-80, these three influences on the real exchange rate effectively lowered the domestic agricultural price by 19 percent relative to home goods and by 25 percent relative to nonagricultural products. This reinforced the effect of falling international commodity prices at the time, resulting in a precipitous decline of relative agricultural prices in the Philippines from the mid-1970s to the early 1980s.

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INTRODUCTION

Most developing countries have relatively open economies in which the agricultural sector is of substantial, if not dominant, importance. Government policies that promote agricultural production in general or affect relative incentives within agriculture can therefore have significant economywide effects. It is also reasonable to expect that trade and exchange rate policies, even if specifically directed to other sectors of the economy, can exert an important influence on agricultural incentives and performance.

As in many developing countries, government policies in the Philippines have been pervasive in their effects on the domestic economy and foreign trade. This study focuses on trade-related policies that create a wedge between domestic and foreign prices, the latter representing a widely used measure of social opportunity cost for tradable goods in a small, open economy. Such price intervention policies collectively define the country's foreign trade regime, or its trade and exchange rate policies. Whereas the effects of the foreign trade regime on the industrial sector have been much analyzed in the development literature, relatively little attention has been given to the impact of trade policy on agricultural incentives and performance.

The importance of agriculture to the Philippine economy is discussed in Chapter 3. It describes the changing structure, growth, and export performance of the agricultural sector since the early 1950s, observing how they correlate with some aspects of the country's macroeconomic performance. The empirical evidence on supply responsiveness of Philippine agriculture to relative price changes is also reviewed, recognizing that the relevance of this study to policymaking depends critically on how agricultural producers respond to price incentives.

To provide a historical perspective and policy context to the study, Chapter 4 briefly describes Philippine trade and exchange rate policies, indicating various stages in the evolution of the foreign trade regime since the late 1940s, the general character of the induced structure of price incentives, and their likely relationship to the observed macroeconomic and sectoral growth patterns.

Chapter 5 investigates the effects of the trade regime on relative incentives to produce tradable goods. The focus is on the period 1950-80, because policy changes beginning in 1981 have been either transitional (in 1981 and 1982) or in the nature of emergency measures addressing the foreign exchange crisis (in 1983 and 1984). The relative measures of sectoral production incentives distinguish between exportables and importables at the most aggregative level; among various exchange control categories, including traditional agricultural exports; and among the country's major agricultural products.

The domestic price structure is influenced by trade and exchange rate policies not only through the effects on relative prices of tradable goods but also through the effects on the domestic prices of tradable goods relative to home goods. Chapter 6 examines the extent to which the foreign trade regime has affected the relationship between tradable and home goods prices in the Philippines, based on a general equilibrium model of exportables, importables, and home goods. The empirical analysis further distinguishes between agricultural and nonagricultural export goods in the determination of the relative price effects vis-à-vis home goods.

In Chapter 7 the intermediary role of the real exchange rate in transmitting the effects of trade policy on agricultural production incentives is examined. After describing the behavior of the real exchange rate during 1983-84, three sources of exchange rate misalignment are investigated. Their separate and combined effects on relative

agricultural prices vis-à-vis home goods and nonagricultural prices are analyzed in Chapter 8.

Finally, Chapter 9 comments on the implicit resource transfer out of agriculture due to the price bias arising from trade and exchange rate policies. Based on the findings of the study, it also considers some implications for development policy and strategy in the Philippines.

3

AGRICULTURE IN THE PHILIPPINE ECONOMY

Structure and Growth

The agricultural sector, broadly defined (as in the national income accounts) to include agricultural crops, livestock, poultry, fishery, and forestry, has traditionally been a major source of employment, income, and foreign exchange earnings in the Philippines. More than two-thirds of the country's population are still in the rural areas, where agriculture and related production activities represent, almost by definition, the principal means of livelihood. Although its relative importance has declined over the years, agriculture still contributes directly about one-half of total employment and one-fourth of the country's gross domestic product. Also, it provides some 40 percent of total export receipts (from raw and simply processed agricultural products), while agricultural imports account for less than 10 percent of the total import bill.

Crop production is the largest component of Philippine agriculture, contributing close to 60 percent of total agricultural value added in recent years. Relatively smaller shares are attributable to livestock and poultry (17 percent), fishery (16 percent), and forestry (7 percent). A frequently used classification of agricultural crops distinguishes between food and export crops. Rice and corn dominate the food crop category, accounting for 28 and 10 percent, respectively, of total value added in Philippine crop production. Coconut and sugarcane are the major export crops, contributing 9 percent each. About 86 percent of total area harvested is jointly accounted for by these four crops. The importance of tobacco and abaca (Manila hemp), which used to be significant sources of foreign exchange earnings, has decreased markedly during the last quarter-century. Some food crops, such as banana, pineapple, and relatively recently mango, coffee, and cocoa, have also been exported, so that the food-export crop distinction is not clear-cut.

The regional cropping pattern is shown in Table 1. Rice and to a lesser extent corn and coconut are widely grown. Production of other principal crops is more regionally concentrated: sugarcane in Western Visayas and Central Luzon, abaca in Bicol and Eastern Visayas, pineapple in Mindanao, and

Table 1—Area harvested by crop and by region, 1969-71 annual average

Region	Rice	Corn	Coconut	Sugarcane	Tobacco	Abaca	Pineapple	Banana	Root-crops	Vegetables
					(1,000 hectares)					
Ilocos	129.2	18.8	1.9	...	31.3	...	...	6.6	10.0	14.8
Cagayan	290.7	197.9	7.7	...	25.2	...	...	7.8	17.5	3.6
Central Luzon	646.1	80.1	7.7	76.7	9.9	...	...	17.8	10.0	14.1
Southern Tagalog	387.6	141.4	335.1	38.4	0.8	...	4.0	36.1	10.0	9.5
Bicol	323.5	94.5	254.6	...	...	70.2	...	24.7	37.6	4.2
Western Visayas	420.0	306.3	142.5	234.0	...	5.0	...	36.6	17.5	4.7
Eastern Visayas	290.7	329.9	392.9	26.9	...	45.1	...	43.4	82.7	2.9
Northern Mindanao	226.1	259.2	344.9	...	...	18.4	11.0	32.0	40.1	1.4
Southern Mindanao	452.2	918.9	429.5	...	...	28.4	9.0	22.9	24.8	4.2
Total	3,166.1	2,347.0	1,916.8	376.0	83.5	167.1	24.0	227.0	250.2	59.4

Source: Howarth E. Bouis, "Rice Policy in the Philippines" (Ph.D. dissertation, Food Research Institute, Stanford University, 1982), Table IV-2.

Note: Total area harvested, including other crops, was 8,987.5 hectares in 1969-71.

tobacco in the northern regions of Ilocos and Cagayan.

While most food crops are either import-competing or exportable, some root crops, fruits, and vegetables are essentially home goods (nontradables) due to prohibitive marketing costs. Nontradables account for less than 10 percent of total crop value added.

Tradable goods also dominate the non-crop agricultural subsectors. The exception perhaps is fishery, although exports of shrimp, prawns, and fish, while still less than 5 percent of total production, have been increasing since the early 1970s. Imports of livestock and poultry products compose about 10 percent of final demand, whereas forestry exports represent about 15 percent of the domestic output.

Historically, the growth of Philippine agriculture has been significantly influenced by foreign trade, technological change, and domestic policies affecting production incentives. Export crop production was fostered under both Spanish and American colonial rule. After the country gained political independence in 1946, the postwar expansion of the U.S. market and the Korean War (1950-53) provided the stimulus for increased export demand for agricultural products at the same time that the rapid growth in population and per capita income boosted domestic demand. During the three decades between 1950 and 1980, Philippine crop and livestock production grew at an average annual rate of 4.9 percent.[1] The most rapid growth occurred during 1950-55 (by 6.7 percent annually), when land area and cultivation expanded markedly in response to the favorable market demand. Even excluding the first half of the 1950s, such growth performance compares favorably with the country's prewar agricultural record and with that of most other middle income countries in the postwar period.

There was a slowdown in agricultural growth during 1955-65 to an average of about 3 percent per year. As noted by David et al., "During this period tariffs and trade quotas on previously favored exports to the U.S. were gradually imposed, domestic currency became increasingly overvalued, and population growth began to press on limited supply of land."[2] Subsequently, the annual growth rate of agricultural output rose to 4.0 percent in 1965-70 and to 6.5 percent in 1970-75. Again, price incentives appear to have been a significant influence. The agricultural terms of trade improved significantly from 1965 to 1975 due to the trade liberalization measures implemented during the first half of the 1960s, the floating of the exchange rate in 1970, and the world commodity boom in 1972-74. The period also witnessed increased adoption of high-yielding rice varieties and massive public investment in irrigation.

As the country's terms of trade began to deteriorate in the late 1970s, agricultural output grew less rapidly. "World prices of major export crops dropped sharply. The increasing distortions in the exchange rate and agricultural output and fertilizer prices . . . further exacerbated the squeeze on agricultural incentives."[3] This would explain in part the drastic decline in the annual agricultural growth rate from 6.2 percent in 1975-80 to 0.3 percent in 1980-82, which took place without a major weather disturbance.

The political turmoil and economic crisis beginning in August 1983 further depressed agricultural activity. Based on national income accounts data, gross value added in the agricultural sector (including fishery and forestry) decreased between 1982 and 1985 by 16 million pesos (P) at 1972 prices.[4] Agricultural crops showed an even larger decline of P 104 million.

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[1] In the remainder of this chapter, agricultural output is more narrowly defined to include only crops and livestock, unless otherwise indicated. The source of data is Cristina C. David, Randolph Barker, and Adelita Palacpac, *The Nature of Productivity Growth in Philippine Agriculture, 1948-82,* Paper No. 84-22 (Los Baños: International Rice Research Institute, 1984).

[2] Ibid., p. 3.

[3] Ibid., pp. 3-4.

[4] In 1972, one Philippine peso was equivalent to U.S. $0.15.

Agricultural Export Performance

The importance of agriculture in the Philippine economy is reflected in the composition of exports. Indicating the country's rich natural resource base, close to 90 percent of total export earnings was being contributed by raw or simply processed agricultural products as late as the mid-1960s (Table 2). There has since been a significant reduction in the agricultural export share, dropping to 47 percent by 1980. This is related to the increasingly active government promotion of industrial exports, especially labor-intensive manufactured goods, and increased domestic processing of primary products since the early 1970s. Indeed the share of such nontraditional manufactured exports climbed from 8 percent in 1970 to 36 percent in 1980.

Another notable development in the 1970s was the rapid expansion of nontraditional agricultural exports. Foreign exchange earnings from exports of fruits and vegetables increased from U.S. $35 million in 1970 to U.S. $365 million in 1980. Exports of fish and marine products, together with coffee, tea, and cocoa, which were almost negligible in 1970, rose to more than U.S. $200 million by 1980. The residual category, Other, which includes the nontraditional animal feeds and miscellaneous preparations, grew more than eightfold over the same period. Much lower growth rates were recorded by the country's traditional exports of coconut, sugar, abaca, tobacco, and forestry products. Their combined share in total agricultural exports declined markedly from 93.0 percent in 1970 to 73.2 percent in 1980.

Since the early 1980s agricultural exports have decreased not only in relation to total exports but also absolutely. Except for tobacco, every category of agricultural products suffered a decline in export value during 1981-83 relative to the 1980 export performance, as can be seen in Table 2. Total agricultural exports decreased from U.S. $2.7 billion in 1980 to an average of $2.1 billion in 1981-83, and their share in overall export earnings declined from 47 to 41 percent. It is significant that this recent deterioration in Philippine export performance largely occurred prior to the emergence of the external debt-induced foreign exchange crisis in late 1983.

Agricultural Growth and Macroeconomic Performance

The declining performance of the agricultural sector in production and exports since 1980 is reflected in the overall growth of the economy. Real GNP growth slowed from 6.9 percent in 1979 to 5.0 percent in 1980, 3.4 percent in 1981, 1.9 percent in 1982, and 1.3 percent in 1983. This was without precedent in the postwar economic history of the Philippines. During the same period the country's annual current account deficit reached record high levels, averaging U.S. $2.4 billion, or about 46 percent of total exports. Underlying reasons commonly cited are the sluggish growth of industrial economies since 1980, the intensification of protectionism in developed-country markets (particularly against labor-intensive manufactures), and the steep fall in world commodity prices. The same factors would have been expected to impede economic growth in neighboring Asian countries, which however did not seem to have been affected as badly.[5]

In 1984-85, as the foreign exchange crisis took its toll and generally contractionary stabilization policy measures were adopted, there was an absolute decline in real GNP by about 10 percent. Clearly, the major challenge currently facing Philippine policymakers is to find the route to economic recovery and longer-term growth.

The critical role of the agricultural sector in providing a basis for future stable growth of the Philippine economy was emphasized in a comprehensive program for agriculture launched by the government in 1984. One

[5] In each year from 1980 to 1984, the real GNP growth rate for the Philippines was lower than in any of the other market economies in Southeast Asia, namely, Indonesia, Malaysia, Singapore, and Thailand.

Table 2—Agricultural exports, f.o.b., 1950-83

Product Category	1950	1955	1960	1965	1970	1975	1980	1981-83 (Annual Average)
				(U.S. $ million)				
Coconut products	178 (53.8)	152 (37.9)	177 (31.6)	271 (35.3)	212 (20.0)	466 (20.3)	811 (14.0)	673 (12.8)
Sugar products	53 (16.0)	111 (27.7)	135 (24.1)	147 (19.1)	196 (18.5)	616 (26.8)	657 (11.4)	458 (8.7)
Forestry products	11 (3.3)	44 (11.0)	95 (17.0)	195 (25.4)	301 (28.3)	260 (11.3)	468 (8.1)	387 (7.4)
Fruits and vegetables	10 (3.0)	6 (1.5)	25 (4.5)	17 (2.2)	35 (3.3)	124 (5.4)	365 (6.3)	360 (6.9)
Abaca and products	42 (12.7)	29 (7.2)	43 (7.7)	26 (3.4)	17 (1.6)	22 (1.0)	31 (0.5)	25 (0.5)
Tobacco and products	2 (0.6)	4 (1.0)	3 (0.5)	16 (2.1)	15 (1.4)	35 (1.5)	30 (0.5)	45 (0.8)
Fish and marine products	. . .	. . .	. . .	. . .	2 (0.2)	17 (0.7)	138 (2.4)	129 (2.5)
Coffee, tea, and cocoa	. . .	. . .	. . .	. . .	. . .	5 (0.0)	66 (1.1)	63 (1.2)
Other agricultural products	2 (0.6)	. . .	2 (0.4)	15 (2.0)	19 (1.8)	37 (1.6)	163 (2.8)	
Total agricultural exports	298 (90.0)	346 (86.3)	480 (85.7)	687 (89.5)	797 (75.0)	1,582 (67.0)	2,729 (47.1)	2,140 (40.7)
Total exports	331	401	560	768	1,062	2,294	5,788	5,249

Sources: Philippines, National Economic and Development Authority, *Philippine Statistical Yearbook, 1985* (Manila: NEDA, 1985); and Central Bank of the Philippines, *Statistical Bulletin*, various issues.
Notes: Numbers in parentheses indicate percentages of total exports; the ellipses (. . .) denote less than $1 million.

of the specific objectives was "to increase agriculture's contribution to the balance of payments through expanded exports and import substitution."[6] The program aimed generally to improve agricultural productivity and promote "a stronger and more diversified farming system." The new government of Corazon Aquino has gone further, moving quickly to announce, in mid-1986, the adoption of employment-oriented agricultural and rural growth as the centerpiece of an "Agenda for a People-Powered Development." Sharply increased public spending on rural infrastructures and improved agricultural prices are being planned with a view to raising farm productivity and rural incomes. Through intermediate and final demand linkages, they are expected to stimulate demand not only for food and other agricultural products but also for industrial goods and services.

On the supply side an agriculture-based development program is also attractive, given the existing foreign exchange shortage in the Philippines, because the import requirements of increasing agricultural production are less than for the more import-dependent industrial sector. Finally, in a country where the rural-urban income differential is quite large, raising employment and income in the rural areas may well prove to be the most efficient means of improving income distribution. This is a matter of increasing policy concern in the Philippines.

[6] José Galang, "Economic Husbandry," *Far Eastern Economic Review* 31 (January 1985): 46-49.

Both the postwar record of the Philippine economy and international experience seem to support the view that there is a strong link between agricultural growth and macroeconomic performance in developing countries. Table 3 shows that, for the four periods indicated, higher average annual growth rates of agricultural value added are associated with higher growth rates of real GNP. The calculated values of the correlation coefficient—0.667 for 1950-85 and 0.784 for the more recent period 1970-85—also indicate a significantly positive association between the annual growth rates of agricultural output and real GNP. This is also evident from the time profiles of the annual growth rates shown in Figure 1. Such statistical correlation is of course only suggestive of, but does not establish, the behavioral relationship between agricultural growth and real GNP growth.

Internationally, it has also been observed that the growth of the agricultural sector is strongly associated with the growth of the national economy. "Among countries where the agricultural share of GDP was greater than 20 percent in 1970 (including the Philippines), agricultural growth in the 1970s exceeded 3 percent a year in 17 of the 23 countries whose GDP growth was above 5 percent a year," according to a World Bank study.[7] Based on data for 31 developing countries whose growth did not deteriorate in the 1970s (relative to the preceding decade), Adelman finds "that 80 percent had above average performance in agriculture."[8] Interestingly, the rank correlation between the growth rates of GDP and agricultural output is especially strong (0.932) among lower middle-income countries, among which the Philippines is included.

Table 3—Growth rates of agricultural value added and GNP at 1972 prices

Period	Annual Average Growth Rate	
	Agricultural Value Added	GNP
1950-60	5.23	6.35
1960-70	4.28	5.15
1970-80	4.83	6.39
1980-85	1.35	−0.53

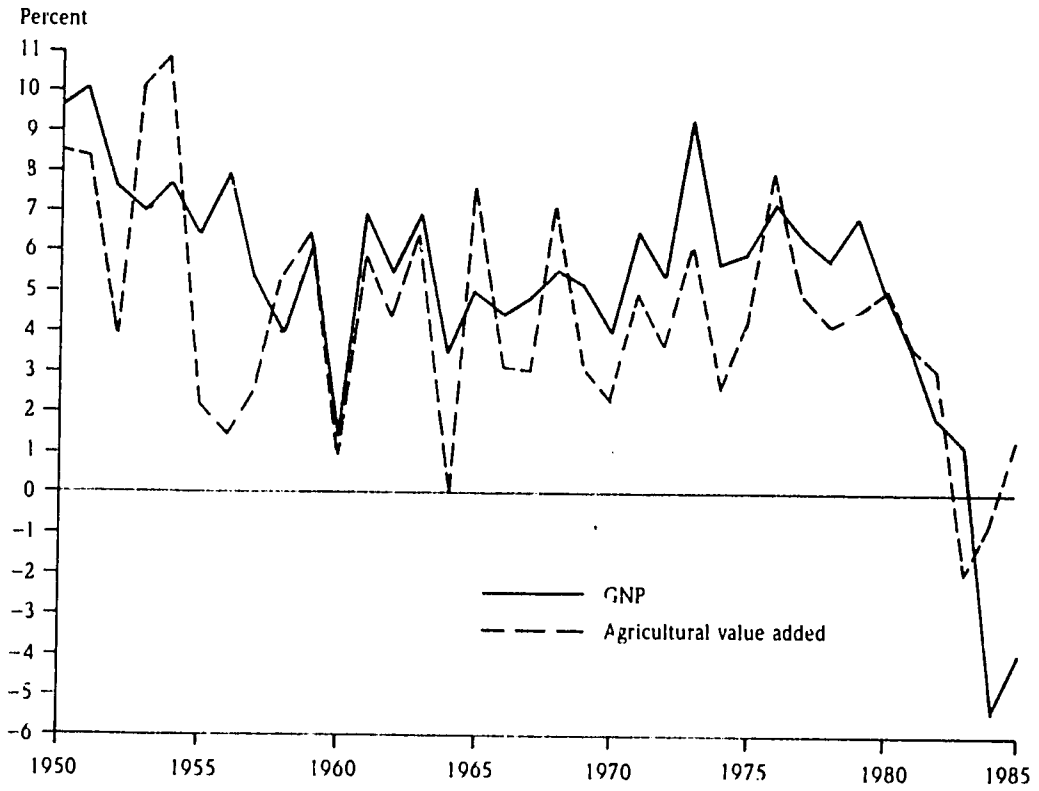
Sources: Based on data for 1950-82 from Philippines, National Economic and Development Authority, *Philippine Statistical Yearbook* (Manila: NEDA, various years); and for 1983-85 from Philippines, National Economic and Development Authority, "The National Income Accounts of the Philippines, 1983-85," Manila, December 1985.

Price Responsiveness of Agricultural Supply

This study is primarily concerned with the effects of Philippine trade and exchange rate policies on the domestic price structure, focusing on the differential effects on agricultural production incentives. Its relevance to policymaking depends critically on the responsiveness of agricultural producers to price incentives, in the aggregate and at various levels of product disaggregation. This is so because there are nonprice instruments available to policymakers that can also influence the structure and growth of agricultural output. If agricultural supply is found not to respond to an improvement in economic incentives, one must presume that some nonprice production constraints need to be overcome, for example, technological backwardness, limited access to the required inputs, or inadequate transport and marketing facilities. On the other hand, it is also possible that simply lifting producer prices from currently depressed levels will lead to a significant increase in farm output. If distortionary policies cause the relative price of certain agricultural products to be artificially low, making the production of those commodities unremunerative, the removal of such a source of price distortions through policy reform could be an inexpen-

[7] World Bank. *World Development Report 1982* (Oxford: Oxford University Press, 1982), p. 44.
[8] Irma Adelman, "Beyond Export-Led Growth," *World Development* 12 (September 1984), p. 946.

Figure 1—Annual growth rates of GNP and agricultural value added (at 1972 prices)



Sources: Based on data for 1950-82 from Philippines, National Economic and Development Authority, *Philippine Statistical Yearbook* (Manila: NEDA, various years); and for 1983-85 from Philippines, National Economic and Development Authority, "The National Income Accounts of the Philippines, 1983-85," Manila, December 1985.

sive means of improving agricultural performance.

In practice there is likely to be some interaction between the price mechanism and nonprice factors as they affect agricultural output. The short-run supply response to price incentives surely depends on the state of agricultural technology and institutions, the adequacy of rural infrastructure, the existing stock of agricultural capital, and the availability of variable inputs. Over time such nonprice influences on agricultural production, especially those determined by private decisions, are themselves likely to be affected by relative price changes, so the longer-run price effects can be expected to be larger than the short-run impact on agricultural output. The quantitative evaluation of these dynamic effects is an inherently difficult econometric task, raising both conceptual and statistical problems.[9]

It matters a great deal whether the price elasticity of agricultural supply is for specific products, a group of closely related products, or the aggregate. There is ample evidence of a high degree of intercommodity substitution in Philippine crop production. Producers of rice, the most widely grown

[9] See, for example, Hossein Askari and John T. Cummings, *Agricultural Supply Response: A Survey of Econometric Evidence* (New York: Praeger, 1976); and more recently Yair Mundlak, "The Aggregate Agricultural Supply," International Food Policy Research Institute, Washington, D.C., September 1985 (mimeographed).

crop, have been found to be generally responsive to changes in the price of rice relative to corn, sugarcane, coconut, and other agricultural commodities. Assuming that the price elasticity of rice hectarage is the lower limit to the price elasticity of output (that is, the price elasticity of rice yield is nonnegative), Mangahas et al. conclude, from a regression analysis of area response based on 1953-54 to 1963-64 data for the country's nine regions, that "it may well be that in several of the regions the elasticity of the marketed surplus of rice with respect to expected (relative) price is at least unity."[10]

Using regional data for 1960-78, which include therefore several years after the introduction of high-yielding rice varieties, Bouis also finds significant reallocation of farm resources due to relative price changes among the principal crops produced in each region.[11] Estimated short-run rice area elasticities with respect to expected rice/corn revenue per hectare are positive for all but one of the nine regions, ranging from 0.09 to 0.57. The regression results also indicate important interactions between rice and other principal crops (apart from corn): sugar in Western Visayas and Central Luzon; coconut in Southern Mindanao, Northern Mindanao, and Eastern Visayas; and tobacco in Cagayan.

Own-price and cross-price elasticities of output supply for two agricultural product categories, namely, food and export crops, have been estimated by the present author using the profit function approach and annual data for 1948-74. Individual crops are aggregated into the food and export crop categories using chained Fisher quantity and price indexes. The short-run elasticity estimates are: own-price, 0.302 for food crops, 0.251 for export crops; cross-price, −0.198 for food crops and −0.121 for export crops.[12]

Finally, at the most aggregative level, Quizon's work on input demand and output supply elasticities in Philippine agriculture (including crops and livestock), also based on the profit function approach but utilizing pooled time-series and cross-section data for the nine regions from 1948 to 1974, indicates a statistically significant estimate of 0.104 (computed at sample means) for the short-run price elasticity of aggregate supply.[13] This figure lies within the range of about 0.0 to 0.3 obtained in a recent survey of empirical evidence on short-run aggregate agricultural supply response in developing countries.[14]

These illustrative findings for the Philippines indicate that the price responsiveness of agricultural supply in the short run diminishes with an increasing level of product aggregation. This would seem intuitively plausible in view of the progressively limited possibilities for resource reallocation as products become more differentiated. It can only be expected that the scope for shifting resources in the short run from agricultural to nonagricultural production would be more limited than that from food to export crops, and even more so in comparison with the scope for factor input substitution from rice to corn and other crops.

In sharp contrast to the extensive empirical work on short-run agricultural supply response, estimates of the longer-run price effects are few and problematical. Specifications of dynamic supply behavior based on adaptive price expectations or partial output adjustment are widely used, but such a mechanistic approach does not address appropriately the problems concerning the

[10] Mahar Mangahas, Aida Recto, and Vernon W. Ruttan, "Market Relationships for Rice and Corn in the Philippines," *Philippine Economic Journal* 5 (First Semester, 1966): 22-23.

[11] Howarth E. Bouis, "Rice Policy in the Philippines" (Ph.D. dissertation, Food Research Institute, Stanford University, 1982).

[12] Romeo M. Bautista, "Domestic Price Distortions and Agricultural Income in Developing Countries," *Journal of Development Economics* 23 (No. 1, 1986): 19-40.

[13] Jaime B. Quizon, "Factor Input Demand and Output Supply Elasticities in Philippine Agriculture," *Philippine Economic Journal* 20 (No.2, 1981): 103-126.

[14] Food and Agriculture Organization of the United Nations, "Agricultural Price Policies," Rome, 1985 (mimeographed).

likely interaction over time between relative price changes and the r onprice influences on agricultural output as indicated above. The latter requires a more general equilibrium framework that explicitly considers how the allocation of new and existing resources among competing production sectors from year to year is affected by the evolving domestic price structure. There has been no attempt to use such an analytical approach to estimate longer-run supply elasticities for Philippine agriculture. For other developing countries, the one published study that can be cited is the work of Cavallo and Mundlak, in which a two-sector model of the Argentine economy is developed that endogenously determines sectoral productivity, resource allocation, and investment from period to period.[15] It is worth noting that the dynamic price elasticity of aggregate agricultural supply derived from that study converges gradually to about 1.0 in 17 years.[16]

The range of elasticity values indicated above, including those for short run and long run and at various levels of agricultural product aggregation, seems to suggest that prices matter but that the "prices alone" approach to policymaking is not likely to be adequate and may need to be complemented by cost-effective measures to improve the nonprice conditions influencing agricultural supply. While the present study focuses on the differential effects of the foreign trade regime on agricultural prices (at varying levels of product aggregation), there is no presumption that nonprice factors (technology, infrastructure, research, extension, and education, among others) are unimportant and can be neglected in the consideration of policy measures to improve agricultural performance.

[15] Domingo Cavallo and Yair Mundlak, *Agriculture and Economic Growth in an Open Economy: The Case of Argentina*, Research Report 36 (Washington, D.C.: International Food Policy Research Institute, 1982).

[16] Domingo Cavallo, "Exchange Rate Overvaluation and Agriculture: The Case of Argentina," background paper for World Bank, *World Development Report, 1986* (Washington, D.C.: World Bank, 1986). An unpublished study on Chile using a similar dynamic framework indicates an even larger "implicit elasticity of about 2" over 20 years (see Mundlak, "Aggregate Agricultural Supply," p. 66).

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POSTWAR TRADE AND EXCHANGE RATE POLICIES

"Trade and exchange rate policies" and "foreign trade regime" are used synonymously in this study to mean not only the various aspects of commercial policy, such as tariffs, export taxes and subsidies, quantitative restrictions, and other trade barriers that create a wedge between the domestic and foreign prices of tradable goods (that is, exportables and importables), but also other policies that affect the domestic prices of tradable goods relative to nontradable or home goods. The need to distinguish between the price effects on tradables and home goods in this study derives from the high degree of tradability of agricultural output in the Philippines.

Import and Foreign Exchange Controls in the 1950s

Domestic demand for consumption and capital goods increased markedly in the period immediately after the Second World War.[17] Because of the severe devastation of the Philippine economy at the time, a large part of this demand could be met only through imports. Export industries had not been fully rehabilitated, and hence there was considerable pressure on the trade balance. The balance-of-payments problem increasingly worsened as monetary and fiscal policies became expansionary in 1949, a presidential election year. The government instituted in 1949-50 a comprehensive program of import and exchange controls. rationed the available foreign exchange among various claimants, and kept the prewar exchange rate of two pesos to the U.S. dollar.[18] Although direct controls on imports and foreign exchange were not deliberately introduced to stimulate industrial import substitution, this objective quickly became an effective motivation for continuing them. Philippine policymakers were eager to promote industrialization. As early as September 1946 a legislative act granted special tax exemptions to "new and necessary industries." However, it was not until the early 1950s, when the substantial benefits from import and exchange controls became evident, that a significant number of industrial firms registered for such special tax exemptions.

The immediate effect of restrictive import and exchange controls was a sharp rise in the prices of imported goods. This prompted the government to liberalize imports of "essential" consumer goods, raw materials, and capital equipment relative to so-called "nonessential" goods. Together with the highly overvalued currency, the criterion of essentiality governing the system of direct trade controls created a strong bias toward the domestic production of substitutes for finished industrial consumer goods, imports of which were considered less essential, while imported raw materials, intermediate products, and capital goods were made available at artificially low prices (in pesos). This effectively penalized the primary production sectors (agriculture and

[17] For a fuller account of the policy developments in the 1950s, see Frank H. Golay, *The Philippines: Public Policy and National Economic Development* (Ithaca, N.Y.: Cornell University Press, 1961); and Robert E. Baldwin, *Foreign Trade Regimes and Economic Development: The Philippines* (New York: National Bureau of Economic Research, 1975), Chapter 2.

[18] The Philippine Trade Act of 1946, passed by the U.S. Congress in 1946 and accepted by the Philippine government as an executive trade agreement, stipulated that until 1973 the government could not change the exchange rate of two pesos per U.S. dollar without the explicit agreement of the president of the United States.

mining), export-oriented industries, and intermediate and capital goods production. The chronic trade deficits during the 1950s, particularly in the second half of the decade, reflected the increasing dependence of domestic industries on imports and the inability to stimulate new exports.

Dissatisfaction with the control system grew as balance-of-payments difficulties continued and as charges mounted of corruption and poor administration of the system. There was also increasing pressure from exporters for a more favorable exchange rate and public perception of large windfall gains accruing to importers as a result of the scarcity premium from restricted imports. A law enacted in September 1955 aimed to compensate exporters for the currency overvaluation by allowing certain exports to be bartered for imports outside the exchange control system. Exports under this "No-Dollar Barter Law" (which was repealed in 1959) accounted for about 10 percent of total exports in 1957. Government efforts to capture part of the windfall gains going to importers included an increase in the sales tax on both imported and domestic products in late 1950, introduction of a 17 percent excise tax on the peso value of foreign exchange sold by the banking system, and increases in tariff rates in 1955 and 1957.

Decontrol, Exchange Rate Adjustment, and Tariff Protection in the 1960s

Toward the end of the 1950s, there was little room left for nonessential imports, as producer goods already amounted to nearly 90 percent of the annual import bill. The worsening trade deficit prompted the authorities to gradually dismantle the control system and rationalize the foreign exchange rate. This was initiated by the introduction in April 1960 of a multiple exchange rate system in which the applicable peso-dollar exchange rate ranged from 2.3 for exports to 4.0 for nonessential imports.[19] This system was modified over the next several months to further depreciate the domestic currency for each control category.

In January 1982, the government of newly elected President Diosdado Macapagal opted to accelerate the decontrol program, removing most controls on foreign exchange and floating the peso in the free market. The requirement of licenses for imports was discontinued, but import duties were raised on many items and special time deposit requirements on imports were imposed. Also, exporters were required to surrender 20 percent of their foreign exchange receipts at the old rate of two pesos per dollar.

By June 1962, the floating exchange rate had stabilized at P 3.90 per dollar, but exporters continued to receive only P 3.52 due to the 20 percent surrender requirement. The latter was only removed in November 1965, when the peso was officially devalued from P 2.00 to P 3.90 per dollar.

These policy reforms did not change qualitatively the incentive structure favoring import-substituting consumer goods industries. The protection structure continued to be heavily biased against exporting by a distorted and protective tariff system, which took effect in 1957 but was made redundant at the time by the import and foreign exchange controls, and discriminatory sales taxes. Tariff escalation, in which import duties are higher on semifinished products than on raw materials and higher still on finished products, encouraged assembly and packing operations that depended heavily on imported materials and capital equipment. The following average nominal tariff rates were calculated for 1957 by Valdepeñas for a sample of 111 commodities classified by Central Bank exchange control categories: highly essential goods, 15 percent; essential

[19] For a detailed discussion of changes in trade and exchange rate policies in the 1960s, see John H. Power and Gerardo P. Sicat, *The Philippines: Industrialization and Trade Policies* (London: Oxford University Press, 1971), and Baldwin, *Foreign Trade Regimes*, Chapters 3-4, pp. 50-83.

consumer goods, 18 percent; nonessential consumer goods, 51 percent; essential producer goods, 25 percent; and nonessential producer goods, 30 percent.[20] In view of the tariff increases in January 1962 for many import-competing products, the average tariff rate for nonessential consumer goods rose to 83 percent, for essential consumer goods to 38 percent, and for producer goods to 47 percent.

From the beginning of 1966 (when the administration of President Ferdinand Marcos first assumed power) to mid-1967, expansionary monetary and fiscal policies were adopted. Reserve requirements against savings and time deposits were reduced, the basic rediscount rate lowered, and credit conditions relaxed. At the same time, the new government undertook a massive program of capital formation emphasizing infrastructure investments and development services financed through both internal and external borrowing.

There were two unfavorable effects of these expansionary policies. One was an increase in inflation rates in 1966 and 1967. The other was the sharp deterioration in the country's trade balance, which was more worrisome to policymakers. After a U.S. $24 million surplus in 1965, the trade account showed deficits of U.S. $9 million and U.S. $224 million in the next two years, forcing the Central Bank to tighten credit and reintroduce foreign exchange controls in mid-1967. This failed to prevent a further worsening of the balance of payments as the government continued to pursue expansionary policies related to the election spending in 1969. Money supply rose 51 percent from 1965 to 1969 and by an unprecedented annual rate of 18 percent in 1969 alone. Both internal and external public debt nearly doubled during the same period.

Flexible Exchange Rate and Export Promotion in the 1970s

In late 1969, a foreign exchange crisis developed, precipitated by the need to service the short-term credit that had financed the trade deficits and expansionary policies in the immediately preceding years. The policy response was to float the Philippine peso in February 1970 and eliminate some of the exchange controls in effect since 1967. By December 1970 the nominal exchange rate had settled to 6.4 pesos per dollar, representing an effective devaluation of 61.4 percent over the year.

As part of the devaluation package, 80 percent of foreign exchange earnings from some traditional exports (including copra, sugar, logs, and copper concentrates) were to be surrendered to the Central Bank at the old exchange rate of 3.90 pesos per dollar, while the remaining 20 percent could be sold at the free market rate. This was replaced in May 1970 by a temporary stabilization tax on traditional exports (at rates ranging from 4 to 10 percent ad valorem), which in turn was made a permanent part of the customs and tariff code in 1973. Moreover, in February of 1974, an additional tax was levied on the premium derived from export price increases beginning in 1973.[21] Thus the significant gains from the devaluation and the world commodity boom in the early part of the 1970s were partly siphoned off from producers of traditional export products.

The de facto devaluation was followed by the enactment of the Export Incentives Act of 1970, which signaled a policy shift toward a more outward-looking industrial development strategy. Among other incentives, enterprises registered with the Board of Investments (BOI) under this act qualified

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[20] Vicente B. Valdepeñas, Jr. *The Protection and Development of Philippine Manufacturing* (Manila: Ateneo University Press, 1970), p. 81.

[21] Rates of this premium export duty, ranging from 20 to 30 percent, were applied to the difference between the ruling export price and the base price as of February 1984. When the commodity price boom ended later in the year, the premium tax became ineffective (except for sugar in 1975), and even the regular export tax was temporarily withdrawn on export commodities hardest hit by the recession.

for various kinds of tax exemptions including export taxes, deductions of the firm's export revenue from taxable income for five years, and a tax credit equivalent to all taxes—sales, specific, and import—on raw materials used in export production. These were additional to the fiscal incentives made available to export producers under the Investment Incentives Act of 1967.[22] The average rate of tax subsidy for BOI-registered firms as a proportion of input value has been estimated at 15 percent in the mid-1970s.[23]

A new tariff code took effect on January 1, 1973, that simplified the previously complicated tariff schedule by reducing the number of tariff rates to only six (a basic revenue rate of 10 percent and a five-level schedule of protection rates). It raised duties on 796 items in the old tariff code, reduced them on 451 items, and left unchanged 392. The net result was an average nominal protection slightly higher by about 3 or 4 percentage points.[24]

In addition to the improved exchange rate and fiscal incentives, export producers also received, on a selective basis favoring labor-intensive manufactured products, various forms of financial and infrastructure support, including the establishment of export processing zones and marketing services, as well as the simplification of export procedures and documentation. They compensated in part for the still pervasive bias of the country's incentive system against exporting. The highly protective tariff system was the primary source of this bias, but no attempt was made to deal directly with it as part of the export promotion program during the 1970s. Even so, the policy measure adopted in the early 1970s must have substantially enhanced the attractiveness of production for export relative to domestic sales during the first half of the decade.

One important and controversial aspect of Philippine economic policy in the 1970s concerns the management of the nominal exchange rate. From the floating of the peso in February 1970 to the 1983 foreign exchange crisis, the authorities maintained a flexible exchange rate policy, allowing the domestic currency to depreciate in nominal terms. The annual rate of depreciation varied slightly from year to year, exceeding 5 percent (but staying within 10 percent) only in 1972, 1975, and 1982.

In the face of sustained large deficits in the current account and higher inflation rates relative to the Philippines' trading partners since 1974, it seems surprising that the peso did not depreciate much more rapidly. The explanation lies in the capital account. The Philippines, having received relatively large foreign loans in the 1970s, faced no threat of depletion of international reserves and hence no immediate pressure to devalue. Indeed, as shown in Table 4, foreign borrowing was so large in 1974-79 that Central Bank reserves even increased significantly.

The current account deficits in the 1970s were of course related to the external shocks that buffeted the Philippine economy during the decade. The policy response to the adverse external developments and trade deficits was to borrow externally. In deciding to sustain the growth momentum initiated in the early 1970s, policymakers adopted a countercyclical strategy through expansionary fiscal and monetary policies. Thus, during 1974-80, the annual rate of increase in government spending and money supply averaged 22 and 18 percent, which were much higher than their trend rates.

Another notable aspect of the policy environment in the late 1970s was the in-

[22] These incentives consisted of: first, a double deduction from taxable income of export promotion expenses and of freight costs incurred in exporting; and second, a tax credit equivalent of 7 percent of the cost of raw materials used in export production.

[23] Norma A. Tan, "The Structure of Protection and Resource Flows in the Philippines," in Romeo M. Bautista, John H. Power, and Associates, *Industrial Promotion Policies in the Philippines* (Makati: Philippine Institute for Development Studies, 1979), pp. 157-159.

[24] International Labour Office, *Sharing in Development in the Philippines* (Geneva: ILO, 1974), p. 113.

Table 4—Foreign trade and payments indicators, 1972-83

Year	Current Account Balance	Ratio of Current Account Deficits to Trade[a]	International Reserves[b]	Ratio of International Reserves to Trade[a]	Foreign Borrowing[c]	External Debt[d]	Debt Service Ratio[e]
	($ million)	(percent)	($ million)	(percent)	($ million)		(percent)
1972	9	. . .	551	35.7	166	2,210	27.8
1973	536	. . .	1,038	43.6	-49	2,306	17.1
1974	-176	4.6	1,504	39.8	642	2,723	14.2
1975	-892	23.4	1,360	35.7	748	3,402	15.6
1976	-1,050	25.6	1,642	40.0	1,188	5,0?9	24.9
1977	-752	15.9	1,524	32.1	634	6,?03	17.2
1978	-1,102	19.6	1,881	33.7	1,459	P 195	20.8
1979	-1,497	20.8	2,416	33.8	2,032	,733	20.3
1980	-1,904	20.7	3,140	34.5	2,628	12,187	18.7
1981	-2,061	20.9	2,574	26.3	1,628	14,826	21.2
1982	-3,121	31.8	1,711	17.7	2,957	17,475	28.9
1983	-2,707	28.4	864	9.1	1,270	18,864	23.9

Sources: John H. Power, "Response to Balance of Payments Crisis in the 1970s: Korea and the Philippines," Staff Paper Series No. 83 03, Philippine Institute for Development Studies, Makati, 1983 (mimeographed); and Filologo Pante, Jr., "The Evolution of the Balance of Payments," Philippine Institute for Development Studies, Makati, 1984 (mimeographed). Revised figures for international reserves in 1981, 1982, and 1983 were obtained from International Monetary Fund, *International Financial Statistics* (Washington, D.C.: IMF, 1986).

[a] Trade is the average of export and import values.
[b] International reserves are end of year gross.
[c] Foreign borrowing is the trade deficit plus the increase in international reserves.
[d] This is the end of year outstanding external debt (inclusive of short-term debt) of the nonmonetary sector.
[e] The debt service ratio is the debt service divided by foreign exchange receipts from exports of goods and services.

creased role of government in the regulation of various sectors of the economy. This was facilitated by the broad powers of the martial law regime imposed in September 1972. Government monopoly on foreign trade in rice, corn, and wheat and direct price controls during the 1970s effectively reduced the instability in domestic prices of major food crops. In the wake of the shortfalls in rice production during 1971-73, which coincided with the world food crisis, a major effort was undertaken by the government to promote rice self-sufficiency. The adoption of the new technology was encouraged by the so-called Masagana 99 program, which provided farmers with noncollateral, low-interest loans to purchase fertilizer and seeds at subsidized prices. Government investment in irrigation during 1973-77 expanded 10-fold in constant pesos relative to 1966-70.[25] Irrigation water was provided to food crop producers at a subsidy rate ranging from 60 to 90 percent.[26] Higher-than-border prices for fertilizer, farm chemicals, agricultural equipment, and fuel tended to offset the subsidized price of irrigation, making the domestic and world prices of inputs used by food crop producers comparable overall.

Trade in coconut and sugar—the country's dominant export crops—has been particularly subject to government intervention since the early 1970s beyond the imposition of export taxes and premium duties already mentioned. An export quota for sugar has been in effect since 1962. Beginning in 1970, sugar trading in both domestic and foreign markets was taken over by state cor-

[25] Randolph Barker, *The Philippine Rice Program: Lessons for Agricultural Development*, Cornell International Agriculture Monograph 104 (Ithaca, N.Y.: Cornell University, 1984).
[26] Cristina C. David, "Economic Policies and Philippine Agriculture," Working Paper 83-02, Philippine Institute for Development Studies, Makati, 1983 (mimeographed), p. 29.

porations. Since 1974, there has been only one buyer and exporter of sugar from sugar mills. During 1974-80, producers received an average of only 77 percent of the world price.[27] It has been estimated that, due to the monopoly of domestic and foreign trade, sugar producers suffered a net loss of between 11 and 14 billion pesos over the crop years 1974/75 to 1982/83.[28] Moreover, the additional link in the market chain and inefficiencies in government marketing operations meant additional mark-ups and a substantially increased marketing margin.

In the case of coconut, the government imposed a production levy, established a dominant coconut milling company, and began a program of coconut reporting. The coconut levy was initially set in 1971 at P 5.50 per ton of copra. It has since evolved into a variety of special levies, which have financed, among other things, the acquisition of a major share of the country's total milling capacity and operation of the Coconut Industry Development Fund to promote replanting of the country's coconut farms with hybrid varieties. Clarete and Roumasset have estimated that the nominal protection rate for copra was -8 percent from 1970 to 1972, and "it became more negative, -24 percent, from 1973 to 1979, reflecting the introduction of the levy."[29]

Tariff Liberalization and Foreign Exchange Shortage in the 1980s

By the late 1970s, Philippine policymakers were acutely aware of the need to further improve the international competitiveness of domestic industry, which was more heavily protected from foreign competition than other market economies in Southeast Asia.[30] With technical and financial support by the World Bank, a program of industrial structural adjustment was initiated in 1981. It included measures to significantly liberalize the foreign trade regime through tariff reform and relaxation of import licensing, to rationalize fiscal incentives, and to revitalize certain industries (for example, textiles) through technical and credit assistance. Unfortunately, the program was overtaken by the foreign exchange crisis beginning in August 1983. Some of its components were superseded by policy actions designed to deal with short-term contingencies.

What remained relatively intact was the tariff liberalization scheme. Peak tariff rates of 100 and 70 percent that did not affect 14 strategic industries (which had their own sectoral plans) were reduced to 50 percent in two stages on January 1 of 1981 and 1982. Very low rates, on the other hand, were raised to at least 10 percent by 1985. The gradual tariff revisions scheduled from 1981 to 1985 would have reduced the average tariff rate from 43 percent in 1980 to 18 percent in 1985. Effective tariff protection for manufacturing would have declined from 70 to 31 percent. Consumer goods industries still would have enjoyed the highest protection at 43 percent, versus 14 percent for intermediate goods and 20 percent for capital goods.[31] Protection for import-substituting industries also would have been reduced and that for export industries raised significantly, but the bias in favor of the former would remain.

To complement the tariff reform, import licensing was also to be gradually released.

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[27] Gerald C. Nelson and Mercedes Agcaoili, "Impact of Government Policies on Philippine Sugar," Working Paper 83-04, Philippine Institute for Development Studies, Makati, 1983 (mimeographed), p. 23.

[28] Dante B. Canlas et al., "An Analysis of the Philippine Economic Crisis: A Workshop Report," University of the Philippines, School of Economics, Quezon City, June 1984 (mimeographed).

[29] Ramon L. Clarete and James A. Roumasset, "An Analysis of the Economic Policies Affecting the Philippine Coconut Industry," Working Paper 83-08, Philippine Institute for Development Studies, Makati, 1983 (mimeographed), p. 28.

[30] Philippine Tariff Commission, *Tariff Profiles in ASEAN* (Manila: National Economic and Development Authority, 1979).

[31] Romeo M. Bautista, "The 1981-85 Tariff Changes and Effective Protection of Manufacturing Industries," *Journal of Philippine Development* 8 (Nos. 1 and 2, 1981): 1-20.

From the original list of 1,300 import items banned or requiring prior approval by the Central Bank and other government agencies, 264 were removed in 1981. Another 610 were taken off the list in early 1982, and the plan was to abolish the whole list by year-end 1983. Because of the foreign exchange crisis, the latter did not materialize. Instead, comprehensive controls on foreign exchange and imports were introduced.

Although the political turmoil and massive capital flight following the Aquino assassination precipitated the foreign exchange crisis, the rapid growth of the country's external debt and the sustained trade deficits that required it could have been avoided had macroeconomic policy been more prudent. As pointed out above, the government borrowed heavily abroad and pursued expansionary fiscal and monetary policies in the face of the large current account deficits induced by the 1973-74 oil crisis in order to sustain the growth momentum initiated in the early 1970s. While it probably made sense to seek foreign loans until 1978 when the London Interbank Offer Rate, LIBOR, was 9.3 percent, the same strategy after 1981 (when LIBOR had increased to 16 percent) proved very costly in terms of the country's debt burden.

What is worse, the investments made did not pay off. Government financial institutions bankrolled many projects of doubtful economic validity whose proponents were frequently persons with strong political connections.[32] Nonfinancial government corporations suffered from huge deficits, which averaged about P 12 billion in 1981-82. By 1982, foreign borrowing had reached a record 8.5 percent of GNP, and the government deficit was at an unprecedented 4.3 percent of GNP. It is not a coincidence that the public sector's share in total external debt rose from 40 percent in 1971 to 56 percent by 1982.

In absolute terms foreign borrowing by the private sector also increased significantly—by 20 percent annually during 1973-82 on the average (or, deflated by the import price index, by 8 percent). This can be attributed in part to the undervaluation of foreign exchange, which made foreign capital more attractive than that from domestic sources. Since the government generally guaranteed debt repayment, foreign lending to the private sector was given additional encouragement. Liberal access to external capital under conditions of restricted trade often leads to excessive foreign borrowing, as Hughes has pointed out.[33]

After 1981 current account deficits could no longer be financed from foreign loans, necessitating a significant drawing down of Central Bank reserves. Moreover, in view of the tightness of the international financial market, there was increasing difficulty in obtaining long-term loans. In 1982, short-term capital inflows were about three times those in 1979 (reaching U.S. $12.1 billion), and the ratio of short-term debt to total outstanding debt rose sharply from 18.6 percent to 25.6 percent. Normally, short-term loans were being rolled over on a 3- to 12-month basis. However, as foreign bank lenders became more apprehensive about the country's mounting indebtedness, short-term loans were increasingly called. The debt crisis arose essentially because lenders discontinued the rolling over of short-term loans owing to the political instability after August 1983. To compound the problem, there was a massive capital flight following the Aquino assassination, estimated at U.S. $200 million within a few weeks. The U.S. $2.7 billion current account deficit incurred in 1983 (representing

[32] The conversion of government loans to equity became a common form of bailout for financially troubled firms. Thus, in mid-1983 the Development Bank of the Philippines, a government institution, owned or managed 73 large once-private firms. Other public corporations, such as the National Development Company and the Philippine National Bank, had also taken over many firms threatened by failure in which government exposure was substantial.

[33] Helen Hughes, "External Debt Problems of Developing Countries," in *Energy and Structural Change in the Asia Pacific Region*, ed. Romeo M. Bautista and Seiji Naya (Makati: Philippine Institute for Development Studies and the Asian Development Bank, 1984), pp. 469-495.

8.0 percent of GNP) had to be financed from international reserves, which slumped to a level equivalent to less than one month's imports by mid-October. This represented, by any standard, a foreign exchange crisis. The Philippine government soon declared a moratorium on payment of debt principal, the total debt outstanding amounting to about U.S. $26 billion at the time.

Foreign exchange and import controls were imposed in October 1983 signaling an emergency retreat from the trade liberalization program. The Central Bank required all commercial banks to turn in their foreign exchange receipts so that priority imports and other payments could be made. It has been noted that the Central Bank priority listing tended to "give more protection to heavily protected import substitutes while penalizing less protected sectors (e.g., exports)."[34]

These controls on foreign exchange and imports superseded therefore the scheduled lifting of import bans in 1983 under the trade liberalization program. Tariff rate revisions through 1985, although made redundant by the exchange and import controls, had not been substantially affected. As a revenue measure and also to curtail imports, a 5 percent general import tax was imposed in November 1983, which was raised to 8 percent in April 1984 and then to 10 percent in June 1984. Additional export duties ranging from 2 to 5 percent were levied on traditional export products from November 1983 to December 1984, and an economic stabilization tax of 30 percent was imposed on all exports during June-September 1984. To discourage imports and reduce capital outflow, the peso was devalued three times—in June 1983 by 7.8 percent to 11 pesos per dollar, then in October to 14 pesos per dollar, and in June 1984 to 18 pesos per dollar. In October 1984 the peso was allowed to float.

Concluding Remarks

It is unfortunate that the recent major attempt at trade liberalization in the Philippines took place during a period of adverse conditions in the external economic environment. The deterioration in the country's terms of trade was especially severe: the trade index (1972 = 100) declined to 71 in 1977 and to 59 in 1982. The world recession that began in 1980 also imposed an effective constraint on the country's ability to expand exports and reduce trade deficits.

Unfavorable external circumstances undoubtedly have been an important influence in Philippine economic performance since the mid-1970s. They have also hampered the implementation of recent trade liberalization policies and contributed to the present balance-of-payments problem. However, this does not tell the whole story. The role of domestic policies has also been significant. The decision to maintain an ostensibly high growth strategy in support of expansionary macroeconomic policies and heavy external borrowing led to rapid increases in imports. This was not matched by a commensurate expansion of exports. This is explained by the depressed foreign demand and the relative uncompetitiveness of domestic industry. The latter in turn can be attributed to market price distortions arising from trade and industrial policies, which not only prevented a more rapid growth of Philippine exports, "but also undermined the efficiency of translating a high level of investment into growth."[35]

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[34] Mario B. Lamberte et al., *A Review and Appraisal of the Government Response to the 1983-84 Balance of Payments Crisis*, Monograph Series No. 8 (Makati: Philippine Institute for Development Studies, 1985), p. xvii.

[35] John H. Power, "Response to Balance of Payments Crises in the 1970s: Korea and the Philippines," Staff Paper Series 83-05, Philippine Institute for Development Studies, Makati, 1983 (mimeographed), p. 27.

5

EFFECTS ON RELATIVE INCENTIVES AMONG TRADABLE GOODS

This chapter examines the impact of Philippine trade and exchange rate policies on incentives to produce tradable goods. It considers first the overall trade bias (OTB), which indicates at the most aggregative level the extent to which the trade regime encouraged or discouraged the production of exportables relative to importables. The empirical analysis also yields annual estimates of aggregate implicit tariff and export tax rates, representing the average disparity between domestic and foreign (border) prices of tradable goods.

As indicated in the preceding chapter, the effects of the trade regime have differed by product categories, especially during the 1950s. It is appropriate, therefore, to examine their effects on production incentives for at least some tradable product groups. The most relevant for the present study are the traditional exports, new exports, essential consumer goods imports, and nonessential consumer goods imports. Finally, as the relationship between domestic and border prices could have varied across individual commodities, the incentive effects of the trade regime on the country's major agricultural products are also analyzed.

Aggregate Measure of Trade Bias

An OTB measure can be represented as:[36]

$$OTB = (P_x/P_m)/(P_x^*/P_m^*), \qquad (1)$$

where P_x and P_m are the domestic prices of exportables and importables, and P_x^* and P_m^* are their respective border prices. A proportionate change in this relative price ratio would reflect the net movement of the relative domestic price of exportables vis-à-vis importables after taking into account the concurrent change in the relative foreign price; hence it can be interpreted to represent the change in the domestic price ratio due to domestic policies. If OTB<1, there is an antitrade bias in the country's commercial policy: the production of importables is being promoted relative to exportables, which would tend to reduce foreign trade. On the other hand, OTB>1 implies a protrade bias: there is price discrimination in favor of export production and against import substitution, increasing possibilities for trade. The unbiased value of OTB = 1 indicates that neither export production nor import substitution is being encouraged by domestic price policies.

In the absence of quantitative trade restrictions,

$$P_x = (1 - t_x)\,R \cdot P_x^* = EER_x \cdot P_x^*, \qquad (2)$$

and

$$P_m = (1 - t_m)\,R \cdot P_m^* = EER_m \cdot P_m^*, \qquad (3)$$

where t_x and t_m are the implicit export tax and import tariff rates, R is the average nominal exchange rate applicable to export and import goods, and EER_x and EER_m are the effective exchange rates for exports and imports, respectively. EER estimates for exports and imports have been derived by Baldwin for the period from 1950 to 1971,

[36] A similar measure has been used in Carlos Diaz-Alejandro, "Exchange Rates and Terms of Trade in the Argentina Republic, 1913-1976," in *Trade Stability, Technology and Equity in Latin America*, ed. Moshe Syrquin (Orlando: Academic Press, 1982).

which Senga has extended through 1980,[37] taking into account "the differential impact on these transactions of tariffs, discriminatory sales or compensating taxes (on imports), special foreign exchange taxes, exemptions from various domestic taxes, subsidized borrowing rates, and marginal-deposit requirements on imports."[38]

Using equations (2) and (3), the expression for the OTB given in equation (1) can be transformed into

$$OTB = (1 - t_x/1 + t_m) = (EER_x/EER_m). \quad (4)$$

The benchmark estimates of t_x, t_m, and OTB for 1971 are first derived based on the weighted averages of Baldwin's 1971 EER estimates for various categories of imports and exports. In view of the trade liberalization measures implemented in 1970-71, which removed much of the import and foreign exchange restrictions introduced in 1968-69, the use of 1971 as a benchmark year is appropriate. The estimated EER_x for that year is 5.96 and the EER_m is 8.46; hence, OTB = 0.704, t_m = (EER_m/R) 1 = 0.316, and t_x = 1 − (EER_x/R) = 0.073. This implies that there was price discrimination due to trade policy in 1971 against export production in favor of import substitution.

For other years during 1950-80, it is possible to estimate t_x and t_m, based on equations (2) and (3), in two ways, using: first, the Baldwin-Senga estimates of EER_x and EER_m; and second, Central Bank data on wholesale price indexes in Manila for export products (P_x) and imported commodities (P_m), and on unit value indexes (in U.S. dollars) for exports (P_x^*) and imports (P_m^*).[39] One difficulty with using the Central Bank price indexes is that P_x^* and P_m^* are Paasche indexes (with current year weights), while P_x and P_m are Laspeyres with 1965 base year weights. As indicated in Chapter 3, the structure of Philippine exports changed markedly during the 1970s, as the share of new industrial exports increased at the expense of traditional agricultural exports. This makes virtually noncomparable the temporal movements of P_x^* and P_x in the 1970s. Because there were no quantitative restrictions on exports during 1950-80 (except on exports of logs toward the end of the period), using the Baldwin-Senga estimates of EER_x is the more reasonable alternative in estimating t_x.

Annual values of the implicit export tax rate so derived are presented in the first column of Table 5. They indicate a very small direct export subsidy of 1.0-1.5 percent during the 1950s and even lower rates in the 1960s. The introduction of stabilization taxes or traditional exports in 1970 led to positive implicit tax rates through 1973, which subsequently reverted to negative rates (except in 1976) as taxes on some major export products were waived due to sharp declines in world commodity prices and as direct subsidies to export producers weighed more heavily. Overall, the range of −6.0 to 7.3 percent does not seem to represent, by developing-country standards, a substantial direct tax or subsidy to exports.

Because imports have been subject to varying degrees of direct controls and quantitative restrictions, most extensively during the 1950s, the EER estimates for imports derived by Baldwin and Senga, which do not include the scarcity premium due to such restrictions, cannot be used for calculating the implicit tariff rate. What can be done, however, is to derive t_m from the Central Bank indexes of wholesale and trade unit values of imported and export goods. Because the composition of Philippine imports did not change significantly during

[37] Baldwin, *Foreign Trade Regimes;* and Kunio Senga, "A Note on Industrial Policies and Incentive Structures in the Philippines; 1949-80," *Philippine Review of Economics and Business* 20 (September-December 1983): 299-305. The annual EER estimates for various product categories are given in the Appendix, Table 17.

[38] Baldwin, *Foreign Trade Regimes,* pp. 84-85.

[39] Annual values of these indexes are given in the Appendix, Table 18.

Table 5—Implicit export tax rates, implicit and average tariff rates, and overall trade bias, 1950-80

Year	Implicit Export Tax Rate	Implicit Tariff Rate	Average Tariff Rate	Overall Trade Bias
1950	-0.010	1.205	0.003	0.458
1951	-0.010	1.280	0.202	0.443
1952	-0.010	1.906	0.202	0.348
1953	-0.015	1.707	0.202	0.375
1954	-0.015	1.678	0.199	0.379
1955	-0.015	1.599	0.210	0.391
1956	-0.015	1.445	0.262	0.415
1957	-0.015	1.570	0.268	0.395
1958	-0.015	1.644	0.283	0.384
1959	-0.015	1.704	0.549	0.375
1960	-0.011	1.852	0.536	0.354
1961	-0.011	1.981	0.423	0.339
1962	-0.006	0.756	0.382	0.573
1963	-0.006	0.726	0.356	0.583
1964	-0.006	0.728	0.345	0.582
1965	-0.005	0.708	0.389	0.588
1966	-0.005	0.697	0.366	0.592
1967	-0.008	0.658	0.371	0.608
1968	-0.008	0.515	0.382	0.665
1969	-0.008	0.658	0.380	0.608
1970	0.055	0.287	0.368	0.734
1971	0.073	0.316	0.322	0.704
1972	0.034	0.301	0.399	0.743
1973	0.033	0.184	0.353	0.817
1974	-0.009	0.051	0.388	0.961
1975	-0.025	0.050	0.383	0.976
1976	0.009	0.152	0.388	0.860
1977	-0.019	0.150	0.388	0.886
1978	-0.056	0.204	0.405	0.831
1979	-0.051	0.333	0.405	0.788
1980	-0.060	0.220	0.405	0.869

Sources: Derived from the Appendix, Table 17, which is based on Robert E. Baldwin, *Foreign Trade Regimes and Economic Development: The Philippines* (New York: National Bureau of Economic Research, 1975); and Kunio Senga, "A Note on Industrial Policies and Incentive Structures in the Philippines: 1949-80," *Philippine Review of Economics and Business* 20 (September-December 1983): 299-305.

1950-80, the two sets of indexes are comparable.[40] The calculated annual values of t_m are shown in the second column of Table 5. The marked differences of the t_m values over the three decades are striking. From 1950 to 1960 the domestic price of importables exceeded the foreign price, on the average, by 163 percent. The average implicit tariff rate went down to 68 percent during 1962-69, and further declined to 20 percent during 1970-80.

The third column of Table 5 reports the calculated values of the average tariff rate implied by the Baldwin-Senga estimates of the effective exchange rates for imports (EER_m), which, as pointed out above, do not take into consideration the protective effect of quantitative import restrictions. They are understandably much lower in the 1950s compared to the corresponding values of the implicit tariff rate. The difference is seen to be significantly smaller in the 1960s, reflecting the effects of the decontrol program implemented early in the decade. Finally, one finds that, for many years during the 1970s, the average tariff rate was even higher than the implicit rate, reflecting the widespread exemptions from tariffs and other import taxes granted to government-favored industrial enterprise, including (but not exclusively) those registered under the Investment Incentives Act of 1967 and the Export Incentives Act of 1970.

Based on the implicit export tax and tariff rates calculated above, annual values of the OTB from 1950 to 1980 are obtained and presented in the last column of Table 5. Because the OTB values were consistently less than one, it appears that the Philippine trade policy throughout the entire period favored producers of import-competing goods over export producers. However, there was an increasing OTB trend, implying a decreasing bias against trade. The intensity of bias (represented by the deviation of the OTB value from one) is seen to be highest in the 1950s, as might be expected from a period of comprehensive import and foreign exchange controls. The policy reform in the early 1960s appears to have favored export

[40] These estimates represent weighted averages of the EER_x estimates derived by Baldwin and Senga for traditional and new exports (see the Appendix, Table 17). The weights used for 1950-69 are based on the 1960 shares in total exports, 0.905 for traditional exports and 0.095 for new exports. For 1970-80 the annual shares of these two export categories are used. The marked export diversification that occurred in the 1970s is reflected in the rising share of new exports from 0.114 in 1970 to 0.504 in 1980.

production, as reflected in the increasing OTB. Finally, it seems that exporting was further encouraged in the 1970s by fiscal and other incentives to export producers. However, these incentives did not fully offset the still significant price bias in favor of import-competing production. After 1975 the increasing trend of the OTB was reversed, as export subsidies declined during the second half of the decade. The average values of OTB during the subperiod broadly reflect the extent of price discrimination against export producers in the aggregate during the three major phases in the evolution of the country's foreign trade regime: 1950-61, 0.388; 1962-69, 0.600; and 1970-80, 0.763.

Relative Incentives Among Tradable Product Categories

The concept of OTB provides a useful summary indication of the influence of domestic price policies on relative production incentives between exportables and importables. Such an aggregate measure, however, conceals possible differences in the effects on different classes of export and import-competing products. In the Philippine context this is an important consideration in view of the nature of trade and exchange rate policies adopted during the postwar period.

Based on the evolution of the country's foreign trade regime, it is necessary for the purposes of the study to distinguish between "essential" and "nonessential" consumer goods imports and between "traditional" and "new" exports. The two principal food crops, rice and corn—import-competing throughout most of the postwar period—are in the essential consumer good (EC) import category, while the major export crops such as sugar and coconut are classified as traditional exports (TX). On the other hand, imports of most industrial consumer goods, especially light manufactures, are considered nonessential (NEC), their domestic production being promoted through direct trade controls in the 1950s and by high tariffs since the early 1960s. Also, since 1970 the expansion of new exports (NX), consisting largely of manufactured goods and to a limited extent nontraditional agricultural and mining products, has been officially encouraged: the average values of the effective exchange rates for these categories of tradable goods, based on the Baldwin-Senga estimates, are given for 1950-59, 1960-69, and 1970-80 in Table 6.

It is evident from the markedly higher EER values for NEC imports that the trade regime indeed favored industrial import substitution. As noted earlier, the EER values for the "control period" of the 1950s even understate the implicit protection to import-competing production, in particular of nonessential consumer goods. Relative incentives due to trade and exchange rate policies tended to be increasingly biased against the production of traditional agricultural exports. The average EER for this product category relative to NEC imports decreased from 0.549 in the 1950s to 0.327 in the 1960s and 0.259 in the 1970s.

Table 6—Average effective exchange rates, by product category, 1950-59, 1960-69, and 1970-80

Product Category	1950-59	1960-69	1970-80
Traditional exports (TX)	2.000 (0.549)	3.459 (0.327)	6.602 (0.259)
New exports (NX)	2.294 (0.629)	3.704 (0.351)	8.018 (0.315)
Essential consumer good (EC) imports	2.064 (0.566)	3.906 (0.370)	8.136 (0.320)
Nonessential consumer good (NEC) imports	3.645	10.563	25.459

Sources: Derived from the Appendix, Table 17, which is based on Robert E. Baldwin, *Foreign Trade Regimes and Economic Development: The Philippines* (New York: National Bureau of Economic Research, 1975); and Kunio Senga, "A Note on Industrial Policies and Incentive Structures in the Philippines: 1949-80," *Philippine Review of Economics and Business* 20 (September-December 1983): 299-305.

Note: Numbers in parentheses indicate ratios of effective exchange rates (EER) for a given product category to EER for NEC imports.

Based on the annual values of the EER ratios in Table 7, one observes a continuing bias in favor of import-competing industrial production from 1950 to 1980. Indeed, it is remarkable that, even in the 1970s when a more outward-looking development strategy was being promoted by the government, the bias against agricultural export products continued. In the case of industrial exports, the existing biases of the trade regime were being offset, at least in part, by fiscal and financial incentives provided to registered enterprises under the Export Priorities Act of 1970, as well as the development of export infrastructure specifically directed to manufactured exports. The annual values of the EER ratio for traditional (agricultural) exports relative to both new exports and essential consumer good imports (including rice and corn) are seen from the last two columns of Table 7 to be consistently greater than one. Particularly noteworthy are the higher values of the EER ratio of NX/TX in the first half of the 1970s and of EC/TX throughout the decade, indicating the increased policy biases toward production of nontraditional export and import-competing essential consumer goods during those periods.

Relative Incentives to Major Agricultural Products

In examining the differential price effects of Philippine trade and exchange rate policies among agricultural tradables, the major agricultural commodities considered here are the traditional exports, which include coconut, pineapple, tobacco, and abaca, and the import-competing goods, rice and corn.

Analogous to equations (2) and (3), an effective exchange rate for commodity i, representing the number of units of domestic currency (pesos) per U.S. dollar received by exporters or paid by importers of i, can be defined as:

$$EER_i = P_i/P_i^*, \qquad (5)$$

where P_i and P_i^* are the domestic and border prices of commodity i.

The ratio of EER_i to EER_j, the latter denoting the effective exchange rate for the commodity category j (= TX, EC) that includes i, would indicate the extent to which the price effect of the trade regime is more (or less) favorable to commodity i relative to the other commodities included in category j. Subperiod averages of the annual values of EER_i/EER_j are presented in Table 8, calculated from the Baldwin-Senga estimates of EER_j and Central Bank data on wholesale and border prices of the major agricultural products.[41]

Among the traditional export commodities, tobacco shows the lowest values of the EER ratio, indicating relative price discrimination, which became more severe over time. This contributed undoubtedly to the declining profitability of tobacco production. Pineapple appears to have been favored the most in the 1950s, sugar in the 1960s, and coconut in the 1970s.

Relative to other import-competing essential consumer goods, rice benefited from domestic price policies in the 1960s. This was not the case in the next decade, which does not seem consistent with well-publicized government efforts at promoting rice self-sufficiency. With corn, the trade regime was apparently discriminatory in the 1960s but became favorable in the 1970s. Commodity-specific price effects of domestic policy can also be compared within each product category using the bilateral measure

$$RPR_{ik} = (P_i/P_k)/(P_i^*/P_k^*), \qquad (6)$$

which is the relative price ratio between the domestic (farm-gate or wholesale) and border prices of commodities i and k in the same product category. This formulation permits an examination of how the farm-gate price, which is clearly more meaningful than the wholesale price in the assessment of the impact on agricultural production incentives, is being affected by foreign price changes and the trade regime. A change in this index would reflect the *net* movement

[41] See the Appendix, Tables 19-21.

Table 7—Ratios of effective exchange rates, by product category, 1950-80

Year	Effective Exchange Rate Ratio				
	TX/NEC	NX/NEC	EC/NEC	EC/TX	NX/TX
1950	0.976	1.093	0.976	1.000	1.120
1951	0.590	0.661	0.599	1.015	1.120
1952	0.590	0.661	0.599	1.015	1.120
1953	0.590	0.684	0.599	1.015	1.160
1954	0.599	0.695	1.020	1.020	1.160
1955	0.543	0.630	0.554	1.020	1.160
1956	0.518	0.601	0.547	1.055	1.160
1957	0.485	0.563	0.510	1.050	1.160
1958	0.480	0.556	0.504	1.050	1.160
1959	0.395	0.455	0.427	1.080	1.150
1960	0.319	0.360	0.321	1.009	1.131
1961	0.382	0.420	0.449	1.175	1.101
1962	0.314	0.336	0.373	1.187	1.070
1963	0.313	0.331	0.377	1.205	1.057
1964	0.317	0.335	0.382	1.205	1.057
1965	0.326	0.346	0.359	1.100	1.059
1966	0.334	0.353	0.367	1.100	1.059
1967	0.331	0.354	0.364	1.100	1.069
1968	0.327	0.350	0.360	1.100	1.069
1969	0.327	0.349	0.359	1.100	1.069
1970	0.291	0.370	0.367	1.258	1.270
1971	0.299	0.377	0.366	1.222	1.260
1972	0.312	0.367	0.367	1.175	1.174
1973	0.290	0.339	0.359	1.239	1.169
1974	0.280	0.366	0.344	1.230	1.308
1975	0.280	0.356	0.344	1.230	1.274
1976	0.279	0.312	0.344	1.230	1.116
1977	0.279	0.328	0.344	1.231	1.173
1978	0.280	0.342	0.350	1.251	1.225
1979	0.279	0.337	0.348	1.244	1.208
1980	0.279	0.337	0.348	1.244	1.207

Sources: Derived from the Appendix, Table 17, which is based on Robert E. Baldwin, *Foreign Trade Regimes and Economic Development: The Philippines* (New York: National Bureau of Economic Research, 1975); and Kunio Senga, "A Note on Industrial Policies and Incentive Structures in the Philippines: 1949-80," *Philippine Review of Economics and Business* 20 (September-December 1983): 299-305.

Notes: TX is traditional exports; NEC is nonessential consumer good imports; NX is new imports; and EC is essential consumer good imports.

of the domestic (farm-gate or wholesale) price of commodity i relative to k (the reference commodity) after taking into account the accompanying changes in the foreign prices of the two commodities. Hence, RPR_{ik} represents a measure of the extent to which the production of commodity i is being favored (or discriminated against), relative to commodity k, by domestic price policy.

Coconut and rice are used as the reference commodities for the traditional export and import-competing categories, respectively. As before, the foreign price is represented by the unit values of exports (f.o.b.) and imports (c.i.f.). The domestic price is represented either by the wholesale price in Manila or the farm-gate price. Although the latter is more appropriate for comparing production incentives, it has the disadvantage of being farther away (vis-à-vis the wholesale price) from the relevant point in the marketing chain.[42]

It is evident from Table 9 that the two sets of RPR_{ij} values, based alternatively on wholesale and farm-gate prices, have some significant differences. The wholesale-price-

[42] Data limitations preclude adjustment for marketing margin.

Table 8—Average effective exchange rate ratios (EER_i/EER_j)

Commodity	1950-59	1960-69	1970-80
Coconut (TX)	0.976	0.966	1.070
Sugar (TX)	1.030	1.036	0.963
Pineapple (TX)	1.118	0.907	1.031
Tobacco (TX)	0.829	0.654	0.548
Abaca (TX)	1.008[a]	1.013	1.013
Rice (EC)	. . .	1.078	0.890
Corn (EC)	. . .	0.754	1.093

Sources: Basic data are from Central Bank of the Philippines, *Statistical Bulletin,* various issues; Robert E. Baldwin, *Foreign Trade Regimes and Economic Development: The Philippines* (New York: National Bureau of Economic Research, 1975); and Kunio Senga, "A Note on Industrial Policies and Incentive Structures in the Philippines: 1949-80," *Philippine Review of Economics and Business* 20 (September-December 1983): 299-305.

Note: EER_i/EER_j denotes the ratio of the effective exchange rate for commodity i (coconut, . . . , corn) to that for commodity category j (= TX, EC), which includes i; TX denotes traditional exports and EC essential consumer goods.

[a] Based on data for 1950 and 1955.

based estimates indicate that, on the whole (referring to the entries in the second to the last column), only tobacco was not favored by domestic price policies relative to coconut, and that corn was slightly discriminated against vis-à-vis rice. However, based on farm-gate prices (last column of the table), one finds that, in addition to tobacco, there was also significant price discrimination against pineapple. Furthermore, corn was heavily favored over rice. It would appear therefore that some of the relative price effects of the trade regime at the wholesale market were not transmitted fully to the farmer.

There are nonetheless some common qualitative inferences that can be made from the two sets of RPR_{ij} values. One is that, throughout 1950-80, tobacco growers suffered more from domestic price policies than coconut producers. The other traditional export product that declined in importance over the years, abaca, was neither penalized nor favored more heavily than coconut. Finally, as can be seen from the last row of Table 9, the price effect of the trade regime that favored rice over corn in the 1960s was reversed in the 1970s.

Relationship Between Farm-Gate and Wholesale Prices

The analysis above uses wholesale prices in Manila and the farm-gate prices of individual commodities to represent domestic prices. For comparison with border prices (representing foreign prices), Manila wholesale prices seem the most appropriate of available domestic price data sets, inas-

Table 9—Relative price ratios (RPR_{ij}), 1950-80

Commodity	1950-59		1960-69		1970-80		1950-80	
	World Price	Farm-gate Price	World Price	Farm-gate Price	World Price	Farm-gate Price	World Price	Farm-gate Price
j = coconut								
i = sugar	1.055	1.340	1.072	0.826	0.900	1.194	1.005	1.122
pineapple	1.145	0.648	0.939	0.366	0.964	0.826	1.014	0.620
tobacco	0.857	0.598	0.677	0.427	0.512	0.978	0.677	0.593
abaca	1.033[a]	0.940[a]	1.049	0.806	0.947	0.926	1.008	0.892
j = rice								
i = corn	. . .	. . .	0.700	0.822	1.228	2.231	0.977[b]	1.560[b]

Sources: Basic data are from Philippines, National Economic and Development Authority, *Philippine Statistical Yearbook* (Manila: NEDA, 1975, 1982, and 1985); and Central Bank of the Philippines, *Statistical Bulletin,* various issues.

Note: $RPR_{ij} = (P_i/P_j)/(P_i^*/P_j^*)$, where P and P* denote domestic (wholesale or farm-gate) and border prices, respectively.

[a] Based on data for 1950 and 1955.

[b] Based on 1960-80 data.

much as Manila is the country's principal port. As indicated above, however, the farm-gate price is most relevant to agricultural producers. Farmers are expected to respond to changes in farm-gate prices, which, as pointed out earlier, do not appear to correspond closely to the movements of wholesale prices, at least for some commodities. The empirical relationship between farm-gate and wholesale prices of the major agricultural products for which data are available are examined more systematically in the following.

By definition,

$$P_w = P_f + M, \qquad (7)$$

where P_w and P_f are the wholesale and farm-gate prices, respectively, and M is the marketing margin. Logarithmic differentiation leads to the following expression for the proportionate change in the farm-gate price:

$$\hat{P}_f = (P_w/P_f)\hat{P}_w - (M/P_f)\hat{M}, \qquad (8)$$

where the hat (ˆ) above a variable denotes proportionate change.

Suppose that the marketing margin changes with the wholesale price as follows:

$$\hat{M} = a + b\hat{P}_w, \qquad (9)$$

where a and b are constants. Substitution into equation (8) yields

$$\hat{P}_f = -aM/P_f + c\hat{P}_w, \qquad (10)$$

where $c = (P_w/P_f - bM/P_f)$.

Because $(P_w/P_f - bM/P_f) = 1$ from equation (8), the coefficient c, which indicates the percentage change in the farm-gate price due to a 1 percent change in the wholesale price, will be greater or less than one as b is less or greater than one. Therefore, if the elasticity of the farm-gate price with respect to the wholesale price is less than unity ($c<1$), one would expect the marketing margin to increase or decrease at a faster rate than the wholesale price. For instance, if over a specified period the wholesale price increased, $c<1$ would imply that the marketing margin increased even more. One should also note that the special case of $c = 0$ arises when $b = P_w/M$.

Estimates of c can be derived for the major agricultural products by regressing log P_f on log P_w, using annual data for 1950-69[43] and 1970-80. The need to distinguish between the two periods is warranted by the increased government participation in the marketing of agricultural products and the more rapid rise in oil prices (and hence transport costs) during the 1970s.[44]

Except for rice and corn in the pre-1970 period, the coefficient estimates are less than one (Table 10), which suggests that

Table 10—Coefficient estimates in the regression of log P_f on log P_w

Commodity	1950-69	1970-80
Rice	1.047[a]	0.870
	(0.162)	(0.042)
Corn	1.012[a]	0.956
	(0.142)	(0.265)
Coconut	0.969	0.591
	(0.091)	(0.163)
Sugar	0.499	0.308[b]
	(0.121)	(0.255)
Pineapple	0.791	0.833
	(0.186)	(0.277)
Tobacco	0.762	0.998
	(0.260)	(0.002)
Abaca	0.651	0.976
	(0.205)	(0.242)

Notes: P_f and P_w are farm-gate and wholesale prices, respectively. Numbers in parentheses are standard errors of coefficient estimates.
[a] The observation period is 1960-69 for this commodity.
[b] The coefficient is not statistically significant at the 5 percent level.

[43] Because of data limitations, the subperiod 1960-69 is used for rice and corn.

[44] It should also be noted that a few agricultural products in the wholesale market have already undergone some processing, for example, milled rice, centrifugal sugar, and canned pineapple. The cost of such processing needs to be interpreted as part of the marketing margin as defined in equation (7).

the marketing margin increased as a proportion of the wholesale price. Alternatively stated, price increases in the wholesale market were not fully transmitted to the farm gate. The coefficient estimates show higher values for pineapple, tobacco, and abaca in 1970-80, indicating a stronger link between farm-gate and wholesale prices (presumably due to the reduced reliance on foreign markets). In each of the remaining commodities, the marketing role of the government increased significantly during the 1970s. The coefficient values for the country's principal food crops—rice and corn—declined slightly, which may reasonably be attributed to the increased transport cost occasioned by the higher real price of fuel. For the two major export crops, however, the sharp decline in the coefficient from 1950-69 to 1970-80 indicates the extent to which the marketing margin had increased, relative to the wholesale and farm-gate prices, beyond what can be reasonably attributed to higher transport costs. This would seem to support the view that coconut and sugarcane farmers were effectively taxed in the 1970s, not only by domestic pricing policies but also by the increased government intervention in marketing those products (see Chapter 4).

6

EFFECTS ON RELATIVE INCENTIVES BETWEEN TRADABLE AND HOME GOODS

This chapter investigates the extent to which the foreign trade regime in the Philippines has affected the relationship between tradable and home goods prices. An analytical discussion is first given that examines the general equilibrium effects of trade policy on the structure of domestic prices among exportables, importables, and home goods. This is followed by a statistical estimation of the incidence equations linking the domestic price of exportables relative to home goods to the domestic price of exportables relative to importables, the latter directly influenced by trade policy. The estimation results provide the basis for representing quantitatively the indirect price effects of the trade regime. As in the preceding chapter, special attention is given to the effects on agricultural production incentives.

Analytical Framework

In the simple model of a small economy in which three goods are produced, namely, exportables, importables, and home goods, trade policy directly affects the domestic price of exportables relative to importables, which in turn affects the domestic price of exportables relative to home goods. If foreign trade is in balance, the equilibrium properties of the model can be analyzed in terms of the equilibrium in the home goods market.[45] This approach is used in deriving the equilibrium price relationships among the three goods. For subsequent application to Philippine data, two classes of exportables are distinguished: traditional agricultural export products and other exports.

The domestic price ratios among exportables, importables, and home goods are indicators of relative incentives to producers and at the same time of relative costs to consumers. These relative price variables, therefore, determine the supply of and demand for each of the three commodity categories at any given time.

The demand and supply functions for home goods can be represented by

$$D_h = D_h(P_m/P_h, P_x/P_h, Z_h), \qquad (11)$$

and

$$S_h = S_h(P_m/P_h, P_x/P_h, C_p), \qquad (12)$$

where

D_h = demand for home goods,
S_h = supply of home goods,
P_m = domestic price of importable goods,
P_x = domestic price of exportable goods,
P_h = domestic price of home goods,
Z_h = total expenditure in terms of home goods, and
C_p = productive capacity of the economy, determined by the existing domestic resources and technology.

The activity variables Z_h and C_p are expected to change over time. They are usually assumed to be fixed, however, in a compar-

[45] See Rudiger Dornbusch, "Tariffs and Nontraded Goods," *Journal of International Economics* 4 (1974): 177-185; Larry A. Sjaastad, "Commercial Policy, 'True' Tariffs, and Relative Prices," in *Current Issues in Commercial Policy and Diplomacy*, ed. John Black and Brian Hindley (New York: St. Martin's Press, 1980), pp. 26-51; and Jorge Garcia Garcia, *The Effects of Exchange Rates and Commercial Policy on Agricultural Incentives in Colombia: 1953-1978*, Research Report 24 (Washington, D.C.: International Food Policy Research Institute, 1981).

ative static analysis of price effects. Differentiating equations (11) and (12) while holding Z_h and C_p constant yields

$$\hat{D}_h = \varepsilon_m(\hat{P}_m - \hat{P}_h) + \varepsilon_x(\hat{P}_x - \hat{P}_h), \quad (13)$$

and

$$\hat{S}_h = \eta_m(\hat{P}_m - \hat{P}_h) + \eta_x(\hat{P}_x - \hat{P}_h), \quad (14)$$

where ε_m and ε_x are the demand elasticities for home goods with respect to the relative prices of importables and exportables, respectively; η_m and η_x are the corresponding supply elasticities; and the hat $(\hat{\cdot})$ over a variable denotes a proportionate change.

Setting $\hat{D}_h = \hat{S}_h$ to examine the comparative static properties of the model,

$$\theta_m(\hat{P}_m - \hat{P}_h) + \theta_x(\hat{P}_x - \hat{P}_h) = 0, \quad (15)$$

where $\theta_m = \varepsilon_m - \eta_m$ and $\theta_x = \varepsilon_x - \eta_x$.

Therefore,

$$[\theta_m(\hat{P}_m - \hat{P}_x) + \theta_m(\hat{P}_x - \hat{P}_h)] + \theta_x(\hat{P}_x - \hat{P}_h) = 0,$$

and hence

$$\hat{P}_x - \hat{P}_h = \omega(\hat{P}_x - \hat{P}_m), \quad (16)$$

where $\omega = \theta_m/(\theta_m + \theta_x)$. Equation (16) is a necessary relationship among the domestic prices of exportables, importables, and home goods when the economy is displaced, in a comparative static sense, from one equilibrium state to another. Note that ω is positive and less than one if $\theta_m, \theta_x > 0$; that is, the cross-price elasticities of *excess* demand for home goods are positive.[46] Also, the incidence parameter ω will be greater the higher (lower) is the degree of substitutability in consumption and production between home goods and importables (exportables). For any given change in P_x and P_m due, for example, to changes in trade and exchange rate policies, ω determines uniquely the induced change in the domestic price of exportables relative to home goods.

Equation (16) can be transformed into an expression for the real exchange rate, defined as the ratio of the nominal exchange rate R to the price of home goods. Using the expressions for P_x and P_m given in equations (2) and (3) in the preceding chapter,

$$\hat{P}_x = \hat{T}_x + \hat{R} + \hat{P}_x^*, \quad (17)$$

and

$$\hat{P}_m = \hat{T}_m + \hat{R} + \hat{P}_m^*. \quad (18)$$

When $\hat{P}_x^*, \hat{P}_m^* = 0$ and equations (17) and (18) are substituted into equation (16) to eliminate P_x and P_m, then

$$\hat{R} - \hat{P}_h = -[\omega\hat{T}_m + (1 - \omega)\hat{T}_x], \quad (19)$$

which shows explicitly the effect of trade policy, represented by T_m and T_x, on the real exchange rate, under the assumption of unchanged foreign prices.

It follows that

$$\hat{P}_m - \hat{P}_h = -(1 - \omega)(\hat{T}_x - \hat{T}_m), \quad (20)$$

and

$$\hat{P}_x - \hat{P}_h = \omega(\hat{T}_x - \hat{T}_m), \quad (21)$$

which indicates explicitly the effects of trade restrictions on the domestic prices of importables and exportables relative to home goods.

Distinguishing between agricultural and nonagricultural export goods, equation (17) can be modified to yield

$$\theta_m(\hat{P}_m - \hat{P}_h) + \theta_{ax}(\hat{P}_{ax} - \hat{P}_h) + \theta_{nx}(\hat{P}_{nx} - \hat{P}_h) = 0, \quad (22)$$

where P_{ax} and P_{nx} are the domestic prices of agricultural and nonagricultural export

[46] As pointed out by Dornbusch, this condition does not require that home goods and tradable goods are substitutes both in production and in demand, or that exportables and importables are necessarily substitutes or complements (Dornbusch, "Tariffs and Nontraded Goods").

products, respectively, and $\theta_{ax} = \varepsilon_{ax} - \eta_{ax}$ and $\theta_{nx} = \varepsilon_{nx} - \eta_{nx}$, the θ's, ε's, and η's being defined as before but in reference to the two classes of export goods.

Let $\omega_m = \theta_m/\theta$, $\omega_{ax} = \theta_{ax}/\theta$, and $\omega_{nx} = \theta_{nx}/\theta$, where $\theta = \theta_m + \theta_{ax} + \theta_{nx}$. Equation (20) can then be written

$$\hat{P}_h = \omega_m \hat{P}_m + \omega_{ax} \hat{P}_{ax} + \omega_{nx} \hat{P}_{nx}, \quad (23)$$

or

$$\hat{P}_{ax} - \hat{P}_h = \omega_m(\hat{P}_{ax} - \hat{P}_m) + \omega_{nx}(\hat{P}_{ax} - \hat{P}_{nx}). \quad (24)$$

Equation (23) expresses $\hat{P}_h$ as a weighted average of the proportionate changes in the domestic prices of the three categories of tradable goods. In equation (24) the domestic price of agricultural export products relative to home goods is seen to depend first on the structure of domestic prices among the three classes of tradable goods, and second, on the incidence parameters ω_m and ω_{nx}.

Analogous to equations (19), (20), and (21), the effects of trade restrictions on the real exchange rate and the relative prices of the three classes of tradable goods (relative to home goods) can be explicitly shown as

$$\hat{R} - \hat{P}_h = -[\omega_m \hat{T}_m + \omega_{nx} \hat{T}_{nx} + (1 - \omega_m - \omega_{nx})\hat{T}_{ax}], \quad (25)$$

$$\hat{P}_m - \hat{P}_h = \omega_{nx}(\hat{T}_{ax} - \hat{T}_{nx}) - (1 - \omega_m)(\hat{T}_{ax} - \hat{T}_m), \quad (26)$$

$$\hat{P}_{nx} - \hat{P}_h = \omega_m(\hat{T}_{ax} - \hat{T}_m) - (1 - \omega_{nx})(\hat{T}_{ax} - \hat{T}_{nx}), \quad (27)$$

and

$$\hat{P}_{ax} - \hat{P}_h = \omega_m(\hat{T}_{ax} - \hat{T}_m) + \omega_{nx}(\hat{T}_{ax} - \hat{T}_{nx}), \quad (28)$$

where $\hat{T}_{ax} = 1 - t_{ax}$, $t_{nx} = 1 - t_{nx}$, and t_{ax} and t_{nx} are the implicit tax rates of agricultural and nonagricultural exports, respectively.

Estimating the Incidence Equations

Available price data permit a disaggregation of export goods into the traditional agricultural export products and other exports, but not a disaggregation of import goods into the exchange control categories (including nonessential consumer goods). This is the underlying reason for having only an aggregate P_m variable in the analytical discussion above. In applying them to Philippine data, P_{ax} is defined as index of the domestic prices of traditional agricultural export products and P_{nx} as the index of domestic prices of other export goods.[47] To represent the price of home goods (P_h), a weighted average of the Central Bank wholesale price index for "locally produced commodities for home consumption" and the two consumer price index components for housing and services are calculated.[48] Each of these price indexes suffers from the usual index number problem, including deficiencies of coverage and in measuring quality changes. The problem is particularly severe in the case of the commodities component of the price index of home goods because its composition could have been affected by the observed changes in the protection structure from the 1950s to the 1970s. However, to exclude this component entirely from P_h

[47] Using wholesale price data from the Appendix, Table 20, P_{ax} is calculated as the weighted average (based on 1965 export value shares) of the wholesale price indexes for the five major agricultural export products. P_{nx} can then be computed,

$$s_{ax} P_{ax} + (1 - s_{ax}) P_{nx} = P_x,$$

where P_x is the aggregate domestic export price index and s_{ax} (= 0.601) is the export value share of agricultural products in 1965. The annual values of P_{ax} and P_{nx} so calculated are given in the Appendix, Table 22.

[48] The weights used are based on the value added shares computed from the aggregated 12-sector input-output transaction table for 1965.

would be quite unrealistic in the Philippine context.[49]

It should be remembered that the analysis is based on comparative statics, assuming that total expenditure (Z_h) and productive capacity (C_p) remain constant. Using historical data invalidates this assumption, warranting the inclusion of Z_h and C_p as shift variables in the regression equation. However, because they are highly correlated, only C_p is included, represented by real GNP, in both the aggregative and disaggregative specifications. Also, since equations (16) and (24) represent domestic price relationships when external trade is in balance, a balance-of-trade variable (BOT) is included, defined as the ratio of the trade balance (exports minus imports) to exports, as an additional explanatory variable in each of the estimating equations. Lastly, serial correlation of the error terms appears to be significant in the initial regressions for each equation; the Cochrane-Orcutt iteration technique is used to correct for first-order autocorrelation.

The estimation results for the aggregative equation (expressed in natural logarithms), including specifications with and without C_p and BOT, are:[50]

$$\log P_x/P_h = \underset{(-0.15)}{-0.005} + \underset{(9.25)}{0.858}\log P_x/P_m + \underset{(5.50)}{0.323}\log C_p + \underset{(2.21)}{0.095}\,BOT, \qquad (29)$$

$$\bar{R}^2 = 0.941, \quad \rho = 0.637;$$

$$\log P_x/P_h = \underset{(-0.16)}{-0.032} + \underset{(9.23)}{0.846}\log P_x/P_m + \underset{(2.87)}{0.121}\,BOT, \qquad (30)$$

$$\bar{R}^2 = 0.930, \quad \rho = 0.959;$$

and

$$\log P_x/P_h = \underset{(-0.48)}{-0.107} + \underset{(8.44)}{0.873}\log P_x/P_m, \qquad (31)$$

$$\bar{R}^2 = 0.911, \quad \rho = 0.961.$$

Each of the coefficient estimates is statistically highly significant, and more than 90 percent of the variance of the dependent variable is explained. The estimates of the incidence parameter (coefficient of $\log P_x/P_m$) are seen to lie within a narrow range from 0.846 to 0.873, indicating robustness across different specifications. It may be inferred that, in the Philippine case, trade and exchange rate policies biased against exportables relative to import-competing production have also tended to reduce substantially the relative incentive to produce export goods vis-à-vis home goods.

Considering only traditional agricultural exports, the estimated equation is

$$\log P_{ax}/P_h = \underset{(2.12)}{0.081} + \underset{(7.04)}{0.659}\log P_{ax}/P_m + \underset{(4.08)}{0.412}\log P_{ax}/P_{nx} + \underset{(4.94)}{0.298}\log C_p + \underset{(2.61)}{0.127}\,BOT, \qquad (32)$$

$$\bar{R}^2 = 0.986, \quad \rho = 0.745.$$

Again the statistical goodness of fit is excellent. Other things remaining the same, a 10 percent rise in the domestic price of importables (for example, due to tariffs) is associated with a 6.6 percent decline in the domestic price of agricultural export products relative to home goods. On the other

[49] This is in view of the significant share of domestic products that enjoy natural protection from foreign competition due to prohibitive marketing cost, as reflected in the lack of response of the domestic price to foreign price changes. See Ma. Cecilia T. Gonzalez, "Money, Nontraded Goods, and Devaluation: The Experience of the Philippines, 1967-1983," University of California, Berkeley, May 1985 (mimeographed).

[50] Ordinary Least Squares estimation was used on annual data for the period 1950-76. Numbers in parentheses are t-values of the coefficient estimates.

hand, a 10 percent increase in the domestic price of other export products (for example, due to subsidies to industrial exports) leads to a 4.1 percent fall in the price of agricultural export goods relative to home goods.

It is necessary to point out that the estimated values of the incidence parameters represent the average values over the entire observation period. While statistical tests for differences in subperiod estimates can easily be done, it is not clear that such an exercise is desirable in the absence of an a priori judgment on the directions in which the underlying supply and demand elasticities might change from one subperiod to the next.

Aggregative Price Effects on Exportables and Importables

Based on the estimated values of the incidence parameters, the extent to which the domestic prices of tradable goods relative to home goods were affected by the foreign trade regime during 1950-80 can be quantified. In considering the price effects at the aggregate level, equations (20) and (21) imply that

$$\log RPR_{mh} = (1 - \omega)(\log T_m - \log T_x), \quad (33)$$

and

$$\log RPR_{xh} = -\omega(\log T_m - \log T_x), \quad (34)$$

where $RPR_{mh} = (P_m/P_h)/(P_m^*/P_h^*)$ and $RPR_{xh} = (P_x/P_h)(P_x^*/P_h^*)$, the asterisk (*) denoting the price under an unbiased trade regime, that is, when the implicit tariff and export tax rates are zero (T_m, $T_x = 1$).

The relative price ratios RPR_{mh} and RPR_{xh} indicate the direction and magnitude of the price effects of trade policy (represented by T_m and T_x) on importables and exportables relative to home goods. A value of unity for either measure implies a neutral price effect. It should be emphasized that the price effects embodied in these two measures are of a comparative static nature, assuming an adjustment period long enough for the direct and indirect effects of trade policy to work themselves out within the general equilibrium framework described earlier.

The calculated annual values of RPR_{mh} and RPR_{xh} are given in the first two columns of Table 11.[51] The effect of trade policy on production incentives for importables relative to home goods is consistently positive ($RPR_{mh}>1$), and consistently negative on production incentives for exportables ($RPR_{xh}<1$). It would appear that trade restrictions effectively pushed up the relative price of importables vis-à-vis home goods by an average of 14.5 percent during the 1950-61 period of direct controls, by 7.5 percent from 1962 to 1969, and by 2.6 percent during 1970-80. On the other hand, the domestic price of exportables relative to home goods was being reduced by 58.7 percent, 35.5 percent, and 14.1 percent during those three periods. These observations imply that the incentive bias of the foreign regime against home goods relative to importables decreased significantly over the entire period, and that the bias in favor of home goods relative to exportables was reduced even more significantly.

Differential Incentive Effects Based on Disaggregate Incidence Parameters

Distinguishing between traditional agricultural exports and other exports, the estimated incidence parameters in equation (29) can be used to evaluate the policy-induced relative incentive effects. Analogous to (33) and (34), the following relationships can be derived from equations (26), (27), and (28).

[51] Estimation of the aggregative price effects (vis-à-vis home goods) of the foreign trade regime on importables (RPR_{mh}) and exportables (RPR_{xh}), as well as of the disaggregative price effects on agricultural exports (RPR_{axh}), and nonagricultural exports (RPR_{nxh}) involves the calculation of annual values of the "power" of the import tariffs and export taxes: $T_m (= 1 + t_m)$, $T_x (= 1 - t_x)$, $T_{ax} (= 1 - t_{ax})$, and $T_{nx} (= 1 - t_{nx})$, where the t's are the implicit tax rates. Appendix Table 23 presents the time series for each of the T's.

Table 11—Calculated values of relative price ratios between tradable and home goods, 1950-80

Year	RPR^{a}_{mh}	RPR_{xh}	RPR^{d}_{mh}	RPR_{nxh}	RPR_{axh}
1950	1.117	0.512	1.250	0.635	0.567
1951	1.123	0.497	1.264	0.621	0.554
1952	1.162	0.404	1.373	0.529	0.473
1953	1.149	0.479	1.321	0.566	0.488
1954	1.148	0.435	1.316	0.570	0.491
1955	1.148	0.446	1.303	0.582	0.501
1956	1.133	0.470	1.276	0.605	0.522
1957	1.141	0.451	1.298	0.586	0.505
1958	1.146	0.440	1.311	0.575	0.496
1959	1.149	0.431	1.325	0.564	0.490
1960	1.159	0.411	1.359	0.539	0.476
1961	1.166	0.395	1.400	0.515	0.468
1962	1.082	0.620	1.178	0.718	0.671
1963	1.080	0.629	1.177	0.721	0.682
1964	1.080	0.629	1.178	0.720	0.682
1965	1.078	0.634	1.172	0.727	0.686
1966	1.077	0.638	1.170	0.730	0.689
1967	1.073	0.653	1.156	0.745	0.698
1968	1.060	0.705	1.121	0.791	0.740
1969	1.073	0.653	1.156	0.745	0.679
1970	1.045	0.767	1.034	0.975	0.767
1971	1.051	0.740	1.035	0.956	0.759
1972	1.043	0.775	1.046	0.924	0.787
1973	1.029	0.841	1.015	0.981	0.839
1974	1.006	0.967	0.923	1.133	0.866
1975	1.003	0.980	0.933	1.116	0.876
1976	1.022	0.879	1.017	0.972	0.871
1977	1.017	0.901	0.996	1.002	0.854
1978	1.019	0.894	0.993	1.000	0.812
1979	1.034	0.816	1.036	0.925	0.766
1980	1.020	0.886	1.005	0.979	0.812

Source: Basic data are from Central Bank of the Philippines, *Statistical Bulletin*, various issues.

Notes: The relative price ratio (RPR_{ih}) is defined as the actual relative price of a tradable good (i) to home goods (h) divided by the relative price under an unrestricted trade regime.

The subscripts denote the following product categories: m, importables; x, exportables; ax, agricultural (traditional) exports; nx, other exports; and h, home goods. The superscripts a and d indicate that the calculated RPR_{mh} was based on the aggregative and disaggregative estimates of ω, respectively.

Entries under the first and second columns are based on the aggregative estimates of the incidence parameters; those under the remaining columns are based on the disaggregative estimates.

$$\log RPR_{mh} = (1 - \omega_m)(\log T_m - \log T_{ax}) - \omega_{nx}(\log T_{nx} - \log T_{ax}), \quad (35)$$

$$\log RPR_{nxh} = (1 - \omega_{nx})(\log T_{nx} - \log T_{ax}) - \omega_m(\log T_m - \log T_{ax}), \quad (36)$$

and

$$\log RPR_{axh} = -\omega_m(\log T_m - \log T_{ax}) - \omega_{nx}(\log T_{nx} - \log T_{ax}), \quad (37)$$

where $RPR_{mh} = (P_m/P_h)/(P^*_m/P^*_h)$, $RPR_{nxh} = (P_{nx}/P_h)/(P^*_{nx}/P^*_h)$, and $RPR_{axh} = (P_{ax}/P_h)/(P^*_{ax}/P^*_h)$ are the relative price ratios between each tradable good category (m = importables, ax = traditional agricultural export products, nx = other export goods) and home goods.

As shown in the last three columns of Table 11, the calculated values of the relative price ratios generally indicate that significant disincentives were given to the production of traditional agricultural exports, and to a lesser extent, of nontraditional (manufactured and agricultural) export products. On the other hand, domestic production of import-competing goods appears to have been favored over home goods, at least until the early 1970s.

A declining trend is evident from each of the two sets of RPR_{mh} values based on the aggregative and disaggregative incidence parameters (shown respectively in the first and third columns of the table). However, one finds the annual values in the latter time series decreasing more sharply, starting at comparatively higher values in the 1950s and coming down to generally lower values in the 1970s. Such comparison suggests the size of the aggregation error if the two classes of exportables were not distinguished.

The last two columns of Table 11 document differences in the incidence of trade policy on traditional and new export products over the three decades. The marked improvement in RPR_{nxh} values is evident from the following averages: 0.574 during 1950-61; 0.737 during 1962-69; and 0.997 during 1970-80. By contrast, traditional agri-

cultural exports were more heavily penalized than new exports throughout the period. While the RPR_{axh} values show an increasing trend over the entire period, the average of 0.819 during 1970-80 still reflected a heavy bias against traditional agricultural exports at a time when general expansion of export capacity was being officially promoted by the government. This could explain, at least in part, the marked expansion of nontraditional exports, both agricultural and industrial, during the 1970s.

7

THE REAL EXCHANGE RATE AS AN INTERMEDIATE POLICY VARIABLE

Agricultural output in the Philippines has a high degree of tradability, given the dominance of export and import-competing products (see Chapter 3). Overvaluation of the domestic currency—or, to use a now standard terminology, an "overvalued exchange rate"—resulting from a protective trade regime acts as a tax on tradable goods, depressing their prices (in domestic currency terms) relative to home goods. This distorts the incentive structure and penalizes agriculture by encouraging resource movement toward home goods production. Because home goods are a larger part of nonagricultural than of agricultural production, the effect of exchange rate overvaluation on domestic relative prices also encourages a shift in resources toward nonagricultural production. The exchange rate, therefore, plays an intermediary role in transmitting the effects of trade policy on agricultural production incentives. As is discussed below, there are other trade-related influences on the exchange rate.

It is, of course, the real exchange rate, rather than the nominal exchange rate (which the government can control directly), that is relevant in the assessment of the relative profitability of tradable goods. This chapter first discusses how the real exchange rate is defined and measured in the present study. After an examination of the behavior of the real exchange rate in the Philippines during the period 1950-84, the extent to which it has been affected by three major sources of real exchange rate misalignment is investigated.

The initial focus is on the distortionary effect of restrictive trade policy on the real exchange rate. Import restrictions that protect domestic industries, for example, lower industrial imports relative to their probable level in an unprotected market. This tends to overvalue the real exchange rate. The question to be addressed below is: What would have been the time profile of the real exchange rate had an unbiased foreign trade regime (that is, with zero implicit tariff and export tax rates) been adopted in the Philippines?

Another important policy concern relates to the sharp changes in the country's external terms of trade, particularly since the mid-1970s. The effect on the real exchange rate induced by the actual movements in the terms of trade from 1950 to 1984, making use of 1971 as the base year, is examined below. It is worth noting that the terms of trade index for 1971 closely approximates the average values over the longer periods 1970-72 and 1969-73. The year 1971 also seems appropriate as a benchmark period because it preceded the marked instability in international prices.

In view of the substantial trade deficits that characterized many years, especially after 1973, it is also of policy interest to investigate the extent to which such trade imbalances pushed down the real exchange rate (that is, overvalued the domestic currency), or pulled up the real exchange rate in those few years of trade surplus relative to what it would have been under balanced trade. The combined effects of the three sources of real exchange rate misalignment are analyzed in the final section of this chapter.

The Real Exchange Rate: Definition and Measurement

The real exchange rate can be broadly defined as the real worth of foreign exchange in terms of the domestic currency. Analytical discussions in which foreign prices are taken as given (as in the preceding chapter) typically represent the real exchange rate simply as a ratio of the nominal

exchange rate to a general price level of the small country in question. In empirical work that traces the movement of the real exchange rate over time, foreign prices cannot be assumed constant. Since the real worth of foreign exchange (for example, the U.S. dollar) in one year is not the same as in the next if foreign prices have changed, it is necessary to refer to a basket of goods whose price is a "real dollar." For present purposes, the real exchange rate is defined to represent, for a given year, the foreign price of tradable goods relative to home goods expressed in domestic currency; that is,

$$r = RP^*/P_h, \qquad (38)$$

where

r = real exchange rate;

R = nominal exchange rate in pesos per U.S. dollar;

P^* = index of foreign prices in U.S. dollars of tradable goods; and

P_h = index of home goods prices.

Movements of the real exchange rate can occur through movements of the nominal exchange rate, through movements of foreign prices (exogenous to the small country), or through movements of the general level of internal prices and costs (affecting the price index of home goods). Because domestic prices are affected by nominal exchange rate changes to an extent determined by the accompanying monetary and fiscal policies, there is no one-to-one correspondence between the nominal and real exchange rates. Also, as shown analytically in the preceding chapter, a more restrictive trade policy, other things remaining the same, leads to a lower value of the real exchange rate (that is, an appreciation of the domestic currency). There are, of course, other influences on the real exchange rate, as will be discussed below.

Annual values of two measures of the real exchange rate for 1950-84 are calculated in Table 12 and plotted in Figure 2. Two indicators of foreign price movements are used, based on: first, the simple average of the unit value indexes for exports and imports (in U.S. dollars)[52]; and second, the wholesale price indexes for the country's two principal trading partners, Japan and the United States, with adjustment for changes in their currencies' bilateral exchange rate.[53] The base year chosen is 1971, one year after the large devaluation that resulted from the floating of the nominal exchange rate, beginning in February 1970. A nearly balanced current account was achieved in that year. The year 1971 also preceded dramatic developments in the international economy, such as the world food crisis of 1972-73, the commodity boom of 1972-74, the oil price shocks of 1973-74 and 1979-80, and the drastic decline in world commodity prices in the early 1980s.

As can be seen from the time profiles shown in Figure 2, there are significant differences between the two measures of the real exchange rate in 1974 and 1979-80. This is explained by the sharp price increases in imported crude oil (on which the Philippines is highly dependent) in those years, which were not immediately reflected in the wholesale price indexes of Japan and the United States.

Both measures of the real exchange rate indicate relative stability in the 1950s, a period of fixed nominal exchange rates (see Table 12) and low domestic and foreign inflation rates. The trade liberalization measures implemented in 1962 and 1970, including the nominal exchange rate adjustments, seem to have effectively brought about an immediate *real* devaluation. In the 1962 case, the favorable impact appears to have been slightly

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[52] This indicator is used in, for example, Power, "Response to Balance of Payments Crises in the 1970s."

[53] Japan and the United States each accounted for about one-third of the total value of Philippine exports and imports during 1950-84, other trading partners contributing less than 5 percent. The foreign price index was calculated as: $P^* = (WPI_x \cdot r_x WPI_j)/2$, where WPI_x and WIP_j are the wholesale price indexes for the United States and Japan, respectively, and r_x is an index of the U.S. dollar per yen exchange rate (see the Appendix, Table 24). Including minor trading partners in the calculation did not significantly change the time profile of the foreign price index.

Table 12—Calculation of the real exchange rate, 1950-84

Year	Nominal Exchange Rate R	Price Index for Home Goods P_h	Foreign Price Index		Real Exchange Rate	
			P_1^*	P_2^*	r_1	r_2
	(P/U.S. $)				(P/U.S. $)	
1950	2.00	54.5	83.1	70.5	3.05	2.59
1951	2.00	56.5	90.5	81.6	3.21	2.89
1952	2.00	55.2	78.1	81.3	2.83	2.94
1953	2.00	55.0	86.3	81.1	3.14	2.95
1954	2.00	54.1	78.8	80.9	2.92	2.99
1955	2.00	53.7	74.8	80.3	2.79	2.99
1956	2.00	58.1	75.9	83.4	2.61	2.87
1957	2.00	57.0	77.5	85.8	2.72	3.01
1958	2.00	56.3	80.1	83.7	2.84	2.97
1959	2.00	55.9	84.7	84.1	3.03	3.01
1960	2.02	57.4	84.7	84.6	2.97	2.97
1961	2.02	59.0	81.2	84.9	2.78	2.91
1962	3.83	60.0	82.3	84.3	5.25	5.38
1963	3.91	62.5	87.2	84.8	5.45	5.30
1964	3.91	65.3	87.1	85.0	5.21	5.09
1965	3.90	67.1	88.6	86.2	5.15	5.02
1966	3.90	68.3	89.7	88.8	5.12	5.07
1967	3.90	71.7	91.4	89.6	4.97	4.87
1968	3.90	75.8	98.3	91.2	5.06	4.69
1969	3.90	76.8	99.3	93.9	5.04	4.77
1970	5.90	88.0	101.7	97.3	6.83	6.53
1971	6.43	100.0	100.0	100.0	6.43	6.43
1972	6.67	107.1	99.5	110.1	6.19	6.85
1973	6.76	121.4	136.6	133.5	7.61	7.43
1974	6.78	166.3	226.0	161.0	9.21	6.56
1975	7.25	182.6	205.1	168.7	8.14	6.70
1976	7.44	214.8	191.9	177.1	6.65	6.14
1977	7.40	224.2	205.1	194.2	6.77	6.41
1978	7.36	242.6	218.5	226.6	6.63	6.88
1979	7.38	291.4	251.8	242.6	6.38	6.15
1980	7.51	293.1	300.6	276.2	7.70	7.08
1981	7.90	335.0	317.9	293.8	7.50	6.93
1982	8.50	379.6	268.7	280.6	6.02	6.28
1983	11.10	413.6	274.6	286.2	7.37	7.68
1984	16.70	567.1	301.4	289.3	9.05	8.52

Sources: Basic data are from Central Bank of the Philippines, *Statistical Bulletin*, various issues; and International Monetary Fund, *International Financial Statistics* (Washington, D.C.: IMF, various years).

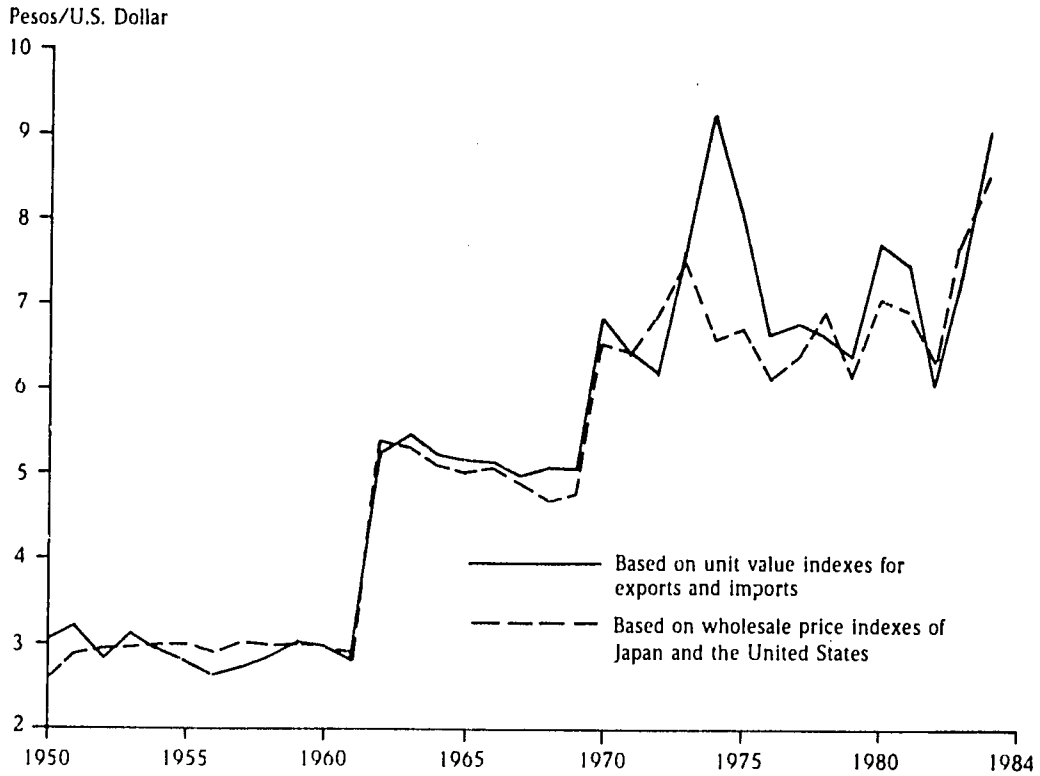
undercut subsequently by the differential changes in domestic and foreign prices. The real exchange rate gradually decreased until the end of the decade. On the other hand, the record since 1970 shows fluctuating values of the real exchange rate following the unstable foreign prices of the country's principal imports (crude oil) and traditional exports, with greater variability characterizing the real exchange rate measure based on the unit values of imports and exports.

In view of the strong correlation between the two measures of the real exchange rate (except in the atypical years of sharp changes in the price of oil imports), only the one based on the wholesale price indexes of the country's principal trade partners (that is, r_2 based on P_2^*) is used in this study.

Exchange Rate Distortion Due to Trade Restrictions

Under the assumption of trade balance, the real exchange rate was shown analyti-

Figure 2—Time profiles of the real exchange rate, 1950-84



Sources: Basic data are from Central Bank of the Philippines, *Statistical Bulletin,* various issues; and International Monetary Fund, *International Financial Statistics* (Washington, D.C.: IMF, various years).

cally in the preceding chapter to be influenced by trade policy, as represented by the implicit tariff and export tax rates, and by foreign prices. Holding constant the foreign prices of importables and exportables, equation (19) implies that

$$\log(r^u/r) = \omega\log(1 + t_m) + (1 - \omega)\log(1 - t_x), \quad (39)$$

where r^u is the real exchange rate associated with an unbiased or free (unrestricted) trade policy (t_m, $t_x = 0$). A measure of the distortion in the real exchange rate due to trade policy is given by the ratio r^u/r, which can be evaluated, using equation (39), given the incidence parameter and existing implicit tariff and export tax rates.

Distinguishing between the traditional agricultural export products and other exports, equation (25) leads similarly to

$$\log(r^u/r) = \omega_m\log(1 + t_m) + \omega_{nx}\log(1 - t_{nx}) + (1 - \omega_m - \omega_{nx})\log(1 - t_{ax}), \quad (40)$$

from which the exchange rate distortion index r^u/r can be calculated, given values of the incidence parameters ω_m and ω_{nx}, the implicit tariff rate t_m, and the implicit export tax rates t_{ax} and t_{nx} (as estimated in Chapters 5 and 6).

It is clear from the expressions for log (r^u/r) in equations (39) and (40) that trade restrictions in the form of tariffs and quotas on imports ($t_m > 0$), as well as subsidies on exports ($t_x < 0$) tend to lower the real exchange rate relative to its free trade value. Intuitively, an export subsidy (import tariff) raises the domestic price of exportables (importables), which encourages their domestic production and induces lower domestic consumption, leading to an increase in ex-

ports (a decrease in imports). Resources are reallocated toward the tradable goods sector away from home goods production. The reduced output of home goods results in an increase in their domestic price, which lowers the real exchange rate. Such overvaluation of the domestic currency, or, what is the same thing, the undervaluation of foreign exchange, cannot be eliminated by nominal exchange rate adjustment. It can be corrected only at its source, that is, by removing the trade restrictions (making t_x, $t_m = 0$).

The calculated annual values of r^u/r from 1950 to 1980, based on equations (39) and (40), are plotted in Figure 3. They are consistently greater than one, implying an overvalued exchange rate throughout the period due to trade policy. However, a generally declining trend is evident over the years in either measure of real exchange rate distortion. The largest deviation of the real exchange rate from the "unrestricted trade" value occurred in 1950-61, the period of import and foreign exchange controls. The index averaged 2.30 and 2.00, based on the aggregative and disaggregative incidence parameters. After decontrol and peso devaluation in the early 1960s, the real exchange rate distortion was reduced, the average values of the index computed at 1.56 and 1.44 during 1962-69. Finally, with nominal exchange rate flexibility and less restrictive trade policies during 1979-80, the corresponding average values of r^u/r are calculated to be 1.17 and 1.20.

Based on either set of estimates, the trade liberalization measures implemented in 1970 were effective in lowering the degree of exchange rate overvaluation through 1975, after which the index rose again, reaching a peak of 1.29 in 1979. Based on the 1978-80 average values, it would appear that the Philippine peso was overvalued by 22 to 24 percent due to trade restrictions toward the end of the decade.

Exchange Rate Effect of Changes in the Terms of Trade

Allowing foreign prices to change, one can transform equation (19) in the preceding chapter into the following expression for the proportionate change in the real exchange rate:

$$\hat{r} = \hat{R} + \hat{P}^* - \hat{P}_h = -\omega\hat{T}_m - (1-\omega)\hat{T}_x + (1-\omega-\beta)(\hat{P}^*_m - \hat{P}^*_x), \quad (41)$$

where

$$P^* = (P^*_x)^{\beta}(P^*_m)^{1-\beta} \quad (42)$$

is the foreign price index represented by a Cobb-Douglas aggregation of the foreign price indexes of exportables (P^*_x) and of importables (P^*_m), and β is the elasticity of P^* with respect to P^*_x (equivalently, the geometric weight of P^*_x in P^*).

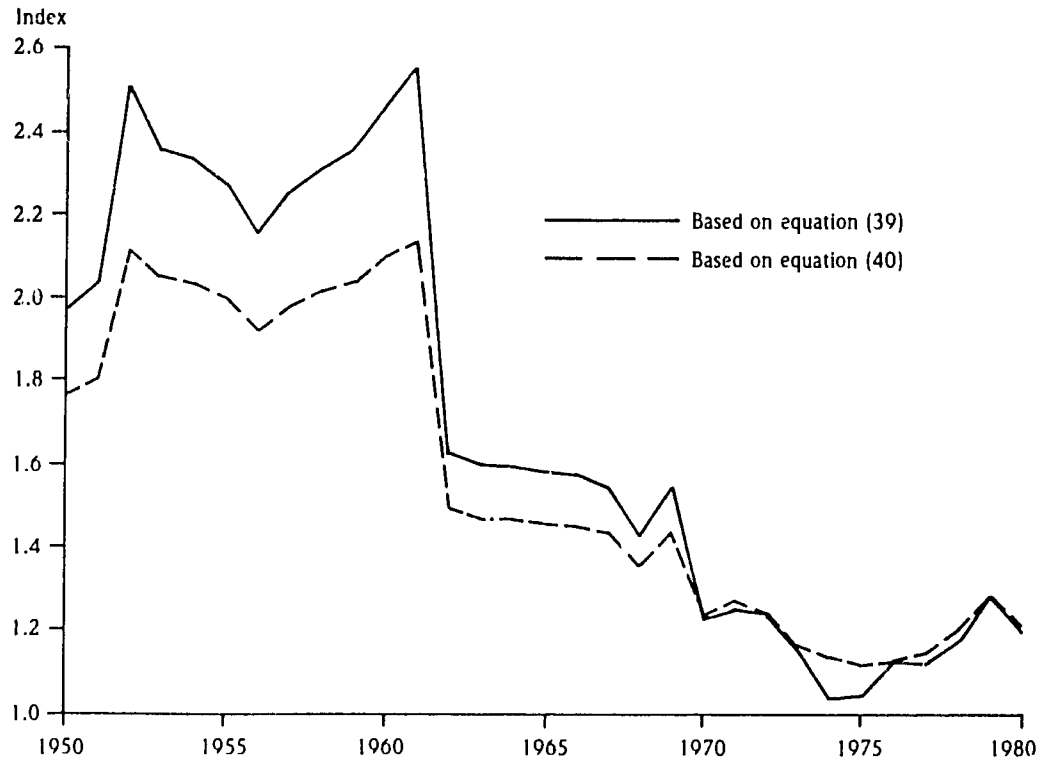
Other things remaining the same (including trade policy, so that $\hat{T}_m, \hat{T}_x = 0$), the effect of changes in the external terms of trade on the real exchange rate is seen from equation (41) to be determined by the coefficient $(1-\omega-\beta)$. An index of the terms-of-trade effect on the real exchange rate, r^t/r, can be defined therefore as

$$\log(r^t/r) = (1-\omega-\beta)(\log P^*_x/P^*_m - \log P^*_{xo}/P^*_{mo}), \quad (43)$$

where P^*_{xo}/P^*_{mo} is the base year terms of trade and r^t is the exchange rate with unchanging terms of trade. As with the other measures developed above, the index r^t/r is a comparative static measure, assuming constant total expenditure (income) and productive capacity of the economy.[54] It is clear from equation (41) that terms-of-trade movements can affect the real exchange rate positively or negatively, depending on the sizes of ω and β. Higher values of the incidence

[54] In effect, equation (43) captures only the substitution effect of a change in the terms of trade, but not the income effect, which tends to lower the real exchange rate if the terms of trade improve. See Alberto Valdés, "Impact of Trade and Macroeconomic Policies' Impact on Agricultural Growth: The South American Experience," in *Economic and Social Progress in Latin America: 1986 Report* (Washington, D.C.: Inter-American Development Bank, 1986), pp. 161-183.

Figure 3—Index of exchange rate distortion due to trade restrictions (r^u/r), 1950-80



Notes: Alternative values of the exchange rate distortion index, r^u/r, are calculated from equation (39),

$$\log(r^u/r) = \omega\log(1 + t_m) + (1 - \omega)\log(1 - t_x),$$

based on the aggregate incidence parameter ω, and from equation (40),

$$\log(r^u/r) = \omega_m\log(1 + t_m) + \omega_{nx}\log(1 - t_{nx}) + (1 - \omega_m - \omega_{nx})\log(1 - t_{ax}),$$

based on the disaggregate incidence parameters ω_m, ω_{ax}, and ω_{nx}.

parameter ω, reflecting greater substitutability between home goods and importables and of the elasticity β, reflecting greater influence of export prices on the foreign price index, make it more likely that $(1 - \omega - \beta)$ will be negative, and hence the effect on r will be positive; that is, an improvement in the terms of trade should lead to an appreciation of the real exchange rate.

In contrast with the index r^u/r, derived earlier, which reflects a domestic policy distortion (due to trade restrictions), there is no policy role in the determination of r^t/r because, under the small-country assumption, a country's external terms of trade are determined exogenously. However, terms-of-trade changes do get transmitted to the domestic price structure through the former's effect on the real exchange rate, which, as will be shown later, can have significant repercussions on agricultural production incentives.

To calculate the index r^t/r, β is first estimated by regressing $\log P^*/P_m^*$ on $\log P_x^*/P_m^*$, based on equation (42). Ordinary least squares applied to annual data from 1950 to 1984 yield a statistically significant estimate of $\beta = 0.582$. Using this and the earlier estimated value of the aggregate incidence parameter ($\omega = 0.858$), the index of exchange rate distortion due to terms-of-trade movements from the 1971 base year value can be estimated, based on equation (43).

The annual values of r^t/r, so calculated,

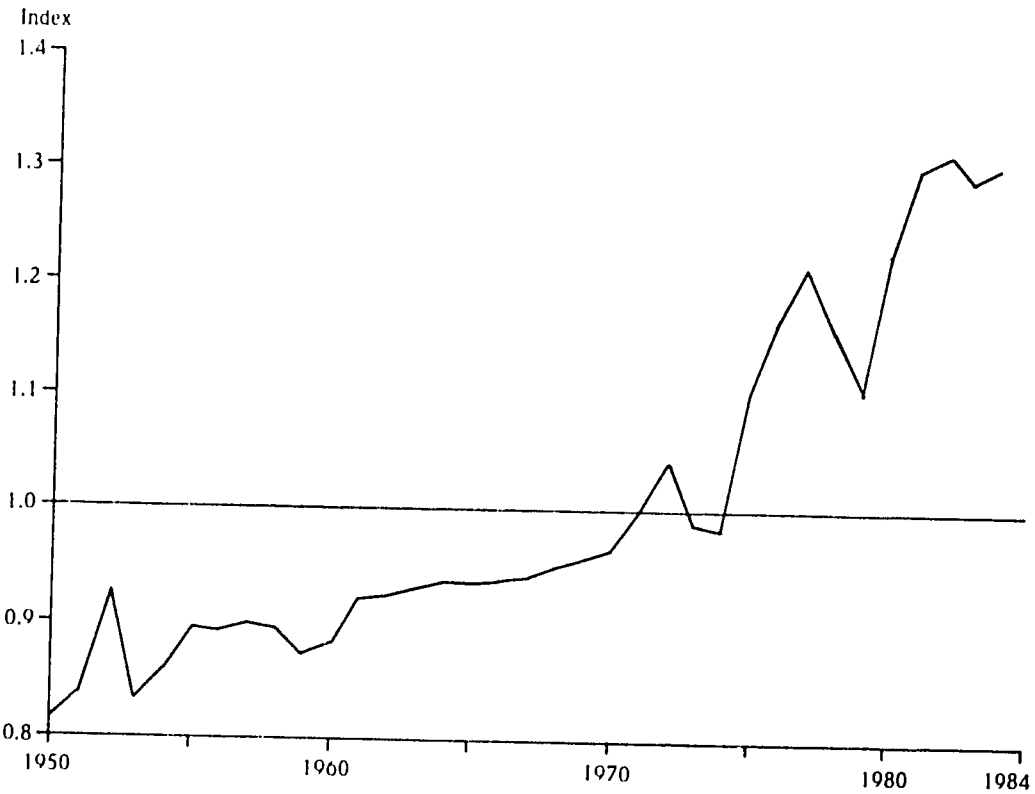
are shown in Figure 4. The country's generally deteriorating terms of trade are reflected in the steeply rising trend of the index. External terms-of-trade changes are seen to have significantly affected the real exchange rate in both directions. In the 1950s the real exchange rate would have been only 87 percent of the actual rate, on the average, had the terms of trade been the less favorable base period value. On the other hand, the deterioration of the country's terms of trade from 1975 to 1984 was such that the real exchange rate would have been higher by 22 percent had the terms of trade remained at the 1971 level.

Exchange Rate Distortion Due to Trade Imbalance

The effects of changes in trade policy and in the external terms of trade as measured by the indexes r''/r and r'/r are based on the induced movement of the economy from one static equilibrium situation to another. It may be recalled from the comparative static analysis in Chapter 6 that foreign trade is assumed to be always in balance. In fact, domestic policy can accommodate an imbalance in the external accounts, resulting in what can be called disequilibrium overvaluation (in the case of trade deficits) of the real exchange rate. For instance, a trade deficit in any given year can be financed by drawing down international reserves or by foreign borrowing and other forms of capital movements influenced by macroeconomic policies. This leads to an exchange rate that is overvalued relative to the exchange rate that would have prevailed without such accommodation.

An existing imbalance in the external accounts that is not sustainable distorts the exchange rate, artificially overvaluing or undervaluing the domestic currency. But what is "sustainable" is difficult to define. Ab-

Figure 4—Index of exchange rate distortion due to changes in terms of trade (r'/r), 1950-84



sence of "excessive" foreign borrowing and "adequate" international reserves are frequently invoked guideposts that, however, only beg the question. For present purposes, what is estimated is simply the degree to which the exchange rate is distorted by accommodation of the observed trade surplus or deficit in a given year.

As shown in the third column of Table 13, deficits in Philippine trade transactions seem to be the rule rather than the exception. The comprehensive system of import and foreign exchange controls during the 1950s apparently did not prevent substantial trade deficits from being incurred. In the three years preceding the 1970 peso devaluation, there was a resurgence of large deficits, averaging $270 million or close to one-third of the country's total export earnings. The trade deficits in the 1950s and 1960s were financed mostly through reserve drawdowns, eventually leading to a drastic reduction in international reserves toward the end of the decade (see the fourth column of Table 13). In the 1970s, accommodation of the massive deficits incurred after the first oil shock of 1973-74 was achieved through external financing. Indeed, there was an accumulation of foreign reserves, which in 1980 totaled $3.14 billion—more than three times the 1973 level of $1.04 billion.

The extent to which the exchange rate was distorted in a given year due to trade imbalance can be quantified using the following index:

$$\log(r^b/r) = T_d/(\varepsilon_x X - \eta_m M), \qquad (44)$$

where r^b is the real exchange rate under balanced trade; T_d, X, and M are the trade deficit, exports, and imports, respectively, in U.S. dollars; and ε_x and η_m are the price elasticities of export supply and import demand. Because equation (44) applies to the small-country case, foreign export demand and import supply are assumed to be perfectly elastic.[55] Based on the findings of an earlier study estimating export supply and import demand functions for the Philippines, $\varepsilon_x = 2.90$ and $\eta_m = -1.43$.[56]

The calculated annual values of r^b/r for 1950-84 are plotted in Figure 5. Had trade been balanced throughout the period, other conditions such as trade policy and the external terms of trade remaining the same, the real exchange rate would have been higher by 3.8 percent in the 1950s, on average, by 2.1 percent during 1960-74, and by as much as 8.0 percent in 1975-84. As indicated above, the latter period witnessed an unprecedented rate of foreign borrowing and expansion of external debt that eventually led to the foreign exchange crisis beginning in late 1983.

Overall Effects on the Real Exchange Rate

It is evident that the effects of trade restrictions, terms-of-trade changes, and trade imbalances on the real exchange rate are additive. Thus, in any given year, there could be an equilibrium exchange rate under existing tariffs and export taxes that is x percent below the equilibrium exchange rate under unrestricted trade with unchanged external terms of trade. With the same trade taxes, a terms-of-trade deterioration could have reduced the equilibrium exchange rate by an additional y percent. (Recall from equation (41) that the real exchange rate is expressed in terms of the trade tax and foreign price variables linearly in proportionate changes.) Finally, accommodation of the observed trade deficit by foreign borrowing or use of reserves could have supported an exchange rate that is z percent below the equilibrium rate. The overall effect of these

[55] For a derivation of an analogous expression for r^b/r when the price elasticity of foreign demand for the country's exports is not infinite, see Erlinda Medalla, "Estimating the Shadow Exchange Rate Under Alternative Policy Assumptions" in Bautista, Power, et al., *Industrial Promotion Policies in the Philippines*, pp. 79-111.

[56] Aggregate elasticity values were obtained by computing the weighted averages of the estimated export supply and import demand elasticities for various product categories. See Romeo M. Bautista, "Effects of Major Currency Realignment on Philippine Merchandise Trade," *Review of Economics and Statistics* 59 (May 1977): 152-160.

Table 13—Foreign trade indicators, 1950-84

Year	Exports	Imports	Trade Deficit	Total Reserves
		(U.S. $ million)		
1950	331	342	11	299
1951	427	489	62	248
1952	346	421	75	240
1953	398	452	54	244
1954	401	479	78	211
1955	401	548	147	155
1956	453	506	53	161
1957	431	613	182	71
1958	493	559	66	92
1959	530	524	−6	94
1960	560	604	44	127
1961	500	611	111	54
1962	556	587	31	75
1963	727	618	−109	109
1964	742	780	38	123
1965	769	808	39	193
1966	828	853	25	194
1967	822	1,062	240	180
1968	857	1,150	293	161
1969	855	1,132	277	121
1970	1,062	1,090	28	251
1971	1,136	1,186	50	376
1972	1,106	1,230	124	551
1973	1,886	1,597	−289	1,038
1974	2,725	3,143	418	1,504
1975	2,295	3,459	1,164	1,360
1976	2,573	3,634	1,061	1,042
1977	3,151	3,915	764	1,524
1978	3,425	4,732	1,307	1,881
1979	4,601	6,142	1,541	2,416
1980	5,788	7,727	1,939	3,140
1981	5,720	7,946	2,226	2,574
1982	5,021	7,667	2,646	1,711
1983	5,005	7,487	2,482	864
1984	5,391	6,070	679	1,090

Sources: Total reserves are taken from International Monetary Fund, *International Financial Statistics* (Washington, D.C.: IMF, various years); all others are from Philippines, National Economic and Development Authority, *Philippine Statistical Yearbook, 1985* (Manila: NEDA, 1985).

independent influences on the real exchange rate would then be (x + y + z) percent.

Accordingly, using earlier notation, a measure of the combined effects of trade restrictions, terms-of-trade changes, and trade imbalances on the real exchange rate is given by the "competitiveness index":

$$r^0/r = 1 + \sum_i \alpha_i, \qquad (45)$$

where

$$\alpha_i = (r^i/r) - 1;\ i = u, t, b \qquad (46)$$

is the contribution of each of the three influences to the proportionate differences between the actual exchange rate r and a hypothetical exchange rate r^0, the latter being associated with unrestricted trade, unchanged terms of trade, and balanced trade. This index can be interpreted to reflect the degree of price competitiveness in the production of tradable goods relative to home goods.

As pointed out above, terms-of-trade movements are an exogenous influence on the real exchange rate. Therefore, the policy-induced exchange rate distortion can be attributed only to the joint effects of trade restrictions and trade imbalance, represented by α_u and α_b using the above notation. Nonetheless, in the analysis of price competitiveness of the tradable goods sector, all three influences on the real exchange rate need to be taken into account.

Table 14 presents the annual values of α_i and r^0/r for 1950-80. Since two sets of r^0/r estimates have been derived above, there are also two alternative values of α_u and the overall index r^0/r for each year.

The first point to note is the consistent overvaluation of the Philippine peso (relative to the hypothetical exchange rate r^0) throughout the period, based on either measure of the competitiveness index. The degree of overvaluation differs significantly over time. Even with favorable external terms of trade in the 1950s, the distortionary effects of trade imbalance and, most dominantly, the heavily protective trade regime of direct controls on imports and foreign exchange resulted in a highly overvalued exchange rate. The index averaged 2.21 (Case A) and 1.91 (Case B) during 1950-61.

The decontrol program and nominal exchange rate adjustment in the early 1960s apparently reduced the real exchange rate overvaluation in a big way. Even so, the high and uneven tariff rates that replaced the system of import and exchange controls still represented a stringent penalty on tradable goods production. The average values of r^0/r from 1962 to 1969 are calculated at

Figure 5—Index of exchange rate distortion due to trade imbalance (r^b/r), 1950-84

1.53 (Case A) and 1.41 (Case B). It should be noted that, in view of the country's favorable terms of trade throughout the 1950s and 1960s, the observed overvaluation of the real exchange rate was entirely policy-induced.

It would appear that the first half of the 1970s constituted the least unfavorable period, from the viewpoint of price competitiveness, for producers of tradable goods. During 1970-74 the overall index of exchange rate effects, based on either measure, declined to an average of about 1.2. This is attributable to the confluence of favorable developments. Domestically, the Philippine peso depreciated markedly in nominal terms, resulting from the adoption of a floating exchange rate system beginning in February 1970. Selective subsidies to export production were introduced by the Export Incentives Act of 1970, which compensated in part for the still pervasive bias against exporting due to tariffs and indirect taxes. Also, the world commodity boom of 1972-74 pushed up the foreign prices of the country's principal exports and consequently the real exchange rate.

With the massive trade deficits, rapid terms-of-trade deterioration, and increasing trade restrictions in the later part of the decade, the real exchange rate overvaluation worsened. The competitiveness index during 1975-80 rose to almost the average of the 1960s (1.41 under Case A and 1.43 under Case B). Of the 41-43 percent disparity between r^0 and r, exogenous terms-of-trade movements accounted on average for 17 percent, leaving 24-26 percent as the joint contribution of the two policy-induced sources of exchange rate overvaluation. The latter in turn divides into the trade imbalance component, which is less than 8 percent, and the component due to restrictive trade policy, which is 16-18 percent.

It does not seem farfetched to infer from the above findings that the degree of real

Table 14—Index of overall exchange rate effects (r^o/r) and contributions of various sources, 1950-80

Year	α_u		α_t	α_b	Overall Index (r^o/r)	
	A	B			A	B
1950	0.974	0.764	−0.182	0.008	1.800	1.590
1951	1.031	0.804	−0.161	0.032	1.902	1.675
1952	1.501	1.116	−0.073	0.048	2.476	2.091
1953	1.355	1.049	−0.168	0.030	2.217	1.911
1954	1.333	1.035	−0.141	0.043	2.235	1.937
1955	1.274	0.995	−0.107	0.078	2.245	1.966
1956	1.158	0.916	−0.109	0.026	2.075	1.833
1957	1.252	0.980	−0.101	0.089	2.240	1.968
1958	1.308	1.017	−0.107	0.030	2.231	1.940
1959	1.353	1.040	−0.130	−0.003	2.220	1.907
1960	1.461	1.099	−0.117	0.018	2.362	2.000
1961	1.557	1.137	−0.078	0.049	2.528	2.100
1962	0.623	0.490	−0.075	0.013	1.561	1.428
1963	0.599	0.466	−0.069	−0.036	1.494	1.361
1964	0.600	0.467	−0.062	0.012	1.550	1.417
1965	0.584	0.457	−0.063	0.012	1.533	1.406
1966	0.575	0.451	−0.061	0.007	1.521	1.397
1967	0.545	0.434	−0.058	0.063	1.550	1.439
1968	0.430	0.351	−0.048	0.074	1.456	1.377
1969	0.545	0.434	−0.041	0.070	1.574	1.463
1970	0.232	0.245	−0.032	0.006	1.206	1.219
1971	0.252	0.272	0	0.010	1.262	1.282
1972	0.247	0.244	0.044	0.025	1.316	1.313
1973	0.150	0.167	−0.011	−0.037	1.102	1.119
1974	0.046	0.138	−0.016	0.034	1.064	1.156
1975	0.047	0.125	0.107	0.106	1.260	1.338
1976	0.128	0.132	0.167	0.087	1.382	1.386
1977	0.130	0.155	0.216	0.053	1.399	1.424
1978	0.182	0.212	0.161	0.081	1.424	1.454
1979	0.289	0.287	0.109	0.072	1.470	1.468
1980	0.196	0.215	0.233	0.072	1.501	1.520

Notes: α_u, α_t, and α_b denote the proportionate exchange rate effects due to trade restrictions, terms-of-trade changes, and trade imbalances, respectively.

Entries under A are based on the aggregate incidence parameter and those under B are based on the disaggregate parameters.

exchange rate distortion bears a significant, negative relationship to the country's ability to prevent a foreign exchange crisis. A highly overvalued exchange rate is bound to lead to a severe balance-of-payments problem sooner or later, as demonstrated by the Philippine experience with the foreign exchange crises of the late 1950s and late 1960s. The policy response in both cases proved adequate only for a short time as the real exchange rate slid back to unsustainable levels after three or four years. The result was an eventual recurrence of the balance-of-payments crisis.

As discussed in Chapter 4, trade liberalization measures were adopted by the government in the early 1980s, as part of a wider program of policy reforms and industrial restructuring to improve the international competitiveness of domestic producers. In particular, the tariff program that aimed to gradually reduce the average level and dispersion of nominal tariff rates from 1981 to 1985 would have reduced significantly the real exchange rate distortion due to trade restrictions. However, from the viewpoint of price competitiveness in tradable goods production, there were concurrently offsetting effects on the real exchange rate arising from the sharply lower terms of trade and large trade deficits financed by foreign borrowing. These are reflected in the estimates

of r^t/r and r^b/r as presented earlier, which averaged 1.31 and 1.10 for 1981-83, respectively.

While political developments precipitated the foreign exchange crisis that began in August 1983, some underlying economic factors, as reflected in the increasing real exchange rate overvaluation since the mid-1970s, have made inevitable the recurrence of a balance-of-payments crisis. The mistake was opting for expansionary macroeconomic policies in disregard of the balance of payments, which was also being battered by adverse external terms of trade during 1975-83. Because sociopolitical conditions at the time (for example, the government's tendency to confer economic gains on so-called "crony capitalists") were not conducive to the promotion of efficient economic growth, not only static but also dynamic losses resulted from the pursuit of what were being touted as countercyclical policies.

8

REAL EXCHANGE RATE CHANGES AND AGRICULTURAL PRODUCTION INCENTIVES

The real exchange rate effects arising from trade restrictions, terms-of-trade movements, and trade imbalances having been estimated in the preceding chapter, their transmission to the domestic price structure can now be analyzed. The present focus is on the impact on agricultural prices relative to the prices of home goods and of nonagricultural products. These two relative price measures are partial indicators of the price competitiveness of the agricultural sector, reflecting the relative profitability of producing agricultural products vis-à-vis home goods and nonagricultural products.

This chapter first examines the behavior of domestic agricultural prices relative to the prices of home goods and of nonagricultural products during 1950-84, indicating the significance of sharp changes in the relative price indexes occurring in certain years. The link to real exchange rate movements is then investigated by regression analysis. Finally, using the estimated coefficients representing the response of relative agricultural prices to changes in the real exchange rate and other factors, an examination is undertaken of the extent to which agricultural producers could have benefited, through improved price incentives, from the elimination of the various sources of exchange rate misalignment discussed above.

Agricultural Prices Relative to Home Goods and Nonagricultural Prices

Indexes relating the prices of agricultural goods to home goods (P_a/P_h) and to nonagricultural products (P_a/P_{na}) for 1950-84 are depicted graphically in Figure 6.[57] The time profiles of the two price indexes are similar. This is not surprising, considering that home goods bulk large in nonagricultural output. The two indexes have generally lower values in the 1950s than in subsequent years through 1984, suggesting that the price effects of the regime of import and foreign exchange controls strongly discriminated against agriculture. There was apparently a positive response to the decontrol measures and nominal exchange rate adjustment in the early 1960s, which continued to the end of the decade. The average values of P_a/P_h and P_a/P_{na} in 1962-69 were higher by 22 and 12 percent than those in 1950-61.

By contrast, the favorable effect on relative agricultural prices of the large peso devaluation in 1970 did not seem to last long and was soon negated by other influences. Indeed the values of both price indexes fell almost continuously, beginning in 1973 for P_a/P_h and in 1974 for P_a/P_{na}, until 1982, just before the foreign exchange crisis came to a head in 1983. In 1982 the value of P_a/P_h was 22 percent lower than in 1973, while that of P_a/P_{na} was 26 percent below its 1974 value.

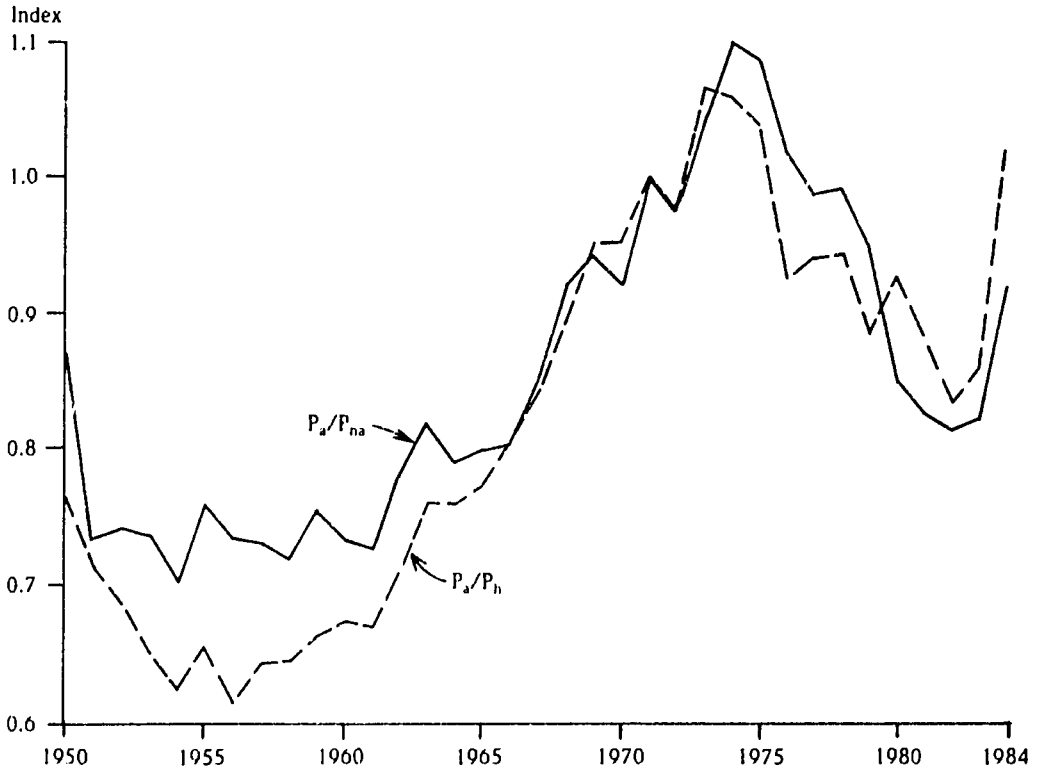
Apart from nominal exchange rate changes, other important influences on the behavior of agricultural prices relative to the prices of home goods and nonagricultural products consisted presumably of the significant changes in foreign prices of the country's principal export commodities, and the various factors responsible for sustaining massive trade deficits since 1974

[57] The nonagricultural price index (P_{na}) is calculated from

$$\omega_a P_a + (1 - \omega_a) P_{na} = P_{gdp},$$

where P_a and P_{gdp} are the implicit price indexes for agricultural value added and GDP, respectively, and $\omega_a = (0.295)$ is the share of agricultural value added to GDP in 1971. The annual values of P_{gdp}, P_a, and P_{na} are shown in the Appendix, Table 25.

Figure 6—Relative price indexes of agricultural products to home goods (P_a/P_h) and agricultural to nonagricultural products (P_a/P_{na}), 1950-84



including various aspects of macroeconomic policy (see Chapter 4). All this would have a bearing on the real exchange rate, indicating that it is a basic determinant of domestic agricultural prices relative to those of home goods and nonagricultural products. Indeed, a cursory comparison of the time profiles in Figures 2 and 6 suggests that the real exchange rate bears a positive relationship to the relative domestic prices of agricultural products. A more systematic examination of the effect of the real exchange rate on relative agricultural prices, based on regression analysis, is given in the next section.

Agricultural Prices and the Real Exchange Rate

It was initially hypothesized that, in addition to the real exchange rate, the more direct influences of the implicit tariffs, export taxes or subsidies, and external terms of trade are also important determinants of the relative prices of agricultural products, P_a/P_h and P_a/P_{na}.[58] The results of the preliminary regressions consistently indicate lack of significance of the estimated coefficient of the terms-of-trade variables, suggesting that only its indirect effect through the

[58] It is possible to express analytically each of these relative price variables in terms of the real exchange rate and the various tradable and home goods components of P_a and P_{na}, which could then be used to estimate the separate influences of those explanatory variables. The data requirements are severe, however. For an attempt to estimate such an equation for P_a/P_h using Argentinean data, see Cavallo, "Exchange Rate Overvaluation."

real exchange rate needs to be considered.[59] Table 15 reports the regression results based on specifications that exclude the terms-of-trade variable. Because the export tax and tariff variables also affect the real exchange rate (as discussed in the preceding chapter), two-stage least squares (TSLS) estimation is used, the terms-of-trade index and a trade deficit variable being chosen as additional instrument variables. Introduction of a few alternative lag structures does not appear to improve the statistical fit. This suggests absence of lagged effects (that is, beyond one year) on domestic relative prices due to changes in the explanatory variables.

The first column of the table shows a coefficient estimate of 0.398 for the exchange rate variable, implying that a 10 percent increase in the real exchange rate (or a real depreciation of 10 percent) will push up the relative price of agricultural products vis-à-vis home goods by slightly less than 4 percent. The same 10 percent increase in the real exchange rate will lead to a 3.3 percent rise in the domestic agricultural price relative to the price of nonagricultural products, according to the coefficient estimate in the second column. This is understandably a smaller effect because nonagricultural output also includes tradable goods, although to a lesser extent than agricultural output.

The estimated elasticity of P_a/P_h with respect to the export tax variable ($T_{ax} = 1 - t_{ax}$) is seen to be more than 0.3, while that of P_a/P_{na} is more than 0.4. The sign in either case is positive as expected because a rise in the agricultural export tax rate (t_{ax}), which lowers T_{ax}, should lead to a lower price of agricultural products, other things remaining the same. The elasticity estimates suggest that the average agricultural export tax rate of 5.8 percent in 1970-80 directly reduced P_a/P_h by about 2.0 percent and P_a/P_{na} by about 2.6 percent.

Nonagricultural tradables have been subject to import taxes, aimed especially at nonessential consumer goods, but they have also benefited from subsidies to nontraditional export production. The elasticity estimate for $T_{nx} (= 1 - t_{nx})$, where t_{nx} is the negative of the export subsidy rate, has the correct sign but is statistically insignificant, owing presumably to the small share of nontraditional export products in nonagricultural output. For $T_m (= 1 + t_m)$ the elasticity estimate is -0.42, which is significant at the 5 percent level. This indicates that a reduction of the implicit tariff rate from an average of 68 percent during 1962-69 to an average of 20 percent for 1970-80 led directly to an increase in P_a/P_{na} of about 12 percent.

Table 15—Estimated equations for relative agricultural prices as dependent variables

Independent Variable	Dependent Variable	
	Log P_a/P_h	Log P_a/P_{na}
Constant	-0.404	-0.373
Log r	0.398	0.329
	(9.220)	(6.180)
Log T_{ax}	0.336	0.446
	(1.680)	(2.330)
Log T_{nx}	. . .	-0.112
		(-0.930)
Log T_m	. . .	-0.418
		(-2.370)
R^2	0.884	0.779

Notes: Estimation is by two-stage least squares using annual data for 1950-80. Numbers in parentheses are t-values.

P_a/P_h represents the domestic price index of agricultural products relative to home goods, and P_a/P_{na} represents agricultural products relative to nonagricultural.

Sources of Exchange Rate Misalignment and Agricultural Prices

The relative price response of agricultural products to changes in the real exchange rate and in the trade tax variables,

[59] This is presumably due to, first, the markedly increasing share of manufactured products in total exports since the early 1970s, and second, the sharp changes in the foreign price of oil imports since 1974.

together with the estimates of exchange rate misalignment derived in Chapter 7, can be used to evaluate their effects on relative agricultural prices vis-à-vis home goods and nonagricultural products. Table 16 contains the results of the calculations distinguishing among the three sources of exchange rate misalignment for four periods representing various stages in the evolution of the country's trade and exchange rate policies (see Chapter 4).[60]

Both direct and indirect effects of trade restrictions on relative agricultural prices are shown in the first four rows of Table 16. During 1950-61, the direct effect of the prevailing import and foreign exchange controls (associated with extremely high values of the implicit tariff rate) was the dominant influence on P_a/P_{na}, which was reduced by more than 100 percent. The indirect effect through the real exchange rate also is not insignificant, as shown by the induced decline in P_a/P_h of about 40 percent. The separate and less significant influences of the favorable terms of trade and trade deficits on relative agricultural prices during the period offset each other to some extent. Overall, the three sources of exchange rate misalignment effectively lowered the domestic agricultural price relative to home goods by 36 percent and relative to nonagricultural products by 100 percent.

Even after the implementation of decontrol measures and nominal exchange rate adjustment in the early 1960s, trade restrictions continued to exert the most important negative influence on domestic agricultural prices. The protective tariff system retained the qualitative biases of the incentive structure against agriculture through the late 1970s. However, the distortionary effect of trade policy on relative agricultural prices continued to diminish.

Overall, the declining trend of price bias against agricultural production was reversed during the second half of the 1970s due to the country's growing trade deficits and deteriorating external terms of trade. These two sources jointly contributed 10 percent of the total decline in P_a/P_h and 8 percent of the decline in P_a/P_{na}. Based on the entries in the last row of Table 16, the combined effects of the three sources of exchange rate overvaluation appear to have reduced domestic agricultural prices in 1975-80 by 19 percent relative to home goods and by 25 percent relative to nonagricultural products. Because the real purchasing power of rural

Table 16—Average proportionate effects of exchange rate misalignment on relative agricultural prices

Source/Period	P_a/P_h	P_a/P_{na}
Effects of trade restrictions		
1950-61	-0.396	-1.026
1962-69	-0.176	-0.438
1970-74	-0.111	-0.215
1975-80	-0.089	-0.174
Effects of terms of trade changes		
1950-61	0.049	0.040
1962-69	0.024	0.020
1970-74	0.001	0.001
1975-80	-0.066	-0.055
Effects of trade imbalance		
1950-61	-0.015	-0.012
1962-69	-0.011	-0.009
1970-74	-0.003	-0.003
1975-80	-0.031	-0.026
Effects from all sources		
1950-61	-0.362	-0.998
1962-69	-0.163	-0.427
1970-74	-0.113	-0.217
1975-80	-0.186	-0.255

Note: P_a/P_h represents the domestic price index of agricultural products relative to home goods, and P_a/P_{na} represents agricultural products relative to nonagricultural.

[60] An illustrative calculation, yielding the estimated effect on P_a/P_{na} for 1950-61, based on Table 15, is

$$(P_a/P_{na}) = 0.329\,\dot{r} + 0.446\,\dot{T}_{ax} - 0.112\,\dot{T}_{nx} - 0.418\,\dot{T}_m.$$

Substituting $\dot{r} = -0.996$, $\dot{T}_{ax} = 0$, $\dot{T}_{nx} = 0.142$, and $\dot{T}_m = 1.631$ gives -1.026, which is the entry in the first row, second column of Table 16.

households is determined in part by the agricultural terms of trade, the stimulus to overall economic growth provided by the growth of rural incomes must have been considerably weakened by the market decline in relative agricultural prices from the mid-1970s to the early 1980s (see Figure 6). It is evident from the above findings that the worsening exchange rate overvaluation contributed heavily to the severe deterioration of the agricultural terms of trade during the period.

9

SOME PERSPECTIVES AND CONCLUSIONS

The price bias against agriculture due to trade and exchange rate policies translates into an effective resource transfer out of the agricultural sector that is quite large relative to the amount transferred into agriculture through government spending. In 1980, for example, the latter was about P3.5 billion, based on the national government's budgetary allocations for current operating expenditures and capital outlays.[61] The resource outflow in 1980 for export crop agriculture alone amounted to P 6.6 billion—consisting of P 2.3 billion from explicit export taxes and P 4.3 billion from policy-induced exchange rate overvaluation.[62]

In fact, production of all tradable goods, not just actual exports, is penalized by the overvalued exchange rate. The high degree of tradability of agricultural output makes agricultural incentives particularly dependent on real exchange rate movements. It follows that the implicit resource transfer out of agriculture from overvaluation of the peso has been much larger than would be indicated by considering only export crops.

The need to extract agricultural surplus to finance capital formation in the rest of the economy during development is a widely accepted proposition in development economics. But there are serious questions about the efficiency with which these transferred resources are used in the nonagricultural sectors. In the Philippines, as in most other developing countries where the industrial sector has been highly protected, the distortions in product and factor markets have led to the inefficient use of investment resources for manufacturing and the inability to compete in international markets.[63] Unless such policy-induced distortions are corrected and, given the opportunities for rapid productivity growth in agriculture provided the capital requirements for technological change and rural infrastructure development are met, there is cause for skepticism that agricultural resource transfers can help accelerate the development process. An additional consideration, of course, is the stimulus to nonagricultural production to be induced by increased rural incomes due to rising agricultural productivity.[64] This form of rural growth linkage is at the heart of recent proposals for an agriculture-based development strategy.[65]

Currency overvaluation has evidently imposed a severe penalty on Philippine agriculture beyond the seemingly light tax burden on agricultural exports. In the 1950s and 1960s the policy thrust favoring industrial import substitution entailed heavy protection of manufacturing through a restrictive trade regime, which led to a highly overvalued Philippine peso. In the 1970s and early 1980s nominal exchange rate flexibility and selective export subsidies tended to reduce the degree of exchange rate overvaluation from trade restrictions. However, expansionary policies and massive trade def-

[61] See Table 15.8 in Ponciano S. Intal, Jr. and John H. Power, "The Political Economy of Agricultural Pricing Policies: The Philippines," prepared for the World Bank, University of the Philippines at Los Baños, June 1986 (mimeographed).

[62] Resource transfer out of export crop agriculture due to the overvalued exchange rate is calculated by multiplying crop export earnings ($2 billion) in 1980 by the actual exchange rate (P 7.51 per U.S. $1.00) and by the estimated degree of overvaluation (0.287) for that year from trade restrictions and trade imbalance.

[63] See Bautista, Power, et al., *Industrial Promotion Policies in the Philippines.*

[64] For an empirical analysis in the Philippine context, see Romeo M. Bautista, "Effects of Increasing Agricultural Productivity in a Multisectoral Model for the Philippines," *Agricultural Economics* 1 (1986): 67-85.

[65] See John W. Mellor, *The New Economics of Growth: A Strategy for India and the Developing World* (Ithaca, N.Y.: Cornell University Press, 1976); and Adelman, "Beyond Export-Led Growth."

icits financed by external borrowing severely distorted the real exchange rate, especially during 1975-83, when the country's terms of trade deteriorated markedly. The debt-related foreign exchange crisis that began in late 1983 was triggered by political events that shook business confidence and induced a massive capital flight. However, because of the severity of the exchange rate overvaluation since the mid-1970s, a balance of-payments crisis was inevitable sooner or later. What the government had touted as "countercyclical" monetary and fiscal policies, which frequently bordered on profligate demand management, became the villain of the piece. Such expansionary macroeconomic policy, adopted in disregard of the balance of-payments consequences, backfired as the immediate effect on the real exchange rate and the longer-run effect on productivity of the massive foreign borrowing undertaken since 1974 proved disastrous.[66]

This study shows that trade policy is a dominant source of exchange rate distortion and price bias against agriculture. Although the disincentive effects of trade restrictions were reduced significantly during 1950-80, the penalty on agricultural production remained stringent. Thus during 1975-80, domestic currency overvaluation resulted in the lowering of the domestic agricultural price relative to home goods by an average of 19 percent and relative to nonagricultural products by 25 percent. That the real exchange rate is at least a partial indicator of the competitiveness of agriculture is borne out by the significant relationships obtained empirically between the real exchange rate and relative agricultural prices.

The role of the real exchange rate in influencing agricultural incentives and performance has assumed added significance in view of the recent decline in agricultural production and exports (Chapter 3). If the agricultural sector is to contribute to the country's economic recovery and longer-run growth, not only sector-specific policies, but also the trade and macroeconomic environment that determines the real exchange rate needs to be improved. Moreover, because the existing foreign exchange shortage is the principal constraint to economic growth, it is important that export production, both agricultural and industrial, should be encouraged.

The removal of export taxes (except on logs) in mid-1986 by the new government of Corazon Aquino is a step in the right direction. For too long they were a direct burden to agricultural producers. Industrial export production, on the other hand, has been receiving subsidies on a selective basis, which offset to some extent the general bias in the protection system against exports. The amount of export tax collected was relatively small, accounting for only 1.4 percent of total government revenue during 1980-84. On efficiency grounds, it is preferable to rely as much as possible on land, income, and consumption taxes, rather than on export taxes and tariffs that distort production incentives. Regardless of the source of taxation, the pattern of government expenditure—particularly, the allocation of public investment—needs to be redirected toward agriculture and the rural sector and away from the past bias favoring urban-based, capital-intensive industries. Improvements in rural infrastructure, such as agricultural research, extension, and credit, will serve to increase the agricultural supply response to price incentives. This would enhance the long-run effectiveness of reform in trade and exchange rate policies.

It will be necessary to prevent the real exchange rate from being overvalued. This would require that import restrictions unduly protective of domestic industry be liberalized and that a sustainable trade balance be maintained. A more realistic exchange rate policy would in the long run encourage not only export production but also efficient import substitution in agriculture as well as in the rest of the economy.

Under present conditions of foreign exchange shortage and depressed economic

[66] The negative productivity effect is related to the propensity of the previous government to finance projects of doubtful economic validity, whose proponents frequently had strong political connections.

activity, the more immediate challenge facing the new government is how to achieve rapid recovery while moving toward stable, long-run growth. Excessive reductions in expenditure due to IMF-prescribed budgetary and monetary restraints have had severe output and employment repercussions. To achieve economic recovery, these restraints will have to be eased. The government's plan to sharply increase infrastructure expenditures in the rural areas has much to recommend it, not only addressing the existing deficiency in aggregate demand but also promoting growth in agricultural productivity and increased purchasing power of the rural population.

In view of the expected lags in the response of export production and import substitution to the improvement in real exchange rates, rapid aggregate demand expansion will run into a foreign exchange constraint. Therefore, foreign financial assistance in the form of soft loans or grants, it is hoped, and concessional terms of debt repayment will be necessary, especially in the early phase of recovery.

How should trade liberalization proceed in the current context of underutilized production capacity? One's apprehension is that exposure to foreign competition at this time will inhibit domestic producers from utilizing excess capacity and expanding output. On the other hand, continuing import restrictions and distorted relative prices give the wrong signal for private investment allocation. An appropriate approach to this dilemma would be to reduce tariff and nontariff barriers *gradually* during the economic recovery period. However, the government should make clear early on its intention to eventually move toward low and uniform effective protection rates. This would help prevent misuse of existing capital and inefficient allocation of new investments.

Beyond the need to achieve rapid economic recovery, the new government also faces the challenge of moving the economy to a new development track that promises improved prospects in the longer run. Given the importance of agriculture and the severity of the employment problem in the Philippines, it is hard to envisage a more appropriate development strategy for at least the next five years than one that gives primary emphasis to agricultural growth and employment generation. Two key conditions for such an employment-oriented, agriculture-based development would be: first, the removal of policy-induced price biases against agriculture; and second, continuing improvements in agricultural productivity. Each can be expected to induce higher farm production and rural incomes.[67]

Because food and other labor-intensive consumer goods bulk large in the consumption of rural households, sectors efficiently producing such products (presumably, small-scale producers in regionally dispersed rural areas) will be favored by the rise in rural expenditure. Whether supply will be able to match the increased demand by the rural population for those products will depend on the availability of production inputs and their prices. For instance, if intermediate inputs to agricultural and nonagricultural production are made artificially scarce or expensive by a restrictive foreign trade regime, the full benefits from increased final demand in terms of output growth and labor absorption will not be realized. It is also clear that public provision of infrastructure investments is critical not only to the generation and diffusion of new agricultural technologies, but also to the development and integration of rural markets.

The employment effect of a given increase in rural income will be greater the more skewed is the consumption pattern toward food and other labor-intensive products. Households of the less affluent, small agricultural and nonagricultural producers are most likely to fit this pattern; as in other

[67] In the Philippine context, it seems reasonable to assume that the income distribution effect of increased agricultural prices will also be favorable (which only a disaggregative, general equilibrium model can verify). For a systematic, empirical analysis of the effects of an exogenous change in food prices on income distribution based on Indian data, see John W. Mellor, "Food Price Policy and Income Distribution in Low-Income Countries," *Economic Development and Cultural Change* 27 (October 1978): 1-26.

developing countries, families of the more prosperous owners of large farms and industrial enterprises in the Philippines spend more on capital-intensive goods, whether locally produced or imported. It is important, therefore, that improvements in price incentives, production technologies, and infrastructure facilities should reach the small producers in regionally dispersed rural areas. This is as crucial to the country's long-run economic growth as it is necessary for the participation of the poor in that growth.

APPENDIX: SUPPLEMENTARY TABLES

Table 17—Effective exchange rates by product category, 1950-80

Year	Essential Consumer Good Imports	Nonessential Consumer Good Imports	Traditional Exports	New Exports
		(P/U.S. $)		
1950	2.00	2.05	2.00	2.24
1951	2.03	3.39	2.00	2.24
1952	2.03	3.39	2.00	2.24
1953	2.03	3.39	2.00	2.32
1954	2.04	3.34	2.00	2.32
1955	2.04	3.68	2.00	2.32
1956	2.11	3.86	2.00	2.32
1957	2.10	4.12	2.00	2.32
1958	2.10	4.17	2.00	2.32
1959	2.16	5.06	2.00	2.30
1960	2.24	6.97	2.22	2.51
1961	3.15	7.02	2.68	2.95
1962	3.74	10.04	3.15	3.37
1963	4.24	11.24	3.52	3.72
1964	4.24	11.10	3.52	3.72
1965	4.29	11.95	3.90	4.13
1966	4.29	11.69	3.90	4.13
1967	4.29	11.77	3.90	4.17
1968	4.29	11.91	3.90	4.17
1969	4.29	11.94	3.90	4.17
1970	6.48	17.67	5.15	6.54
1971	7.04	19.26	5.76	7.26
1972	7.37	20.07	6.27	7.36
1973	7.87	21.92	6.35	7.42
1974	8.02	23.32	6.52	8.53
1975	8.56	24.90	6.96	8.87
1976	8.78	25.56	7.14	7.97
1977	8.74	25.42	7.10	8.33
1978	8.86	25.32	7.08	8.67
1979	8.81	25.35	7.08	8.55
1980	8.97	25.80	7.21	8.70

Sources: Robert E. Baldwin, *Foreign Trade Regimes and Economic Development: The Philippines* (New York: National Bureau of Economic Research, 1975); and Kunio Senga, "A Note on Industrial Policies and Incentive Structures in the Philippines: 1949-80," *Philippine Review of Economics and Business* 20 (September-December 1983): 299-305.

Table 18—Domestic and border price indexes for export and imported products, 1950-80

Year	P_x^*	P_m^*	P_x	P_m
1950	100.5	63.9	39.1	32.0
1951	107.2	72.0	40.3	38.8
1952	84.5	71.0	32.1	48.8
1953	103.1	67.7	39.3	43.4
1954	91.5	64.8	34.5	41.1
1955	83.9	64.8	31.8	39.9
1956	85.1	65.7	33.2	37.9
1957	86.3	67.9	34.7	41.2
1958	89.8	69.3	38.4	43.4
1959	97.3	70.8	43.4	45.2
1960	95.8	72.4	41.9	49.2
1961	88.2	73.4	43.9	52.1
1962	89.1	74.8	53.1	59.9
1963	93.8	79.8	63.6	63.6
1964	93.1	80.4	61.8	64.2
1965	94.7	81.8	63.5	64.5
1966	95.5	83.1	64.1	65.0
1967	97.3	85.0	68.3	65.0
1968	103.3	92·8	76.5	64.8
1969	103.7	94.5	75.1	72.3
1970	105.2	97.9	93.3	87.9
1971	100.0	100.0	100.0	100.0
1972	94.7	104.7	102.4	107.4
1973	138.2	134.9	132.5	127.6
1974	230.0	221.6	222.2	186.6
1975	182.6	229.9	189.1	206.8
1976	159.8	227.4	200.3	230.4
1977	162.2	252.5	251.8	253.9
1978	189.4	257.4	277.9	269.7
1979	223.7	282.8	343.3	328.9
1980	233.0	375.5	351.3	406.5

Source: Central Bank of the Philippines, *Statistical Bulletin*, various issues.

Table 19—Farm-gate prices of major agricultural products, 1950-80

Year	Coconut	Sugar	Pineapple	Tobacco	Abaca	Rice	Corn
			(P/kilogram)				
1950	0.308	0.224	0.150	0.784	0.639	0.294	0.166
1951	0.270	0.218	0.180	0.728	0.611	0.265	0.179
1952	0.191	0.219	0.180	0.734	0.600	0.246	0.168
1953	0.274	0.221	0.149	0.351	0.539	0.216	0.139
1954	0.214	0.253	0.148	0.351	0.366	0.188	0.138
1955	0.211	0.243	0.141	0.375	0.337	0.191	0.137
1956	0.216	0.221	0.139	0.381	0.294	0.186	0.128
1957	0.218	0.221	0.139	0.383	0.295	0.186	0.128
1958	0.279	0.195	0.141	0.400	0.310	0.198	0.125
1959	0.228	0.191	0.145	0.362	0.353	0.191	0.130
1960	0.358	0.188	0.146	0.440	0.622	0.190	0.128
1961	0.285	0.188	0.146	0.439	0.568	0.226	0.155
1962	0.316	0.225	0.139	0.397	0.527	0.231	0.135
1963	0.377	0.233	0.143	0.449	0.480	0.239	0.148
1964	0.420	0.237	0.143	0.564	0.588	0.299	0.203
1965	0.438	0.249	0.144	0.552	0.587	0.308	0.208
1966	0.495	0.314	0.147	0.644	0.483	0.322	0.225
1967	0.530	0.370	0.205	0.818	0.527	0.337	0.220
1968	0.576	0.449	0.288	0.987	0.503	0.407	0.214
1969	0.556	0.554	0.348	1.737	0.625	0.386	0.233
1970	0.660	0.694	0.469	2.050	0.863	0.396	0.262
1971	0.751	0.698	0.518	1.850	0.869	0.469	0.360
1972	0.706	0.732	0.519	2.340	0.932	0.633	1.120
1973	0.844	0.783	0.567	2.460	0.994	0.601	0.451
1974	1.930	0.876	0.844	3.380	2.976	0.887	0.666
1975	1.060	0.909	1.18[illegible]	4.180	3.847	0.944	0.836
1976	0.566	0.786	1.2[illegible]	3.760	2.249	0.964	0.881
1977	1.052	1.740	1.322	3.785	2.030	1.022	0.939
1978	1.049	1.110	1.520	3.658	1.850	0.985	0.955
1979	1.984	1.176	1.217	6.736	2.000	1.008	0.922
1980	2.027	1.350	0.564	4.500	2.802	1.069	0.968

Source: Philippines, National Economic and Development Authority, *Philippine Statistical Yearbook* (Manila: NEDA, 1975, 1982, and 1985).

Table 20—Wholesale prices of major agricultural products, 1950-80

Year	Coconut	Sugar	Pineapple	Tobacco	Abaca	Rice	Corn
				(P/kilogram)			
1950	0.360	0.233	0.300	1.150	0.879	n.a.	n.a.
1951	0.360	0.224	0.330	0.900	1.035	n.a.	n.a.
1952	0.250	0.235	0.400	0.530	0.640	n.a.	n.a.
1953	0.370	0.251	0.390	0.590	0.637	n.a.	n.a.
1954	0.310	0.246	0.380	0.850	0.454	n.a.	n.a.
1955	0.270	0.228	0.400	0.850	0.498	n.a.	n.a.
1956	0.260	0.231	0.390	0.860	0.600	n.a.	n.a.
1957	0.280	0.244	0.390	0.940	0.746	n.a.	n.a.
1958	0.380	0.252	0.390	0.960	0.651	n.a.	n.a.
1959	0.470	0.246	0.390	0.980	0.963	n.a.	n.a.
1960	0.400	0.275	0.360	0.990	0.994	0.360	0.220
1961	0.380	0.347	0.530	1.090	0.982	0.450	0.250
1962	0.470	0.442	0.600	1.190	0.955	0.410	0.200
1963	0.540	0.592	0.680	1.200	0.982	0.470	0.270
1964	0.560	0.473	0.680	1.260	1.069	0.570	0.280
1965	0.640	0.447	0.700	1.270	0.980	0.550	0.360
1966	0.560	0.534	0.700	1.390	0.855	0.670	0.360
1967	0.630	0.626	0.690	1.570	0.764	0.680	0.330
1968	0.760	0.591	0.660	1.880	0.775	0.640	0.330
1969	0.680	0.614	0.670	1.740	0.955	0.600	0.350
1970	0.980	0.804	1.130	2.050	1.465	0.720	0.380
1971	0.890	0.960	1.200	1.850	1.746	0.910	0.660
1972	0.690	1.121	1.240	2.340	1.718	1.150	0.630
1973	1.870	1.248	1.360	2.460	2.752	1.310	0.670
1974	3.760	2.421	1.740	3.380	5.790	1.970	1.070
1975	1.490	2.443	2.140	4.180	2.930	2.080	1.160
1976	1.650	2.026	2.310	3.760	3.180	1.990	1.190
1977	2.530	1.490	2.520	3.780	3.030	2.050	1.220
1978	3.300	1.490	2.740	3.660	2.680	1.960	1.230
1979	4.020	1.490	2.810	6.740	3.780	2.140	1.260
1980	2.550	1.930	3.290	4.540	5.540	2.290	1.620

Sources: For coconut,sugar, pineapple, tobacco, and abaca, Central Bank of the Philippines, *Statistical Bulletin*, various issues; for rice, Laurian J. Unnevehr and Arsenio M. Balisacan, "Changing Comparative Advantage in Philippine Rice Production," Working Paper 83-03, Philippine Institute for Development Studies, Makati, 1983; for corn, Ponciano S. Intal, Jr., and John H. Power, "The Political Economy of Agricultural Pricing Policies: The Philippines," prepared for the World Bank, University of the Philippines at Los Baños, June 1986 (mimeographed).

Table 21—Border prices of major agricultural products, 1950-80

Year	Coconut	Sugar	Pineapple	Tobacco	Abaca	Rice	Corn
				(U.S. $/kilogram)			
1950	0.195	0.109	0.145	0.745	0.423	n.a.	n.a.
1951	0.198	0.113	0.152	0.706	n.a.	n.a.	n.a.
1952	0.135	0.113	0.146	0.832	n.a.	n.a.	n.a.
1953	0.193	0.122	0.148	0.822	n.a.	n.a.	n.a.
1954	0.170	0.121	0.138	0.733	n.a.	n.a.	n.a.
1955	0.147	0.114	0.164	0.694	0.249	n.a.	n.a.
1956	0.139	0.112	0.234	0.747	n.a.	n.a.	n.a.
1957	0.140	0.117	0.212	0.825	n.a.	n.a.	n.a.
1958	0.171	0.119	0.206	0.765	n.a.	n.a.	n.a.
1959	0.202	0.120	0.181	0.210	n.a.	n.a.	n.a.
1960	0.172	0.123	0.165	0.888	0.413	0.135	0.099
1961	0.140	0.126	0.242	0.767	0.345	0.096	0.105
1962	0.145	0.127	0.287	0.861	0.267	0.128	0.143
1963	0.163	0.143	0.224	0.749	0.280	0.128	0.219
1964	0.171	0.136	0.225	0.866	0.291	0.115	0.181
1965	0.192	0.130	0.197	0.757	0.271	0.113	0.092
1966	0.167	0.136	0.197	0.982	0.237	0.131	0.103
1967	0.167	0.145	0.179	0.958	0.218	0.149	0.055
1968	0.192	0.149	0.169	1.077	0.197	0.162	0.062
1969	0.172	0.152	0.158	1.038	0.233	0.156	0.060
1970	0.180	0.152	0.214	1.087	0.277	0.110	0.137
1971	0.165	0.158	0.196	1.067	0.264	0.084	0.060
1972	0.119	0.172	0.181	1.058	0.266	0.127	0.053
1973	0.225	0.186	0.216	1.058	0.269	0.331	0.089
1974	0.521	0.479	0.244	1.408	0.112	0.493	0.145
1975	0.226	0.596	0.297	1.669	0.066	0.305	0.136
1976	0.182	0.293	0.338	1.434	0.055	0.223	0.125
1977	0.315	0.213	0.362	1.890	0.055	0.278	0.108
1978	0.371	0.175	0.370	1.117	0.053	0.309	0.108
1979	0.616	0.184	0.391	1.760	0.075	0.273	0.112
1980	0.390	0.359	0.438	2.033	0.090	0.342	0.140

Sources: Philippines, National Economic and Development Authority, *Philippine Statistical Yearbook* (Manila: NEDA, 1975, 1982, and 1985); and Central Bank of the Philippines, *Statistical Bulletin*, various issues.
Note: Border prices are calculated as unit values of exports (f.o.b.) and imports (c.i.f.).

Table 22—Domestic price indexes for agricultural and nonagricultural export products, 1950-80

Year	Agricultural Export Price Index (P_{ax})	Nonagricultural Export Price Index (P_{nx})
1950	57.4	67.3
1951	57.2	71.9
1952	44.9	58.0
1953	56.7	68.8
1954	50.8	59.2
1955	46.6	54.8
1956	46.4	60.2
1957	50.4	60.4
1958	58.8	62.7
1959	68.1	68.9
1960	64.2	68.4
1961	68.6	70.0
1962	83.7	83.7
1963	100.4	99.9
1964	94.5	101.0
1965	100.0	100.0
1966	97.9	105.1
1967	107.0	108.2
1968	120.0	121.0
1969	115.0	122.7
1970	160.8	128.3
1971	165.4	146.9
1972	161.6	160.7
1973	285.6	152.3
1974	547.7	178.2
1975	341.3	239.5
1976	322.(	306.9
1977	410.2	378.3
1978	505.1	347.5
1979	607.1	451.9
1980	446.6	547.2

Source: Basic data are from Central Bank of the Philippines, *Statistical Bulletin*, various issues.

Table 23—Power of the import tariffs (T_m) and export taxes (T_x, T_{ax}, T_{nx}), 1950-80

Year	$T_m = 1 + t_m$	$T_x = 1 - t_x$	$T_{ax} = 1 - t_{ax}$	$T_{nx} = 1 - t_{nx}$
1950	2.205	1.010	1.000	1.120
1951	2.280	1.010	1.000	1.120
1952	2.906	1.010	1.000	1.120
1953	2.707	1.015	1.000	1.160
1954	2.678	1.015	1.000	1.160
1955	2.599	1.015	1.000	1.160
1956	2.445	1.015	1.000	1.160
1957	2.570	1.015	1.000	1.160
1958	2.644	1.015	1.000	1.160
1959	2.704	1.015	1.000	1.150
1960	2.852	1.011	1.000	1.131
1961	2.981	1.011	1.000	1.101
1962	1.756	1.006	1.000	1.070
1963	1.726	1.006	1.000	1.057
1964	1.728	1.006	1.000	1.057
1965	1.708	1.005	1.000	1.059
1966	1.697	1.005	1.000	1.059
1967	1.658	1.008	1.000	1.069
1968	1.515	1.008	1.000	1.069
1969	1.658	1.008	1.000	1.069
1970	1.287	0.945	0.874	1.110
1971	1.316	0.927	0.900	1.134
1972	1.301	0.966	0.940	1.103
1973	1.184	0.967	0.939	1.098
1974	1.051	1.010	0.960	1.256
1975	1.050	1.025	0.960	1.223
1976	1.152	0.991	0.960	1.071
1977	1.150	1.019	0.960	1.126
1978	1.204	1.056	0.955	1.176
1979	1.333	1.051	0.958	1.157
1980	1.220	1.060	0.960	1.158

Sources: Basic data are from Central Bank of the Philippines, *Statistical Bulletin,* various issues; Robert E. Baldwin, *Foreign Trade Regimes and Economic Development: The Philippines* (New York: National Bureau of Economic Research, 1975); and Kunio Senga, "A Note on Industrial Policies and Incentive Structures in the Philippines: 1949-80," *Philippine Review of Economics and Business* 20 (September-December 1983): 299-305.

Note: t_m is the implicit tariff rate; t_x, t_{ax}, and t_{nx} are the implicit tax rate for all exports, agricultural exports, and nonagricultural exports, respectively.

Table 24—Wholesale price indexes for the United States and Japan and the yen/dollar exchange rate index, 1950-84

Year	Wholesale Price Index		Exchange Rate Index
	United States	Japan	
1950	71.8	75.0	0.965
1951	79.9	90.8	0.965
1952	77.8	92.7	0.965
1953	76.7	93.3	0.972
1954	76.8	92.7	0.972
1955	77.0	91.0	0.972
1956	79.6	95.0	0.972
1957	81.8	97.8	0.972
1958	83.0	91.4	0.972
1959	83.1	92.3	0.972
1960	83.3	93.3	0.972
1961	83.0	94.3	0.972
1962	83.1	92.8	0.972
1963	82.8	94.3	0.972
1964	83.0	94.7	0.972
1965	84.7	95.3	0.972
1966	87.6	97.7	0.972
1967	87.7	99.3	0.972
1968	89.9	100.3	0.972
1969	93.4	102.3	0.972
1970	96.8	106.1	0.972
1971	100.0	100.0	1.000
1972	104.4	106.1	1.150
1973	118.1	122.9	1.287
1974	140.3	161.5	1.199
1975	153.4	166.4	1.175
1976	160.4	174.7	1.179
1977	170.2	178.0	1.302
1978	183.6	173.5	1.661
1979	206.6	186.1	1.594
1980	235.6	219.3	1.538
1981	257.0	222.3	1.573
1982	262.2	226.3	1.399
1983	265.5	221.2	1.469
1984	271.8	220.8	1.469

Source: International Monetary Fund, *International Financial Statistics* (Washington, D.C.: IMF, various years).

Table 25—Implicit price indexes for GDP, agricultural and nonagricultural value added, 1950-84

Year	P_{gdp}	P_a	P_{na}
1950	46.0	41.7	47.8
1951	50.5	40.2	54.8
1952	47.2	37.9	51.1
1953	44.8	35.7	48.6
1954	43.7	33.7	48.0
1955	43.1	35.2	46.4
1956	44.6	35.5	48.4
1957	46.1	36.6	50.1
1958	46.3	36.3	50.5
1959	45.6	37.1	49.1
1960	48.7	38.7	52.8
1961	50.1	39.5	54.5
1962	51.0	42.6	54.5
1963	55.1	47.5	58.2
1964	59.0	49.7	62.9
1965	60.9	51.8	64.8
1966	64.5	54.9	68.5
1967	67.9	60.3	71.1
1968	71.9	67.8	73.7
1969	76.1	73.0	77.4
1970	88.8	83.7	90.9
1971	100.0	100.0	100.0
1972	106.7	104.6	107.6
1973	125.5	129.5	123.8
1974	164.8	176.0	160.1
1975	178.9	189.4	174.4
1976	195.9	198.5	194.9
1977	213.0	211.1	213.8
1978	230.2	229.0	230.7
1979	266.5	257.0	270.5
1980	306.2	272.2	320.4
1981	338.6	295.0	356.9
1982	367.1	316.2	388.4
1983	410.2	356.0	433.0
1984	613.9	578.5	628.7

Source: Basic data are from Philippines, National Economic and Development Authority, *Philippine Statistical Yearbook*, (Manila: NEDA, various years).

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