

■ EDITED BY ■

TERRY
SICULAR

**FOOD
PRICE
POLICY
IN
ASIA**

• A •

**Comparative
Study**

Food Price Policy in Asia

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A Comparative Study

EDITED BY

Terry Sicular

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Preface

At the heart of most food policies is the question of pricing. In national programs designed to promote growth, improve the distribution of income, raise nutritional levels, and increase national food security, food pricing is both an explicit and an implicit actor. Pricing assumes this role because it links food production, consumption, marketing, and processing; agriculture, industry, and services; government and private sectors; and the domestic and international economies. For this reason a focus on food pricing provides a useful framework for assessing how countries address their food problems and rank various food-related policy objectives.

The aim of this book is to understand food pricing, and through it broader food policy choices in a variety of country settings. Chapters examine food price policy in six Asian countries—Indonesia, the People's Republic of China, the Philippines, Nepal, the Republic of Korea, and Thailand. Each is written by a scholar who has devoted substantial time to the study of that country's agricultural economy. Each chapter presents an informed analysis of food price policy and outcomes in a particular country. At the same time, the chapters have been written to a common outline and share a common perspective. As a group, then, they provide a broad comparative picture of the motivations behind and consequences of differing approaches to food policy.

The common perspective underlying the chapters of this book borrows heavily from the ideas Peter Timmer, Walter Falcon, and Scott Pearson expressed so lucidly in their book *Food Policy Analysis*. In particular, we follow their view that food policy includes not just measures narrowly aimed at the food system but also macroeconomic and trade policies whose impact can be as strong as, if not stronger than, more direct measures. Food price policy, therefore, is defined to include both explicit price interventions and macroeconomic, exchange-rate, and trade policies that significantly affect the structure of food prices.

This book is the product of a three-year project on Asian food price policy supported by the Rockefeller Brothers Fund. We owe gratitude to the Rockefeller Brothers Fund not only for its support of the research and writing of this volume but also for providing the resources that made

possible an authors' workshop at Stanford University in March 1986 and a conference at the International Rice Research Institute in Los Baños in January 1987. These gatherings spurred our work and provided essential forums for feedback and discussion.

Two other institutions deserve special mention. The Food Research Institute at Stanford University supplied generous institutional support throughout this project. In addition, the International Rice Research Institute kindly provided logistical and financial support for the Los Baños conference.

We owe gratitude to the many individuals whose thoughtful reading and critical comments have added to the quality of this volume. Some of these individuals have aided authors in their work, and their names are mentioned in the separate chapters. Here I thank those whose help has been pervasive. The many participants in the Los Baños conference, too numerous to name individually, supplied insightful discussion and comments that are reflected throughout the volume. Graham Donaldson, Robert Herdt, Robert Bates, and Raymond Hopkins read through broad sections of the volume, joined in the authors' workshop, and provided critical perspective. Peter Timmer read and supplied thoughtful comments on several chapters. Anne Hoddinott's administrative and organizational contributions to the project aided immeasurably. To them I express my gratitude.

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Lastly, I express special thanks to Wally Falcon, who has so generously given time, counsel, and support to this endeavor.

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Food Price Policy in Asia

1. Introduction: Food Price Policy in Asia

Terry Sicular

Microeconomic theory yields certain standard hypotheses about the relation between food pricing and key variables in economic development. Agricultural production, an important component of national product in most developing nations, should respond positively to high food prices. Policies that raise the prices of farm inputs relative to those of food products should reduce input use and slow growth in production. Overall economic growth, as opposed to that of the agricultural sector alone, is thought to be best served by a price structure that reflects underlying economic scarcities. From this perspective, then, optimal food prices are neither high nor low but those which are “right” in the sense that they reflect opportunity costs. Food pricing is also thought to affect living standards and income distribution: higher food prices reduce the absolute and relative incomes of consumers while benefiting producers.

Regardless of these conventional hypotheses, developing countries follow no predictable pattern of food pricing policies. Some countries maintain policies that raise food prices, whereas others have policies that lower them. Few countries intentionally or, for that matter, inadvertently implement policies to keep food prices in line with relative scarcities however defined. Furthermore, as the countries examined in this volume demonstrate, the effects of food pricing on economic variables do not conform closely to conventional expectations. Food and agricultural production have grown rapidly both in countries that overvalue and in countries that undervalue food. Similarly, rapid overall GNP growth and improved income distributions have occurred under a wide range of food price policies and food price structures.

The six country studies in this book illustrate clearly the diversity of food pricing policies and outcomes. These countries—China, Indonesia, Korea, Nepal, the Philippines, and Thailand—have all implemented policies that have directly or indirectly influenced the structure of food prices. Approaches vary from extensive direct intervention, as in China, to more limited measures in Nepal. Food price structures range from substantial

I thank Walter Falcon, Raymond Hopkins, and Peter Timmer for helpful suggestions on this chapter.

overvaluation of food in Korea to substantial undervaluation in Thailand. Economic performance, whether measured by sectoral growth rates, overall growth rates, or distributional outcomes, have also differed substantially and for the most part show little correlation with observed food price structures.

Food pricing policies and economic outcomes are diverse for several reasons. One reason is that the effects of pricing depend on the setting in which prices function. Relevant aspects of the setting include the country's natural endowment, level of development, economic structure, degree of market integration, and political situation. The influence of these factors, and also of other economic policies, frequently overshadows the effects of pricing. The importance of setting is a theme that recurs throughout this book.

In addition, pricing measures are designed in response to different constraints and objectives. Geography, government financial resources, and political considerations are among the factors that can limit the feasible range of food policy choices. The existence of such constraints has at times provided compelling reason to follow policies apparently at odds with economic reasoning. National objectives also influence food pricing policy. A country that places great weight on food self-sufficiency, for example, would choose different food price measures than one that emphasizes efficient growth. A fair analysis of national food pricing policy, then, must treat not only the ultimate effects but also the factors motivating a country's food pricing policies. These motivating factors are addressed explicitly in the chapters of this book.

Food Price Policy: A Definition

In this volume *food price policy* is defined broadly to encompass policies directly governing the farm and retail prices of food products as well as macroeconomic policies that influence exchange rates, land prices, interest rates, wages, and inflation rates, any of which can affect the relative prices of inputs to outputs for food producers and the price of food relative to incomes for consumers. Defined thus, food price policy includes programs whose primary intent may be to influence variables other than food prices, but wittingly or unwittingly also have a significant effect on food prices.

Food pricing is an integral part of national food policy. National food policy and its component food price policy usually emerge in response to multiple objectives. These objectives include (1) rapid overall economic growth, of which efficient growth in agriculture is one component; (2) distributional goals, which often encompass the desires to promote rural employment and welfare while at the same time maintaining the income

status of politically influential, usually urban, groups; and (3) food security, that is, the provision of sufficient and stable food supplies. Any particular food policy initiative can promote some aspects of these objectives, while detracting from others. In the process of developing a coherent food policy, governments need to assess the tradeoffs among these various objectives, assign priorities, and search for policies that promote priority goals with acceptable compromise of nonpriority objectives.

Tradeoffs arise because of the numerous food policy linkages across economic sectors, groups, and governmental bodies. Measures aimed at one aspect of the food sector, say, food production, inevitably also influence other aspects—food consumption, marketing, and processing—as well as the balance of trade, government revenues, and government expenditures. Specific food programs carried out by a Food and Agricultural Ministry can therefore fail if not accompanied by complementary exchange rate, budgetary, and trade policies. Consequently, effective food programs entail coordination among the Ministry of Agriculture, the Central Bank, and the Ministries of Finance, Trade or Commerce, and Planning.¹

Many such linkages operate through the pricing system. Trade policies that protect domestic industry, for example, affect agriculture because they raise the prices of manufactured inputs relative to the prices farmers receive for their products. An overvalued exchange rate can similarly depress relative food prices. Raising farm prices to increase rural incomes and provide incentives for long-run growth in food production can, by increasing retail food prices, have a devastating effect on poor consumers and cause dissatisfaction among politically influential groups. As a consequence of these and other price-related linkages, pricing decisions require careful weighing of the tradeoffs among national objectives.

The Countries

The countries examined in this volume—Nepal, the People's Republic of China, Indonesia, the Philippines, Thailand, and the Republic of Korea—are all in Asia. Although differences among countries in Asia are substantial, the extent of variation within Asia is considerably less than that among Asia, Africa, and the Americas. Most Asian countries, for example, are relatively land-scarce, have rice as a major food product, and have fairly similar farm size distributions and land tenure systems. These characteristics for the most part apply to the six countries examined here (table 1). The regional focus thus permits one to hold some of the many relevant variables constant in cross-country comparison.

Despite basic similarities, important differences exist among the six countries. Country size, whether measured by population, land area, or

1. See Timmer, Falcon, and Pearson (1983) for further discussion of these issues.

TABLE 1. Comparative statistics on agricultural land, farm-size distribution, and the importance of rice

Country/region	Arable land per person, 1984 ^a (hectares)	Average size of farm holding ^b (hectares)	Gini coefficient for farm-size distribution ^c	Harvested paddy area as a percent of total cereals harvested area, average 1983–85 ^d	Percent of calories consumed in the form of rice, average 1979–81 ^e
Nepal	.14	1.0	.700	54%	50%
China	.10			36%	35%
Indonesia	.13	1.1	.553	76%	58%
Philippines	.21	3.6	.507	50%	38%
Thailand	.39		.455	83%	64%
Korea	.05	0.9	.195	78%	49%
Asia	.17	2.2	.195–.665	42%	37%
Africa	.34	9.1	.399–.822	7%	6%
South America	.47	47.6	.868–.938	17%	11%

^aCountry population data are from World Bank (1986), *World Development Report*. Arable land includes permanent crop land and is from FAO, *Production Yearbook*, 1985.

^bFAO (1981), *1970 World Census of Agriculture*, p. 32.

^cNepal gini coefficient from table 2 of Wallace chapter in this volume. Gini coefficients for other countries are from Berry and Cline (1979), pp. 38–39.

^dFAO, *Production Yearbook*, 1985.

^eCountry data (except China) are from FAO (1984), *Food Balance Sheets: 1979–81 Average*; China data are from Piazza (1983), pp. 74–76. Regional data are for 1974 and are taken from FAO (1977), *Provisional Food Balance Sheets: 1972–74*.

gross national product (GNP), ranges from very large to very small (table 2). Some of these nations (for example, Thailand and Indonesia) have relatively generous endowments of natural resources such as arable land, minerals, and oil, whereas Nepal and Korea are poorly endowed.

Levels of development and economic structure also vary widely (tables 2 and 3). The GNP per capita ranges from \$2,110 in Korea to only \$160 in Nepal. The size of the agricultural sector as a proportion of GNP is inversely related to GNP per capita and declines from a high of 56 percent in Nepal to a low of 14 percent in Korea. The importance of trade also spans a wide range: in Korea merchandise trade is equal to 72 percent of gross domestic product (GDP), in China 18 percent of GDP. The importance of trade in Indonesia, Thailand, the Philippines, and Nepal falls in the middle of this range.

Finally, income distributions and political settings vary. Distributions of income appear to be most equal in China and Korea, and least equal in Nepal (table 4). Political settings range from stable to unstable, and the strength of national governments from strong to weak. The Indonesian government, for example, is relatively strong and stable. In contrast, current instability in the Philippines limits the government's ability to implement innovative policy measures. These variations in setting, whether natural, economic, or political, have influenced the nature and effects of national food price policy.

TABLE 2. Indicators of country size and endowment

	Population, mid-1984 ^a (millions)	Total land area, 1984 ^b (1000s hectares)	Arable land as a percent of total land area, 1984 ^b	GDP 1984 ^a (million U.S. dollars)	Merchandise trade as a percent of GDP, 1984 ^a
Nepal	16.1	13,680	17%	2,290	24%
China	1,029.2	932,641	11%	281,250	18%
Indonesia	158.9	181,157	12%	80,590	44%
Philippines	53.4	29,817	38%	32,840	36%
Thailand	50.0	51,177	38%	41,960	43%
Korea	40.1	9,819	22%	83,220	72%

^aWorld Bank (1986), *World Development Report*.^bFAO, *Production Yearbook*, 1985. Arable land includes permanent crop land.

TABLE 3. Indicators of economic structure and level of development

	GNP per capita, 1984 ^a (U.S. dollars)	Agricultural output as a percent of GDP, 1984 ^a	Percent of economically active population in agriculture, 1985 ^b	Life expectancy at birth, 1983 ^a	
				Male	Female
Nepal	160	56%	93%	47	46
China	310	36%	72%	68	70
Indonesia	540	26%	52%	53	56
Philippines	660	25%	50%	61	65
Thailand	860	20%	66%	62	66
Korea	2,110	14%	31%	65	72

^aWorld Bank (1986), *World Development Report*.^bFAO, *Production Yearbook*, 1985.

TABLE 4. Income distribution statistics

	Year	Percentage of income received by:		Ratio of income shares (2)/(1)
		Lowest 20% of households (1)	Highest 5% of households (2)	
Nepal	1976-77	4.6	35.3	7.7
China*	1978	6.8	12.5	1.8
Indonesia	1976	6.6	23.5	3.6
Philippines	1970	5.2	25.1	4.8
Thailand	1976	5.6	23.0	4.1
Korea	1976	5.7	16.1	2.8

SOURCE: World Bank (1983), *World Tables*, vol. 2.

* Distribution of people ranked by household per capita income.

The Design and Scope of Food Price Policies

Cross-country comparison brings to light similarities and differences in the design and scope of policies that affect food pricing. The design of such policies can range from direct control of prices (for example, state-set

prices), to semidirect approaches (such as price ceilings and floors), to measures that work indirectly by influencing underlying market forces (for example, open-market operations or exchange-rate policies). Direct price setting has been surprisingly common in the countries examined here, although in recent years several of the countries have moved toward more indirect approaches. Usually direct and indirect measures are used concomitantly, sometimes complementing and sometimes offsetting each other.

Direct price interventions have been most common for retail sales of food. All the countries except one have at some time in the past twenty years directly set and controlled retail prices for one or more food staples. Such direct price control usually involves retail marketing by the state or parastatals combined with some form of rationing that limits sales to targeted groups, usually urban consumers. Indonesia, the exception, has not set retail prices, but has until recently announced retail price ceilings and maintained them through supply management. The stated intent of such retail price interventions has been to keep retail prices for key foodstuffs low and, secondarily, stable. Even targeted beneficiaries of such programs, however, do not always come out ahead. In Korea, for example, retail prices remain high by international standards, despite direct interventions to keep consumer prices low, because other policies keep the base against which the retail price is calculated, that is, the producer price, high.

Among the countries examined in this volume, direct interventions have been less common in producer pricing than in retail pricing for food. China's producer price policies have been the most direct: producers have been required to fulfill mandatory delivery quotas at low, state-determined prices. Thailand has used export taxes, the rice premium (essentially a fee for obtaining a rice export license), and a rice reserve requirement that stipulates some proportion of exported rice must be sold to the government at a low, fixed price. Nepal has set levies on rice exports and milling.

Interventions in Indonesia and South Korea have supported rather than reduced farm prices. Indonesia has used open market purchases to maintain a floor price for rice; South Korea has restricted food imports to keep producer prices high. Producer price policies, then, have been more diverse in intention and design than retail price programs.

In most of the countries studied, governments have intervened directly not only in the pricing of food products, but also in the pricing of inputs to agriculture. All but one of the countries examined in this volume have had some form of price or marketing subsidy for chemical fertilizers. Input subsidies often do not, however, reach farmers. In Thailand the fertilizer subsidy applies to only 13 percent of total fertilizer sales, and less than half of the subsidy reaches farmers. Similarly, despite price controls, tax-free importations, and direct subsidies to fertilizer companies, Philippine

farmers continue to pay more than the world price for chemical fertilizers. In Korea input subsidies are offset by the indirect effects of trade policies: restrictions on fertilizer imports raise domestic fertilizer prices so that even with government subsidies the domestic price of nitrogen is 50 percent higher than the world price. Only in Indonesia do fertilizer subsidies effectively lower the nitrogen price paid by farmers below the world price. Direct and indirect price interventions for other inputs vary across the countries and are discussed in more depth in later chapters.

As the discussion to this point indicates, different pricing measures can offset each other. Korea's food marketing subsidies to some extent counter-vail the effect of high producer prices on consumers. In Thailand free water and low land prices partially compensate farmers for the underpricing of rice. Pricing measures can also be mutually reinforcing. In China, for example, farmers have faced both low farm prices and high input prices and thus have been squeezed on both ends. China's urban consumers, on the other hand, have enjoyed a double benefit, because marketing margin subsidies are applied to an already low producer price base.

The scope of a pricing policy is to some extent inversely related to how direct the intervention has been. Direct interventions of the sort just described usually affect only a few prices. Except for China, all the countries examined in this volume have used direct price interventions for, at most, one or two major foodgrains and one or two modern inputs. Rice and chemical fertilizer are common targets. Indirect interventions such as trade restrictions and foreign exchange policies influence broader categories of prices. Such macro-level policies can affect the rural-urban terms of trade and the relative prices of imports to exports.

Because their influence is so broad, macro-level policies can substantially alter the domestic food price structure. The Philippines provides an instructive example of such a situation. As David points out in chapter 5, the nominal rates of protection for rice (measured as the percentage difference between domestic and border prices, converted at the official exchange rate) has in recent years been slightly negative, suggesting that rice is slightly undervalued. Due to national currency policies, however, the exchange rate is overvalued by 30 percent or more. If the exchange rate bias is taken into account, the net effective rate of protection on rice becomes substantially negative. In other words, exchange rate overvaluation significantly increases the degree of price undervaluation for rice, as well as for numerous other food products in the Philippines. The anti-agriculture price bias has been further reinforced by industrial import substitution policies, which raise the domestic prices of industrial, relative to agricultural, products. Together, these two macro-level policies have biased the urban-rural terms of trade against agriculture, thus accelerating capital outflows from agriculture and worsening the urban-rural income distribution.

Food Price Structures

As the design and scope of food price policies have varied, so too has the observed structure of food prices. The countries differ in whether the prices received by producers are under- or overpriced by international standards, whether producer prices are high or low relative to the costs of modern inputs, and in how consumer retail prices compare to producer prices. Comparison of three price ratios—the ratio of the domestic producer paddy price to the international paddy or rice price, of the paddy price to the price of nitrogen, and of the farm paddy price to the retail rice price—provides a good picture of differences in price structure. More detailed examination of national food price structures appears in later chapters.

Table 5 gives by country the farm-level paddy price as a percentage of the world price. Five-year averages are used to smooth out year-to-year price variability.² As of the early eighties, the domestic price of paddy was lower than the international price for five of the six countries shown. Domestic paddy prices were low for a variety of reasons, ranging from direct price setting in China to taxation of rice exports in Thailand. The visible exception is Korea, where import restrictions maintain domestic prices well above the international levels.

A similar picture emerges in the comparison of paddy to nitrogen prices. The ratios given in table 6 indicate that in 1980–82 all but two of the countries overpriced chemical fertilizer nutrients relative to the paddy price. The two exceptions were Indonesia and, once again, Korea, both of whose nitrogen-to-paddy price ratios were lower than the world ratio. In general, then, food price structures in these countries do not favor rice producers.

The price ratios in table 6 reveal the sometimes complementary and sometimes contradictory design of food output and input price measures. As of 1980–82, three of the countries, China, the Philippines, and Thailand, kept the farm paddy price low and the fertilizer price high. Consequently, their nitrogen-to-paddy price ratios were higher than the world ratio. In Korea the output and input prices counterbalanced each other. Korean trade restrictions kept both paddy and nitrogen prices well above their world prices, but the domestic paddy price was so high that Korean farmers faced the lowest nitrogen-to-paddy ratio of the countries shown.

2. Domestic prices are converted into U.S. dollars using official exchange rates. According to Barker, Herdt, and Rose (1985), in 1979–80 the exchange rates of Korea, Indonesia, Thailand, and the Philippines were not significantly over- or undervalued (p. 197). At that time, however, the official exchange rates for China and Nepal were probably overvalued (see Wallace chapter in this volume, pp. 374–75, and Sicular chapter, p. 503). Consequently, the ratios given in table 5 for China and Nepal in the late 1970s overstate the true ratio. Note that China's official exchange rate was devalued considerably after 1979–80, possibly reducing overvaluation by the mid-1980s.

TABLE 5. Farm price of paddy as a percentage of the world price, 1966–84

	1966–70	1971–75	1976–80	1981–84
Nepal ^a	129	100	74	85
China ^b	94–113	83–108	69–95	(1981–83) 61–92
Indonesia	68 (1967–70)	69	104	87 (1981–82)
Philippines ^c	96	94	75	73 (1981–82)
Thailand ^d	51	64	67	66 (1981)
Korea ^e	144	186	260	308
Adjusted world paddy price (U.S. \$ per metric ton)	85	135	182	194

NOTE: Yearly domestic producer prices are converted into U.S. dollars at official exchange rates, then divided by adjusted world paddy prices. Figures shown are the multiyear averages of the resulting yearly price ratios. Adjusted world paddy prices are calculated from the total of world rice import plus export values divided by the sum of world rice import plus export quantities, multiplied by 0.80 to adjust for marketing margins between the border and farm gate, and then multiplied by 0.65 to convert to paddy equivalent prices. Domestic producer prices are from Rose (1985) except where noted below. Exchange rates are from IMF (1986), *International Financial Statistics Yearbook*, and world rice prices from various issues of *FAO Trade Yearbook*.

^aCalculated using national unweighted average market prices (producer prices per se are unavailable), which, due to the large price differential between the plains and mountain areas, overstate the prices received in the major rice-producing regions (see Wallace chapter, this volume, for discussion of regional production and price patterns within Nepal). To correct for this bias, I multiply these prices by 0.85. Domestic prices are from Nepal Department of Food and Agricultural Marketing Services, *Agricultural Statistics of Nepal and Agricultural Marketing Information Marketing Bulletin* (1985–86).

^bLower end of range is calculated using the quota procurement price, and upper end using the above-quota procurement price. Chinese prices are taken from the appendix tables of the Sicilar chapter in this volume.

^cNineteen eighty-two domestic producer prices are from IRRI (1986), *World Rice Statistics*, 1985. All other years are from Rose (1985). These price ratios are lower than those given in table 1 of the David chapter in this volume, but they tell essentially the same story, i.e., that Philippines producer prices compared well to world prices in the 1960s and early 1970s but have fallen below world prices since then.

^dDomestic producer prices are from the Thailand Ministry of Agriculture, Office of Agricultural Economics (quoted in World Bank, 1982, p. 221). These ratios are similar to those calculated using the Thai prices given in Rose (1985).

^eKorean producer prices for polished rice are taken from the Anderson chapter in this volume, Table A. These are divided by the adjusted average world rice price divided by 0.93 to convert to a polished rice equivalent price. The resulting price ratios differ slightly from those given in the Anderson chapter because Anderson uses the Korean border price rather than an average world price for rice, and he also uses a marketing margin of 0.10 before 1970.

In order to cover the costs of milling and marketing, the retail price of rice would typically be about twice the farm paddy price (Barker, Herdt, and Rose, 1985, pp. 236–37). Table 6 suggests that in the early eighties retail-to-farm price ratios were more or less in line with marketing costs in Indonesia, the Philippines, Thailand, and perhaps Nepal. In China and Korea, the retail-to-farm price ratios were noticeably less than two, reflecting government subsidization of marketing costs. China's marketing subsidies in combination with a low farm price implies urban retail rice prices that are very low by international standards. For Korea, the marketing subsidy has partially offset the high farm price, but consumer prices are still unusually high.

TABLE 6. Nitrogen-to-paddy and retail-to-farm price ratios, 1980–82

Country/region	Ratio of nitrogen to paddy price (producer prices)	Ratio of domestic nitrogen to world nitrogen price	Ratio of retail rice to farm paddy price
Nepal	2.9	1.33	1.5–1.9 ^a
China	2.9–4.3 ^b	1.36	0.9–1.32 ^b
Indonesia	1.3	0.56	2.3
Philippines	3.8	1.33	2.2
Thailand	4.7 ^c	2.13 ^c	2.0
	(1979–81)		(1979–81)
Korea	0.9	1.49	1.1
			(1979–81)
World	2.1		

SOURCES: Paddy prices and exchange rates are the same as those in table 5. World fertilizer prices are from IRRI (1986), *World Rice Statistics*, 1985.

Nepal: Note that the “paddy” price is the national average market price for paddy, and the “retail rice” price is the national average market price for rice. Producer and retail prices per se are not available. All prices are from Nepal Department of Food and Agricultural Marketing Services, *Agricultural Statistics of Nepal and Agricultural Marketing Information Marketing Bulletin* (1985–86).

China: Urea price of 450 yuan per ton is taken from the Agricultural Technical Economics Handbook Editorial Group (1983). A national average state rice retail sales price of 293.4 yuan per ton was provided by the Chinese Academy of Social Sciences Institute of Finance and Trade.

Indonesia: The urea price is from the Timmer chapter in this volume, appendix table A. Retail rice prices are from Rose (1985).

Philippines: Urea and retail rice prices are from IRRI (1986), *World Rice Statistics*, 1985.

Thailand: The ammonium sulphate price is from O'Mara (1987), p. 82. The retail rice price is from Rose (1985).

Korea: Urea and retail prices from IRRI (1986), *World Rice Statistics*, 1985.

NOTE: Nitrogen prices are calculated using urea prices, except where noted otherwise.

^aLower ratio calculated using government rice distribution price; higher ratio uses market retail price.

^bLower ratio is calculated using the above-quota price and the upper ratio using the quota price.

^cUrea is used very little in Thai rice production, so these ratios are calculated using domestic and world ammonium sulphate prices.

Explaining Differences in Food Price Policies and Structures

The chapters in this volume indicate that food pricing policies and outcomes are to some extent endogenous. Consequently, an analysis of food pricing should not only judge food price policies on the basis of whether prices are low or high by international standards, but also should examine the factors that give rise to those policies.

The factors explaining differences in food price policies and structures are numerous and complex. In general, however, they fall into four broad, interdependent categories. The first is a country's natural or geographical endowment. In this category fall exogenous physical factors that cannot be altered by policy, at least in the short run. The second is the political context. Political factors include domestic and external political circumstances that limit or shape a government's ability to implement policy.

Third, the level of economic development can be influential. Finally, national objectives, through their effect on government policy, affect food pricing. National objectives are, of course, sensitive to a country's physical and political context, and to the level of development.

The geographical factor whose influence on food pricing is perhaps most obvious is the endowment of arable land. In the absence of foreign trade, a country with more, higher quality arable land per capita would, all else equal, tend to have lower food prices. Most countries, of course, participate in trade. Since trade barriers make imperfect the transmission of international prices to the domestic economy, however, national agricultural endowments continue to influence the domestic price structure.

Examination of the countries included in this study reveals an inverse relationship between arable land per capita and the level of the paddy price. Thailand, with the most arable land per capita, has over the past two decades consistently had the lowest domestic-to-world paddy price ratio. Korea, with the least arable land per capita, has dominated the higher end of the scale (tables 2 and 5). In both these countries trade policies have caused domestic prices to deviate from international prices. Consequently, their natural resource endowments are quite clearly reflected in their domestic price structures. The inverse relationship between arable land per capita and the level of paddy prices also holds for the remaining four countries, but the pattern is less clear because of differences in the extent to which world price trends are transmitted to the domestic economies.

The transmission of world price movements to the domestic economy can, in itself, be affected by geographical endowment. A country's geography influences accessibility to foreign trade, which in turn affects transfer costs and thus the relationship between world and domestic prices. Geography can also govern a nation's ability to control flows of commodities across its borders and so maintain prices that deviate from international prices. For Korea, Indonesia, the Philippines, and to a lesser extent, Thailand, in the absence of trade restrictions domestic and foreign prices for tradables would be nearly identical because most regions of these countries are close to a coast. At the same time, oceanic trade is sufficiently controllable that policy makers in these countries have been able to restrict imports and exports and so cause domestic and international prices to diverge. The larger the difference between domestic and international prices, however, the greater the costs of enforcing trade restrictions.

Although China has a long coastline and several major inland waterways, large areas of the interior are relatively inaccessible. If trade were unrestricted and if markets determined prices, then due to transfer costs, inland prices of imported commodities would be higher, and inland prices of exported commodities lower, than the world prices. Strict control of foreign trade in agricultural products and direct state intervention in

domestic food pricing has, however, obscured any correspondence between domestic and world prices. Nepal's inaccessible, landlocked location makes trade difficult except with India. Ironically, however, Nepal has the least enforceable border. Nepal's boundary with India cuts through a large plain. In the absence of any natural geographical barrier, Nepal has difficulty maintaining a domestic price structure that deviates from that of its large neighbor.

Natural endowment can influence pricing policy through its effect on the government's fiscal status. Indonesia provides an illustration of this point. During the 1970s and until the recent decline in petroleum prices, Indonesia's oil resources provided an important source of government revenue. Because of oil revenues, the Indonesian government could afford to support a large fertilizer subsidy program and did not have to rely heavily on agriculture as a source of revenue. Governments without such resources face tighter fiscal budget constraints and thus more difficult choices among different pricing objectives.

Natural endowment can also act upon the design of policy through its impact on the consequences of policies. A country that has a large population and arable land area can generate agricultural import and export levels that are sizable relative to the volume of trade on international markets. Policy makers in such countries cannot assume that they face perfectly elastic world supply or demand curves. Thus while Nepal and possibly Korea can develop food policies with little regard to their impact on world markets, China, Thailand, and Indonesia cannot do so. Thailand's rice export policies provide an example of how a national food policy can be motivated by the recognition of a downward sloping international demand curve for rice. Assuming that curve to be inelastic, Thai policy makers have used export restrictions on rice in an attempt to raise world prices and so extract surplus from consumers abroad. The mixed results of this policy are discussed in the Thailand chapter.

Similarly, a country's size and resources can determine the gains from trade or, conversely, the costs associated with self-sufficiency. For Korea, a country with limited land area and natural resources, the costs of self-sufficiency policies are high. China, on the other hand, is large and diverse enough to permit considerable internal diversification and trade. It is not surprising, then, that the importance of trade relative to GDP declines as country size increases (table 2).

A second set of factors that shape food pricing is political. Political factors can be internal or external in origin. If a government's internal power base is limited, a major consideration in its food policy program may simply be to maintain the political support of key groups. Both Nepal and Indonesia, for example, initially developed their state grain procurement and distribution systems in order to provide inexpensive staples to the military.

Later these systems were expanded to supply segments of the influential urban populations. Extension of these systems to assist rural producers has occurred only recently in Indonesia, and has not yet taken place in Nepal. Similar measures to protect urban consumers have been employed in Thailand and China. Usually food producers bear the costs of such programs, reflecting the fact that poorer, rural segments of the population are generally less influential.

External political factors can also weigh upon domestic food pricing. China's lack of attention to international prices and its efforts to be self-sufficient in food were in part the result of the West's foreign trade embargo on China during the fifties and sixties. For Korea and Nepal, the availability of foreign aid in the form of subsidized grain has, during certain periods, influenced domestic food pricing.

The overall level of economic development constitutes a third factor that shapes food pricing. Developed countries in general have price structures more favorable to agriculture than developing countries.³ This pattern to some extent applies to the countries studied here. Data in tables 3 and 5 show that domestic-to-world paddy price ratios tend to rise with per capita GNP and other indicators of development, such as smaller shares of agriculture in GDP and the labor force.

The studies in this volume highlight several reasons why such a pattern occurs. First, during the development process potential sources of government revenue grow in number, so that it is possible to lighten the tax burden on agriculture. Since manufacturing sectors in lower-income countries are usually small, even with heavy taxation they could not provide substantial revenues. Consequently, lower-income countries by necessity rely on taxation of agriculture and trade to generate government revenue. The tendency to tax agriculture is often reinforced by the perception that taxation of incipient industry will hinder the development of a key sector.

In addition, the absence of enforcement and monitoring infrastructures often leaves governments in low-income countries with only a limited number of revenue-raising tools at their disposal. Implicit taxation through pricing and the extraction of levies on imports and exports are relatively easy instruments to implement and monitor, and so they are commonly used. With development, nonagricultural sectors grow and the selection of revenue-raising instruments broadens. Governments can successfully implement value-added, profit, and personal income taxes, and the bases to which such taxes apply expand (table 7). Thus the higher the level of development, the more feasible it is for countries to promote a price structure that favors agriculture.

As development proceeds, it also becomes politically safer to raise food

3. See, for example, Anderson and Hayami (1986), and World Bank (1986), pp. 11–13.

TABLE 7. Government revenues and their selected components, 1983

	Central government revenues as a percent of GNP	Selected components of revenues as percent of total revenues	
		Taxes on income, profits, and capital gains	Taxes on international trade and transactions
Nepal	8.7	7.2	31.3
China	21.3 ^a	85 ^b	<0 ^d
Indonesia	22.7	73.6 ^c	4.3
Philippines	11.9	19.3	26.8
Thailand	15.2	19.6	21.4
Korea	19.5	22.9	15.8

SOURCES: World Bank (1986), *World Development Report*, pp. 224–25. China State Statistical Bureau (1986), *China Statistical Yearbook*, p. 597.

^aCalculated using revenue data from Sicular chapter in this volume and an official Chinese estimate for China's GNP of 549 billion yuan cited in Rock Creek Research (1986), *China Macroeconomic Newsletter*, p. 2. Chinese government revenue data include both central and local government revenues.

^bEstimated by author. Revenues from industrial profits plus industrial and commercial taxes alone exceed 80 percent of total revenues.

^cThis number reflects revenues from taxes on oil extraction.

^dChinese government revenues from international trade were negative in 1980–84.

prices. At higher levels of personal income, food, and especially staple foods, constitute a smaller proportion of household expenditures. The impact of an increase in the price of grain or other foods on consumers' real incomes is therefore reduced. Concurrently, with development rural interests begin to figure more prominently in national politics. As farmers become better organized and integrated in the national economy, their increased political clout creates pressures to protect and subsidize, rather than exploit, agriculture.⁴

These considerations suggest that low-income countries have compelling reasons for implementing policies that depress food prices. It is therefore not terribly constructive to propose that developing countries eliminate any antirural price biases. A more realistic approach would be to isolate the conditions that make feasible a more favorable pricing program, and to encourage correction of pricing biases as those conditions emerge.

Finally, national objectives can affect food pricing policies and structure. National objectives are, of course, formed within the context of a country's resource endowment, political environment, and level of development; moreover, food pricing may be used only to promote a subset of national goals, while other policies may be used to address the rest. Differing visions of countries' leaderships nevertheless account for some intercountry variation in food pricing.

Most developing countries place high priority on rapid economic growth, although the emphasis on industry as opposed to agriculture in the

4. See Anderson and Hayami (1986) for a discussion of the politico-economic reasons why agricultural protection increases with development.

development process has not been uniform. Several of the countries examined here have at one time emphasized rapid industrialization, for example, Korea in the 1950s and early 1960s, Thailand in the 1960s and 1970s, and China prior to the recent reform period, but especially in the 1950s. This emphasis on industry was translated into trade policies protecting domestic manufacturing and direct interventions to keep food prices low, both of which turned the terms of trade in favor of industry and against agriculture.

Several of these countries have since begun to place greater weight on the importance of agricultural growth in overall national development. Growth in agricultural production, especially of food, has also received greater attention as national leaders have increasingly placed priority on food self-sufficiency. Price regimes more favorable to agriculture have accompanied such shifts in priority, although nonprice measures, such as investment in new agricultural technologies and direct production planning (in China), have sometimes been used instead.

The agricultural sector began to receive greater attention in China in the early 1960s and in Korea during the late 1960s. Korea has, however, moved much further than China in implementing food price policies that benefit agriculture. Nepalese leaders have for many years acknowledged the need to promote agriculture, but successful policies have yet to be implemented. Indonesia provides a good example of favorable pricing to promote food production. In the early 1970s the Indonesian government introduced a paddy price support system, since which time rice production has grown to the point that Indonesia has shifted from a rice importer to exporter. Thailand, until recently able to rely on its land resources as a source of agricultural growth, has in the last few years begun to use price policies to promote food production.

Distributional objectives of one sort or another have also played a role in shaping the food pricing policies of most of these countries. Distributional measures, however, have often been motivated by political rather than equity considerations. As previously mentioned, most of these countries have taken steps to protect urban consumers from increases in and variability of staple food prices, usually at the expense of producers. Marketing margin subsidies have been used in China, Indonesia, and Korea to resolve the contradiction between urban consumer and rural producer welfare. Such subsidies have at times caused a substantial drain on the state budget, and when poorly designed can discourage food transport, processing, and storage activities.

Food Pricing and Economic Outcomes

Since food pricing is used to promote the various national objectives discussed above, one might ask whether, in fact, cross-country compari-

sons yield a discernible relationship between food price structure and economic outcomes. Interestingly, comparisons among the six countries studied in this volume show no clear correlation between food pricing structure and growth in food production, agriculture, or national product. The discussion in the next few pages mainly examines the paddy price level (relative to the world price) and its relationship to growth in rice production, agricultural value-added, and GNP. More comprehensive discussion of food price structures and outcomes can be found in later chapters.

The data presented in table 8 provides both a cross-sectional and longitudinal view of the pattern of pricing and outcomes. Neither cross-sectional nor longitudinal comparisons reveal a clearly positive relationship between the paddy price level and growth in rice production. During the late seventies and early eighties, for example, Korea had the highest paddy price ratios among the six countries, but growth in rice output over these years was slower than that in all but one of the other countries. In Thailand, whose paddy price ratios were considerably lower than those of the other nations, rice output grew 3.5–4.0 percent annually, a rate that falls in the middle of the range for the six countries. Nepal's rice production grew most slowly, even though its paddy price ratio was on average higher than Thailand's and the Philippines', and not significantly different from China's.

Longitudinal patterns similarly show no clear relationship between the paddy price and rice production. Historically China's paddy price ratio has slowly declined; however, the rate of growth in rice production has clearly accelerated since the late 1970s. Between 1965 and 1984 Indonesia's paddy price gradually rose to a level more or less in line with world prices. Since the early 1970s Indonesia's rice output has indeed grown at increasing rates. Nevertheless, this impressive growth in recent years has yet to surpass the 7 percent rates Indonesia achieved in the late 1960s.

Although the relationship between growth in rice output and the domestic-to-world paddy price ratio is weak, cross-country comparison shows a correlation between fertilizer price ratios and the levels of fertilizer use and yields. Data on fertilizer applications and yields per hectare (table 9) show that in Indonesia and Korea, the countries with the most favorable nitrogen-to-paddy price ratios, fertilizer applications are indeed higher than in Thailand, the Philippines, and Nepal. Paddy yields, and to some extent corn yields, are similarly in line with the level of fertilizer use. This pattern suggests that farmers in these countries are sensitive to the relative prices of inputs and outputs.

China deviates noticeably from the pattern: applications of fertilizer per hectare in China are extremely high despite an unfavorable nitrogen-to-paddy price ratio. The reasons for this are not completely clear but may have to do with the wide extension of irrigation, which raises the yield

TABLE 8. Domestic-to-world paddy price ratios and average annual rates of growth in rice output, agricultural value-added, and GNP^a

	1965–70	1970–75	1975–80	1980–84
Nepal				
Price ratio	129	100	74	85 (1981–83)
Rice output	2.0	1.1	–1.5	3.9
Ag. value-added	2.8	1.6	–1.1	
GNP	2.6	1.8	1.3	
China				
Price ratio ^b	94–113	83–108	69–95	61–92
Rice output	2.9	2.2	4.6	4.7
Ag. value-added ^c	4.0	2.6	3.2	7.5
GNP ^d	8.3	5.5	6.0	7.4
Indonesia				
Price ratio	68 (1967–70)	69	104	87 (1981–82)
Rice output	7.1	4.4	5.5	6.0
Ag. value-added	4.3	4.1	4.0	
GNP	7.1	7.2	7.5	
Philippines				
Price ratio	96	94	75	73 (1981–82)
Rice output	5.2	3.2	4.7	1.4
Ag. value-added	3.7	4.3	5.4	
GNP	4.8	6.5	6.2	
Thailand				
Price ratio	51	64	67	66 (1981)
Rice output	2.2	1.5	3.6	3.8
Ag. value-added	6.2	5.2	3.2	
GNP	9.2	6.2	7.0	
Korea				
Price ratio	144	186	260	308
Rice output	1.3	3.6	0.3	3.6
Ag. value-added	3.0	4.3	1.6 ^e	
GNP	10.4	9.0	7.2	

SOURCES: Price ratios are from table 5; Rice output is from *FAO Production Yearbook* (various issues); agricultural value-added and GNP are from World Bank (1983), *World Tables*, vol. 1, pp. 86, 87, 102, 103, 128, 129, 146, 147, 176, 177; China's agricultural value-added and national product data are from China State Statistical Bureau (1984, 1986), *China Statistical Yearbook*.

^aRice output growth rates are calculated using three-year averages for the base and end-points to eliminate year-to-year variation. Agricultural value-added and GNP growth are calculated using constant prices.

^bLower end of range is calculated using the quota price, upper end using the above-quota price.

^cGross value of agricultural output (*nongye zong chanzhi*), excluding village industry.

^dNet material product (*guomin shouru*).

^eFor 1975–81, because 1980 was an atypical year.

response to increased fertilizer applications, and perhaps also with a complicated planning structure that obscures the relationship between input prices and input use.

One might expect that growth in agriculture as a sector would be

TABLE 9. Indicators of agricultural technology

	Nitrogen to paddy price ratio, 1980-82	Chemical fertilizer applications per hectare (ha), 1984 (kg nutrients/ha)	Paddy yields 1983-85 average (kg/ha)	Corn yields 1983-85 average (kg/ha)	Percent of arable land irrigated, 1984
Nepal	2.9	19.8	2,011	1,465	28%
China	2.9-4.3	180.6	5,300	3,709	45%
Indonesia	1.3	74.6	3,937	1,767	26%
Philippines	3.8	31.9	2,494	1,025	13%
Thailand	4.7	25.0	2,046	2,425	18%
Korea	0.9	331.1	6,339	4,392	55%

SOURCES: FAO *Fertilizer Yearbook*, 1985. FAO *Production Yearbook*, 1985.

positively correlated with farm prices for major foods. The statistics on table 8 suggest that this relationship is also weak. Those countries with the higher domestic-to-world paddy price ratios do not necessarily have the fastest growth in agricultural value-added. Countries with historically rising paddy price ratios, that is, Indonesia, Thailand, and Korea, have experienced slowing or, at best, constant growth in agricultural value-added. Those with deteriorating paddy price ratios have shown both slowing of growth in agricultural value-added (Nepal) and improvement (China), as well as fluctuation (Philippines).

The absence of a noticeably positive correlation between rice production or agricultural value-added and relative paddy prices could have several explanations. Production may be more responsive to the domestic price's increase relative to past domestic prices rather than relative to the world price. Changes in domestic prices over time are reflected only indirectly in the price data given in tables 5 and 8. Thus, for example, the recent decline in China's paddy price ratio is due largely to currency devaluation; the domestic paddy price index rose in 1979. Lack of a clear relationship between the price indicators and agricultural growth could also reflect simultaneity in the price-production relationship. Higher prices induce output growth, but output growth in turn causes prices to fall. Conversely, slow growth in output can drive prices up, either through market forces or because governments respond by raising prices.

In several of the countries, overall trends in agricultural growth have been largely due to growth in nongrain products such as livestock or cash crops. Such has been true in recent years for China and Korea. In these countries the relationship between paddy-based price indicators and overall agricultural growth may be weak because price interventions for selected food crops do not affect directly those products driving overall agricultural growth. Finally, price structure is only one of many factors that can influence agricultural production. Other factors—technological ad-

vances, demand trends, or changes in managerial organization—frequently obscure the price-production link. It is often these other factors that determine long-term rates of growth for rice and the agricultural sector.

Food prices are thought to influence not only agricultural production, but also the performance of other sectors and growth in national product. Views about what sort of price structure is most favorable to overall development differ: some suggest that overvaluation or undervaluation of agriculture can be beneficial, and others believe that prices that reflect opportunity costs are most consistent with rapid growth. Data for recent years (table 8) does not appear to favor one view over another. Growth of GNP has been rapid in Korea, which overvalues rice, in Thailand, which undervalues rice, and in Indonesia, where rice prices are more or less in line with world prices; GNP growth similarly does not seem to be correlated over time with the level of the paddy price.

Food pricing is often used to pursue objectives other than rapid growth, for example, distributional objectives. Unfortunately, changes over time in national income distributions are not available. Data on the proportion of total personal income received by the lowest 20 percent and highest 5 percent of households for the six countries for selected years (table 4) indicate that inequality is greatest in Nepal and smallest in China and Korea. Indonesia, the Philippines, and Thailand fall more or less in the middle of the range. Excluding China, the degree of equality appears to be greater in countries that have higher food prices. This pattern is consistent with the conclusion that efforts to keep rice retail prices low do not promote greater equity, possibly because the target groups of such policies are rarely the poorest segments of the population.

The inverse relationship between paddy prices and inequality suggests that food price increases can help promote equity. Price increases have been used explicitly to raise rural incomes in Korea and also in China. Although raising food prices can improve urban-rural equity, however, it does not necessarily improve the intra-rural income distribution. Rural residents consume as well as produce food, and higher food prices yield net benefits only to those segments of the rural population that produce more food than they consume (Hayami and Herdt, 1977).

Conclusion

The countries examined in this volume show considerable variation in food price policies and food price structures. As discussed in the following chapters, food price policies in these countries have been motivated not only by growth objectives, but also by distributional goals, the desire to generate government revenues, and food security. Furthermore, food

pricing choices have been influenced by the presence or lack of natural endowments, the level of development, and the political setting. For these reasons, most of these countries have at some time maintained food pricing policies at odds with the usual policy prescriptions.

This is not to say that such policies have been costless. Indeed, as the chapters point out, in some cases significant short- and long-term efficiency losses can be attributed to national food price policies. Despite these costs, however, food price policy often does not lead to predictable outcomes. Economic progress, as well as economic stagnation, can occur under a variety of price regimes.

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