

# Korean Agricultural Protection in Historical Perspective

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## I. Introduction

The Republic of Korea is becoming increasingly more important to the world economy. Its industrial growth since the mid 1960s and its export-oriented development strategy have ensured that it is now among the world's twenty leading countries in international trade. Having a very small area of agricultural land per capita by world standards, and ready access to foreign industrial capital over the past two decades, Korea has switched from being the agricultural exporter it was in the Japanese colonial period to being increasingly dependent on agricultural imports. This change in agricultural comparative advantage is to be expected and to intensify, given the country's changing factor endowments and rapid industrial growth (Tolley; Anderson 1980; Anderson and Smith). But the changes in trade specialization have been influenced considerably by the effects of agricultural price and trade policies (and exchange rate policies) on domestic prices.<sup>1</sup> The objective of the present paper is to examine the extent to which those policies have caused producer and consumer prices of agricultural products in Korea to differ from prices at the country's border. Without infor-

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<sup>1</sup> For a descriptive account of these policies and their changes over time, see Moon; Moon and Ryo; Ban, Moon and Perkins (Ch. 8); and Huh.

mation on the divergence between domestic and border prices it is difficult to assess the efficacy of existing (or alternative) policies for achieving the desired objectives of society. This paper is thus the first step in such an assessment. It summarizes the changing patterns over the past 25 years of the ratios of domestic to border prices for the major crop and livestock products produced and/or consumed in Korea. It also compares Korea's protection in agriculture with that in manufacturing in 1968 and 1978, and its agricultural protection with that of Japan. It shows that while Korean agriculture was effectively taxed slightly in the 1950s and early 1960s, at a time when manufacturing was heavily protected, it has been protected increasingly since the late 1960s when manufacturing has become more export-oriented and less assisted. Indeed, its protection levels in the late 1970s rival those of Japan, a country which is recognized as having one of the most protected agricultural sectors in the world. The final section discusses some policy implications. It points out that while the high prices of the 1970s have helped maintain food self-sufficiency and farm/non-farm income parity (the two major farm policy objectives), the production of new technologies and the adjustments made by farm families to changing economic circumstances have also contributed very substantially towards meeting these objectives. This suggests that since further public expenditure on agricultural research and on improving the abilities of rural people to adjust are likely to be far less costly than higher price supports as ways of achieving these objectives of farm policy, perhaps more emphasis should be given to those instruments relative to price and trade policies in the future.

## II. Growth of Agricultural Protection, 1955-1980

Table 1 summarizes recent estimates of the ratios of domestic to border prices for major agricultural products for Korea from 1955 to 1980. Clearly, wholesale product prices have shown a continuous upward trend relative to border prices over the past 25 years. Grain and livestock product domestic prices were both slightly below international levels in the 1950s and early 1960s, and were about equal to border prices in the mid 1960s. Since the late 1960s, however, the domestic to border price ratios have been increasing rapidly, apart from the mid 1970s period in which international prices reached extraordinarily high levels. Moreover, pro-

**Table 1**  
**RATIO OF DOMESTIC TO BORDER PRICES FOR**  
**AGRICULTURAL PRODUCTS,<sup>a</sup> KOREA, 1955 TO 1980**

	1955-59	1960-64	1965-69	1970-74	1975-79	1980 <sup>p</sup>
<b>GRAIN</b>						
Rice	.88 (.86)	.94 (.91)	1.04 (1.06)	1.46 (1.55)	2.30 (2.38)	2.48 (2.56)
Barley	.96 (.86)	1.10 (1.07)	.94 (.94)	1.20 (1.35)	1.11 (1.77)	1.39 (1.90)
Wheat	.95 (.78)	.80 (.92)	1.19 (1.18)	.98 (1.16)	1.06 (1.47)	1.14 (1.33)
Corn		(1.31)	(1.17)	(1.48)	(1.67)	(1.79)
Soybean	.80 (.77)	1.08 (1.05)	1.55 (1.51)	1.64 (1.68)	2.63 (2.09)	2.62 (2.74)
AVERAGE GRAIN	(.85)	(.95)	(1.05)	(1.51)	(2.24)	(2.49)
<b>LIVESTOCK</b>						
Beef	1.03	1.03	1.55	1.88	3.81	3.25
Pork	.89	.95	1.82	2.11	2.13	2.07
Chicken		1.07	2.32	2.03	2.53	2.46
Eggs	.97	.80	1.00	1.00	.93	1.15
Milk <sup>b</sup>				2.30	2.29	
AVERAGE, MEAT AND EGGS	.94	.91	1.42	1.59	1.92	2.03
<b>OTHER</b>						
Sugar	2.16	2.70	4.58	2.12	2.63	2.20
Red pepper			2.07 <sup>c</sup>			5.39
Sesame seed		1.07	1.80	2.27	1.91	3.08
Apples			1.38	1.28	2.04	
Oranges					3.85	

a Domestic wholesale prices are used except for the ratios in parentheses, which refer to producer prices. Border prices are unit cif import values, except in the case of rice prior to 1968 where the fob export price from Taiwan is used because Korea would have exported rice then if world prices had ruled domestically. For years in which Korean imports were close to zero, use has been made of comparable prices for other countries (US beef import prices, Hong Kong import prices for other livestock products, refined sugar and oranges). The weights used to obtain commodity group averages are based on production valued at border prices. The official won/US dollar exchange rate is used from 1964. Prior to the trade and payments liberalization of 1964, however, the won was overvalued substantially, so the purchasing-power-parity exchange rate (as estimated by Frank, Kim and Westphal) is used for years prior to 1964 in an attempt to net out the effects of this exchange rate overvaluation.

b The wholesale fluid milk price is divided by the Hong Kong full cream powdered milk unit import price converted to a fluid milk basis by dividing by 14.

c 1969-72.

p Preliminary.

Source: Revised from Anderson (1981, Tables 1 to 4) and based on data reported in Bank of Korea, *Price Statistics Summary*, various issues, National Agricultural Cooperatives Federation, *Agricultural Cooperatives Yearbook*, various issues; and Food and Agriculture Organization, *Trade Yearbook*, various issues.

ducer to border grain price ratios (shown in parentheses in Table 1) have been increasing even more rapidly than the wholesale to border grain price ratios. This is because since 1968 the government has been selling grain to consumers at less than the prices received by growers. The producer price of rice reached a high of 3.4 times the border price in 1979, and the average producer to border price ratios for all five grains shown was 2.7 in the 1977-1980 period. Since there are costs of marketing grain from the farm gate to the same point in the marketing chain as imported grain, these data suggest that the nominal rate of protection of grain production in Korea in the late 1970s was more than 170 per cent. If there were no input price distortions in those years, the effective rate of grain protection would have exceeded 250 per cent, since purchased inputs accounted for about one-third of grain output valued at border prices in the late 1970s.

Insofar as livestock product wholesale prices are indicative of returns to producers, they suggest protection rates for livestock production have increased in close parallel with those for grain. Domestic meat prices were two to three times border prices at the end of the 1970s, with the beef price ratio reaching 4.6 in 1977 and 1978. Domestic egg prices have been very close to border prices in most years, while milk prices have been well above international levels. Wholesale fluid milk prices have been up to two or three times higher in Korea than in the United States or Australia during the 1970s, and the price received by Korean producers has been more than three times the price received by New Zealand milk producers in recent years. These differences are reflected in Table 1, which shows that the price of fresh milk in Korea in the 1970s has been two or three times higher than the border price of reconstituted powdered milk. The average domestic to border price ratio for all livestock products in the 1977-1980 period was around 2.2, that is, the nominal rate of livestock protection was about 120 per cent. The effective rate of protection for the livestock sector is probably many times greater, since the share of value added in livestock output is well below one-third when measured at domestic prices and negative when measured at border prices.

Most of this increased protection for grain and livestock production has come about simply through restricting imports, with the sale of government grain at less than the purchase price being a

relatively minor contributor at least for the major crop, rice.<sup>2</sup> Import restrictions have applied to more than just grain and livestock products, however. In particular, fruit and vegetable imports have also been severely restricted. It is difficult to obtain border prices for many fruits and vegetables because in many cases they are traded in small quantities and hence are reported in the trade statistics only in aggregate form. Nonetheless, it is clear from the lower part of Table 1 that some fruit and vegetable prices have been well above import prices in recent years. Indeed, in the shortfall years of the early and late 1970s, the domestic prices of some vegetables rose to eight times import prices, despite considerable imports in those years (Anderson 1981). The overall index of fruit and vegetable producer prices has been highly correlated with the index of producer prices of grain and livestock products over the past two decades. If border prices of fruits and vegetables have changed to the same extent as those of grain and livestock products, this would suggest the nominal protection changes would also have been similar.

Since the grain and livestock products listed in Table 1 contributed about 70 per cent of the value (at constant domestic prices) of Korea's total agricultural production over the past 25 years, and since it appears that protection of fruits and vegetables (which contributed about 20 of the remaining 30 per cent of all agricultural production) has closely paralleled that for grains and livestock, a weighted average of the grains and livestock protection estimates is probably a reliable index of overall agricultural protection. That index suggests the nominal rate of agricultural protection has increased from slightly below zero prior to the mid 1960s to around 75 per cent in the early 1970s and to around 160 per cent in the late 1970s. The effective rate of protection in the late 1970s may well have exceeded 300 per cent. Thus the overall effect of Korea's agricultural price and trade policies has been to gradually switch from effectively taxing agriculture to heavily assisting it relative to what would have been the case if free market forces had been allowed to operate in the agricultural sector, *ceteris paribus*.

<sup>2</sup> This is not to say that the budgetary cost of the grain deficiency payment scheme has been minor. On the contrary, the total deficit in the Foodgrain Management Account, net of earnings from selling imported grain as well above c.i.f. import levels, has amounted to US\$1.6 billion over the decade of the 1970s. Since 1974 this deficit has averaged 0.8 per cent of GNP and has represented more than one-quarter of all government expenditure on the agricultural sector.

Whether price and trade policies have retained resources in agriculture since the late 1960s depends not just on the rate of agricultural protection, however. It also depends on the extent to which policies have favoured other sectors, especially manufacturing. Up until the early 1960s, most manufacturing industries were heavily protected from import competition, which would have more or less offset the negative effects on manufacturing of the overvalued exchange rate (Frank, Kim and Westphal). Thus agriculture in the first post-Korean War decade was doubly squeezed, by negative incentive for farm production and positive manufacturing incentives. The trade liberalization of the mid 1960s, however, reduced substantially the assistance to manufacturing. Indeed, Frank, Kim and Westphal estimate that the effective rate of assistance to manufacturing in 1968 was actually slightly negative, -5 per cent, compared with 21 per cent for agriculture. During the 1970s, assistance to manufacturing was increased, but to a much smaller extent than that to agriculture. Nam estimates that the effective rates of assistance in 1978 were 7 per cent for manufacturing and 69 per cent for agriculture. Within the manufacturing sector, the import-competing industries suffered a cut in assistance between 1968 and 1978, from an estimated 50 per cent to 35 per cent, while the export sector received an assistance boost from -10 to 6 per cent. It is possible that these studies underestimate some forms of implicit assistance to export manufacturers. But it is also likely that, at least for 1978, they underestimate agricultural protection.<sup>3</sup> Thus it is reasonable to conclude from these various estimates that Korea's price and trade policies have gradually changed from disfavouring to strongly favouring agriculture relative to manufacturing over the past quarter century, relative to what would have been the case if free market forces had been operating in both sectors.

It is instructive to compare the growth of agricultural protection in Korea with that in Japan, a country which is recognized as

<sup>3</sup> Nam estimates the 1978 nominal rate of protection for the agriculture, forestry and fisheries sector to be 55 per cent, whereas the data in the present study suggest the rate for grains and livestock (which constitute more than half the sector's output) was 134 per cent in that year. The 1968 nominal protection rate estimated by Frank, Kim and Westphal for the agriculture, forestry and fisheries sector was close to that suggested here for grains and livestock (16 compared with 20 per cent in this study). So too was a 1975 agricultural estimate made by the Korea Chamber of Commerce and Industry: 20 per cent compared with this study's 14 per cent for grains and livestock.

having one of the most protected agricultural sectors in the world. No comprehensive estimates of nominal protection coefficients on a time series basis have been published for Japan to the author's knowledge. However, preliminary estimates are reported in an unpublished paper by Saxon and Anderson, which compare as follows with those for Korea (where sugar has a zero weight):

	Grain, Soybean and Sugar		Meat and Eggs	
	Japan	Korea	Japan	Korea
1955-59	1.46	.85	1.22	.94
1960-64	1.71	.95	1.24	.91
1965-69	2.01	1.05	1.16	1.42
1970-74	2.56	1.51	1.26	1.59
1975-79	3.56	2.24	1.30	1.92

These estimates show that agricultural protection has been greater in Japan than in Korea, but that the difference has narrowed over time with the greater rate of increase in Korean protection for foodgrains and meat. It would appear that Korea is following a very similar path to Japan in steadily increasing its agricultural protection, and with only a few year's lag for crops despite Japan's much more advanced stage of economic development.

### III. Some Policy Implications

The appropriateness of Korea's policy of steadily increasing agricultural protection depends of course on the country's policy objectives and on the constraints facing the government in attempting to meet those objectives. The two major stated objectives of farm policy are to increase food security, especially through boosting self sufficiency of rice and barley, and to maintain farm household incomes at the same level as rising urban household incomes. If one were to judge the success of policy simply by looking at the extent to which these goals were achieved, Korea's record over the 1970s would look impressive. Its food self sufficiency in all but wheat and feedgrains is still very high, even if it has declined somewhat. And the published data on farm and nonfarm incomes indicate that the gap between them has narrowed considerably

over the past decade or so: farm household incomes as a percentage of household incomes of urban wage and salary earners increased from an average of 74 per cent in the latter half of the 1960s to 84 per cent during the first half of the 1970s and 97 per cent in the second half of the 1970s.<sup>4</sup>

However, in evaluating policy one needs to also examine both the extent to which other factors contributed to these goals and the cost of chosen policies as compared with alternative policies that might have been used. Certainly the rise in farm product prices was not the only factor boosting farm incomes and food self sufficiency in Korea in the 1970s. Also of importance has been the very rapid response of farmers to the large rises in real wages in the manufacturing sector (6 per cent per year in the first half of the 1970s and 16 per cent in the second half).<sup>5</sup> These wage increases have attracted increasing numbers of farm workers to industrial jobs on a part-time or full-time basis. Kim, *et al.* estimate that the percentage of the farm labour force leaving agriculture rose from less than 3 per cent per year in the late 1960s to around 5 per cent in the mid 1970s and more than 7 per cent in the latter 1970s. Also, the rise in wages relative to the cost of farm machinery services has induced a substantial and increasing degree of capital-labour substitution on farms (Anderson and Joo). As a result, farm labour productivity grew at 9 per cent per year during the 1970s, compared with 5.6 per cent in the latter 1960s and only 0.7 per cent in the decade before that (Ban). In addition, the production and dissemination of new farm technologies, especially high-yielding fertilizer-responsive rice varieties, boosted land productivity in the 1970s by almost 6 per cent per annum compared with less than 2.5 per cent in the 1960s (Ban). This not only raised farm incomes but also boosted food self sufficiency. Thus society's objectives have been met in large part by the ability of farmers to adjust efficiently to changing economic circumstances: their adoption of profitable new technologies as they become available, their substitution of machinery for labour and draft power as relative factor prices changed and, most importantly, their ability to allow some of their family to leave agriculture and obtain employment in the nonfarm sector in response to rising industrial wage rates.

Moreover, in view of the huge and rapidly rising cost of Korea's

4 Economic Planning Board, *Handbook of Korean Economy 1980*, Table 120.

5 *Op. cit.*, Table 108.



current agricultural protection policies,<sup>6</sup> one needs to ask whether more emphasis could be given to less costly forms of assisting society to achieve its objectives of boosting farm incomes and food security. In fact, numerous public policy instruments are available that may be far less costly than protection — or even socially profitable. One is further public investment in producing new and adapting imported farm technologies. Korea has over the years spent far less on agricultural research per dollar of agricultural output (measured at international prices) than most other developing countries. Data presented in Anderson (1981) suggest that while expenditure on extension has been comparable with other developing countries (and probably exceeded many of them in the latter (1970s), expenditure on research per dollar of output has been only a small fraction of that in other countries with similar incomes per capita. While this does not necessarily mean more investment is warranted, it in conjunction with the fact that many other developing countries have tended to underinvest substantially in agricultural research (though not extension) suggested that Korea ought to at least examine the possibility that it has scope for considerably more profitable investment in agricultural research.<sup>7</sup> Since the social returns from crop research usually far exceed the private returns (Schultz 1971), it may be possible to put a strong economic case for more public expenditure in this area. The case is made even stronger by adding equity considerations, because the income distribution effects of new farm technologies within both the farm and nonfarm sectors are also likely to be judged desirable, so long as the new technologies are applicable to small as well as large farms (Hayami and Herdt). Insofar as such research expenditure produces profitable new farm technologies, it is likely to boost both farm incomes and food self sufficiency.

With respect to the equity objective of ensuring that farm household incomes keep pace with rising nonfarm incomes, a number of more efficient and less inequitable alternatives to ever-increasing farm prices exist. Providing more part-time nonfarm jobs in rural areas is one means of boosting farmers' non-

6 Estimates of the increasing magnitude of the welfare cost of Korea's agricultural protection are provided in Anderson (1981).

7 For a survey of evidence on the high rates of return to agricultural research investment in developing and developed countries, see Arndt, Dalrymple and Ruttan (Ch. 1). Chapter 6 of that volume discusses the issues concerned with measuring such rates of return.

agricultural incomes,<sup>8</sup> although the net returns from the considerable public investment in infrastructure that would be required to attract industry away from the large coastal cities would need to be weighed against the net returns from other public investments. The most obvious and perhaps most efficient and most desired alternative is to provide adjustment assistance to farm families.<sup>9</sup> A particularly effective form of adjustment assistance in the long run is to invest more in education in rural areas. All the available evidence suggests that education enhances farmers' abilities to adjust to changing circumstances, especially if that requires them to leave farming (Schultz 1975; Jamison and Lau). An empirical study by Hong showed that schooling has indeed contributed economically to Korean agriculture through enhancing farm managerial abilities. While no results are available to show the social rate of return to further expenditure on different levels of education in rural areas in particular, the results reported in Jeong and Psacharopoulos for the country as a whole suggest that the returns from investment in more primary and secondary schooling are likely to be considerably higher than the returns from further tertiary education in Korea. And since it is in rural areas that school leavers have the least education, returns from further pre-tertiary education are likely to be highest in these areas.<sup>10</sup> Thus from an efficiency point of view alone, more expenditure on rural education may well be warranted. Furthermore, because rural people who migrate to the city take their skills with them and subsequently contribute to industrial growth, an equity case exists for compensating the farm sector for this loss by subsidizing both formal schooling and job retraining for farmers wishing to leave

8 Only about 30 per cent of farm household income was earned off the farm in Korea in the late 1970s, compared with more than 60 per cent in Taiwan and 75 per cent in Japan (Anderson and Joo).

9 That Korean farmers are not averse to seeing their children leave the farm sector is suggested by the results of a recent opinion survey, which show that 70 per cent of rural residents would like to send their children to college and only 4 per cent would like to see their children become farmers (Kim, p. 212).

10 McGinn, *et al.* (Table 30) report that in 1970, 39 per cent of farmers and fishermen had no formal schooling and a further 49 per cent had only some primary schooling, whereas those percentages for the total population were 24 and 44, respectively. While farmers and fishermen made up 51 per cent of the total workforce in 1970, they comprised 83 per cent of those with no schooling and only 22 and 5 per cent of those with some secondary and some tertiary education, respectively. The 1980 population census data are not yet available for providing information on the current situation, but since it is the younger and better-educated people who have migrated to the cities in the 1970s, the contrast is likely to have been even more stark in 1980.

agriculture (Schultz 1961).

How can Korea's concern about its vulnerability to international markets be reduced, given that its current level of food self sufficiency can only be maintained at ever-rising costs? First, it needs to be recognized that food self-sufficiency is not necessarily synonymous with food security. Since the crucial inputs for crop and livestock production in Korea depend almost entirely on imported raw materials such as nitrogen and feedgrains, dependence on the world market still remains high even though the final products are produced domestically. Secondly, if it is feared that there may again be freak years such as 1974 in which supplies are difficult to obtain on the international market at any price, then it is likely that holding larger stockpiles domestically would be a much cheaper form of insurance than maintaining high-cost domestic production capacity. Other ways to increase the security of depending on imports are to enter into long term contracts with import suppliers and/or to hedge on futures markets. Since long term contracts also provide security of demand for export suppliers, they may involve lower prices than would be the case if Korea were to remain a sporadic buyer on the spot market. This is especially so with beef because its supply response is negative in the first two years after a demand expansion while beef producers withhold breeding stock from slaughter to build up their herds.

To sum up, it needs to be recognized that, because Korea's comparative advantage in manufacturing relative to agriculture is growing so rapidly, food self-sufficiency and farm/nonfarm income parity cannot be maintained by agricultural price and trade policies alone except at huge and increasing cost. Much more efficient ways to help achieve these twin farm policy goals are available, for example through more expenditure on agricultural research and on rural education. Perhaps it is an appropriate time to redirect agricultural policy away from a heavy reliance on price supports and import controls towards more reliance on productivity-boosting and socially profitable public investments in agriculture.

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