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# Sector-Specific and Economywide Policies and Agricultural Incentives in LDCs

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**Abstract:** The concept of sector-specific and economy-wide policies on incentives for agriculture is defined. A methodology is described for measuring the impact of those policies and results are given for a sample of commodities for 18 developing countries for 1975-84. On average, sector-specific policies tax agricultural exports and protect agricultural imports. Economywide policies tax agricultural products. The impacts of the economywide policies dominate those of the sector-specific policies both for agricultural exports (where they are negative) and imports (where the impact of the specific policy to agriculture is positive).

## Introduction

Most developing countries have attempted to encourage the growth of industry by: (1) erecting high walls of protection against imports that would compete with domestic production; (2) maintaining overvalued exchange rates through exchange-control régimes and import licencing mechanisms even more restrictive than those adopted in connection with import substitution; and (3) often attempting to suppress producer prices of agricultural commodities through government procurement policies (especially agricultural marketing boards), export taxation, and/or export quotas. Some governments have attempted to offset, at least in part, these latter disincentive effects on producers by subsidizing input prices and investing in irrigation and other capital inputs.

The third of these sets of policies has been extensively studied. But attempts have been made to estimate the combined impacts on incentives and returns to agricultural producers of those direct government policies and the indirect effects of exchange rate policy and protection to industry. Moreover, those few studies that have attempted to estimate those indirect effects have been undertaken with widely varying methodologies; e.g., Valdés (1973) on Chile, Schuh (1981) on the USA, Oliveira (1981) on Brazil, Garcia Garcia (1981) on Colombia, Cavallo and Mundlak (1982) on Argentina, Oyejide (1986) on Nigeria, and Bautista (1987) on the Philippines. These studies, therefore, do not permit systematic comparative analysis across countries of the effects of differing degrees of discrimination against agriculture.

In this paper, however, such estimates are provided on a comparable basis for 18 developing countries.<sup>2</sup> These estimates are some of the results of the World Bank's research project on the political economy of agricultural pricing policies. The first section gives background information on the way the estimates were made in order to permit appropriate interpretation of the data. The second section provides estimates of the direct, indirect, and total intervention affecting incentives for agricultural output for the 18 countries, for 1975-84 and presents some preliminary analysis of the findings. The final section draws some conclusions.

## Estimates

In this paper, the focus is on quantification of the magnitude of the impacts of direct and indirect policies on agricultural prices. For all countries, the impacts are measured relative to what prices would have been had there been no interventions and a régime of free trade. For all tradeable commodities, the reference prices used were the border prices that would have prevailed under an intervention-free régime (adjusted for transport, marketing margins, quality difference, etc.).<sup>3</sup> The results presented here are limited to one exported and one imported product per country. In the project, the concentration was on four to six commodities for most countries, and that coverage typically represented about half to three quarters of net agricultural product.

A second step was to obtain estimates of domestic producer and consumer prices as well as border prices (adjusted for transport costs to or from producer and consumer locations, storage costs, quality difference, etc.) of these commodities. For instance, in the case of wheat in Chile, adjustments were made for domestic transport costs from the main port of entry for wheat to the mills, for customs duties and custom agent fees, for unloading costs and losses in transit, for the annual average quality difference between domestic and imported wheat, and for seasonality (storage).

Estimation of the effects of direct interventions (i.e., those aimed directly at agricultural inputs or outputs) was relatively simple contrasted with the procedures needed to estimate indirect effects. Here the focus was on the real exchange rate and on the tax on agricultural production implicit in the protection of industry. A full account of the procedures used to obtain these estimates may be found in Krueger, Schiff, and Valdés (forthcoming, b, Vol. 1). Here, only the economic rationale behind the estimates is conveyed.

First, estimates were made of the degree of divergence between the actual real exchange rate and the real exchange rate that would have kept the current account at a sustainable level—taking into account normal capital flows—if all quantitative and tariff protection to imports as well as the interventions affecting exports had been removed. This involved estimation of the equivalent tariff of import protection, use of foreign exchange demand and supply elasticity estimates, and use of the resultant numbers to estimate the amount of real exchange rate change that would have had to be undertaken to yield the sustainable current account level.

Taking the border price at the equilibrium exchange rate gave an estimate of the border price that would have prevailed in the absence of interventions. Measuring the nonagricultural price index at the equilibrium exchange rate and in the absence of tariffs and quantitative restrictions on imports and interventions on nonagricultural exports (by adjusting the tradeable part of the price index) gave an estimate of the value of that price index in the absence of interventions. Using these estimates, the indirect effects of the interventions on the prices (and value added) of agricultural products (relative to the nonagricultural price index) were obtained.

Calculations of the indirect effects are less sensitive to the choice of elasticity values for supply and demand for foreign exchange and to the choice of a sustainable level of current account deficit than they might first appear. The indirect effects have three components. First, elimination of the nonsustainable part of the current account deficit requires an increase in the real exchange rate. Second, removal of trade policy interventions (mainly industrial protection policies) also leads to an increase in the real exchange rate. Both the first and second components raise the price of agricultural products relative to the nontradeable part of the nonagricultural price index. Third, removal of trade policy interventions raises the price of agricultural products relative to the tradeable part of the nonagricultural price index. In many cases, the third component was as important as or more important than the first two components.

Empirically, the assumptions about the current account imbalance turned out to be less influential for the indirect effects than industrial protection because the former only affects the first component while the latter affects both the second and the third components. The indirect effects also turned out to be less sensitive to the selected value of elasticities than expected because a proportional change in the elasticities of demand and supply for foreign exchange only affects the first component of the indirect effects. It has no effect on the second or third component.<sup>4</sup>

For those countries where reliable estimates of supply and demand elasticities for foreign exchange were not available, elasticity values of 1 for supply and 2 (in absolute value) for demand were used, based on estimated elasticities from other studies.

Changing the real exchange rate to close the nonsustainable part of the current account deficit might imply changing the underlying macroeconomic policies, and this may affect the location of the supply and demand curves for foreign exchange and may thus affect the

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results. However, this problem is part of a more general claim that simulations of policy changes alter the constraints agents face and thus affect the parameter values of the model.

In the case of Ghana, calculation of the equilibrium real exchange rate involved an additional complication. The increase or depreciation of the real exchange rate to its equilibrium value for a given world price of cocoa implies an increase in Ghana's cocoa output and therefore a reduction in cocoa's world price. The equilibrium real exchange rate was therefore determined in a simultaneous system where the world price of cocoa is determined endogenously as a function of Ghana's real exchange rate. This methodology resulted in a higher equilibrium real exchange rate than the one based on calculations that ignore the impact of Ghana's real exchange rate on the world price of cocoa.

The total effect of the interventions was taken to be simply the sum of the direct and indirect effects.

### Degrees of Intervention

Table 1 presents estimates of the degree of direct and indirect intervention in representative key exportable and importable products for the 18 countries for 1975-84. The impacts of "direct" pricing policies are given in columns (3) and (6). These numbers provide an estimate of the percentage by which domestic producer prices diverged from those that would have prevailed in a well-functioning market at free trade (but at the exchange rate and with the degree of protection that actually prevailed). The measure is equivalent to the nominal protection accorded to the product in question.

Table 1-Direct, Indirect, and Total Nominal Protection Rates for Exported and Imported Products, 1975-84 (in percent)

Country	Indirect (1)	- - - Exportables - - - -			- - - Importables - - - -		
		Product (2)	Direct (3)	Total (4)	Product (5)	Direct (6)	Total (7)
Argentina	-27	Wheat	-19	-46	*		
Brazil	-23	Soyabeans	-14	-37	Wheat	14	-9
Chile	7	Grapes	1	8	Wheat	10	17
Colombia	-30	Coffee	-6	-36	Wheat	7	-23
Dominican Rep.	-19	Coffee	-23	-42	Rice	23	4
Egypt	-16	Cotton	-29	-45	Wheat	-20	-36
Ghana	-78	Cocoa	30	-48	Rice	99	21
Ivory Coast	-30	Cocoa	-26	-56	Rice	12	-18
Korea	-15	†			Rice	89	74
Malaysia	-7	Rubber	-22	-29	Rice	53	46
Morocco	-10	†			Wheat	-4	-14
Pakistan	-42	Cotton	-9	-51	Wheat	-17	-59
Philippines	-28	Copra	-18	-46	Maize	22	-6
Portugal	-9	Tomatoes	17	8	Wheat	21	12
Sri Lanka	-33	Rubber	-30	-63	Rice	15	-18
Thailand	-17	Rice	-22	-39	*		
Turkey	-38	Tobacco	-13	-51	Wheat	13	-25
Zambia	-50	Tobacco	4	-46	Maize	-11	-61
Average	-27		-11	-38		21	-6

\*Argentina and Thailand's main agricultural products are all exported.

†Korea and Morocco's main agricultural products are all imported.

Although government policies differ significantly among individual agricultural commodities, commodities were selected for analysis that were deemed fairly representative of government policy towards agricultural exportables. Thus, the group of commodities shown here can be used as a rough indicator of the incentives provided for agricultural products in general. As can be seen in column (2), most countries adopted policies that

resulted in the equivalent of export taxes for the exportable commodities covered here. The exceptions were Ghana (where a highly unrealistic exchange rate resulted in such strong disincentives that some compensatory action was politically essential), Portugal, Chile, and Zambia. The average taxation rate for the products selected was 11 percent.

The more surprising finding is that the impact of indirect interventions on producer incentives was even stronger than the direct ones.<sup>5</sup> Indirect effects include both the effects of trade and macroeconomic policies on the real exchange rate and the extent of protection afforded to nonagricultural commodities. As can be seen from column (1), exchange rate policy, protection to industry, and other policies that were not aimed at agricultural exports often had larger impacts than the direct policies. For Argentina, Brazil, Colombia, Ghana, Ivory Coast, Pakistan, Philippines, Sri Lanka, Turkey, and Zambia, the discrimination against the agricultural exportable crops inherent in policies external to agriculture had larger impacts on agricultural incentives than did policies aimed directly at agriculture. As already noted, indirect negative protection in Ghana was so large that direct agricultural policy provided something of an offset.

For most countries, indirect negative protection intensified the negative direct protection, often resulting in extremely large total negative protection equivalents. The resulting total nominal protection rates are given in column (4) for exportables. As can be seen, the magnitude of disprotection was in many cases large indeed. In the Ivory Coast, for example, cocoa producers received less than half the price they would have received under a free-trade régime at realistic exchange rates and no direct intervention. Sri Lankan rubber producer prices were close to two thirds less than the nonintervention prices. Producer prices were also less than half of the nonintervention price in Pakistan and Turkey. Overall, a simple unweighted average rate of total nominal protection was -38 percent.

People have long recognized that agriculture has been discriminated against. What Table 1 brings out is the degree. As is analyzed in the individual country studies, the negative protection accorded to producers of agricultural export commodities was a significant factor in depressing export earnings in many countries. Even those countries regarded as successful exporters of agricultural commodities, such as Thailand and Malaysia, adhered to this pattern. Of the 18 countries covered in the project, only Chile and Portugal maintained régimes that provided positive total protection to producers. The dominant pattern has been one of systematic and sizeable discrimination.

As for importable products, the impact of direct interventions is shown in column (6). Several findings are noteworthy. First and foremost, in contrast with the negative direct protection accorded to exportable crops, the countries covered here (with few exceptions) provided positive direct protection to import-competing crops. Indeed, the degree of discrimination in policy against exportables and in favour of import-competing crops is remarkable: contrast Malaysian rice, receiving the equivalent of 53 percent nominal protection, with Malaysian rubber, taxed at the equivalent of 22 percent. Direct pricing policy led to an increase in the relative price of rice of 96 percent (relative to rubber).

By definition, those policies that indirectly affect agriculture have the same net impact on import-competing commodities as on exportable commodities. Taking the effects of both direct and indirect policies into account, the effects of direct price policies were in many cases reversed. In Brazil, Colombia, Ivory Coast, Philippines, Sri Lanka, and Turkey,<sup>6</sup> positive direct effects were more than offset by negative indirect effects.

In this regard, one remarkable developing country is South Korea, where direct protection of agricultural commodities (no exportables exist) is very high, and the impact of policies towards the rest of the economy is not large by comparison. However, even with the strong Korean protection and sizeable total protection of rice in Malaysia, the average level of total protection for all the import-competing commodities covered here was negative, although not large (6 percent). If the numbers for Korea and Malaysia are excluded, the average negative total protection for import-competing crops changes to -17 percent.

## Summary and Conclusions

The above discussion deals only with the measures of price intervention and reports only for a subset of the products and of the subperiods included in the country studies. The results are striking. A first observation is how differently imported food products and exported products are affected by the direct, sector-specific pricing policies, with the imported products being subsidized on average and exported products being taxed. Why this difference? A number of reasons emerge from the individual country studies, including a desire for self-sufficiency for the basic staples (and in some cases a reversal of policy from subsidy to tax once self-sufficiency is attained and the product becomes exported) and the need for government revenue from the taxation of exported products.

The taxation of foods *exports*, such as wheat and beef in Argentina and rice in Thailand, generates revenues and reduces the cost of food, and thus results in a subsidy to consumers. However, subsidizing consumption of a food *import*, such as wheat in Egypt, results in a fiscal expenditure. This may also help explain why imported food products tend to be protected rather than taxed. The direct protection granted to the production of food in about 70 percent of the countries included suggests that the wage-good argument for cheap food policies would seem to operate mainly through the overvaluation of the exchange rate rather than through explicit price policies.

Perhaps even more striking is the magnitude of the effects of the indirect, economywide interventions, which generally dominate the direct effects, whether the latter are positive or negative. Thus, if indirect price interventions are ignored, the results indicate that on average imported food products were protected (at a rate of 21 percent) and exports were taxed (11 percent). However, the results for total price interventions show that both activities were taxed, at a rate of 6 percent for imported food products and 38 percent for exports.

## Notes

<sup>1</sup>World Bank. The views expressed in this paper are those of the author and should not be construed as representing those of the World Bank.

<sup>2</sup>A more detailed presentation and analysis of results and methodology are found in Krueger, Schiff, and Valdés (forthcoming, a). The countries covered in the project are listed in Table 1. Summaries of the results of the individual country studies are found in Krueger, Schiff, and Valdés (forthcoming, b). Chapter 1 and the Appendices of Volumes 1 and 2 provide information on the concepts and methods used to ensure comparability across countries. A third (synthesis) volume, containing an analysis of the comparative results, will cover quantification of the direct and indirect effects on incentives in much greater depth than can be undertaken in this paper, analysis of the effects of these policies, and analysis of the political economy of agricultural price policy and its evolution over time.

<sup>3</sup>Several authors have also calculated the deviations from the domestic price that would have prevailed if optimal export taxes were applied. These results are not presented here but may be found in Krueger, Schiff, and Valdés (forthcoming, b).

<sup>4</sup>This should be clear from examining the model of exchange rate determination used, which is presented in Krueger, Schiff, and Valdés (forthcoming, b, Appendices to Vols. 1 and 2).

<sup>5</sup>In most studies, relatively large elasticities were used to ensure that calculations of the indirect effects were not biased upwards, and the values obtained thus tend to represent a lower bound of the indirect effects.

<sup>6</sup>Wheat is exported in some years and imported in other years in Turkey.

## References

- Bautista, R.M. (1987) *Production Incentives in Philippine Agriculture: Effects of Trade and Exchange Rate Policies*, Research Report No. 59, International Food Policy Research Institute, Washington, D.C., USA.
- Cavallo, D., and Mundlak, Y. (1982) *Agriculture and Economic Growth in an Open Economy: Case of Argentina*, Research Report No. 36, International Food Policy Research Institute, Washington, D.C., USA.
- Garcia Garcia, J. (1981) *Effects of Exchange Rates and Commercial Policy on Agricultural Incentives in Colombia: 1953-78*, Research Report No. 24, International Food Policy Research Institute, Washington, D.C., USA.
- Krueger, A.O., Schiff, M., and Valdés, A. (forthcoming, a) "Measuring the Impact of Sector-Specific and Economy-Wide Policies on Agricultural Incentives in LDCs," *World Bank Economic Review*.
- Krueger, A.O., Schiff, M., and Valdés, A. (forthcoming, b) *Political Economy of Agriculture Pricing Policies: Country Studies*, Vols. 1 and 2, Johns Hopkins University Press, Baltimore, Md., USA.
- Oliveira, J. do C. (1981) "Analysis of Transfers from Agricultural Sector and Brazilian Development, 1950-1974," PhD dissertation, University of Cambridge, Cambridge, UK.
- Oyejide, T.A. (1986) *Effects of Trade and Exchange Rate Policies on Agriculture in Nigeria*, Research Report No. 55, International Food Policy Research Institute, Washington, D.C., USA.
- Schuh, G.E. (1981) "Floating Exchange Rates, International Interdependence, and Agricultural Policy," in Johnson, G., and Maunder, A., *Rural Change: Challenge for Agricultural Economists*, Gower Publishing Co., Aldershot, UK, pp. 416-423.
- Valdés, A. (1973) "Trade Policy and Its Effect on the External Agricultural Trade of Chile, 1945-1965," *American Journal of Agricultural Economics*, Vol. 55, No. 2, pp. 154-164.

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## DISCUSSION OPENING—*John Strasma* (Department of Agricultural Economics, University of Wisconsin)

Schiff and his colleagues have made a brilliant contribution to the measurement of the effects of government policies. This is truly an impressive and extraordinarily useful project. To open the discussion, however, I want to suggest two areas in which the method used leads to bias in interpretation of the results—taxation and use of border prices to measure domestic intervention.

**Taxation.** Exports are taxed because governments need revenue and not just because they want to repress prices. Schiff and his colleagues call this intervention, and implicitly they compare these taxes with a no-tax situation. That is not reality. Someone has to pay for at least minimum government services—the lights in the presidential palace and at least some roads and bridges. Agriculture's share is not zero. The intervention should thus be measured by the amount by which the export and other taxes on the sector exceed agriculture's fair share and not by the entire amount of the tax.

Agriculture in many countries is practically exempt from income tax. In Chile, fruit growers pay on a presumptive income related to the tax on land (without the value of the fruit trees). The result is a higher rate of after-tax return on investment in fruit for export than in domestic commerce or other activities. This tax preference is also an intervention, but it apparently has not been included in the Schiff calculations.

**Use of border prices to measure domestic intervention.** European and US producers receive double and triple the prices charged to importing countries, and the resulting surpluses depress world market prices. The imported commodities shown by Schiff are wheat, rice, and maize. None of their border prices are free of intervention, and they are not valid measures of an intervention-free price.

To correct this enormous bias, the Krueger-Schiff-Valdés project could estimate what the prices of these commodities would be in the absence of intervention by exporting countries and then use those prices to estimate protection in the developing countries. The result would be very different from that shown in this paper.

Finally, where the papers resulting from this study now say "free trade régime," they should say "régime of one-way free trade" and where they say "intervention-free régime," they should say "a régime in which the developing country does not intervene but its trading partners do."

### **GENERAL DISCUSSION—*Ralph D. Christy, Rapporteur*** (Department of Agricultural Economics and Agribusiness, Louisiana State University)

A comment was made that this paper was excellent and provided some useful information on the nature of protectionism in LDCs. The use of the real exchange rate is correct, in theory, but the questioner wondered if the author had considered a simpler measure of purchasing power.

In reply, Schiff essentially agreed with the concerns regarding border price assumptions; border prices are interventionist prices. However, the border prices are still of some use because they are an opportunity cost and, if the intervention were removed, border prices would increase.

What matters for the farmer in his decision process is not always the current prices but the expected prices. And to the extent prices are largely shaped by policy, the farmer is also interested in expected policy and changes in policy.

Participants in the general discussion included V. Beker, G. Flichman, and O. Knudsen.