MEASURING GOVERNMENT INTERVENTION IN AGRICULTURE

FOR THE GATT NEGOTIATIONS

by

Nancy E. Schwartz and Stephen Parker*

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Developing a measure of government intervention for the GATT negotiations faces two fundamental problems. First, the complexity of most national agricultural programs means that a number of different policies may affect any particular commodity. This requires an aggregate measure--one that combines the effects of a set of diverse policies on each good. Such a measure must satisfactorily compare overall government intervention in agriculture by commodity for at least the key developed countries. Second, it must be decided how government intervention is measured, since government policies influence a number of different economic variables. For example, some agricultural policies that support domestic farm income cause trade distortions, while others do not. Trade distortions traditionally have been the focus of GATT negotiations, but reducing government spending and farm-income support are relevant objectives for some in the negotiations.

The producer subsidy equivalent (PSE), which was introduced by Josling (FAO) and is being adapted on an on-going basis by others (OECD, USDA), is a prominent aggregate measure proposed for use in the negotiations. The PSE measures the income transfers to farmers resulting from government policies, including the effect of both direct government spending on agricultural programs and the effect of policies such as import quotas that transfer income from domestic consumers to producers. By focusing on income transfers, however, the PSE differs fundamentally in concept from standard aggregate measures of trade

distortions such as the nominal rate of protection (NRP) and the effective rate of protection (ERP).

This paper examines how the PSE compares to these more traditional aggregate measures of protection, both in analytical terms and in the context of the negotiating process. Although the PSE may be a good gauge of how countries support their farmers, we focus in this paper on comparing how these measures reflect trade distortions and market access. The analytical section shows how the income effects of various policies can be translated to price effects, allowing the trade distorting effects captured by the PSE to be compared with those of the NRP and ERP. The last section discusses the general implications of using an aggregate measure of protection in the negotiations--an aggregate measure has not been used before in GATT negotiations--highlighting the relative advantages and disadvantages of the measures addressed in this paper. While we recognize that agriculture is being negotiated separately in the GATT, this discussion also considers the effects of negotiations on nonagricultural commodities.

Five Aggregate Measures of Government Intervention

Five aggregate measures of government intervention are defined: a nominal rate of protection for producers, a nominal rate of protection for consumers, an effective rate of protection for producers, a producer subsidy equivalent, and a modified producer subsidy equivalent.[1] Tables 1 and 2 list the mathematical formulas and the types of policies covered for each measure, respectively. These five metrics differ in several ways: by which policies are included in the measure; by which prices are affected by those policies; by their emphasis on measuring trade distortions versus income transfers; and more technically by which reference point is chosen for the calculation.

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Table 1. Definitions of Measures[1]

Nominal Rates of Protection

$$NRPc_i = (PCD_i - PW_i)/PW_i.$$

$$NRPp_i = PD_i - PW_i)/PW_i.$$

Effective Rate of Protection

$$ERP_i = (VD_i - VW_i)/VW_i = \frac{(t_i - \sum_j a_{ij}(t_j)}{1 - \sum_j a_{ij}} = \frac{NRPp_i - A(NRPc_j)}{1 - A} = \frac{NRPp_i - AT_j}{1 - A}$$

Producer Subsidy Equivalent

$$PSE_i = [(PD_i - PW_i)QS_i + (A'T_j' + B_i' + C_i' + D_i)]/(PD_iQS_i + C_i')$$

$$= [(NRPp_i)QS_i + (A'T_j' + B_i' + C_i' + D_i)]/(PD_iQS_i + C_i')$$

Modified Producer Subsidy Equivalent

$$\text{Modified } PSE_i = [(NRPp_i)QS_i + (A'T_j')]/PD_iQS_i$$

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For the ith commodity and the jth intermediate input,

a_{ij}	undistorted input-output coefficient
A	set of input-output coefficients ($\sum a_{ij}$)
A'	subset of A
B_i	net subsidies on primary inputs (capital, labor, land)
B_i'	subset of B_i
C_i	output policies which don't affect PD_i
C_i'	subset of C_i
D_i	long-term structural program costs for the ith good
PCD_i	domestic consumer price
PD_i	domestic producer price
PW_i	undistorted (world) price
QS_i	domestic quantity produced
t_i	NRPp on the ith output
t_j	NRPc on the jth intermediate input
T_j	set of all net taxes, on intermediate goods, t_j
VD_i	value-added at domestic prices
VW_i	value-added at world prices

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[1]Percentage values obtained by multiplying each measure by 100.

Table 2. Policy Coverage under Alternative Quantitative Measures

Measure	Border Policies	Output Price Policies	Nonprice Output Policies	Intermediate Input Subsidies and Taxes	Primary Input Subsidies and Taxes	Other Consumer Taxes and Subsidies	Research Long-term Structural Policies
NRPc	X					X	
NRPp	X	X					
ERP	X	X		X			
PSE	X	X	selected agric.-specific[1]	mainly agric.-spec. subsidies[1]	mainly agric.-spec. subsidies[1]		depends[2]
Modified-PSE	X	X		selected			

[1]Agric.-specific refers to inputs which are specific to agriculture and generally not used in the rest of the economy, e.g., fertilizer subsidies.

[2]Not in original Josling measure, but in OECD, USDA estimates.

A nominal rate of protection measures how domestic prices for traded goods change in response to government policy. A different NRP can apply to consumers and producers, since some trade policies affect producer prices differently than consumer prices. The nominal rate of protection to consumers (NRPc) measures the percentage difference between the domestic consumer (market) price and the world (free trade) price--the trade distortion that consumers face. It records how market prices for consumers are altered by border measures--such as import tariffs and quotas, export subsidies and taxes, and other non-tariff barriers--and domestic consumer subsidies and taxes. The NRPc is the consumption component of market access: higher consumer prices resulting from policies reduce domestic consumption, and therefore imports, by an amount dependent on the price elasticity of demand for the good in question.

The nominal rate of protection to producers (NRPp) measures how output prices received by producers change in response to government policies. In other words, it measures the wedge between the domestic price that producers receive and the (world) price that they would receive without government intervention. Policies captured by the NRPp include border measures and producer subsidies and taxes that change producer prices. Taxes and subsidies on intermediate and primary inputs are excluded, as are lump-sum and other income transfers that do not affect current production levels (such as decoupled income support). The NRPp, however, is only a partial indication of how government policy influences domestic production because it ignores the effect of price distortions on intermediate inputs.

The effective rate of protection incorporates the influence of government intervention on both output and intermediate input prices. More formally, an ERP is the percentage difference in the value added (returns to primary factors) of

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a sector with and without trade distortions, or more simply, the difference between the sales value of a good and the cost of intermediate inputs used to produce the good. In the trade literature, the ERP has been used to analyze resource misallocation among sectors in an economy (Corden). The ERP, however, can be viewed as an "extended nominal rate", calculated as a weighted average of the impact of trade policies on output and intermediate inputs, where the weights are fixed input-output coefficients. Used in this way, the ERP is an aggregate measure of protection that captures the net price effect of policies applied throughout an economy.

By including intermediate input prices, the ERP provides a better indication of how government policies alter producer incentives than does the NRPp. Calculating an ERP for a commodity, however, requires an estimate of the NRPp for the output good, NRPcs for all intermediate input goods--including nonagricultural products--and a set of undistorted input-output coefficients.

The producer subsidy equivalent measures the percentage of current gross farm income for producers of a commodity that comes from government programs. This roughly translates into the compensation that would be required in the absence of sectoral policies to maintain sector income at its protected level, assuming fixed output and constant world prices. Unlike the first three metrics listed, which calibrate trade distortions, the PSE focuses on income transfers. Both government budgetary expenditures on agriculture and the income transferred from consumers to farmers because of border measures are included in the PSE.

Accepted conventions for calculating the PSE do not exist yet--several versions of the PSE, differing primarily according to policy coverage, have been computed (FAO, OECD, USDA). The PSE, which we define to match the largely comparable OECD and USDA conventions, generally includes intermediate input

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subsidies, but not taxes. (The ERP includes all intermediate input policies.) For example, it includes fertilizer subsidies, but not tariffs on farm machinery nor the higher price of feedgrains to livestock producers resulting from crop support programs (the OECD now also estimates a PSE for livestock that includes distortions in the costs of feeds). The PSE does include several types of subsidies for primary inputs, such as concessionary financial terms for land and machinery purchases, which are not commonly included in the ERP.

Government expenditures on agricultural policies are distributed on a commodity basis in the PSE. It includes not only the income transfers related to policies with clear price effects--such as border measures, producer subsidies and some input subsidies--but it also includes as an income transfer government expenditures on programs with disproportionate or ambiguous price effects, e.g., long-term structural policies such as research and development expenditures, certain direct income payments and marketing services, disaster payments, and concessionary financing and other transfers to primary factors. The more important these programs are--represented by C_i and D_i in Table 1--the more difficult it is to estimate the trade distortion affiliated with any PSE. (For many of these policies, even the income transfer effect is difficult to measure.)

The PSE could be redefined to limit coverage to policies with relatively well-defined price distortion effects--which we call a modified-PSE. Minor differences would still remain between this measure and the ERP: the modified-PSE still relies on budget data for some policies; it does not include all policies on intermediate inputs; and it uses implicit input-output relationships.[2]

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An Analytical Framework for Comparing Aggregate Measures

Since each of these measures focus on different price and income effects, each reflects trade distortions and market access differently. For example, an import quota raises domestic prices, causing a trade distortion. Corresponding to this trade distortion is a redistribution of income (price-induced transfers or rents) from consumers to producers and whomever holds the import quota rights. In this case, since the per unit income transfer to producers from the quota equals the per unit trade distortion, the PSE would accurately measure the trade distortion and the PSE would be equal to the NRPp. This result holds as well for commonly applied export taxes and subsidies, import tariffs and subsidies, and domestic producer and consumer subsidies and taxes (under the strong assumptions listed below). Where the link between the PSE and trade distortions becomes uncertain is for those government policies without direct price distortion effects. For these cases, the unit cost of government spending does not necessarily match how a policy affects prices (nor income transfers to producers).

How different aggregate measures capture different aspects of these price and/or income effects can be illustrated using the simple partial equilibrium diagram for a homogeneous import good. Consider a commodity market characterized by the supply curve S_1 and demand curve D, as shown in Figure 1. In the absence of trade distortions, producers receive and consumers pay the world price, P_w. Now introduce an import quota equal to Q_2Q_3, which increases the domestic price to P_t. The price wedge, P_t-P_w, is the trade distortion. There are also price-induced income effects related to this trade distortion. Consumers pay a higher price for fewer goods, represented by a fall in consumer surplus by P_wP_tGE. Some of this consumer surplus is transferred to producers, P_wP_tAC, some to whomever
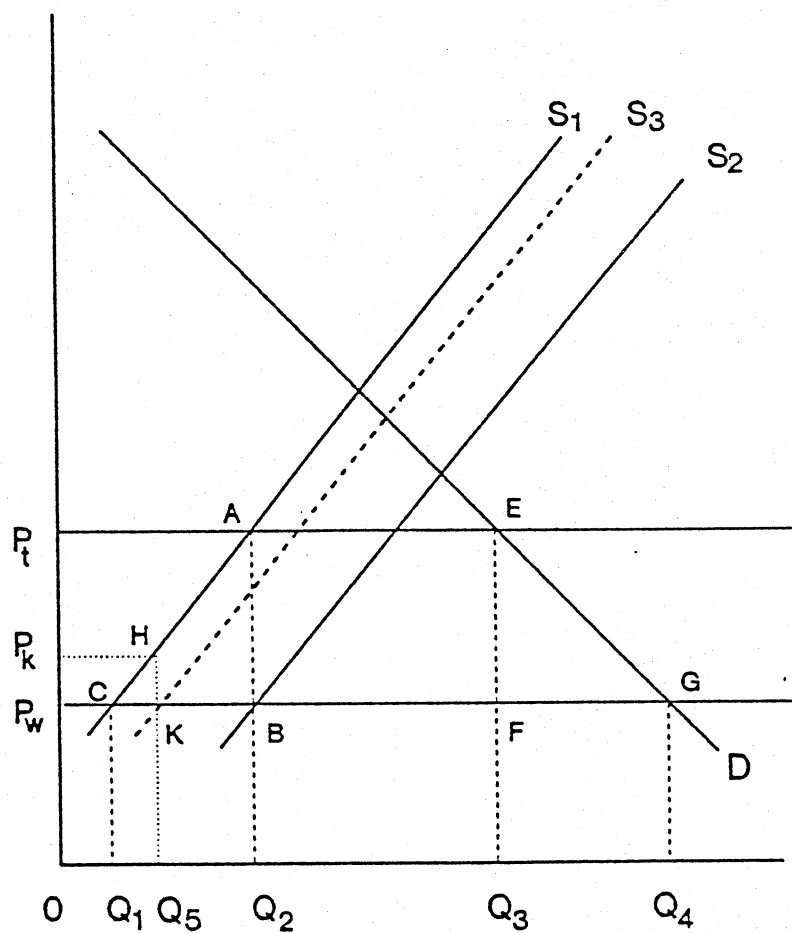
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Figure 1

receives the import quota rents, ABEF, and some is lost to inefficiency, ABC and EFG. The trade distortion caused by the import quota also induces changes in real economic variables: production rises by Q_1Q_2, consumption falls by Q_3Q_4, and imports fall by $(Q_1Q_2 + Q_3Q_4)$. This decline in imports represents a restriction to market access.

Notice the distinction between a price-induced income transfer and a lumpsum transfer. A price-induced producer subsidy of $P_t - P_w$ per unit of output raises the producer price to P_t, while the consumer price remains at P_w. The income transfer to producers and the increase in production is identical to the quota case, but the subsidy is now paid by the government instead of consumers, and there are no import quota rents. A trade distortion still occurs since the rise in production causes imports to fall, but since consumption is unaffected, imports fall by a smaller amount than for the quota. An equivalent lumpsum transfer of P_wP_tAB by the government to producers, by definition, does not change prices, and thus has no effect on production, consumption or trade. Producer rents actually are higher in this case by ABC. There is considerable debate over whether a pure lumpsum transfer can occur in practice (bearing importantly on any analysis of decoupled payment schemes).

Comparing the Five Measures of Protection. Again referring to Figure 1, the NRPc is the percentage price effect of a policy on consumers, which for the import quota equals $(P_t - P_w)/P_w$, and zero for a producer subsidy. The income effect corresponding to the NRPc for the import quota is P_wP_tEF and zero for the producer subsidy. The NRPp equals the percentage price effect for producers, which is $(P_t - P_w)/P_w$ for both the quota and producer subsidy. The income effect in this case is P_wP_tAB. To illustrate the ERP, let S_1 be the undistorted supply of an output good, such as meat, that uses feedgrains as in intermediate input.

An input subsidy that lowered the cost of feedgrains by AB per unit of meat produced would shift the supply curve of meat out to S_2, raising meat output and lowering meat imports. Domestic consumption of meat remains the same, since consumer prices remain at P_w, but domestic production (value added) of meat is subsidized (again the income transfer equals $P_w P_t AB$) and market access is limited without changing the NRPp for meat. Since neither the NRPp nor the NRPc capture this subsidy, the ERP provides a better measure of how government policies influence price incentives for producers.

For both the import quota and the price-induced producer subsidy, the PSE is identical to the NRPp--the income transferred per unit of output equals the trade distortion. When intermediate input policies are in place, however, the PSE may differ from both the NRPp and the ERP. The PSE captures chiefly intermediate input subsidies, not input taxes. When intermediate input subsidies are in place, the PSE approximately equals the ERP, providing a better measure of producer incentives than the NRPp. The PSE will overstate producer incentives (compared to the ERP) where intermediate input taxes are in place.

The additional complication with interpreting the PSE as a trade-distortion measure is that it measures the effect of some government programs by its level of expenditure, which may bear little relationship to its effect on trade distortions. For example, even though the per unit cost of one of these programs might be AB in Figure 1 (total spending equals $P_w P_t AB$), its effect on producer incentives may correspond to a small shift out in the supply curve, say from S_1 to S_3, yielding a price effect of only $P_k - P_w$, and a price-induced income effect of just $P_w P_k HK$. Some of the additional expense of the program may reflect a lump-sum transfer to producers, or may have no affect on producers at all. In this example, the PSE clearly overstates the trade-distorting effects of

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government policy. The primary contribution of the modified-PSE is that it excludes most policies with ambiguous price effects.

Common Methodological Problems. A number of methodological problems arise regardless of which aggregate measure is used. The price effects of nontariff barriers and various other government policies often are difficult to estimate, although the extensive agricultural data collection systems in most countries and the existence of world markets for similar grades of commodities makes this less a problem for agriculture. The effect of some trade policies may be redundant when other trade policies are binding--a change in tariff rates has no allocation effect when quotas are binding. The trade distortion measured for a given NTB can change over time as underlying supply and demand conditions change. For example, for an import quota, an increase in demand or fall in supply can increase the trade distortion resulting from a given quota limit. Since trade distortions are generally measured relative to an undistorted world price, an additional complication arises when world prices change in response to government policies--the theoretical large country case that, in practice, clearly holds in many agricultural commodity markets.

Two policies, in particular, can be hard to handle in an aggregate measure. Supply controls sever the relationship between producer price incentives and farmers' ability to alter production levels. And, price and income stabilization schemes, e.g., where governments buy stocks of a commodity during surplus periods and sell stocks when demand is high, represent a temporal problem because any trade distortion in one year may be offset in another year. Whether actuarially-sound stabilization policies cause a trade distortion is more a negotiating point than an economic question.

All of these aggregate measures reflect only the price and/or income impact of government policies. Economic models that include market structure and interaction among key variables in the economy are needed to diagnose the broader economic implications of policy. In our simple partial equilibrium example, as with all the measures discussed above, a number of potentially important economic relationships are ignored. Prices of nontraded goods and goods in other sectors are held constant. Cross-commodity substitution effects for both consumers and producers are left out. Exchange rates and foreign tariffs are assumed to be exogenous, macroeconomic implications are disregarded, small-country assumptions are maintained, and domestic and foreign goods are assumed to be perfect substitutes. Models of varying degrees of sophistication and product detail can incorporate these factors, helping to inform negotiators of the importance of any unexpected consequences of various liberalization schemes formulated in terms of aggregate measures.

Evaluating Aggregate Measures in the Context of the Negotiations

Any use of an aggregate measure complicates the negotiations, but some more than others. Ideally, an aggregate measure should satisfy at least five criteria, although in practice, no aggregate measure can. First, the measure should make the effects of policies transparent. Second, it should be relatively simple and easily understood so that negotiators minimize time spent arguing over measurement issues and maximize their effort to reduce trade distortions. Third, it should be flexible enough to accommodate policy reform packages needed to maneuver for domestic political support, but not so flexible that parties can manipulate reforms in non-bargained, self-serving ways. Fourth, it should be a consistent measure across products, countries and over time, so that outcomes of the measures can be compared and ranked. Fifth, it

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should be a _reliable_ indicator of how changes in policy affect real economic variables, that is, it should be positively correlated in a roughly linear manner with the main objectives of the negotiations.

Each of the five measures addressed in this paper do add greatly to transparency, making it much easier to compare how governments' intervene in agriculture. The greatest contribution to transparency, however, is the initial effort to quantify how each of the many agricultural policies used by governments distort prices and transfer income. The choice of an aggregate measure involves how best to combine these individual policy effects for a particular commodity. Viewed purely in terms of trade distortions, the PSE is less transparent than the NRP and ERP, since the PSE includes policies with ambiguous price effects. The NRPp, however, gives only a partial view of trade distortions (since input policies are ignored).

The NRP is clearly the most simple measure. Both the ERP and the PSE include a wider range of policies than the NRP, introducing an additional layer of complexity. The ERP, by including intermediate input policies, requires some mutual agreement among parties on input-output coefficients as well as information on trade distortions in non-agricultural sectors. The broad range of policies included in the PSE--especially those with minimal price effects--and its inconsistent treatment of intermediate input policies may add confusion. Some, but not all, of this confusion is eliminated by the modified-PSE. Explicit input-output coefficients, however, are not needed to calculate the PSE.

The wide policy coverage of the PSE makes it the most flexible measure--there may be many permutations of policy changes that can yield the same change in a PSE rate. The greater flexibility equips negotiators with more room to maneuver to accommodate domestic political constraints, but opens the possibility for

policy changes that reduce the PSE without proportionately lowering trade distortions. On the other hand, the NRPp, by limiting policy coverage, implicitly opens up loopholes through which trade distortions can be manipulated without changing the NRPp (e.g., by changing input policies). The ERP is flexible in the explicit sense that a certain ERP target can be achieved by either changing input and/or output policies.

None of the measures meet a rigid consistency criteria, since they all include nontariff barriers (NTBs). The trade distortion caused by a given NTB, which depends on the market conditions existing at a point in time, may change over time as market conditions evolve.

Reliability is likely to be crucial to the negotiations, although none of the measures fully comply with the reliability criteria. Again, identical changes in an NTB can yield different real economic effects depending on the market structure of each commodity. Also, if a percentage cut in any of the measures can be accomplished through different policy mixes, the real economic effects will likely differ. For example, trading off 10 percent reductions in a tariff versus a production subsidy would have the same effect on production, _ceteris_ _paribus_, but have a different effect on trade. As demonstrated in the analytical section above, the ERP (and, secondarily, the modified-PSE) provides the most reliable indicator of incentives for producers and the NRPc is most reliable for consumers.

Economic models can enhance the reliability of each of these measures for negotiators. Models--which incorporate the economic structure and interactions that these simple measures of trade distortion neglect--can estimate how changes in the individual policies encompassed in changes in these aggregate measures affect real economic variables. Negotiators can then set, and adjust, their

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bargaining stance (and diagnose competing proposals) in terms of some aggregate measure based on this more complete information set. Improving reliability raises confidence among negotiators that reductions in aggregate measures yield desired results.

Models, at this stage of development, however, are a supplement to, not a substitute for, aggregate measures of protection. Nobody agrees on the "right" model and economic models have a number of data limitations. The simplicity criterion overwhelmingly rejects a bargaining process based on a "battle of the models".

Since no aggregate measure, given the complexity of most national agricultural programs, meets these five criteria, the important question is whether one type of "imperfect" aggregate measure is more likely to advance the negotiations than another. The primary tension among these criteria is between simplicity and reliability. No one of the five measures examined here is clearly superior to the others, although policy coverage and the liberalization formula can greatly reduce any important differences among these measures.

Policy Coverage In Practice. In practice, the differences between the four producer measures are less than appears. Policies with direct price effects -- border measures, output- and input-price subsidies -- make up between 80 and 90 percent of the total value of PSEs for most developed countries (Schwartz et al.). Border and output price policies compose more than 70 percent. Therefore, it would be virtually impossible to significantly cut any of these measures without substantially reducing trade distortions and increasing market access.

Liberalization Formulas and Aggregate Measures. The attributes of each aggregate measure also are dependent on the liberalization scheme employed. Large, linear, economy-wide percentage cuts in NRPs in all sectors minimize the differences

among all five of the measures. Similar results hold if only agricultural policies are cut, holding nonagricultural policies constant. Across-the-board percentage cuts generate roughly equivalent reductions in the NRPp and ERP for each commodity. Large cuts reduce the importance of differences between the PSE and the ERP, as the impact of the additional policy coverage of the PSE is diminished. Lowering the NRPp significantly tends to reduce the NRPc--the magnitude of the gain to consumers would depend on the mix of producer subsidies versus border measures employed. Broad adherence to such a liberalization formula almost surely would reduce substantially trade distortions and improve market access worldwide. As discovered in previous GATT negotiations that successfully lowered tariff rates for manufactured goods, a linear percentage cut in nominal rates of protection with a minimum of exceptions is a simple and productive formula.

Complications arise the smaller the cuts and the more that cuts differ among products. A small, across-the-board percentage cut exposes differences between the PSE and the ERP. In such a case, government expenditure on programs with minor trade distortion effects could be reduced to achieve a PSE target without proportionately altering the ERP. A linear formula with many exceptions or a product-by-product (policy-by-policy) bargaining format would generate different cuts for different goods. Nominal rates could be manipulated to achieve favorable ERPs. For example, a country could agree to stop protection on animal feeds, but not on livestock production. If only agricultural goods are included in the negotiations, a cut in the NRPp for wheat could be offset by a subsidy on fertilizer inputs, maintaining the ERP (and PSE) for wheat.

Non-linear cuts--especially where protection is cut by a large amount for some goods, but not for others--may reduce market efficiency by enlarging the

variance of protection in the economy. Since resource allocation is determined ultimately by relative price changes among commodities throughout the economy, changes in relative rates of protection may generate unexpected results. If ERPs are reduced less in agricultural than other sectors in the negotiations, then resources on net may flow into the agricultural sector. Or, since the key primary input in agriculture, land, is relatively immobile, changing relative protection rates may tend more to alter land prices (rent) than the movement of land out of agricultural use.

Conclusion

The key distinction between the PSE and more common measures of protection is that the PSE stresses income transfers to farmers while the others focus on trade distortions. If the intent of the negotiations is to reduce trade distortions, as has traditionally been the case in GATT negotiations, the ERP provides the best analytical measure of trade distortions for production, as does the consumer-NRP for consumption. The modified-PSE is a viable alternative to the ERP, since it covers most policies with direct price effects. Because the PSE includes income transfers from policies that do not have direct price effects, the link between the measure and trade distortions are uncertain.

In the context of the negotiations, the advantages of one measure over another depends importantly on two issues: how policies excluded from the negotiations are treated and what liberalization formula is used. Excluded policies become loopholes through which support can be increased unless procedures are in place to prevent it. To avoid excluding major trade-distorting policies, the ERP or modified-PSE would be preferable. The PSE, on the other hand, by including policies with uncertain price effects, opens the possibility for altering

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policies that reduce the PSE without reducing trade distortions, especially if the liberalization formula permits small cuts in the PSE.

The liberalization formula influences the importance of differences between the measures by establishing which commodities are on the bargaining table and what the size of the reduction in an aggregate measure is required. For example, a large, linear percentage cut in any one of the producer measures applied to all agricultural commodities holding nonagricultural policies constant, is likely to generate a similar reduction in the rates of the other producer measures (for reductions in producer subsidies, the consumer-NRP would not be reduced). On the other hand, differences among measures are accentuated the smaller the cut, the more that cuts vary across products, and the more products or policies that are allowed to be excepted from any cuts. In these cases, different countries may find one measure to be more to their advantage than another measure, depending on their current policy structure, introducing a dimension of "measure gaming" that may be detrimental to the negotiating process.

Since all of these measures estimate trade distortions and/or income effects, and not the full economic effects of agricultural policies, economic models are needed to evaluate the effect of various liberalization proposals on the real economic variables--production and consumption, trade flows, world prices, and ultimately national and world welfare--that are, after all the main concern of the negotiations.

An aggregate measure is a means to an end. Given the political will to reduce trade distortions, neither the selection of an aggregate measure of protection, nor the resolution of technical measurement problems, are insurmountable hurdles to a successful round of negotiations. Significant cuts in any of the measures

examined in this paper would almost surely lead to a major reduction in government intervention worldwide.

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ENDNOTES

1. Due to space constraints, several other aggregate measures are not examined. Canada has proposed using a trade distortion equivalent (TDE)--a variant of the PSE that focuses more closely on measuring trade distortions and that resembles the modified-PSE and the producer incentive equivalent (Rausser and Wright). Australia has expressed interest in the non-agricultural negotiations in an effective rate of assistance (Australia). Early discussions by the Australian Minister of Agriculture emphasized the price adjustment gap or nominal rate of assistance (Miller). These assistance measures, by including policies with ambiguous price effects, confront many of the same problems as the PSE. A consumer subsidy equivalent (CSE) measures how governments assist consumers. Most points that differentiate the NRP between consumers and producers also hold for the CSE versus the PSE.

2. The PSE and modified-PSE incorporate input subsidies by adding the estimated income transfer (budget expenditures) associated with the subsidy. The ERP requires an explicit estimate of input-output coefficients.