DOMESTIC AND INTERNATIONAL AGRICULTURAL POLICY INTERFACES

Robert G. Chambers

Since 1981, American agricultural export earnings have plummeted from $43 billion to around $29 billion for 1985, a 37 percent decline. Many factors have been offered as partial explanations for this phenomenon: a strong dollar, the continued fallout from the grain embargo placed by the Carter Administration on the Soviet Union, poor American marketing practices in international agricultural markets, debt problems in heretofore rapidly developing third-world countries that had been among our fastest growing export markets, and uncompetitive practices spawned by the foreign trade policies of our major competitors in international agricultural markets. My job today is to address the last, and to some extent the first, item in this litany of complaints with a peculiar emphasis upon what implications these have for the future of Southern agricultural exports. In what follows, I am intentionally going to give the future of southern agricultural exports short shift in order to comment upon some points, which apply to a broader menu of commodities than just those produced in the South. To the extent that this represents false advertising, I apologize and plead extenuating circumstances as well as comparative advantage.

As a reaction to the continual erosion of export markets for United States farm products, we have witnessed in recent months the creation of an agricultural export commission investigating the disappearance of these markets and the establishment of an in-kind export subsidy program that has come to be referred to as the Export Enhancement Program and under which a number of subsidized sales of American farm products have been made. The recently passed Food Security Act of 1985 extended the in-kind export subsidy program to all potential exporters and mandated that at least $2 billion be spent on this program in the next 3 years. As such, there is significant sentiment in Congress and in other quarters that the only solution to many of our current trade problems in agriculture is the continued and expanded subsidization of our agricultural exports. Standard trade theory unstintingly shows that export subsidization is a self-defeating policy that perpetuates and exacerbates trade problems rather than cures them. In this presentation, I want to argue from a slightly different perspective that good reasons exist to believe that export subsidies and the like may not achieve some of the ends in the real world that back of the envelope theory suggests. The reason is that in formulating such policies we all too often ignore the root cause of other nations' international agricultural policies.

The main idea that I want to pursue in what follows is that prior to being able to forecast just how and why international policies impinge upon southern agricultural exports, we need a clear idea of just what these policies are trying to accomplish in a generic sense. We often operate under the assumption that export subsidies are simply paid to expand exports without recognizing that the need to expand exports is really predicated upon domestic policy considerations, such as full employment or surplus disposal. Thus, in considering policies to deal with export subsidization, it seems logical to consider the policy goals that spawned the practice in order to devise efficient means for countering or dealing with such effects. The framework that I intend to use is to consider the

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formulation of public policy that affects international trade as a classic case of Ramsey taxation: maximization of national welfare subject to various policy constraints that prohibit the achievement of first-best equilibria.

The main axiom that I work from is that there is no such thing as a purely international policy. What we in the United States perceive as international policies are usually the outward manifestation of other countries domestic policies. In understanding international policy, therefore, I feel that the key is to try to understand the underlying domestic policy. Clear examples of domestic policies that eventually became international policies, albeit to countries other than the United States, are our decision as a nation to maintain a domestic sugar producing capability even in the face of our obvious absolute and comparative disadvantages in this area. Maintenance of high domestic loan rates and a no forfeiture policy imposed first by Congressional intent and later by Congressional mandate have made the use of restrictive import quotas almost inevitable. As a consequence, many sugar-producing countries have to deal with the international sugar policy of the United States that has really grown out of a purely domestic policy. Other examples from our collective memories would include the use of subsidies by the United States to export its surplus commodity production before the export boom in agricultural products of the early 1970s and the use by the European Community currently of export refunds (subsidies) to export the surplus production caused by its variable levy cum intervention price system. In what follows, I make a brief attempt to consider the effects of three specific domestic policies on international policy. The three policies considered are agricultural self-sufficiency (this may be loosely associated for at least nemonic purposes with the European Community), revenue generation through the use of export taxes and import tariffs (many developing countries essentially tax agriculture to finance other domestic policy goals), and specific sectoral income goals. Before I discuss these issues, however, it will be convenient for me to introduce the model and the notation that I intend to use for the remainder of the paper.

THE MODEL

The productive technology of the country or group of countries in question is assumed to be characterized by a closed, compact, and convex set which we denote as T. At the loss of some generality, we shall dichotomize between inputs and outputs throughout the presentation. Inputs are denoted as x and in what follows we shall use x to denote the aggregate input endowment of the country in question. Outputs are denoted by y and are assumed to be strictly positive. An alternative characterization of T is offered by the economy's revenue function which we denote as R(p,x) and define by:

$$(1)\quad R(p,x) = \text{Max } [py: (x,y) \text{ belongs to } T].$$

R(p,x) is linearly homogeneous, nondecreasing, and convex in p and nondecreasing in x. Here p is taken to be a vector of the same dimension as y of strictly positive prices. Furthermore, if it is differentiable, then its gradient in x represents a vector of shadow prices.

For convenience, we presume that there exists an aggregate community indifference function defined over the domain of y in which we represent as U(y). U(y) is presumed to be nondecreasing in y and quasiconcave in y. In what follows, we shall simplify matters greatly by presuming that the country in question is small and cannot affect world prices. I fully realize that making this assumption begs the most important question of international trade policy, but it also makes it easier both notationally and analytically for me to make the central point of the paper. The arguments made below can be readily extended to the case of a large country by straightforward calculation and manipulation. The indirect trade utility function (Woodland), which will be critical in the following analysis, is defined as:

$$(2)\quad H(p, b, x) = \text{Max } [U(y): py \leq R(p,x) - b],$$

where b is any adjustment necessary to aggregate income as a result of international transfers or the collection of tax or tariff revenue.

Suppose now that prevailing prices in international markets can be denoted as p^*. Remember we have assumed that the country in question views these prices as given. With these definitions, any revenue collected from export taxes or tariffs or extra disbursements required as a result of export subsidies can be written as:

$$(3)\quad (p^* - p)\, e(p,x) = t\, e(p,x),$$

where e(p,x) now denotes the vector of excess supplies associated with the indirect trade utility function and t is obviously the associated vector of taxes or subsidies. Using a balanced trade constraint, this allows us to rewrite the indirect trade utility function as H(p, pe(p,x), x) (Woodland, p. 913).

SELF SUFFICIENCY OR FOOD SECURITY

Unlike many other products traded in international markets, trade in food is often subject to national security or food security arguments; i.e., most countries are unwilling to rely totally on world markets for the necessities of life for fear that their supply of these commodities might dry up in times of national or international emergency. A number of developed and developing nations have as explicit national goals self sufficiency in basic foodstuffs. For example, the Treaty of Rome in 1957 specifically lists food security as an objective of the European Community. At least partly toward this end, the European Community has set up its common agricultural policy (CAP) which many believe is the essential glue behind the overall structure of the European Community. Under the CAP, the European Community has gone from being the largest importer of temperate zone food products to the world's second largest exporter of these same food products. No small part of this is attributable to its use of the variable levy to effectively insulate itself from world markets and the maintenance of its intervention prices far in excess of what would be necessary to clear world markets. The not unsurprising result has been excessive production and a decision to dispose of this excessive production in world markets using trade subsidies.

In what follows, I do not intend to look at the CAP in detail. However, I do want to pay particular attention to the achievement of self sufficiency in the context of Ramsey-like pricing decisions. Since the European Community has decided to effectively insulate itself from world markets by pricing imports of certain food products out of their internal market, we can view them as essentially setting their internal price—the intervention price—as a result of a policy decision. One aspect of that decision is the policy goal of self sufficiency which in our current notation is equivalent to requiring that:

(4) $e\ (p,x) \geq 0$ for k belonging to K,

where K is the set containing the indexes of all commodities for which self sufficiency is a goal. Formally, their decisionmaking process might be modelled by:

(5) Max $[H(p,pe(p,x),x)$: $e\ (p,x) \geq 0$ for all $k \in K]$.

Using the Kuhn-Tucker conditions, we see after some manipulation using results contained in Woodland (p. 909, eq. (6)) that the first order conditions for an interior solution require:

$$(6)\ \frac{\partial H}{\partial b} \sum_i p_i \frac{\partial e_i}{\partial p_j} = \sum_{k \in K} \lambda_k \frac{\partial e_k}{\partial p_j}$$

which is a fairly obvious extension of the usual Ramsey pricing rule familiar from the literature on public finance. As such, I will not take up too much time discussing it other than to say that for most indirect trade utility functions it rules out the possibility of proportional taxation of subsidization. Furthermore, for the case of a single subsidy and a single self-sufficiency constraint, this result is also consistent in an intuitive fashion with the usual inverse elasticity rule.

What I want to focus on instead is the reaction of a country like the one described previously to a change in the world price. Remember for this portion of the analysis that $p = p^* - t$. With this identity in hand and for analytical convenience restricting ourselves to the case where only the goods subject to the self-sufficiency constraint are taxed and where only the prices of these same goods change, we find that equilibrium requires:

(7) $dt = dp^*$.

That is, the country in question will respond to any change in the world price vector by holding the internal price constant and varying the export subsidy or export tax as appropriate to ensure self-sufficiency. This relatively obvious result follows directly from the constraint and is thus independent of the objective function. It will characterize all programs that require a self-sufficiency constraint or any program that requires exports of these commodities to be kept above a specified level. It is simple, neat, and intuitive. For the case of one constraint and one subsidy, it is illustrated in Figure 1. In the absence of internal price intervention, the country illustrated in Figure 1 would be a

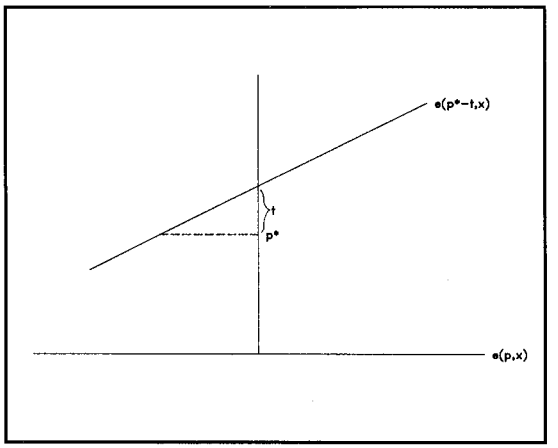

Figure 1. Self Sufficiency and Optimal Taxes.

net importer of the commodity at the prevailing world price. The appropriate Ramsey subsidy then is just the difference $p-p^*$ since it is at the internal price p that the country is self-sufficient. If p^* falls, the subsidy simply goes up by the same amount.

If this result is so simple, why bother to show it? The answer is because I believe that it is deceptively powerful in explaining some phenomena that we have recently observed in world markets. As I already have alluded to several times in the past, last year the United States announced an Export Enhancement Program (EEP) that was to use in-kind subsidies against targeted subsidizing exporters. In virtually every case so far, the European Community has been the target. What was the European Community's immediate reaction? It announced that it would match the United States' subsidies dollar for dollar just as the above model would suggest that a country attempting to maintain self-sufficiency, or perhaps in this case market share, would respond. Now, the European Community's response was not a surprise to many people. In the discussions that led up to formalization of the EEP, many offered this observation on the basis of *seat of the pants* analysis without even resorting to an envelope much less a Ramsey tax model. And, depending upon whom the point was being made to, the response ranged from *nonsense* to *good*. Those saying *nonsense* really believed that we could permanently expand our export markets by limited duration subsidy programs. Those saying *good* were hoping for just such a response on the part of the European Community. To them, the EEP was just another mechanism to put pressure on the European Community CAP budget that has been severely strained and then expanded in recent years. But, if you want to do the latter, remember that the current European Community export subsidy level is around $5 billion per year while the EEP is only funded at $2 billion over 3 years. Even if the total EEP budget were devoted to wheat, world trade would rise by only about 5 percent. The European Community can afford to sit around and try to outwait such programs. It cannot afford to outwait drastic reductions in world price levels on the magnitude of 20 to 30 percent. In my personal opinion, therefore, I see little hope for these export subsidy programs to achieve any real gains for American agriculture. If gains are to be had, they are to come from making ourselves not just marginally more competitive in the short run, but very much more competitive in the long run.

REVENUE CONSTRAINTS

The constrained revenue case is just the usual Ramsey-price problem that is slightly modified to deal with the indirect trade utility function. As such, it really does not deserve very much formal treatment in a forum such as this, especially because the points that I wish to make rely entirely upon well-known results that are derived in detail and explained in a variety of standard references (see e.g. Mirrlees). The main point is that Ramsey pricing and second best taxation or subsidization, in general, do not usually require equiproportionate taxes or subsidies. Instead, it usually requires just the opposite.

This is important for two reasons. First, there are a number of countries that use taxes on agricultural exports as a primary source of government revenue. If these countries' policies can be approximated by the Ramsey rule, we should expect to observe differential export subsidies. And, that is just what we see. As a primary example, we might want to consider the case of Argentina that makes heavy use of export taxes to raise revenue. Their export taxes are levied at different rates as evidenced by the recent Section 301 case the National Soybean Processors Association has brought against the Argentines for the use of differential export taxes on soybeans and soybean crush products. The soybean processors allege that this is an attempt at implicit export subsidization of crush products by the Argentines. As strange as it may seem that export taxes can be manipulated

to create implicit export subsidies, this is a theoretical possibility. Just as clearly, however, such a result could be consistent with efficient revenue gathering. And, although the subsidy may be there, in fact, on an *a priori* basis, it seems difficult to conclude that such practices wherever they occur are any more attempts to artificially stimulate exports than are the deficiency payment-target price system used in the United States.

The second reason that this result is important to me is that in the last few years, I have increasingly heard the argument made that the theory of second best suggests that agriculture should be subsidized at the same rate as the other sectors of the economy. Usually, this argument is made to call for higher agricultural subsidies. This, in the Ramsey case, is either false or assumes a very restrictive indirect trade utility function.

SECTORAL INCOME GOALS

The final policy that I want to consider is essentially a policy of favoring certain sectors of the economy over others in terms of their claims on national income. For example, this could be reflective of a minimum wage constraint for urban workers. If we assume that T is a cone, then such a constraint can be easily formalized in our model since in that case the partial derivative of R(p,x) with respect to any factor endowment represents the shadow price of that factor which under constant returns would also equal the equilibrium wage. Because the endowment of x is taken as fixed, we can represent this particular problem as one of maximizing the indirect trade utility function subject to the constraints:

$$(8)\ \frac{\partial R}{\partial x_k} \geq a_k \quad \text{for } k \in K.$$

Here K now represents the set of all indices for which we have constraints on earning power. As is apparent from the discussion surrounding the self-sufficiency case, this problem is almost mathematically identical to that earlier case. Therefore, let me just skip the presentation of first order conditions and state the main implication of the first order conditions for this problem. After manipulation that requires the recognition of the derivative and symmetry properties of R(p,x) as well as the homogeneity of compensated excess supplies, I get:

$$(9)\ e_i = \sum_{k \in K} \mu_k \frac{\partial y_i}{\partial x_k}$$

where μ_k is a Lagrangean multiplier as the main result. In the case of only one constraint, this result considerably simplifies and tells us that the setting of optimal taxes and subsidies in this case must result in the ith excess supply being proportional to the effect on national production of the ith input when the factor of production which benefits from the constraint is expanded. Here, the usual Ramsey result can be interpreted in terms of elasticities of national outputs with respect to the factor endowments of interest.

These results, quite honestly, have not been very suggestive to me from an intuitive standpoint. In fact, the only thing that I can say with confidence about them is that such a policy goal again does not necessarily require proportional subsidization or taxation of all outputs. Therefore, it would not be or should not be surprising to see developing countries, which for reasons of political stability and the like are often argued to face such constraints, imposing differential export taxes on agricultural commodities.

CONCLUDING REMARKS

In this short paper, I have tried to analyze international trade policy from a slightly different perspective than usual. If anything, the results of this analysis can be described as modest to meagre. However, to me they do point the way to a path which should be thoroughly pursued, i.e., the influence of domestic policy constraints on international trading practices. International trade theory typically views all such problems as ones that can be easily handled by nondistortionary lump-sum transfers. While theoretically correct, this view is not as close to reality as it might be. And in my limited experience in assessing policy actions, I have become convinced that realistic policy analysis involves not eschewing formal analytical methods but in using formal analytical methods to deal with realistic constraints. In the foregoing, I have tried to introduce some realistic constraints that I think are quite important.

By way of results, we have seen that when faced with a self-sufficiency constraint that countries may respond to any attempt by other countries to lower prices simply by increasing their export subsidy by an equal

amount to compensate for the fall in international prices. The usual results from Ramsey pricing tell us to expect differential export subsidies and/or taxes in a world where decisionmakers face binding domestic policy constraints.

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