

DERIVED PROTECTION
FOR NONTRADED PRIMARY PRODUCT

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ABSTRACT

Most primary products are practically nontraded, usually due to very high transport costs, for reasons of bulk, perishability, et. al. These commodities possess natural protection. Once processed, however, they become highly tradable, e.g., coconut processed into copra. The conclusion of this paper is that these primary products, though nontraded but are mainly an input to a tradable output, share by some proportion in the protection given the tradable output. The proportion depends mainly in the share of the primary product in the value of the processed product and the elasticities of demand and supply respectively of the primary and the processes products.

DERIVED PROTECTION FOR NONTRADED PRIMARY PRODUCT

A common problem with primary products is that many are practically nontraded, usually due to very high transport costs, for reasons of bulk, perishability et al. These commodities possess natural protection. Once processed, however, they become highly tradable, e.g., paddy converted to rice, coconut converted to copra, oil etc., and others. Furthermore, these primary products have no demand other than as inputs to these tradable processed products. The purpose of this short paper is to study how these primary products are affected by the protection accorded to the tradable processed products. The question has not been addressed to elsewhere. In view of many recent EPR studies, it is quite worthwhile looking into.

Prices dictate consumption and production of goods and resources. If prices correctly reflect social values, which should be true in the absence of market distortion (whether government policy-imposed or inherent in the market), then the market will efficiently allocate resources such that social welfare is optimized. If there exist genuine market failures (e.g., externalities non-competitive elements, etc.) government intervention

is justified and indeed could be optimum provided it is used for the sole purpose of correcting the distortion at the source. Otherwise, it would be purely distortionary. In any case, government policies, particularly price policies, would have direct impact on resource allocation and welfare.

1. Nominal Protection Rate (NPR) and Implicit Tariffs (IT)

In an open economy, assuming fairly competitive market and in the absence of price intervention policies, relative domestic prices of tradables should be given by the relative world prices. The extent to which a government price intervention policy creates a wedge between the domestic price and the world price would be the measure of the effect of the policy since it allows the domestic producers of the affected product this wedge in the selling price. These price intervention policies are mainly import tariffs, export taxes, trade quotas, nationalization of marketing and direct price control.^{1/} If the wedge is positive, i.e.,

^{1/}The last two policies apply for example to crops such as sugar and rice.

the domestic price is higher than the world price, then its policy affords as much protection as the wedge indicates. However, if it is negative, then the policy penalizes the producer of the affected product by as much as this "negative" wedge.

The measure of this wedge is what the nominal protection rate (NPR) and implicit tariffs (IT) are in principle. They are defined as the percentage difference between the domestic price and border price of a commodity or a set of commodities, the NPR from the point of view of the producers, the IT from the point of view of the consumers. Thus if the implicit tariff of a commodity equals T , and the domestic sales tax equals v (applied to the producer price) then $P_D = P_B (1 + T)$ where P_D is the domestic consumer price and P_B is the border price of the commodity. Letting P_S denote the producer price of the commodity, then

$$P_S = P_D / (1 + v) = P_B (1 + T) / (1 + v)$$

Hence:

$$NPR = \frac{P_S}{P_B} - 1 = \frac{1 + T}{1 + v} - 1$$

2. Direct Price Comparison vs. Tax and Tariff Rates

When the import or export good and their domestic counterparts possess identical qualities and if perfect competition exists, the tax and tariff rates should exactly indicate the wedge between domestic and border prices, assuming there are no trade quotas, no evasion or exemption from duties and that tariffs are not prohibitive. We would be indifferent between deriving implicit tariffs using direct price comparison and using the legal tax and tariff rates. If tariff and tax exemptions, as well as evasions, are significant, if import or export control dominate the protection system or if the tariff and tax rates are redundant, direct price comparison might be preferred to measure protective effects of government policies. However, a serious problem regarding the use of direct price comparison is the quality differential, imagined or real, between imported or exported good and the domestic counterpart. Medalla and Power deal with this problem of heterogeneity in a special paper in IPPP. They argue that imposing a tariff on imports of a commodity, for example, may not raise the price of

the domestic substitute by as much as the tariff but only increase its market share. At the new relative prices between the foreign and the domestic product, the marginal buyer considers the price differential just to offset the quality differential. Thus, the price of the domestic substitute may rise only partly while its market share increases until the perceived quality differential at the margin reflects the tariff rate. Hence, Medalla and Power recommend using the tax and tariff rates to measure protection (or penalty) accorded an industry. However, they suggest that for certain commodities where strong evidence of rampant evasion is present or where import or export controls are clearly dominant, it would be preferable to use direct price comparison if homogeneity could be approximated.

Thus, two methods of measuring implicit tariff (and NPR) are available - the tax and tariff system and direct price comparison. Which is more appropriate would depend upon the commodities involved.

In attempts to measure nominal protection rates in agriculture, the problem of quality comparability

frequently arises. It is virtually impossible to make any meaningful direct price comparison. However, in a number of cases (e.g., other fruits and nuts, other vegetables) the legal tax and tariff rates appear too high a measure of protection.

A common problem with agricultural crops is that many are practically nontraded, especially primary products (e.g., palay, coconut in husks, etc.), due mainly to very high transport costs associated. One solution is to consider such commodities as nontraded and recognize that the protection system is neutral in its price effects on these goods. Neutral could mean that the nontraded good does not derive any protection structure or that it should be left out in measuring average nominal protection rate.

Such a solution would be valid if the nontraded good is a final consumer good where price is not constrained by border prices directly or indirectly (via input demand from tradable processed product). What if it is largely an input to a processed commodity which is tradable?

3. Measuring Derived Protection for Nontrade Primary Product from the Protection of Traded Processed Product.

The standard assumption in effective protection theory is that inputs other than primary factors are in perfectly elastic supply so that all of the protection goes to value added. The assumption would be true for tradable inputs since their prices are constrained by world prices. But what if a primary good which is a nontradable goes into the production of the tradable processed commodity? What if this primary product's supply is less than infinitely elastic, as would be expected? Then, it should, in some way share in the protection given the processed commodity. A model is thus constructed below addressed to this problem.

Suppose a processed good, Q , is traded but the primary product, R , which is mainly an input to Q is nontradable. Suppose also that the supply of the primary product is less than infinitely elastic. Our problem is to build a model which would indicate how much R would share in the protection given Q .

To simplify the analysis, assume further a fixed ratio between primary product and processed products, i.e., $\frac{R}{Q} = C$ where C is a constant. For example, so many kilograms of R is used to produce so many kilograms of Q . For first, second stage processing of primary products, this assumption is deemed reasonable. Adjust units of R and Q such that C equals one.

The supply function of Q would depend upon the marginal cost of processing and the cost of the primary product input - i.e.,

$$P_Q = M(Q) + P_R = S(Q; P_R)$$

where:

P_Q = supply price of Q

$M(Q)$ = marginal cost of processing R into Q

and P_R = price of primary product

Thus ceteris paribus, any change in P_R will shift the supply curve of Q by as much as the change, i.e.,

$$P_Q + \Delta P_Q = M(Q) + P_R + \Delta P_R$$

Let P_B be the border price of the processed good and $P_Q = P_B(1+T)$ where T is the implicit tariff on Q .

Suppose we are given P_B and that initially, T equals zero. Hence $P_Q = P_B$. Thus given P_R and hence $S(Q; P_R)$, Q will be determined and so would R be since by assumption $R/Q = 1$ ($R = Q$). Hence we could locate a point R for every P_R , i.e., we could construct the derived demand schedule for the primary product (See figure 1) given the implicit tariff level (in the figure $T = 0$).

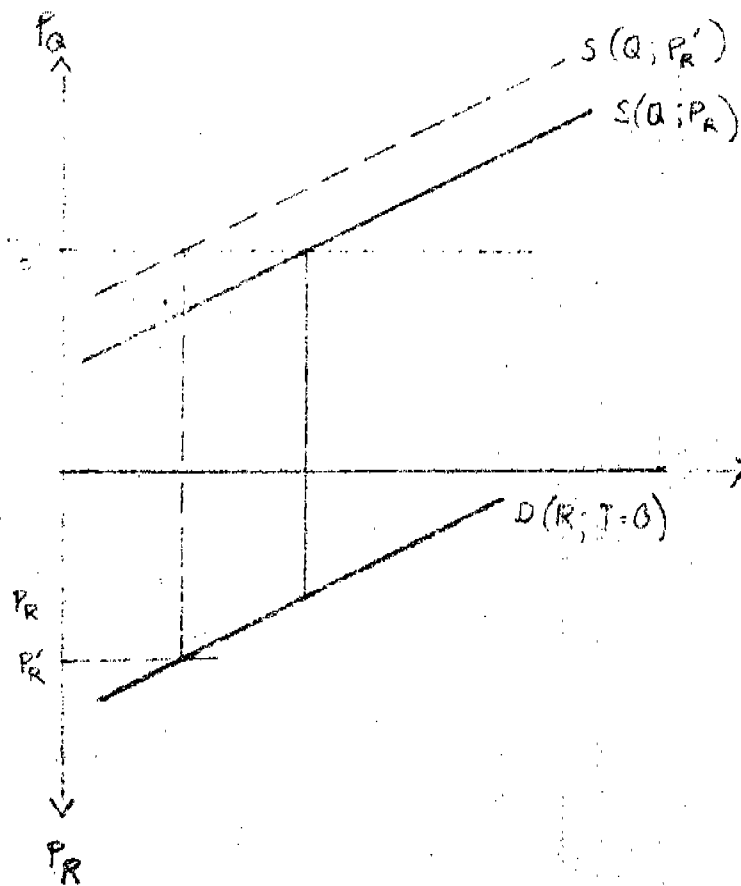


Figure 1

We now ask what happens if a tariff T is imposed on the processed product. How would the derived demand for the primary product be affected? This is shown in Figure 2.

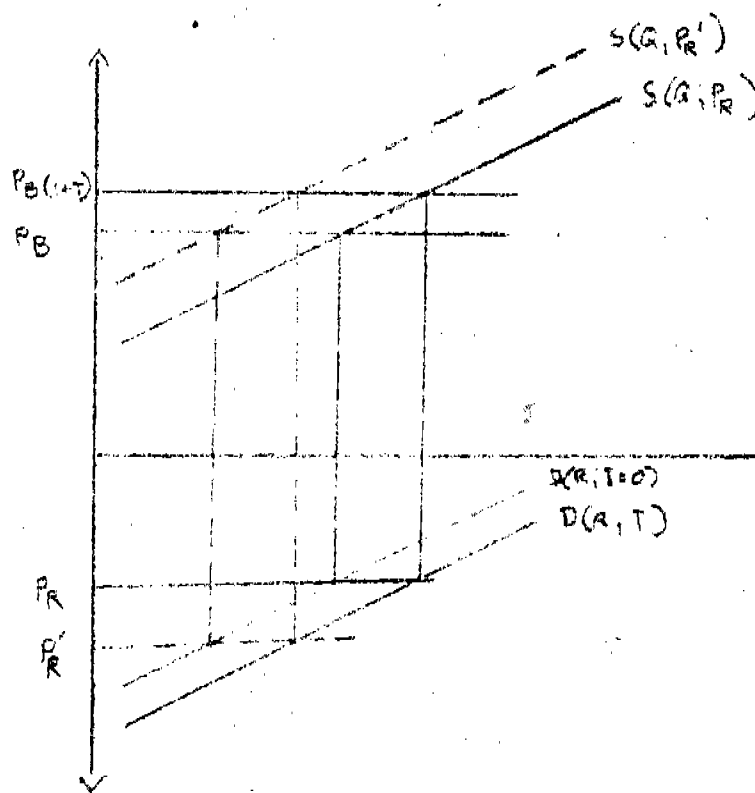


Figure 2

A tariff T shifts the derived demand by a proportion of the tariff.

Specifically, this is

$$\frac{T_R}{T_Q} = \frac{1/e_{SR}}{1/e_{DR}}$$

where: $T_R = \bar{P}_R' - \bar{P}_R = dP_R$, ie, the amount by which producers of R are able to raise their output's price due to tariff on Q, the processed output.

$$\text{and } T_Q = T \cdot P_Q - dP_R$$

e_{SR} = elasticity of supply for R

e_{DR} = elasticity of demand for R

Note however, that the elasticity of the derived demand is dependent on the elasticity of supply for the processed product. In particular, it could be derived that

$$e_{DR} = e_{SQ} \cdot \frac{P_R}{P_Q}$$

where:

e_{SQ} = elasticity of supply for Q

hence:

$$\frac{dP_R}{T} = \frac{e_{SQ} P_R}{e_{SR} P_Q}$$

Knowing that $T_Q = TP_Q - dP_R$ then:

$$\frac{dP_R}{TP_Q} = \frac{P_R/P_Q}{\frac{P_R}{P_Q} + \frac{e_{SQ}}{e_{SR}}}$$

so that:

$$\frac{\frac{dP_R}{P_R}}{\frac{T}{P_R}} = \frac{1}{\frac{P_R}{P_Q} + \frac{e_{SQ}}{e_{SR}}} = p$$

Hence the derived protection $\frac{dP_R}{P_R}$ equals $p.T$, i.e., some

proportion of the nominal protection on the processed product.

From formula for p , to measure the derived protection, we need information regarding P_R/P_Q , e_{SQ} and e_{SR} . From our definition of units of Q and R , P_R/P_Q is really the proportion of the value of processed output paid to the primary product input. Since we are looking mainly at early stages of processing of primary products, P_R/P_Q would be quite high. A range of .5 to .75 would be reasonable^{6/}

^{6/} This is supported by calculation from the 1974- I-0 table. For example, P_R/P_Q is approximately .75 in rice milling, .58 in meat products, .46 in fruit and vegetable processing.

of the primary product (especially in the short-run). Thus, a reasonable range for e_{SQ}/e_{SR} would be from 1 to 1.5. This, together with P_R/P_Q , gives a range of value of d from .44 to .50 to .57 to .66.

Our conclusion then is that the primary product, though nontraded but is mainly an input to a tradable output, shares by some proportion in the protection given the tradable output. The proportion depends largely in the share of the primary product in the value of the processed product and the relevant elasticities of demand and supply. This proportion could be as much as 50 percent.



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