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THE WELFARE CONSEQUENCES OF DIRECTLY-UNPRODUCTIVE PROFIT-SEEKING (DUP) ACTIVITIES: PRICE VERSUS QUANTITY DISTORTIONS

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I. Introduction

This paper considers briefly the welfare theory of directly-unproductive profit-seeking activities, focusing on the asymmetry of outcomes depending on whether the distortion that triggers off such activities is a price or a quantity distortion. Section II considers the nature of such activities and the reasons for treating them as separate from traditional profit-seeking activities, contrasting and evaluating the approaches taken to this broad subject by differrent recent writers. Having so clarified the essential nature of such activities, the paper proceeds in Section III to illustrating the asymmetry of outcomes for the specific case of tariffs versus trade quotas, raised in the literature by Krueger (1974) and discussed further by Bhagwati and Srinivasan (1980). Section IV then extends the analysis to derive two Propositions of a more general nature. Section V offers some concluding remarks on the asymmetrical effects of directly-unproductive profit-seeking activities induced by price and quantity distortions.

II. Directly-unproductive Profit-seeking (DUP) Activities: The Concept

In the last decade, a number of economists have turned to analyzing esoteric activities such as illegal transactions (e.g. smuggling or tariff evasion) lobbying for licenses, lobbying for tariffs or monopoly etc., none of which were part of the economists' standard tool kit.

Bhagwati (1980b) has recently argued that the key characteristic of these activities is that they represent, unlike the "normal" or "traditional" activities of economic models, ways of making profits that do not involve directly the production of any output. In short, they are directly-unproductive, profit-seeking (hereafter DUP) activities.[1] Moreover, these activities fall into two distinct categories: those that are triggered by existing distortions

(as when a distortionary quota leads to a premium-seeking lobby in Krueger (1974)) and hence, since the equilibrium in the absence of DUP activities is itself one characterized by distortions, create an inherently second-best problem; and those that may analytically be related to a first-best situation (as when lobbying for a tariff is implicitly or explicitly relative to an optimal free trade equilibrium for a small, undistorted economy in the absence of DUP activities).

The earlier attempt by Krueger (1974) to develop the concept of "rent-seeking" addressed a narrower class of DUP activities: one where the lobbying activities were triggered by licensing of one kind or another. Thus her illustrations of "rent-seeking" activities were almost wholly related to licensing mechanisms and her formal analysis explicitly considered an import quota which, in fact, was contrasted with an otherwise-equivalent tariff on the assumption that the latter, being a price distortion and hence not involving rents to licenses, would not generate any "rent-seeking" activity. Thus Krueger's "rent-seeking" concept and theory omitted reference to DUP activities unrelated to licensing mechanisms.

At the same time, her concept did not bring out the distinguishing essence of the license-generated DUP activities. For, the interesting and critical analytical essence of her license-related profit-seeking activities is not the fact that these activities are aimed at profits which represent economic rents but rather that, as Bhagwati (1980b) has argued, they involve zero-output, directly-unproductive profit-seeking. In fact, if one really takes the presence of rents in the economic sense as the critical test for defining a relevant category of profit-seeking activities as against others, then a

slight reflection will show that such rent-seeking activities will fail to exclude wholly our traditional, productive activities as well. Thus, consider the standard models with primary factors producing goods entering the social utility function with given factor endowments in full employment. In these familiar classroom models, remuneration of producing agents is wholly pure rents (and hence involves "rent-seeking") because the minimum supply price of factors is zero and any return over the minimum supply price is evidently economic rent.

Thus, Krueger (1974) in coming to the problem from the standpoint of licensing-generated profit-seeking activities which were thus characterized by both DUP and rents (on the licenses), thus failed to note the (generic) DUP feature and focussed instead on the incidental rent characteristic. Thus she did not see the far more general nature of DUP activities, of which license-generated profit-seeking activities are only a fraction. And her phrase, "rent-seeking", is inappropriate though fetching and additionally has the drawback just noted, i.e. that it also can embrace traditionally analyzed productive profit-seeking activities from which one wants to differentiate the (DUP) activities at hand.

By contrast, Buchanan (1980) has adopted the phrase "rent-seeking" to go beyond the Krueger conception of license-generated profit-seeking activities and happens to have defined it far more generally, much like Bhagwati (1980b). While the phrase rent-seeking is inappropriate in that event, as argued above, there is a far more basic problem with the Buchanan definition which is radically different, as it happens, from Bhagwati's DUP activity definition despite superficial similarity. Thus Buchanan (1980, p. 4) states:

> "The unintended results of individual efforts at maximizing returns on opportunities may be "bad" rather than "good". The term rent seeking is designed to describe behavior in institutional settings where individual efforts to maximize value generate social waste rather than social surplus."

It is evident therefore that whereas Bhagwati defines DUP activities as all those that involve zero output at their direct or primary impact, Buchanan is defining his "rent-seeking" activities as those profit-seeking activities that, unlike others, result in ultimate loss. Since Buchanan, Tullock (1980) et al. of the public-choice school evidently intend, if their examples of what they describe as rent-seeking are any guide, to include DUP activities in their ambit and their definition, it would appear that at least they think that there should be no conflict between the two definitions: as indeed there would not be if primary-impact zero-output DUP activities resulted in a social loss of resources, thus guaranteeing an ultimate "social waste".[2]

But that is precisely what cannot be assumed. As Bhagwati and Srinivasan (1980) and Bhagwati (1980a) (1980b) have demonstrated, DUP activities which are triggered by distortions and hence are characterized by a second-best situation may well be characterized in turn by "social surplus" rather than "social waste". Thus, any DUP activities which result paradoxically in welfare improvement would automatically have to be ruled out from the umbrella extended by Buchanan and associates! E.g. illegal trade that impoves welfare --Bhagwati and Hansen (1973), Sheikh (1974) etc.--, revenue seeking or premium-seeking that are beneficial in their outcome, and so on: all these would drop out of Buchanan's, not Bhagwati's, reach.

But surely that was not intended! Quite simply, Buchanan's definition appears to have been based on the erroneous assumption that real resources expended in lobbying and such activities must obviously amount to social waste. This is the fallacy of treating as necessarily a first-best problem what can be a second-best problem.

Therefore, whereas Buchanan must be complimented on attempting to go beyond Krueger's concern with only license-related profit-seeking activities and to get at a general formulation, he seems to have erred in adopting her inappropriate "rent-seeking" phraseology and, even more critically, in using a definition that begs the question whether the kinds of activities he wished to describe would lead to social waste.

In this paper, therefore, we reject both the Krueger and Buchanan conceptualizations, definitions and phraseology and adopt that of Bhagwati, addressing the subsequent analysis in this paper therefore to DUP activities and their welfare consequences, especially in regard to the asymmetry of outcomes when DUP activities are triggered by price rather than quantity distortions.

III. Second-best DUP Activities: The Case of Trade Quotas versus Tariffs or Trade Subsidies

It has been noted above that, as already well known from earlier work of ours , DUP activities that are triggered by existing distortions must be analyzed as constituting a second-best problem. And we also know, from Bhagwati and Srinivasan (1980), that in view of the second-best nature of the problem, DUP activities may be paradoxically beneficial. Or, in other words, since we

are dealing with zero-output activities that utilize real resources, the shadow factor price of a factor may be sufficiently negative in the initially-distorted equilibrium to make the zero-output DUP activity welfare-improving.

This point was made in Bhagwati and Srinivasan (1980) with reference to a revenue-seeking lobby. Thus, imagine a tariff-seeking lobby has succeeded and a protective tariff has been put in place. Imagine next that the revenue that results from this (nonprohibitive) tariff attracts a revenue-seeking lobby. This revenue-seeking lobby therefore operates from an initally-distorted, tariff-ridden equilibrium. Thus, turn to Figure 1. There a small country with given terms of trade P_tC_t and a production possibility curve AB is depicted. Then a tariff is imposed, making the importable good 2 more expensive domestically and leading to production at P_t at the point of tangency of the tariff-inclusive price-ratio P_tS with AB, and consumption at C_t. Now, a DUP revenue-seeking activity which this tariff generates would lead to production of goods shifting from P_t to somewhere inside AB and, if this shift occurred to a point such as P^D in the striped zone, the revenue-seeking activity would paradoxically improve welfare: as at C_t^D. I.e. the shadow price of a factor at a tariff-distorted equilibrium such as P_t could be (sufficiently) negative to generate this outcome.

Now, does this paradoxical possibility, inherent in the second-best nature of the problem at hand, not arise equally if the tariff at P_t is replaced instead by an import quota? It would seem at first blush that it would. And, Bhagwati and Srinivasan (1980) indeed argued that it would.[3] However, as Mehmud dul Anam of Carleton University noticed, this is not so.

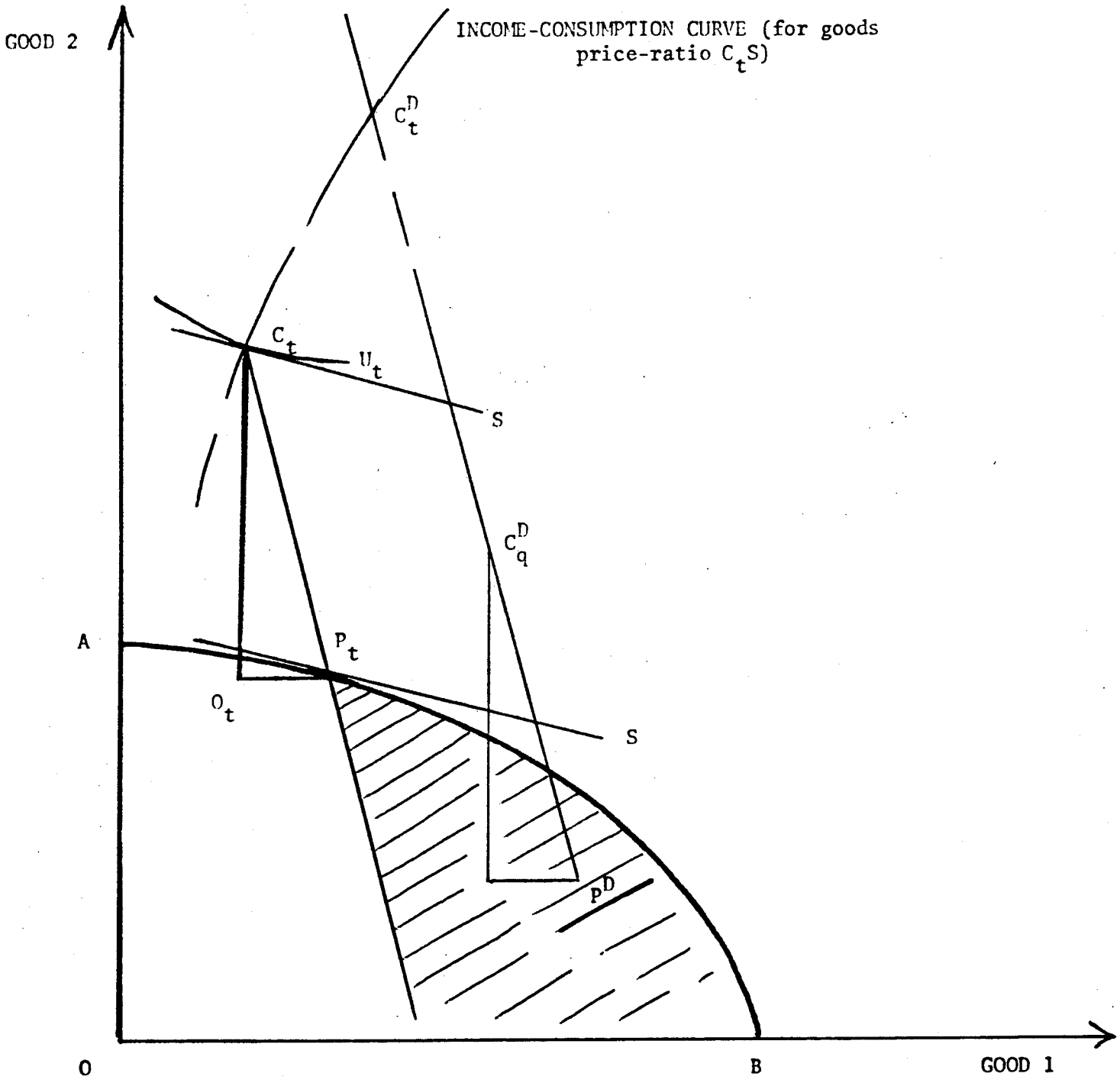
GOOD 2
INCOME-CONSUMPTION CURVE (for goods price-ratio C_tS)
C_t^D
C_t
U_t
S
C_q^D
A
P_t
O_t
S
p^D
O
B
GOOD 1

FIGURE 1

For, in the case of a QR on exports or imports, when defined purely in quantity (rather than value) terms, the trade triangle is fixed for the binding quota as $C_tO_tP_t$ and, no matter where P_t shifts to within AB as a result of premium-seeking, the attendant constrained-trade equilibrium must imply that the resulting consumption point C_q^D cannot rise above C_tS and hence above U_t as well.

As long as imports are fixed quantitatively, therefore, premium-seeking has to be immiserizing. (i) The result holds equally for export and import quotas, when the country is small. (ii) Again, for a small country, the result will hold if the quotas are defined in foreign values, rather than in pure quantity. (iii) However, even for a small country, the critical constraint on import quantity may be relaxed, opening up the possibility of beneficial premium-seeking if an import quota is defined in domestic values: for, as the implicit tariff falls, the same domestic-value constraint can accommodate an increasing quantity of imports. (iv) For a large country, however, the possibility of admitting the paradox of beneficial premium-seeking is enhanced. Thus, while an import quota will close off this possibility, an export quota does not (unless one imposes the restriction that the foreign offer curve be elastic). Thus, the same export level may be compatible with more than one import quantitites and thus the critical import quantity constraint may not operate to exclude the paradox of beneficial premium-

seeking. (v) Again, even if the import quota is fixed in foreign values, the variable terms of trade implied by the large country assumption can relax the import constraint and open up the paradoxical possibility.

Finally, the above analysis of tariffs and trade quotas indicates that the presence of quotas, rather than (ad valorem) price distortions , may quite generally restrict the scope of paradoxical welfare-improvement from premium-seeking. This general result on price versus quantity distortions is precisely what is analyzed in the next Section.

IV. Price versus Quantity Distortions and Negative Shadow Prices for Factors

Evidently, the critical question to be investigated in examining the paradoxical possibility of welfare-improving DUP activity (which has zero output) is whether at least one shadow factor price is negative: for, that is a necessary condition for the net welfare impact of such activity to be positive. It can then be shown quite readily that:[4]

PROPOSITION 1: Whenever the distortion that triggers seeking activity is the only distortion in the economy, and is a (pure) quantity constraint and remains a binding constraint in the presence of the seeking activity, the shadow price of a primary factor cannot be negative; and

PROPOSITION 2: When the only distortion is instead an ad valorem price distortion, the shadow price of a primary factor may be negative (except when the distortion does not affect productive efficiency).

The essential argument underlying proposition (1) is that, while the DUP activity takes place in a second-best distortionary situation, it fails to improve welfare because the quantity constraint "bottles up" the source of positive gain that might outweigh the loss implied by diversion of real resources to the DUP activity. This, on the other hand, does not happen when the distortion is instead of a price variety.

To see this in the traditional 2x2, small, open economy model, consider then the four classic distortionary cases,[5] in their quantity and price versions: (1) trade quota/constraint and trade tariff; (2) production quota/constraint and production tax-cum-subsidy; (3) factor use quota/constraint and factor tax-cum-subsidy; and (4) consumption quota/constraint and consumption tax-cum-subsidy.

In the algebraic analysis below, we will write the transformation function as $X_1 = F(X_2, \bar{K}, \bar{L})$ where X_1 and X_2 are the output levels of the two goods 1 and 2, and $\bar{K}$, $\bar{L}$ are the factor endowments. The social utility function is $U = U(X_1 - E, X_2 + E)$ where E is the export of good 1 and the world goods price-ratio is unity by choice of units. The shadow price of L, w*, in terms of utility impact is then derived for the different distortions.

A. Trade Quota and Trade Tariff:

We have already considered these in Section III, using geometrical arguments and developing the underlying rationale.[6] The algebraic treatment is fairly straightforward.

(i) Trade Quota: In this case, we can write:

$$X_1 = F$$

$$\frac{U_2\ [X_2 - \bar{E},\ X_2 + \bar{E}]}{U_1\ [X_1 - \bar{E},\ X_2 + \bar{E}]} = -F_1$$

with X_1 and X_2 as the two unknowns determined by the two equations. Then, the shadow price of labour is:[7]

$$w^{*q} = \frac{1}{U_2}\left[U_1 \frac{dX_1}{d\bar{L}} + U_2 \frac{dX}{d\bar{L}}\right]$$

$$= F_3 > 0$$

And F_3 is also the market wage rate.

(ii) Trade Tariffs: While therefore w^{*q} cannot be negative, w^{*t} (the shadow wage for a tariff) can be. For, in this case, we have three unknowns X_1, X_2 and E being determined by:

$$X_1 = F$$

$$\frac{U_2\ [X_1 - E,\ X_2 + E]}{U_1\ [X_1 - E,\ X_2 + E]} = (1 + t)$$

$$-F_1 = (1 + t)$$

where t is the tariff rate. Then:

$$w^{*t} = \frac{1}{U_1}\frac{dU}{d\bar{L}} = F_3 + t\frac{dE}{d\bar{L}}$$

Since $F_3 > 0$, w^{*t} may be negative when $\frac{dE}{d\bar{L}} < 0$, i.e. (as evident from the diagrammatic analysis in Section III) when the quantity of imports rises with the diversion of L to seeking activity.

B. Production Quota and Production Tax-Cum-Subsidy:

Next, consider Figure 2 for the case of production distortions. Assume that the initial equilibrium production is distorted to P_{ps} but consumption takes place at international prices at C_{ps}.

(i) Quota: Now, if the distortion is a quantitative one, i.e. $X_2 = \bar{X}_2$, the DUP activity generated to get the lucrative premia on production licenses (for producing good 2) will necessarily immiserize the economy, i.e. w^{*q} will be positive. The reason is clearly that the loss of resources to the DUP activity will only shift the social budget line inwards and, given $\bar{X}_2$, this must reduce X_1 and hence social utility. In Figure 2, the shift of production is shown, under the quota, to P_q from the initial P_{ps}.

(ii) Tax-Cum-Subsidy: However, if the distortion is of a price variety, i.e. a production tax-cum-subsidy brings production initially to P_{ps}, the corresponding shadow price, w^{*p}, can well be negative. This, in fact, will happen if the production point shifts under the DUP activity to within the striped area, of course.

Algebraically, this is seen readily as follows, for the quota and subsidy cases in turn.

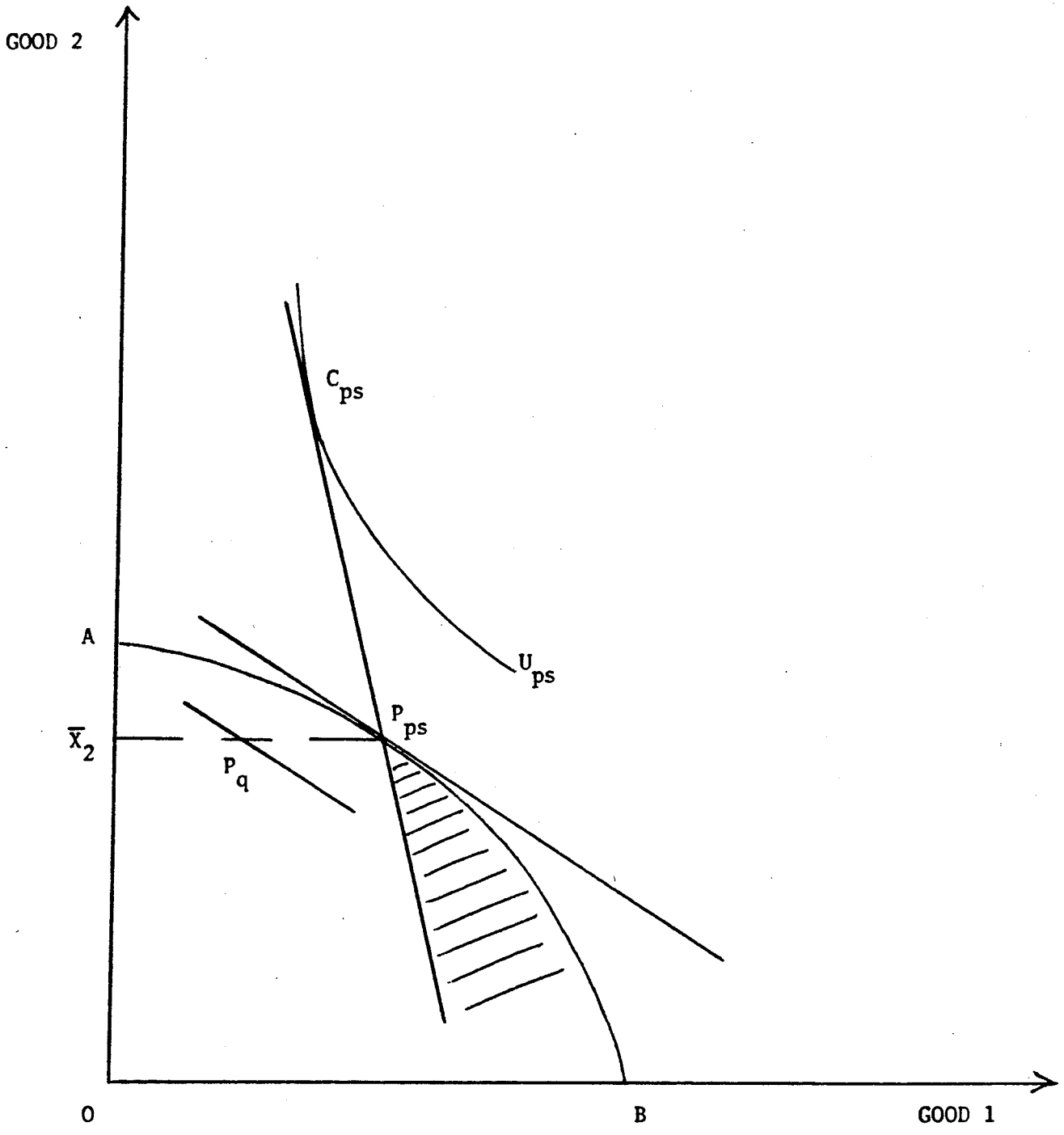

FIGURE 2

(i) Production Quota: In this case, we can write:

$$X_1 = F(\bar{X}_2, \bar{K}, \bar{L})$$

$$\frac{U_2[X_1 - E, \bar{X}_2 + E]}{U_1[X_1 - E, \bar{X}_2 + E]} = 1$$

with X_1 and E as the two unknowns determined by the two equations. Then, we can solve readily for the shadow price of labour as:

$$w^{*q} = \frac{1}{U_1}\left[U_1\left(\frac{dX_1}{d\bar{L}} - \frac{dE}{d\bar{L}}\right) + U_2 \cdot \frac{dE}{d\bar{L}}\right]$$

$$= \frac{dX_1}{d\bar{L}} = F_3 \equiv \text{Market Wage Rate} > 0.$$

(ii) Production Subsidy: In this case, one can write:

$$X_1 = F(X_2, \bar{K}, \bar{L})$$

$$\frac{U_2[X_1 - E, X_2 + E]}{U_1[X_1 - E, X_2 + E]} = 1$$

$$-F_1 = (1 + s)$$

with X_1, X_2 and E as the three unknowns determined by the three equations and s as the production subsidy rate. The shadow price of labor now is:

$$w^{*s} = \frac{1}{U_1}\left[U_1\left(\frac{dX_1}{d\bar{L}} - \frac{dE}{dt}\right) + U_2\left(\frac{dX_2}{d\bar{L}} + \frac{dE}{d\bar{L}}\right)\right]$$

$$= -s\frac{dX_2}{d\bar{L}} + F_3$$

Thus, if $\frac{dX_2}{d\bar{L}}$, is positive, i.e. if the production of the subsidized good increases as the aggregate endowment of labor increases, w^{*s} may be negative. I.e. we must admit the possibility that there may be beneficial DUP activity.

C. Factor Employment Quota and Factor Tax-Cum-Subsidy:

Here again, a factor employment quantity constraint will eliminate the possiblity of a negative shadow factor price whereas a factor tax-cum-subsidy distortion will not. Confining ourselves to algebraic analysis, since the geometry is too cumbersome to be illuminating, we show this below.

(i) Factor Employment Quota: Let us denote by k_i the capital-labour ratio in the production of good i (i = 1,2). Let $\bar{L}_1$ be the employment quota in the production of good 1 implemented through an optimum wage subsidy to that industry. Let $f^i(k_i)$ be the average product of labour in industry i. Then, given that producer and consumer prices equal world prices and that marginal value product of capital is the same in the two sectors, we have under full employment of labour and capital (with k_1, k_2, E as unknowns):

$$\frac{U_2[\bar{L}_1 f^1 - E,\ (\bar{L} - \bar{L}_1)f^2 + E]}{U_1[\bar{L}_1 f^1 - E,\ (\bar{L} - \bar{L}_1) f^2 + E]} = 1$$

$$\frac{f_1^1(k_1)}{f_1^2(k_1)} = 1$$

$$\bar{L}_1 k_1 + (\bar{L} - \bar{L}_1)k_2 = \bar{K}$$

We can then solve for the shadow wage of labour to get:

$$w^{*q} = \frac{1}{U_1}\left[U_1 \left\{L_1 f_1' \frac{dk_1}{d\bar{L}} - \frac{dE}{d\bar{L}}\right\} + U_2 \left\{ f^2 + (\bar{L} - \bar{L}_1) f_1^2 \frac{dk_2}{d\bar{L}}\right\}\right]$$

$$= (f^2 - k_2 f_1^2) > 0$$

This result is easily explained. With employment in industry 1 fixed at $\bar{L}_1$, any change in aggregate endowment of labour is accommodated by an equivalent change in the employment in industry 2. Hence the shadow price of labour is the marginal value product of labor in industry 2, i.e. the shadow wage equals the market wage and must therefore be non-negative.

(ii) Factor-use Subsidy: Now we have L_1, k_1, k_2 and E as the unknowns and the following equations:

$$\frac{U_2[L_1 f^1 - E,\ (\bar{L}-L_1)f^2 + E]}{U_1[L_1 f^1 - E,\ (\bar{L}-L_1)\ f^2 + E]} = 1$$

$$\frac{f_1^1\ (k_1)}{f_1^2\ (k_2)} = 1$$

$$f^1[k_1] - k_1 f_1^1(k_1) = (1-s)\ [f^2(k_1) - k_2\ f_1^2\ (k_2)]$$

$$L_1 k_1 + (\bar{L}\ - L_1)\ k_2 = \bar{K}$$

We can then solve for the shadow wage of labour to get:

$$w^{*s} = \frac{1}{U_1}[U_1 \frac{dL_1}{d\bar{L}} f^1 + L_1 f_1^1 \frac{dk_1}{d\bar{L}} - \frac{dE}{d\bar{L}}) + U_2((1 - \frac{dL_1}{d\bar{L}})f^2 + (L-L_1)f^2 + (\bar{L}-L_1)f_1^2 \frac{dk_2}{d\bar{L}} + \frac{dE}{d\bar{L}}]$$

$$= (f^2 - k_2 f_1^2)\ [1 - s \frac{dL_1}{d\bar{L}}]$$

If $\frac{dL_1}{d\bar{L}} > 0$ i.e. if employment in the subsidized industry increases as the aggregate endowment $\bar{L}$ increases, then w^{*s} could be negative. Once again, therefore, DUP activity can be beneficial.

D. Consumption Quota and Consumption Tax-cum-Subsidy:

Finally, we consider the consumption quota and tax-cum-subsidy cases and demonstrate that, in both cases, the paradox negative shadow prices will not arise, despite the second-best nature of the problem at hand.

(i) Consumption Constraint: Let the initial situation be at P^*, C_{cs} and U_{cs} in Figure 3. Interpreting this as a consumption quantity constraint, such that $C_2 \leq \bar{C}_2$, we can see that seeking will necessarily shift the social budget line to the left (i.e. from P^*C_{cs} to C_qC_p) and hence immiserize the economy (shifting it from U_{cs} to U_q).

(ii) Consumption Tax-Cum-Subsidy: In this instance, however, even if the initial situation is treated as a consumption tax-cum-subsidy distortion, there will be a shift in welfare from U_{cs} to U_p as consumption shifts from C_{cs} to C_p down the income-consumption curve at constant (consumer) goods price-ratio 'd'. Thus, in the case of a consumption distortion, a negative shadow factor price for a factor cannot arise even for a price distortion!

The reason why in both the price and quantity cases, we now have necessarily positive shadow factor prices is easily understood. Since the initial situation represents full

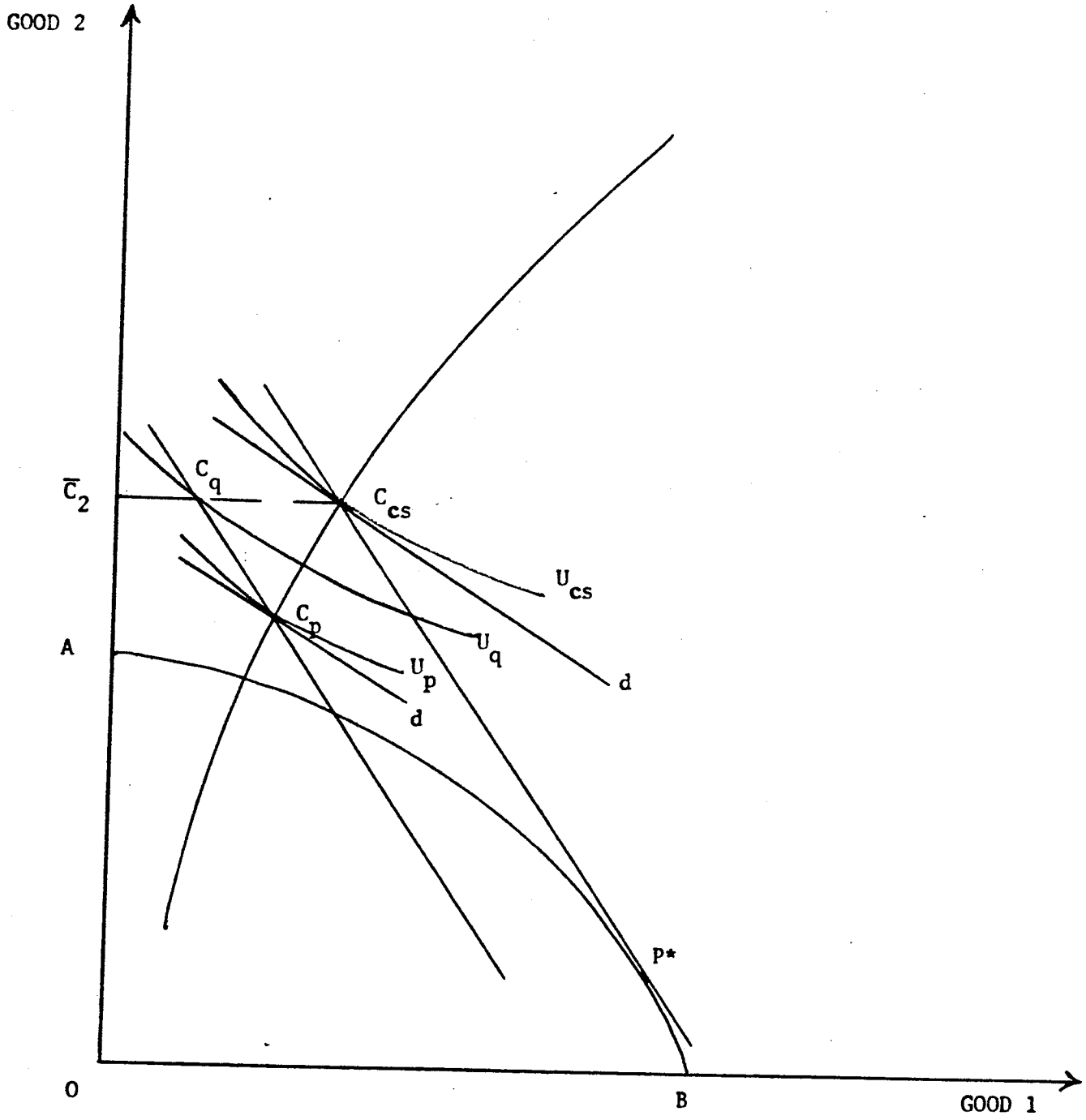

FIGURE 3

production efficiency (at P^*), any seeking must necessarily shift the social budget line inwards. For the fixed price distortion in consumption, by writing the indirect utility function in terms of the domestic goods price ratio (p) and the world-price-valued social income (y), we see immediately that the former (p) is fixed and the latter (y) declines with seeking. Hence a decline in social utility is inevitable. For the quantity distortion, again the decline in social income (y) implies that, given $\bar{C}_2$, the attainable C_1 must fall, and hence again a decline in social utility follows.

Algebraically, these results are readily derived as follows, taking the quota and subsidy cases, in turn.

(i) Consumption Quota: In this case, we have:

$$X_1 = F[\bar{C}_2 - E, \bar{K}, \bar{L}]$$

$$-F_1 = 1$$

and two unknowns, X_1 and E, to be determined. The solution for the shadow wage then is:

$$w^{*q} = \frac{1}{U_1}\left[U_1\left(\frac{dX_1}{d\bar{L}} - \frac{dE}{d\bar{L}}\right)\right]$$
$$= F_3 > 0$$

(ii) Consumption Subsidy: Here, we have:

$$X_1 = F(X_2, \bar{K}, \bar{L})$$

$$C_1 + C_2 = X_1 + X_2$$

$$\frac{U_2(C_1, C_2)}{U_1(C_1, C_2)} = 1 - s$$

$$-F_1 = 1$$

and four unknowns, X_1, X_2, C_1 and C_2, to be determined. The shadow wage now is:

$$w^{*s} = \frac{1}{U_1}\left[U_1 \frac{dC_1}{d\bar{L}} + U_2 \frac{dC_2}{d\bar{L}}\right] = \frac{dC_1}{d\bar{L}} + (1-s)\frac{dC_2}{d\bar{L}}$$

But $\frac{dC_2}{d\bar{L}} = \theta \frac{dC_1}{d\bar{L}}$ where $\theta = \frac{U_{21}U_1 - U_{11}U_2}{U_{12}U_2 - U_{22}U_1} > 0$ under normailty in consumption

of both goods. Therefore:

$$w^{*s} = [1 + \theta\ (1 - s)]\ \frac{dC_1}{d\bar{L}} = \left[\frac{1+\theta(1-s)}{1+\theta}\right] F_3 > 0.$$

E. General Principles

In all these cases, the quantity distortion does not permit the shadow price of a factor to be negative. Why? The answer is clear as soon as one understands that the marginal variation in factor supply, to determine the shadow price of that factor, is in each such quantity-constrained case undertaken from what can be regarded as a second-best optimal position; and, as Bhagwati's (1968) generalization of the theory of immiserizing growth shows, immiserizing growth (and hence its mirror image phenomenon of a negative shadow factor price, see Bhagwati, Srinivasan and Wan (1978)) can arise only if sub-optimality is present. The reason why the quantity-constrained cases can be regarded as involving marginal variation of factor supply from an optimal position is that, as we know from the theory of optimal policy intervention in the case of non-economic objectives (Bhagwati and Srinivasan, 1969), the optimal way to achieve quantity constraints or objectives relating to production, consumption, trade and factor employment is to utilise implicit or explicit tax-cum-subsidies on production, consumption, trade and factor use respectively. In fact, utilizing this very insight, Bhagwati (1970, pp. 82-84) had argued that the phenomenon of immiserizing growth could not

arise when non-economic objectives were being pursued with the aid of first-best policies, but that it would resurrect itself if second-best or third-best policies were adopted to implement them in the first place. Proposition (1) above therefore follows immediately.

At the same time, it is equally clear that if the initial situation is regarded as one of price distortion, it cannot now be interpreted as one characterized by second-best optimality. Therefore, the possibility of a negative shadow price of a factor cannot be ruled out (except for the case of a consumption distortion since productive efficiency obtains in this case even under the distortion in consumption). Hence Proposition (2) follows.

V. Concluding Observations:

In conclusion, two further asymmetries between QR-triggered and price-distortion-triggered DUP activities may be noted and their implications analyzed.

A. Rank-Ordering DUP Activities Triggered by QRs and Price Distortions:

While DUP activities, triggered by pure and only quantity distortions, will necessarily be "socially wasteful", whereas this cannot be maintained in general for price distortions, it does not follow that one can uniquely rank order these distortions in the presence of DUP activity. This may be illustrated by comparing a tariff with a quota.

Thus, take Figure 1 again and consider two possibilities. First, let the equilibrium at P_t, without the DUP activity, be a tariff equilibrium and let it trigger a revenue-seeking DUP activity which is, for simplicity, fully competitive and results in all revenues being sought. Next, consider P_t to be a quota equilibrium and again allow it to trigger a premium-seeking DUP activity which is fully competitive and results in all premia on the import licenses being sought. Compare now the two outcomes. One just cannot rank order the two outcomes, even if the technology of the revenue-seeking and premium-seeking DUP activities is assumed to be identical.

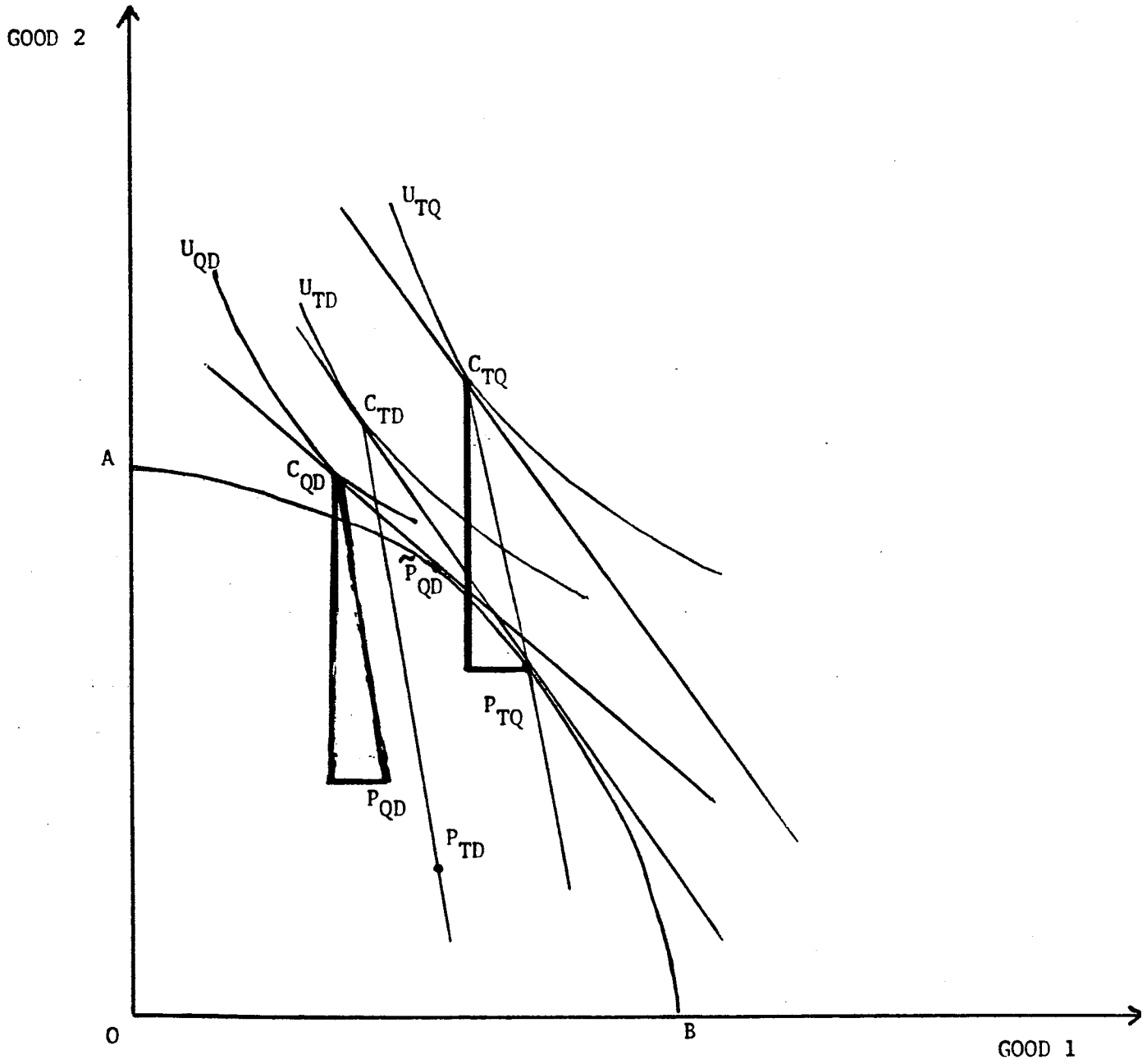

FIGURE 4

The answer depends, in the model underlying Figure 1, on whether the implicit tariff under premium-seeking falls or rises. In the former case, the tariff-cum-DUP-activity equilibrium will be superior to the quota-cum-DUP-activity equilibrium whereas in the latter case, this ranking will be reversed. Figure 4 illustrates the case where the equilibrium with a tariff (price) distortion leads to higher welfare U_{TD} than the welfare U_{QD} under a quota, with full revenue and premia being sought in the respective cases. We start from an initial equilibrium production at P_{TQ} and consumption at C_{TQ} and then, with the tariff (imports) being maintained at the same level as at (C_{TQ}, P_{TQ}), revenue-(premium-) seeking activities are introduced leading to full revenue-seeking equilibrium at (C_{TD}, P_{TD}) (and premium-seeking equilibrium at (C_{QD}, P_{QD}). One can join P_{TQ} and P_{TD} by a generalized Rybozynski line since producer prices at these points are the same. However, with a quota, producer price ratio at P_{QD} is in general different from that at P_{TQ}: thus, the initial point for the corresponding Rybzynski line is not P_{TQ} but $\tilde{P}_{QD}$ where the producer price-ratio is the same as at P_{QD}. The reader can readily redraw Figure 4 to show the reverse outcome, i.e. that the tariff-cum-DUP-activity welfare is lower than the quota-cum-DUP-activity welfare $(U_{TD} < U_{QD})$ by depicting a situation where the implicit tariff falls with DUP activity. This would of course imply that Figure 4 would have to be redrawn such that $\tilde{P}_{QD}$ is to the right of P_{TQ} on AB.

Algebraically, this is seen as follows. At the full seeking equilibrium, consumer expenditure equals factor incomes that correspond to the production point on the production possibility curve at which the marginal rate of transformation equals the domestic price ratio. Hence, denoting by p this domestic

price ratio and by $Y(p)$ the total factor income given p, we can write welfare in terms of the direct utility function $V(p, Y(p))$. From the fact that p equals the marginal rate of transformation, we get $\frac{dY}{dp} = X_2 \equiv$ output of good 2. Hence $\frac{dV}{dp} = \frac{\partial V}{\partial p} + \frac{\partial V}{\partial Y} \cdot X_2$. Now from Roy's identity we know $\frac{\partial V}{\partial Y} C_2 = -\frac{\partial V}{\partial p}$ where C_2 is the consumption of good 2. Thus $\frac{dV}{dp} = -\frac{\partial V}{\partial Y}(C_2 - X_2) < 0$, given that $\frac{\partial V}{\partial Y} > 0$ and good 2 is the importable. Hence if the domestic price ratio corresponding to the equilibrium with a quota and full rent seeking is greater (smaller) than the tariff inclusive price, welfare in that equilibrium will be lower (higher) than that under a tariff with full revenue seeking. In other words, the comparison of welfare levels reduces to a comparison of the implicit tariff under the quota (and full rent seeking) with the explicit tariff.

B. Shadow Factor Prices in Presence of DUP Activities:

Finally, it is evident that the shadow prices of factors at the DUP-activity-inclusive equilibrium,[8] even if perchance such equilibrium is identical for a price and a quantity distortion (a most unlikely occurence, of course, in view of our analysis in Bhagwati and Srinivasan (1980) and here), will be different. It was shown in Section IV that the shadow factor price of each factor at the initial equilibrium with DUP activities absent is its market price as long as the distortion is a quantity distortion. But, following on an interesting contribution of Foster (1981), we can see that this rather remarkable result holds for the tariff-cum-revenue-seeking equilibrium: namely, that in this instance, short of specialization, the shadow prices are the market prices. Thus, consider the equilibrium (P_{TD}, C_{TD}) in Figure 4. Now, with the entire revenue sought away, the consumer expenditure on goods equals income at market prices for factors. And these factor prices and goods prices do not change

as we vary factor endowments thanks to the tariff. As such, the value of change in the labour (capital) endowment by a unit is its market reward: hence the shadow factor prices are the market prices. Asymmetrically, this proposition does not extend generally to shadow prices of factors at the quota-cum-premium-seeking equilibrium (P_{QD}, C_{QD} in Figure 4). For, generally, the implicit tariff and hence factor prices will vary with marginal variation in the factor supply.

Footnotes

[1]Pronounced as "dupe" activities, the phrase DUP activities also comes close to the spirit in which economists are likely to view such activities! The alternative of calling them ZOP (i.e. zero-output profit-seeking) activities is, on that ground, less appealing. Strictly speaking, these activities provide income to factors employed in them. As such, 'income-seeking' rather than 'profit-seeking' is a more appropriate way of characterizing them. However, given the aptness of the word "dupe" in describing them, we have chosen to retain the phrase "profit-seeking".

[2]There would nonetheless appear to persist a difference since, in principle, Buchanan's definition could include positive-output, traditional activities that, just because some distortion was present in the economy, created a social loss. That also seems to be an objectionable feature of the Buchanan definition, if indeed the definition permits this interpretation as it seems to.

[3]We did notice that, in the presence of quotas, welfare could not be inferred from shifts in the budget constraint, i.e., the Little-Mirrlees logic had to be modified. So, we cast the algebra in eqs. (9) and (10) on shadow prices into the utility-impact format but, in discussing the sign of eq. (11) on the utility impact of premium-seeking, we admitted the possibility that the sign could be positive, i.e. welfare might improve thanks to premium-seeking, whereas our present analysis shows that, in the model we used, this is not possible.

[4]These propositions are based upon there being just one distortion in the economy and need not hold when there are more than one distortion. For instance, if there are several foreign distortions, proposition 1 need not hold unless each distortion happens to be a quota. Alasdair Smith drew our attention to these possibilities.

[5]These four cases have been distinguished and analyzed, from the viewpoint of the theory of policy intervention in the presence of non-economic objectives, in Bhagwati and Srinivasan (1969).

[6]The full rationale for all cases is developed in subsection E below.

[7]The intermediate steps in deriving $w^{*q} = F_3$ are:

$$w^{*q} = \frac{dX_1}{d\bar{L}} + \frac{U_2}{U}\frac{dX_2}{d\bar{L}}$$

$$= F_1 \frac{dX_2}{d\bar{L}} + F_3 \cdot F_1 \frac{dX_2}{d\bar{L}}.$$

[8]I.e. in Figure 4 at P_{TD}, C_{TD} and P_{QD}, C_{QD} for revenue-seeking and premium-seeking DUP activities respectively.

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