Point $W$ is a point on the foreign offer curve $RB^1$. It is the tangent point between price line $RN$ (not drawn) and the foreign trade indifference curve $ty$. It is possible that the home offer curve $RS$ intersects $RB^1$ at $W$. In this case, $Q_3$ coincides with $W$ and the foreign country will reach the same welfare level as that before the transfer payment. It is also possible for $Q_3$ to lie below $W$. In this case, the foreign country will be better off in consequence of making a transfer payment.

Footnotes


2. For the offer to be acceptable to the home country, the transfer payment is assumed to be equal to the home country’s tariff revenue under the maximum revenue tariff. It is also assumed that the foreign country does not raise its revenue for the transfer payment by a tariff on trade.

3. Meade, James E., A Geometry of International Trade, (1952, George Allen and Unwin). In the present example, tariff revenue is measured in units of the exportable good. The conclusion will not be affected if the tariff revenue is measured in units of the importable good instead.


5. Curve $RS$ is the locus of the tangent points between price lines (through $R$) and home trade indifference curves.

6. Curve $RB^1$ is derived in the same way as $RS$. It is the locus of the tangent points between price lines (through $R$) and foreign trade indifference curves.

---

Eastern Economic Journal, Volume XII, no. 2, April-June 1986

A Note on the Welfare Cost of a Tariff

James Cassing*

It is a well known result in international trade theory that for a small country the imposition of a tariff diminishes the value of national income at world prices. Suppose, however, that in the short-run (SR) some factors are specific to particular industries. Then, an interesting question is whether or not in the long-run (LR) the reduction in national income at world prices -- and so the domestic welfare cost of the tariff -- will be greater or smaller than in the SR. Figure 1 illustrates the point at issue. An increase in the tariff will result in a short-run loss of output (valued at world prices) identified by the area $AB^1C$, and a long-run loss equivalent to area $ABC$. But there is no presumption of which area is larger.

Two polar cases which assume a simple two-commodity world, quickly illustrate the issue. Suppose, first, that sectors produce outputs in fixed proportions. Then, unless all factors are mobile so that short-run cost is less than the long-run cost, a (sufficiently large) tariff increase cannot diminish national income at world prices. Alternatively, suppose both sectors have identical isoquants with constant returns to scale, and that the world price is unity. In the long-run a tariff cannot diminish national income at world prices since the long-run transformation curve is then linear with slope unity. But, in the short-run, the tariff drives output inferior to the long-run transformation set and so the tariff cost is higher than in the long-run.

In order to isolate the forces at work, we adopt the standard two factor two good, constant returns to scale model. Taking capital to be the industry specific factor, SR equilibrium is characterized by equations (1) - (5).

\[
\frac{2X_1(l_1X_1)}{X_1} = \beta \frac{2X_2(l_1X_2) - Y}{3(l_1X_2)}
\]

\[
\frac{3X_2(l_1X_2)}{X_1} = \omega
\]

\[
\frac{3X_1(l_1X_1)}{X_1} = r_1
\]

*University of Pittsburgh, Pittsburgh, Pa. 15260. This paper has benefited from the helpful comments of Steve Husted, Jack Ohs, and two anonymous referees.
\[ (4) \quad \frac{x_2 (\bar{a} + \bar{a}_1)}{\bar{a}_2} = r_2 \]

\[ (5) \quad \bar{a}_1 + \bar{a}_2 = \bar{a} \]

In each equation bars denote predetermined variables and \( l_i, x_i, \) and \( x_i \) represent the amount of labor, capital services, and output of industry \( i, i=1,2. \) Factor prices are denoted \( r_i, i=1, 2 \) and \( w. \) Equations \( (1)-(4) \) represent four equations in \( l_i, w, x_i, r_1, r_2 \) which are endogenous variables. Capital is quasi-fixed. \( P \) denotes the relative price of good 2 and good 1 is imported.

Now, suppose initially that a tariff \( t \) has been imposed and that a SR second best solution prevails in which the SR domestic rate of transformation is equal to the tariff distorted price ratio \( P = \frac{1}{1+t} P^a. \)

Since capital is industry specific in the SR, the return to capital will not be equal between industries. In particular, it must be that if \( P \) has risen, then \( r_1 > r_2. \)

The value of production at world prices for such a second best solution is given by:

\[ (6) \quad Y = x_1 + P x_2 \]

Now, the issue at hand is what happens to \( Y \) in the LR as capital is shifted from the lower return to the higher return industry? That is, does the tariff cost go up or down? Mathematically, the answer depends on the effect of an increase in \( K_1, \) subject to the full employment condition \( dK_1 = -dK_2. \) Differentiating equation \( (6) \) totally yields:

\[ \frac{dy}{dK_1} = \frac{\partial y}{\partial x_1} \frac{dx_1}{dK_1} + \frac{\partial y}{\partial x_2} \frac{dx_2}{dK_1} = \frac{\partial x_2}{\partial K_1} - \frac{\partial x_2}{\partial K_2} \]

Substituting for \( P^a \) and using the SR profit maximizing condition

\[ (7) \quad \frac{\partial x_1}{\partial K_1} = 0 \quad \frac{\partial x_2}{\partial K_2} = 0 \]

it follows that:

\[ \frac{dy}{dK_1} = (-tP) \frac{\partial x_2}{\partial K_1} + \left( \frac{\partial x_2}{\partial K_1} - \frac{\partial x_2}{\partial K_2} \right) \]

Each of the three terms on the R.H.S. requires interpretation. Specifically, the middle term is positive since \( \frac{\partial x_2}{\partial K_1} - \frac{\partial x_2}{\partial K_2} \) represents the gain in national income attributable to a move from the interior to the boundary of the LR production possibilities set. That is, capital is being reallocated to the higher return industry. The last term, however, captures the fact that this is not wholly desirable. In particular, each unit of capital drawn away from the good 2 industry reduces output by \( \frac{\partial x_2}{\partial K_2} \) units of good 2 at a net income loss in terms of good 1 of \(-tP\) per unit. That is, the unprotected good 2 is already "underproduced."

Similarly, the first term is also negative and reveals the deadweight loss of additional labor following capital away from the already unproductive good 2 industry. To see the extent of this effect, differentiate equations \( (1)-(4) \) totally and solve for:

\[ \frac{dK_1}{K_1} = \frac{\partial x_2}{\partial K_1} - \frac{\partial x_2}{\partial K_2} > 0 \]

Now, observe that the magnitude of \( dK_1 \) depends on the degree of \( dK_1 \) complementarity in production between capital and labor in each industry. If increases in capital contribute significantly to the productivity of labor at the margin, then in the LR capital mobility will generate very large shifts away from good 2 production at a cost to national income of \(-tP\) per unit decreases. This is shown in the first term of equation \( (7). \)

The net impact on national income given the tariff distortion of LR capital mobility is apparently ambiguous and depends on two conflicting forces. First, LR capital mobility permits production at the boundary of the LR production possibilities set, which should be beneficial. Second, however, the domestic prices are tariff distorted and the friction of capital mobility may have retarded a somewhat the misallocation of resources to the protected industry.

Implications for Commercial Policy

Suppose a small country pursuing short-run goals imposes a tariff. The preceding analysis suggests conditions under which such a policy retains some efficacy. If the industry specific factor is strongly complementary to the SR mobile factor in production, then the SR cost of the production
distortion may be considerably less than is commonly held. Of course, this
does not alter the case for the superiority of no tariff at all. And,
finally, if the factors are only weakly complementary, then the cost of the
distortion may be considerably less than is commonly held. Of course, this
does not alter the case for the superiority of no tariff at all. And,
finally, if the factors are only weakly complementary, then the cost of the
production distortion may be even greater in the SR than in the LR.

\[ \text{Price, Cost} \]

\[ \text{SR supply} \]

\[ \text{LR supply} \]

\[ \text{post-tariff price} \]

\[ \text{pre-tariff price} \]

\[ \text{A C I B} \]

\[ \text{Importable} \]

\[ \text{Figure 1} \]

FOOTNOTES

1/ The literature on trade in the presence of factor specificity is rapidly
increasing and has taken the tack of exploiting the standard variable
proportions model. See, for example, the common framework utilized in Mayer
[1], Mussa [2], and Neary [3].

REFERENCES


[2] Mussa, M., "Tariffs and the Distribution of Income: The Importance of
Factor Specificity, Substitutability, and Intensity in the Short and


A Common Fallacy About In-Kind Subsidies:
A Housing Program Application

Alan S. Caniglia

I. Introduction

The relative effects of different types of subsidies on recipients are
well known from the theory of public finance. The general conclusion is
that a recipient's level of well being will be smaller with an in-kind sub-
sidy than with a cash grant of equal size. This paper, however, undertakes
to show that this is not necessarily the result involving the subsidization
of a public good within a collectivity. This may occur if a locality is
the recipient collectivity of an intergovernmental grant or a family is
the recipient of benefits under a welfare program.

If the good has public good characteristics, and if the recipient is a
collectivity (as opposed to an individual), these aspects should be incor-
porated into our welfare economic analysis; this, however, has not typi-
cally been done. The literature on intergovernmental grants is an exception.
Some aspects of that literature will be summarized in Section II and the
analysis will be extended to the issue at hand. The results derived in
Section II have implications not only for the evaluation of intergovern-
mental grants but also for the evaluation of housing programs. These programs
can be viewed as subsidizing the consumption of a good (housing) having
public good characteristics within a collectivity (the family). In
Sections III and IV I will explore how the analysis of housing subsidy
programs in general and public housing programs in particular is affected
by this consideration. Section V offers some concluding remarks.

II. Perspectives on Intergovernmental Grants

Consider a situation in which there are two levels of government, the
"state" and a "locality". Each individual within the locality consumes two
goods, X and Y. The relative effects of two different grants from the
state to the locality will be considered: (1) a matching grant in which
the state agrees to pay a fraction m of the cost of providing X; and (2) a
lump sum grant of equal size.

\[ ^{a}\text{Franklin and Marshall College, P.O. Box 3003 Lancaster, PA 17604-3003.} \]

I am grateful to the General Electric Foundation for financial support,
and to Janneke van Beusekom, Edgar Olsen, and Jonathan Skinner for helpful
comments on an earlier draft.