Very Preliminary

LOBBYING AS A TRANSPORT INDUSTRY

by

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1. Introduction

The first lecture on commercial policy to the undergraduate international economics class often begins with a reference to Bastiat and the revealing insight that tariffs and transport costs impose economically equivalent barriers to trade. Of course, at first face in light of some contributions to the transport cost literature, this is not quite correct since tariffs raise revenue at no direct resource cost while transportation charges divert revenue to a resource using shipping industry. Recent contributions to international political economy, however, have similarly introduced a resource using and revenue squandering element into the tariff model through rent and revenue seeking. The purpose of this paper is simply to highlight the analytical equivalence between these two large but mutually oblivious bodies of literature: lobbying models and resource using shipping models. As it happens, each literature has independently derived some similar theorems. Along the way, we also steal some theorems from each of the literatures and introduce them into the other as a new theorem, no proof necessary.

Section two discusses the formal similarities between models. Section three notes parallel results. Section four offers some cheap new results. While we focus on revenue seeking and tariff seeking as analogs to resource using transport costs, note that any DUP activity would be analogous as well. For example, Bhagwati and Hansen (1973) and Sheikh (1974) analyze resource using "illegal trade" and Bhagwati, Panagrariya, and Srinivasan (1998) allude to the use of the "melting ice" assumption, reminiscent of Samuelson's early characterization of transport costs, in describing a model of smuggling.

2. The Model(s)

We assume a competitive world with linear homogeneous production functions which

combine capital, K_i, and labor, L_i, to produce output X_i at price P_i. The factors are in the aggregate perfectly inelastically supplied and command rewards, r and w. There are three industries: exports (E), imports (M), and, variously, transport or tariff/revenue seeking (T). For concreteness, we think of the transport industry as comprised of international shipping firms and the tariff/revenue seeking industry as comprised of law firms, all of which use some portion of the resource base.

Formally, using "*" for foreign variables, and denoting consumption and unit input-output coefficients by C_i and a_{ij} respectively, the equilibrium model is given by equations (1) - (10).

(1) $\quad a_{LE}\ X_E\ +\ a_{LM}\ X_M\ +\ a_{LT}\ X_T = L$

(2) $\quad a_{KE}\ X_E\ +\ a_{KM}\ X_M +\ a_{KT}\ X_T = K$

(3) $\quad a_{LE}\ w +\ a_{KE}\ r\ =\ P_E^* - \ \tau$

(4) $\quad a_{LM}\ w + a_{KM}\ r =\ P_M^*\ + t$

(5) $\quad a_{LT}\ w + a_{KT}\ r = P_T$

(6) $\quad \tau = \alpha_E\ P_T$

(7) $\quad t = \alpha_M\ P_T$

(8) $\quad \alpha_E\ (X_E - C_E) +\ \alpha_M\ (C_M - X_M) = X_T$

(9) $\quad Y = P_M^*\ X_M + P_E^*\ X_E + t(C_M - X_M) + \tau(X_E - C_E)$

(10) $\quad C_i = C_i\ (P_E\ ,\ P_M\ ,\ Y)$

While the equilibria are formally the same, the interpretation of the variables differs for each of the transport, revenue seeking, and the tariff seeking models.

Resource Using Transportation:

Equations (1) - (2) are the usual full employment conditions and equations (3) - (5) are the

2

competitive conditions. In particular, τ and t represent the per unit cost of shipping exports and imports respectively. P_T is the competitive unit price of shipping so that, as in equations (6) - (7), the unit cost of shipping goods is given by how many units of shipping are required per unit of the commodity, α_E and α_M, times the unit price of shipping. Equation (8) guarantees the provision of adequate shipping and the model is closed by the consumption functions (10) which utilize the definition of national income (9).[1]

Revenue Seeking:

In the revenue seeking models, the existence of trade taxes τ and t, assumed exogenously determined, creates revenues which are sought by resource using law firms, possibly serving on behalf of the Congress or public service. In equation (5), P_T is the competitive price of a law firm unit and so in equations (6) - (7), α_i has the interpretation of the number of lawyer units used to secure the revenue created by one unit of (taxed) exports or imports. (Apparently, α_E and α_M are defined by (6) - (7) and are not technical parameters as in the shipping model.) Full revenue seeking is implied by equation (8) since, substituting from (6) - (7),

$$\tau(X_E - C_E) + t(C_M - X) = P_T X_T$$

That is, the trade tax revenues just equal the value of law firm services expended. Partial revenue seeking is also admissible.

Partial revenue seeking would correspond to a combination of trade taxes and resource using shipping. Formally, equations (6) - (7) would be replaced by

[1]Versions of this model appear in Herberg (1970), Falvey (1976), Cassing (1978), and Casas and Choi (1989).

6') $\tau = \alpha_E \ P_T + \tau'$

7') $t = \alpha_M \ P_T + t'$

there τ' and t' are the tax components of the additional cost of international trade. Equation (9) in either model would now include some unsought tax revenue which could be used to augment consumption.[2]

Geometrically, the equivalence of the models is illustrated in Figure 1, which appears independently in Falvey's (1976) resource using transport cost paper and in Bhagwati and Srinivasan's (1980) revenue seeking paper. In the transport literature, the price line tangent to P_t represents the transport cost inclusive domestic price. In the DUP literature, that price line represents the domestic price ratio following the imposition of a tariff. The production of transport services requires the use of capital and labor, and this shifts the production point to P_r. In the DUP literature, revenue seeking leads to DUP activity and a shift in production also to P_r. The actual production point is determined by the factor intensity in the production of transport or lobbying services; here the two are assumed to be the same. In both cases, the consumption point lies at C_r. This is due to the resource cost effect of the shift of otherwise productive resources into activities that, in most cases, cannot be exchanged for imports. But, as we noted in our introduction, there is one difference between the transport literature and the tariff literature. In the absence of revenue seeking, consumption in the latter occurs at C_t.

[Insert Figure 1 about here]

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[2]Versions of this model have been explored by Bhagwati (1982), Bhagwati and Srivivasan (1982), and Husted (1991).

Tariff Seeking:

In the tariff seeking model, trade taxes are determined endogenously. Equations (6) - (7) now have the interpretation of a "tariff formation function." Since tax levels depend on the amount of resources expended, however, we must write

6") $\tau = \tau (X_{TE}) = \alpha_E (X_{TE}) P_T$

7") $t = t(X_{TM}) = \alpha_M (X_{TM}) P_T$

where X_{Ti} is the share of X_T devoted to lobbying for or against trade taxes on good i and so α_i has the interpretation of the per unit trade tax secured as a proportion of the price of one unit of law firms devoted to the legal struggle. This model is always qualitatively equivalent and exactly equivalent in equilibrium to the model of transport costs if the height of the barriers are the same, $\tau > 0, t > 0$, and if the value of the resources used in tariff seeking equal the tariff revenue which is raised (which equals the transport costs in the shipping model). If the value of the resources expended on tariff seeking are less than the tariff revenue raised, then the tariff seeking model resembles the transport cost model with tariffs.[3]

Isomorphisms:

In equilibrium, the models look mathematically very similar. Thus, we will be able to compare theorems which rely only on the configuration of the equilibrium.

For notational convenience, denote:

TC, transport cost model

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[3]Versions of this model appear in Findlay and Wellisz (1982), Feenstra and Bhagwati (1982), and Wellisz and Wilson (1986) .

TS, tariff seeking model

RS, revenue seeking model

Assume away income redistribution problems – say, tastes are identical and homothetic. Suppose that capital intensities are the same across models no matter what the interpretation of the industry, and that the heights of the trade barriers are the same. Then, to summarize the earlier discussion of equilibria, we offer as a lemma the insight to be used in our proofs below:

Lemma 1

1. The TC, the full RS, and the TS where total lawyers fees equal tariff revenues are identical.

2. The TC with trade taxes ("partial TC"), the partial RS, and the TS where lawyers fees are less than tariff revenues ("partial TS") are identical.

Of course, if we are to compare equilibria before and after the introduction of some new resource using transport industry then we must recognize that TC and full RS represent analysis in an already distorted world. Alternatively, models of the TS variety, or TC moving from no transport costs to resource using transport costs, represent analysis between initially undistorted (or less distorted) equilibria to distorted (or more distorted) equilibria.

3. Old Theorems in New Bottles

In this section we enumerate several interesting results which have been derived in either the transport or lobbying literature and introduce the theorem to the other literature. For example, if the

transport industry uses resources, then one might think it possible that the industry withdraw resources from the economy in a way that paradoxically reduces exports enough to improve welfare through a favorable terms of trade improvement. But this cannot happen, as is "proved" in the revenue seeking literature.

Theorem 1

Relative to free transport, the existence of a resource using transport industry can lead to a terms of trade improvement, but welfare cannot increase.

proof:

i. Full revenue seeking reduces welfare (Bhagwati - Srinivasan (1980)).

ii. TC and RS are equivalent by lemma 1.

Note that either of the TC and RS results follow from the well known result in the trade literature that, with some qualifications, transfers cannot enrich the donor country.

Theorem 2

Technological <u>regress</u> in transport (e.g., the Suez canal closes) accompanied by tariff reductions which keep domestic prices the same can improve welfare.

proof:

i. Partial revenue seeking increasing can improve welfare (Bhagwati - Srinivasan (1980)).

ii. Partial TC and partial RS are equivalent by lemma 1.

Corollary 2.1

Technological <u>progress</u> in transport accompanied by tariff increases which keep domestic

prices the same can reduce welfare.

Corollary 2.2

In the presence of quantitative restrictions (QRs), technological progress (regress) in shipping will lead to an improvement (a deterioration) in welfare.

proof:

Increases in DUP activities in the presence of QRs leads to decreases in welfare (Krueger (1974)).

Interestingly, some of the results on technical progress in shipping and welfare changes have been around in the transport cost literature independent of the DUP activity literature (Casas and Choi (1989); Cassing (1980),(1986)).

Theorem 3

Transport cost induced capital flows leave domestic welfare unchanged: They cannot lower welfare as they can with tariffs *a la* Brecher-Diaz Alejandro (1977).

proof:

i. Tariff induced capital flows leave domestic welfare unchanged with full revenue seeking (Rieber (1986)).

ii. The TC and full RS are equivalent by lemma 1.

There are also some theorems in the transport cost literature which relate to the internal distribution of income when tariff are altered. These theorems carry over to the DUP models.

Theorem   4

In the presence of tariff/revenue seeking, an increase in the price of the relatively labor-(capital-) intensive traded good can result in a fall in the factor price of labor (capital). That is, tariffs can fail to protect the intensively-used factor in the importable industry even for a small country.

proof:

i. The Stolper-Samuelson result can be lost with respect to traded goods in the presence of a resource using transport industry (Cassing (1978)).

ii. TC, TS, and RS are equivalent by lemma 1.

Activities that use resources should have an impact on comparative advantage and the pattern of trade. In the resource using transport cost literature there is a theorem showing, in the context of a fairly general model, that the existence of resource using transport cannot reverse the pattern of trade (Cassing (1979)). We would conjecture that this result carries over to the DUP models.

Finally, there is a small literature of foreign lobbying which has implications for the transport models (Hillman and Ursprung (1988) ; Husted (1991)). We offer one such carry-over theorem.

Theorem 5

Suppose that the home country produces shipping solely for export. If foreign demand for home shipping increases, home welfare will not change from free trade levels if home is small. However, if the home country is large, then home welfare may rise, fall, or remain unchanged relative to free trade levels.

proof:

i. Foreign expenditures on lobbying in the home country results in unchanged welfare if home is small and may raise, lower, or leave welfare unchanged if home is large (Husted (1991)).

ii. Lemma 1.

4.   Conclusions

Transport costs and tariffs both drive a wedge between foreign and domestic prices. The effects generally are not the same if in addition the transport industry requires some of the domestic resources. This has been explored in the transport cost literature. However, if tariffs are also associated with demands on the resource base, then an equivalence between tariffs and transport emerges. This association between tariffs and directly unproductive uses of resources is just what the DUP activity literature investigates. Since the mathematics of the two models are the same, reinterpretation of the variable has enabled us to establish some "new" results for each of the two literatures by borrowing theorems already proven in one of the literatures.

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Figure 1

Xm

Ct

Cr

Pt

Pr

Xe