Strategic Export Policy with Foreign Direct Investment and Import Substitution*

Richard G. Harris
Department of Economics
Simon Fraser University
Burnaby, BC V5A 1S6 Canada
and Canadian Institute for Advanced Research

and

Nicolas Schmitt
Department of Economics
Simon Fraser University
Burnaby, BC V5A 1S6 Canada

Final Version: October 1999

Abstract

The paper examines discretionary and strategic foreign direct investment incentives in the export sector relative to a non-interventionist policy. The analysis is based on a two-country model with both countries seeking to attract FDI. Countries differ in cost levels and in their levels of tariff protection on intermediate inputs. A shift in the trade policy regime toward the strategic promotion of exports results in a decrease in FDI allocated to the low-cost country when it has a low level of protection on intermediate inputs, and an increase in FDI when it has a high level of protection on intermediates inputs. Furthermore, even if FDI increases with export policy activism relative to non-intervention, welfare may be lower.

Keywords: Foreign Direct Investments, Tariff, Investment Subsidy, Strategic Trade Policy.
J.E.L. Classification: O12, F12, F13, F23
Corresponding author: Nicolas Schmitt, Department of Economics, 8888 University Drive, Simon Fraser University, Burnaby, BC, V5A 1S6, Canada. E-mail: schmitt@sfu.ca. Phone: (604) 291 4582. FAX: (604) 291 5944.

* We thank two anonymous referees for useful comments. The first version of this paper was written when Schmitt was visiting the University of Sydney. Hospitality of the Department of Economics is gratefully acknowledged.

1. Introduction

This paper is concerned with the trade policy regimes of small open developing economies in which there is a significant multi-country general equilibrium interaction between protected import sectors producing an intermediate input, export sectors which depend on inward investment by foreign multinational firms, and the strategic allocation of MNE investment across countries. Our analysis seeks to fill a gap in the neoclassical trade and development literature on the 'bias' of trade policy against exporting developed by Bhagwati (1990), Falvey and Gemmel (1990a,1990b), and others who investigate how exogenous trade policies affect resource allocation in small open economies.[1] These papers concentrate on the role of trade policies in the absence of foreign direct investments (hereafter FDI). In this paper, we show how the trade policy regime, which conditions the outcome of the government-to-government competition for FDI in the export sector, is affected by differences in the level of economic development, and the import-substitution policies of the countries which compete for FDI.

The analysis is relevant to many small developing open economies whose trade policy objective is to attract FDI in the export sector but which, at the same time, have in place import substitution policies for other reasons, possibly income distribution objectives or industry development. The East Asian economies are the most commonly cited examples of countries having successfully employed such strategies, although there are others. Rodrik (1995c) argues for example that, contrary to the conventional wisdom on the superiority of rule-based trade policy regimes, some of the most successful export-oriented trade policies are in those countries that have used highly discretionary export subsidies.[2] What is somewhat different about the analysis of this paper, but in common with some of the more recent work in public finance, is the view that the multinational firm investing in the export sector considers alternative countries (locations) as potentially competing with one another for the same investment. Thus attempts to attract FDI by competing governments become `investment tournaments'. There is a significant public finance literature dealing with government-to-government competition for investment using subsidies,

---

[1] Other discussions on this issue particularly in the case of East Asia include Balassa (1991), Flatters and Harris (1995), Hill (1990), Kim(1985), Nam (1990), Rodrik (1995a) and World Bank (1993).

[2] Important theoretical contributions to the value of commitment in trade policy include Staiger and Tabellini (1987), Matsuyama (1990) and Calvo (1989). A rule-based approach for trade policy practitioners is Vinod and Nash (1991).

taxes, or regulations, often referred to as locational competition (see for instance Siebert (1995), Markusen, Morey and Olewiler (1995), Zodrow and Mieskowski (1986)). However, these ideas have had few applications to the problem of trade policy for countries relying heavily on FDI for access to export markets. Some recent exceptions in a partial equilibrium framework include the contributions of Haufler and Wooton (1999) and Haaparanta (1996).[3] Haufler and Wooton (1999) is concerned with tax competition to attract FDI through lump-sum profit tax or subsidy when imports in the same sector incur transport costs and governments can, or cannot, use tariffs or consumption taxes. They use the strategic trade policy approach to understand the role of integration (as in Europe) on tax competition aimed at attracting FDI. Haaparanta (1996) is concerned with the impact of technology on tax competition and for FDI between two countries. Thus, wages are assumed to be exogenous and hence FDI has no impact on other sectors of the economy. Results then depend on the nature of the technology, and in particular on the elasticity of substitution between labor and FDI. The focus of these papers is on FDI within industrialized countries. They ignore the general equilibrium repercussions of FDI because they are more interested in policies affecting directly the international allocation of FDI than about welfare effects, or how policies in *other* sectors of the economy might impact on the allocation of FDI. As is well known, an important practical aspect of trade policy in many developing countries and NIC's is the combined use of both export promotion and import substitution policies.[4] With the continuous thrust towards regionalism in trade and investment, there has been considerable discussion about the possibility of including clauses in these agreements limiting, or even prohibiting, the use of subsidies aimed at attracting FDI. Even for developing countries this has been raised as a serious possibility, most recently in the (now failed) Multilateral Agreement on Investment (MAI) put forward by the OECD.[5] Investigating these issues requires a general equilibrium analysis especially

---

[3] There is however a computational general equilibrium literature dealing with the evaluation of trade policy in the presence of MNE firms. See Markusen, Rutherford and Hunter (1995).

[4] There is a neoclassical literature on export-oriented trade policy with capital mobility. See Buffie (1987) and Raimondos (1993) for example. As is well known tariffs may lead to immiserization with capital mobility and export subsidies are one remedy for this problem.

[5] For a discussion of the MAI and the case for restricting competitive subsidization of investment see the documents at the web site www.oecd.org/daf/cmis/mai.

when, as in the present model, import substitution policies affect intermediate inputs used by the MNE.

We develop a two-country model where competing governments interact with export policies which can be activist/discretionary or non-activist/non-discretionary. In one regime, trade policy authorities are export policy activists setting export incentives in response to external and strategic circumstances with an objective to maximizing national social welfare. In the other regime, the government can credibly commit *not to engage* in an activist and discretionary export policy. Countries competing for FDI are differentiated both by the level of their import tariffs, their cost competitiveness, *and* by their export policy regime (activist versus non-activist). One of the main results is that a low-wage country that chooses to be an export activist loses FDI relative to the high-wage country when its import tariff level is low, but it gains FDI when its tariff is high. Thus, conditional on both countries being activists, import protection can actually be export promoting for the low-wage country. Paradoxically, in terms of welfare, the low-wage country may nonetheless be worse off by adopting an activist policy toward FDI, even when its export capacity increases as a result of that policy.

The present analysis relies on three important characteristics of the developing economies depending heavily on FDI in the export sector. First, because the import and the export sectors interact through the use of a common primary factor input, the analysis is set within a general equilibrium model of goods and factor markets within each of the two competing countries. Unlike other papers in this literature, factor prices are determined endogenously, and they provide information used by policy makers to determine export-investment incentives and by multinational firms to make locational decisions about their investment (Horstmann and Markusen (1992)). The second key aspect of the analysis is the endogenous determination of export-investment incentives. The approach taken is similar to that in the political economy literature on trade policy as the determination of export incentives by authorities is discretionary, subject to incomplete information and contingent upon observed prices. The criterion function for the export authorities however is motivated by the normative literature on trade reform (Falvey and Gemmel (1990a,b), Diewert, Turunen-Red and Woodland (1991)). In particular, it is assumed that export authorities base their decisions on considerations of national welfare to evaluate export-investment incentives even though they use an approximate cost-benefit test to do so, rather than a full information general

equilibrium impact analysis. We think of this as describing an export regime in which policies are set by bureaucrats guided by considerations of public interest.[6] In this respect, the model corresponds to some accounts to the implementation of export promotion policies in East Asia.[7] The third aspect of the analysis is that we set the model as a strategic competition in export-investment incentives between two countries. Thus, as a by-product of this analysis, the implications of using simple cost-benefit criterion are drawn out when both strategic interactions and general equilibrium induced feedback effects on factor prices are allowed for.

The paper is organized as follows. In the next Section, the basic model is laid out and the cost-benefit evaluation of FDI is explained in Section 3. Section 4 presents the results for the case of export activism on the part of both countries export authorities. In Section 5, activism is compared to situations in which one or both countries can commit to non-activism. Section 6 concludes.

2. The Model

The model is an extension of a single country model developed in Harris and Schmitt (1999). There are two small countries, Home and Foreign, subscripted $i=h, f$ and each country produces an export good that is sold through a foreign multinational in third-country markets. Think of a Japanese electronics firm choosing a location to produce a certain component for its global production system from a number of low- to middle-income countries. In order to export, Home and Foreign must attract investment by this multinational. Each country has two sectors of production: an import-competing sector which produces an intermediate input with output A_i and an export sector with output X_i which is also the output of the MNE.[8] There is a single primary factor of production, labor, supplied inelastically with fixed endowment N_i. Labor is used in both sectors

---

[6] Thus we depart from the conventional political economy model in which politicians implement policies motivated by self-interest in the interaction with various interest groups. See Rodrik (1995b) for a survey.

[7] Wade (1990) provides a summary of export promotion policy in East Asia. A particularly interesting discussion of activist versus non-activist export policy is Rodrik (1995c). He identifies Korea as an outstanding example of a country in which discretionary export promotion policy was successful.

[8] We assume throughout that there is a single MNE responsible for investing in both countries. The analysis could be easily extended to multiple export sectors, each associated with a different MNE. What would complicate matters would be to focus on competition between MNE's in final product markets in third countries. The latter question has been explored extensively in the strategic trade literature and does not seem relevant here.

and is fully employed so that $N_i = L_i^a + L_i^x$ where L_i^a represents the units of labor used in country i's import-competing sector and L_i^x the number of units used in the export sector. The labor market is competitive and the market-clearing wage is w_i. The import-competing sector uses labor to produce A_i according to the production function $A_i = F_i(L_i^a)$ which exhibits strictly diminishing returns in L_i^a.[9] The intermediate good produced in sector A_i competes with a perfect substitute sold in the world market at price p^* and subject to a unit tariff t_i. Assuming domestic producers of A_i never fully meet domestic demand so that the intermediate good is also imported, the domestic price of good A_i is $p_i = p^* + t_i$. The market-clearing wage is determined by the usual value marginal product condition:

$$w_i = (p^* + t_i) MP_i(N_i - L_i^x). \qquad (1.)$$

The technology of production in the export sector has fixed coefficients with one unit of labor and b units of intermediate product per unit of output. Export-investment incentives are treated as a subsidy s_i per unit of intermediate input used by the export sector so that, with export-investment incentives, the unit cost of production of X_i to the MNE in country i, c_i, is given by

$$\begin{aligned} c_i &= w_i + p_i b_i - s_i b_i, \\ &= w_i + p^* b_i + (t_i - s_i) b_i. \end{aligned} \qquad (2.)$$

The export 'sector' of each country consists of a single plant owned by an MNE which allocates a capacity x_i to country $i=h,f$. The output of the export sector X_i is assumed equal to capacity x_i and this good is not consumed domestically. Exports are best thought of as intermediate components produced by the MNE's plant as part of its global production system.

The MNE makes its capacity investment such as to minimize the total cost of achieving a target level of capacity subject to the constraint that $\bar{x} = x_h + x_f$, where total export capacity $\bar{x}$ is treated as exogenous. The MNE's joint cost function over export capacity is approximated by a function quadratic in investment levels in both countries. Thus,

$$TC = \frac{k_h}{2} x_h^2 + c_h x_h + \frac{k_f}{2} x_f^2 + c_f x_f, \qquad (3.)$$

---

[9] The conventional rationalization of diminishing returns to labor would be a specific factor to the A-sector.

where k_i *(i = h,f)* are parameters reflecting installation costs giving rise to no factor demands in either country and the c_i are unit costs of production in each country.[10] The capacity allocation rule derived from cost minimization is

$$\hat{x}_h = \frac{1}{k}\left[k_f \bar{x} + \left(c_f - c_h\right)\right];$$
$$\hat{x}_f = \frac{1}{k}\left[k_h \bar{x} + \left(c_h - c_f\right)\right], \qquad (4.)$$

where $k = k_h + k_f$. The allocation rule is linear in the unit cost differential between countries. We assume profits are not taxed so that the only means by which each country benefits from having these export plants is through the generation of wage income and intermediate input payments.

The labor market equilibrium condition (1) and the capacity allocation rule (4) determine the general equilibrium in the Home and Foreign country given their joint trade policies. Note that an increase in the export subsidy equal to a tariff increase can have effects since, by (2), this leads to an increase in c_i due to the general equilibrium effect through the labor market (as w_i depends on t_i). If this happens in one country, the country with higher cost will have a reduced level of investment in its export sector.

3. Welfare and the Cost-Benefit Evaluation of FDI

The true welfare function for each of the two counties can be expressed as the national income evaluated at an outside consumption price and denoted as[11]

$$W_i^* = w_i N_i + G_i + p_i F_i(L_i^a) - w_i L_i^a, \qquad i = h, f, \qquad (5.)$$

---

[10] The quadratic cost function reflects a combination of two assumptions: (1) output of each plant is constant returns to scale in the use of the variable inputs, labor and materials; (2) the marginal costs of installing a plant of given capacity are increasing in size. The latter assumption can be rationalized as a static approximation to a dynamic model of investment with convex costs of adjustment. Another justification is provided by a model of tax competition for FDI due to Janeba (1998). MNE's diversify their capacity allocation as an insurance against exploitation by the local governments choosing output taxes after the firm has invested in capacity. By holding sufficient capacity in two locations the firm discourages each country from raising taxes as this would shift output to the other country. The quadratic term in our cost function can then be interpreted as the expected cost coming from the 'hold up' by the local government.

[11] All prices are expressed in units of a common external numeraire good. A more complex version of the model would involve introducing an import-competing sector producing a consumption good which is also protected. This would complicate the analysis by introducing a consumption loss due to the tariff, which in turn would provide another second-best reason for an export subsidy.

where w_iN_i is the wage bill in country i; G_i is the government's net revenue, and $(p_iF_i(L_i^a) - w_iL_i^a)$ is the rent to the specific factor in sector A. It can also be written as[12]

$$W_i^* = w_i x_i + (t_i - s_i)b_i x_i + p^* F_i(N_i - x_i), \qquad (6.)$$

and thus as the sum of the wage bill in the export sector, the net revenue from tariff/subsidy policy on use of intermediate inputs in the export sector, and the value added evaluated at world prices in the intermediate good sector, respectively. With discretionary export policy, the export authorities choose s_i maximizing

$$W_i(x_i, s_i; w_i, w_i^*, t_i) = (w_i - w_i^*)x_i + (t_i - s_i)b_i x_i, \qquad i = h, f, \qquad (7.)$$

subject to the capacity allocation rule (4) and their conjectures about the policy response in the Foreign country. In (7), $w_i^* = p^*MP_i(N_i - x_i)$ is the shadow price of labor in country i. Thus, the authorities use the standard world price methodology in calculating the shadow price of labor. By assuming export authorities use (7) rather than the true welfare function (6), it is recognized they have imperfect information in determining export-investment incentives. W_i is a linear approximation of W_i^* in x_i where w_i,w_i^* and t_i are treated as parameters. The export authorities' rule is thus discretionary and contingent upon observed market prices. Still, at the margin, export authorities are assumed to understand the allocation rule (4) and thus know that they must change the cost structure faced by the MNE in order to change the level of FDI.[13]

The benefit function (7) is consistent with standard cost-benefit criterion used in project evaluation of export-incentive schemes. It reflects the fact that one of the export authorities' main concerns is the employment generated by the export industry as the social benefits derived from generating an additional job there outweigh its opportunity cost. Interestingly, Warr (1990) provides estimates of the ratio of the shadow price to market price of labor. Not only was this ratio very low for most South-East Asian countries, but it was lower than for other inputs. These gaps are due to a number of policies including the protection of import competing sectors.[14]

---

[12] This follows as $G_i=t_iM_i-s_ib_ix_i$, $M_i=b_ix_i-A_i$, and $x_i=N_i-L_i^a$.

[13] This ability to calculate the response of export capacity to changes in domestic cost conditions is justified on the ground that export authorities have detailed experience with the export sector's past behavior.

[14] In practice, the gaps between market and shadow prices can be substantial. The ratio of the shadow price to market price of labor was estimated by Warr (1990, Table 8.5, p. 154) at .75 for Indonesia, .91 for Korea, .83 for Malaysia, and .64 for the Philippines.

4. Competing for FDI: an Activist Trade Policy

The two countries are rivals in that both are seeking to attract FDI. They set their export subsidies given conjectures about the response of the other country. The export authorities with an activist policy understand the strategic interdependence. Furthermore they understand that the allocation of FDI to a given country depends not only on the level of their own protection on intermediate products used by the MNE and on export-investment incentives, but also on the tariff and export-investment incentives set by the other country. This rivalry between countries is an important feature of the determination of export incentives. Export incentives have an aspect of `beggar-thy-neighbor' policy that is recognized by governments. Note however that, in this model, aggregate FDI is constant and independent of trade policy. Thus we take an admittedly extreme case in which the competition for FDI is 'zero sum'--one country's gain equals the other's loss. We shall refer to the outcome of the Nash subsidy/tax game as the Competitive Export Promotion equilibrium or CEP.[15]

It is useful to re-write the capacity allocation rule (4) as function of all relevant prices and trade policy values:

$$\begin{aligned}\hat{x}_h &= \frac{1}{k}\left[k_f\bar{x} + \left(w_f - w_h\right) + p^*\left(b_f - b_h\right) + b_h\left(s_h - t_h\right) - b_f\left(s_f - t_f\right)\right];\\ \hat{x}_f &= \frac{1}{k}\left[k_h\bar{x} + \left(w_h - w_f\right) + p^*\left(b_h - b_f\right) + b_f\left(s_f - t_f\right) - b_h\left(s_h - t_h\right)\right],\end{aligned} \tag{8.}$$

The allocation rule for the MNE is linear in wage, productivity, and net subsidy differences. In each country, the sector producing the intermediate input is protected by tariffs. Since one unit of labor is required per unit of capacity, factor market equilibrium in each country is determined by

$$\begin{aligned}w_h &= \left(p^* + t_h\right)MP_h\left(N_h - \hat{x}_h\right);\\ w_f &= \left(p^* + t_f\right)MP_f\left(N_f - \hat{x}_f\right).\end{aligned} \tag{9.}$$

Each country's export authority uses its approximate welfare function (7) to determine export incentives. Hence, export authorities in *i* choose s_i to maximize W_i taking tariff policy, factor prices, as well as the other country's export incentives as given. In addition, they are assumed to know the capacity allocation rules (8). As a consequence, the export authorities' discretionary

---

[15] In the non-strategic case, a single country facing a perfectly inelastic supply of FDI would of course levy a tax on that investment. In the CEP, the outcome will reflect a balance between the desire to tax FDI and the desire to attract FDI relative to the competing country.

behavior is given by reaction functions describing own-subsidy as a function of the other country's subsidy and other parameters:[16]

$$s_h = \frac{1}{2b_h}\left[b_f s_f + \alpha_h\right] \quad and \quad s_f = \frac{1}{2b_f}\left[b_h s_h + \alpha_f\right]. \tag{10.}$$

The policy reaction functions are illustrated in Figure 1 for given levels of protection and wages. The Home country's reaction function can be expressed as a sum of four terms:

$$s_h = \left[\hat{x}_h\left(b_h \frac{\partial \hat{x}_h}{\partial c_h}\right)^{-1} + t_h + \frac{w_h - w_h^*}{b_h}\right] + \frac{b_f}{2b_h} s_f. \tag{11.}$$

The first term inside the square brackets in a standard 'rent-extraction' term reflecting the desire to tax the inelastic demand for export sector resources on the part of the MNE. The second term is a cost-neutralizing effect. If the supply of capacity were perfectly elastic, the optimal policy would be to set the subsidy equal to the tariff rate familiar from the traditional small open economy model of trade policy bias.[17] The third term represents the labor market effects of protection. Protection creates a wedge between the shadow price of labor and market price. Given positive tariffs, there is a welfare incentive at the margin to exploit this difference by re-allocating labor to the export sector from the import-competing sector. The strategic interaction between the two countries adds the last term in (11) reflecting the strategic complementarity between export subsidies in the two host countries. An increase in the subsidy by one country induces a best-response increase in the subsidy of the other country.

[Insert Figure 1 about here]

Solving (10) produces the CEP subsidies conditional on factor prices:

$$\begin{aligned} \hat{s}_h &= t_h + \frac{1}{3b_h}\left[3\left(w_h - w_h^*\right) + \left(w_h^* - w_f^*\right) + p^*\left(b_h - b_f\right) - \bar{x}\left(2k_f + k_h\right)\right]; \\ \hat{s}_f &= t_f + \frac{1}{3b_f}\left[3\left(w_f - w_f^*\right) + \left(w_f^* - w_h^*\right) + p^*\left(b_f - b_h\right) - \bar{x}\left(2k_h + k_f\right)\right]. \end{aligned} \tag{12.}$$

---

[16] In (10), α_h and α_f are given by the expressions

$$\begin{aligned} \alpha_h &= \left(2b_h t_h - b_f t_f + \left(w_h - w_f\right) + \left(w_h - w_h^*\right) + p^*\left(b_h - b_f\right) - k_h \bar{x}\right); \\ \alpha_f &= \left(2b_f t_f - b_h t_h + \left(w_f - w_f^*\right) + \left(w_f - w_h\right) + p^*\left(b_f - b_h\right) - k_f \bar{x}\right). \end{aligned}$$

[17] See Falvey and Gemmel (1990b) for a complete exposition.

The sign of $\hat{s}_h$ and $\hat{s}_f$ will depend upon the sign of α_h and α_f (see note 17). In Figure 1, we have assumed that α_h and α_f are positive. Interestingly, each country's equilibrium subsidy is independent of the direct effect of the other country's level of protection but is increasing in its own tariff rate and in its own difference between the market wage and the shadow price of labor. Since this latter gap is a function of own protection, the *net* subsidy $(\hat{s}_i - t_i)$ is positively related to the own tariff rate. Due to the endogeneity of the wages, however, the Home subsidy does depend *indirectly* on the Foreign tariff through the Foreign market-shadow wage gap. Thus, an increase in own tariff causes the individually optimal subsidy to increase by more than the increase in the tariff,

$$\frac{\partial \hat{s}_i}{\partial t_i} = 1 + \frac{MP_i(N_i - \hat{x}_i)}{b_i} \quad . \qquad (13.)$$

Graphically, both reaction functions in Figure 1 shift to the right by $(1 + MP_h / b_h)$ when t_h increases and so $\hat{s}_h$ increases by the same magnitude while $\hat{s}_f$ does not change (it is independent of t_h given Foreign authorities take wages in Home as given). This new equilibrium is illustrated by point B in Figure 1.

From a strategic point of view, the two export authorities are stuck in a Prisoners' Dilemma. To see this, first observe that the iso-W_i curves are inversely U-shaped along the respective reaction functions.[18] Second, the net benefit to Home export authorities is decreasing along the home's reaction function with increases in the level of foreign subsidy (i.e., $\partial W_h / \partial s_f < 0$ along *h*'s reaction function). Hence, this is a typical subsidy 'duel' in which each export authority responds aggressively to the other's increase in subsidy, and where both export authorities would jointly prefer lower subsidy rates rather than the Nash equilibrium subsidies $(\hat{s}_h, \hat{s}_f)$.

Given the subsidies coming out of the export promotion game, the resulting export capacities are found by substituting (12) into (8):

---

[18] This follows since the slope of the iso-W_h curve is $ds_h / ds_f = -(\partial W_h / \partial s_h)/(\partial W_h / \partial s_f)$ with $\partial W_h / \partial s_f = -(b_f / k)[w_h - w^*_h + (t_h - s_h)b_h] < 0$ for $\hat{x}_h > 0$, while $\partial W_h / \partial s_h$ is positive for $s_h < \hat{s}_h$ and negative for $s_h > \hat{s}_h$.

$$\hat{x}_h = \frac{1}{3k}\left[\left(k_h + 2k_f\right)\bar{x} + p^*\left(b_f - b_h\right) + \left(w_f^* - w_h^*\right)\right];$$
$$\hat{x}_f = \frac{1}{3k}\left[\left(k_f + 2k_h\right)\bar{x} + p^*\left(b_h - b_f\right) + \left(w_h^* - w_f^*\right)\right]. \qquad (14.)$$

The CEP equilibrium capacities are independent of the market wage and are only dependent on the difference in shadow wages in the two countries. Factor market equilibrium in both countries can be expressed in terms of the shadow prices as

$$w^*_h = p^* MP_h\left(N_h - \hat{x}_h\right);$$
$$w^*_f = p^* MP_f\left(N_f - \hat{x}_f\right). \qquad (15.)$$

Hence, the equilibrium in these two countries is fully determined by (14) and (15). Summarizing,

Proposition 1: *The CEP equilibrium allocation of FDI is independent of the level of import protection in either country.*

Proposition 1 implies that activist export promotion essentially eliminates the impact of protection on the ultimate CEP equilibrium.[19] Thus, even in the presence of strategic interaction export subsides which are approximately optimal in a cost-benefit sense, are independent of the level of import protection in *either country*. It is important to note that, despite Proposition 1, the incentive to engage in the game of export subsidization is quite strong and, more significantly, this incentive is increasing in the level of protection. This occurs because the non-activist equilibrium *is* a function of tariff rates in the two countries. The marginal value of an export subsidy to the Home country at the non-activist equilibrium (that is, evaluated at $s_h = 0$) is

$$\frac{\partial W_h}{\partial s_h} = \frac{b_h}{k}\left[t_h\left\{MP_h\left(N_h - \hat{x}_h\right) + b_h\right\} - \hat{x}_h\right]. \qquad (16.)$$

This expression is increasing in the Home tariff rate as $\hat{x}_h$ is decreasing in t_h. A higher tariff rate implies a larger efficiency incentive to remove the distortion between the export and import sectors for the traditional reasons. Thus, although the resource allocation becomes insensitive to tariff levels if a CEP equilibrium emerges, the incentives to engage in such policies are greater, the higher is the level of import protection.

5. The Gains to Export Activism

This Section has three main results. First, a country may gain or lose FDI in the export sector by engaging in a policy of discretionary export promotion depending on its own level of protection relative to the other country. Second, there is no necessary correspondence between changes in FDI and changes in welfare. Finally a low-wage country competing with a high-wage country for FDI has the most to lose in terms of reduced capacity to attract FDI if there is a shift in trade policy regimes toward export activism.

To establish these results, we further simplify the model of the previous section. In particular, we assume that fixed costs of capacity are symmetric across the two countries $k_h=k_f$. If both countries refrain from export activism (i.e., $s_h = s_f = 0$), the relationship between export capacity allocation, the home tariff and factor price differences is given by (8) which can be rewritten as

$$\hat{x}_h = \frac{\overline{x}}{2} + \frac{1}{k}\left[\Delta w + b_f t_f - b_h t_h + p^*\left(b_f - b_h\right)\right], \qquad (17.)$$

where $\Delta w = w_f - w_h$ is the Foreign-Home wage gap. The locus (17) tells us that the MNE's allocation of export capacity to the home market is higher, the lower the domestic market wage relative to the foreign one, the lower Home tariff, and the higher the home total factor productivity as compared to foreign factor productivity. Since (17) reflects the allocation decision without trade policy activism on the part of both countries, or a *No Activist Policy*, it will be referred to as the NAP schedule drawn in $(\Delta w, x_h)$ space.

If both countries use an activist policy, $\hat{x}_h$ is determined by (14) which can be written as

$$\hat{x}_h = \frac{\overline{x}}{2} + \frac{1}{3k}\left[\Delta w^* + p^*\left(b_f - b_h\right)\right], \qquad (18.)$$

where $\Delta w^* = w_f^* - w_h^*$ is the shadow wage gap. Observe that (18) is independent of t_h. It is the case because, as Proposition 1 shows, both countries neutralize the effects of protection. With export activism, the allocation of export capacity depends then only on the `fundamentals'; that is,

---

[19] In Harris and Schmitt (1999), we show that the CEP equilibrium is equivalent in welfare terms to one in which trade policies are chosen through a full information general equilibrium calculation while taking the trade policies of the other country as given. The broader implications of this equivalence and cases where it does not hold are explored further in that paper.

the difference in the shadow prices of labor and total factor productivity. To ease comparison with (17), (18) can be rewritten as a function of Δw. Since $\Delta w^* = \Delta w + t_h MP_h - t_f MP_f$, (18) becomes

$$\hat{x}_h = \frac{\bar{x}}{2} + \frac{1}{3k}\left[\Delta w + p^*\left(b_f - b_h\right) + t_h MP_h\left(N_f - \hat{x}_f\right) - t_f MP_f\left(N_f - \hat{x}_f\right)\right]. \qquad (19.)$$

Observe that, with an activist policy, the allocation of export FDI to *h* is relatively insensitive to the difference in market wages whereas under NAP, $\hat{x}_h$ is more sensitive to Δw.[20] This occurs since subsidies are endogenous with export activism and take into account wage differences. Since (19) describes the CEP allocation occurring with an activist trade policy, we call it the AP schedule.

The labor market-clearing conditions (15) can be written as

$$\Delta w = p^*\left[MP_f\left(N_f - \hat{x}_f\right) - MP_h\left(N_h - \hat{x}_h\right) + t_f MP_f\left(N_f - \hat{x}_f\right) - t_h MP_h\left(N_h - \hat{x}_h\right)\right]. \qquad (20.)$$

As this schedule reflects the Factor-Market Equilibrium, it will be denoted the FME schedule. The equilibrium capacity allocation in both countries can now be fully characterized. Assuming that $b_h = b_f$, the NAP, AP and FME schedules are illustrated in Figure 2 for $t_h = t_f = 0$. The figure is drawn such that, in equilibrium, the Home country is the low-wage country relative to the Foreign country $\left(\Delta w > 0\right)$.[21]

[Insert Figure 2 about here]

Observe that, in $(\Delta w, \hat{x}_h)$ space, both the AP and NAP schedules are upward sloping (with the AP schedule steeper than the NAP schedule), whereas the FME schedule is downward sloping. When $b_h = b_f$ and $t_h = t_f = 0$, the AP and NAP schedules intersect the horizontal axis at $\bar{x}/2$. The equilibrium Δw and $\hat{x}_h$ (and $\hat{x}_f$ given $\bar{x}$) are then found at the intersection of the FME schedule and the NAP schedule when both countries have no export-incentive policies (point A), or at the intersection between the FME schedule and the AP schedule when they both adopt an activist policy (point B).

Figure 2 reveals that, when $t_h = t_f = 0$ and countries have same MNE cost parameters (i.e., $b_h = b_f$ and $k_h = k_f$), a shift to activism reflected in a CEP equilibrium *decreases* the export capacity of the low-wage country (*h*) and increases the export capacity of the high-wage country. Without

---

[20] Specifically, $\partial \hat{x}_h / \partial \Delta w = 1/3k$ with activist trade policy, and $\partial \hat{x}_h / \partial \Delta w = 1/k$ under NAP.

[21] Thus $MP_h < MP_f$. This may be due to a more efficient technology for A in the Foreign country, or given identical technologies, other specific factors to the A sector may be in greater supply in the Foreign country.

activist policies, the low-wage country has a cost advantage over the high-wage country. The MNE therefore allocates a larger share of its total capacity to the low-wage country. With export activism, the Home country advantage of lower wages is reduced since both countries take into account the competitive cost of labor in setting their export-investment incentives. Everything else being equal, the high-wage country is thus more generous to the MNE than the low-wage country. Specifically, with $t_h=t_f=0$, $b_h=b_f=b$ and $k_h=k_f=k/2$, $\hat{s}_h = \frac{1}{3b}\left(w_h^* - w_f^*\right) - \frac{k}{2b}\bar{x}$ and $\hat{s}_f = \frac{1}{3b}\left(w_f^* - w_h^*\right) - \frac{k}{2b}\bar{x}$. Hence, the low-wage country uses its cost advantage and taxes FDI export investments, i.e. $\hat{s}_h < 0$. The high-wage country also taxes export investments although at a lower rate.[22] Not surprisingly then, the low-wage country loses FDI when both countries adopt an activist policy. As a result, offering export incentives necessarily increases the wage difference between the two countries as compared to the NAP outcome since the wage in the low-wage country decreases as it loses export capacity. Hence,

Proposition 2: *When both countries follow a policy of export activism, a low-wage country that has little (or no) import protection always loses FDI in the export sector to the high-wage country.*

Suppose now that the Home country tariff is positive. In the absence of activist policy, the Home country (and thus the low-wage country) is a relatively less cost efficient location than it was without import tariffs. Hence, for every level of $\Delta w, \hat{x}_h$ falls (see (17)) and thus the NAP schedule shifts to the left in $(\Delta w, \hat{x}_h)$ space (see Figure 3). A higher t_h also decreases the market-clearing gap between w_f and w_h when h is a low-wage country, and thus, equivalently, decreases $\hat{x}_h$ for every level of Δw. This corresponds to a shift down of the FME schedule in Figure 3. Hence, both the MNE's decision and the factor market reaction to higher t_h contribute to a decline in $\hat{x}_h$. In Figure 3, this change in export capacity without export activism is represented by the movement from A to C. With export activism, a higher t_h induces the home country to adopt unilaterally a higher subsidy while it induces the foreign country to lower its subsidy. In $(\Delta w, \hat{x}_h)$ space, a higher t_h shifts

[22] This occurs since, in the absence of tariffs in both countries, the CB rules reduce to a rent-shifting motive. Thus, in this case, both α_i are negative (see note 17).

therefore the AP schedule to the right (see (19)).[23] In this case, the combination of the factor market adjustment and the MNE's reaction has opposite effects. From Proposition 1, the net effect of these shifts must be such as to leave unchanged the allocation of export capacity. Hence, in Figure 3, D is vertically below B.

[Insert Figure 3 about here]

It is apparent that, with sufficiently high tariffs, export incentives can now help the low-wage country *h* (D vs. C) to gain export capacity. Simply, export activism, when home protection is sufficiently high, allows the low-wage country to neutralize the effects of protection and thus to exploit its fundamental cost advantage at the expense of the high-wage country. Export incentives also increase the wage of the low-cost country relative to the high-cost country (Δw falls). In other words, export activism penalizes the low-wage country when it has no protection but it helps it to gain export capacity when its level of protection is high. Hence,

Proposition 3: *When both countries follow a policy of export activism, the low-wage country gains FDI in the export sector at the expense of the high-wage country provided its level of import protection is sufficiently high.*

This result indicates that, interacting with a high-wage country with no import protection, a low-wage country can have a completely different experience in a game of export activism depending on its level of protection. It is then not very surprising that less developed countries do not like proposals aimed at constraining FDI promotion policies, especially when they have import substitution policies in place. In effect, unless they lower their import barriers, such a prohibition would likely make them lose FDI in the export sector.

It turns out to be difficult to get analytical results on true welfare comparing activist to non-activist policy regimes for arbitrary levels of tariff protection. However some insights can be drawn from some numerical simulations. They serve to illustrate the sensitivity of the benefits of export policy activism relative to a policy of non-activism with respect to the levels of protection existing

[23] Note that the AP schedule becomes flatter as t_h increases, the FME schedule becomes steeper and the NAP schedule keeps the same slope. Moreover, irrespective of t_h, the gap between shadow wage rates has the same value along the AP schedule for any given value of $\hat{x}_h$

in the two countries. To investigate the welfare effects of export activism, the two-country model is parameterized to produce the same configuration as in Figure 3. Table 1 shows the results for $t_f = 0$ and $b_f = 1$. We assume that $F(N_i - \hat{x}_i) = \ln(N_i - \hat{x}_i)$ with $N_h = 10$ and $N_f = 5$ so that *h* is a low-wage country because its labor supply is greater than in *f*. We show the effects of increasing the level of home protection on the wage differential (as given by (20)), the FDI in each country (as given by (8) without export activism, and by (14) with export activism), the level of welfare in each country (as given by (6)).[24]

[Insert Tables 1 and 2 about here]

Table 1 shows clearly that, with low tariffs, the low-wage country loses FDI with export activism, whereas it gains FDI when its level of protection is higher.[25] The welfare effect of a shift to export activism is positive for both countries.

Result 1: *In the case of low tariffs in both countries, engaging in export activism has a strong positive welfare effect on both countries.*

The welfare effect holds even for the country that loses FDI with export activism. This outcome is possible because of the strong rent-shifting motive inducing both countries to tax export capacity, transferring rents from the MNE, and hence indirectly from third country markets (recall that consumers in *h* and in *f* do not consume *X)*. Here is an example where discretion as opposed to rules is welfare enhancing for both countries.

To diminish the influence of the rent-shifting motive, we now increase the level of protection in both countries ($t_f = .7$ and $t_h \geq .7$). Table 2 shows that the welfare effects of export activism are no longer clear cut.

Result 2: *Export activism in the presence of high levels of protection may be welfare deteriorating for the low-wage country even if it is not the case for lower tariff rates.*

When $t_h = .7$, Home has a very low tax on export capacity under the AP regime. As in Table 1, however, a shift to activism results in a loss of FDI and welfare gains for *h*. For higher

[24] Note that several of the results derived analytically are obvious in the tables below. In particular, in a CEP equilibrium, the allocation of capacity and welfare are independent of tariff levels.

[25] With log production functions we restrict ourselves to those ranges of parameters such that output is positive and there are positive levels of imports in both countries.

levels of own protection ($t_h=1.1$), Home ends up subsidizing FDI under the AP regime. Home now increases its share of FDI but ends up nonetheless worse off. The main reason why welfare decreases in the low-wage country with export activism, despite higher export capacity, is due to a more than proportional increase in imported intermediates accompanying the increase in exports. Indeed, when $t_h=1.1$, imports to Home increase by 46% with export activism while exports increases only by 8%. Imports increase more than exports due to the rising supply curve of the domestic production of importables. Also contributing to the decrease in welfare are the increased subsidies to FDI with export activism. When $t_h=1.1$, a shift to activism decreases unit cost to the MNE by 6.8% as a consequence of the export-investment subsidy.

6. Conclusions

The focus of this paper has been on developing a model of government-to-government competition for foreign direct investment in the export sector when import protection of intermediate inputs is also present. Export-oriented trade regimes in many developing countries are often characterized by the existence of generous incentives for foreign direct investments in the export sector. These policies are often characterized as reducing the 'anti-export bias' inherent in the import substitution policies. Trade policy towards exports can be either a committed non-interventionist approach, or one of activist and discretionary intervention. In both types of trade policy regimes, countries compete in the global market for the allocation of FDI. If the export promotion process is discretionary and activist, it will induce strategic behavior on the part of governments seeking to attract FDI.

The main result of the paper is that the net benefits to a policy of export activism relative to committed non-intervention in the export sector depends upon both the level of economic development and the pattern of protection in the countries competing for FDI. If the low-wage country has low rates of tariff protection on intermediate inputs, then it will lose its relative cost advantage by switching to a policy of export activism. Alternatively, a low-wage country having a high level of protection on intermediate inputs can successfully attract FDI to its export sector by adopting a discretionary policy of selective and strategic policy of export subsidy. This model may help explain the popularity of export oriented FDI promotion. But a successful FDI policy as measured by inward investment in the export sector does have to coincide with an increase in

domestic welfare. We have shown that the removal of an `anti-export' bias in trade policy through export activism does not in itself indicate that such policies are welfare improving.

References

Balassa, B. (1991), *Economic Policies in the Pacific Area Developing Countries*, (New York: New York University Press).

Bhagwati, J. (1990), Export-Promoting Trade Strategy: Issues and Evidence, in C.R. Milner (ed.), *Export Promotion Strategies: Theory and Evidence*, (London: Harvester Wheatsheaf), 11-39.

Buffie, E. (1987), Labour Market Distortions, The Structure of Protection and Direct Foreign Investment, *Journal of Development Economics* 27, 149-63.

Calvo, G. (1989), Incredible Reforms, in G. Calvo et al. (eds*.), Debt, Stabilization and Development: Essays in Honor of Carlos Diaz-Alejandro*, (New York: Basil Blackwell).

Diewert, W.E.; A.H. Turunen-Red and A.D. Woodland (1991), Tariff Reform in a Small Open, Multi-Household Economy with Domestic Distortions and Nontraded Goods, *International Economic Review*, 32, 4, 937-58.

Falvey, R. and N. Gemmell (1990a), Trade Taxes and Welfare: The Case of Export Incentives in South-East Asian Countries, *The Australian Economic Review*, 61-73.

Falvey, R. and N. Gemmell (1990b), Compensatory Financial and Fiscal Incentives to Exports, in C.R. Milner (ed.), *Export Promotion Strategies: Theory and Evidence*, (London: Harvester Wheatsheaf), 109-29.

Flatters, F. and R.G. Harris (1995), Trade and Investment: Patterns and Policy Issues in the Asia-Pacific Rim, in W. Dobson and F. Flatters (eds), *Pacific Trade and Investment: Options for the 90's*, (Kingston: John Deutsch Institute for the Study of Economic Policy).

Haaparanta, P.(1996), Competition for Foreign Direct Investments, *Journal of Public Economics*, 63(1), 141-53.

Harris, R.G. and N. Schmitt (1999), Do Two Wrongs Make A Right? Export Incentives and Bias in Trade Policy, in J. Piggott and A. Woodland (eds), *International Trade and the Pacific Rim*, (London: Macmillan), Chapter 8, 191-212.

Haufler, A. and I. Wooton (1999), Tax Competition for Foreign Direct Investment, *Journal of Public Economics*, 71, 121-139.

Hill, H. (1990), Indonesia: Export Promotion after the Oil Boom, in C.R. Milner (ed.), *Export Promotion Strategies: Theory and Evidence*, (London: Harvester Wheatsheaf), 184-212.

Horstmann, I.J. and J.R. Markusen (1992), Endogenous Market Structure in International Trade, *Journal of International Economics*, 32, 109-29.

Janeba, E. (1998), Tax Competition when Governments Lack Commitment: Excess Capacity as a Countervailing Threat, mimeo., Indiana University, October.

Kim, K.S. (1985), Lessons from South Korea's Experience with Industrialization, in V. Corbo, A.O. Krueger and F. Ossa (eds), *Export-Oriented Development Strategies: The Success of Five Newly Industrializing Countries*, (Boulder: Westview Press).

Markusen, J.R.; E.R. Morey and N. Olewiler (1995), Competition in Regional Environmental Policies when Plant Locations are Endogenous, *Journal of Public Economics*, 56, 1, 55-78.

Markusen, J.R.; T.F. Rutherford and L. Hunter (1995), Trade Liberalization in a Multinational-Dominated Industry, *Journal of International Economics*, 38, ½, 95-117.

Matsuyama, K. (1990), Perfect Equilibrium in a Trade Liberalization Game, *American Economic Review*, 83: 367-371.

Nam, C.-H. (1990), Export Promotion Strategy and Economic Development in Korea, C.R. Milner (ed.), *Export Promotion Strategies: Theory and Evidence*, (London: Harvester Wheatsheaf), 165-83.

Raimondos, P. (1993), Export Subsidies and Foreign Capital Inflows, *The Journal of International Trade and Economic Development*, 125-32.

Rodrik, D. (1995a), Trade Strategy, Investment and Exports: Another Look at East Asia, *NBER WP 5339*, November.

Rodrik, D. (1995b), The Political Economy of Trade Policy, in G. Grossman and K. Rogoff (eds.), *Handbook of International Economics*, Vol. III, (Amsterdam: North-Holland.)

Rodrik, D. (1995c), Taking Trade Policy Seriously: Export Subsidization as a Case Study in Policy Effectiveness, in J. Levinshon, A. Deardorff, and R. Stern (eds.), *New Directions in Trade Theory*, (Ann Arbor: University of Michigan Press).

Siebert, H. (ed) (1995), *Locational Competition in the World Economy*, (Tubingen: Mohr Siebeck).

Staiger, R.W. and G. Tabellini (1987), Discretionary Trade Policy and Excessive Protection, *American Economic Review*, 77: 823-837

Vinod, T. and J. Nash (1991), *Best Practices in Trade Policy Reform*. (New York: Oxford University Press).

Wade, R. (1990), *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*, (Princeton: Princeton University Press).

Warr, P. (1990), Export Processing Zones, in C.R. Milner (ed.*), Export Promotion Strategies: Theory and Evidence for Developing Countries*, (London: Harvester Wheatsheaf), 130-62.

World Bank (1993), *The East Asian Miracle: Economic Growth and Public Policy*, (New York: Oxford University Press).

Zodrow, G. and P. Mieszkowski (1986), Pigou, Tiebout, Property Taxation, and the Underprovision of Local Public Goods, *Journal of Urban Economics*, 19, 356-70.

Table 1: Welfare with and without Export Activism ($t_f = 0$)

		No Activist Policy				Activist Export Policy					
t_h	b_h	Δw	$\hat{x}_h$	W_h^*	W_f^*	Δw	$\hat{x}_h$	$\hat{s}_h$	$\hat{s}_f$	W_h^*	W_f^*
0	1	.19	3.0	2.4	1.8	.23	2.7	-1.1	-.92	5.3	4.0
.2	1	.23	2.6	2.9	1.9	.21	2.7	-.9	-.92	5.3	4.0
.4	1	.28	2.2	3.3	2.1	.18	2.7	-.6	-.92	5.3	4.0

Parameters: $b_f = 1; k_h = k_f = .2; p^* = 1, \bar{x} = N_f = 5, N_h = 10.$

Table 2: Welfare with and without Export Activism ($t_f = .7$)

		No Activist Policy				Activist Export Policy					
t_h	b_h	Δw	$\hat{x}_h$	W_h^*	W_f^*	Δw	$\hat{x}_h$	$\hat{s}_h$	$\hat{s}_f$	W_h^*	W_f^*
.7	1	.28	3.2	5.0	3.4	.40	2.7	-.28	.04	5.3	4.0
.9	1	.33	2.8	5.3	3.9	.37	2.7	-.05	.04	5.3	4.0
1.1	1	.40	2.5	5.5	4.4	.34	2.7	.17	.04	5.3	4.0

Parameters: $b_f = 1; k_h = k_f .2; p^* = 1, \bar{x} = N_f = 5, N_h = 10.$