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The 'New Regionalism': Integration as a Commitment Device for Developing Countries

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Abstract

Increasingly, developing countries embrace foreign direct investment (FDI) and simultaneously pursue economic integration with developed countries. Foreign investment is subject to sovereign risk and free trade agreements may serve as a commitment mechanism in order to achieve higher sustainable levels of FDI. This paper shows that such agreements, by inducing sunk investments in expanding export sectors, can indeed increase the level of self-enforcing FDI. While one might expect FDI from any source to increase, the analysis shows that this need not be true for FDI originating in non-partner countries even though export-platform type FDI will rise. The reason is the offsetting effect from trade diversion, which diminishes the ability to retaliate should a host country renege on its ex ante commitment to a foreign investor. The choice of partner is thus crucial for a country's ability to attract FDI through economic integration.

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- **Keywords:** Foreign Direct Investment, Economic Integration, Commitment

I. Introduction

One of the salient developments in the world economy over the last few years has been the surge in free trade agreements (FTAs). About 130 regional trade agreements have been notified since the formation of the World Trade Organization (WTO) in 1995 alone. This compares to a total of some 250 notified

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agreements since the end of World War II. Over 170 are currently in force. These include such well-known arrangements as the North American Free Trade Agreement (NAFTA), the Association of South East Asian Nations (ASEAN) or Mercosur in the Americas. It also includes a large number of small agreements that typically involve a free trade or cooperation arrangement of one country with an established trading bloc. The European Union (EU) has been most active in this way, although there are numerous bi- and trilateral agreements all over the world.[1]

The characteristics of these agreements differ so fundamentally from the types of agreements seen in the 1950s and 1960s that this wave of regionalism has been dubbed the "new regionalism" (Ethier 1998a). The "old" regionalism usually combined similar countries. The most successful ones were among developed, the less successful among developing countries. Many of the recent arrangements, in contrast, consist of a small, often developing country teaming up with a large, usually developed country or established trading bloc.

From a traditional trade economist's point of view, the proliferation of such FTAs is surprising. Since liberalization is in large part undertaken by the small country as the developed country's trade barriers were small to begin with, the traditional gains from trade should be small. Thus, it has been suggested that instead, developing countries' main motivation for pursuing these agreements is a desire to attract foreign direct investment (FDI).[2]

Developing countries, especially those with a history of arbitrary or even hostile treatment of FDI, face a standard time inconsistency problem. Ex ante, foreign investors are assured that they would receive national treatment. Ex post, there is an incentive to renege and fully tax (expropriate) investment instead. This is especially true for FDI which, unlike portfolio investment, is characterized by often substantial sunk investments, and therefore tends to be lumpy.

Unilateral reforms and the multilateral trading system can help alleviate this commitment problem, but preferential agreements can do more. It is relatively easy to retract unilateral reforms. Despite attempts at improving enforcement, the multilateral system effectively lags a credible enforcement mechanism (see Bagwell and Staiger, 1990, 1997b). Regional integration, on the other hand, can

[1]See the WTO web site at http://www.wto.org/english/tratop_e/region_e/region_e.htm for links to a list of notified regional trade agreements.

[2]See Ethier (1998a). Tornell and Esquivel (1997) make this argument with respect to NAFTA, pointing out that entering negotiations it was Mexico's clearly stated objective to increase its attractiveness to foreign investors. Fernandez and Portes (1998) discuss nontraditional gains from FTAs more generally.

function as a commitment device.

The intuition is straightforward. Consider a small and a large country, such as Mexico and the United States or Japan and Singapore. After the conclusion of a trade agreement between them, private agents in the small country make investments that are either irreversible or costly to reverse in the sectors that benefit from increased trade due to the standard trade creation effect. These sunk investments are the source of the commitment value of the trade agreement for the small country. They increase the punishment value to the large country should the partner renege on her commitment to provide national treatment for foreign investors. This setup is similar in spirit to McLaren (1997). The crucial difference is that he assumes that sunk investments are made in anticipation of a trade agreement, which diminishes the small country's bargaining power. Here, in contrast, sunk investments are assumed to be made once the FTA has been concluded.

While attitudes towards FDI in many developing countries have been mixed at best in the past, they started changing about the same time countries began to open up their economies and pursue FTAs. There is ample theoretical support for the beneficial effects of FDI in developing countries in particular, dating at least as far back as Rosenstein-Rodan (1943) and more formally Murphy et al. (1989). Both emphasize the importance of foreign capital to achieve a certain degree of industrialization in an initially capital-poor country and the potential for technological spillovers. In the context of NAFTA, computable general equilibrium models have found that increased FDI increases NAFTA's welfare gains for Mexico from under 2%, when only tariffs and non-tariff barriers are removed, to between 4.5 and 6.8%. Young and Romero (1994), who consider an improvement in investor confidence that decreases the risk premium on investment in Mexico by 2.5 percentage points, find welfare benefits up to 11% in their dynamic model. Empirically, Aitken and Harrison (1999) find some evidence of positive spillovers of FDI in Venezuela, while Borensztein et al. (1998) find positive effects on growth in a cross-section of developing countries.

FDI in developing countries has been rising considerably since the advent of the new regionalism. By the end of the 1990s, developing countries' share of the world inward stock of FDI had increased to over 30%, from just over 20% a decade earlier (UNCTAD 2000). Of the top 20 recipients 1999-2001 as measured by the share of world inward FDI relative to GDP share, twelve countries were either developing or transition countries (UNCTAD 2003). Most outward FDI, in

contrast, keeps originating in developed countries.

The principal aim of the paper is to formally investigate the effect of the commitment value of an FTA between a small developing and a developed country on inward foreign direct investment in the developing country. In doing so, the focus is on the potentially differential effect on FDI originating in the partner country versus FDI from third countries. Intuitively, one might expect FDI from any source to increase. The trade creation effect should lead to an increase from the partner, as pointed out above. Moreover, the developing country, presumably a low-wage location, should become more attractive for export-platform type investment. On the other hand, trade with non-partner countries may fall due to the trade diversion effect, thus diminishing the commitment value with respect to that set of countries. Consequently, the possibility of less equilibrium FDI from these exists and the paper examines the conditions under which such an outcome will obtain. The analysis thus shows that the choice of partner is crucial in determining how much foreign investment a country is able to attract due to integration. Teaming up with a major trading partner is potentially more beneficial than turning to one's geographic neighbors. This can help explain, e.g., why Chile, after its efforts to join NAFTA failed, turned to the European Union rather than its Latin American neighbors in pursuit of a trade agreement.

The work of Fernandez-Arias and Spiegel (1998) is closest in spirit to ours. Their analysis, however, focuses on the possible investment diverting effect for other developing countries. Moreover, an important shortcoming of their paper is that they do not consider the lumpy nature of FDI, but model foreign capital flows as smooth. In contrast, this particular characteristic of FDI is explicitly considered here and central to the findings. In analyzing the effect of economic integration among industrialized countries on FDI, Motta and Norman (1996) have shown that FDI by outside countries may not increase since integration may increase the competitiveness of intra-regional firms sufficiently to deter outside firms from entering the market in the form of FDI, while they may still export if outside trade barriers are not too high. Raff (2002) considers the differential effects of free trade agreements and customs unions on location choice of multinationals and finds that tax competition for FDI may result in lower social welfare in a free trade area, creating a role for a customs union.

Of course, factors such as proximity to major markets, infrastructure, skill level of the labor force, taxes, and exchange rate movements also help determine the magnitude of inward FDI as they differ across countries. This paper does not

attempt to specify a full model of the determinants of FDI in developing countries nor a model of the multinational firm. Instead, it analyzes one specific channel through which a country may improve its attractiveness to foreign investors, all else equal.[3]

The paper proceeds as follows. Section 2 discusses the issues of integration, commitment and punishment in more detail, which serves to justify the model setup. Section 3 presents the model, with results following in section 4. Section 5 discusses some empirical and policy implications. Section 6 concludes.

II. Integration, Commitment, and Punishment

This section briefly discusses some issues that are pertinent to foreign direct investment in a developing country, which serves to justify the main features of the model. These are the typical economic opening path of developing countries, culminating in the "new regionalism", the commitment problem regarding FDI and the appropriate punishment following violation of the pledge of national treatment of foreign investors.

The analysis focuses on how regional integration in addition to participation in the multilateral regime affects inward FDI. This is motivated by the observation that typically a developing country does not move directly from autarky to a new regionalism-type FTA, but begins with unilateral reforms. This is then followed by relying less on exceptions historically granted by the GATT/WTO for developing countries. Some countries did not even join the GATT until after they had begun to open up their economy. The surge in regional agreements has followed these earlier developments. A case in point is Mexico, which joined the GATT in 1986, while also implementing unilateral trade and investment reforms, with NAFTA going into effect only in 1994. Eastern European transition countries have pursued all strategies simultaneously. Thus, an analysis which were to take autarky as the starting point would likely overstate the effect of regional integration.[4]

[3]For a fuller discussion of determinants of FDI in developing countries see Singh and Jun (1996) and Fernandez-Arias (1996). A unified model of the determinants of multinational activity can be found in Markusen (2002).

[4]This is a slight departure from Ethier (1998a) who argues that another purpose of joining regional agreements for developing countries has been to achieve integration into the world economy, which is related to the debate on whether regional integration will be a step towards or a stumbling block on the road to further multilateral liberalization (see, e.g., Bagwell and Staiger, 1997a and 1997b, Ethier, 1998b, Krueger, 1997, or the collective articles volume by de Melo and Panagariya, 1993).

In trying to attract foreign investment, developing countries face a standard time inconsistency problem. Ex ante, they commit to national treatment of foreign investors, implying a tax rate no greater than that faced by domestic investors. Ex post, it may be preferable to tax foreign investors at a higher rate. The equilibrium level of FDI is then constrained by the availability of credible punishments and commitment technologies. Punishment can take on various forms. Direct punishment implies that should foreign investors be expropriated, no FDI will materialize in future periods.[5] Since the units of observation are sovereign nations, credible equilibria must be self-enforcing.[6] A self-enforcing policy is defined as a policy that can be sustained under the most severe punishment that can credibly be threatened against the party committing the offense. This is restricting the analysis to trigger strategy equilibria. In the context of expropriations it has been shown that such equilibria, which imply that expropriated investors will never invest in the country again, are subgame-perfect (Cole and English 1991).

There is also the possibility of indirect punishment, which includes the use of trade sanctions following expropriation. The advantage over direct punishment is that it can be employed immediately. It can take several forms. Exports from the expropriating to the expropriated country may face higher trade barriers, exports going the other way may be blocked or reduced, and financial sanctions may be imposed.[7] This issue-linkage has been observed in practice. Hufbauer et al. (1990) provide a number of case studies of sanctions episodes in which expropriation by one country has been answered with trade restrictions by the country whose investors were affected. Most cases involve the U.S. as the sanctioning party. The sanctioned countries include Mexico, Brazil, Chile, Peru, Sri Lanka and Ethiopia, among others. These are of course only the most drastic cases in which expropriation has in fact occurred, but cannot include cases in which the threat of retaliation was sufficient to deter it. As Eaton and Gersovitz (1984) and Raff (1992) have pointed out, expropriation is never actually an equilibrium outcome since a rational multinational firm would not invest in a country that pursues a

[5]This type of punishment is used in the model of Cole and English (1991). It is similar in spirit to considerations in the sovereign debt literature. There, if a country fails to repay its debt, it will be cut off from future lending. For an overview see Eaton and Fernandez (1995).

[6]Throughout the paper it is assumed that the interests of foreign investors and their countries are identical and they act as one.

[7]Due to the negligible amount of outward developing country FDI, retaliation by expropriation is not considered a viable option.

policy of expropriation and currently has a positive net benefit of doing so. This might explain the low levels of FDI that we see in many countries where investment is not secure, at least not to the same degree as in otherwise similar countries.

III. The Model

A. Setup

The model laid out in this section captures the key features of FDI in a developing country. For any firm to set up operations, investments must be made prior to production. They are subsequently sunk. If they are made by a foreign firm, they are subject to sovereign risk. When the host country enters a trade agreement with another country, exports to that country face lower trade barriers. Both foreign-owned and domestically owned plants increase capacity as a result of the higher demand. This increases the benefit of taking over a foreign-owned plant, but also the loss from the cessation of future FDI. The same is true for non-member country firms if they use the host country as an export platform. The expansion of capacity (the sunk investment) by domestically owned firms, in contrast, only increases the loss from facing trade sanctions as a result of reneging.

Intuitively, export platform exports should always increase the punishment value and hence FDI. However, the formalization of the model reveals that this is not necessarily so. The intuitive result does not hold if non-member countries use the host country as an export platform to the member, because the trade punishment value does not increase as exports to the home country of a firm from a non-member country do not increase as a result of the regional agreement.

Consider the following framework. The world consists of a set of N developed countries and one small developing country h, the home country.[8] Let N be large and call one of the N countries P (which will be home's partner country). The N countries are identical in every respect, i.e. they are of the same size, have identical preferences and technology. The home country has two sectors, a perfectly competitive numeraire sector that produces for the local market and a differentiated

[8]There are no other developing countries so that the issue of competition among countries for FDI can be neglected for this analysis. Lee (1997) illustrates the competition issue in discussing how Korea may be affected by NAFTA. Fernandez-Arias and Spiegel (1998) analyze the welfare effects on Southern non-members, but their model has no Northern non-members.

products export sector, in which foreign investment takes place.[9] In home's export sector, each variety is also differentiated by export market due to the presence of (identical) trade costs. These arise because the product has to be tailored for the specific market it is being shipped to, e.g. manuals have to be printed in the local language, technical specification requirements must be considered, etc. Preferences everywhere are of the CES-type and completely symmetric in all export products, so that the same international price p_x^* obtains for every variety. Price is equal to unit cost in the numeraire sector.

In the export sector, there is a setup cost S for a new factory. As is well known, with symmetric differentiated products this implies that a new entrant into the export market will choose to supply a new variety since this will yield strictly greater profits than entering a market that already has a competitor (Helpman and Krugman, 1985). This also ensures positive profits during the operation of the plant.

Workers are heterogeneous in their ability to work in the export sector. Ex ante, abilities are unobserved so firms are screening workers and retain only those that turn out to be of high ability. Since this is costly, the wage in the export sector for retained workers exceeds the wage in the non-tradable sector. If a firm retains a worker, it signals that the worker is of high ability. For another firm not to bid away that worker (and save the screening cost) firms must pay workers of known high ability higher wages. If a worker is let go and returns to the labor pool, her ability will again become unknown since firms cannot distinguish between previously screened workers and new ones.[10] All workers have identical abilities in the numeraire sector.

Labor is the sole input in production. For convenience, it is scaled such that one unit of labor produces one unit of output Q in the export sector and is getting paid w_x. Workers in the non-tradable sector receive a wage $w_n < w_x$. The gain from foreign investment thus arises from wages in the export sector exceeding those in the numeraire sector.[11]

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[9]Empirically, most FDI takes place in order to produce for the local market in developed countries, while the motive to undertake FDI in developing countries is predominantly to take advantage of lower production cost and then use them as an export platform. This is true for example for Mexico (Ortiz, 1994, p.167).

[10]See Drazen (1982) for a model of worker heterogeneity in developing countries that shows how observed wage differentials constitute an equilibrium.

[11]Aitken *et al.* (1996) provide some evidence that foreign-owned firms (though not exporters in general) pay higher wages than domestically owned ones and that this gap is persistent in Mexico and Venezuela, the two developing countries in their study.

Foreign investors are subject to sovereign risk and may be expropriated. The cost of expropriating a foreign-owned factory consists of several parts. First, countries whose nationals have been expropriated impose an embargo on output from expropriated facilities (if this output had been exported back to that country) and impose the Nash tariff τ_N on all other exports from that country.[12] A country's Nash tariff τ_N is the tariff which is optimal given the country's bargaining position.[13] Since all countries are assumed to be large relative to *h*, this tariff will be positive and higher than the pre-expropriation tariff.

Secondly, if home expropriates a foreign-owned factory, there is a takeover cost, which captures costs such as installing new managers, getting acquainted with the operation of the plant and losses through the transition period. If output from expropriated plants is exported back to the expropriated firm's home country, a new market for the variety now produced by home must be found, which is captured in a separate cost termbecause this cost does not arise if output was exported to a third country. Both of these costs are a function of the total capacity of the expropriated plants, which is the number of plants (varieties) times each plant's capacity. Thirdly, if a multinational has been expropriated, there will be no further investment in the future.

The following assumptions capture the fact that *h* is a small developing country. First, it has no outward FDI. Thus, expropriated countries cannot expropriate in retaliation. Secondly, wages are sufficiently low even in the export sector that, absent the threat of expropriation, profit maximization implies that a multinational from either *N* or *P* would produce a new variety in *h*. Thirdly, since there is a setup cost for a new plant in the export sector and a new one is needed to serve a new market, the number of varieties produced by domestic *h*-firms is small relative to the number of known varieties. This is because *h* is poor and faces imperfect credit markets. In this setup the gain for *h* from FDI comes from employing more workers in the export sector which pays a higher wage than the other sector in the economy. The government is assumed to maximize national income.

[12]The expropriated country could impose the Nash tariff on all exports by *h*, including those from expropriated plants. Assuming that the latter will not be imported, but there will not be a total trade embargo seems most in line with historical experience. A Nash tariff on all products would not greatly change the results.

[13]The Nash tariff can be prohibitive, but most likely will not be (Dixit 1987). In order to make a distinction between imposing the Nash tariff and imposing an outright embargo, it is assumed to be non-prohibitive here.

As a starting point, h is taken to be open and part of the multilateral trading system. Since all N countries are identical, so are their import tariffs, negotiated multilaterally and set at τ_m. It is assumed that $0 < \tau_m < \tau_N$. With p_x^* determined on the world market and taken as given by all firms, identical preferences in each country and symmetry in the export goods, demand for each differentiated good is just a function of the respective import tariff. All goods are assumed to be normal and thus demand is inversely related to the tariff. Each plant serves exactly one market with one good, so the scale of all plants is identical in the multilateral regime. In this regime, there are two types of investment. Either a firm from one of the N countries invests in a variety that is exported back to the firm's home country market or the output is exported to a third country market.

In the free trade regime, there are five types of investment. There is investment from the partner country, P, which can be either exported back to P, or exported to a non-member market. Investment from a firm of a non-member country can be for that firm's home country, another non-member country, or P.

The sequence of events is as follows. Each period, a foreign investor decides how many varieties to produce in h. For each variety, the setup cost S must be spent. Then, the host country decides whether to expropriate or not. Then, sales take place and profits are realized. Since all varieties have identical prices, all plants (within a given type) are of the same scale and punishment is total, it is rational to expropriate fully if expropriation is to occur. Capital is assumed to depreciate after one period, so that the setup cost (which includes training export sector workers) must be spent each period. There are an infinite number of periods.

The lumpiness of FDI is brought out starkly in this model, in that only entire production facilities can be erected. Thus the number of varieties of any type, s, can only take on integer values and the net benefit of expropriation is not a continuous function of s. Furthermore, the benefit function is not defined for s=0 since when there is no foreign-owned plant in h of a particular type, there is nothing to expropriate.

The necessary condition for investment in the monopolistically competitive export sector to be profitable is given by $S \leq (p_x^* - w_x)L_x$ where we have made use of the fact that one worker produces one unit of output. If there is free entry into the export sector, this equation will hold with equality. The profitability condition is assumed to be satisfied for at least some products, but at most for a finite number. This might be for several reasons. For example, the more workers are employed in the export sector already, the more difficult it is to find talented

workers to retrain for the more challenging work in that sector and thus retraining costs may be increasing in the number of export sector workers. Thus, let the support of s be $[1, \bar{s}]$, where $\bar{s}$ is the maximum number of profitable investment projects and is taken to be exogenous.[14]

The optimal number of investment projects is determined endogenously by the benefit of expropriation for each level of s. The home country compares total welfare when expropriating the plant with welfare if the multinational can operate undisturbed. Finally, note that since agents are rational and have perfect foresight, no expropriation will occur in equilibrium.

B. The multilateral regime

In the multilateral regime, there are two cases to consider. Either, a firm from country i exports back to its home market or exports to a third-country market j. If output is exported back to the multinational's own country, the benefit of expropriation in the current period (t=1) is given by

$$\begin{aligned} B_{ii} = {} & s_i[p_x^* Q_x(\tau_m) - w_x L_x(\tau_m)] - D[s_i Q_x(\tau_m)] - E[s_i Q_x(\tau_m)] \\ & - l_l^h[p_x^*(Q_x(\tau_m) - Q_x(\tau_N)] - w_x(L_x(\tau_m) - L_x(\tau_N))] \\ & - l_l^h(w_x - w_n)(L_x(\tau_m) - L_x(\tau_N)) - \sum_{t=2}^{\infty} \beta^{t-1}(w_x - w_n) s_i L_x(\tau_m) \end{aligned} \tag{1}$$

where s_i is the number of plants (varieties) operated by firms of country i, Q_x is the output of a single plant in the export sector as a function of the import tariff, L_x are the units of labor employed in an export sector plant and l_i^h is the number of varieties home exports to i. The first term gives the gain of expropriating all i-owned plants, given by instantaneous profits. The cost of expropriation is given by five distinct cost terms. $D[\cdot]$ is the cost of finding new markets for the expropriated variety. Naturally, it is an increasing function of its arguments. The second term gives the cost $E[\cdot]$ of taking over an expropriated plant which is also an increasing function of total capacity of plants taken over. Note that both D and E are decreasing functions of τ_m. The third term quantifies the cost of lost profits

[14] If one of the determinants of the maximum number of profitable investment projects (varieties) $\bar{s}$ is how many workers are already employed in the export sector, then $\bar{s}$ should be endogenous. When switching from the multilateral to the regional regime, the output of all varieties exported to the partner country in the agreement is increasing, requiring more workers, hence reducing $\bar{s}$ if the preceding argument applies.

from imposition of the Nash tariff on all varieties home exports to *i*. The fourth term gives the cost in terms of reduced wages of workers displaced due to the punishment. They must find employment in the numeraire sector where wages are lower. The fifth term is the loss from the absence of any future FDI of this type should expropriation occur. It is given by the discounted loss in national income as the workers that would have been employed in the foreign export sector work in the numeraire sector instead.

More explicit results can be obtained if the costs of finding a new market and taking over a production facility are linear in the number of plants expropriated (*s*): $D[s_i Q_x(\tau_m)] = s_i D[Q_x(\tau_m)]$ and $E[s_i Q_x(\tau_m)] = s_i E[Q_x(\tau_m)]$. This assumption is not very restrictive. If one believes that it becomes more difficult to find new markets as the volume of production for which new markets must be found is increasing, this possibility is not ruled out. While linearity in the number of plants is assumed, the cost can still be convex in the capacity of any one plant, i.e. as a function of Q_x. Since products are differentiated, the cost of finding a new market should be the same for each product category. The same is true for the cost of taking over an export plant. Any product plant should have about the same cost of being taken over for a given capacity. Again, neither convexity nor concavity of cost as a function of the plant capacity is ruled out.

The notation can be simplified since labor is the only input in production and labor units are defined such that $Q_x(\tau) = L_x(\tau) \forall \tau$, so we will write L instead of Q_x henceforth (dropping the *x*-subscript since it always refers to labor employed in the export sector). Combining cost terms three and four and simplifying the last one, (1) becomes

$$\begin{aligned} B_{ii} = {} & s_i(p_x^* - w_x)L(\tau_m) - s_i D[L(\tau_m)] - s_i E[L(\tau_m)] \\ & - l_l^h[(p_x^* - w_n)(L_x(\tau_m) - L_x(\tau_N))] - \frac{\beta}{1-\beta}(w_x - w_n)s_i L(\tau_m) \end{aligned} \tag{2}$$

If instead all output from *i*-operated plants is exported to a third country *j*, the net benefit of expropriation becomes

$$\begin{aligned} B_{ij} = {} & s_i(p_x^* - w_x)L(\tau_m) - s_i E[L(\tau_m)] \\ & - l_l^h[(p_x^* - w_n)(L(\tau_m) - L(\tau_N))] - \frac{\beta}{1-\beta}(w_x - w_n)s_j L(\tau_m) \end{aligned} \tag{3}$$

since we assume that j will not retaliate if i-owned plants are expropriated, so there is no cost of finding new markets for this output.[15]

C. The regional trade agreement regime

Now suppose that home enters a free trade agreement with one of the N countries, P. Without loss of generality, it is assumed that tariffs will be uniformly zero in the FTA, whereas tariffs vis-à-vis non-member countries remain unchanged in accordance with WTO requirements. Thus demand from P for each variety is now $Q(0) > Q(\tau_m)$. The demand for each variety and hence output of each variety of the type exported to P has increased. All varieties home is exporting to P have this higher output, so more of home's export sector is now oriented towards P. These sunk investments as a result of the FTA increase the value of the indirect punishment since reversion to the Nash tariff facing home's exports to P results in a higher loss. In addition, the gain from future FDI of this type has increased, which in turn increases the direct punishment value of the loss of future FDI. However, instantaneous profits are also higher, which increases the benefit of expropriation.

Now we must distinguish between production considered by a multinational from P versus production considered by an i-firm. The benefit of expropriating i-owned plants whose output goes back to i's own market or a third country market j that is not part of the FTA is unchanged since multilateral tariffs are unchanged. Hence, the benefit of expropriating that type of investment continues to be given by equations (2) and (3), respectively. If, however, an i-firm uses h as an export platform to P, the net benefit of expropriation for home is now given by

$$\begin{aligned} B_{iP} = {} & s_i(p_x^* - w_x)L(0) - s_i E[L(0)] \\ & - l_l^h[(p_x^* - w_n)(L(\tau_m) - L(\tau_N))] - \frac{\beta}{1-\beta}(w_x - w_n)s_i L(0) \end{aligned} \tag{4}$$

The capacity of expropriated plants is higher since exports face no tariffs in P, and so is the cost E of taking over such a plant. The loss from other h exports facing the higher Nash tariff, however, remains unchanged.

Since P is now in a FTA with home, the expressions for the net benefit of expropriation of P-owned plants are as follows. If P uses h as an export platform for another market j, the net benefit is given by

[15] This is actually not a very restrictive assumption. It can be shown that all results are qualitatively unchanged if j is allowed to retaliate.

$$B_{Pj} = s_P(p_x^* - w_x)L(\tau_m) - s_pE[L(\tau_m)] - l_P^h[(p_x^* - w_n)(L(0) - L(\tau_N))] - \frac{\beta}{1-\beta}(w_x - w_n)s_PL(\tau_m) \quad (5)$$

where l_P^h is the number of plants operated by h that export to P and s_P is the number of plants operated by P. The capacity of the expropriated plant depends on the multilateral tariff since exports go to country j which is not a member of the FTA between P and h. Home-owned plants that export to P now face a greater loss due to their larger capacity before expropriation. The loss in future FDI depends on the multilateral tariff since the type of investment that is considered produces for a non-FTA market j.

If, on the other hand, P's varieties produced in h are exported back to its own market, the net benefit becomes

$$B_{PP} = s_P(p_x^* - w_x)L(\tau_m) - s_pD[L(\tau_m)] - s_pE[L(\tau_m)] - l_P^h[(p_x^* - w_n)(L(0) - L(\tau_N))] - s_P(w_x - w_n)(L(0) - L(\tau_m)) - \frac{\beta}{1-\beta}(w_x - w_n)s_PL(0) \quad (6)$$

The capacity of the expropriated plant is given by $Q(0)=L(0)$. When it is expropriated, this variety can now only be exported to one of the non-FTA countries where it is facing the multilateral tariff τ_m. Therefore, only part of the capacity of the expropriated plant may be utilized, lowering the gain from expropriation. Moreover, the cost D of adapting to this new market raises the cost of expropriation. A new loss term accounts for the fact that some of the workers employed in the expropriated plants must move back into the numeraire sector, resulting in lower wages for those displaced workers. The loss due to the shrinking capacity of h's other plants that export to P is unchanged. The loss from lack of future FDI increases since each new plant would have had a level of output corresponding to the zero FTA tariff.

IV. The Regional versus the Multilateral Regime

A. Some equilibrium considerations

Before investigating in the next subsection how entering a free trade agreement

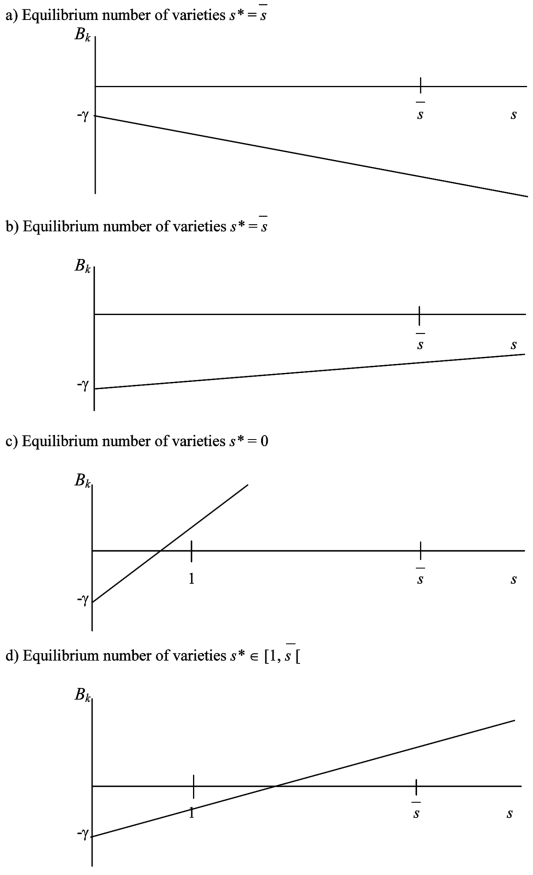
changes the amount of foreign direct investment in the host country via a change in the net benefit of expropriation, it is necessary to discuss some equilibrium considerations. The following proposition considers the uniqueness of the Nash equilibrium of the number of foreign investment projects (varieties) s for each type of investment.

Proposition 1. *Considering one type of investment at a time, there is a unique pure-strategy Nash equilibrium for the number of FDI projects undertaken.*

Proof. See appendix.[16]

Possible equilibria include no FDI or any positive number of varieties over the support of s and are illustrated in figures 1.1a - 1.1d. Two immediate implications are formalized in the following lemmas.

Figure 1. Different Scenarios for the Equilibrium Number of Varieties



[16]In order to avoid cluttering the text, all proofs are relegated to the appendix.

Lemma 1. *The net benefit of expropriating the first foreign-owned plant is positive* $\Leftrightarrow$ *The only equilibrium entails no foreign direct investment:* $s^*=0$.

This lemma follows from the linearity of the net benefit of expropriation B_k, $k \in \{ii, ij, iP, Pj, PP\}$, in the number of foreign investment projects, s. If B_k were a concave function of s (which obtains when expropriation costs are convex in s), then there are two possible switches in the sign of B_k and the determination of the equilibrium s^* would be somewhat more complicated.[17] It would, however, not change the main arguments about the effect of a regime switch below. Moreover, as argued above, linearity in s is a sensible assumption since it still allows for non-linear expropriation costs. If B_k were a convex function of s (which obtains when expropriation costs are concave in s), the analysis would be practically identical to the present one with linearity in s.

Lemma 2. *If there are no plants operated by domestic firms that export to the country whose nationals are being expropriated, i.e.* $l_g^h = 0, g \in \{i, P\}$, *then there are only two possible equilibria,* $s^* = 0$ *and* $s^* = \bar{s}$.

The intuition for this result is straightforward. If home does not export to country i, there is no indirect punishment and thus no indirect cost from expropriating investment from that country. All other expropriation costs depend on the number of foreign-produced varieties, hence B_k is a multiple of s. If B_k were positive for the first plant, we can invoke lemma 1. If it were negative for one plant, it would be for any number of plants. In that case it would never pay to expropriate a plant and the maximum number of investment projects would be realized.[18]

B. Partner country investment

In the purely multilateral world, P is like any other third country i, whereas in the regional regime, the expressions for the net benefit of expropriation differ when we consider investment from the partner country versus investment from third countries. Comparing expressions (2) and (6) compares investment from the

[17] There are five cases and still three possible equilibria. If $B_k < 0$ at $\bar{s}$, there are three possibilities: $B_k < 0$ at s=1 and $B_k < 0$ over the entire support of s; $B_k < 0$ at s=1, but $B_k > 0$ at some points over the support of s; $B_k > 0$ at s=1, but becoming <0 at some point before $\bar{s}$ is reached; given full punishment the equilibrium is always $s^* = \bar{s}$. If $B_k > 0$ at $\bar{s}$, then $s^* = 0$ if $B_k > 0$ at s=1 since by the concavity of B_k, it can never be <0 over the support of s; if $B_k > 0$ at $\bar{s}$ and $B_k < 0$ at s=1 s* will be in the interior, i.e. $\in [1, \bar{s}[$ and will be determined by $B_k(s^*) = 0$.

[18] If B_k were concave, an interior solution would be possible.

partner country in the FTA with investment from that country in the multilateral regime for the case when output is exported back to the multinational's own country; comparing expressions (3) and (5) does the same for output exported to a third (non-FTA) country. Now consider a switch from the multilateral to a regional regime.

Proposition 2. *If the equilibrium in the multilateral regime is one without FDI from the future partner in the FTA, the regime switch results in the possibility of a positive amount of FDI as long as there is at least one variety exported to the partner; if the equilibrium in the multilateral regime is one with FDI from the future partner country in the FTA, the regime switch cannot result in a no-FDI equilibrium.*

The proof shows that the drop in the net benefit of expropriation is larger for investment in varieties that are exported to the partner country's home market than for investment in varieties that are exported to a third country market, making this the most likely type of FDI to occur or expand. The likelihood of a switch in equilibrium from no FDI to FDI is higher, the larger is the increase in capacity under the FTA and the higher is the pre-FTA tariff. The larger the plant capacity after implementation of the regional agreement relative to the capacity consistent with the multilateral tariff, the larger is the drop in B_k following the regime switch. For either type of investment by firms from P, the Nash tariff does not matter at all. The size of the commitment value conferred through conclusion of the FTA only depends on the size of the reduction in tariffs. This result is intuitive because the punishment Nash tariff is the same in either regime. The source of the reduction in the incentive to expropriate and hence the source of the commitment value is the expanded trade volume following an agreement. The size of the commitment value is directly related to the size of the tariff reduction and is thus greater, the higher pre-FTA tariffs were.

Also, the larger the spread between wages paid in the export sector versus wages in the numeraire sector, the more likely it is that FDI is induced, since this imposes a greater loss to home if FDI is not realized. Finally, the more patient a country (a higher β), the larger is the drop in B_k due to a regime change. This is because the loss of future FDI is discounted less heavily.

If firms from the future partner country are already producing some varieties in h in the multilateral regime, the switch to a regional regime cannot lead to a reduction in the number of varieties produced and is likely to result in an increase in the number of varieties. This is formalized in the following proposition.

Proposition 3. *If the equilibrium in the multilateral regime is one with a positive amount of foreign investment, the equilibrium in the regional regime has no fewer varieties from the partner country than the equilibrium in the multilateral regime.*

In summary, the number of varieties from the country that becomes home's partner country in the agreement can never decrease and is likely to increase because a switch from a no-FDI to an FDI equilibrium may occur or, if the equilibrium in the multilateral world is one with FDI from that country, it must increase unless the maximum number of varieties has already been reached.

C. Non-member country investment

The next step is to investigate the effect a conclusion of a free trade agreement has on investment from countries outside the agreement. As far as trade flows are concerned, the theory of regional integration predicts the possibility that non-member countries may be hurt by regional integration due to the adverse effects of trade diversion. Can a similar effect occur with respect to investment? Consider first investment by country $i \neq P$ in varieties that are exported back to country i or a third country $j \neq P$.

Proposition 4. *Investment by country i in varieties that are exported to country* $i \neq P$ *or* $j \neq P$ *is not affected by a free trade agreement between h and P.*

This result arises because tariffs between i and h are unchanged and no other country is assumed to react to expropriation of i-firms.

Now consider the effect of switching from the multilateral to the regional regime on FDI by country i in a variety that is exported to P.

Proposition 5. *For investment from a country that is not part of the regional agreement, but exports the output of its h-based plants to P, both a switch from a no-FDI equilibrium to an FDI equilibrium and a switch from a FDI to a no-FDI equilibrium are possible. A switch from a FDI to a no-FDI equilibrium is more likely if*

a) The wage premium in the export sector is not too high.

b) The markup is high.

c) h is impatient (a low β*).*

A switch from a no-FDI equilibrium to a FDI equilibrium is more likely if

d) There is a large increase in the direct cost of expropriation.

The proof gives the full set of necessary and sufficient conditions for either switch to occur. Intuitively, a large increase in the direct cost of expropriation E lowers the net benefit of expropriation upon entering a FTA. Beyond that, there are

two opposing forces. On the one hand, the increased output of each variety due to the tariff reduction increases B as instantaneous profits are higher. A higher markup $(p_x^* - w_x)$ raises these profits further and hence raises the likelihood that no FDI will occur in the free trade regime even if there previously was a positive amount of FDI in the multilateral regime. On the other hand, B is lowered as increased output leads to a greater loss in future FDI. Since the benefit home derives from non-expropriated FDI is the difference in wage payments in the export versus the numeraire sector, B is likely to rise in a regime switch, the lower this benefit is (a low wage premium) and the more heavily these future losses are discounted (a low β).

Corollary 1. *If the equilibrium in the multilateral regime entails a positive amount of investment, the equilibrium number of varieties in the regional regime may increase or decrease compared to the number of varieties in the multilateral regime. A decrease is more likely if*

a) The wage premium in the export sector is not too high.

b) The markup is high.

c) h is impatient (a low β).

An increase is more likely if

d) There is a large increase in the direct cost of expropriation.

The intuition is the same as for the Proposition 5 since the necessary condition for a fall in the number of varieties is the same as the one for a switch from a FDI to a no-FDI equilibrium.

The analysis shows that there is indeed a commitment effect conveyed by the trade agreement. It has a larger effect on partner country FDI, which is likely to increase and cannot decrease, than on non-partner FDI, which may even decrease when moving from the multilateral to the regional regime. The main reason is that the increase in trade between the partners that formed the FTA translates into a higher indirect punishment value following reneging and hence is able to support a larger amount of foreign investment. In this sense, the trade diverting effect of a trade agreement leads to investment diversion as well.

V. Empirical and Policy Implications

The analysis carried out in this paper has some important policy as well as empirical implications. It also has implications for modeling the effects of regional integration, which generally have focused on trade creation and trade diversion.

As a greater bilateral trade volume is correlated with a greater increase in FDI, economically large countries make superior partners in a FTA if a country's objective of integration is to raise its attractiveness for FDI. This helps explain why Mexico chose to integrate with the United States, historically its largest trading partner. It also helps explain why other Latin American countries are eager to join this agreement as well in order to reap its apparent benefits. Chile was long considered a prime candidate, but efforts to include it in NAFTA were not progressing. In response, Chile has chosen to forge closer trading ties with the EU, its second largest trading partner, rather than join Mercosur, the free trade area closest to it geographically. While this would have been surprising under the old regionalism, this paper suggests that such a move is entirely rational. For the case of Asia, the implications are that in order to attract FDI, integration ought to be pursued either with Japan, who appears more willing lately, or else turn towards Europe or the United States.

There are also important testable implications. As a small country concludes a regional agreement with one of its major trading partners, first we should see trade flows between the two expand. This is a natural result of decreased trade barriers and well established. The model suggests that subsequently foreign direct investment should increase as well, but along two dimensions. There should be more firms entering the market of the small country, and the average scale of those newly established operations should be increasing relative to the time before the trade agreement. Moreover, the model suggests that the main source of new FDI should be the partner country in the FTA since the commitment effect is larger with respect to partner investment, whereas the effect on non-member country investment is ambiguous. The NAFTA and the recent eastward expansion of the EU are prime candidates to test these predictions.[19]

The focus of many analyses of the effect of regional economic integration is on the trade effects of the agreement, often neglecting changes in capital flows. This paper shows how entering a regional agreement will impact FDI as well. This effect is in addition to the effect the FTA may have on the terms of trade, and thus consumer and producer surplus, or tariff revenue. The positive effect of attracting FDI becomes particularly important if other effects tend to create losses. Traditional analyses that consider trade creation, trade diversion and trade revenue effects emphasize this possibility. Schiff (1997) argues that the larger the pre-FTA

[19]Indeed, in a study of FDI in Mexico, Waldkirch (2003) finds that NAFTA helped raise foreign investment almost exclusively from the United States and Canada, not from non-partner countries.

trade volume of a country with the potential partner has been, the more likely this country will be to lose from entering a regional agreement due to large losses in tariff revenue. The present analysis suggests that FDI is increasing in pre-FTA trade volume. Hence, the negative tariff revenue effect may be mitigated by the positive FDI creation effect. Any general equilibrium analysis of the impact of FTAs must weigh the relative importance of these effects.

VI. Conclusion

Many developing countries have had only limited success in inducing foreign direct investment even though laws were made more welcoming and nationalistic rhetoric has been toned down. Seeking closer ties with a large developed trading partner is the latest attempt to increase a country's attractiveness for FDI. This paper has shown that the commitment value such integration confers can indeed raise the level of FDI. Investment from the partner country is most likely to increase, whereas the effect on investment from countries outside of the agreement is potentially ambiguous.

The desirability of a commitment to regional integration with the intention of attracting FDI rests on the implicit assumption that foreign investment helps in inducing and sustaining substantial economic growth and thus development for an underdeveloped country. This insight has been put forward over fifty years ago in a contribution by Paul Rosenstein-Rodan (1943), but only recently have developing countries started to embrace foreign direct investment as a means of furthering growth and development. This paper suggests that in order to maximize the commitment benefits arising from integration, partner countries should not necessarily be selected on the basis of geography but from among the main trading partners. The two may coincide, as is the case with Mexico and the United States, but may be quite different, as is the case with Chile and the EU.

Future work ought to incorporate the commitment value a regional agreement confers into more comprehensive analyses of the welfare effects of the new regionalism. In doing so, additional features of FDI such as its effects on capital accumulation and technology transfer should be taken into account. Moreover, the costs for a country from such close association with another country or trading bloc must be considered. The resulting dependency means that not only positive shocks affecting the larger and more developed trading partner will have spillover effects to the smaller one, but negative shocks as well. This paper has focused on only one

beneficial aspect of commitment.

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Appendix

Proof of Proposition 1:

First, note that the expressions for the net benefit in all cases are of the general type $\alpha * s - \gamma$, where α is the gain in future profits from expropriation minus costs D and E and minus the loss in future FDI; α can be positive or negative; γ is the loss due to lower exports from h-owned plants to the punishing country, which is independent of s. I.e. the net benefit of expropriation is linear in s. Let s^* be the equilibrium number of investment projects (varieties) of a particular type, which is bounded by $\bar{s}$. Thus start by considering the net benefit of expropriation given that $s = \bar{s}$. If this expression is negative, B_k (where $k \in \{ii, ij, iP, Pj, PP\}$) cannot be positive for any s. This is easy to see. $B_k < 0 \Leftrightarrow \alpha * \bar{s} - \gamma < 0$. If $\alpha \leq 0$ the expression is <0 for any s because s is positive (Figure 1.1a illustrates this case). If α>0, then $\gamma > \alpha * \bar{s}$, and hence $\gamma > \alpha * s \forall s < \bar{s}$. Then expropriation is never an equilibrium and thus $s^* = \bar{s}$ (Figure 1.1b illustrates this case).

If $B_k = \alpha * \bar{s} - \gamma > 0$ (from which immediately follows that α>0), the equilibrium s^* depends on the value of B_k for s=1. If $B_k(s=1)$, the linearity of B_k in s implies that B_k>0 over the full support of s, in which case s^*=0 (implying $\alpha > \gamma$). In this case the gain from future profits of the expropriated plants is so high that it cannot be outweighed by the various costs of expropriation (Figure 1.1c illustrates this case).

The final case to consider is $B_k(\bar{s}) > 0$ and $B_k(s = 1) < 0$ in which case s^* is unique by the linearity of B_k and is given by the condition $B_k(s^*) = 0$. The actual s^* is then just the next lower integer and $\in [1, \bar{s}[$ (Figure 1.1d illustrates this case).

Proof of Lemma 1:

Consider the general functional form of the net benefit of expropriation in all

cases, $\alpha * s - \gamma$. Consider s=1. If $\alpha - \gamma > 0$, then $\alpha > 0$ and the net benefit of expropriation is strictly increasing in s: $\partial B / \partial s = \alpha > 0$. Since γ is independent of s, $B_k > 0 \forall s \in [1, \bar{s}]$. This proves $\Rightarrow$.

To prove the reverse, it must be shown that if s^*=0, then $B_k > 0 \forall s \in [1, \bar{s}]$. If B_k >0 for s=1, then by the first part of this proof, $B_k > 0 \forall s \in [1, \bar{s}]$. If $B_k \leq 0$ for s=1, then $s^* \geq 1$, contradicting the earlier assertion that $s^* = 0$. This proves $\Leftarrow$.

Proof of Lemma 2:

Again consider the general way of writing B_k as $\alpha * s - \gamma$. If $l_g^h = 0, g \in \{i, P\}$, then $B_k = \alpha * s$. If $\alpha > 0$, B_k is always positive, hence expropriation of any number of plants is beneficial and thus s^*=0, the only equilibrium entails no FDI. If $\alpha < 0$, then $B_k < 0$ for any s, expropriation is never beneficial and thus $s^* = \bar{s}$.

Proof of Proposition 2:

Output of plants from P can be of one of two types. It will either be exported back to P's own market, or to some third country j. In the latter case, we compare equations (3) and (5). If the equilibrium in the multilateral regime is one without FDI, by lemma 1 the net benefit of expropriation of one plant must be positive, i.e. (setting s=1):

$$B_{ij} = (p_x^* - w_x)L(\tau_m) - E[L(\tau_m)] - l_i^h[(p_x^* - w_x)(L(\tau_m) - L(\tau_N))] - \frac{\beta}{1-\beta}(w_x - w_n)L(\tau_m) > 0$$

In order for a switch from this equilibrium to one with FDI to be a possibility, the net benefit of expropriating the first plant in the regional regime must be negative. This implies that the net benefit of expropriation must unambiguously fall when switching from one regime to the other, i.e. $B_{ij}(s=1) - B_{Pj}(s=1) > 0$.[20] Assuming that the number of home-owned plants that export to P does not change in the regime switch, i.e. $l_i^h = l_P^h$[21], we have

$$B_{ij}(s=1) - B_{Pj}(s=1) = l_P^h[(p_x^* - w_n)L(0) - L(\tau_m)]$$

[20]Since discrete regime switches are considered, simply taking derivatives would not be appropriate here.

[21]This assumes that the only immediate reaction of home to the FTA is to expand the capacity of its existing export plants that sell to P, but not its number, which is reasonable if the time period within which the transition occurs is short.

For $l_P^h \geq 1$, this expression is unambiguously positive since $L(\tau)$ is a decreasing function of τ. For $l_P^h = 0$, there is no change in the net benefit and thus no equilibrium change can occur.

By the same reasoning, a switch from an FDI to a no FDI-equilibrium is impossible. In that case, the net benefit of expropriating one plant in the purely multilateral regime must be negative. For the switch to occur, this net benefit would have to be positive in the regional regime, implying that the difference between the two would have to be negative, which was just shown not to be the case.

If *P*-owned plants in *h* export back to their own market, we compare (2) and (6). If the equilibrium in the multilateral world is one without FDI, the net benefit of expropriation of one plant must be positive, i.e. \

$$B_{ii} = (p_x^* - w_x)L(\tau_m) - D[L(\tau_m)] - E[L(\tau_m)] - l_i^h[(p_x^* - w_x)L(\tau_m) - L(\tau_N)] - \frac{\beta}{\beta - 1}(w_x - w_n)L(\tau_m) > 0$$

Again, the net benefit of expropriation must unambiguously fall when switching from one regime to the other. For $l_i^h = l_P^h$, we have

$$B_{ii}(s = 1) - B_{PP}(s = 1) = \left\{ l_P^h(p_x^* - w_x) + \frac{(w_x - w_n)}{1 - \beta} \right\}[L(0) - L(\tau_m)]$$

which is unambiguously positive, even if $l_P^h = 0$, since $w_x > w_n$ and $L(\tau)$ is a decreasing function of τ.

Proof of Proposition 3:

Consider first an interior solution, i.e. $0 < s^* < \bar{s}$. As shown in the proof to proposition 1, s^* is determined by the condition $B_k(s^*) = 0$ (neglecting the integer requirement for the moment). Consider the general way of writing B_k as $\alpha * s - \gamma$. Then $s^* = \frac{\gamma}{\alpha}$. If investment is of the type of investment that is exported to a third country *j*, then γ rises and α is unchanged when switching regimes (comparing equations (3) and (5)):

$$\alpha(\beta_{ij}) = \alpha(B_{Pj}) = (p_x^* - w_x)L(\tau_m) - E[L(\tau_m)]$$

$$\gamma(\beta_{ij}) = l_i^h[(p_x^* - w_n)(L(\tau_m) - L(\tau_N))]$$
$$< \gamma(\beta_{ij}) = l_P^h[(p_x^* - w_n)(L(0) - L(\tau_N))]$$

since L is strictly decreasing in τ and $l_i^h = l_P^h$ (see proof of proposition 2 for an explanation of this assumption). Due to the integer requirement, the actual s^* is just the next lowest integer, which can be the same in the two regimes if the increase in s^* is sufficiently small. If $s^* = \bar{s}$ in the multilateral regime already, then this equilibrium is unchanged.

If investment is of the type that is exported back to P, then γ rises and α falls when switching regimes, again unambiguously increasing s^* (comparing equations (2) and (6)):

$$\alpha(B_{ii}) = (p_x^* - w_n)L(\tau_m) - D[L(\tau_m)] - E[L(\tau_m)] - \frac{\beta}{1-\beta}(w_x - w_n)L(\tau_m)$$
$$> \alpha(B_{PP}) = (p_x^* - w_n)L(\tau_m) - D[L(\tau_m)] - E[L(\tau_m)]$$
$$- (w^x - w_n)(L(0) - L(\tau_m)) - \frac{\beta}{1-\beta}(w_x - w_n)L(0)$$
$$\gamma(\beta_{ii}) = l_i^h[(p_x^* - w_n)(L(\tau_m) - L(\tau_N))]$$
$$< \gamma(\beta_{PP}) = l_P^h[(p_x^* - w_n)(L(0) - L(\tau_N))]$$

It is easy to see that α falls because the fourth term is an extra negative term and the fifth term deducted is larger because L is strictly decreasing in τ. The two γ' are the same as in the first type of investment. Again, if $s^* = \bar{s}$ in the multilateral regime already, then this equilibrium is unchanged.

Proof of Proposition 4:

In the case of FDI by country i in a variety that is exported back to i, both the net benefit of expropriation in the multilateral regime and the net benefit of expropriation in the regional regime is given by expression (2). Hence there is no change in B_k from a regime switch. In the case of FDI by country i in a variety that is exported to a third country market $j \neq P$, both the net benefit of expropriation in the multilateral regime and the net benefit of expropriation in the regional regime is given by expression (3). Hence there is no change in B_k from a regime switch.

Proof of Proposition 5:

The net benefit of expropriation for this case is given by equation (3) for the multilateral regime and equation (4) for the free trade regime. Again, by lemma 1, the equilibrium will entail no FDI if B_k is positive for s=1, but will entail a positive amount of FDI if B_k is nonpositive for s=1. Hence, sufficient conditions for a switch from a no-FDI to a FDI {from a FDI to a no-FDI} equilibrium to occur are:

$$B_{ij} = (p_x^* - w_x)L(\tau_m) - E[L(\tau_m)] - l_i^h[(p_x^* - w_n)(L(\tau_m) - L(\tau_N))] - \frac{\beta}{1-\beta}(w_x - w_n)L(\tau_m) > \{<\} 0$$

$$B_{iP} = (p_x^* - w_x)L(0) - E[L(0)] - l_i^h[(p_x^* - w_n)(L(\tau_m) - L(\tau_N))] - \frac{\beta}{1-\beta}(w_x - w_n)L(0) < \{>\} 0$$

A necessary condition for a switch from a no-FDI to a FDI {from a FDI to a no-FDI} equilibrium to occur is that the net benefit of expropriation of the first plant must fall {rise}. Assuming that the number of home-owned varieties exported to does not change in the regime switch, we have:

$$\begin{aligned} B_{ij}(s=1) - B_{iP}(s=1) &= (p_x^* - w_x)[L(\tau_m) - L(0)] \\ &\quad + E[L(0)] - E[L(\tau_m)] + \frac{\beta(w_x - w_n)}{1-\beta}[L(0) - L(\tau_m)] \\ &= E[L(0)] - E[L(\tau_m)] \\ &\quad + [L(0) - L(\tau_m)]\left[\left(\frac{1}{1-\beta}\right)w_x - \left(\frac{\beta}{1-\beta}\right)w_n - p_x^*\right] \end{aligned}$$

The change in the direct cost of expropriation, $E[L(0)] - E[L(\tau_m)]$, is positive, as is the difference between the number of workers employed, $[L(0) - L(\tau_m)]$. The term in square brackets is ambiguous in sign. For the whole expression to be negative (so that a switch from a FDI to a no-FDI equilibrium is a possibility), this last term must be negative. Re-writing this condition as

$$\beta < \frac{p_x^* - w_x}{p_x^* - w_n}$$

reveals that this is more likely to hold the lower β, the larger $p_x^* - w_x$ (the markup) and the smaller $w_x - w_n$.

Proof of Corollary 1:

Consider first an interior solution, i.e. $0 < s^* < \bar{s}$. As shown in the proof to proposition 1, s^* is determined by the condition $B_k(s^*) = 0$ (neglecting the integer requirement for the moment). Consider the general way of writing B_k as $\alpha * s - \gamma$. Then $s^* = \frac{\gamma}{\alpha}$. With investment of the type considered, γ is unchanged (comparing equations (3) and (4)):

$$\gamma(B_{ij}) = \gamma(B_{iP}) = l_i^h[(p_x^* - w_n)(L(\tau_m) - L(\tau_N))] \text{ if } l_i^h = l_P^h$$

A necessary condition for s^* to rise {fall}is then for α to fall {rise}:

$$\begin{aligned}\alpha(B_{ij}) - \alpha(B_{iP}) &= (p_x^* - w_x)[L(\tau_m) - L(0)] \\ &\quad + E[L(0)] - E[L(\tau_m)] + \frac{\beta(w_x - w_n)}{1-\beta}[L(0) - L(\tau_m)] \\ &= E[L(0)] - E[L(\tau_m)] \\ &\quad + [L(0) - L(\tau_m)]\left[\left(\frac{1}{1-\beta}\right)w_x - \left(\frac{\beta}{1-\beta}\right)w_n - p_x^*\right]\end{aligned}$$

which is the same condition as in proposition 6. Hence, it gives the same implications.

If $s^* = \bar{s}$ in the multilateral regime, by the same argument it is possible that s^* falls enough so that it is $< \bar{s}$. .