The Location Effects of Isolation

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INTRODUCTION
In a recent article on China, THE ECONOMIST (March 16th, 1996) analyzes the likely effects of the new-found enthusiasm for China on the international network of Japanese factories around Asia. The article presents the reader with a rich list of factors that might affect firms’ location choices among alternative production sites in different countries. Top of the list are production costs in terms of land, labour, capital, energy and other natural resources. Then comes the fiscal dimension in terms of corporation taxes. However, the bulk of the article points at the importance of other factors. These are trade costs, in particular custom expenses, and the market potential for sales. A way of circumventing a high wall of tariffs and regulations is to build a factory in each protected national market. On the other hand, chopping production among many different plants has a cost in terms of foregone economies of scale. That is why, all the rest equal, if obstacles to trade are not prohibitive, corporations prefer to concentrate production in few factories close to the markets with the highest potential for sales and to ship their products to the smaller markets. This maximizes economies of scale while minimizing trade costs. Thus, the story goes, having an obvious advantage in terms of market size, China is already subtracting more and more Japanese foreign direct investment from other countries in Asia and in Europe as well. Therefore China’s neighbours fear that this shift in the international allocation of resources might drive production out of their markets, a phenomenon known as «de-localization». The twist of the article is to argue that a free trade area among other smaller countries could be used to balance the market size advantage of China. Increased interest in the ASEAN Free Trade Area (AFTA) should be interpreted along these lines.

AFTA is not an isolated case. During the last years, Canada, Mexico and the United States have liberalized trade among themselves much more than with the rest of the world signing the North American Free Trade Agreement (NAFTA). States taking part in the European Union (EU) moved towards discriminatory trade liberalization among themselves even before and have pursued this line further with the Single European Act.
However, as pointed out by Baldwin and Venables (1996), NAFTA and the EU are only the largest of no less than seventy preferential trade arrangements (PTA's) notified to meet article XXIV of the General Agreement on Tariffs and Trade (GATT).

With such developments on the international scene, «delocalization» is a threat to those countries that are (or choose to be) left out of discriminatory trade agreements, in particular to those, as for example Switzerland and many Far-East Asian countries, that cannot rely on a large domestic market. Such a threat has both a short term («static») and a long term («dynamic») dimension. In the short term, «delocalization» will increase the number of products that have to be imported from abroad. This could be welfare reducing if trade costs are high and are not compensated by lower costs of foreign production. Such effects are likely to persist and even to be amplified in the long run. First of all, as Porter (1990) points out, «delocalization» is difficult to reverse even if cultural, political, or cost differences between locations are small. «A good example is the United States. Geographic concentration of industries within the United States persists despite linguistic, cultural, and legal homogeneity, open and efficient internal transportation and communication, a common currency and capital markets, and virtually no trade barriers». Secondarily, location effects are often self-reinforcing since they can trigger cumulative processes. The concentration of firms in a certain area makes it convenient for new firms to settle there. This happens because a concentration of rivals, customers, and suppliers will promote efficiencies and specialization, improvement and innovation, accumulation and circulation of information: in Marshall's (1920) words, in some areas industry is «in the air».

In general, in recent years the economic policy debate on economic integration has collected a rich bulk of anedoctal and systematic evidence on the location effects of PTA's suggesting that their implementation can lead to a diversion of investment from the excluded to the partner countries (Baldwin, Forslid and Haaland [1995]). The relevant pieces of the explanation are trade costs and increasing returns to scale in production. Increasing returns to scale make it optimal for firms to concentrate production at few factories. Trade costs make the largest markets the best sites for factories. They also have the obvious implication that, all the rest equal, an integrated market is larger than a segmented one.

This paper makes an attempt at putting the two pieces of the explanation together. Focussing on constant returns to scale, the traditional literature on free trade areas and customs unions (e.g. Lipsey [1960]) is not a suitable analytical tool. Therefore the paper builds on the results of «new trade theory» (Helpman and Krugman [1985]) which allows for increasing returns to scale and imperfect competition. In particular, it relates to a recent spin-off of that literature sometimes called «new economic geography» (Krugman [1991a, b] Venables [1996]). The «new economic geographers» use trade models with horizontally differentiated goods and monopolistic competition to formalize the intuitive argument spelt above according to which, as frictional trade barriers due to the existence of protected national markets go down, one should expect firms in «sensitive» sectors to relocate to the biggest national markets. «Sensitive» sectors are
identified as those characterized by strong returns to scale in production and absorbing a large share of aggregate expenditures. With frictional barriers countries with large local markets enjoy a «competitive advantage» in the increasing returns sectors because firms can run down their cost curves to take advantage of a larger scale. However, most results in the literature are derived in a simple setting in which firms can choose where to locate between two countries only. Notable exceptions are KRUGMAN (1993) and PUGA and VENABLES (1995) who allow for more than one location. The former uses a one-factor (labour) two-sector (one sector with constant the other with increasing returns to scale) three-country model to show that, when two countries sign a discriminatory trade agreement, the reallocation of resources within each country makes the partners specialize in the increasing returns sector and the outsider in the constant return sector. However, only big reductions in trade costs between partners can lead to complete specialization. Also the latter look at the effects on intranational reallocation of resources in a one-factor two-sector model. However, by considering vertically linked firms, they are able to show that the specialization effect can be dramatic. Even if the PTA succeeds in reducing the trade barriers between partners only by a modest amount, a cumulative process can set in fostering complete specialization. Drawing on previous work by MARTIN and OTTAVIANO (1995, 1996), the present paper aims at overcoming two of the main limits of those contributions when tackled with real world issues. The first is the neglect of the effects of PTA’s on the international allocation of resources which, as pointed out in the beginning, is often perceived to be a (if not the) relevant dimension of the issue. The second is their static (or short term) vision. In the policy discussions the welfare effects of PTA’s are debated. However, focussing on the static effects only, it would not be too difficult to argue convincingly that PTA’s are welfare-improving for the partners and welfare-reducing for the outsiders. Nonetheless PTA’s have not been fought by the GATT before and are not fought by the WTO now due to the argument that PTA’s represent a first step towards broader liberalization and are therefore good for the excluded countries too. The present contribution argues that moving to a dynamic setting in which resources are endogenously accumulated, rather than given forever, can help to shed light on the policy debate by showing that a PTA is not necessarily welfare reducing for the excluded countries.

To achieve its goal, the paper develops a simple model in which there are still two sectors and three countries, but, differently from the existing literature, there is also a second factor (capital) which is freely mobile between countries and is employed where its return is higher. The general result is that, when a PTA is signed, return to capital will become higher inside the integrated countries (the «partners») with respect to the isolated one (the «outsider»). This will cause capital to leave the outsider to be invested in the partners. This flow of direct investment will increase (reduce) the number of factories in the partners (outsider). The outsider will therefore suffer from «delocalization». It will be investigated how, in the presence of national technological spillovers between industries, this short term location effect can have relevant effects on the long run rate of growth as well as on the welfare of countries.
The paper consists of four parts. Part 1 introduces and solves the static model to study the short run location effects of a PTA. Part 2 investigates a simple dynamic extension of the model to assess the long run effects of a PTA. Part 3 draws the welfare implications. Part 4 concludes.

1. THE STATIC EFFECTS OF A PTA

The model is a variant of FLAM and HELPMAN (1987), one of the leading models in «new trade theory». The economy consists of three initially identical countries with the same fixed endowments of labour \((L)\) and capital \((N/3)\). These factors are used to produce two goods: a homogeneous «traditional» good with constant returns to scale and perfect competition and a horizontally differentiated «industrial» good with increasing returns to scale and monopolistic competition. Entry and exit are free in both sectors. Labour enters the production of both goods while capital only that of the industrial good. The traditional sector has a labour unit input requirement equal to 1. Industry has a linear cost function: variable costs are paid in terms of labour its unit input requirement being equal to \(\beta\); fixed costs are paid in terms of capital its unit input requirement being equal to 1 i.e. the number of active firms is determined by the capital endowment. Therefore a unit of capital is required to produce each variety of the differentiated industrial good but its scale of production is determined by the input of labour. Such a cost structure implies increasing returns to scale in the production of each variety. Assuming zero costs of product differentiation is enough to ensure a 1:1 relation between varieties and firms and therefore capital in each country.

Preferences are nested C.E.S. (SPENCE [1976], DIXIT and STIGLITZ [1977]):

\[
U = D^{\alpha} Y^{1-\alpha} D = \left[ \sum_{i=1}^{N} D_i \left( \frac{\sigma - 1}{\sigma} \right) \right]^{\frac{\sigma}{\sigma - 1}}
\]

(1)

where \(\sigma > 1\) is the elasticity of substitution between any two varieties and the elasticity of demand for each variety of the industrial good, \(D_i\) is the consumption of the \(i\)-th variety, \(D\) is the C.E.S. quantity index or aggregator, \(Y\) is the consumption of the traditional good and \(0 < \alpha < 1\) is the share of expenditures devoted to the industrial good.

Trade is free in the traditional good while it incurs frictional trade costs in the industrial good. Such costs are modelled following SAMUELSON (1954) as «iceberg» costs: to transport a unit of the industrial good from one country to another more than one unit have to be sent. Let \(\tau > 1\) be the number of units to be sent for one unit to arrive from a partner country to the other and \(\tau' > 1\) from (to) a partner to (from) the outsider. It is as if \(\tau - 1\) (\(\tau' - 1\)) units of the good melt away because of friction and it is equivalent to assume that trade costs are paid in terms of the transported good.
Finally, factor mobility is assumed to be partial: labour is freely mobile between sectors in the same location but internationally immobile; capital is freely mobile between any two countries. This distinction is made to mirror the policy debate which is concerned more with investment diversion than with labour migration.

Under these assumptions the traditional good will be priced at marginal cost. Given that only labour is used in its production and the unit input requirement is one, in each country the traditional good price will be equal to local wages. However free trade will ensure that the wage will be the same in all countries as long as each country produces the traditional good. This will be the case if the world demand of the traditional good cannot be satisfied by a single country alone which is assumed from now on. Therefore, by choosing labour as the numeraire good, the price of the traditional good and the wages will be equal to 1 worldwide. Of course, this result is counterfactual and removes one of the relevant factors affecting firms' location choices as discussed in the introduction. However it is a simplification that is useful in order to focus on the other relevant factors whose importance has been stressed in the introduction i.e. trade costs and economies of scale.

Because of monopolistic competition the varieties of the industrial good will be priced following the standard mark-up rule over marginal costs:

\[ p = \frac{\beta \sigma}{\sigma - 1} \]  
(2)

where \( p \) is the domestic price of any variety. With free entry and exit profits have to be zero in equilibrium. Together with free international capital mobility, this allows to determine the worldwide return to capital, say \( \pi \), as the residual value of sales after labour costs i.e. operating profits:

\[ \pi = \frac{\beta x}{\sigma - 1} \]  
(3)

where \( x \) is the scale of production that is the output of each variety.

From (1) this economy spends a constant share \( \alpha \) of expenditures for the consumption of the industrial good. Call \( E = 1 + \pi (N/L) \) the expenditures of a typical resident in any partner country which in equilibrium are also equal to those of a typical resident in the outsider. Then in equilibrium it must be:

\[ px = \frac{3}{N} \alpha EL \]  
(4)

Together with (2) this implies the following scale of production:
\[ x = \alpha L \frac{\sigma - 1}{\beta \sigma} \frac{3E}{N} \tag{5} \]

Finally, the location of firms can be determined by considering that in equilibrium demand (inclusive of transport costs) and supply of each industrial variety must be equal:

\[ \gamma = n \frac{(1 - 2\delta' + \delta) - \delta'(1 - \delta')}{3(1 - 2\delta' + \delta)(1 - \delta')} \tag{6} \]

where \( n \) is the number of firms located in a partner country, \( \delta \equiv \tau^{1-\sigma} \) and \( \delta' \equiv \tau'^{1-\sigma} \).

Equation (6) can be used to shed light on the location effects of a PTA between the two partner countries. It is useful to start with a situation of perfect symmetry in which \( \tau = \tau' \) so that \( \delta = \delta' \). As expected, equation (6) entails a uniform initial distribution of firms among countries with \( \gamma = 1/3 \). Let us allow for a PTA between the partners. In this stylized economy the impact of such a PTA is modelled as a one-off reduction in the frictional costs of trade between the partners i.e. a reduction in \( \tau \) and an increase in \( \delta \) while holding \( \delta' \) constant:

\[ \frac{\partial \gamma}{\partial \delta} \bigg|_{\delta=\delta'} = \frac{1}{3} \frac{\delta'}{(1 - 2\delta' + \delta)^2} \bigg|_{\delta=\delta'} = \frac{1}{3} \frac{\delta}{(1 - \delta)^2} > 0 \tag{7} \]

So, starting from an initial situation where all countries face the same obstacles to trade, a discriminatory liberalization between the two partners induces a capital flow from the outsider to the partners. As a result the number of firms increases in each of the partners and falls in the outsider. The isolated country suffers from «delocalization».

The intuition is the following. As the frictional trade costs are lowered in the integrated area, a partner’s demand for the industrial products made in the other partner increases while the demand for the industrial products made in the outsider decreases. More precisely, because of lower transaction costs between the partners, consumers in both countries will demand more of the now cheaper products of the partner and less of the now more expensive products of the outsider. Partners are now a better export base for each other than the outsider. It is as if the world markets for the industrial good were bigger if supplied from a partner than from the outsider since, on average, consumers have to waste a larger share of expenditures on trade costs when buying varieties made in the outsider country. As a result of scale economies, given the initial international distribution of firms, firms in the partners will start enjoying higher returns to capital than firms located in the outsider. Because of free mobility and free entry/exit, capital will flow from the outsider to the partners. Firms will be shut down in the outsider to be re-opened in the partners. By creating a larger integrated market in the presence of increasing returns to scale, the PTA breaks the balance of our initially symmetric world
in a way that gives solid theoretical ground to the policy argument about «delocalization» reported in the introduction.

As a further comment, it can be noticed that in absolute value the impact in (7) is decreasing in $\tau$, in $\tau'$ and $\sigma$. It is decreasing in the trade costs between the partners because high trade costs make it difficult to supply the partners markets from a single location. It is decreasing in the trade costs between the partners and the outsider because location in the integrated area is less attractive the more difficult it is to supply the isolated country from the intergrated area. Finally, it is decreasing in the elasticity of substitution between industrial products because the more substitutable these products are the easier it is for a consumer in the excluded country to substitute domestic varieties for more expensive foreign ones. As pointed out by KRUGMAN (1991b), the elasticity of substitution $\sigma$ can also be seen as an inverse index of the degree of equilibrium returns to scale. Therefore one can read the last result as stating that location in the partners is more attractive the stronger the returns to scale i.e. the more the cost savings (losses) that would be made by firms in the integrated (excluded) market through scale expansion if entry (exit) were not allowed for.

With respect to welfare, a PTA represents an improvement for the partners for two reasons. First, even for a given international distribution of industry, partners pay lower trade costs on each other’s products and this is a direct cost saving effect. Second, because a PTA shifts plants from the outsider to the partners, partners have to import fewer varieties from the outsider and this represents an indirect cost saving effect of the PTA. As to the outsider, the direct effect is of course null while the indirect effect is adverse since, due to relocation, more products have to be imported at the same cost as before. This static setting has the strong policy implication that a PTA is always welfare reducing for the discriminated country. This might not necessarily be true when we move to a set-up in which a PTA not only redistributes given resources among countries but also affects the rate of accumulation of resources.

2. THE DYNAMIC EFFECTS OF A PTA

To analyze the implication of «delocalization» on long-run growth, the analytical framework of the previous section must be enriched to allow for ongoing capital accumulation. In principle, this could be done in a neoclassical framework with exogenous growth. But, as it is well known, this would cover most policy implications. Moreover, as shown by GROSSMAN and HELPMAN (1991), «new trade theory» lends itself to interesting applications when the long-run rate of growth is endogenized. While following MARTIN and OTTAVIANO (1996), this section builds on the work of those two authors not to develop a general theory of trade and growth, but rather to build a realistic model by which it can be convincingly argued that, under some specific but empirically relevant circumstances, a PTA can be beneficial also to the excluded countries.
In recent years substantial empirical work has pointed at the role of the geographical concentration of economic activities in explaining growth (Rivera-Batiz and Rivera-Batiz [1995]). Therefore the location effects of PTA’s studied in the previous section, which are in themselves short-run effects, can be expected to have important effects on long-run growth if «sensitive» sectors have relevant national spillovers on other sectors that are the engines of growth. Typically, this would be the case if one thought of manufacturing as a «sensitive» sector and that the proximity of R&D labs to manufacturing plants is important for innovation because it fosters communication between researchers and producers. To build a similar story into the simple model of the previous section, assume now that the typical consumer maximizes an intertemporal utility function which is equal to the discounted flow of instantaneous utility where such utility is a monotone transformation of the one in equation (1). Assuming unit elasticity of intertemporal substitution, the intertemporal utility function is:

\[
U = \int_0^\infty \log D(t)^\alpha Y(t)^{1-\alpha} e^{-\rho t} dt \\
D(t) = \left[ \sum_{i = 1}^{N(t)} \frac{\alpha - 1}{\sigma} \right]^{\frac{\sigma}{\sigma - 1}}
\]

where, apart from the introduction of the time variable \(t\) and the rate of time preference \(\rho\), the definitions of the other variables and parameters are the same as in the previous section.

The main differences come from the supply side. Accumulation of capital takes place through R&D which is modelled as a costly perfectly competitive activity that produces new capital \(N = dN/dt\) using labour as the only input. Entry and exit are free in the R&D sector. In each country the labour unit input requirement in R&D is \(\eta\) divided by the number of local industrial firms, that is the stock of resident capital. This assumption is made to incorporate the spillover story discussed above. The presence of manufacturing firms has a beneficial effect on the productivity of labour in local R&D: proximity between production and R&D enhances the feedbacks from plants to labs making R&D efforts more effective.

This specification of the mechanics of accumulation leaves the instantaneous («short-run») dimension of the model the same as in the previous section so that all the results above apply. As to the solution of the dynamics, it can be noticed that this kind of model jumps immediately to a steady growth path where the world as well as the national capital stocks grow at a constant rate \(g\) and location is constant too. Since all the future of the economy is embedded in the initial value of a unit of capital (firm), say \(v_0\), to find \(g\) one has only to solve the following system under the assumption of a constant growth rate of \(N\):
The first equation states that the value of the firm is equal to the discounted flow of its operating profits that are also the returns to a unit of capital. The second is the zero-profit condition in the R&D sector: the benefit and the cost of R&D have to be equal in equilibrium. The right hand side shows the spillover effect: costs of innovation are decreasing in proportion to the number of the world firms with a factor of proportionality equal to the local share of firms. The third equation states that total expenditures are equal to total factor income. Together with (3) and (5), these three equations imply that the equilibrium rate of growth of \( N \) is:

\[
\frac{\alpha}{\gamma} \left( \frac{\sigma - \alpha}{\sigma} \right) \rho
\]

while the equilibrium location of firms is still determined by equation (6).

Equation (12) states the standard result (GROSSMAN and HELPMAN [1991]) according to which the equilibrium growth rate is increasing in the world stock of labour (3L), the expenditure share of the industrial good (\( \alpha \)) and the degree of increasing returns to scale in the industrial sector (decreasing in \( \sigma \)) while it is decreasing in the cost of innovation (\( \eta \)) and the rate of time preference \( \rho \).

Equation (12) also shows the importance of location which is peculiar to the present model. All the rest equal, the equilibrium growth rate is increasing in \( \gamma \), the share of industrial firms in a partner country. This should be expected. Because of free trade in the traditional good, wages are the same everywhere. This makes the strength of the spillover from manufacturing the only relevant cost dimension for R&D location. Before the PTA takes place, when the frictional trade costs are the same between any two locations, industry is evenly split among countries. As a result the spillover strength as well as the cost of innovation are the same in all countries: R&D activities are evenly spread too. Consider now what happens after the PTA. As already argued in the previous section, firms relocate to the partner countries. This enhances the spillover in the partners while reducing it in the outsider. The costs of innovation become lower in the partners and all R&D activities concentrate there because of free entry and exit. Therefore, by
inducing spatial concentration of industry in the partners, the PTA reduces the world cost of R&D and fosters growth.

In reality, one would not expect such a dramatic effect on R&D location. However, since partial relocation of R&D would not change the flavour of the results while making the analytical apparatus more cumbersome, the modelling choice can be defended.

As a last comment, equation (12) shows that the impact of a marginal change in location $\gamma$ on the equilibrium growth rate is increasing in the degree of returns to scale (decreasing in $\sigma$). Therefore low value of $\sigma$ are associated not only with a large impact of a PTA on location but also with a large impact of location changes on growth.

So, a PTA causes firms in the industrial sector to move production to the partner countries. This enhances the spillover on R&D in those countries and makes innovation more costly in the outsider country. Consequently, all R&D labs move to the partners. But this is only a side-show: because of free capital mobility and wage equalization the location of R&D is immaterial. What matters is the location of production in the industrial sector that allows a better exploitation of national spillovers and a lower cost of innovation. From a welfare point of view, the end result is twofold. On one side, being it cheaper to produce new capital by innovation, the value of the initial stock of capital (i.e. the value of the initially existing firms) drops and this implies a negative welfare effect for everybody. On the other hand, lower costs of innovation raise the incentive to innovate thus fostering faster growth in every country. The assessment of whether this positive welfare effect can offset the negative effects of «delocalization» and lower firm value in the isolated country is the subject of next section.

3. WELFARE ANALYSIS

In the previous sections it has been argued that a PTA affects welfare through four channels. First, there is the direct trade cost saving effect due to lower trade frictions between the partners. Second, there is the relocation effect that yields an indirect trade cost saving effect for the partners, whose expenditures share of more expensive imported varieties falls, and an indirect trade cost increase for the outsider, whose share of imported varieties rises. Third, there is a negative effect on the value of the existing stock of capital due to the lower cost of new capital that geographic concentration brings about in the presence of national intersectoral spillovers. Fourth, there is a worldwide positive effect on the rate of capital accumulation.

To investigate under which circumstances negative or positive welfare effects will eventually dominate, more analytical details are required. The chosen welfare measures are the present value of the indirect utility flows in the three countries, $V$ in a partner and $V^*$ in the outsider. Instantaneous indirect utility is equal to the logarithm of factor incomes divided by the relevant («exact») price index.

Since only the profits of firms already existing at time 0 are pure rents:
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\[
V = \frac{1}{\rho} \ln \left\{ \alpha^\alpha (1 - \alpha)^{(1 - \alpha)} \left( 1 + \rho \frac{\eta}{\gamma N_0} \frac{H_0}{L} \right) \left( \frac{\sigma - 1}{\beta \sigma} \right) ^\alpha \right\}
\]

\[
N_0 \sigma^{-1} \left[ (1 + \delta) \gamma + \delta' (1 - 2 \gamma) \right]^{-\frac{\alpha}{\beta \sigma}} \left( \frac{\sigma - 1}{\beta \sigma} \right) ^\alpha
\]

(13)

\[
V^* = \frac{1}{\rho} \ln \left\{ \alpha^\alpha (1 - \alpha)^{(1 - \alpha)} \left( 1 + \rho \frac{\eta}{\gamma N_0} \frac{H_0^*}{L} \right) \left( \frac{\sigma - 1}{\beta \sigma} \right) ^\alpha \right\}
\]

\[
N_0 \sigma^{-1} \left[ 2 \delta \gamma + (1 - 2 \gamma) \right]^{-\frac{\alpha}{\beta \sigma}} \left( \frac{\sigma - 1}{\beta \sigma} \right) ^\alpha
\]

(14)

By differencing with respect to \( \delta \) in an initial situation of perfect symmetry in which \( \tau = \tau' \) so that \( \delta = \delta' \):

\[
\frac{\partial V}{\partial \delta} = \frac{1}{\rho} \left[ -\frac{3 \rho \eta}{[L + \rho \eta]} \frac{\partial \gamma}{\partial \delta} + \frac{\alpha}{\sigma - 1} \frac{1}{1 + 2 \delta} + \frac{6(1 - \delta)}{\sigma - 1} \frac{\partial \gamma}{\partial \delta} + \frac{3 \rho g}{\eta \sigma (\sigma - 1)} \frac{\partial \gamma}{\partial \delta} \right]
\]

(15)

\[
\frac{\partial V^*}{\partial \delta} = \frac{1}{\rho} \left[ -\frac{3 \rho \eta}{[L + \rho \eta]} \frac{\partial \gamma}{\partial \delta} - \frac{\alpha}{\sigma - 1} \frac{1}{1 + 2 \delta} \frac{6(1 - \delta)}{\sigma - 1} \frac{\partial \gamma}{\partial \delta} + \frac{3 \rho g}{\eta \sigma (\sigma - 1)} \frac{\partial \gamma}{\partial \delta} \right]
\]

(16)

where \( g \) is the equilibrium growth rate in (12).

The four terms on the right hand sides of the partner expression are respectively: (i) the «firm value effect» by which a PTA through relocation in the presence of spillovers affects the value of the initial stock of capital; (ii) the (direct) «trade cost effect» by which a PTA reduces the prices of imported industrial varieties from the partner for a given spatial distribution of firms; (iii) the «relocation effect» by which, for given industrial prices, a PTA shifts firms to the partner countries decreasing their price indexes while increasing the outsider’s; (iv) the «growth effect» by which a PTA through relocation affects the speed of invention.

As to the outsider, the terms are respectively: (i) the firm value effect; (ii) the negative relocation (or «delocalization») effect; (iii) the growth effect. As already argued, the outsider is not directly affected by the trade cost reduction signed between the partners.

Equations (15) and (16) are fairly unpromising objects to get any insight from. Nonetheless two important results can be readily assessed. First, since \( \partial V / \partial \delta > \partial V^* / \partial \delta \), if a PTA is welfare-improving for the outsider then it has to be welfare-improving for the partners as well. Therefore, it is always the partners that gain more from a PTA. Second, all the rest equal, the outsider gains at the margin if the initial level of trade frictions (\( \tau \)) is low enough and if returns to scale are strong enough (\( \sigma \) low enough). As
discussed in section 2, under such circumstances the impact of a PTA on the location of firms is strong but, because of low trade costs, the related welfare loss for the outsider is little. On the other hand, as pointed out in section 3, independently from the value of \( \tau \), when \( \sigma \) is low the impact of relocation on growth is strong too. Consequently the overall effect of a PTA on the outsider's welfare is positive.

4. CONCLUSION

Recent work in international economics has drawn renewed attention on the location effects of obstacles to trade. Increasing returns sectors are attracted by large markets because firms can run down their cost curves. Therefore discriminatory trade agreements let the participants enjoy access to world markets at a lower average trade cost. If such a cost is due to bureaucratic frictions that waste resources, it is indeed as if firms located in the integrated area faced larger world markets. Then locating plants in the integrated area allows to reap economies of scale that would be inaccessible in the excluded countries and this attracts foreign direct investment and firms. Therefore, the recurrent fear of «delocalization» by countries that are (or choose to be) excluded from discriminatory trade agreements has some theoretical ground.

This does not readily imply that preferential trade agreements are necessarily detrimental to the excluded countries as it could be expected when they cause the international reallocation of given resources. By allowing for some growth effect of trade, it can be shown that they can be beneficial to everybody. This would be the case if, for example, the reallocation of economic activities towards the integrated areas speeded up worldwide growth by allowing better exploitation of nationwide external economies of scale.

To illustrate how, this paper has developed an endogenous growth model with national intersectoral technological spillovers from industrial production to \( R&D \). While the model is indeed quite peculiar, the message is far more general. To limit the attention to the static allocation of resources gives only a partial picture of the far-reaching effects of trade arrangements on the welfare of the nations. As recent research has acknowledged the dynamic effects of trade on the accumulation of resources are relevant and still to be better understood.

REFERENCES


ZUSAMMENFASSUNG

Länder, die aus einem diskriminierenden Handelsabkommen fernbleiben, fürchten häufig, dass die in den «sensiblen» Wirtschaftssektoren tätigen Firmen ihre Produktion-
betriebe in die Signatarländer verschieben könnten. Der vorliegende Beitrag überprüft die Stichhaltigkeit dieser Befürchtungen durch eine Analyse aus der Sicht der neuesten Handelstheorie. Der Wegzug der Firmen ist in der Tat ein Risiko für die diskriminierten Länder, doch stellt er nicht automatisch eine Gefahr für den Landeswohlstand dar, wenn langfristige Entwicklungsmöglichkeiten in Betracht gezogen werden.

SUMMARY

Often countries that are left outside a discriminatory trade agreement are concerned that firms in «sensitive» sectors might move out of their borders to relocate their plants to the countries signing the agreement. From the point of view of recent developments in trade theory, this paper assesses to what extent such fears are grounded. «Delocalization» is indeed a threat for discriminated countries but it is not necessarily welfare reducing once long-run growth effects are taken into account.

RESUME

Souvent, les pays qui restent au dehors d’un accord commercial discriminant craignent que les entreprises opérant dans les secteurs «sensibles» ne transfèrent leurs usines dans les pays signataires de l’accord. Cette contribution examine la validité de ces préoccupations en analysant le problème du point de vue des développements les plus nouveaux dans la théorie des échanges commerciaux. La «délocalisation» peut en effet représenter un risque pour les pays discriminés, mais n’entraîne pas nécessairement une réduction majeure de la prospérité nationale, quand les effets à long terme sur la croissance sont pris en considération.