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Abstract

The paper uses a spatial model of endogenous growth to investigate the likely impact of discriminatory integration among two advanced insider countries on their own welfare as well as on the welfare of an outsider transition economy. On the one side, since per capita income level convergence depends on relative market access and local market size, piece-wise integration causes insider-outsider divergence. This phenomenon is exacerbated by slow transition. On the other side, simultaneous exclusion from the integration process and ongoing transition have unpredictable effects on the structural adjustment, which might even exhibit a swinging behavior. Since in practice such swings imply large adjustment costs, careful integration design is required. Under this respect, the asymmetric phasing-out of trade barriers built into the Europe Agreements works in the right direction.

Keywords: trade and monetary integration, economic geography, transition economies.

JEL classification: F15, F31.

1. Introduction

By reducing transaction costs across members of the area, regional agreements of economic and monetary integration, have implications for trade and investment flows, as well as for growth and welfare, both in included and excluded economies.

The implications of preferential trade agreements for the location of economic activity and wealth have been explored in the literature on economic geography both in static (see, e.g., Fujita, Krugman and Venables, 1999) and dynamic models (Ottaviano, 1996; Martin and Ottaviano, 1999). The same models can be naturally extended to gauge the transaction-cost effects of monetary integration in that the adoption of a single currency can be viewed as reducing trade costs and exchange frictions among insiders, with potential externalities and spillovers for residents in other areas (Portes and Rey, 1998). In essence, in those models the equilibrium geographical distribution of economic activities is determined by the interaction between economies of scale, which support the concentration of production in large markets, and trade costs, which incentivate its presence also in small ones (Ottaviano and Puga, 1998). In equilibrium large markets host a more than proportionate share of economic activity. The more so, the lower the trade costs: when the costs of overcoming distance are small, the advantage of locating in large markets gains strength.

The aim of this paper is to build on these insights in order to investigate the likely impact of discriminatory integration among developed insider countries on the welfare of an outsider transition economy. The analysis is carried out in two steps. First, we establish some general results on the absolute and relative welfare of insiders and outsiders before and after integration occurs. In so doing, we abstract temporarily from the transition nature of the outsider. Such nature is explicitly introduced in the second step which focuses on the structural adjustment of an outsider transition economy. In so doing, we model ‘economic

transition' as a removal of production inefficiencies which leads to increased factor productivity and enlarged domestic market size. This way we aim at capturing the process of resource re-allocation away from inefficient (state-owned) economic activities by which transition is customarily modelled (Castanheira and Roland, 1996; Coricelli, 1998).

The paper is in four additional sections. In the next we start presenting a static set-up and establishing general results about the welfare and income effects of regional integration on included and excluded countries. We conclude that, as a consequence of restricted integration, a market-size effect (Helpman and Krugman, 1985) diverts advanced-sector investments away from the outsiders towards the insiders inducing per capita real income in the former to fall below that of the latter. In the outsiders such investment-diversion materializes in the reallocation of productive resources from advanced to traditional sectors and absolute wealth reduction. Hence, the model provides a rationale for structural assistance to mitigate the outsiders' loss. This rationale would be strengthened by the fact that the implied insider-outsider income divergence might also jeopardize future enlargement projects ('self-fullfilling exclusion').

In section 3 we present an endogenous growth model whose steady state corresponds to the equilibrium of the static set-up. Its main message is that, under certain conditions, even if the welfare gains are always larger for insiders than for outsiders, the latter as well can gain in terms of growth and welfare from a process regional integration. The reason is that, through the associated international specialization, the abatement of trade barriers fosters innovation and long-run growth both in integrated and isolated countries. Were this the case, structural assistance would entail a generalized cost in terms of foregone faster growth for all countries involved.

Section 4 uses the model to study the structural adjustment of an outsider which is a transition economy. In order to disentangle the various effects at work, we focus on the clearcut case of an economy which is left out of the regional

agreement before its transition process takes off. The implication is that its structural evolution undergoes two distinct phases. First, when the economy is left out of the integration agreement, we have the effects we have already discussed above: advanced-sector investments are diverted towards the insiders and, whenever growth effects are not strong enough, real income per capita falls. Then, after the transition takes off, some investments flow back and the income gap vis-a-vis the insiders shrinks. Therefore, due to its outsider position, the transition economy initially experiences advanced-sector investment outflows and specialization in traditional sectors, while later, along with successful transition, investments flow back and advanced-sector activities expand again. We show that the asymmetric phasing-out of trade barriers between the integrated area and the transition economy can be used to reduced such structural fluctuations.

Section 5 summarizes the results of the paper. Two are its main insights. On the one side, since per capita income level convergence depends on market access and local market size, piece-wise integration causes insider-outsider divergence. This phenomenon is exacerbated by slow transition. On the other side, simultaneous exclusion from the integration process and ongoing transition have unpredictable effects on the structural adjustment, which might even exhibit a swinging behavior. Since in practice such swings imply large adjustment costs, careful integration design is required. Under this respect, the asymmetric phasing-out of trade barriers built into the Europe Agreements works in the right direction.

Other interesting results of the model can be related to the empirical literature on external developments in transition economies, especially those of Central Eastern Europe. First of all, we find that transition triggers a net inflow of direct investment from the developed region, and that (expected) accession to an integrated area stimulates net direct investment even further (see Landsbury et al., 1996; Lankes and Stern, 1998; Brenton and Di Mauro, 1998; Claessens et

al., 1998). Second, we find that, as a result of successful economic transformation, labor productivity gains and terms-of-trade improvements occur that could lead to real exchange rate (RER) appreciation (see Halpern and Wyplosz, 1997). Finally, in terms of the links among relative prices, direct investment, and productivity gains, we find a direction of causality which differs from the one pointed out by other authors such as Grafe and Wyplosz (1997). While they suggest that RER appreciation, due to the release of pent-up demand for services, *drives* the transition process, in our set-up causality runs in the opposite way *from* the removal of inefficiencies, *to* net direct investment and eventually *to* the terms of trade.

2. Static effects of trade and monetary integration and isolation

We start with examining the welfare effects of the creation of an economic and monetary union (henceforth, EMU) for both included and excluded countries. We define the abatement of trade barriers and the introduction of a single currency as a reduction in the transaction costs within a regional agreement.

The model 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 the literature on 'new economic geography' (Krugman, 1991a,b; Venables, 1998) which formalizes the intuitive argument that, as frictional trade barriers due to the existence of protected national markets go down, one should expect firms in increasing-returns-to-scale sectors to relocate in the biggest national markets ('market-size effect'). Most results in this literature are derived in a simple setting in which firms can choose where to locate between two countries only.

Drawing on previous work by Ottaviano (1996) and Martin and Ottaviano (1999), we address this issue in different terms. First, we adopt a multi-country framework to study the effects of an EMU on the international allocation of

resources. Second, and more important, we move to a dynamic setting in which resources are endogenously accumulated, rather than given forever: this can be relevant when making welfare comparisons both for insiders and outsiders.

We develop a stylized model in which there are two sectors, three countries and two factors, internationally immobile labor and freely mobile capital which is employed where its return is higher. The general result is that, when an EMU is created, return to capital will become higher inside the integrated countries (the 'insiders') with respect to the isolated one (the 'outsider'). This will cause capital to leave the latter in order to be invested in the former. This flow of investment will increase (reduce) the number of factories in the insiders (outsider). The outsider will therefore suffer from 'delocalization'. It will be investigated how, in the presence of localized (or national) technological spillovers, this short term location effect can have relevant effects on the long-run rate of growth as well as on welfare.

For the sake of simplicity, we start from an initial symmetric situation of three identical countries with the same fixed endowments of labor (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 'advanced' good with increasing returns to scale and monopolistic competition. Entry and exit are free in both sectors. Labor enters the production of both goods while capital only that of the advanced good. The traditional sector has a labor unit input requirement equal to one. The differentiated good has a linear cost function: variable costs are paid in terms of labor its unit input requirement being equal to β. Fixed costs are paid in terms of capital whose unit input requirement is equal to one, or in other words 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 good but the scale of production is determined by the input of labor. 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 one-to-one relation between varieties and firms and therefore capital in each country.

Preferences are nested C.E.S. (Dixit and Stiglitz, 1977):

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

where $\sigma > 1$ is the elasticity of substitution between any two varieties and the elasticity of demand for each variety of the advanced 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 expenditure devoted to the differentiated good.

Trade is free in the traditional good while it incurs frictional trade costs in the advanced good. Such costs are modelled following Samuelson (1954) as 'iceberg' costs: to sell a unit of the differentiated good from one country to another more than one unit have to be sent because of transport and other transaction costs (for instance, foreign exchange costs). Let $\tau > 1$ be the number of units to be sent for one unit to arrive from a country belonging to the EMU to the other, and $\tau' > 1$ from (to) a insider to (from) the outsider. It is as if τ-1 (τ'-1) units of the good melt away because of frictions: this 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.

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 global demand of the traditional good cannot be satisfied by a single country alone which is henceforth assumed. Therefore, by choosing labour as the numeraire, the price of the traditional good and the wages will be equal to one in every country. Of course, this result is counterfactual and removes one of the relevant factors affecting firms' location choices. However, this simplification is useful in order to focus on other relevant factors, namely transaction costs and economies of scale.

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

$$p = \frac{\beta\sigma}{\sigma - 1} \tag{2}$$

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 determines the worldwide return to capital, say π, as the residual value of sales after labour costs (i.e. operating profits):

$$\pi = \frac{\beta x}{\sigma - 1} \tag{3}$$

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

From equation (1), a constant share α of expenditure is devoted to the advanced good. Call $E=1+\rho(N/3L)$ the expenditure of a typical resident in any insider country which in equilibrium is also equal to that of a typical resident in the outsider. Then in equilibrium it must be:

$$px = \frac{3}{N}\alpha EL \tag{4}$$

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 variety must be equal:

$$\gamma \equiv \frac{n}{N} = \frac{(1 - 2\delta' + \delta) - \delta'(1 - \delta')}{3(1 - 2\delta' + \delta)(1 - \delta')} \tag{6}$$

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

Equation (6) can be used to shed light on the location effects of an EMU between two of the three 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 the creation of an EMU between two insiders. In this stylized economy the impact of an EMU is modelled as a one-off reduction in the frictional costs of trade between the insiders (due for instance to the participation to an internal market and the adoption of a single currency). Formally, this is equivalent to a reduction in τ and an increase in δ while holding δ' constant, which in turn alters the distribution of firms among countries:

$$\left.\frac{\partial \gamma}{\partial \delta}\right|_{\delta = \delta'} = \frac{1}{3} \left.\frac{\delta'}{(1 - 2\delta' + \delta)^2}\right|_{\delta = \delta'} = \frac{1}{3} \frac{\delta}{(1 - \delta)^2} > 0 \tag{7}$$

Hence, starting from an initial situation where all countries face the same obstacles to trade, a discriminatory liberalization between the two insiders

induces a capital flow from the outsider to the insiders. As a result the number of firms increases in each of the insiders and falls in the outsider. The isolated country suffers from 'delocalization'.

The intuition is the following. As frictional trade costs become smaller in the integrated area, a insider's demand for the 'advanced' products made in the other insider increases while demand in the outsider decreases. More precisely, because of lower transaction costs between the insiders, consumers in both countries will demand more of the now cheaper products of the insider and less of the now more expensive products of the outsider. Insiders are now better export bases for each other than the outsider. On average, consumers have to waste a larger share of expenditure on trade costs when buying varieties made in the outsider country. Viewed from another perspective, given the initial symmetric situation, firms in the insiders will start enjoying higher returns to capital than firms located in the outsider and this, because of free mobility and free entry/exit, induces capital flows from the outsider to the insiders. Firms will be shut down in the outsider to be re-opened in the insiders. By creating a larger integrated market in the presence of increasing returns to scale, piece-wise integration breaks the initial balance of our stylized symmetric world.

As a further comment, it can be noticed that the absolute value of the impact in (7) is decreasing in τ, in τ' and σ. It is decreasing in the trade costs between the insiders because high trade costs make it difficult to supply the insiders' markets from a single location. It is decreasing in the trade costs between the insiders and the outsider because location in the integrated area is less attractive the more difficult it is to supply the isolated country from the integrated area. Finally, it is decreasing in the elasticity of substitution between differentiated 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 σ can also be seen as an inverse index of the equilibrium degree of

returns to scale. Therefore one can read the former result as stating that location in the insiders is more attractive the stronger the returns to scale, namely the larger the cost savings (losses) that would be incurred by firms in the integrated (excluded) market through scale expansion if entry (exit) were not allowed for.

With respect to welfare, integration represents an improvement for the insiders for two reasons. First, even for a given international distribution of the increasing-returns-to-scale sector, insiders pay lower trade costs on each other's products and this is a *direct* cost saving effect. Second, because an EMU shifts plants from the outsider to the insiders, insiders have to import fewer varieties from the outsider and this represents an *indirect* cost saving effect of the EMU. For 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, leading to a fall in real income.

Therefore, this static setting has two strong implications: *first*, per capita real income in the outsider diverges relative to the insiders; *second*, piece-wise integration is always welfare-reducing for the excluded country. However, it can be shown that the latter is not necessarily true when we move to a dynamic setup in which integration not only redistributes *given* resources among countries but also affects the rate of accumulation of resources hence long-term growth.

3. Integration, isolation and long-run growth

To analize the implications for long-run growth, our analytical framework must be enriched to allow for ongoing capital accumulation. We assume that the typical consumer maximizes an intertemporal utility function which is equal to the discounted flow of instantaneous utility. Such instantaneous utility is modelled as a monotone transformation of that in equation (1). Assuming unit elasticity of intertemporal substitution, the intertemporal utility function is:

$$U = \int_0^{\infty} \log D(t)^{\alpha} Y(t)^{1-\alpha} e^{-\rho t} dt \qquad D(t) = \left[\sum_{i=1}^{N(t)} D_i(t)^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}} \tag{8}$$

where, apart from the introduction of the time variable *t* and the rate of time preference ρ, the definitions of the other variables and parameters are the same as before.

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 *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 η divided by the number of local firms of the advanced sector (in other words, the stock of resident capital). To be consistent with the previous analysis we assume that all countries are initially identical.

This specification of the mechanics of accumulation leaves unaltered the instantaneous ('short-run') dimension of the model hence all the above results apply. As to the solution of the dynamics, it can be noticed that this model is essentially an AK-model and therefore 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. In equilibrium, since all the future of this economy is embedded in the initial value of a unit of capital (v_0), to find *g* one has to solve the following system under the assumption of a constant growth rate of *N*:

$$v_0 = \int_0^{\infty} \pi e^{-\rho t} dt \tag{9}$$

$$v_0 = \frac{\eta}{\gamma N_0} \tag{10}$$

$$3EL = 3L + \frac{\rho\eta}{\gamma} \tag{11}$$

The first equation states that the value of the firm is equal to the discounted flow of its operating profits that are given by 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. As in equilibrium all R&D activities concentrate in the larger market because of spillovers, the costs of innovation are decreasing in number of the world firms but according to a factor of proportionality equal to the share of firms in insider countries. The third equation states that total expenditure is equal to total factor income. Together with (3) and (5), these three equations imply that the equilibrium rate of growth of *N* is:

$$g = \frac{3L}{\eta}\frac{\alpha}{\sigma}\gamma - \left(\frac{\sigma - \alpha}{\sigma}\right)\rho \tag{12}$$

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

Equation (12) re-states a standard result (see 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 differentiated good (α) and the degree of increasing returns to scale (a negative function of σ), while it is decreasing in the cost of innovation (η) and the rate of time preference ρ.

Equation (12) also shows the importance of location which is peculiar to our model. All the rest equal, the equilibrium growth rate is *increasing* in γ, the share of industrial firms in a insider country. The reason is the following: because of free trade in the traditional good, wages are the same everywhere, and this makes spillover intensity the only relevant cost dimension for R&D location. Before piece-wise integration takes place, when the frictional trade costs are the same between any two locations, the increasing-returns-to-scale

sector is evenly split among countries. As a result, both the spillover intensity and the cost of innovation are the same in all countries: R&D activities are evenly spread too. After integration occurs, firms relocate to the insider countries. This enhances the spillover in the insiders while reducing it in the outsider: the cost of innovation become lower in the insiders and, as we anticipated before, *all R&D activities concentrate there* because of free entry and exit. Therefore, by inducing spatial concentration of the advanced sector in the insiders, the EMU reduces the global cost of R&D and fosters growth in every region. In reality, one would not expect such a dramatic effect on R&D location; nonetheless, even partial relocation of R&D would not change the basic insight of these results.

Summarizing the findings of this dynamic extension of the model, an EMU causes firms in the advanced sector to move production to insider countries. This enhances the innovation spillover in those countries and makes innovation more costly in the outsider. Consequently, *all* R&D labs move to the insiders. What really matters is that an asymmetric geographical distribution of the 'advanced' sector allows a better exploitation of localized (national) spillovers and lowers innovation costs. From a welfare point of view, the outcome is twofold. On one hand, as it is 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 R&D costs raise the incentive to innovate thus fostering growth in *every* country.

To investigate under which circumstances negative or positive welfare effects will eventually dominate, additional formal analysis is required. The chosen welfare measure is the present value of indirect utility flows in a insider (V) or in the outsider (V^*). 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, we can write V (V*) as:

$$V = \frac{1}{\rho}\ln\left\{\alpha^{\alpha}(1-\alpha)^{1-\alpha}\left(1+\rho\frac{\eta}{\gamma N_0}\frac{H_0}{L}\right)\left(\frac{\sigma-1}{\beta\sigma}\right)^{\alpha} N_0^{\frac{\alpha}{\sigma-1}}\left[(1+\delta)\gamma+\delta'(1-2\gamma)\right]^{\frac{\alpha}{\sigma-1}} e^{\frac{\alpha g}{\rho(\sigma-1)}}\right\}$$

(13)

$$V^* = \frac{1}{\rho}\ln\left\{\alpha^{\alpha}(1-\alpha)^{1-\alpha}\left(1+\rho\frac{\eta}{\gamma N_0}\frac{H_0^*}{L}\right)\left(\frac{\sigma-1}{\beta\sigma}\right)^{\alpha} N_0^{\frac{\alpha}{\sigma-1}}\left[2\delta'\gamma+(1-2\gamma)\right]^{\frac{\alpha}{\sigma-1}} e^{\frac{\alpha g}{\rho(\sigma-1)}}\right\}$$

(14)

where H_0 and H^*_0 are initial endowments of capital owned by residents in each country which are necessary to start the innovation process. By hypothesis H_0 and H^*_0 take the same value (so that $N_0 = 3H_0$) because this guarantees that individual expenditure E is the same across countries as we previously assumed (for further details, see Martin and Ottaviano, 1999). Differencing with respect to ### in an initial situation of perfect symmetry in which $\tau=\tau'$ so that $\delta=\delta'$:

$$\frac{\partial V}{\partial \delta} = \frac{1}{\rho}\left[-\frac{3\rho\eta}{[L+\rho\eta]}\frac{\partial\gamma}{\partial\delta}+\frac{\alpha}{\sigma-1}\frac{1}{1+2\delta}+\frac{\alpha}{\sigma-1}\frac{3(1-\delta)}{1+2\delta}\frac{\partial\gamma}{\partial\delta}+\frac{3\alpha^2 L}{\eta\sigma\rho(\sigma-1)}\frac{\partial\gamma}{\partial\delta}\right] \quad (15)$$

$$\frac{\partial V^*}{\partial \delta} = \frac{1}{\rho}\left[-\frac{3\rho\eta}{[L+\rho\eta]}\frac{\partial\gamma}{\partial\delta}-\frac{\alpha}{\sigma-1}\frac{6(1-\delta)}{1+2\delta}\frac{\partial\gamma}{\partial\delta}+\frac{3\alpha^2 L}{\eta\sigma\rho(\sigma-1)}\frac{\partial\gamma}{\partial\delta}\right] \quad (16)$$

where we substituted for g taking account of equation (12).

The four terms on the right hand side of the insider expression are respectively: (i) the 'firm's value effect' by which relocation in the presence of spillovers affects the value of the initial stock of capital; (ii) the (direct) 'trade cost effect' by which integration reduces the prices of imported varieties from the insider for a given spatial distribution of firms; (iii) the 'relocation effect' by which, for given prices, integration shifts firms to the insider countries decreasing their

price indexes while increasing the outsider's; (iv) the 'growth effect' by which integration through relocation affects the speed of invention. In the case of the outsider, the terms are respectively: (i) the firm's value effect; (ii) the negative relocation (or 'delocalization') effect; (iii) the growth effect. As already argued, the outsider is not *directly* affected by a trade-cost reduction between the insiders.

Equations (15) and (16) are cumbersome. Nonetheless two important results can be readily assessed. First, since $\partial V/\partial\delta > \partial V^*/\partial\delta$, if an EMU is welfare-improving for the outsider then it is has to be welfare-improving for the insiders as well. Therefore, it is always the insiders that gain more from an EMU. Second, all the rest being constant, the outsider gains at the margin if the initial level of trade frictions (τ) is low enough and if returns to scale are strong enough (low σ): under such circumstances the impact of an EMU on the location of firms is strong but, because of low trade costs, the related welfare losses for the outsider are limited. Moreover, independently from value of τ, when σ is low the impact of relocation on growth is strong too. Consequently the overall effect of an EMU on the outsider's welfare *can* be positive.

Despite the possibility that also the outsider gains in terms of welfare from the creation of an integrated area, it always loses in *relative* terms with respect to members of the trade and monetary union. This is true both of welfare and real income: therefore, as stated in section 2, this model predicts *absolute* divergence in per capita income between insiders and outsiders. We explore in the next section the possibility of mitigating the outsider's income loss due to piece-wise integration, hence of improving the prospects of the excluded region in relative terms (namely, in terms of convergence of per capita real income). In particular, we focus on the case of a 'transition' economy.

4. Location and terms-of-trade effects of economic "transition"

In this section we extend our framework to encompass the case where the outsider is a 'transition' economy. We showed in sections 2 and 3 that, although it may gain in absolute terms if spillovers are strong enough and trade barriers not too high, an outsider always loses relative to insiders in terms of per capita income levels. This has potentially heavy consequences as it suggests that piece-wise integration generates divergence between insiders and outsiders: this makes the future accession of an outsider more problematic, as a further enlargement could involve a larger redistribution of income or welfare between old insiders and newcomers. We draw on these intuitions to investigate the special case of a transition economy which is left out of the EMU; in particular, we study how the advancement of transition affects the geographical distribution of economic activities, the outsider's terms of trade, and the income gap between the insiders and the outsider. A 'transition economy' (TE) is defined as an economy where poor enforcement of property rights, high administrative and bureaucratic costs, and widespread corruption abate average labor productivity; the 'transition process' involves the removal of these obstacles to the rise of labor productivity. This definition builds on the traditional modelling of transition as a process of resource reallocation from state-owned to private enterprises (see, among others, Castanheira and Roland, 1996; and Coricelli, 1998, chapter 3) while it departs from Halpern and Wyplosz (1997, p.438-39) who suggest that, due to poor quality and marketing, domestically produced tradables are sold at a discount on world markets. More specifically we assume that, because of inefficiencies and rent-seeking activities, unit labor productivity is proportionally smaller in TEs relative to market economies in both productive sectors. Successful transition leads to the progressive removal of this sort of inefficiencies, which is equivalent to assume that the *size* of the workforce in the TE (L^{TE}) is initially curbed relative to the

potential that could be attained if all distortions were eliminated. In other words, *L* now measures efficiency units instead of the mere number of workers. Equation (17) shows that successful transition, through its effect on efficiency hence on the size of a TE, leads to a new distribution of firms with more varieties of the differentiated good now produced in the outsider TE:

$$\frac{\partial \gamma}{\partial L^{TE}} = -\frac{1+\delta-2(\delta')^2}{(1-\delta')(1+\delta-2\delta')}\left[\frac{L^{INS}}{\left(2L^{INS}-L^{TE}\right)^2}\right] < 0 \qquad (17)$$

where L^{INS} is the size of an insider economy. This in turn implies that per capita real income increases in the outsider *beyond* the rate involved by the pure efficiency gain: in other words, the transition process involves faster convergence of the TE in this model with respect to a 'benchmark' situation of non-increasing-returns-to-scale technologies. This is due to the enlargement of the domestic market that triggers capital inflows and a relocation of firms in the 'advanced' sector. The marginal impact on the *growth rate* could be negative in the case of localized spillovers because production in the advanced sector is more dispersed after transition is completed; nonetheless, welfare improves in the TE provided the discount rate is large enough (see equations 14 and 15).

Interestingly, in our model the increase in per capita income occurs along with an improvement in the *terms of trade* of the TE, which is a feature of the post-1989 experience of the most successful among Central Eastern European countries. Notice that the outsider is a *net exporter* of the traditional good, and a *net importer* of the differentiated good: the relative price of this two sets of products then represents the outsider's 'exact terms of trade', in analogy with the concept of 'exact price index' mentioned above. Taking the price of the traditional good as fixed, a decline in the price of the differentiated good in the outsider corresponds to an *improvement* in its terms of trade, and viceversa.

Let us define the outsider's "exact" terms of trade (Φ*) as:

$$\Phi^* = \left(\frac{p_T}{p_{DG}^*} \right) \quad . \tag{18}$$

After controlling for the secular decline in the price of advanced goods due to the introduction of new varieties, the 'exact' price of the basket of differentiated goods in the outsider, evaluated in the neighbourhood of the pre-transition equilibrium location of firms, is given by:

$$p_{DG}^* = \left[\; 2\delta \; '\gamma + (1 - 2\gamma) \; \right]^{\frac{1}{1-\sigma}} \quad . \tag{19}$$

Then, one can check that the outsider's terms of trade *improve* as γ declines:

$$\frac{\partial \Phi^*}{\partial \gamma} = 2\left(\frac{1}{\sigma - 1} \right) \left[\; 2\delta \; '\gamma + (1 - 2\gamma) \; \right]^{\frac{-\sigma}{\sigma-1}} (\delta \; ' - 1) < 0 \quad . \tag{20}$$

Hence, the improvement in Φ* is a side-effect of the rise in the share of firms producing differentiated goods which decide to relocate in the outsider as the transition process occurs. This in turn suggests that fastening the transition process can be a remedy against exclusion from the EMU, as it enlarges the outsider's domestic market, triggers direct investment from abroad in the advanced sector and reduces the TE's income gap vis-a-vis the insiders. A possible drawback is that the global growth rate may diminish in the case of localized (national) innovation spillovers. In any case, per capita real income convergence of the excluded TE occurs and it is faster than what the mere efficiency gains indicate.

The above results show how the structural changes induced by the exclusion from the integration process are later (partially) reversed by successful transition. Therefore, if structural adjustment is costly, resources are wasted

along the way. We argue that the asymmetric phasing-out embodied in the Europe Agreements provides an effective way to control for that waste. By those agreements, transition economies are allowed to remove their trade barriers with the EU at a slower pace than EU members commit to do with them. In terms of our model, it is readily shown that asymmetric phasing-out reduces capital outflows from the transition economy and therefore the extent of structural adjustment.

The easiest way to convey the message is to consider an initial situation where all countries have the same size ($L^{TE}=L^{INS}$) and insiders unilaterally lower their external barriers from τ' to τ''. For a marginal change, the impact is the following:

$$\left.\frac{\partial\gamma}{\partial\delta''}\right|_{\delta''=\delta'} = -\frac{1}{3}\frac{1+\delta}{(1+\delta-2\delta')^2} < 0 \qquad (21)$$

and its negativity reveals that asymmetric phasing-out indeed reduces the capital outflows from the outsider triggered by piece-wise integration.

An effective way to convey this idea is embodied in Fig. 1. It depicts the share of firms located in an insider economy (γ) as a function of time. Time covers a period during which the outsider undergoes three major events: exclusion from an EMU, subsequent accession, and transition. For the sake of neatness and of some wishful realism, the three events are shown to happen sequentially and the time span is artificially divided in three corresponding subperiods: piece-wise integration comes first, transition follows and enlargement concludes. The solid curve depicts the evolution of γ through the three subperiods. It shows that the share of firms in an insiders first goes up due to piece-wise integration, thus exhacerbating the initial discrepancy between the insiders and the outsider. Then, as the transition process takes off, the gap is reduced and eventually it disappears as a consequence of enlargement. The dotted curves represent two

possible paths that the adjusment might follow under asymmetric phasing-out (a.p.o.). The lower curve is attained for wider gaps between insiders' and outsider's import duties. Such curves show how asymmetric phasing-out can be used to manage wasteful swings along the process of structural adjustment.

6. Concluding remarks

We have shown that, due to investment diversion, piece-wise integration leaves outsiders in a worse position than insiders. Although even the excluded country can gain in absolute welfare terms - if the growth effects of integration are strong and insider-outsider trade costs are low - this is nonetheless associated with per capita income divergence, which might make it more difficult for the outsider to join in at a later stage ('self-fulfilling exclusion').

When the excluded country is a transition economy, we have shown that the removal of inefficiencies enlarges the size of the isolated economy, attracts direct investments and reduces the insider-outsider income gap. Of course, the interpretation of this finding must be careful: for instance, whenever the transition process involves a peak in the rate of unemployment, the size of the economy may actually shrink before enlarging so that our results could be initially reversed (Castanheira and Roland, 1996; Coricelli, 1998). Thus, simultaneous exclusion from the integration process and ongoing transition have unpredictable effects on the structural adjustment, which might even exhibit a swinging behavior. Since in practice such swings imply large adjustment costs, careful integration design is required. Under this respect, the asymmetric phasing-out of trade barriers built into the Europe Agreements seems to work in the right direction.

Other interesting results of the model can be related to the literature on the external developments of TEs, especially in Central Eastern Europe. First, we have found that transition triggers a net inflow of direct investment from the

integrated developed region. This seems to be consistent with the empirical literature on Central Eastern Europe, which shows that direct investment from the European Union has been disproportionately directed towards successful transition countries where the dimension of the domestic market has grown (see Landsbury et al., 1996; Lankes and Stern, 1998; Brenton and Di Mauro, 1998). The model also formalizes the idea that accession in an integrated area stimulates net direct investment: in fact, a common finding of the empirical literature on direct investment in TEs is that *even* perspective EU accession raises capital inflows (Claessens et al., 1998; Lankes and Stern, 1998).

Second, as far as the terms of trade are concerned, Halpern and Wyplosz (1997, p.455) argue that, as a result of successful economic transformation, labor productivity gains and terms-of-trade improvements have been amongst the channels of real exchange rate (RER) appreciation in transition countries. While their argument rests on quality and marketing improvements, we have shown that a similar effect arises due to the location implications of increasing returns and trade costs.

Third, in terms of the links among relative prices, direct investment, and productivity gains, our model stresses a direction of causality which differs from the one pointed out by Grafe and Wyplosz (1997). While for those authors RER appreciation, due to the release of pent-up demand for services, *drives* the transition process - defined as the re-allocation of labor from the inefficient state sector to newly established private firms, in our set-up causality runs in the opposite way *from* the removal of inefficiencies, *to* net direct investment and eventually *to* the terms of trade. In Grafe and Wyplosz (1997), RER appreciation raises the real wage in a TE and therefore progressively crowds out the state sector (what the authors call a “reverse Balassa-Samuelson effect”); here it is the removal of pre-transition inefficiencies that triggers net direct investment in the increasing-returns-to-scale sector. This matches the general observation that economic and political distortions seem to affect the

allocation of foreign capital to transforming economies (see, e.g., Manzocchi (1999), chapter 6). Net investment in the advanced sector, in turn, yields a terms-of-trade improvement which is consistent with a tendency towards RER appreciation, although in this paper we do not elaborate further on this point.

Future research should build on the complementarity between these two visions of the links among relative prices, direct investment, and productivity gains in transition: for instance, improvements in property rights enforcement or in anti-corruption provisions can lead to foreign investment and to a rise in the terms of trade, and this in turn may crowd out production units in the public sector (a sort of virtuous transition circle).

References

Brenton P. and F.Di Mauro (1998), *The potential magnitute and impact of FDI to CEECs*, CEPS working document n.116, CEPS, Brussels.

Castanheira M., G. Roland (1996), The optimal speed of transition: a general equilibrium analysis, *CEPR Discussion Paper 1442*, London: Center for Economic Policy Research.

Coricelli F. (1998), *Macroeconomic policy and the development of markets in transition economies*, Central European University Press, Budapest.

Claessens S., D. Oks, R. Polastri (1998), *Capital flows to Central and Eastern Europe and the former Soviet Union*, Policy research working paper n.1976, World Bank, Washington.

Dixit A., J. Stiglitz (1977), Monopolistic competition and optimum product diversity, *American Economic Review*, 67 (2), pp 297-308.

Fujita M., P. Krugman, A. Venables (1999), *The Spatial Economy: Cities, Regions and International Trade*, MIT Press, Cambridge MA, forthcoming.

Grafe C., C. Wyplosz (1997), The real exchange rate in transition economies, *CEPR Discussion Paper 1773*, London: Center for Economic Policy Research.

Grossman G., E. Helpman (1991), *Innovation and Growth in the World Economy*, MIT Press, Cambridge MA.

Halpern L., C. Wyplosz (1997), Equilibrium exchange rates in transition economies, *IMF Staff Papers*, 44, 430-61.

Helpman E., P. Krugman (1985), *Market Structure and Foreign Trade*, MIT Press, Cambridge MA.

Krugman P. (1991a), *Geography and Trade*, MIT Press, Cambridge MA.

Krugman P. (1991b), Increasing returns and economic geography, *Journal of Political Economy*, 99, 483-499.

Lankes H.P. and N. Stern (1998), *Capital flows to Eastern Europe and the former Soviet Union*, EBRD working paper n.27, European bank for reconstruction and development, London.

Lansbury M., N. Pain, K. Smidkova (1996), FDI in Central Europe since 1990: An Econometric Study, *National Institute Economic Review*, May, 104-14.

Manzocchi S. (1999), *Foreign capital in developing economies. Perspectives from the theory of economic growth*, Macmillan, Houndmills.

Martin P., G.I.P. Ottaviano (1999), Growing locations: industry location in models of endogenous growth, *European Economic Review*, 43, 281-302.

Ottaviano G.I.P. (1996), The location effects of isolation, *Swiss Journal of Economics and Statistics*, 132, 427-440.

Ottaviano G.I.P., D. Puga (1998), Agglomeration in the global economy: a survey of the "new economic geography", *The World Economy*, 21, 707-731.

Portes R., H. Rey (1998), The emergence of the Euro as an international currency, *Economic Policy*, 26, 307-343.

Samuelson P. (1954), The transfer problem and transport costs, II: Analysis of effects of trade impediments, *Economic Journal*, 64, 264-289.

Venables A. (1998), The assessment: trade and location, *Oxford Review of Economic Policy*, 14, 1-5.