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The Geography of Multi-Speed Europe

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The Geography of Multi-Speed Europe

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Gianmarco Ottaviono

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RESUME

L'intégration économique en Europe est de fait devenu un processus multi-vitesses. Pour les Pays d'Europe Centrale et Orientale (PECO), cela résulte du défi d'intégrer jusqu'à vingt-cinq pays se situant à des niveaux de revenus très différents, sans pour cela arrêter l'approfondissement de l'intégration. La différenciation prévaut aussi pour le processus d'unification monétaire, pour lequel les conditions permettant à un pays d'être dans le premier groupe ont été définies dans le Traité de Maastricht. Les conséquences de cette nouvelle dimension temporelle et séquentielle de l'intégration régionale ne sont pas très bien comprises. Une des questions les plus intéressantes est de savoir si l'existence de différentes vitesses d'intégration peut avoir un impact sur les caractéristiques de long terme de cette intégration.

Notre papier examine cette question du point de vue de la localisation des activités économiques. Notre objectif est d'utiliser les outils de la "nouvelle géographie", pour décrire l'impact possible d'une approche multi-vitesses sur le choix de localisation des industries et donc sur la géographie de long terme des activités économiques en Europe. Nous utilisons un modèle à trois pays où deux pays riches identiques décident d'intégrer leurs économies et d'exclure de manière temporaire un troisième, plus pauvre. Les questions que nous posons sont les suivantes : une approche multi-vitesses permettra-t-elle d'éviter la concentration des activités dans le noyau dur de l'Europe ou au contraire peut-elle la précipiter ? La période de transition, pendant laquelle le pays pauvre est exclu de la région intégrée, est-elle nécessaire pour empêcher une délocalisation massive des industries vers le noyau dur riche jusqu'à ce que le différentiel de revenu ait suffisamment diminué ? Ou, au contraire, peut-elle être à l'origine du phénomène d'agglomération ? Les réponses à ces questions sont importantes parce qu'elles déterminent en partie si l'intégration à l'UE des pays tels que les PECO doit avoir pour condition préalable une diminution du différentiel de revenu, ou si l'imposition d'une telle condition est perverse parce que la transition imposée va générer un phénomène d'agglomération dans le noyau dur de l'Europe, et donner lieu une divergence de revenu, et donc obligera à différer indéfiniment l'intégration de ces pays.

Pour répondre à ces questions nous utilisons un modèle dans lequel l'histoire a un rôle essentiel comme déterminant de la géographie de long terme. Nous modélisons le différentiel de revenu entre les pays riches, d'une part, et le pays pauvre, d'autre part comme une différence des dotations de capital humain. L'intégration est caractérisée par l'élimination des coûts de transaction. Nous distinguons deux scénarios; dans l'un, les mécanismes d'agglomération ne peuvent se mettre en place pendant la période de transition, dans l'autre ils le peuvent. Dans notre modèle, la source du mécanisme d'agglomération est la migration du capital humain.

Lorsque les mécanismes d'agglomération ne peuvent se mettre en place pendant la phase de transition, les "entrepreneurs" (les détenteurs du capital humain) peuvent choisir où implanter leurs entreprises mais ne peuvent eux mêmes émigrer. Nous montrons que lorsque deux des trois pays diminuent entre eux leurs coûts de transaction, le pays exclu sera toujours confronté à une délocalisation de ses activités vers la zone intégrée quelques soient les différentiels de revenus. Lorsque les coûts de transaction sont réduits dans la zone intégrée, les deux pays qui appartiennent à cette zone deviennent en effet une meilleure base d'exportation l'un vers l'autre que le pays exclu. Du point de vue de la localisation des activités économiques, le pays exclu préférerait que cette intégration régionale n'ait jamais eu lieu.

Cependant, cela n'implique pas que le pays exclu devrait insister pour entrer le plus tôt possible. En effet, lorsque les coûts de transaction sont diminués, l'effet sur la localisation des activités économiques du différentiel de revenu est amplifié. Si ce pays rejoint l'aire intégrée, les entreprises choisiront de se localiser près des marchés les plus riches qui sont dans le noyau dur. Si la période de transition est une période de convergence des revenus, l'approche multi-vitesses a l'avantage de permettre au pays "périphérique" de rejoindre la zone intégrée lorsque le différentiel de revenu n'est pas trop important et permet ainsi d'éviter une délocalisation massive vers le noyau dur

Cette conclusion est renversée lorsque un mécanisme d'agglomération peut se déclencher. En effet, lorsque les entrepreneurs peuvent émigrer, les revenus ne sont plus fixes géographiquement si bien que l'exclusion temporaire du pays pauvre peut entraîner l'agglomération des activités dans le noyau dur pendant la transition. Nous montrons que la période de transition, pendant laquelle le pays pauvre est exclu, peut conduire à l'agglomération du secteur à rendements croissants dans les pays riches intégrés, générant ainsi une divergence de revenus. Cela est possible même si la convergence entre les deux groupes de pays était en cours avant l'intégration entre les pays du noyau dur. Cette possibilité est ce que nous appelons "l'effet d'agglomération" d'une intégration multi-vitesses. Si la longueur de la période de transition dépend de la convergence des revenus, le pays "temporairement" exclu pourrait ainsi ne jamais être intégré. Nous analysons en détail comment ce scénario pervers dépend des paramètres du modèle.

Les implications de politique économique découlent naturellement de ces résultats. Si les gouvernements ne croient pas que la migration du capital humain et plus généralement les mécanismes d'agglomération sont significatifs en Europe, une approche multi-vitesses est avantageuse puisque dans ce cas, les différentiels de revenus sont le principal déterminant des choix de localisation des entreprises. En revanche, dans le cas où les mécanismes d'agglomération peuvent se mettre en place, cette approche est dangereuse puisque l'attractivité du noyau dur pendant la période de transition est cumulative et ne peut jamais être inversée. Si l'on considère le mécanisme d'agglomération comme un mécanisme de long terme, notre modèle suggère donc une base théorique au point de vue de bon sens selon lequel la période de transition avant l'intégration des pays périphériques ne devrait être ni trop courte ni trop longue.

SUMMARY

Economic integration in Europe has de facto become a multi-speed process. For the Central and Eastern European Countries (CEECs), this has come as a response to the challenge of integrating possibly twenty-five countries with very different income levels without halting altogether the deepening of integration. This is also the case for the process of monetary unification for which the conditions for being in the fast track group have been defined in the Maastricht Treaty. We do not know much of the effect of this new dimension of time and sequentiality in regional integration. One of the most interesting questions is whether the existence of different speeds of integration can have an impact on the long term characteristics of this integration.

Our paper looks at this question from the point of view of location of economic activities. Our objective is to use the tools of the "new geography", in order to describe the possible impact of a multi-speed approach to integration on the location choice of industries and therefore on the long term geography of economic activities in Europe. We use a three-country model where two identical rich countries decide to integrate their economies and leave a third, poorer, country temporarily outside. The questions we ask are the following: if the concentration of economic activities in the core of Europe is a concern to policy makers, will a multi-speed approach help alleviate this problem or will it exacerbate it? Is the transition period, during which the poor country is excluded from the integrated area, necessary to avert massive relocation to the rich core until the income gap has sufficiently decreased? Or, on the contrary, will this transition period increase the risk of agglomeration in the rich countries of the core? The answers to these questions are important because they partially determine whether the integration of the outside countries (in particular the CEECs) should be conditioned on a decrease of the income gap or whether the imposition of such condition is perverse because the imposed transition period will generate agglomeration in the core, income divergence and therefore the indefinite postponement of complete integration.

To answer these questions, we use a stylised model in which history is given a strong role as a determinant of long term economic geography. We model the income gap between the two rich countries and the poor country as a difference in the endowment of human capital or « entrepreneurs » who also are the mobile factor. Integration is characterised by the elimination of transaction costs. We distinguish between two scenarios: one where agglomeration economies can not set in during the transition period and one where they can. In our model, the source of agglomeration forces is migration of human capital. However, we could as well have modelled agglomeration as arising from vertically linked industries.

When agglomeration economies can not set in during the transition because migration is not allowed, then «entrepreneurs» (the owners of human capital) can choose where to locate their plants but cannot migrate themselves. We show that when two out of the three countries lower their transaction costs, the excluded country will always face relocation of its firms towards the integrated area. This is true whatever the income differential between the countries: as the transaction costs are lowered in the integrated area, both integrated countries become a better export base to each other than the excluded country. Hence, from the point of view of location of economic activities, the excluded country would prefer that regional integration in the core had never happened. This does not readily imply that the excluded country should insist to enter as soon as possible. This is because, as transaction costs are lowered, the income gap effect will be reinforced as a determinant of industry

location. If it joins the integrated area, firms will relocate in the richest markets which are in the core. If the transition period is associated with income convergence, then a multi-speed approach may be a good idea: it enables the « periphery » country to join the integrated area at a time where the income differential is not too large and does not generate massive relocation to the core countries. The transition period is then characterised by relocation of firms from the core to the periphery.

This conclusion is reversed when agglomeration economies can set in. This is because, when we let entrepreneurs free to migrate, incomes are not fixed geographically so that the temporary exclusion of the poor country may trigger agglomeration in the rich integrated core during the transition. We show that the transition period, during which the poor country is excluded, can induce the agglomeration of the increasing returns sector in the rich integrated countries, causing divergence in terms of incomes between the core and the periphery. This may occur even though convergence between the rich and poor countries was taking place before integration among the first track countries. We call this the « agglomeration effect » of multi-speed integration. If the length of the transition period itself is conditioned on income convergence, the country « temporarily » excluded may never be able to be integrated. We analyse in detail how this perverse scenario depends on the parameters of the model.

The policy implications follow naturally. If policy makers do not believe that migration of human capital and more generally agglomeration economies can set in, then a multi-speed approach to integration makes sense because income differentials between countries are the main determinant of industry location. However, if agglomeration can set in, this approach is dangerous because the attraction of the core during the transition period when the poor country is excluded is cumulative and may never be reversed. If we think of agglomeration as a long-term phenomenon, our model then suggests some theoretical ground for the common sense view according to which the transition period before integration of the periphery countries should not be too short but it should not be too long either.

THE GEOGRAPHY OF MULTI-SPEED EUROPE

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I. INTRODUCTION

The emergence of the new democracies of Eastern Europe has obliged to rethink the process of regional integration in Europe. This is all the more urgent because of the acceleration of the integration process itself in Western Europe. The challenge comes from the difficulty to integrate possibly twenty-five countries with very different income levels without halting altogether the deepening of integration. *De facto*, the answer has been a programme of differentiated or flexible integration with different "speeds" or "circles". This is also true for the process of monetary unification. The convergence criteria described in the Maastricht Treaty have created two - or more - groups of countries: those which can hope to join the monetary union when it is created and those whose entry will be delayed at a future uncertain date. The exact form which "multi-speed" integration (both in the monetary domain and for the integration of the Central and Eastern European countries to the E.U.) will take is far from clear. This is so in particular because the different E.U. members differ in their position on the question and in their aims, both official and hidden[3].

This new dimension of time in regional integration has been studied in the political economy literature by Alesina and Grilli (1994) and Martin (1994 and 1995). These papers show that a sequential approach to monetary or trade integration may endanger the very process of integration. Alesina and Grilli look at the question of monetary integration. In their model, the low inflation countries, once they have created a European Central Bank, will have no incentive to invite the high inflation countries. In Martin, countries which have been excluded early on (the high inflation countries in the case of monetary integration or the countries with lower income in the case of trade integration) may have in the long term an incentive to free-ride on the integrated zone. In these papers, sequential integration may endanger the process of integration because of the strategic aspects sequentiality generates.

Our paper will look at this question from a different point of view. Our objective is to use the analytical tools of the "new geography" (Krugman, 1991a) to describe the possible impact of a multi-speed approach to integration on the geography of economic activities in Europe. We look at the impact of integration among a core of rich countries on a country which is excluded from the early integration process because of its lower income. To analyse this question, we use a three-country model where two identical rich countries decide to integrate their economies and leave a third, poorer, country temporarily outside. In our model, a country is rich if it has a higher endowment of human capital (entrepreneurs). We think of integration as describing either monetary integration or trade

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[3] On this debate, see in particular, Baldwin (1994) and Pisani-Ferry (1995).

integration of countries to the E.U., which, in both cases, translates into a decrease in transaction costs. We ask the question whether more economic activity is displaced from the excluded country if it stays at the periphery during the transition period or whether the initial income differential can lead to a larger loss of economic activities in an early integration scheme. The answer to this question crucially depends whether agglomeration economies can set in during the transition period when the poor country is excluded. In our model, an agglomeration process can set in if we allow for migration of human capital. One way to think about these two alternatives is to interpret the equilibrium without agglomeration economies as describing a medium term scenario or one where the transition period during which the poor country is excluded is not too long. We will interpret the equilibrium with agglomeration economies as describing a multi-speed integration process for which the transition period is very long and migration is a significant factor.

In the absence of agglomeration economies, because incomes are fixed geographically, the role of income differentials at the time of integration is key in determining industry location in the long term. This is why, if the poor country is excluded from the first track, a long transition period, during which income differentials converge exogenously, may be called for to avert industry concentration in the core countries.

When we consider the possibility of agglomeration economies, the analysis becomes more complex since the timing of integration alters the dynamic properties of the system. In a two-country setting, Krugman (1991a) shows that agglomeration economies can arise when allowing for factor migration in the presence of low transaction costs, strong returns to scale and a large share of expenditures devoted to the goods produced with increasing returns to scale. In another paper, Krugman (1993) argues that considering three countries instead of two adds a new dimension to the location problem of firms. If a country can supply the other two at a lower transaction cost, it will become a better transaction hub and thus a better export base for firms ("hub effect"). We build on both results to illustrate how the timing of integration among three countries interacts with the insurgence of agglomeration economies in the core or in the peripheral countries[4]. We identify necessary conditions for firms to agglomerate in a single location and show how these conditions are affected by multi-speed integration. We show that, for certain sets of parameters values, agglomeration in the integrated core is a stable long-run equilibrium while agglomeration in the periphery is not. So, when agglomeration economies are present, a "perverse" scenario may occur: the transition period during which the "peripheral countries" are excluded may trigger complete agglomeration in the core countries. In such a case, the poor country should insist to be integrated as soon as possible. We also analyse how this result depends on the other parameters in the model i.e. the expenditure share of the differentiated good and the degree of returns to scale.

Section II presents the model which is common to the whole paper. In section III, we analyse the different types of integration when agglomeration economies, or migration, do not set in. In section IV and V, we look at the same question with the possibility of agglomeration economies. Section VI concludes.

[4] Puga and Venables (1995) analyse how preferential trading aggreements affect the location of industries in a model where agglomeration forces arise from vertically linked industries rather than from migration. Baldwin and Venables (1993) study how the nature of the transition in the CEECs, and in particular how it affects factor mobility, can influence the nature of the long-term equilibrium.

II. THE MODEL

The model is a variant of Flam and Helpman (1987), Krugman (1991b) and Martin and Rogers (1995b). There are three countries, A, B and C. We will assume throughout the paper that A and B are identical. We first describe the behaviour of consumers and firms in only one country as it is symmetric in the other countries. The subscripts A, B and C denote the variables for each of the three countries. Consumers are of two types: workers and entrepreneurs. In all countries, a typical consumer (whether a worker or an entrepreneur) chooses from a menu of goods to maximise the utility function:

$$U = D \quad Y^{1-} \tag{1}$$

Y will be the numeraire good and D is a composite good made up of a number of differentiated products:

$$D = \left[\sum_{i=1}^{N} D_i^{1-1/} \right]^{1/(1-1/\ )} , \quad > 1 \tag{2}$$

N is the total number of differentiated goods produced in the world. This total will turn out to be fixed by initial endowments of human capital, but the location of firms will be determined in equilibrium.

Consumers in country A chooses D_i and Y to maximise (1) subject to the budget constraint:

$$\sum_{i=1}^{n_A} p_i D_{iA} + \sum_{j=n_A+1}^{n_A+n_B} p_j D_{jA} + \sum_{k=n_A+n_B+1}^{N} ' \, p_k D_{kA} + Y_A = i_A \tag{3}$$

where $N = n_A + n_B + n_C$, and n_A, n_B, and n_C are the respective numbers of differentiated goods produced in countries A, B and C. "i" is individual income.

We have allowed in equation (3) for transaction costs (τ and τ') in Samuelson's iceberg form, so that some of each of the differentiated goods melts away in transit: only $1/\tau < 1$ of a good produced in B is available for consumption in A and vice-versa; only $1/\tau' < 1$ of a good produced in C is available for consumption A or B and vice-versa. Economic integration, whether in the trade or in the monetary domain, will affect these transaction costs[5].

As in Martin and Rogers (1995b), the differentiated products are produced with identical technologies that use two factors of production, capital and labour. For reasons that will become clearer in section IV of the paper, we interpret capital here as human capital and capital owners as entrepreneurs. One unit of human capital is required to produce one variety of good. Thus, the total number of varieties is fixed through the endowment of entrepreneurs. One way to interpret this is that one ‘idea’ or innovation is required to produce a different variety and that entrepreneurs are each endowed with a

[5] Note that,as usually assumed in this literature, there are no transport nor transaction costs on good Y which is introduced to tie down the wage rate.

different 'idea'. There are H_A, H_B, and H_C entrepreneurs respectively in countries A, B, and C[6]. Each good also has a unit labour cost of β and the wage is w. As workers are mobile in the two sectors, the wage will be identical in the two sectors. The choice of p_i that maximises profits obeys the standard rule in monopolistic competition: $p_i = w\beta\sigma/(\sigma-1)$. With the appropriate choice of β, the price of all differentiated goods is set to w. In equilibrium, $w\sigma/(\sigma -1)$ is the ratio of average cost to marginal cost, so that, as in Krugman (1991b), σ can be interpreted as an inverse index of equilibrium economies of scale. Rents to human capital equal the difference between revenues and labour costs: $r_i = wx_i - w\,\beta\, x_i = (wx)/\sigma$ where x_i is production of each differentiated good which will turn out to be identical for all varieties.

Good Y is produced under constant returns to scale, using only labour as an input. It takes one unit of labour to produce one unit of Y. Since Y is the numeraire, profit maximisation implies that w=1.

There are L workers in each of the three countries. Workers each inelastically supply one unit of labour and entrepreneurs' income is r, so that aggregate income in country A is: $I_A = L + r_A H_A$.

Solving the first order conditions for the consumers, we get that consumer demands in country A are:

$$D_{iA} = \frac{i_A}{n_A + n_B + n_C} \tag{4a}$$

$$D_{jA} = \frac{i_A}{n_A + n_B + n_C} \tag{4b}$$

$$D_{kA} = \frac{i_A}{n_A + n_B + n_C} \tag{4c}$$

$$Y_A = (1 -)\, i_A \tag{4d}$$

where $= {}^{1-} < 1$, and $'$ is defined analogously.

III. THE EQUILIBRIUM WITHOUT AGGLOMERATION ECONOMIES

We first analyse the impact of multi-speed integration on geography in a model where entrepreneurs can sell their ideas abroad (through patents for example) but do not move abroad[7]. Hence, the location of firms is free (ideas can travel costlessly) but the rents to

[6] $H_A = H_B$ as we assume that A and B are identical.

[7] An alternative, and maybe more natural, way to interpret this equilibrium is to think of H as physical capital that can be sold abroad without migration. We will continue to interpret H as human capital in this section to be consistent with the next section.

human capital are geographically fixed. As incomes are fixed geographically by initial endowments of human capital, agglomeration economies will not set in.

As A and B are identical and there are no agglomeration forces, we know that in equilibrium A and B will have the same number of firms ($n_A = n_B$) of identical size ($x_A = x_B$). Hence, four equilibrium conditions determine firms' size (x_A,x_C) and location (n_A,n_C). First, when differentiated goods are produced in all countries, demands (inclusive of transaction costs) must equal supplies:

$$x_A = \frac{I_A(1+\quad)}{n_A(1+\quad)+n_C\quad'} + \frac{I_C\quad'}{n_C+2n_A\quad'} \tag{5a}$$

$$x_C = \frac{I_C}{n_C+2n_A\quad'} + \frac{2\quad I_A\quad'}{n_A(1+\quad)+n_C\quad'} \tag{5b}$$

Next, when firms can relocate freely, neither country can offer a higher rent to capital. In equilibrium, when n_A and n_B are positive, rents to human capital must be equalised ($r_A = r_B = r_C$), which implies:

$$x_A = x_B = x_C \tag{5c}$$

Finally, the total number of firms is fixed by the capital endowment, so that:

$$2n_A + n_B = 2H_A + H_C \tag{5d}$$

Equations (5a)-(5d) determine x_A, x_C, n_A and n_C. Firms' output is:

$$x_A = x_C = \frac{2L_A + L_C}{2H_A + H_C} \tag{6}$$

The relative number of firms in country A to country C is[8]:

$$n_A / n_C = \frac{(1-2\quad'+\quad)-\quad'(1-\quad')}{(1+\quad)(1-\quad')-2\quad'(1-2\quad'+\quad)} \tag{7a}$$

where $\lambda = I_A / I_C$ is the relative income of country A to country C.

Since capital ownership is fixed and labour is immobile, no agglomeration force is set into motion when firms relocate. If a firm relocates from one country to another, this automatically decreases the difference in returns which was at the origin of the move. This reduces the incentive for further movement. Therefore, this equilibrium location is stable.

We first analyse the situation in which no asymmetry exists between the three countries in the degree of economic integration. This situation before integration is best characterised by one where $\rho = \rho'$, that is, the transaction costs between the three countries

[8] We abstract from the integer problem and treat the number of firms as a continuous variable.

are identical and they have not been reduced by attempts of trade or monetary integration. However, suppose that C, at least initially, has a lower endowment of human capital than its two partners. From the definition of income, this also implies that C has a lower aggregate income than both A and B.

When $\rho = \rho'$, then $(n_A/n_C)=[(\lambda-\rho)/(1+\rho-2\lambda\rho)]$ so that there will be less firms in the differentiated sector located in C than in A or B: $n_C < n_A = n_B$ as long as income is higher in A than in C ($\lambda > 1$). This is simply because C has a lower aggregate income and therefore a lower demand for the differentiated goods. Because of increasing returns, firms will be located close to where the largest demand is located. However, this does not readily imply that C has "lost" some of its industrial base because of trade, or put differently, that some human capital of country C is used in firms located in countries A and B. It can be checked that n_C can be larger or smaller than H_C. As explained in Martin and Rogers (1995b), differentials in capital endowments have two effects that have opposite implications for firm location. On the one hand, a country with a lower human capital endowment produces fewer differentiated products. This makes the country an attractive location for firms, because competition is less stringent and therefore the scale of production is larger for each variety. On the other hand, this country will have a lower income and therefore a smaller demand for differentiated goods, making it a less attractive location for firms. This second effect will dominate if returns to scale are strong (σ is low), if the share of differentiated goods, α, is high, and if transport and transaction costs are small. In this case, a country that is initially rich in human capital will have attracted more firms. In the opposite case, a poor country will have attracted capital flows when these are unrestricted.

Now suppose that countries A and B decide to integrate their economies, which we translate as implying the elimination of transaction costs so that ρ is increased to 1. Country C is excluded from the group of countries which can participate in this project because of its lower income. We first analyse what is the impact of integration between countries A and B on industrial location:

$$n_A \;/\; n_C \;=\; \frac{2 \quad - \quad '}{2 - 4 \quad '} \tag{8a}$$

Comparing the number of firms before and after integration between A and B, it is easy to see that the partial integration has led to relocation of firms from C to the integrated area formed by countries A and B. This would be true whatever the income levels of the different countries. If a group of countries lower the transaction costs between themselves, countries excluded will always loose firms to the first group. This is because, as the transaction costs are lowered in the integrated area, the demand for differentiated goods produced in the integrated area increases and the demand for the differentiated goods produced in the outside countries decreases so that firms will relocate in the integrated area: consumers of country A demand more of the goods produced in B and consumers of country B demand more of the goods produced in country A. A now becomes a better export base to B (and vice-versa) than C. In our model, as A and B are identical and there is no agglomeration process so that firms relocate from C evenly to A and B. Hence, the conclusion is that, from the point of view of location of economic activities, C would prefer that regional integration between A and B had never happened.

This does not imply however that C should insist to enter at the same time than A and B. This is because there are two opposite effects of a one shot integration when compared to a multi-speed integration process. On the one hand, if it enters at the same time as A and B, because the geography is frozen at its pre-integration level, the income differential will imply a very unequal distribution of firms. On the other hand, if it does not enter at the same time as A and B, these two countries, as explained above will have attracted firms in a permanent way because regional integration will have increased their market size. This advantage, given the strong role of history in our model, is permanent. We now want to analyse this trade-off. Assuming an identical level of transaction costs between the three countries before the integration process, the relative number of firms in a one shot integration scenario is frozen to its pre-integration value given by equation (7a) where $\rho = \rho'$:

$$n_A \;/\; n_C = \frac{{}_0 - \;'}{(1+\;')-2\;{}_0\;'} \qquad (9a)$$

where the subscript 0 is a reminder that this specific industry location in the case of a one shot integration scenario will take place at the initial income differential level.

If C joins the integrated area later on at some time t, then, when C is finally integrated, industrial location is given by equation (8a) where the relative income λ is the one at time t, λ_t. Suppose we assume that incomes converge exogenously which implies that λ converges to 1 with time. C will loose less firms through a one shot integration process than through a multi-speed integration process if the relative number of firms in A with respect to C is less in equation (9a) than in (8a). This will be the case if the difference in aggregate incomes (and therefore in this model the difference in endowments of human capital) between the two sets of countries is relatively small initially. This is because in one case (one shot integration) industrial relocation is driven by income differentials. In the other case (multi-speed) relocation is driven, through the strong role of history, by the market size effect of regional integration between A and B.

It is not certain that in the European context, low income countries can indeed make this choice or even influence whether they can choose to enter at the same time than high-income countries or later. Multi-speed integration is a reality, especially if we think of the integration of Eastern European countries, and the remaining question is how long the transition process should be. In this model without agglomeration, if some countries are not integrated at the same time as the core because of their relatively low income, then the long term location will be less concentrated if they enter at a low level of income differential. If we assume that incomes converge exogenously with time, then economic geography militates in favour of a long transition phase. Industrial location will be determined by equation (8a). The relative number of firms n_A / n_C is larger the larger the income differential.

From the point of view of firm location, C would have preferred the whole integration process to be delayed. If it cannot stop it and is excluded from the early integration steps then it will lose less firms by getting in as late as possible. The transition period, during which we assume income convergence occurs, sees firms relocate to C. Note however, that even if its income converges to the level of A and B, the number of firms will never

converge. This is because, given the role of history, the firms « lost » because of the integration between A and B will never be regained.

For an equal long term distribution of firms in the three countries, A and B must be ready to implement policies that tend to make C a more attractive location for economic activities. In our model, income transfers would not be sufficient. Another possibility is that countries A and B finance, through regional policies, public infrastructure projects in C. Martin and Rogers (1995a and b) analyse these policies and their limits.

Multi-speed integration as described in this model without agglomeration economies does not imply changes in incomes. Even though economic activity is lost by countries left out of the regional integration process, nothing in the model itself prevents convergence in incomes to happen. This is because income of the capital invested in a foreign country is repatriated and consumed in the home country. However, if we let human capital move (because of migration) this will not be the case anymore. This is the possibility that we now want to investigate[9].

IV. ENTREPRENEURS' SPATIAL MOBILITY AND AGGLOMERATION ECONOMIES

The introduction of entrepreneurs' spatial mobility modifies the assumptions made so far about the way human capital moves across country borders: ideas cross borders along with entrepreneurs. We therefore move to a longer term scenario or one where the transition period, during which the poor country is excluded, is long. We want to argue that during the transition, under certain conditions, the introduction of human capital mobility may induce the agglomeration of the increasing returns sector in the rich integrated countries causing divergence between the core and the periphery in terms of real per capita income. This may occur even though convergence was taking place before the integration of A and B. We call this the "agglomeration effect" of multi-speed integration.

In this section, we use the results of a numerical simulation of the model to show that there exist values for the parameters that make the model exhibit the ''agglomeration effect'' of multi-speed integration. Then next section derives explicit necessary conditions for that effect to occur.

[9] While migration is an obvious and relatively simple way of introducing agglomeration forces in the model, it is not the only way. For example, agglomeration economies could also arise from the presence of vertically linked industries as in Venables (1993). The exact source of agglomeration is not essential for point we want to make.

Allowing entrepreneurs' migration has a major impact on the setting used in the previous section. First of all, each country can use in production only the amount of capital owned by its own residents. Capital crosses borders only if entrepreneurs migrate[10]. As a consequence, condition (5d) is replaced by:

$$n_i = H_i \qquad i=A,B,C \tag{12a,b,c}$$

Second, since migration may trigger agglomeration, in general rents to human capital in different countries will not be equalised in equilibrium. Thus, in general, condition (5c) does not hold anymore. Finally, for the same reason, A and B cannot be expected to remain always identical along the transition and in the final equilibrium. If agglomeration sets in, firms might well concentrate in either country. So, conditions (5a) and (5b) have to be replaced by the more general:

$$x_A = \frac{I_A}{n_A + \quad n_B + \quad 'n_c} + \frac{I_B}{n_A + n_B + \quad 'n_C} + \frac{' \quad I_C}{'(n_A + n_B) + n_C} \tag{13a}$$

$$x_B = \frac{I_A}{n_A + \quad n_B + \quad 'n_c} + \frac{I_B}{n_A + n_B + \quad 'n_C} + \frac{' \quad I_C}{'(n_A + n_B) + n_C} \tag{13b}$$

$$x_C = \frac{' \quad I_A}{n_A + \quad n_B + \quad 'n_c} + \frac{' \quad I_B}{n_A + n_B + \quad 'n_C} + \frac{I_C}{'(n_A + n_B) + n_C} \tag{13c}$$

where:

$$I_i = L_i + (x_i/\sigma)H_i \qquad (i=A,B,C) \tag{14a,b,c}$$

For expositional purposes, one can think of entrepreneurs as spatially immobile in the short run and mobile in the long run: H_i is given in the short run while it is endogenously determined in the long run. Then the short term equilibrium is determined by equations (12a,b,c), (13a,b,c) and (14a,b,c) for given L_i and H_i. These equations together establish a system of nine linear equations in nine unknowns (x_A, x_B, x_C, n_A, n_B, n_C, I_A, I_B, I_C).

Dynamic considerations about entrepreneurs' migration can be introduced in this otherwise static setting by Marshallian tatonnement[11], assuming that, while in the short run entrepreneurs are immobile, in the long run they will migrate to the location offering the highest indirect utility, which in this model is equal to real rents to human capital. A short run equilibrium will be also a long run equilibrium if there is no incentive for an entrepreneur to change location i.e. if he cannot be better off by changing location. If real rents are higher the richer a location is, then in the long run all entrepreneurs will eventually

[10] It can be shown that if there is an incentive to invest abroad, there is an even stronger incentive to migrate so that we will not consider the type of equilibrium described in the former section.

[11] Therefore we do not consider the issue of history-vs-expectations (Matsuyama (1991), Krugman (1991c)) and we assume that only history matters when migration takes time.

migrate to the richer region, the increasing returns sector will concentrate there, the rich and the poor countries will diverge in terms of real per capita income. Using a numerical simulation, we illustrate the possibility that a two-speed integration process, that leaves the poor countries excluded during the transition, can trigger this kind of divergence.

The parameter values chosen for the simulation are shown in Table 1. The total endowment of human capital is set to one by choice of units. Country A and country B are identical (H_A=H_B=H=0.34) and both have more human capital than C (H_C=0.32).

Table 1 - Parameters values

$L_A = L_B = L_C = 5/3$		$H_A + H_B + H_C = 1$	
$\alpha = 0.7$	$\sigma = 2.5$	$H_A=H_B=H=1/3+1/100$	$H_C=1/3-1/100$
Before integration:		$\tau = 5$	$\tau' = 5$
One-shot integration:		$\tau = 1$	$\tau' = 1$
Two-speed integration:		$\tau = 1$	$\tau' = 5$

We consider three scenarios: the initial pre-integration situation with high transaction costs and free human capital mobility; the one-shot integration scenario in which all transaction costs among all countries are removed at once; the two-speed integration scenario in which transaction costs are first removed between A and B (the 'core countries') and only later between the core countries and C (the ''second track'' country). Initially C is left out because of its lower real per-capita income due to its lower human capital endowment.

Table 2 - Before integration: migration, no agglomeration, convergence

	income	price index[12]	real income	initial total population	real income per-capita	nominal rents to human capital	real rents to human capital
country A	2.325	1.836	1.52	2.01	0.756	1.917	1.253
country B	2.325	1.836	1.52	2.01	0.756	1.917	1.253
country C	2.295	1.924	1.452	1.98	0.733	2.004	1.268

Table 2 represents the situation before integration. Real per-capita income is higher in A and B while prices are lower because more entrepreneurs are located there. However real rents to human capital are higher in C in this numerical example. According to the tatonnement argument, in the long run entrepreneurs will move from A and B to C inducing real rents equalisation and convergence among countries in terms of both income and price levels. Free trade in the homogeneous good and free mobility of one of the two factors bring factor price equalisation.

[12]This is the 'exact' price index corresponding to the nested C.E.S. utility function defined in equation (1). For example, the exact price index in A is defined as $(P_A)^{\alpha}(1)^{1-\alpha}$ where $P_A=[n_A+\tau^{1-\sigma}n_B+\tau'^{1-\sigma}n_C]^{1/(1-\sigma)}$ is the C.E.S. price index of the differentiated good in A.

Table 3 - One-shot integration: no migration, no agglomeration

	income	price index[13]	real income	initial total population	real income per-capita	nominal rents to human capital	real rents to human capital
country A	2.334	1	2.334	2.01	1.161	1.944	1.944
country B	2.334	1	2.334	2.01	1.161	1.944	1.944
country C	2.276	1	2.276	1.98	1.149	1.944	1.944

Table 3 represents the one-shot scenario where all transaction costs are removed at once. Factor price equalisation holds for both labour and human capital. This is the standard general equilibrium result granting that with two factors, two goods and incomplete specialisation, free trade in the two goods delivers factor price equalisation even if the two factors are not mobile. The incentives to migrate are removed and the economy spatial distribution of human capital will not change even in the long run. Real income per capita will remain lower in C. Thus, while factor mobility yields convergence in per-capita income and prices (Table 2), free trade does not (Table 3).

Finally, even if there is factor price equalisation both in Table 2 and in Table 3, welfare, as measured by real per-capita income is higher in Table 3 since transaction costs are lower (null).

So, if convergence in per-capita income has to be achieved along with higher welfare, human capital mobility should be implemented immediately, while trade should be liberalised only after convergence has taken place.

Table 4 - Two-speed integration (transition): migration, agglomeration, divergence

	income	price index[14]	real income	initial total population	real income per-capita	nominal rents to human capital	real rents to human capital
country A	2.35	1.251	2.009	2.01	0.999	1.992	1.703
country B	2.35	1.251	2.009	2.01	0.999	1.992	1.703
country C	2.244	1.924	1.419	1.98	0.717	1.841	1.164

The *de facto* choice of a multi-speed process in Europe raises further issues. Table 4 shows the transition of a two-speed scenario where A and B integrate leaving C aside. Real rents are higher in the core countries than in the peripheral C. Then, in the long run, human capital will flow from C to the core enhancing the initial differential of income and price levels between the rich countries A and B and the poor country C[15]. So, during the transition

[13]This is the 'exact' price index corresponding to the nested C.E.S. utility function defined in equation (1). For example, the exact price index in A is defined as $(P_A)^{\alpha}(1)^{1-\alpha}$ where $P_A=[n_A+\tau^{1-\sigma}n_B+\tau'^{1-\sigma}n_C]^{1/(1-\sigma)}$ is the C.E.S. price index of the differentiated good in A.

[14]This is the 'exact' price index corresponding to the nested C.E.S. utility function defined in equation (1). For example, the exact price index in A is defined as $(P_A)^{\alpha}(1)^{1-\alpha}$ where $P_A=[n_A+\tau^{1-\sigma}n_B+\tau'^{1-\sigma}n_C]^{1/(1-\sigma)}$ is the C.E.S. price index of the differentiated good in A.

[15]See e.g. Razin and Sadka (1994) for a detailed survey on the general question whether trade in goods can be expected to narrow or widen the gap between the prices of factors in different regions thus reducing or exacerbating the incentives to migrate.

human capital will concentrate in the core countries triggering divergence between the core and the periphery. This is the agglomeration effect.

If the final stage of the two-speed process is implemented and C is finally integrated, divergence will be interrupted but not reversed by factor price equalisation. However, if the integration of C is conditional on convergence during the transition, the final stage will never be reached and C will be left out forever.

To summarise, with increasing returns in production, a multi-speed process of integration can trigger agglomeration during the transition that drains human capital and firms from the poor peripheral countries to the rich core countries. This effect exacerbates the initial (transitory) differences in income and prices that motivates the multi-speed approach in the first place.

V. NECESSARY CONDITION FOR AGGLOMERATION DURING THE TRANSITION

We want now to discuss the necessary conditions for two-speed integration to cause the agglomeration effect that was described in the previous section. They can be derived following Krugman's (1991a) strategy.

From the point of view of the tatonnement process introduced in the previous section, the necessary condition for agglomeration in the core countries to be a stable long run equilibrium is that, if all human capital is in A and B ($H_A+H_B=1$), no entrepreneur has an incentive to migrate to C i.e. real rents to human capital are higher in A and B than in C:

$$\equiv \frac{\frac{x_A}{P_A}}{\frac{x_C}{P_C}} > 1 \qquad \text{s.t. } H_A=H_B=1/2 \qquad \textbf{(15)}$$

where P_i's are the price indexes associated to the composite good D as defined in equation (2)[16]. When $H_A=H_B=1/2$, their values are:

$$P_A = P_B = \left(\frac{1+}{2}\right)^{\frac{1}{1-}} \qquad (16a)$$

$$P_C = \quad '^{\frac{1}{1-}} \qquad (16b)$$

Subject to $H_A=H_B=1/2$ system (13) can be easily solved to yield:

$$x_A = x_B = \frac{3}{-} L \qquad \textbf{(17a)}$$

[16]See footnote number 9.

$$x_C = \left[\frac{2\ '}{1+} \left(\frac{2\ +}{-} \right) + \frac{1}{'} \right] L \qquad \textbf{(17b)}$$

Substituting equations (16) and (17) into (15), the necessary condition for agglomeration of the increasing returns sector in the core countries can be written as:

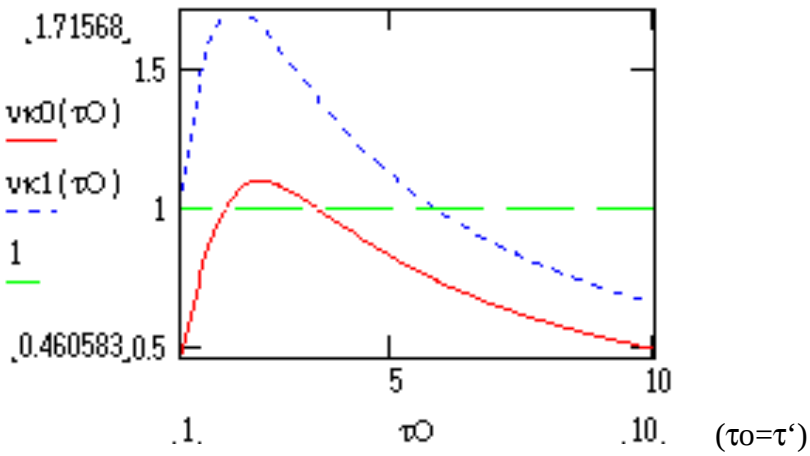
$$\equiv \frac{\frac{3}{-}}{2\frac{'}{1+}\left(\frac{2\ +}{-}\right)+\frac{1}{'}} \left(\frac{2\ '}{1+} \right)^{\frac{}{1-}} > 1 \qquad \textbf{(18)}$$

Call ν^{κ}_0 the value of ν^{κ} before integration and ν^{κ}_1 its value during the transition of the two-speed integration process when transaction costs are removed between A and B (τ =1 so that ρ=1) but not between A (B) and C (τ'>1 so that ρ'<1).

Figure 1 portrays ν^{κ} as a function of τ' for given values of α and σ (α=0.7 and σ =2.5 as in the previous section) and for alternative values of τ. By inspection it can be seen that the necessary condition (18) is verified if the transaction costs remaining between the core and the peripheral country C are relatively low or "medium" (as they are in the tables). Thus, there are two disjoint intervals where the condition holds. This behaviour can be interpreted in terms of the balance between "centripetal" forces that lead to agglomeration and "centrifugal" forces that induce dispersion of firms in space (Henderson (1977)). Centripetal forces stem from the incentive for firms to place increasing returns productions close to the bigger markκet and from the incentive for consumers to locate where there are more varieties of the differentiated good (Krugman (1991a). Thus, they are stronger the higher the returns to scale in production (the lower σ) and the bigger the share of expenditure devoted to the differentiated good (the higher α). Centrifugal forces arise from the incentive to place production close to the dispersed market formed by the immobile unskilled workers and they are stronger the higher the cost of supplying these workers from a single place (the higher τ and τ'). Given τ=1, the fact that, as τ' goes to 1, υ^{κ} goes to one shows that location is indifferent when transaction costs are null. Thus, the balance between these opposing forces explains the behaviour of the curves in Figure 1: *ceteris paribus* centrifugal forces prevail if the cost of supplying the peripheral C are high.

When τ > 1, the behaviour of ν^{κ} as a function of τ' can be understood considering a further effect. In Figure 1 the case when it is costly to trade between A and B is represented by the dotted curve. Given the cost of shipments between A and B, as the costs between A (B) and C get lower and lower, at a certain point it becomes convenient to locate production in C to supply both A and B at a lower cost. Krugman (1993) call this effect the "hub effect" since C becomes a transportation hub. This effects erodes the incentive to concentrate production in the core countries. That is why the curves are lower the higher the transaction costs within the core.

Figure 1. Necessary condition for agglomeration in the core countries
(α=0.7, σ=2.5, τ=5 before integration-solid curve, τ=1 after integration-dotted curve)



Along the same line of reasoning we can derive a necessary condition for agglomeration in the peripheral C to be a long run equilibrium. Agglomeration in C is a stable long run equilibrium if, when all entrepreneurs are concentrated in C, none of them as an incentive to change location:

$$\equiv \frac{\frac{x_A}{P_A}}{\frac{x_C}{P_C}} > 1 \qquad \text{s.t.} \qquad H_C = 1 \tag{19}$$

When H_C =1 the price indexes are:

$$P_A = P_B = (\ \ ')^{\frac{1}{1-}} \tag{20a}$$

$$P_C = 1 \tag{20b}$$

Solving system (13) subject to H_C =1 yields:

$$x_A = x_B = \left[\frac{1+}{'} + \ '\left(\frac{+2}{-}\right)\right] L \tag{21a}$$

$$x_C = \frac{3}{-} L \tag{21b}$$

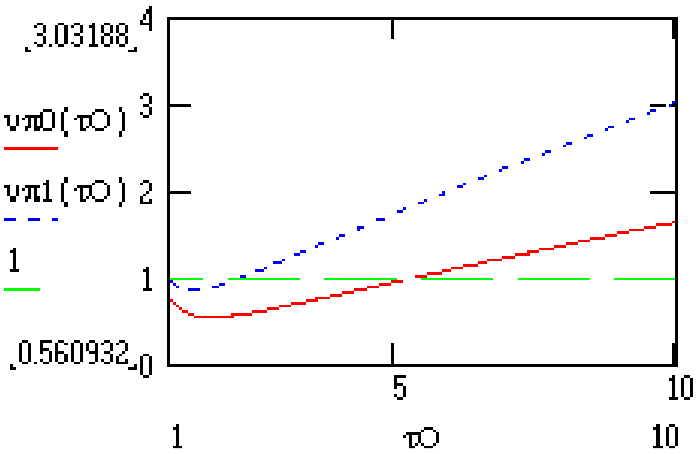
Substituting equations (21) and (22) into (20), the necessary condition for agglomeration of the increasing returns sector in the peripheral C can be written as:

$$\equiv \frac{\left[\frac{1+}{'} + '\left(\frac{+2}{-}\right)\right]}{\frac{3}{-}}\left(\frac{1}{'}\right)^{\frac{}{1-}} < 1 \qquad \textbf{(22)}$$

Call ν^{π}_{0} the value of ν^{π} before integration and ν^{π}_{1} its value during the transition of the two-speed integration process when transaction costs are removed between A and B (τ =1 so that ρ=1) but not between A (B) and C (τ'>1 so that ρ'<1).

Figure 2 portrays ν^{π} as a function of τ'. Agglomeration of the increasing returns sector in C is a stable long-run equilibrium if transaction costs between C and A or B are low so that centrifugal forces are weak. When A and B integrate and $\nu^{\pi}=\nu^{\pi}_{1}$, centrifugal forces get stronger and agglomeration in C is sustainable for lower values of transaction costs between C and A or B than before. Thus, integration between A and B reduces the threshold value of τ' below which agglomeration in the peripheral C can be sustained as a long run equilibrium.

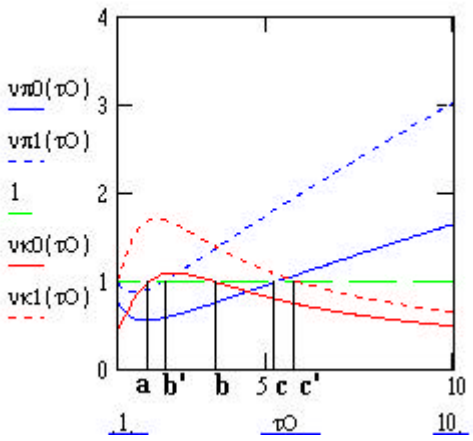
Figure 2. Necessary condition for agglomeration in the peripheral country (α=0.7, σ=2.5, τ=5 before integration-solid curve, τ=1 after integration-dotted curve)



We are now ready to study the impact of two-speed integration on the number and stability properties of spatial equilibria.

Figure 3 plots the necessary conditions for agglomeration discussed above in the same diagram. Solid curves show the situation before integration while dotted curves show the situation after integration between A and B. By condition (15) agglomeration in the core countries is a stable equilibrium when $\nu^{\kappa}>1$ while by condition (22) agglomeration in the peripheral country is a stable long run equilibrium when $\nu^{\pi}<1$.

Figure 3. Necessary conditions for agglomeration in the core and in the periphery (α=0.7, σ=2.5, τ=5 before integration - solid curves,τ=1 after integration - dotted curves)



Consider the solid lines first. We can identify four intervals for τ' according to the dynamic properties of the economy. For $\tau' \in [0,a]$, both ν^{π}_0 and ν^{κ}_0 are less than 1 so that agglomeration in C is a long run stable equilibrium while agglomeration in the core is not. This scenario is due to the hub effect as described above. For $\tau' \in [a,b]$, ν^{π}_0 is still less than 1 while ν^{κ}_0 is greater than 1: agglomeration in either the core or the periphery is a stable long run equilibrium. This comes from the fact that, at least for a while, the centripetal forces overcome the hub effect as the transaction costs between the core and the periphery increase. However as such costs grow the hub effect is supported by the growing strength of centrifugal forces. If $\tau' \in [b,c]$, both ν^{π}_0 and ν^{κ}_0 are again less than 1 and agglomeration is a stable long run equilibrium only if it happens in the periphery. Finally, when $\tau' \in [c,+\infty]$ both the necessary conditions are violated since $\nu^{\pi}_0>1$ and $\nu^{\kappa}_0<1$ and agglomeration in neither country is a long run stable equilibrium.

Integration among A and B changes those properties dramatically. We have now three intervals. For $\tau' \in [0,b']$ ν^{π}_1 is less than 1 while ν^{κ}_1 is greater than 1: agglomeration in either the core or the periphery is a stable long run equilibrium. Of course this comes from the fact that no hub effect exists when A and B are integrated so that centripetal forces dominate. If $\tau' \in [b',c']$ ν^{π}_1 and ν^{κ}_1 are both greater than 1 so that, while agglomeration in the core is a long run stable equilibrium, agglomeration in C is not. Again, this is due to the absence of the hub effect. Finally, when $\tau' \in [c',+\infty]$ centrifugal forces dominate, both the necessary conditions are violated since $\nu^{\pi}_1>1$ and $\nu^{\kappa}_1<1$ and agglomeration in neither country is a long run stable equilibrium.

Three points are noteworthy. First, after A and B integrate, there is a new range of values [b',c'] for the transaction costs between the core countries and the peripheral C that support agglomeration only in the core. Since b'<b and c'>c, this range encompasses the

interval which, before integration, supported agglomeration only in C. Second, since the elimination of transaction costs between A and B also eliminates the hub effect, the integration of A and B increases the threshold below which agglomeration is an equilibrium (c'>c). Finally, when A and B integrate, again because of the elimination of the hub effect, there is no value of τ' that supports agglomeration in the periphery and not in the core.

Figure 4 and 5 illustrate the impact on the trade-off between centripetal and centrifugal forces of different values of α and σ. Figure 4 shows that if α is low (α=0.3), the scenario changes even more dramatically if A and B integrate. Above a certain threshold for τ', which is lower than when α=0.7, agglomeration in neither country is a long run stable equilibrium. That is due to the fact that centripetal forces are weaker the lower α. However, below that threshold, while before integration (the dotted curves) both ν^{π}_{0} and ν^{κ}_{0} are less than 1 so that agglomeration in C is a long run stable equilibrium and agglomeration in A or B is not, after integration both ν^{π}_{0} and ν^{κ}_{0} are greater than 1 and the situation is the opposite. A low share of expenditure on the differentiated good weakens the centripetal forces and exacerbates the hub effect.

Figure 4. Necessary conditions for agglomeration in the core and in the periphery (α=0.3, σ=2.5, τ=5 before integration - solid curves,τ=1 after integration - dotted curves)

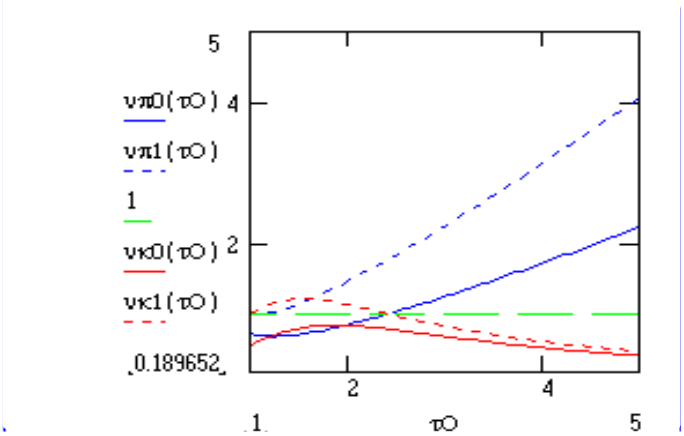
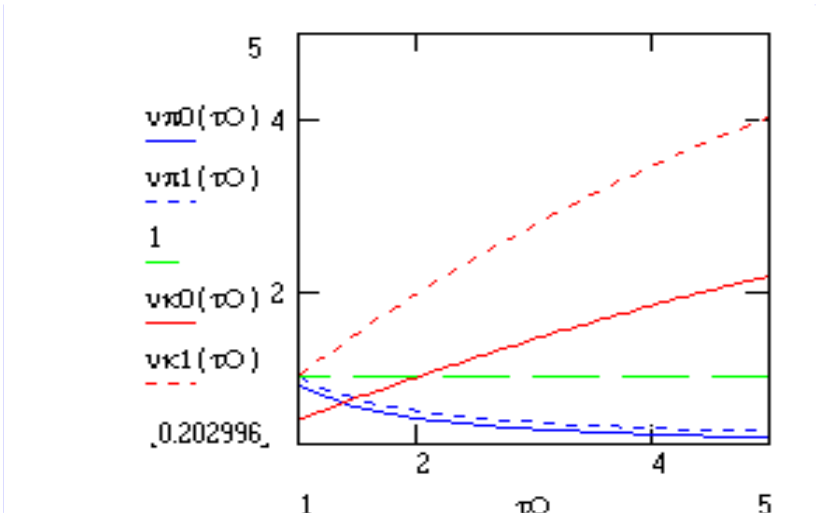


Figure 5 shows that with a high degree of returns to scale (σ=1.5), the centripetal forces are stronger and agglomeration is always a long run stable equilibrium. However, while above a certain threshold value for τ', agglomeration can happen both in the core and in the periphery, below that threshold agglomeration can take place only in the periphery due to a strong hub effect. Therefore, the hub effect is strengthened by high returns to scale.

Figure 5. Necessary conditions for agglomeration in the core and in the periphery (α=0.7, σ=1.5, τ=5 before integration - solid curves,τ=1 after integration - dotted curves)



This implies that the agglomeration effect of two-speed integration is closely related to the values of the parameters of the model. Whether it is likely or not is an empirical question. If indeed agglomeration sets in because of the transition, we can then compare the three alternative choices on the timing of integration: (i) one-shot integration now; (ii) one shot-integration when convergence occurs; (iii) first stage now among core countries and second stage when the poor country has converged. By inducing factor price equalisation immediately, choice (i) freezes the current spatial distribution of economic activity so that regional transfers have to be used to obtain real per-capita income convergence. By triggering agglomeration economies in the core, choice (iii) causes divergence and jeopardises the completion of the integration process. Only under choice (ii) market forces alone can attain and equally distribute all gains from liberalisation. The problem is of course that the gains of liberalisation are pushed away in the future.

As already discussed in section III, these choices may not be available when some countries have already integrated among themselves leaving some other countries outside their club. The relevant question then becomes: should the outsider countries wait to join the insiders or should they try to get in as soon as possible? To gain some insight on this issue in the case of agglomeration economies we can refer to the dotted lines in figure 3. By inspection we realise that, if the transaction costs remaining between the core and the peripheral C belongs to the interval [b',c'], then the necessary conditions for agglomeration only in the core are met. In such a situation C should get in as soon as possible since otherwise it loses firms as time goes on. As already shown in figure 4 and 5, this outcome is sensitive to changes in the values of other parameters in the model. Hence, unless the transaction costs remaining between the core and the periphery are large enough to prevent agglomeration, C should get integrated as soon as possible in order to avoid the risk of the complete delocalization of its increasing returns sector.

The message of this section is that the design of the transition to an integrated economy affects the global dynamic properties of the system in a complex way determined also by the values of parameters of tastes and technology. A deep understanding of the impact of alternative institutional settings on the spatial dynamics of the system is required to avoid perverse outcomes such as the agglomeration effect discussed in these final sections.

CONCLUSION

The economic geography of Europe will be transformed by the process of regional integration as it may imply concentration of economic activities in the "core" countries. This is the strong message that the "new geography" models or models with localised growth [see Bertola (1992)] deliver. In this paper, we deliver another message. We argue that the form of the integration process itself will be important for its location consequences. The long term economic geography of Europe depends on the history or the sequence of integration so that it may differ depending on the form of multi-speed integration: who will be integrated first and the length of the transition will define the long term geography of Europe. However, the economic geography of Europe, and to some extent whether countries and regions of the core and the periphery converge, will themselves condition the timing of the integration process. Hence, a perverse scenario could set in: because some countries are excluded from the fast track of the integration process, they may diverge and never be able to join the integrated area.

Some policy implications follow naturally. If policy makers do not believe that migration of human capital and more generally agglomeration economies can set in, then a multi-speed approach to integration makes sense. Income differentials between countries are then the main difficulty of integration because they lead to a concentration of industries in the core. A multi-speed approach has the advantage of integrating the ‘second tier’ countries when their incomes have sufficiently converged. However, if agglomeration can set in, the multi-speed approach is dangerous because the attraction of the core during the transition period when the poor country is excluded is cumulative and may never be reversed. If we think that agglomeration is a long-term scenario, our model then suggests some theoretical ground for the common sense view according to which the transition period before integration of periphery countries should not be too short but it should not be too long either.

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