

Regional Integration Agreements

A Force for Convergence or Divergence?

Anthony J. Venables

Developing countries may be better served by "north-south" than by "south-south" free trade agreements. Free trade agreements between low-income countries tend to lead to divergence in member country incomes, while agreements between high-income countries tend to lead to convergence.



Summary findings

Venables examines how benefits — and costs — of a free trade area are divided among member countries.

Outcomes depend on the member countries' comparative advantage, relative to one another and to the rest of the world.

Venables finds that free trade agreements between low-income countries tend to lead to divergence in member country incomes, while agreements between high-income countries tend to lead to convergence.

Changes induced by comparative advantage may be amplified by the effects of agglomeration.

The results suggest that developing countries may be better served by "north-south" than by "south-south"

free trade agreements, because "north-south" agreements increase their prospects for convergence with high-income members of the free trade area.

In "north-south" free trade agreements, additional forces are likely to operate. The agreement may be used, for example, as a commitment mechanism to lock in economic reforms (as happened in Mexico with the North American Free Trade Agreement and in Eastern European countries with the European Union). A free trade agreement may also — through its effect on trade and through foreign direct investment — promote technology transfer to lower-income members.

This paper — a product of Trade, Development Research Group — is part of a larger effort in the group to study the effects of regional integration. Copies of the paper are available free from the World Bank, 1818 H Street, NW, Washington, DC 20433. Please contact Lili Tabada, room MC3-333, telephone 202-473-6896, fax 202-522-1159, email address ltabada@worldbank.org. Policy Research Working Papers are also posted on the Web at www.worldbank.org/research/workingpapers. The author may be contacted at avenables@worldbank.org. December 1999. (26 pages)

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Regional Integration Agreements: a force for convergence or divergence?

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Paper prepared for the Annual Bank Conference on Development Economics, Paris, June 1999. Thanks to M. Schiff and participants in the ABCDE conference for helpful comments.

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Summary

How does the formation of a free trade area or customs union affect the distribution of activity within the area? Are the gains (or losses) divided between members, or do some gain while others lose? Do the real incomes of member countries tend to converge or diverge? The European experience has been of convergence, with lower income countries succeeding in narrowing the gap in per capita incomes between them and the high income center. But a number of regional agreements between developing countries have been associated with divergence of economic performance (for example in the East African Common Market, the Central American Common Market, and the Economic Community of West Africa).

In this paper we use two strands of research to address these issues. First, we show how the comparative advantage of member countries, relative to each other and relative to the rest of the world, provides a basis for predicting who gains and who loses. Typically the country in the free trade agreement (FTA) that has comparative advantage most different from the world average is most at risk from trade diversion. Thus, if a group of low income countries form an FTA, there will be a tendency for the lowest income members to suffer real income loss due to trade diversion. In contrast, if an FTA contains a high income country (relative to other members and to the world average) then lower income members are likely to converge with the high income partner.

The second strand of research analyses the importance of agglomeration forces, which tend to lead to the spatial clustering of activities. We argue that the tendency for these forces to lead to large concentrations of economic activity will be more pronounced

in FTAs amongst low income countries than for those containing high income countries. This will be a further force for divergence of income levels in developing country FTAs.

Taking these arguments together, our main conclusions are that there are economic reasons for thinking that an FTA between developing countries might lead to divergence of their income levels, with the richer countries benefiting at the expense of the poorer. However, FTAs that contain high income members are more likely to lead to convergence of income levels. These results suggest that developing countries are likely to be better served by 'north-south' than by 'south-south' free trade agreements.

1. Introduction:

How does the formation of a free trade area or customs union affect the distribution of activity within the area? Are the gains (or losses) divided between members, or do some gain while others lose? Do the real incomes of member countries tend to converge or diverge? The standard theory of economic integration (from Viner (1950) onwards) tells us that the effects of membership are ambiguous, but gives little guidance on the answers to these questions.¹

In this paper we use two strands of research to address these questions. The first involves identifying underlying characteristics of economies that make them more or less prone to trade creation or trade diversion. In particular, we look at the comparative advantage of member countries, relative to each other and relative to the rest of the world, and show how this provides a basis for predicting who gains and who loses. Typically the country in the free trade area (FTA) that has comparative advantage most different from the world average is most at risk from trade diversion. Thus, if a group of low income countries form an FTA, there will be a tendency for the lowest income members to suffer real income loss due to trade diversion. In contrast, if an FTA contains a high income country (relative to other members and to the world average) then lower income members are likely to converge with the high income partner.

The second strand of research analyses the importance of agglomeration forces, which tend to lead to the spatial clustering of activities. We argue that the tendency for these forces to lead to large concentrations of economic activity will be more pronounced in FTAs amongst low income countries than for those containing high income countries. This will be a further force for divergence of income levels in developing country FTAs.

Taking these arguments together, our main conclusions are that there are economic reasons for thinking that an FTA between developing countries might lead to divergence of their income levels, with the richer countries benefiting at the expense of the poorer. However, FTAs that contain high income members are more likely to lead to convergence rather than divergence of income levels. There is therefore a case for developing countries to forge trade links with high income countries.

Our analytical arguments about the effects of FTAs are consistent with at least some experiences of convergence and divergence within FTAs. The experience of the European Union is one of considerable convergence of per capita income levels of member countries. The historical record from 1947 (when the BeNeLux Customs Union was created), through 1957 (creation of the EEC), 1968 (when internal tariffs were finally eliminated) and to the early 1980s is studied by Ben-David (1993). He finds that per capita income differences narrowed more or less steadily, falling by about two thirds over the period, due mainly to more rapid growth of the lower income countries.² The most interesting features of the more recent experience are the strong performance of Ireland, Spain and Portugal, which have made substantial progress in closing the gap with richer members of the EU. Whereas in the mid 1980s these countries' per capita incomes were, respectively, 61%, 49% and 27% of the income of the large EU countries³, by the late 1990s the numbers had risen to 91%, 67% and 38%.

The experience of a number of developing country FTAs paints a very different picture, and suggests some instances at least in which integration has promoted divergence. Perhaps the best documented example of this is the concentration of manufacturing in the old East African Common Market. Uganda and Tanzania

contended that all the gains of East African Common Market were going to Kenya, which in the 1960s steadily enhanced its position as the industrial center of the Common Market, producing more than 70% of the manufactures and exporting a growing percentage of them to its two relatively less developed partners. The Common Market collapsed in 1977 as it failed to satisfy the poorer members that they were getting a fair share of the gains. More recent examples include the concentration of industry, commerce and services in and around Guatemala City and San Salvador in the Central American Common Market, and Abidjan and Dakar in the Economic Community of West Africa. Guatemala and El Salvador now account for over 80% of manufacturing value added in the Central American Common Market, up from 68% in 1980. And in the Economic Community of West Africa the combined share of Cote d'Ivoire and Senegal in manufacturing value added has risen from 55% in 1972 to 71% in 1997.

The remainder of the paper is structured as follows. In the next section we develop the relationship between trade diversion and the comparative advantage of members of an FTA. We do this by developing some simple examples and by drawing on more technical material from Venables (1999). Section 3 discusses the agglomeration arguments, and section 4 concludes.

2: Trade creation and trade diversion:

Internal and external comparative advantage

The classic analysis of the real income effects of membership in an FTA is that of Viner (1950), who established the ideas of trade creation and trade diversion. Membership in an FTA changes the sources from which products are supplied to member

country markets, increasing supply from the partner countries as these receive preferential treatment, but possibly also reducing supply from domestic production and from the rest of the world. To the extent that overall supply is increased and lower cost imports from the partner country replace higher cost (previously protected) domestic production, we expect the welfare gains of *trade creation*. However, to the extent that increased imports from partner countries displace lower cost imports from the rest of the world (a possibility that arises because of the preferential treatment of partner imports) then the country experiences the welfare loss of *trade diversion*.

To link these forces to the characteristics of member countries we need to look at the comparative advantage of these countries relative to each other and relative to the rest of the world. Let us start by thinking through an example of two developing economies that both have a comparative *disadvantage* in manufactures relative to the rest of the world, but the disadvantage is less for one of them than the other. Kenya and Uganda can serve as examples. Their comparative disadvantage in manufactures could come from many alternative sources – technological, geographical or institutional differences – but let us suppose that it is because of low endowments of human capital: Kenya has little human capital per worker relative to the world average, and Uganda has even less. The initial position is one in which both Kenya and Uganda have some manufacturing (which we suppose is human capital intensive), serving local consumers and surviving because of high tariff protection.

What happens if these two countries form an FTA? Since Kenya has a comparative advantage in manufacturing (relative to Uganda, but not relative to the rest of the world), it will draw manufacturing production out of Uganda, so consumers in both

countries will be supplied with manufactures from Kenya. This moves Kenya's production structure further away from its comparative advantage (relative to the world at large), while moving Uganda's closer. What are the effects of this on real income? Surprisingly, Kenya will gain from the relocation, and Uganda may lose (and will certainly do less well than Kenya). The reason is that Uganda is suffering trade diversion – some manufactures that were previously imported from the rest of the world are now imported from Kenya. But for Kenya, there are gains from being able to supply manufactures to the Ugandan market, protected from competition with the rest of the world.

This argument focuses just on manufactures. Are there not forces cutting in the opposite direction for other sectors, such as agriculture, offsetting the argument? Just as Kenya expands its manufacturing production and exports, so Uganda expands its agriculture. However, given the initial comparative advantage of these countries they are both exporting agriculture to the rest of the world, so trade diversion does not arise.

This simple example makes the point that it is possible to relate the distribution of the gains and losses to the comparative advantage of member countries – compared to each other and to the rest of the world. And in this example, the country with the comparative advantage most different from the rest of the world is the loser (Uganda). Intuitively, a country suffers a lot of trade diversion if its partner has comparative advantage which comes between it and the rest of the world.

A Ricardian example

A rigorous argument – albeit for a very special case – is made on figure 1. There are two goods, X and Y, and three countries, a large rest of the world (country 0), and two small countries, (1 and 2). The figure has on the axes quantities of goods X and Y, and we assume (for simplicity) that consumption of the goods takes place in fixed proportions, along the consumption line illustrated. The world price of good Y in terms of X is p_0 .

Production possibilities for countries 1 and 2 are illustrated by the solid lines XY_1 and XY_2 . The levels of these lines are unimportant, so they are all constructed to go through the same point X on the vertical axis, and we also draw a world price line (XY_0) through this point. The slopes of the lines do matter, since they measure the rate of transformation between goods. The figure is constructed such that country 1 has comparative advantage in good X relative to world prices, p_0 , but not relative to country 2. Country 2 has a comparative advantage in good X relative to both country 1 and the rest of the world. (These comparative advantages can be seen by comparing Y_1 with Y_0 and Y_2).

In the initial situation all countries have a tariff at ad valorem rate t on all imports. What is the pattern of trade? Imports of good Y from the rest of the world will have price $p_0(1 + t)$, which is the slope of the dotted line. At these prices country 2 specializes in good X and imports good Y. Its internal price ratio is therefore $p_0(1 + t)$, and its consumption is point A_2 ; although internal decisions are governed by price ratio $p_0(1 + t)$ the terms of trade are p_0 and government revenue is being earned, this financing

consumption at A_2 . In contrast, country 1 does not trade. Given the tariff rate on imports of Y, it is cheaper to produce them domestically than import them; and it does not pay to export them, since it would receive only p_0 per unit, not $p_0(1 + t)$. Its price is p_1 , between p_0 and $p_0(1 + t)$, and since it is not trading, its consumption is at point A_1 .

Now, consider the effects of an FTA between countries 1 and 2. Since trade between countries 1 and 2 is tariff free they will have the same price ratio, and this will be somewhere between the initial prices in the two countries (i.e. between $p_0(1 + t)$ and p_1). It is illustrated by price ratio p^* , the slope of the dashed lines.⁴ At this price ratio country 1 specializes in good X and country 2 in good Y; they trade with each other (and not with the rest of the world), and consume at points B_1 and B_2 . We see that country 1 gains (consumption goes from A_1 to B_1) and country 2 loses (consumption goes from A_2 to B_2) from formation of the FTA.

There are several messages from this figure. First, country 1 experiences trade creation; it is able to exploit its comparative advantage (relative to country 2) and reap some gains from trade that it was not getting in the original position. These gains arise despite the fact that country 1's production structure has moved in the opposite direction from the way it would have had it gone under full free trade. In contrast, country 2 suffers trade diversion; its production structure has not changed, but it is now getting its imports of Y at price p^* , which is less than the private cost of importing from the rest of the world, $p_0(1 + t)$, but greater than the social cost, p_0 .

Second, the losing country – country 2 – is the one with comparative advantage most different from that of the rest of the world. The intuition is as we saw in our Kenya/Uganda example above. The outlier has little scope for trade creation – it was trading in

the initial situation. However, freeing up trade with a country with comparative advantage between it and the rest of the world is exactly the sort of circumstance in which trade diversion is likely. The general argument here is that countries with comparative advantage closer to the world average do better in an FTA than do countries with more extreme comparative advantage. Interposing the ‘intermediate’ country between the ‘extreme’ one and the rest of the world distorts the extreme country’s trade, causing it to switch import supplier. But the intermediate country does not experience this switch in supply; its trade with the ‘extreme’ country and with the rest of the world are less close substitutes, and therefore less vulnerable to trade diversion.

Results from a model

A more general analysis of these issues requires a model in which (unlike the Ricardian model of the preceding subsection) countries do not completely specialize and all countries trade both within the FTA and externally. Such a model is developed and analysed in Venables (1999), and here we just illustrate some of the main points from it. The model is a generalization of a Heckscher-Ohlin trade model, and assumes that all countries have the same technology and have different endowments of two factors, which we refer to as skilled and unskilled labour, S and U. There are three countries one of which – the rest of the world – is large, and is endowed with equal quantities of these two factors.⁵ Countries 1 and 2 may have factor endowments different from each other and from the rest of the world, and these differences are the basis of their comparative advantage.

Each country can produce three goods. One is a non-tradable, and uses S and U symmetrically (so has isoquants symmetric around the 45° line). The other two are tradable, and use S and U in different proportions. Each of these goods is differentiated by location of production – an Armington assumption. We impose this primarily for computational convenience, and set the amount of product differentiation at a minimal level -- the elasticity of substitution between products from different locations is 50 in the examples that follow. Also, for ease of interpretation, we impose symmetry between the two tradable products, assuming that they take the same share in consumption, and that the factor intensity of one industry is the reciprocal of that in the other industry.

The model is constructed such that prices in the rest of the world are unity, and this we take to be the world price ratio, held constant in all experiments. In the initial equilibrium all of the imports of countries 1 and 2 face the same tariff rate, regardless of source or commodity type. The internal price ratios and trade patterns of countries 1 and 2 reflect these tariffs and each country's factor abundance. The experiment we study is the removal of the tariff between countries 1 and 2; we want to see how outcomes depend on the endowments of the two countries, relative to each other and to the rest of the world.

Results are illustrated on figure 2, the axes of which give the country 1 and 2 factor endowments, expressed as deviations from unity. Thus, point 0 on the horizontal axis corresponds to a point where $S_2 = U_2 = 1$, giving country 2 the same endowment ratio as the rest of the world. To the right of this country 2 becomes S abundant and U scarce. As S_2 is increased so we reduce U_2 to hold their sum constant; thus, at point $\Delta S_2 = 0.4$

we also have $\Delta U_2 = -0.4$, so the endowment levels are $S_2 = 1.4$, $U_2 = 0.6$. Similarly on the vertical axis; country 1 is S abundant (relative to the world) above point 0 and U abundant below. While comparison of countries' endowments with those of the rest of the world is done with reference to the 0 points on each axis, comparison of country 1 with country 2 is done with reference to the 45° line (labeled *cc*). Above this line country 1 is S abundant relative to country 2, while below the line it is U abundant.

The contour lines on the figure are the country 2 welfare changes caused by formation of the FTA with country 1.⁶ The lines marked 00 are the zero contour, and the plus and minus signs indicate regions of country 2 gain and loss from FTA formation. The welfare surface forms a saddle, with very small gains occurring along the 45° line, on which the countries have the same relative endowments.⁷

The figure illustrates first, that the gains from union between countries 1 and 2 are largest for a country with relative factor endowment close to that of the rest of the world. Thus, the highest levels of welfare change for country 2 arise when the country 2 endowment ratio is the same as the rest of the world's, $\Delta S_2 = -\Delta U_2 = 0$. And second, the gains for this country are largest if the country with which it forms the FTA has a relatively extreme endowment, well away (in either direction) from that of the rest of the world (i.e. at the top and bottom of the figure).

The reason is as we have argued previously. If a country has endowment like that of the rest of the world, there is little scope for trade diversion; it is doing little trade with the rest of the world in the initial situation, so the potential amount of trade that can be

diverted is small. Forming an FTA with a country with a very different endowment maximizes the scope for trade creation.

The converse of this is that countries with 'extreme' endowments, well away from that of the rest of the world, are most likely to suffer a welfare loss. Thus, if S_2 is very low (or high) country 2 is likely to experience welfare loss, particularly if its partner is like the rest of the world (ΔS_1 close to zero). In the two triangle shaped regions marked *cab* both countries' endowment ratios are on the same side of the world ratio, but country 2's is further away than country 1's. Inspection of the figure indicates that these are regions in which country 2 is relatively likely to experience welfare loss.

Convergence and divergence.

We can now address the question, does FTA membership promote convergence or divergence of members' real incomes? Let us suppose that country 2's endowment is always more extreme than country 1's, and do an experiment in which we vary their difference from the world average. The precise experiment is to vary endowments along the line *ee* in figure 2. At all points on this line country 2 is more extreme than country 1, but the two countries vary from being U abundant relative to the world to being S abundant.

Figure 3 gives the welfare effects of FTA formation for this set of endowments. Country 2 always does worse than country 1 (except at point 0 where they have the same endowments as the rest of the world, and both experience the same gain from forming a union). As 1 and 2 become more different from the world average, so 2 does even worse

– relatively and absolutely – and 1 does better; essentially, as comparative advantage differences open up so welfare changes are magnified.

The welfare *changes* from forming the FTA that are reported on figures 2 and 3 can also be related to underlying welfare *levels*. It will generally be the case that initial welfare levels depend on factor endowments – so, for example, per capita income is higher the more physical or human capital there is per worker. Let us suppose then that economies that have higher endowments of S relative to U have, initially, higher per capita income levels.⁸ Starting at a point on the left of figure 3, this means that country 2 has little S relative to U, and a low initial income, relative both to country 1 and to the rest of the world, (as summarised at the top of the figure, where Y_i denotes real income, and subscript W denotes rest of world). Formation of the FTA therefore reduces the welfare of the low income country (2), and raises welfare in the higher income country (1). But now select a point to the right of point 0, at which country 2 is initially relatively well endowed with S and has relatively high income: it is now the relatively high income country (2) that loses and the lower income country (1) that gains.

What this shows is that FTAs between low income countries will cause divergence of real income, with the low income (extreme endowment) country losing. FTAs between high income countries will cause convergence, with the high income (extreme endowment) country losing.

We have already discussed a hypothetical example of the low income case, with our Uganda - Kenya FTA. The high income analogue might be, say France and Portugal. If France is relatively S abundant (so higher income), then it would be better off importing its U intensive products from the rest of the world than from Portugal – which

has a comparative advantage in such products relative to France but not relative to the rest of the world; the FTA causes France trade diversion. But for Portugal the FTA results in an increase in imports of S intensive products from France – and the price of these in S abundant France is less than the world price. Thus in this high income FTA it is the high income country which suffers trade diversion, and the low income which experiences trade creation.

North – South agreements

The preceding sub-section looked at a case in which both members of the FTA are on the same side of the world average. What if the two countries are on different sides – a ‘north-south’ FTA? To explore this let us fix the endowment of country 2 and show how the effects of FTA membership depends on the endowment of its partner. In terms of figure 2, the comparisons we make are along line ff , with country 2 endowment fixed at a moderately U abundant level ($\Delta S_2 = -0.25$), and 1’s varying from U abundant to S abundant. The welfare changes from FTA formation for this set of endowments are illustrated on figure 4, with country 1’s factor abundance varying along the horizontal axis.

What type of partner is best for country 2 (assumed moderately U abundant)? From figure 4 we see that it does well with either a very U abundant or a very S abundant partner. What it wants to avoid is a partner that is close to the world average.

The logic behind avoiding a country similar to the world average (e.g. in the interval between f and 0) is as we have described before. Country 2 has little scope for

trade creation, but maximum scope for trade diversion as its partner comes between it and the rest of the world.

The benefits from picking a country with even higher U abundance (to the left of f , where $\Delta S_1 < \Delta S_2 = -0.25$) is also as we have seen. Country 2 has trade creation, since its partner has comparative advantage quite different from the rest of the world. However, in this 'south-south' agreement country 2's gain is associated with a much worse outcome for the partner country.

The 'north-south' agreement, ($\Delta S_1 > 0$), by contrast, offers gains for country 2 and for the partner. They both benefit from liberalizing trade with a partner country that has a very different factor endowment. Both countries' production structures move towards production of the good intensive in the factor with which they abundantly endowed. This factor abundance is now relative to each other *and* relative to the rest of the world, and it is this that creates the mutual benefits.

Increasing the S abundance of the partner country (1) brings increasing gains for country 2.⁹ However, country 1's welfare change turns down beyond some point, eventually becoming a loss. The intuition is that once country 1 becomes extremely S abundant, then the FTA as a whole is S abundant relative to the rest of the world. At the margin, country 1 would then do better expanding trade with the rest of the world than within the FTA.

Pulling this together, we see a strong case for 'north-south' integration schemes. If country 2 links with another U abundant country ($\Delta S_1 < 0$ on figure 4) then it may gain or lose, and any gains it makes usually come at a cost to its partner, so at least one of the

‘southern’ countries is losing. But if it joins an FTA with an S abundant country ($\Delta S_1 > 0$) then country 2 gains – as may its partner also.

3: Agglomeration and cumulative causation:

Comparative advantage is not the only force that drives relocation of activity in an FTA. As economic centers start to develop, so ‘cumulative causation’ mechanisms come into effect, leading to the spatial clustering (or agglomeration) of economic activity, and extending the advantage of locations that have a head-start.¹⁰

Spatial clustering of economic activities is all pervasive. Cities exist because businesses, workers and consumers benefit by being in close proximity. Particular types of activity are frequently clustered, the most spectacular examples being the electronics industries of Silicon Valley, cinema in Hollywood, and the concentration of banking activities in the world’s financial districts. Clustering also occurs in many manufacturing industries – for example US automobile manufacturing in the Detroit area, or industries such as medical equipment, printing machinery and others studied by Porter (1990).

We can analyse clustering by thinking of it as the outcome of a balance between ‘centripetal’ forces, encouraging firms to locate close to each other, and ‘centrifugal’ forces, encouraging them to spread out. We want to ask whether membership of an FTA changes this balance, promoting concentration – or deconcentration – of activities. Let us start by outlining the main centripetal and centrifugal forces.

The centripetal forces are usually classified in three groups (Marshall 1920). The first are knowledge spillovers, or other beneficial technological externalities that make it

attractive for firms to locate close to each other – in Marshall’s phrase, “the mysteries of the trade become no mysteries, but are, as it were, in the air..” The second are various labor market pooling effects, which encourage firms to locate where they can benefit from readily available labor skills – perhaps by attracting skilled labor away from existing firms. The third centripetal force arises from ‘linkages’ between buyers and sellers. Firms will, other things being equal, want to locate where their customers are, and customers will want to locate close to their suppliers. These linkages are simply the ‘backwards’ (demand) and ‘forwards’ (supply) linkages of Hirschman (1958). They create a positive interdependence between the location decisions of different firms, and this can give rise to a process of cumulative causation, creating agglomerations of activity.¹¹

These centripetal or agglomeration forces can operate at quite an aggregate level, or can be much more narrowly focused. For example, aggregate demand creates a backwards linkage, drawing firms from all sectors into locations with large markets. Some agglomeration forces affect broad classes of business activity – providing basic industrial labor skills, or access to business services such as finance and telecommunications. In contrast, other forces are more spatially focussed. Knowledge spillovers affecting particular technologies, or the availability of highly specialized inputs might operate at the level of a narrowly defined industry. In this case the forces work for clustering of the narrowly defined sector, rather than for clustering of manufacturing as a whole.

Pulling in the opposite direction are ‘centrifugal forces’, encouraging the dispersion of activity. These include congestion, pollution, or other externalities that

might be associated with concentrations of economic activity. Competition for immobile factors will deter agglomeration, as the price of land and perhaps also labor is bid up in centers of activity. In addition, there is demand from consumers who are located outside the centers of activity; dispersed consumers will encourage dispersion of producers, particularly if trade barriers or transport costs are high.

How might the balance between centripetal and centrifugal forces be upset by membership of an FTA? Can membership cause, or amplify, the clustering of economic activity, and if so might it widen income differentials between partner countries?

By reducing trade barriers, membership in an FTA makes it easier to supply consumers (or customers more generally) from a few locations. This suggests that the balance of forces may be tipped in favor of agglomeration, although the ensuing relocation of industry could develop in several different ways.

One possibility is that particular sectors become more spatially concentrated, and this is likely if the centripetal forces act at a quite narrow, sectoral level. For example, industries in the US are much more spatially concentrated than in Europe (even controlling for the distribution of population and manufacturing as a whole), suggesting that regional integration in Europe could cause agglomeration at the sectoral level (for example, Germany gets engineering, the UK financial services, and so on). The possibility that this might happen is generating some concern in Europe, although evidence for it is so far rather weak. If it does happen it will create considerable adjustment costs – as the industrial structure of different locations changes – but aggregate benefits, as there are real efficiency gains from spatial concentration. This

sectoral agglomeration need not be associated with increases in intra-RIA inequalities; each country or region may attract activity in some sectors.

An alternative possibility is that, instead of relatively small sectors each clustering in different locations, manufacturing as a whole comes to cluster in a few locations, de-industrializing the less favored regions. In this case, it is likely to lead to divergence of the income levels of members of the FTA. Under what circumstances might this be the outcome? It will be relatively more likely to occur if manufacturing as a whole is a small share of the economy. This is because fitting the whole of manufacturing in one (or a few) locations is then less likely to press up against factor supply constraints and lead to rising prices of immobile factors (such as land). It will be more likely if linkages are broad, across many sectors, rather than narrowly sector specific. This in turn is more likely in early stages of development, where a country's basic industrial infrastructure – transport, telecommunications, access to financial markets and other business services – is thinly developed and unevenly spread. And it will be more likely to occur with preferential trade liberalization – an FTA – than with general import liberalization. This is because an FTA is inherently more inward looking, strengthening linkages between firms in the FTA, so increasing one of the centripetal forces.

These arguments suggests that there is possibility that FTA membership could lead to agglomeration. For industrialised countries this is more likely at the sectoral level, in which case it need not lead to divergence of per capita income levels. But for countries with less developed industrial sectors, it is more likely to occur at the level of industry as a whole, in which case it will foster income divergence.

We expect that these agglomeration forces will interact with the comparative advantage arguments we made in the preceding section. In south-south FTAs they are likely to be reinforcing. For example, as Nairobi, Abidjan and Dakar have attracted manufacturing, so they have started to develop business networks and the linkages that tend to lock manufacturing in to the location. The process might be further accelerated by the propensity of foreign direct investment to cluster in relatively few locations. Agglomeration then accentuates the comparative advantage forces for divergence. In 'north-south' FTAs that span a wide range of factor endowment ratios, the forces may pull in opposite directions. For example, firms choosing locations in Europe may want the agglomeration benefits of locating in France, but factor price differences create an incentive for them to locate in Portugal.

4: Concluding comments

The analysis contained in this paper has not covered all the forces that might drive convergence or divergence of income levels between member countries of an FTA, and in 'north-south' FTAs in particular additional forces for convergence are likely to operate. For example, a country may be able to use the agreement as a commitment mechanism to lock in economic reforms. This seems to have happened in Mexico with NAFTA, and in the agreements between the European Union and East European economies. An FTA may also promote technology transfer from the high income country to lower income members. Although the mechanisms of technology transfer are not fully understood an important body of work argues that it is promoted by trade flows. For example, Coe and Helpman (1995) and Coe, Helpman and Hoffmaister (1997), construct an index of total

knowledge capital in each industrial country, and assume that trading partners get access to a country's stock of knowledge in proportion to their imports from that country. They find that access to foreign knowledge is a statistically significant determinant of the rate of total factor productivity across OECD and developing countries.¹² Thus an FTA might promote technology transfer via its effect on trade. Similarly, FTAs typically promote foreign direct investment, another likely source of technology transfer. These considerations probably reinforce the argument that a 'north-south' FTA may promote convergence of income levels.

What we have shown in this paper is that the distribution of the benefits of an FTA can be linked directly to the comparative advantage of member countries – comparative advantage relative to each other and to the rest of the world. This leads to the strong result that FTAs between low income countries will tend to cause divergence of their income levels, whereas FTAs between high income levels will lead to convergence. We have argued that agglomeration forces might amplify divergence forces in FTAs between low income countries. The analysis suggests that developing countries are likely to gain more from FTAs with high income countries, where there are better prospects for convergence with the other – high income – members.

Endnotes:

- ¹ There is a large literature on sufficient conditions, typically in terms of changes in endogenous variables. For a survey see Baldwin and Venables (1995).
- ² Differences measured by the standard deviation across countries of log per capita incomes.
- ³ We use the average of France, Germany, Italy and the UK.
- ⁴ This price is determined by the equality of supply and demand within the customs union.
- ⁵ This fixes the units of measurement for the two factors.
- ⁶ Welfare is measured as the utility of a single representative consumer.
- ⁷ The welfare gain on line *cc* arises only because of the Armington assumption and the small amount of product differentiation we have introduced.
- ⁸ Factor endowments are both inputs to production and sources of household income. Once a an ownership structure of factors is specified, changes in the ratio of *S* to *U* will generally change household income. Providing such a change is monotonic the argument of the text goes through.
- ⁹ Until quite extreme levels, at which point countries have moved to the edge of their cones of diversification
- ¹⁰ This section is based on Fujita, Krugman and Venables (1999) and Puga and Venables (1998).
- ¹¹ This argument only works if there are increasing returns to scale in production. (If not, firms can put small plants in many different locations). For formal analysis see Fujita, Krugman and Venables (1999).
- ¹² The conclusion has been challenged because the paper assumes, rather than tests, that imports from industrial countries provide the correct weights with which to combine stocks of foreign knowledge. Keller (1998) has suggested that the results are little better than would be obtained from relating TFP to a random weighting of foreign knowledge stocks.

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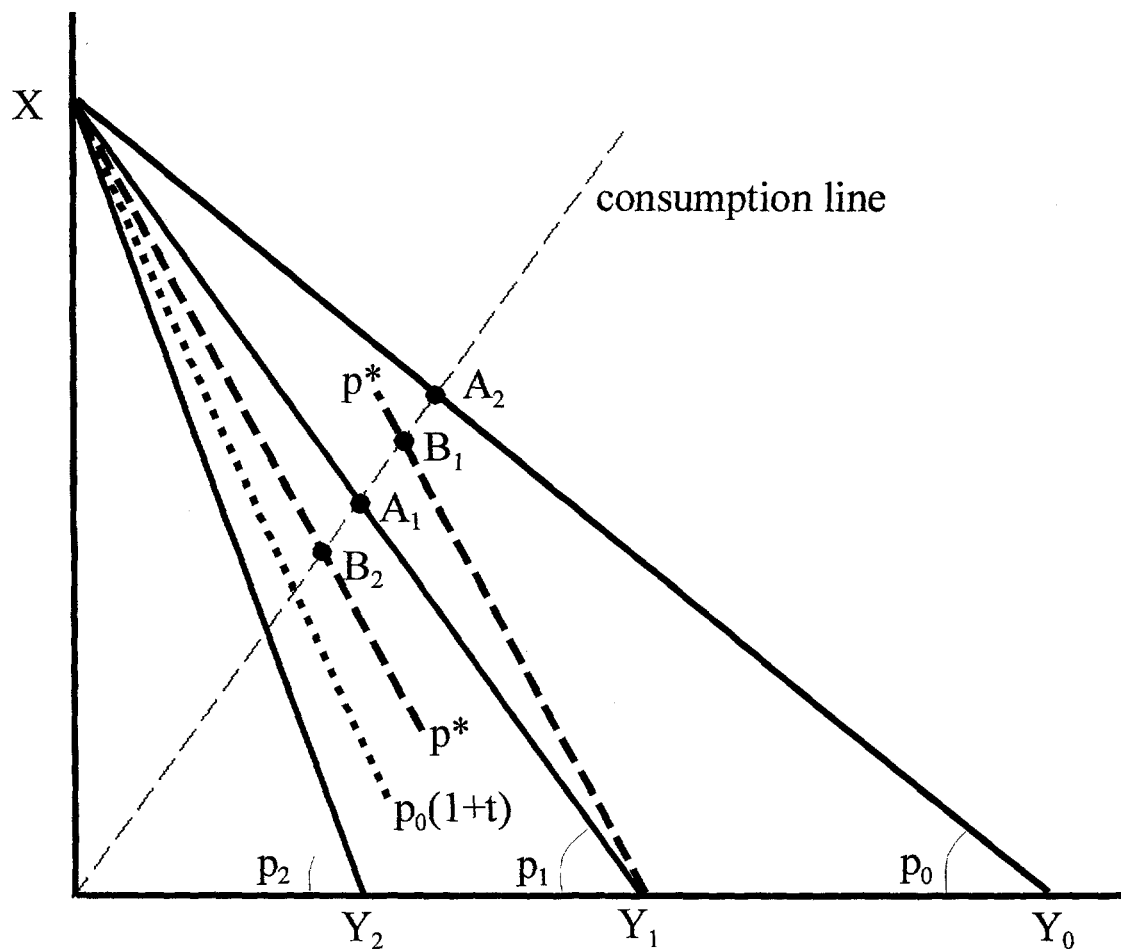


Figure 1: Preferential liberalization

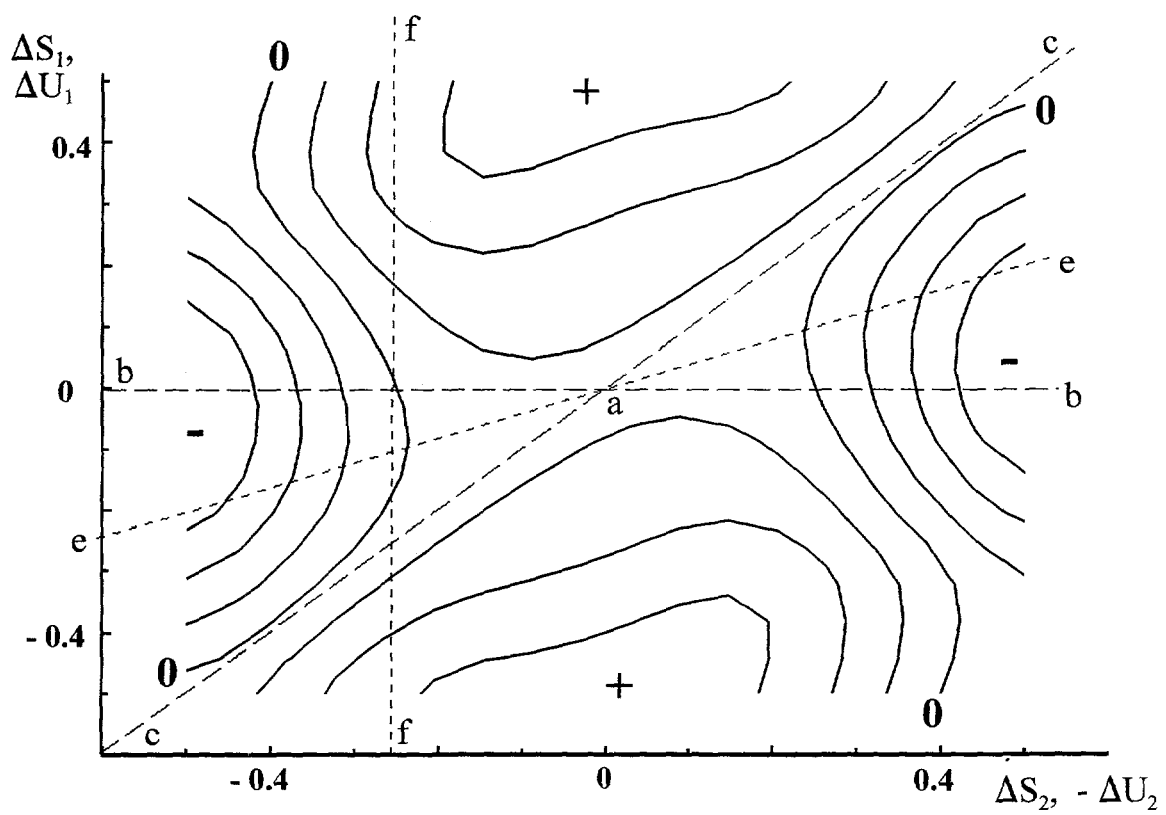


Figure 2: Country 2 welfare change contours

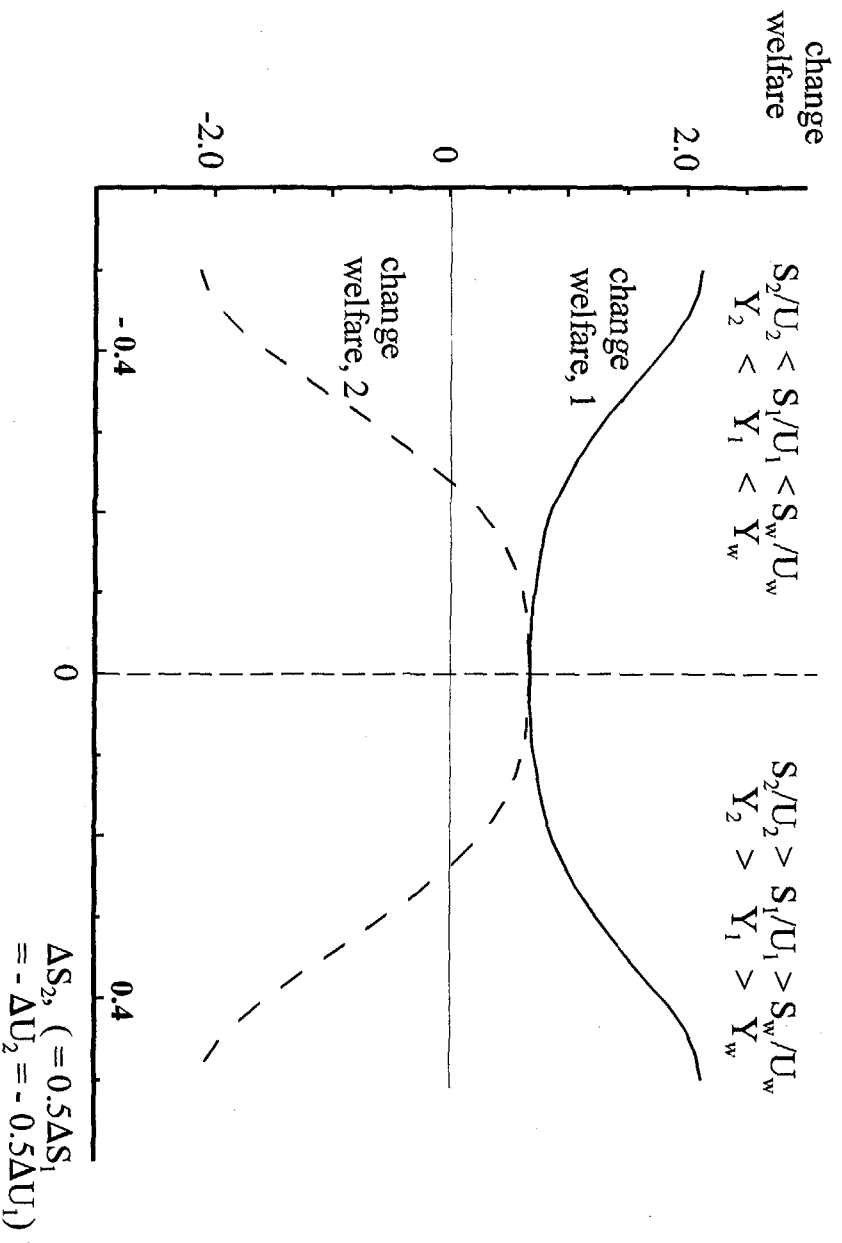


Figure 3: Welfare change along line ee

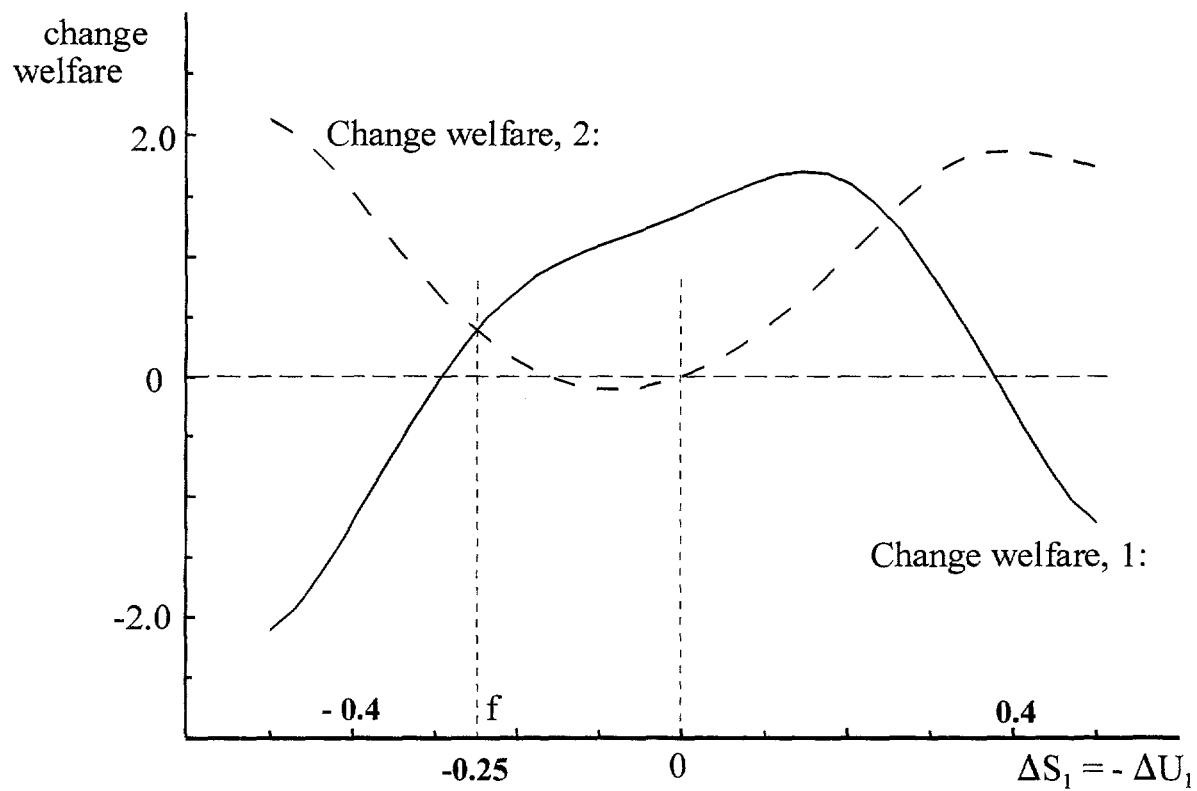


Figure 4: Welfare change along line ff: $\Delta S_2 = -0.25$

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