

Conditions for Successful Integration among LDCs: A Graphical Presentation

Thomas Straubhaar*

This article provides a simple graphical device for viewing the existence of an optimal degree of integration which is jointly determined by the size of the integrated area, and the level and homogeneity of industrial development among its members. It easily and clearly demonstrates that neither "homogeneity", nor a specific "level of economic development", nor "optimal size" guarantee an optimal degree of economic integration if they are taken independently from each other.

I. Introduction

Why has the actual implementation of integration agreements among the less developed countries (LDCs) been a story of conflicts and failures rather than a story of success, in contrast with the (abstract) expectations of the integration theory and with the (actual) results of the European groupings of the European Community and the European Free Trade Association?

This article is intended to provide an answer to that question. It illustrates *graphically* that an *optimal* degree of integration exists, *jointly* determined by the size of the integrated area and the level and homogeneity of industrial development among its members.

Our graphical device provides a simple tool for *viewing* this joint interaction between the size of the integrated area and the level and homogeneity of industrial development. It easily and clearly demonstrates that neither "homogeneity", nor "optimal size", nor a specific "level of economic development" guarantee an optimal degree of economic integration if they are taken independently from each other. Only a *sim-*

* Department of Economics, University of Berne, Switzerland

University of Berne. The postdoctoral research reflected in this article has been supported by a grant from the Swiss National Foundation. The academic advice of John M. Letiche is gratefully acknowledged, as are the remarks from a referee of this journal concerning an earlier version of this article.

ultaneous consideration of these factors indicates the optimal degree of economic integration for an area.

II. A Story of Failures

After Viner (1950) and Meade (1955) had put forward the theory of Customs Unions in the early fifties, numerous attempts were undertaken for wider economic cooperation among LDCs (for a survey of the most important ones cf. Straubhaar 1987). In looking for the success of these agreements, the answer is rather negative. Measured against the expected economic benefits derived from the integration theory, the progress and achievements of integration among LDCs were slow and sometimes interrupted. In his extensive survey article, Vaitos (1978, p. 719) summarizes that "... the actual examples of economic integration—whether in Africa, Asia, the Caribbean or Latin America—find themselves today in various degrees of serious crises, in states of stagnation or in process of disassociation."

In the literature on international integration theory one (among many others) of the standard explanations for the conflicts and failures in economic integration among LDCs has been concerned with "the issue of equity in the distribution of benefits". (Robson 1984, p. 154) If within an integrated area some countries are much more developed than others, the gains from being integrated are very likely to be distributed unequally. The advanced countries tend to attract more new industries than the less advanced. The possible consequence is a wider gap between the members: The already industrialized area becomes more industrialized while the more rural area is condemned to stay on its lower level of industrialization.

The knowledge that (at least in the short run) the gains from integration are unequally distributed makes the negotiation process very difficult. Every member tends to attract as many common industries as possible. To give up short term national interest in favor of long term common goals within the integrated area requires a high level of political statesmanship. It is not surprising that under such conditions the poorer countries are not eager to join their richer neighbors in an integrated area. The example of the timeconsuming negotiations within the EC demonstrates how difficult this task is even within a successfully industrialized area.

In a recent study, Langhammer and Spinanger (1984) have questioned this belief that the heterogeneity of the members is a reason for the conflicts and failures within the integration agreements among LDCs. By looking at the income per capita (as an index for the development level) and at the level of industrialization, they found no statistical evidence that the variations within an integrated area in LDCs have been significantly higher than in the EC (Langhammer and Spinanger 1984, p.15-17).

We might suppose that the indicators used by Langhammer and Spinanger are not the correct measures to reflect heterogeneity within an integrated area. These indicators are rather rough and do not reflect differences in the nationally different levels of protectionism before the integrated area was formed. But, besides this fact, the following graphical device shows another reason why heterogeneity of the members might not be a significant determinant *per se* in explaining conflicts and failures within integration agreements among LDCs.

If it is true, indeed, that "the usefulness of the union is maximized in sharing out industries with substantial economies of scale, extending over the whole regional market" (Lewis 1980, p.561), we have to look for those industries with substantial economies of scale and ensure that they can be moved and spread over the whole area. In the LDCs, however, almost no production factors are engaged in the industrial sector that could be moved (with negligible costs) from one place to another. As long as the LDCs are mainly producers of agricultural products and raw materials and the industrial production is based on the manufacturing of these primary products, few possibilities exist for cost reducing shifts in the industrial sector within the integrated area, and there is little chance for potential economies of scale. To yield the dynamic (long-run) effects of an enlarged "domestic market", a minimal degree of industrialization and a minimal size of the integrated area are indispensable. The homogeneity of industrial development within the integrated area becomes an additional explanatory variable only. We conclude, therefore, that the level and the homogeneity of industrial development and the size of the area represent simultaneously the key variables in the integration process. They are the determinants that decide the pace of the integration process.

III. The Optimal Degree of Integration

Starting

1) from the question "is there an optimum economic size of the integrated area" (Cooper 1976),

2) from two articles by Peñaherrera (1980 a, b), who considers the most favorable circumstances for economic integration as being : "(a) The lower the degree of industrial development achieved by the participating countries, and the further their economic size is from the size 'required' for a change in industrial structure ; (b) The larger the economic size of the integration area, and the more it approaches or exceeds the economic size 'required' by all the participants ; (c) The more homogeneous (or the

less heterogeneous) the participants are in the degree of industrial development achieved and in economic size," (p. 180), and

3) from Balassa (1962, 1967, 1975) who has shown the advantages of a stepwise procedure according to the different levels of development in the member countries,

we propose that for every integrated area an optimal degree of integration exists which is simultaneously dependent on the level AND homogeneity of industrial development, AND on the size of the integrated area. Every degree of integration higher than the optimum bears a higher possibility of conflicts and failures (than the optimal degree), while every lower degree represents a waste of possible further benefits of economic integration on a higher (i.e. optimal) integration level.

To move from a suboptimal degree of integration (I) to an optimal degree (I^o), an integrated area has the alternatives of :

- a) equalizing the degree of industrialization within the area ;
- b) enlarging the size of the area by accepting new members (or reducing its size, if the integrated area is too large) ; and
- c) increasing the level of industrial development by unchanged differences between the national levels of industrialization.

Each one of these alternatives allows by itself the area to move towards a higher degree of integration, but only by a combination of them is it possible to reach the optimal degree of integration.

Formalized, we could write the integration function (I) as :

$$I = i(S, DH, LID)$$

where

I = degree of integration,

S = size of the integrated area,

DH = degree of homogeneity in industrial development,

LID = level of industrial development,

Splitting the degree of integration into its partial derivatives (by assuming the other things constant) we get :

$$I^S = \delta I / \delta S > 0, \text{ and } I^S < I^{S^o}, \text{ if } S < S^o ;$$

$$I^S = \delta I / \delta S = 0, \text{ and } I^S = I^{S^o}, \text{ if } S = S^o, \quad (\delta^2 I / \delta S^2 < 0) ;$$

$$I^S = \delta I / \delta S < 0, \text{ and } I^S < I^{S^o}, \text{ if } S > S^o ;$$

$$I^{DH} = \delta I / \delta DH > 0, \text{ and } I^{DH} < I^{DH^o},$$

if $0 (= \text{Heterogeneity}) < DH < 1 (= \text{Homogeneity}) ;$

$$I^{DH} = \delta I / \delta DH = 0, \text{ and } I^{DH} = I^{DH^0}$$

$$\text{if } DH = DH^0 = 1, \quad (\delta^2 I / \delta DH^2 < 0) ;$$

and

$$I^{LID} = \delta I / \delta LID > 0, \text{ and } \delta^2 I / \delta LID^2 < 0, \text{ for all LID.}$$

In this formulation, we assumed a specific nature and shape for the partial derivatives of the integration function that we have to justify :

We assumed that an optimal size (S^0) of an integrated area exists. that is: I^* rises with an enlargement of the integrated area as long as the size (S) remains below a certain (= optimal) level S^0 . In this case, the *technological* benefits of economies of scale (including external effects as a more general case of economies of scale) and the possibilities for reducing economic disturbances through integrating markets exceed the higher *organizational, managerial, and informational* costs.

After having passed the optimal size (S^0), the marginal return of a further enlargement of the area becomes negative. In this case, the higher *organizational, managerial, and informational* costs exceed the *technological* benefits. Additionally, the external effects of a larger area become smaller and smaller, due to the *limited mobility* of factors. Considerations of economics, geography, language and culture all limit the actual domain of mobility for both people and firms.

Another factor that limits the optimal size of an integrated area to a level below the one required by the cost-minimizing production function is given by the *diversity of preferences for collective goods*. Conditioned by differences in cultural, socioeconomic and political background and in income level, individuals differ greatly in their preferences for collective goods. Obviously, the greater an economic area, the more difficult it is to satisfy all the individual preferences for public goods, as public goods are by their very nature provided in roughly equal magnitude to all residents of the relevant area. That is: Smaller economic areas are more homogeneous in their *preferences for collective goods*.

We conclude that while the *technological* benefits argue for increasing the size of an integrated area, several factors pull in the other direction, towards an integrated area on a smaller scale. Increasing costs of management, organization, information and bureaucracy, increasing diversities of individual preferences for collective goods and freedom of choice, reasons of national prestige and sovereignty, and the sense of cultural identity all lower the optimal size of an integrated area to below the maximal level (i.e. the global level).

We assumed that the optimal degree of integration is the higher the more homogeneous in their industrial development the members of an integrate area are. This assumption corresponds to the commonplace idea that the most frequent cause of conflict in integration among LDCs was the difference in the national level of industrial development reached by the members. ". . . going to the heart of the problem, we see that the source of the main conflicts in efforts at integration among developing countries is to be found in the heterogeneity of the countries belonging to integration groups in terms of the level of industrial development reached and capacity to make good use of integration industry." Peñaherrera (1980a, p. 72)

Finally, we assumed that the optimal degree of integration is the higher, the higher the average level of industrial development within an integrated area is. With that assumption, we stress that the benefits of integration like trade creation, trade diversion, internal (by specialization) and external economies of scale (by intra-industrial spread of technology and human skills), higher overall level of productivity (by a more efficient division of labor and capital within the integrated area), and a more competitive economic climate (attracting inflows of investment capital, new technologies and know-how from outside the integrated area) are more likely to occur in an integrated area with a higher level of industrialization.

IV. A Graphical Presentation

In *figure 1*, we provide a simple tool for *viewing* this joint interaction between the size of the integrated area and the level and homogeneity of industrial development. It easily and clearly demonstrates that neither "homogeneity", nor "optimal size", nor a specific "level of economic development" guarantee an optimal degree of economic integration if they are taken independently from each other. Only a *simultaneous* consideration of these factors indicates the optimal degree of economic integration for an area.

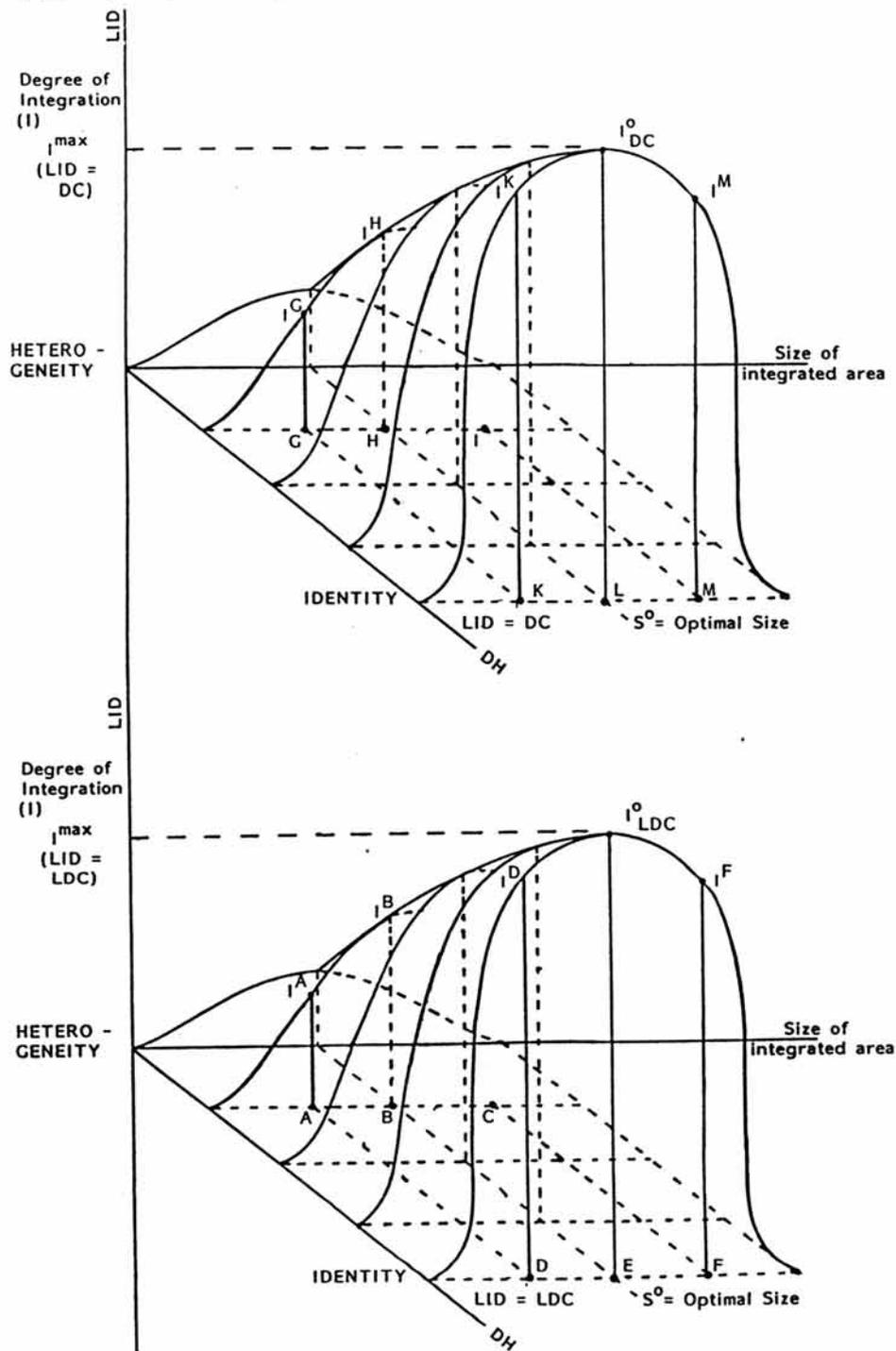
By choosing

the x-axis to represent the size of the integrated area,

the y-axis to represent the degree of homogeneity in industrial development, and

the z-axis to represent the level of industrial development on the one hand and the degree of integration on the other hand,

Figure 1: Optimal Degrees of Integration



we get a surface representing the optimal degree of integration (I^0) for every combination of the three independent variables. Thereby, in our presentation, following the formulation above, we assumed a diminishing marginal increase of the degree of integration due to a higher homogeneity among the members or to a higher level of industrial development of the integrated area.¹

Given the three determinants—size of the integrated area, level of industrial development, and its homogeneity—and with their values lying between the extremes “small, optimal and large”, “low developed and high developed”, “heterogeneity and identity”, respectively, every integrated area can be classified within one of the following 12 groups:

GROUP	INDUSTRIAL DEVELOPMENT		SIZE
	LEVEL	HOMOGENEITY	
A	LOW	HETEROGENEITY	SMALL
B	LOW	HETEROGENEITY	OPTIMAL
C	LOW	HETEROGENEITY	LARGE
D	LOW	IDENTITY	SMALL
E	LOW	IDENTITY	OPTIMAL
F	LOW	IDENTITY	LARGE
G	HIGH	HETEROGENEITY	SMALL
H	HIGH	HETEROGENEITY	OPTIMAL
I	HIGH	HETEROGENEITY	LARGE
K	HIGH	IDENTITY	SMALL
L	HIGH	IDENTITY	OPTIMAL
M	HIGH	IDENTITY	LARGE

1. The smooth and continuous shape of the surface in figure 1 is chosen intuitively. Discontinuities or irregularities might produce another surface. For simplification we drew only the two planes representing a higher level of industrial development like in the developed countries (DC), and a lower one-like in the less developed countries (LDC). However, we assumed implicitly a continuous sequence of planes, representing every different level of industrial development. To simplify further, we assumed that the independent variables are uncorrelated. However, we believe that these variables are correlated in reality. For instance, it seems likely that an enlargement of an integrated area (as the EC-South -Enlargement) will increase the heterogeneity among its members (at least in the short run). It is the intention of this article and of our further research to direct the focus of econometric work to the question of how and to what degree under different circumstances our (here assumed) independent variables are in fact correlated.

To increase the degree of integration, therefore, with other things constant, an integrated area will move on an isoquant parallel to :

a) the x-axis, enlarging its size by accepting new members. (Corresponds to a movement from A to B to C or from D to E to F or from G to H to I or from K to L to M in our figure 1) ;

b) the y-axis, equalizing the degree of industrialization within the area. (Corresponds to a movement from A to D or from B to E or from C to F or from G to K or from H to L or from I to M in our figure 1) ;

c) the z-axis, increasing the level of industrial development. (Corresponds to a parallel upwards shift of the plane from the level LDC to DC in our figure 1).

Let us show now what this adjustment procedure means for the integrated area A. This group A is supposed to be typical for many of the integrated areas among the LDCs. It is characterized by a relatively *low level of industrialization, high heterogeneity among its members* and a *small size of the integrated area*. We can see that this integrated area has the alternatives of :

a) moving towards I^D by equalizing the degree of industrialization within the area in point D,²

b) moving towards I^B by accepting new members and an enlargement of its size,³

2. Robson (1984, pp. 157-164) shows possible corrective policies to promote balanced development within an integrated area and appropriate instruments for their implementation. He mentions especially: A) Fiscal compensation by intergovernmental income transfer through the common budget, which has been an element in the financial arrangements that underlie UDEAC, CEAO, ECOWAS, and the Southern African Customs Union (p. 158). B) Fiscal incentives to influence the location of (new) industry in an economic grouping. Financing the provision of loan finance on a subsidized basis for investment in the industry of the less industrialized members has been done by the Central American Bank for Economic Integration and the East African Development Bank and to a limited extent in the Entente Countries and in CEAO, and it is envisaged in the ECOWAS Fund (p. 160). C) Regional industrial policy and planned industrial specialisation for new industrial development. This approach has been implemented within LAFTA, ASEAN and some regional groupings in South-East Asia and in the Pacific. However, "the history of earlier arrangements that resorted to this approach is one of failures both of negotiation and implementation." (Robson 1984, p. 161)

3. To illustrate this point further, we come back to our example of the EC-South-Enlargement: Assuming that before this enlargement took place the EC was characterized by G (or K), in our figure 1, the enlargement brought the EC towards its optimal size H (or L). (Again, we treat the enlargement of the size isolated and uncorrelated from its effects on the degree of heterogeneity in industrialization among its members and on the average level of industrial development.) On the other hand, if we assume that the EC was characterized by H (or L) before this enlargement took place, the enlargement drove the EC away from its optimal size towards I (or M).

c) increasing the level of industrial development towards G (and switching from the actual plane LDC to a higher level plane DC) by unchanged differences between the national levels of industrialization.⁴

While each of these alternatives by itself increases the degree of integration, a combination of them only, however, leads to the optimal degree of integration I°_{LDC} and I°_{DC} respectively.⁵

If our LDC—area A tries to step from I^A to a higher degree I^B by choosing alternative b) and it has reached its optimal size B (and therefore the degree of integration I^B), the heterogeneity of its members will become the binding factor. There is no way to go further towards I°_{LDC} other than by designing measures equalizing the national levels of industrialization (no change in the average level of industrialization assumed, cfr. footnote 5).

On the other hand, if it chooses alternative a) an adjustment path following first the size—isoquant from A—after having reached D (and therefore the degree of integration I^D), the suboptimal size of the integrated area will become the binding factor.

For this second case—where the suboptimal size of the area is the reason for a suboptimal degree of integration, and where the adjustment path follows a homogeneity—isoquant (like line ABC or DEF)—going to a higher degree of integration is independent of the degree of homogeneity. In this case, heterogeneity among its members will not appear as an explanation for conflicts within the integrated area.

In other words: If the size rather than the heterogeneity of its members is the reason for the suboptimal degree of integration for an area, the insignificance of heterogeneity as a reason for its failures is not unexpected.

V. Conclusions⁶

Why has the actual implementation of integration agreements among the LDCs been a story of conflicts and failures rather than a story of success? Our simple graphical device provides the following answer:

4. This alternative is a general topic of economic development rather than a specific aspect of international integration. Consequently, this alternative seems to be rather unlikely in the short run.

5. In our figure 1, we reach the highest possible degree of integration I°_{DC} at point L. For an LDC—grouping, a more realistic maximal degree of integration is I°_{LDC} because alternative C) seems rather unlikely in the short run.

6. here, we only draw very rigorous conclusions for the policy of integration among LDCs. We are convinced, however, that our approach is also useful in explaining some problems of integration among DCs (e. g. problems in the context of the EC—South—Enlargement).

There exists an optimal size of an integrated area. Consequently, the size of the integrated area becomes an additional explanatory factor within a simultaneous combination of level and homogeneity of industrial development that determines the optimal degree of economic integration. Our figure suggests that under specific preconditions rationally coordinated activities on a regional basis might be more efficient than a broader attempt on a worldwide basis. To be successful in the process of international economic integration means choosing a degree of integration according to the size of the integrated area and to the level and homogeneity of industrial development among its members.

Our graphical presentation demonstrates that it is possible for areas which are industrially homogeneous nevertheless to have trouble integrating if they are not at the optimal size. The experience of some of the integration groupings among the LDCs is a good illustration of our graphical result :

In the Central African Customs and Economic Union (UDEAC), the Caribbean Community (CARICOM), the Central American Common Market (CACM) and in the East African Community, conflicts and limits in the process of integration were given by the size of the integrated area rather than by the heterogeneity among their members.

References

- Balassa, B. (1962), *The Theory of Economic Integration* (London : Allen & Unwin).
- Balassa, B. (1967), "Trade Creation and Diversion in the European Common Market", *Economic Journal*, vol. 77, pp. 1-21.
- Balassa, B. (1975), "Trade Creation and Diversion in the European Common Market : An Appraisal of the Evidence", in : B. Balassa (ed.), *European Economic Integration* (Amsterdam : North-Holland ; New York : American Elsevier), pp. 79-118.
- Cooper, R. N. (1976), "Worldwide versus Regional Integration : Is there an Optimum Size of the Integrated Area ?", in : F. Machlup (ed.), *Economic Integration : Worldwide, Regional, Sectoral* (London : Macmillan), pp. 41-53.
- Langhammer, R. J. and Spinanger, D. (1984), *Wirtschaftliche Zusammenarbeit zwischen den Entwicklungsländern (Chancen und Risiken)*, Kieler Studien 190 (Tübingen : Mohr).
- Lewis, A. (1980), "The Slowing Down of the Engine of Growth", *American Economic Review*, vol. 70, pp. 555-564.
- Meade, J. E. (1955), *The Theory of Customs Unions* (Amsterdam : North-Holland).

- Peñaherrera, G. S. (1980a), "Viable Integration and the Economic Co-operation Problems of the Developing World", *Journal of Common Market Studies*, vol. 19, pp. 65-76.
- Penagerrera, G. S. (1980b), "Viable Integration and the Economic Co-operation Problems of the Developing World", *Journal of Common Market Studies*, vol. 19, pp. 175-188.
- Robson, P. (1984), *The Economics of International Integration*, 2nd edition (London : Allen & Unwin Ltd).
- Straubhaar, T. (1987), "South-South Trade : Is Integration a Solution ?" *Intereconomics*, vol. 22, pp. 34-39.
- Vaitsos, C. V. (1978), "Crisis in Regional Economic Cooperation (integration) among Developing Countries : A Survey", *World Development*, vol. 6, pp. 719-769.
- Viner, J. (1950), *The Customs Union Issue* (New York : Carnegie Endowment For International Peace).