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LOCATIONAL STRATEGIES OF MULTINATIONAL ENTERPRISES AND REGIONAL TRADING BLOCS: DEFINING THE BOUNDARIES OF STRATEGIC OPTIMALITY

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ABSTRACT

The paper analyses a specific side of an advocated coevolution process between firms and trading systems. It does so by modelling the decision-making processes underlying the locational choices of multinational enterprises (MNEs) in regional trading blocs. The assumed scenario explores the case of the formation of a new bloc and its interactions with value-adding activities in another (already established) economic agreement.

A three-country, two-trading bloc model is proposed to map and analyse the distinct strategies available to the firm when the environmental shock under consideration (economic integration) occurs. Global interactions and inter-bloc dialectic are discussed and formalised.

The discrete choice model here proposed identifies the strategy set available to an archetypal MNE. The model is solved and boundaries of strategic optimality clearly drawn. The suggested framework takes into account a variety of material and intangible flows and their respective costs. The model appears to be realistic considering what firms *de facto* do, i.e. minimising system-wide cost in a drive for global efficiency. The costs considered are not only those implied by the effective carrying out of the firm's value-adding activities, but also those inherent to the linkages structuring these activities. Possible trade-offs between alternative locations and distinct cost categories are addressed and discussed.

This theoretical paper is marked by generality and flexibility, and may be modified to take into account distinct assumptions and to accommodate further refinements.

Keywords: Multinational enterprises, locational strategies, trading blocs, strategic decision-making, globalisation.

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INTRODUCTION

The paper explores a specific side of an advocated coevolution process between firms and trading systems. It argues that economic integration between countries is a key environmental variable that multinational enterprises (MNEs) need to take into account when designing their global (and regional) strategies.

The main objective of the investigation is to account for the interaction of two of the most paramount phenomena in the contemporary global economy (economic integration and corporate integration), in particular formalising the impact of the formation of trading blocs on corporate strategies and on the organisation of the multinational firm.

Certain structural similarities assist the coevolution process between MNEs and trading blocs. Both can be envisaged as dynamic systems. A systems perspective, notably emphasising the key issue of systemic embeddedness, is quite promising in the conceptualisation of this dialectic (Beer, 1985; Casson, 1990; Tavares, 1999). Just as trading blocs are composed by distinct countries, regions and localities, and themselves they are a part of the global economy (which acts as a 'systemic envelope'), so MNEs include distinct subsidiaries which in turn are composed by distinct departments and functions. This approach helps to understand better the phenomena under analysis.

The paper purports to shed some light on the strategy and organisation of the MNE. Given the fact that a two-bloc scenario is modelled, global issues are allowed due consideration.

The paper will be organised as follows. After a first part on the motivations and context of the research, the background to the model and respective underlying assumptions will be specified and discussed. The pre- and post-integration scenarios will be characterised.

The main part of the paper consists of the description of the economic model and respective analysis of its results. A strategy set will be clearly identified and formalised in order to

evaluate which will be the optimal course of action according to distinct assumptions. Trade-offs will be highlighted and results analysed.

Finally, some concluding comments and indications for future research along these lines are suggested.

MOTIVATIONS AND CONTEXT OF RESEARCH

The first motivation behind this research has to do with the undeniable importance of both economic integration and corporate integration (materialised on specific strategies undertaken by MNEs) in the context of the contemporary world economy. Furthermore, and despite the relevance of these phenomena, there is a shortage of theoretical investigations of their interface.

Dunning & Robson (1988) called the attention for the relative neglect of the dialectic economic-corporate integration. Despite the fact that there have been several empirical studies relating the two phenomena [Scaperlanda and Mauer (1969); Goldberg (1972); Franko (1976); Lunn (1980); Scaperlanda and Balough (1983); Hood and Young (1988); Clegg (1996); Pearce and Papanastassiou (1997); Dunning (1997), among many others], much remains to be done, in particular implying formal modelling and theoretical contributions.

In this vein, opportunities for formalisation were detected and the proposed theoretical framework offers a possible way of conceptualising the impact of economic integration on the MNE's strategic decision-making process.

The type of model deemed adequate is a discrete choice model, a quite established methodology, although that has never been applied to the issue of the link between economic integration on MNEs' strategies. Some recent applications of this methodology can be found in the international business and industrial organisation literatures [Buckley and Casson (1998); Casson and Wadeson (1996)].

The model here proposed takes into account the strategic options available to the archetypal MNE in the circumstance of the imminent formation of the new trading bloc.

This approach links aspects of economic theory and strategic management, and follows the methodology of a previous paper (Tavares, 1999) developing a two-country model, formalising the impact of the formation of a trading bloc inside the bloc (thus ignoring purposefully global interactions).

In this previous piece of analysis, it was found that a key trade-off tended to exist between production and linkage costs (Teece, 1983)[1]. This paper will confirm this trade-off but will allow other type of practical results.

Just like in the former paper, the MNE as a decision-making institution will constitute the focus of the analysis.

That is exactly the main distinction relatively to the already mentioned empirical studies, which were mainly dedicated to the analysis of the impact of the dismantling of trade barriers on FDI flows. This paper adopts a rather more institutional perspective, focusing on the MNE (the institution that is ultimately responsible for these - often fragmentary - FDI decisions) as the decision-maker and on the key issue of coordination of activities intra-firm.

The proposed theoretical framework's usefulness relates to its generality and flexibility for further developments. Furthermore, it provides a quite practical payoff, by identifying clearly the best strategic alternatives and the circumstances under which each is more appropriate.

As any model, it is a partial and selective representation of reality, although it is hopefully reasonably plausible by assuming a profit maximising assumption, and by the inclusion of information costs. Until quite recently, and as Casson (1997) emphasised, information flows were considerably neglected in the prevalent materialistic view of the economy, with the exception of pioneering works such as Marshak and Radner (1972), Richardson (1972), and Hayek (1945).

The profit maximising/cost minimising assumption, although certainly not the only possible objective of the firm, appears realistic according to what firms *de facto* do (Cheung, 1983).

BACKGROUND TO THE MODEL AND ASSUMPTIONS

The Pre-Integration Scenario

Consider a typical multinational enterprise (M), operating in three countries: X, Y and Z.

M develops three value-adding activities, notably:

* Production (P)

* Distribution (D)

* Research and Development (R & D)

M has to take decisions concerning the location of these activities.

The following information regarding these three countries applies.

X and Y are geographically contiguous. Despite the fact that they are neighbouring countries, for historical and political reasons trade between them is effectively inhibited by a host of barriers (a mixture of tariffs, NTBs and quotas).

Due to their own macroeconomic circumstances, X can be seen as the 'peripheral' country and Y as the 'core' country (this connotation is developmental rather than geographic).

Country X has a comparative advantage in labour-intensive activities.

In turn, Y is comparatively advantaged in knowledge-intensive, high-tech production involving very skilled (and well paid) labour.

Z is geographically distant from both X and Y. It belongs to a distinct continent. It is also a part of an important economically integrated scheme, A.

This economic integration agreement (A) represents a market of quite considerable dimension.

Z has a comparative advantage in labour-intensive activities (even though in a less pronounced way than X).

X and Y are considering the possibility of founding an economic integration agreement (B), which will be translated in the eradication of all trade barriers in manufactured goods (including those produced by M).

Examples of these countries can be Mexico (X) and the US (Y), respectively, in the phase they were considering forming NAFTA.

Z could be for instance Spain, a medium-sized country with fully-implemented free trade with a vast market (the EU).

The market of the economic integration agreement that Z is a part of is larger than that of Y, even though Y's market is of a considerable dimension. It is very important for the firm's success to be present or have a basis in the trading bloc to which Z belongs.

The firm manufactures only one consumer good, that is sold in the three above-mentioned countries. The good is labour-intensive. For the sake of simplification, the model here presented assumes constant returns to scale. The assumption of a production process amenable to economies of scale would only reinforce the model's conclusions.

By assumption, this archetypal MNE's home country is Y, the most 'developed' of the two prospective members of the new trade agreement.

The firm's objective is profit maximisation. Assuming stable demand conditions, this objective becomes equivalent to cost minimisation. M has, like any other firm, its own cost structure (to be developed later).

Before integration, the firm was producing in all countries, in a multidomestic strategy due to the trade barriers that hindered trade between X, Y and Z. The firm had 3 autarkic subsidiaries (see typology in Tavares & Pearce, 1998 and Tavares, 1999), producing exactly the same

good, and using the same technology. R & D was conducted at the main HQ in Y, and its results would be transmitted to the other subsidiaries in a dyadic relationship.

Distribution occurred in all three countries.

The firm had an important manufacturing unit in Z that served as a supply basis for the markets of the economic bloc A (regional subsidiary).

The considerable market of Y was supplied by a manufacturing subsidiary located in Y, even though *a priori* wages in Y were higher than in other neighbouring countries, including X. But trade barriers on manufacturing goods were so high that more than compensated the comparative disadvantage of Y in the production of the labour-intensive good in question.

In turn, X's market was supplied by a subsidiary located in X. Unit production cost was considerably cheaper than in its Y counterpart. Again, trade barriers impeded cost-effective exports from X to Y.

This situation was considerably inefficient. Unit production costs were higher as production occurred partly in comparatively disadvantaged countries. The global costs faced by the firm were much higher than in a free trade situation.

The customers were price-sensitive, and would not mind whether the product was manufactured in the country or not, provided its price would be cheaper.

After economic integration between X and Y

In a scenario where X and Y would have dismantled all barriers hindering trade, it would be irrational for the firm to persist producing in every country, given the potential to reap efficiencies from operating fewer manufacturing plants and to choose location of productive facilities according to relative comparative advantages. Hence, there was a competition between X, Y and Z in order to attract production. In fact, this competition was mainly

between X and Z, as the good was labour-intensive and Y was in this aspect considerably disadvantaged *vis-à-vis* the other two countries.

In the above-mentioned three-country scenario, three trade-offs can be clearly identified in what concerns the *locus* of production:

* Trade-off between X ⇔ Y

* Trade-off between X ⇔ Z

* Trade-off between Y ⇔ Z

These various trade-offs concerning production (P) are driven by distinct factors. Nevertheless, these drivers can be subsumed into three main considerations:

1. Transport costs (due to distance). Given that X and Y are geographically contiguous and Z is more distant, there are higher transport costs to consider between X ⇔ Z and between Y ⇔ Z than between X ⇔ Y. Higher communication costs between X ⇔ Z and Y ⇔ Z than between X ⇔ Y are a fact, as well. Both categories are included in the broader category of 'linkage costs' (characterised in detail in the part below describing the specifics of the model).

2. Factor costs (governed by relative comparative advantages of the countries, as described before in the assumptions of the model).

3. Trade barriers between trading bloc A (which includes country Z) and bloc B (including countries X and Y). Naturally, trade barriers only affect material flows (P ⇒ D) between the two blocs (A and B).

The first trade-off (X ⇔ Y) has as a main driver the discrepancy in the comparative advantages and consequently different production costs. As X and Y are geographically contiguous, transport/linkage costs tend to lose importance (in relative terms) *vis-à-vis* production costs. As there are no trade barriers between X and Y, this factor has no relevance for the solution of this trade-off. Also if exports to Z are considered, linkage costs (transport

and trade barriers) between X ⇔ Z and Y ⇔ Z are similar, hence the comparative advantage differential has to be the criterion for distinction.

The trade-off between X and Z is driven primarily by the high linkage costs that result from the considerable geographical distance between the two countries and by the trade barriers applicable. Another (even though more secondary) driver of this trade-off refers to the greater comparative advantage of X in production. However, Z belongs to a market of considerable dimension, which has also to be considered.

Finally, the trade-off between production in Y and Z is driven by the linkage cost component (both in terms of transport costs and costs implied by trade barriers) and by the comparative advantage differential in the production of labour-intensive goods (the latter aspect being more pronounced here than in the case of the choice between production in X and Z).

Concerning R & D, where to conduct it becomes an interesting question. The decision would be mainly between conducting R & D in Y as the dictates of comparative advantage suggest, and whether M could/should delegate R & D functions to a local lab in Z to adapt the product to customers of the economic bloc to which Z belongs.

A detailed analysis of the R & D function, and eventual discussion of the distinct types of R & D and its possible decentralisation, though worthwhile, escapes the objectives of this paper.

In a global cost minimisation approach like the one used in the model (Cheung, 1983), the location of R & D cannot be known *a priori*, as this activity accounts only for a part of the costs and production and distribution have to be taken into account simultaneously, as well as linkage costs between these three activities. The strategy set considered in the model will include explicitly this aspect.

Post-integration the circumstances governing the MNE's strategic decision-making process can be described in greater detail by the model in the next section.

THE MODEL: DESCRIPTION, RESULTS AND ANALYSIS

The Strategy Set Available to the Firm

Considering that the firm always distributes its products in the three countries (as that is assumed profitable), and it has only one R & D department (knowledge is a public good intra-MNE and can be transferred from subsidiary to subsidiary and from subsidiary to HQ and *vice-versa*), the following strategic permutations are possible:

Table 1. Distinct strategic options available to the firm.

Strategy	Production (P)	R & D (R)	Distribution (D)
S1	X	X	X + Y + Z
S2	X	Y	X + Y + Z
S3	X	Z	X + Y + Z
S4	Y	X	X + Y + Z
S5	Y	Y	X + Y + Z
S6	Y	Z	X + Y + Z
S7	Z	X	X + Y + Z
S8	Z	Y	X + Y + Z
S9	Z	Z	X + Y + Z
S10	X + Y	X	X + Y + Z
S11	X + Y	Y	X + Y + Z
S12	X + Y	Z	X + Y + Z
S13	X + Z	X	X + Y + Z
S14	X + Z	Y	X + Y + Z
S15	X + Z	Z	X + Y + Z
S16	Y + Z	X	X + Y + Z
S17	Y + Z	Y	X + Y + Z
S18	Y + Z	Z	X + Y + Z
S19	X + Y + Z	X	X + Y + Z
S20	X + Y + Z	Y	X + Y + Z
S21	X + Y + Z	Z	X + Y + Z

To solve such a model, it is fundamental to identify and eliminate eventual dominance relationships that may exist (Casson, 2000).

From an analysis of the strategies described above, and having present the formerly explained assumptions (about comparative advantages in production and R & D, and linkage costs –

including transport costs, communication costs, and trade barriers), several strategies are clearly dominated.

S3 is undoubtedly dominated by S2. *Ceteris paribus* it is better to research in Y than in Z. However, the main issue is that the linkage costs between X and Z are significantly higher than between X and Y, due to the considerable distance involved.

S4 is dominated by S1, as both in production and in R & D it represents a situation where the comparative advantages are 'distorted'. In S1, the situation regarding comparative advantages is more favourable. Linkage costs are not the key issue here, even though S1 is also better in this account.

On the other hand, S6 is always worse than S5. Production occurs in the most disadvantaged place in both cases (Y). Nevertheless, S5 is better in terms of location of R & D (due to comparative advantages). Furthermore, S6 involves much more considerable linkage costs than S5.

S7 is dominated by S8, due to higher R & D costs.

S10 and S12 are proved to be more disfavourable than S11, also due to the R & D component of the cost structure and S12 even more because of linkage costs.

Nonetheless, S11 itself is dominated by S2, as it involves higher linkage costs and higher comparative production costs.

S15 is clearly dominated by S13 due to higher communication/linkage costs between R & D and distribution. The same reason justifies the fact that S18 is less favourable than S17, which is compounded by the fact that Y is comparatively advantaged over Z in R & D. S16 is always an inferior option when compared to S13 (mainly due to the production cost differential but also due to higher linkage costs) and S17 (higher linkage costs and comparative advantage of Y in R & D).

The strategic options that involve production in the three countries are always rejected *a priori*. S19 is dominated by S13, S20 by S14, and finally S21 by S15, due to the higher production and linkage costs that they imply.

Strategy Set After Elimination of Dominated Strategies

From these considerations and subsequent elimination of dominated strategies, the only strategies (8 in total) that the firm should realistically consider in its decision-making process should be the ones described in the following table:

Table 2: Strategy set after elimination of dominated scenarios

Strategies	**Production (P)**	**R & D (R)**	**Distribution (D)**
S1	X	X	X + Y + Z
S2	X	Y	X + Y + Z
S5	Y	Y	X + Y + Z
S8	Z	Y	X + Y + Z
S9	Z	Z	X + Y + Z
S13	X + Z	X	X + Y + Z
S14	X + Z	Y	X + Y + Z
S17	Y + Z	Y	X + Y + Z

Cost Structure Associated to the Distinct Strategic Options

Each of these strategies has a corresponding cost structure associated to it (see Table 3, p.24). In Table 3, it was assumed that the market of the economic bloc to which Z belongs has the same size as the markets of countries X and Y together (Z represents 50% of the total market for this product, whereas X and Y represent 25% each). It was also assumed that when the firm chooses simultaneously one of the countries (X, Y) and Z as production *loci*, it will produce half in X or Y and half in Z, and no cross-hauling of production will be allowed due to cost inefficiency (what is produced in X or Y will be distributed in X or Y, in case of Z producing, and naturally Z's production will be distributed in the trading bloc B).

The cost structure inherent to any of the above mentioned strategies (K_i) has four distinct additive components:

$K_i = \Sigma [P_i+R_i+L_i+D_i]$

In which:

P_i = Production costs

R_i = R & D costs

L_i = Linkage costs

D_i = Distribution costs

As it can be inferred from Table 3, production costs are proportional to output volume, whereas linkage costs depend on both output volume and number of linkages established.

At this stage it is worthwhile differentiating among three types of linkage costs. The first refers to transport costs associated with moving the goods/resources. They are naturally proportional to the volume of output transported. They represent material flows from production to distribution. The second type of linkage costs consists of transaction costs due to the existence of three types of trade barriers (tariffs, costs of surmounting NTBs, and the implicit cost involved by the existence of quotas. As soon as economic integration between X and Y occurs, this component is set to zero (just between X and Y), so it is not relevant in the computation of linkage costs. Nevertheless, when material P $\Rightarrow$ D flows occur between blocs A and B, the cost implied by trade barriers has to be included. Finally, information costs need to be considered. This category encompasses information costs of both a transactional and a non-transactional nature, the latter referring to information costs not associated with preventing attitudes such as shirking and opportunism. A considerable part of information costs are linked to the formulation of suitable business strategies rather than preventing this type of behaviours [Buckley and Carter (1996); Casson (1997b)]. These costs refer to

intangible two-way flows of information between production and R & D and R & D and distribution, and they are paramount in the evolution of linkage costs and in the strategic decision-making process as a whole. In Table 3, these costs are proportional to the number of linkages (l).

As an example of an equation considered in the system to be solved, take S1:

$K_1 = P+R(1+\beta)+D+0.25*l*q+0.25*l*q(1+\gamma)+0.5*l*q(1+\gamma+\varphi+\theta)+2*l*n(1+i)$

$+2*l*n(1+i)+2*l*n(1+i)*(1+\gamma)+2*l*n(1+i)*(1+\gamma+\varphi)$

that may be simplified to:

$K_1 = P+R(1+\beta)+D+0.25*l*q(4+3\gamma+2\varphi+2\theta)+2*l*n(1+i)*(4+2\gamma+\varphi)$

And in which:

q = volume of output

n =number of linkages

π =unit production cost (in X)

λ = unit linkage cost

ρ = unit R & D cost (in Y)

P = total production costs (in X) = π*q

R = total R & D costs (in Y) = ρ*q

α = premium to produce in Z rather than in X

β = premium to conduct R & D in X or Z rather than in Y

γ = premium when a linkage is international rather than national (from X to Y and *vice versa*)

ι = premium when the flow is of an intangible nature

φ = extra premium when the international linkage occurs between distinct trading blocs (includes higher transport costs in terms of material flows and higher communication costs in terms of information flows)

θ = unit cost of trade barriers (when there is a material flow from A to B or vice-versa)

ψ = extra premium to produce in Y

Explaining the structure of equation S1, it must be taken into account that production and R & D occur exclusively in X, whereas distribution occurs (like in all strategies) in the three countries. Production costs (P) are not penalised by any premium as production occurs in the cheapest possible location. As R & D is performed in X, which is comparatively disadvantaged in knowledge-intensive activities, premium β applies.

In what concerns linkage costs, the three first components refer to the part of linkage costs (transport costs and trade barriers) proportional on output (q). Given previously expounded assumptions regarding their market sizes, X and Y account for 25 per cent of the production each and the trading bloc to which Z belongs accounts for the other half of the output volume (exported to Z). The 25 per cent of the output volume sold in X does not incur any premium, as it is produced and distributed in the same country. The other quarter of production sold in Y, as it involves an international linkage (although between neighbouring countries), is penalised by premium γ. To the half of the production that is exported to Z for sale in the trading bloc A, a further premium (φ) is applicable, and also a factor θ representing trade barriers between the two trading blocs (unit cost).

The last four components of the cost structure refer to intangible (information) flows. Hence, premium ι applies to all these components as they are of an intangible nature.

Moreover, as they are bilateral or two-way flows, all need to be multiplied by 2 in the respective cost equations. The first of these four components respects to the bilateral flow from production to R & D (both occurring in X), whereas the other three concern two-way flows between R & D and distribution, between X and X, Y and Z (respectively). Therefore, no premium applies in the first case, γ has to be considered in the second, and both γ and φ in

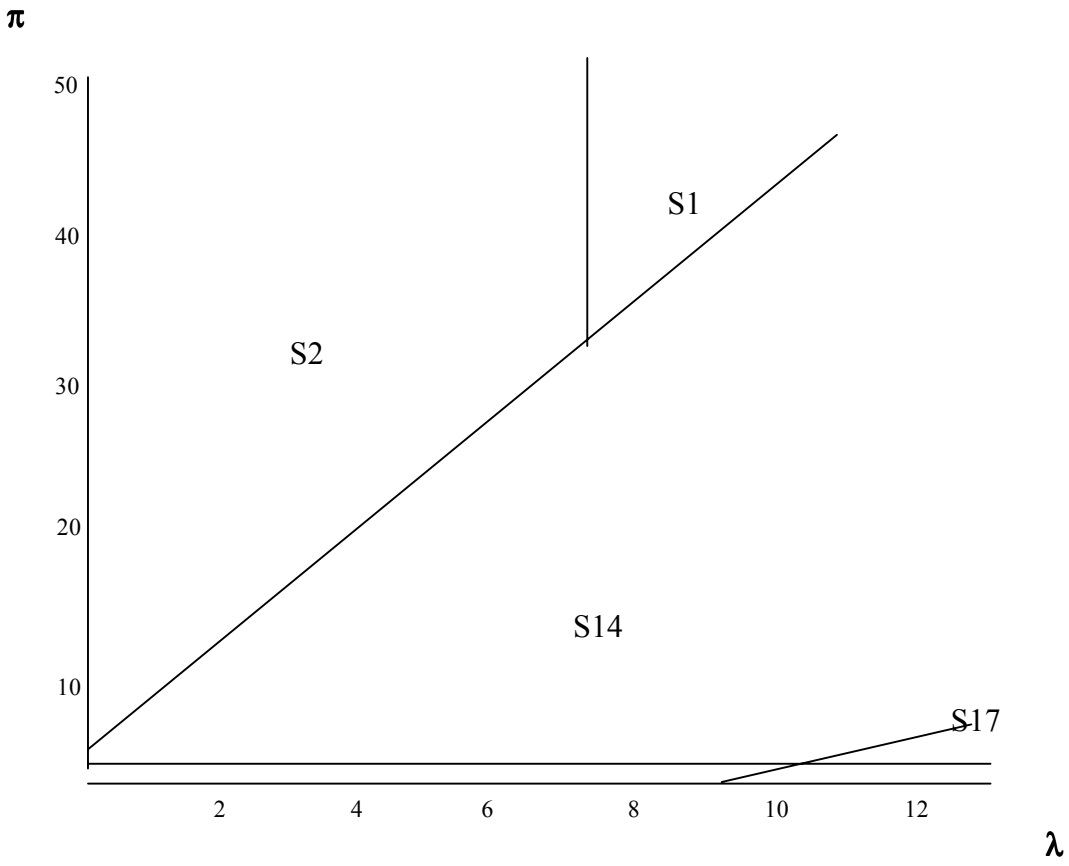
the last component. For intangible flows, the parameter φ includes increased communication costs as these information flows occur between two geographically distant countries.

The remaining cost equations (Table 3) follow the same logic as S1.

RESULTS

The solution of the above mentioned system of equations has led to the following results[2]:

FIGURE 1



In order to obtain such results in a two-dimensional form, all parameters but two (the ones in the horizontal and vertical axes) need to be fixed.

Figure 1 shows the boundaries of strategic optimality and the range of (λ,π) for which each strategy is best. The results confirm the dominance of the eight equations included in the

system. It is also illustrative of the production-linkages cost trade-off (Tavares, 1999; Teece, 1983).

In Figure 1, λ and π were allowed to vary, and the remaining parameters were assumed to have the following values:

q=1000	n=10	$\alpha = 0.5$	$\beta = 0.3$	$\rho = 0.4$
$\gamma = 0.6$	$\iota = 0.2$	$\varphi = 0.8$	$\psi = 0.7$	$\theta = 1$

The output level and the number of linkages were set to 1000 and 10 respectively. Here, the choice is uncontroversial, as any output volume or number of linkages would be acceptable and viable in the simulations. However, it seems sensible to assume that the number of linkages is inferior than the number of units produced. The different premia weighing on the decision (α, β, γ, ι, φ, ψ, θ) were also selected with plausibility in mind, although other suggestions are possible without perverting the logic of the model.

These premia were ranked in the following way. The premium penalising production in Z over production in X (α=alfa) was assumed to be smaller than the extra premium penalising production in Y (ψ=fi), as it was assumed that the differential in comparative advantages is more pronounced in Y (labour costs are much higher than in the other two countries).

The R & D onus of producing the good in countries X or Z (β=beta) is assumed to be smaller than both α and ψ (its production counterparts). In relative terms, the differences in unit production costs are more significant than the differentials in unit R & D costs.

Three premia penalise the establishment of an international linkage versus a domestic one. γ (gamma) refers to the premium when an international linkage occurs within the same continent (i.e. between countries X and Y), whereas φ (psi) represents the extra premium when an international linkage is established between two distinct continents (e.g. from X to Z and from Y to Z and *vice-versa*). In terms of material flows these premia refer to transport

costs, and for information flows they represent higher communication costs. The second is set higher, which appears plausible given the fact that X and Y are geographically contiguous and the continent to which country Z belongs is considered quite distant. Finally, θ represents the value of trade barriers that correspond to one unit of the product transferred from one trading bloc to the other.

ι (iota), the premium when the flow is of an intangible nature, is assumed to be the most insignificant of all. This is the value that is most difficult to define, therefore it was chosen to assume a modest magnitude for it.

Figure 1 shows that, from the eight original dominant strategies, four of them are optimal for distinct ranges of (λ,π) values. The values of the axes were allowed to be very considerable to enable the inclusion of all extreme cases.

Analysing more specifically these results, the main outcome refers to the fact that for the majority of values, S14 and S2 represent the best strategy, which would be quite in line with initial expectations.

S14 involves production in both X and Z and R & D in Y. *A priori*, this strategy seems quite advantageous, and the results confirm this expectation for an important range of (λ,π) combinations. It is indeed the best strategy when both linkage and production costs are not extreme. This strategy mirrors what many MNEs actually do, that is, producing in at least one country in all major trading blocs (hence avoiding inter-bloc trade barriers). Naturally, this occurs not only due to efficiencies in production, R & D and distribution, but also due to other important considerations such as goodwill and proximity to customers.

S2, involving production in X and R & D in Y, captures more of the 'optimal space', the more important are production costs *vis-à-vis* linkage costs. As X represents the country with lower production costs, for a moderate level of linkage costs it is preferable to produce only in X and export to both Y and Z, even though considering the transport costs and the trade barriers

involved in exporting from X to Z (located in another continent). This argument may be reinforced also by an economies of scale argument, and many MNEs use this strategy, especially when the product does not involve many manufacturing stages intensive in distinct productive factors. The aspects of proximity to customers and goodwill are relegated for second plan here in favour of cost reductions (relevant when consumers are considerably price-sensitive).

When both production and linkage costs are extremely high, S1 becomes the most appropriate strategy, involving producing exclusively in X and also research in X (due to outstanding linkage costs). Producing and researching in the same country minimises logically linkage costs from production to R & D but also the other types of linkage costs mentioned.

Also for S2 to be the best strategy comparatively to S1, the relative importance of production costs has to be more significant as it can be seen from the diagram.

Finally, for a very small part of the optimal space, S17 is the most adequate, notably in the case that production costs are insignificant (no matter linkage costs). If so, the most unlikely strategy of producing in Y and not in X for the trading bloc A and in Z for B becomes optimal. This is explained by the fact that production costs are so small that the economy in linkage costs from R & D to production (as both occur in Y) makes this strategy involve less total costs than S14.

All results seem credible in the light of *a priori* expectations and the production-linkage costs trade-off highlighted earlier.

CONCLUDING COMMENTS AND SUGGESTIONS FOR FUTURE RESEARCH

The paper developed a three-country model of the impact of economic integration in the locational strategies of a typical multinational enterprise. Departing from the dismantling of trade barriers between two of these countries (X and Y), it explored the interactions of free

trade between these countries and a third country Z, geographically distant and already integrated economically in a distinct trading bloc.

This formal exercise, by including two economic blocs, enabled the discussion of an inter-bloc dialectic and global issues.

The structural aspects of the model were analysed, and key properties established. The results of the model pointed to a fundamental production *versus* linkage costs trade-off, and comparative advantages and linkage costs (including trade barriers) were found to be the key criteria for locational choice of production and R & D activities. As distribution occurred in all countries, it did not constitute a discriminating variable.

The model clearly specified a strategy set available to the firm when X and Y decided to form the new trading bloc. From the initial twenty-one strategic permutations, and through the identification of dominance relations based on economic theory and on a cost-minimisation objective, eight strategies were considered in a system of equations. The results show which are the optimal strategic options for distinct combinations of parameters (namely production and linkage costs). The model takes into account both absolute and relative costs, and points to the relative importance of different categories of the cost structure.

The main strength of the approach here proposed is that it applies for the first time an established methodology (discrete choice model) the issue of the impact of economic integration on corporate strategies, resulting in a practical payoff materialised in quite specific outcomes. The model is general and flexible to accommodate any parameter changes, and may lead to a research agenda of its own.

In terms of other potential examples, distinct locations and historical periods could provide interesting applications for this framework, notably:

I) The British Empire in the 18th century

II) The Portuguese Empire in the 16th century

III) The very case of the EEC in the early 1960s (e.g. the cases of France, Germany and Italy). For instance, it is usually said that EEC membership had a considerable impact in the North of Italy, comparatively advantaged in labour-intensive manufacturing.

Different levels of recursion and 'systems in focus' could be investigated, for instance regions in a country rather than countries in a trading bloc (more micro perspective).

A richer treatment of the R & D issue could also be included, notably analysing the importance of establishing a local lab in Z to adapt for A's consumers, thereby distinguishing between basic and applied research, and also discussing the topical issue of decentralisation of R & D.

The question of what determines locational choices *in* a bloc could also be explored in more detail, for instance developing issues such as cultural distance and language.

Distinct magnitudes of trade barriers can be used (encompassing scenarios of 'open' and 'closed' regionalism). Nevertheless, for values of θ between 0 and 1 the optimal strategies are exactly the same.

Last but not least, an interesting path to follow would be to try to relate the three-country model to a view of the world economy and to the structure of world trade. This task, though complex, could be better tackled on an industry basis, probably using case studies of certain sectors given that the structure of trade varies so considerably from industry to industry.

ENDNOTES

1. Teece (1983) discussed the existence of a trade-off between production costs and governance/transaction costs. The category of linkage costs here considered is more general than Teece's transaction costs, including also information costs of a non-transactional kind, implied by the efficient carrying out of the firm's activities.

2. Results were obtained through programming and solving the system of equations described in the Mathematica computer package.

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TABLES

Table 3: Cost structure inherent to the distinct strategic options

	Production (P)	R & D (R)	Distribution (D)	Linkage (L)
S1	P	R (1+β)	D	0.25*l*q+0.25*l*q(1+γ)+0.5*l*q(1+γ+φ+θ)+2*l*n(1+i)+2*n(1+i) +2*l*n(1+i)*(1+γ)+2*l*n(1+i)*(1+γ+φ)
S2	P	R	D	0.25*l*q+0.25*l*q(1+γ)+0.5*l*q(1+γ+φ+θ)+2*l*n(1+i)*(1+γ) +2*l*n(1+i)*(1+γ)+2*l*n(1+i)+2*l*n(1+i)*(1+γ+φ)
S5	P (1+α+ψ)	R	D	0.25*l*q(1+γ)+0.25*l*q+0.5*l*q(1+γ+φ+θ)+2*l*n(1+i) +2*l*n(1+i)*(1+γ)+2*l*n(1+i)+2*l*n(1+i)*(1+γ+φ)
S8	P (1+α)	R	D	0.25*l*q(1+γ+φ)+0.25*l*q(1+γ+φ+θ)+0.5*l*q+2*l*nb(1+i)*(1+γ+φ) +2*l*n(1+i)*(1+γ+φ)+2*l*n(1+i)*(1+γ+φ)+2*l*n(1+i)
S9	P (1+α)	R(1+β)	D	0.25*l*q(1+γ+φ+θ)+0.25*l*q(1+γ+φ+θ)+0.5*l*q+2*l*n(1+i) +2*l*n(1+i)*(1+γ+φ)+2*l*n(1+i)*(1+γ+φ)+2*l*n(1+i)
S13	0.5P+0.5P (1+α)	R(1+β)	D	0.25*l*q+0.25*l*q(1+γ)+0.5*l*q+2*l*n(1+i)+2*l*n(1+i)*(1+γ+φ) +2*l*n(1+i)+2*l*n(1+i)+2*l*n(1+i)*(1+γ)+2*l*n(1+i)*(1+γ+φ)
S14	0.5P+0.5P (1+α)	R	D	0.25*l*q+0.25*l*q(1+γ)+0.5*l*q+2*l*n(1+i)*(1+γ)+2*l*n(1+i)*(1+γ+φ) +2*l*n(1+i)*(1+γ)+2*l*n(1+i)+2*l*n(1+i)*(1+γ+φ)
S17	0.5P(1+α+ψ)+0.5P (1+α)	R	D	0.25*l*q(1+γ)+0.25*l*q+0.5*l*q+2*l*n(1+i)+2*l*n(1+i)*(1+γ+φ) +2*l*n(1+i)*(1+γ)+2*l*n(1+i)+2*l*n(1+i)*(1+γ+φ)