

SOME EXPLANATIONS ON FIRM LOCATION IN A DEVELOPING COUNTRY

By Cayetano W. Paderanga, Jr.*

Some analysts of firm and industrial location have doubted the applicability of the standard approach¹ to less developed countries (LDCs). This paper aims to adapt the standard model to LDCs somewhat along the lines suggested by some of these writers.² The main thesis is that in contrast to developed economies, LDCs are segmented into regional markets that interact relatively minimally with each other. Because of problems in transportation and other infrastructure services, prices of products are often substantially different from one region to another. This may also be true of the prices of production inputs. These and other differences have served to limit the applicability of the standard model to less developed economies.

1. Industrial Location in Less Developed Countries

As mentioned, practitioners have been dissatisfied with the standard model because of its failure to explain and predict the urbanization and spatial development patterns of less developed countries.³ Among the patterns that do not seem to accord with conventional theory, for example, is the persistent attraction of the capital regions in LDCs despite the presence of cost advantages in the other regions and the increasing disamenities of congestion in the country's capital. Increasing disappointment with the conventional approach and reasons for its failure to provide an explanation for the actual patterns have been presented by various writers.

Richardson (1979) puts forward one of the more sweeping indictments against what he terms the "neoclassical model." According to him, the assumption of uniform prices and inputs and marginal adjustments in order to attain profit-maximization is so far from the realities

*Assistant Professor of Economics, University of the Philippines.

¹See for example Alonso (1968, 1970a and 1970b), Richardson (1979) and Myrdal (1957) among others.

²Especially Alonso, *ibid.*

³Even after the difference between actual observed spatial patterns and the expected patterns due to the inertia of firms in locating or transferring caused by the longevity of capital equipment has been considered.

of LDCs that the whole apparatus should be discarded entirely. He favors the use of the spiral-backwash effects model proposed earlier by Myrdal (1957). He has proposed the use of attraction and repulsion indices to make the approach operational.

Alonso (1968) attributes the failure of the standard model largely to the inattention of researchers to the influence of agglomeration economies and the perceived uncertainties present in locating in undeveloped regions (e.g., uncertainty as to the presence of *all* types of skilled labor). However, further research is needed before quantitative indications of the effects of these uncertainties are possible.

Miranda (1977) has formulated a model that explicitly incorporates the influence of "non-economic factors" on the industrial location decision. The difficulty of identifying these non-economic factors that systematically influence location decisions, coupled with the difficulty of determining how much weight to give to each factor, makes the model even less immediately operational than Alonso's explanation.

This paper attempts an adaptation of the standard model with the incorporation of two factors that may be mutually reinforcing:

- (a) regional fragmentation in LDCs
- (b) disparity of information about regions, with the resulting information edge in favor of the national capital region.

These additional aspects are not mutually exclusive and neither do they exclude the previous explanations. They provide further directions for the possible modification of location theories for adaptability to LDCs. Further, these aspects explicitly consider conditions in LDCs.

2. Conditions in Less Developed Countries

The main characteristic of most LDCs is inadequate transportation and communications among different regions of the country. The national economy is disjointed into several largely independent regional sub-markets with minimal interaction with each other and interacting relatively more with the main metropolitan region regarding products that require a national market (e.g. cars and household appliances). Demand and cost surfaces are not smooth over the whole national geographic space. Rather, these surfaces are akin to broken plates, corresponding to regions, that do not strongly interact with each other. Prices of products and inputs may be substantially different from one region to another.

This modified explanation explicitly incorporates the market fragmentation of LDCs into the conceptual decision process. Because of the disjointedness of the regions comprising the national market, the location decision is broken down into two steps:

- (i) choice of the regional market to operate in given constraints, and
- (ii) choice of a specific location within the regional market chosen in the first step.

Formally, this two-step process is shown by explicitly introducing two subscripts in the profit function:

$$(1) \quad \pi_{ji} = R_{ji} - C_{ji}$$

$R = \text{Revenue}$
 $C = \text{Cost}$

where j corresponds to the j th regional submarket and i represents the i th location within the j th region. In our model, the j subscript signifies a different set of demand and cost surfaces for each j . The level of each surface may be radically different from the corresponding surfaces in the neighboring regions.

In the static version of the model, the decision-maker first decides over the j 's before deciding over the i 's. This consideration is graphically illustrated below, contrasting the case in DCs (Figure 1) to that in LDCs (Figure 2).

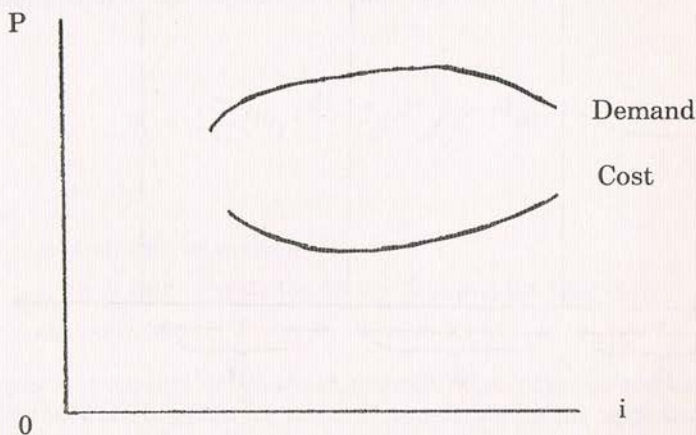


Figure 1. Demand and Cost Surfaces in Developed Countries*

*In models that emphasize only one side (e.g., transportation cost minimization), the other side may implicitly be assumed to be a horizontal line.

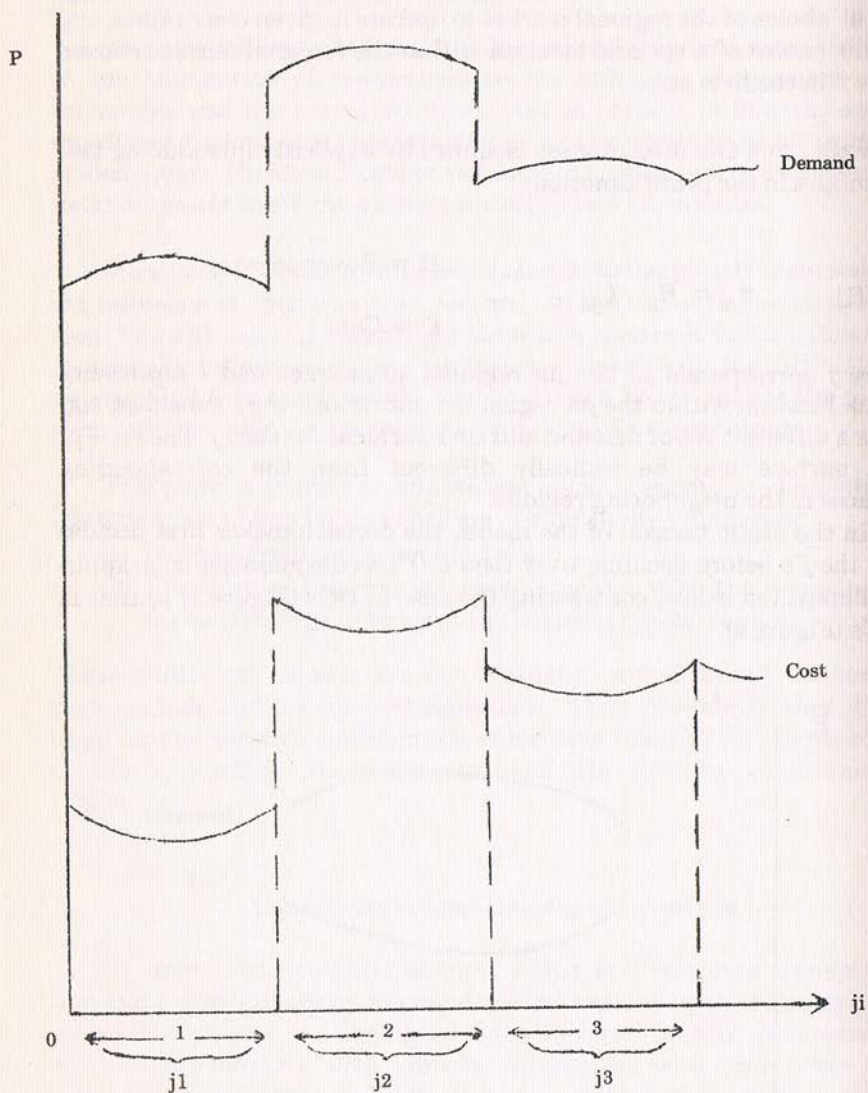


Figure 2— Demand and Cost Surfaces with Market Segmentation in LDCs

3. The Effect of a Geographically Fragmented Market

An explicit consideration of the division of the national market into regional segments is needed for the conventional model to be useful for less developed countries. First of all, recognition of the importance of both sides of the profit equation implies that attention can no longer be focused on the point of minimum cost or maximum price alone. The incorporation of regional fragmentation further implies that in terms of regions, the optimal choice is not the highest demand surface or the least-cost surface region. Inattention to one term of the profit equation is no longer admissible, even as a rough approximation. The region with the maximum distance between the demand and cost surfaces has to be explicitly searched for.

Even the consideration mentioned above is not enough. The static view of looking for the absolute distances between the capitalized value of the revenue and cost surfaces is still wanting. In fragmented markets, the directions and magnitudes of change of the financial surfaces will vary from one region to another.⁴ In some regions, the changes may be in the same direction for both revenue and cost; in others, the changes may go in opposite directions. Not only does the decision-maker have to look closely at the capitalized difference between revenue and cost (profit) for each region, he also has to gauge how the revenue and cost surfaces will change over time, because these changes may radically vary among regions. We formally show this by introducing a rate of growth in the current values of revenue and cost to the definition of the capitalized value of profit.

$$(2) \quad \pi_j = \int_C^T (R_{jt} e^{\beta t} - C_{jt} e^{\gamma t}) e^{-\alpha t} dt$$

where:

β : growth rate of revenue

γ : growth rate of cost; the i 's are dropped for simplicity.

α : discount rate

The explicit introduction of these growth rates emphasizes that more than normal care is given by the decision-maker in his appraisal of the region's prospects in both sides of the profit calculus. β , for example, may be affected by the region's overall growth rate, expansion of the

⁴This is also true to some extent in developed economies; however, the differentials are greatly magnified in LDCs because changes in any region are confined there.

regional communication network and other factors. γ on the other hand, may be influenced by the change in the region's cost advantages, among other things, as other firms move in by the agglomeration economies of having numerous firms in the same area. An explanation that ignores the effects of regional fragmentation on the movements of the demand and cost advantages for each region will not be able to explain the locational choice of firms that take into consideration the effect of differential changes of the regions into their calculations.⁵ Conventional theory, which appears to have neglected the treatment of this aspect explicitly, may have left out a substantial portion of the reality in LDCs.

This aspect is particularly important in the attempt to measure the impact of government policy on urbanization and spatial development. Too often, researchers and policymakers have considered only the direct impact of policies on industries. The indirect effects through differential changes among different regions have been neglected. For example, while some studies would assert that government macroeconomic and growth policies favored the national capital region for firm and industrial location, the cumulative effects of all the infrastructure that is put in just to service the firms that are in place serve to make Metro Manila even more attractive to potential entrants. Increased prospects of new production further increase the expected growth of demand in the region, further increasing expected profits for the location. Because of regional fragmentation, the changes will be confined to the region. As a result, the attractiveness of Metro Manila persists and even widens over time.

4. The Effect of Information Scarcity

An additional important feature of LDCs is the role that the capital region plays in the accumulation, processing and dissemination of knowledge and information. National newspapers and magazines are invariably based in the nation's capital, which is also the hub of communication facilities. Perhaps, more important, the main educational institutions are also found there. Consequently, the probability is high that most entrepreneurs would know intimately only two regions of the country: his native region and the national capital region. Because of the high cost of gathering information in all of the aspects, the locational choice must often boil down to that between the two familiar regions,

⁵This is particularly important with regard to the national capital region which seems to enjoy a positive correction factor in the view of most decision-makers.

$$\tilde{\pi}_c > \tilde{\pi}_j$$

where:

c : capital region

j : native region of the entrepreneur.

The probability that the investor will choose Metro Manila is positive in each case. This choice is repeated for investors from the other regions—and each time, Metro Manila receives a share of new firms inordinately larger than its objective attractiveness. As the location decisions are added up over all the regions (of origin of entrepreneurs), the national capital region starts to get a share of new business disproportionate to its “objective attractiveness” (i.e. over and above the normal considerations which include agglomeration economies).⁶ Any exploration of industrial or firm location that does not consider this information scarcity in LDCs will be incomplete for explaining the spatial development patterns observed in those countries. The interaction of the effects of information scarcity with those of market fragmentation results in the persistence of the national capital center’s attractiveness for firm location in comparison with the other regions.

5. LDC Conditions and Government Policies

The two features of less developed economies discussed above provide the national capital region with built-in advantages over other regions. They also magnify the differential whenever an initial impulse is applied to the primate city. In LDCs, growth and trade policies during the past four decades have typically introduced a tendency for firms to locate close to the capital. Regional fragmentation has exacerbated the bias by containing the effects of these policies within the main region. The differentials build up over time and significant concentration of economic activity over and above their natural advantages accrues to certain regions.

The foregoing explanation is a partial account of the existing locational pattern in LDCs. It does not rule out the presence of other influences. Rather, it incorporates some spatial characteristics of LDCs and the persistence of the attraction of the national capital in a

⁶In a static sense, this cannot happen. As firms agglomerate in a region, their number will be limited by the volume of output that will be optimal for production in that region. However, dynamically, the objective advantages of that region could persist if the region’s resources also expand in response to the increase in economic activity. The inflow of resources will, in turn, increase demand for some of the region’s products.

consistent manner. It attempts to place the role of trade and growth policies in the context of spatial development. Helping initiate discussion in this direction may ultimately be the purpose best served by this paper.

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