

# **LOS TRANSPORTES, EL DESARROLLO REGIONAL, Y UN ANALYSIS DEL POTENCIAL ECONOMICO DEL INTERIOR DE LA ARGENTINA**

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## **Resumen**

Las desigualdades regionales en el crecimiento socioeconómico son componentes críticos de las dimensiones espaciales de desarrollo en la Argentina. Dentro del contexto del MERCOSUR, los planificadores frecuentemente han sostenido que una reducción del tiempo de los viajes interregionales y intraregionales y de los costes de transportes pueda realzar significativamente la posición competitiva de los géneros de exportación argentinos en el mercado del Cono del Sur y a la inversa. En esta ponencia, la hipótesis es que los mejoramientos en el sistema de transportes puedan tener un mayor impacto beneficioso en la estructura económica de las regiones norteñas y occidentales de la Argentina en comparación con la región núcleo de la Pampeana.

El objeto principal de esta ponencia es examinar y evaluar empíricamente el impacto económico regional de los mejoramientos de transportes empleando el análisis del potencial económico. Primero, la metodología que apoya el modelo del potencial económico es explicado en términos generales. Segundo, los resultados del análisis son presentados y las consecuencias de los mejoramientos de transportes para la accesibilidad regional son discutidos. Por último, una crítica de las políticas contemporáneas del gobierno para con la transportación destaca las limitaciones que son impuestos a la regionalización de los beneficios del potencial económico los que son creados por los mejoramientos de transportes.

**Palabras Claves:** Desarrollo Regional, Transportes, Potencial Económico, Argentina.

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## Introducción

As countries and regions continue to move toward regional economic integration within the context of the evolving global economy, geographers and others have focused increased attention on the role of transport and communication in facilitating the development and integration process. Transport is a catalyst for interactions over space and through time among individuals and communities, and between them and the physical and cultural environment. The reciprocal relationship between transport, space, and time provides the basis for the widely accepted proposition that transport is a fundamental component of regional development and integration (Voight 1984; Dugonjic 1989). Regional transport services and infrastructure are the lifeline for economic and social interchange.

Analyses of transport and communication's role in the regional development process typically have concentrated on changes at three different scales: global, suprastate regional, and substate regional. Each scale of connectivity has implications for the ability of regions and countries to interact and compete in the global economy. Transport spaces and actors are inextricably intertwined at different scales with transport processes and infrastructure. In turn, these processes have distinct impacts at myriad scales. For example, research on global transport networks has helped our understanding of the relationship between world cities and their regional hinterlands (Keeling 1995), while studies of global telecommunications systems have shed light on the articulation of local, regional, and national economies in the global system (Heldman 1992; Kellerman 1993). At the suprastate regional scale, Europe has dominated recent examinations of transport's role in the regional development process (Noam 1992; Gibb 1995; Ivy 1995). However, recent passage of the North American Free Trade Agreement promises to stimulate research on the transport-regional development nexus in Mexico, Canada, and the United States (ECLAC 1995). However, empirical analyses have proved that a dominant interregional transport and communication network does not automatically encourage capital flows from rich to poor regions, nor does it produce a reduction in regional inequalities (Blum 1982; Dugonjic 1985)

Despite tremendous theoretical and empirical advances in our understanding of how local, regional, and global socioeconomic spaces are evolving and coalescing, progress on examining the role of transport in shaping and structuring these spaces has been slow. The lack of an adequate theorization of transport's role in regional and global development has inhibited research on the changing circumstances of cities, regions, and states in the contemporary global economy. As Nigel Thrift (1986:62) argued, few researchers have seemed willing to "come out of their national shells and take the wider view which would enable them to understand what is going on within their own countries." Latin America, for example, has suffered tremendously in recent years from a lack of focus by governments, planners, and academics on the relationship between transport, urban growth, regional development, and global economic change. Arguably, intra- and interregional connectivity in Latin America is as poor today as at any time in the 20th century. Constraints on the flow and interaction of people, goods, and information in Latin America remain at the top of a long list of regional development problems facing the region.

As geographers and others continue to explore the local-global continuum of socioeconomic relationships and the impact on peoples and places of the globalization phenomenon, a much clearer understanding is needed of the links between transport, regional development, and local-global restructuring. This paper summarizes ongoing research on this important theme in the growing

debate over regional development issues. Of particular concern are the nature and rates of socioeconomic development in disparate regions, both within a country and across international political boundaries, and the role of relative regional accessibility in shaping transport investment decisions. Using Argentina as a case study, economic potential analysis is used to illustrate the important economic role that transport can play in the regional development process. Economic potential analysis can serve as a useful tool for highlighting the relative importance of transport services and infrastructure between and among regions and urban centers. The paper concludes with a critique of existing regional development strategies in Argentina and offers some suggestions for future research in the transport-regional development arena.

### El Análisis del Potencial Económico

Economic potential measures the nearness or accessibility of a specific volume of economic activity to a particular point or region. Its genesis lies in the concept of regional potential and was first used in an analysis of population distribution (Stewart 1947). Between the 1950s and the 1980s, researchers such as Harris (1954), Clark (1966), and Rich (1980) refined the regional potential concept in analyses of industrial location, focusing specifically on the market or economic potential of regions. Most recently, Gibb and Smith (1994) used economic potential analysis to challenge the generally accepted belief that the benefits generated by the Channel Tunnel linking England and France will be confined to the southeast region of the U.K.

The formula for measuring a region's accessibility to economic activity, as given by Rich (1980), is:

$$P_i = \sum_{j=1}^n M_j/D_{ij}^{\mu} \quad (1.1)$$

where  $P_i$  = the potential of region "i"

$M_j$  = a measure of the volume of activity activity in region "j"

$D_{ij}$  = the measure of the journey distance/time or transport cost between regions "i" and "j"

$\mu$  = the distance/time/cost exponent.

When summed for all "n" regions in the study area, the potential value for region "i" in units of economic activity per unit of distance, time, or cost is yielded. Regions with the highest potential values theoretically have access to more economic activity within a specified distance than regions with lower values. High relative accessibility confers comparative advantages within the region concerned by reducing the time and distance costs associated with moving products, people, inputs, and information. In contrast, more inaccessible regions are handicapped by comparative disadvantages in the form of higher time and distance costs, which include the perception of regional inaccessibility. Economic potential analysis, therefore, provides useful evidence of how and where transport improvements can potentially be the most effective.

The major methodological issues presented by economic potential analysis include scale of analysis, the definition and measurement of economic activity, the distance matrix, the problem of tariff barriers, and the estimation of a region's self-potential. Before turning to an analysis of

Argentina's regional economic potential, however, a brief overview of why Argentina was chosen for this study provides a framework of reference.

## **El Desarrollo Regional y el Potencial Económico en la Argentina**

### ¿Por Qué la Argentina?

For many Latin American countries, the gloomy prognosis that the 1980s would be a "lost decade" for socioeconomic development proved to be true. Rampant inflation, continued political upheaval, increasing social inequalities, and deteriorating infrastructure throughout the region retarded the development process and widened the gap between rich and poor. As the 1990s dawned, Latin American countries found themselves in a desperate struggle to redefine their role in a rapidly evolving and sophisticated global system. New regional economic alliances, the end of an ideologically bifurcated world order, and the spread of free-market capitalism and democracy forced countries such as Argentina to reappraise their policies, economies, and territorial spaces. In Argentina, Carlos Menem, newly elected as president in 1989, chose to pursue privatization, deregulation, and globalization strategies to reshape Argentina's position in the global economy. Dubbed "Menem-stroika" by many observers, these strategies were designed to open up Argentina's economy to regional and global competition, to pursue a policy of rapprochement with neighboring countries, to disengage the state from many aspects of the national economy, and to restructure society.

The implementation of restructuring policies in Argentina has begun to change the country in profound and fundamental ways. New social, political, and economic spaces are emerging out of the debris of the pre-1990s state to redefine Argentina's role in the world. At the same time, global, hemispheric, and regional forces are changing the map of Argentina at the sub-regional, provincial, and local scales. Tensions, strengths, and weaknesses in Argentina's bidirectional links along the local-global continuum of economic, social, and political relationships are having a direct impact on patterns of growth and change in the country. For example, tensions exist between Argentina's global integration strategies and domestic social policies, strengths are evident in the country's development of regional economic ties, and weaknesses continue in Argentina's transport links to both internal and external regions. To understand more clearly the role that Argentina is likely to play in emerging regional, hemispheric, and global networks, it is necessary to examine in detail the impact of these policies and linkages over space and through time. Geographers, in particular, are extremely interested in how changes in these linkages are reshaping patterns of interaction between people and the environment at the local and regional levels. Especially important is the problem of uneven socioeconomic development among a country's constituent regions and the role that transport and communication play in facilitating accessibility and mobility.

As the foundation for the three major pillars of regional development, transport and communication are critical to growth and change in Argentina. Transport and communication services and infrastructure facilitate and condition interaction between people, institutions, labor, capital, and the regional environments. However, since the nineteenth century, transport routes in the country have been dendritic in nature, geared to carry export products from the interior to the ports. In the more remote areas of the Northeast, the Northwest, and Patagonia, transport provision historically has been poor and unsuitable for regional development (Roccatagliata 1992). Moreover,

successive transport policies have failed to address the lack of connectivity with neighboring countries and have reinforced Buenos Aires' dominant position within Argentina (Keeling 1993). Privatization of the transport and communication sector has caused a realignment of internal spatial arrangements, with important consequences for the locational utility of regions and places.

The level of connectivity experienced by Argentina along the local-global continuum plays a crucial role in shaping relationships between the country, its neighbors, and regional urban centers. Transport and communication also help to shape the response of individuals and institutions to the forces of change. The long-term success of globalization forces in Argentina and the country's incorporation more fully into the world economy depend, in large part, on the government's response to increased demands for transport and communication services and infrastructure. Regional economic potential analysis can provide good data and a spatial rationale to support government and private transport investment strategies for future development.

### Methodología

The area of study comprises 24 regions, which include the 23 provinces of Argentina and the Federal District of Buenos Aires. In each region, a major town or city was chosen as the nodal point for that region, and the volume of economic activity in the region was allocated to that location. Gross Domestic Product (GDP) values for 1993, based on regional distribution percentages derived from Argentina's 1994 national economic census, were used to measure the mass  $M_j$  term (expressed in millions of Argentine pesos at current prices) (República Argentina 1994a,b). GDP values are regarded widely as the best available accurate measure of the volume of economic activity in regions.

All nodes in the study area were connected by "links" to neighboring nodes, including, where necessary, links to nodes in non-contiguous regions. The nodal matrix for Argentina comprises 59 primary links, with a mean distance between each node in the matrix of 638 kilometers. The nodal matrix had a standard deviation of 369 kilometers, and 38 percent of the 59 primary links had distances between nodes above the mean distance for the study area. The shortest link between two nodes (Corrientes and Resistencia) was 25 kilometers across the Río Paraná, with the longest link 1,831 kilometers between Buenos Aires and Comodoro Rivadavia in Patagonia.

The major empirical work in calculating potential economic values centers on the calculation of the distance, time, or transport cost between nodes. This involves selecting appropriate cost or distance measures and calculating the necessary transport time, cost, or distance exponents. Meaningful transport cost data for Argentina are extremely difficult to obtain and the considerable time and problems involved in gathering such data could not be justified in terms of providing any appreciable difference in the final potential results. Therefore, the present study uses the most direct road or rail distances between the regional nodes. A Thomas Cook Overseas Timetable (1994) and an Argentine road atlas provided the base data required to build a distance matrix. The distance term  $D_{ij}$  represents potential interregional rail freight journey times. Manufacturers are concerned primarily with the time needed to ship their goods, especially in the contemporary world of just-in-time inventory practices, not with the distance over which those goods have to travel. Moreover, in most urbanized, industrialized countries, transport costs have become a relatively minor component of the final cost of delivered goods and services. However, the importance to regional socioeconomic development of the accessibility and mobility of people should not be overlooked.

Efficient, cheap, rapid, and high-quality passenger services and infrastructure are fundamental to the regional development of Argentina and are a major component of the present study.

A further consideration in operationalizing the economic potential model is the issue of a region's self-potential, the contribution to the potential of region  $i$  of its own mass value. In other words, how can the special case of  $D_{ii}$  in the array  $D_{ij}$  be quantified? Various approaches to this problem have been tried in past research. Rich (1980) has argued that the clustering of economic activity around the major urban center of most officially-defined regions supports the use of the following formula to calculate  $D_{ii}$ :

$$D_{ii} = \frac{1}{2} \frac{\bar{O} \text{ area of the region}}{P} \quad (1.2)$$

Finally, four time scenarios were incorporated into the economic potential calculations. The base scenario assumed an average node-to-node journey time of 60 kilometers per hour. This scenario recognizes existing road and rail conditions in Argentina, accounts for the police checkpoints located around many cities and provincial boundaries, and draws on field experience of internal journey times. Scenario two assumes an overall improvement in the operating condition of Argentina's major roadways, with an average node-to-node journey time of 110 kilometers per hour. In the third scenario, average node-to-node journey times are calculated at 160 kilometers per hour. These times would result from the introduction of an integrated, multimodal national road and rail network between Argentina's major cities, allowing for rail running speeds up to 200 kilometers per hour along rehabilitated intercity pathways. The final scenario assumes a high-speed rail network similar to that under construction in Europe, which would allow for node-to-node average journey times of 225 kilometers per hour.

## Resultados

It was originally hypothesized that the more peripheral areas of Argentina could experience higher gains in absolute and relative accessibility than the core areas with basic improvements in transport services and infrastructure. The initial results for scenario one (60 kph) show that the smallest potential increases in economic potential are experienced by the four dominant industrial provinces: Buenos Aires province, the Greater Buenos Aires Metropolitan Area (GBAMA), Córdoba, and Santa Fé. The largest potential increases are found in the northern interior provinces of Catamarca, Chaco, Formosa, La Rioja, and Santiago del Estero. These provinces traditionally have lagged behind socially and economically and long have been considered the most under-developed of Argentina's interior provinces. Curiously, La Pampa province, traditionally incorporated into the coastal, and thus wealthier, region shows a potential gain of 11.23 percent. This is a function of the province's extremely low self-potential (12.51 percent) and its relatively central location within Argentina. As expected, provinces with above-average rates of GDP also experience the highest percentage of self-potential increase. In other words, the GBAMA gains only 16.54 percent of its potential increase from other provinces; 83.46 percent of the GBAMA's total potential increase comes from its own self-potential. In contrast, provinces with below-average rates of GDP experience the lowest percentage of self-potential increase. La Rioja, for example, one of Argentina's poorest provinces, gains nearly 90 percent of its total potential increase from other

provinces. Tierra del Fuego, however, the most isolated province in Argentina with an average distance to every other node in the matrix of 3,244 kilometers, shows a high rate of self-potential (61.49 percent). Transport time and distance are so high for Tierra del Fuego that it experiences lower benefits from overall improved connectivity than other interior areas.

Scenario two, based on an overall improvement of travel times to 110 kilometers per hour, reveals that the four northeastern pro-vinces of Chaco (27.45%), Corrientes (14.96%), Formosa (27.76%), and Misiones (14.72%) achieve the largest combined average increase in economic potential at 19.25 percent. The six northwestern pro-vinces follow with a combined average increase in potential of 16.37 percent. The lowest potential increases are experienced by the most economically active Pampas provinces. Potential increases in millions of pesos are fairly uniform for the majority of interior provinces.

In terms of potential increase relative to the GBAMA, which records the highest potential increase across the board, the major industrialized provinces within the Pampas planning region show the highest percentage increase. Santa Fé records a 43.43 percent increase in potential relative to the GBAMA, while Buenos Aires province shows a 37.74 percent increase. However, many of the interior provinces fare extremely well when compared to the maximum increase in total economic potential. Chaco, Corrientes, San Luis, Mendoza, and Tucumán all experience increases relative to the GBAMA of over 20 percent. The lowest percent increases relative to the GBAMA are recorded by the more remote Patagonian provinces of Chubut (10.29%), Santa Cruz (6.99%), and Tierra del Fuego (11.97%). Scenarios three and four are based on an improved railroad network and presume average point-to-point journey speeds of 160 and 225 kilometers per hour respectively. At 225 kilometers per hour, many of the northern interior provinces experience increases in their own economic potential of over 40 percent. La Rioja (63.31 percent) shows the highest potential gain, with Formosa (56.79%), Chaco (56.15%), Catamarca (53.44%), and Santiago del Estero (47.73%) experiencing substantial gains. The low overall potential increase in millions of pesos per kilo-meter in Patagonia suggests that investment in railroad infra-structure would not be economically feasible at the present time. With the exception of a major line from Bahía Blanca in Buenos Aires province across to Neuquén in northern Patagonia, little railroad infrastructure presently exists in Patagonia. In contrast, a basic, although extremely dilapidated, railroad network already exists in the western and northern provinces. Improvements in this network to attain the running speeds used in the analysis could generate acceptable economic returns and would provide a strong boost to the depressed economies of the interior.

A further benefit to Argentina's development that goes beyond pure economic growth lies in the ability of transport improvements to reshape individual and community perceptions about place and region. Buenos Aires, for example, is perceived by many as the sophisticated, Europeanized, and civilized heart of the nation, whereas interior provinces are viewed as isolated, backward, uncivilized, and barbaric. Rural-urban migration patterns over the past fifty years have been driven, in part, by this perception of the capital's attractiveness and also by the location of major industries in and around the relatively well-connected Pampas cities. Growth pole strategies in Argentina designed to encourage development in interior provinces have mostly been a miserable failure, in part because little attention was paid to the practical and perceptual issues of accessibility and mobility. Transport improvements, then, could not only revitalize the stagnant and depressed interior economies, but also could help to reshape traditional perceptions about the quality of life in the interior and to improve individual mobility.

For example, the city of Tucumán is approximately 3,000 kilo-meters northwest of the federal capital. Present surface journey times average about 22 hours between cities. Basic road improvements would reduce the journey time to about 12 hours, while the introduction of high-speed rail services would further reduce intercity journey times to under 6 hours. Although initially some demographic and economic backwash might occur, as access to the dominant city becomes quicker, more affordable, and easier, over the long-term a "spread effect" (to use Gunnar Myrdal's (1957) terminology) should counteract the initial depletion of human and financial resources in the interior. In Argentina, however, back-wash is unlikely to have any serious negative consequences as the human and financial resources of the interior provinces already have been severely depleted. As Truman Hartshorn (1971:269) observed, "growing markets, new technology and friction of distance, combined with congestion, pollution, and diseconomies of scale in the heartland and the amenities of the hinterland, [should] make outlying areas more attractive to development (over time)."

Another important potential benefit from transport improvements in Argentina's hinterland stems from the country's growing trade and social links with its neighbors. Argentina is part of MERCOSUR, the Common Market of the Southern Cone, in partnership with Brazil, Uruguay, and Paraguay. Increased socioeconomic activity between the MERCOSUR members has focused attention on the inadequate nature of surface transportation between the countries. Particularly problematic are the cross-border links. If Argentina is to take advantage of the socioeconomic development impetus provided by MERCOSUR, and if the potential benefits of regional economic integration are to "trickle down" to the interior provinces, then much closer attention must be paid by Argentina's planners and policy makers to the role of transport and communication in the integration process.

### **Una Crítica de las Políticas de Transportes en la Argentina**

The results of the economic potential analysis for Argentina demonstrate that the advantages offered by transport improvements are not necessarily confined to the already dominant Pampas provinces. However, inadequate supporting transport infrastructure and services are likely to limit any potential benefits from transport improvements and to have some serious repercussions for Argentina's more isolated regions. In light of Argentina's recent move toward neoliberal economic restructuring policies, what is the potential for meaningful transport improvements in the near future? Transport languished throughout the 1960s, 1970s, and 1980s and, in many ways, proved to be the Achilles heel of successive government development policies. Interior industries and manufacturers could not compete with Buenos Aires in national and global markets because inadequate transport facilities placed many interior provinces at a competitive disadvantage. Contemporary transport policies in Argentina have not responded to current theories about the role of transport in regional development. The idea that transport's role is merely to facilitate economic interaction at the global and interregional levels has become embedded in transport policy planning. Present regional development and integration strategies in Argentina make the same mistake as past policies of focusing solely on global and interregional links. Little attention has been paid in these policies to intraregional and local connectivity. Furthermore, transport planners and policy makers have elected to address transport issues and problems on a modal basis or from a modal perspective.

The development of an integrated, multimodal approach has not been forthcoming. The potential cost and service benefits from focusing on the coordination of multimodal transport have been largely ignored. In northwest Argentina, for example, air, rail, bus, and road freight networks operate independent of each other, with no spatial or temporal coordination at any level of the system. Vertical or horizontal integration in the transport and communication networks of the Northwest is unknown.

In addition, Argentina's transport policies have responded to a conception of the interior that emanated from regional development policies formulated in Buenos Aires. These policies have treated the Northwest, for example, as a functional region with homogeneous characteristics rather than as a historically defined region with spatially and temporally complex characteristics. Policy priorities have been driven by an emphasis on state and corporate action rather than by considerations of distinctive regional economic, social, and cultural characteristics. Thus, policies are reactive rather than proactive, and Argentina's federal government has had to respond to regional inequalities instead of preventing them from occurring. Conceptualizations of the Northwest and other regions also have been driven by the implicit assumption that these regions should be like Buenos Aires, rather than by the realities of spatial conflict and struggle within the region itself.

Transport's role in Argentina's regional, hemispheric, and global development should include an explicit acknowledgement of the relationship between transport, people, and places. Transport networks cannot be planned without an understanding of the cultural inputs that help to define the network. Why do people choose to travel to a particular location? Where are needed services located? What are the time and cost relationships between communities, individuals, and the needed services? And what are the ideologies that drive the provision of the infrastructure needed to facilitate interaction? The role of transport in regional development, however, cannot be measured by transport mode and provision analyses alone. Applying a gravity model, for example, to the cities of Salta and Tucumán in Northwest Argentina may indicate that a certain amount of interaction is likely to occur between them. Yet without a detailed analysis of the economic, social, political, and environmental circumstances of each city (in other words, the cultural factors), such models have little value.

Argentina's transport policies in the 1990s are aimed at privatizing and deregulating the transport arena. Airline, rail-road, and telephone networks have been sold piecemeal to private concerns without any overarching national development plan. The government believes that supply and demand mechanisms will act as a development agent and thus, beyond the privatization strategies, no federally driven national, integrated, multimodal transport policies are needed. A long history of government financial and management ineptitude in the transport sector lends credence to the popular belief that private enterprise will provide a better quality of service, while relieving the financially strapped federal and provincial governments of fiscal responsibility for transport provision. Although short-term benefits are beginning to be felt from the transport privatization process, the long-term consequences may be disastrous for Argentina's goal of creating a dynamic, unified, national economy and society able to compete at the regional and global levels.

## **Una Conclusión**

The nature and evolution of the privatization and deregulation of Argentina's transport systems will determine the character, shape, and efficiency of the country's transport networks at both the

national and international scale for the remainder of the 1990s and beyond. Many critics of Argentina's neoliberal economic strategies have argued that the government is repeating the mistakes of the past by allowing the fate of the nation's transport systems to be determined by foreign interests. Moreover, transport planners have been criticized for focusing on the ideological aspects of privatization and ignoring the very real problem of developing a multimodal, integrated transport and communication system capable of carrying Argentina into the next century. Although it is still too early to determine if private sector ownership of Argentina's transport infrastructure will lead to increased investment and improved linkages to interior regions and cities, many analysts, including this one, are extremely doubtful. If Argentina's interior regions are to realise the potential advantages that transport improvements will offer (for example, reduced journey times, lower transport costs, changing perceptions of the interior, and enhanced intra and interregional mobility), the Government must take the initiative in providing the policies, funding, and motivation for transport infrastructure improvements. Absent any serious government action in the transport arena, Argentina's citizens, industries, and businesses will suffer from missed opportunities and will almost certainly be further peripheralized in the emerging world economy.

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