URBAN TRANSPORT AND ECONOMIC DEVELOPMENT

Rémy PRUD'HOMME[*]

Abstract - *The paper aims at analyzing the key contribution of urban transport to economic development. It shows ow megacities contribute to development, because of their higher productivity. The paper criticizes the 'exploitation' thesis (according to which cities are richer beause they exploit the rest of the country), and shows that cities are net losers at the budget game. It proposes an explanation of urban overproductivity, based upon the effective size of urban labour markets. This size is defined and measured. It is explained by the size of the agglomeration, the relative location of jobs and homes, and the efficiency of the transport system. This means, amongst other things, that urban transport policy should not primarily aim at reducing congestion, but at increasing the effective size of urban labours markets.*

Key-words - MEGACITIES, URBAN LABOUR MARKETS, URBAN SUR-PRODUCTIVITY, URBAN MANAGEMENT, URBAN TRANSPORT POLICY.

Keynote speech for the 7th conference on the Development and Planning of Urban Transport in Developing Countries (CODATU VII), New Delhi, February 12, 1996.

[*] OEIL, Observatoire de l'Économie et des Institutions Locales, IUP, Université de Paris XII, 94000 Créteil Cédex.

1. INTRODUCTION

For long, there has been a strong anti-urban bias in economic development analysis and policies. In part, it was a matter of common sense: because most people in the less developed countries lived and worked in rural areas, it seemed obvious that this was the place where to direct scarce resources. In part, it was a matter of mere survival: because the need for food was acute and pressing, even when the specter of famine was not lurking, and because food is produced in rural areas, it was felt that the development of these rural areas was an overriding priority. In part, it was a matter of social justice: the poorer sections of the population were indeed, and still are, to be found in the countryside, and it seemed only fair to exert every effort to try and relieve their lot. In part, it was a reaction against the policies of the former colonial powers: in the pursuit of their own selfish economic and political interests, these powers had strengthened cities and ignored villages, and the new independent governments naturally wanted to do the reverse. In part, it was also an issue of morality: to many, cities appeared as the locus of evil, cosmopolitanism and corruption, as opposed to the virtuous villages, and protecting as many people as possible from the temptations of the city was a sort of moral duty. For these reasons, and probably for many others, cities, particularly large cities, have often been the black sheep of development.

The great Mahatma Ghandi himself shared this view of cities and advocated a rural-based form of development. MaoTse-Tung, who accessed to power with the help of an army of peasants, also beware of large cities. Intellectuals and analysts did no better. In 1984, the World Bank asked ten prominent scholars defined as "pioneers (...) who have helped define the debate over development issues during the past forty years" to reflect on their own contributions. Their papers were published under the name of *Pioneers in Development* (Meier and Seers, 1984). The index of this 350 pages long book which has more than fifty entries under "agriculture" has no entry at all under "city" and only two under "urbanization". In one of these, by Sir Arthur Lewis, a Nobel Laureate, the only point made about urbanization is: "this is an expensive process" (id, p. 137).

These attitudes were widely shared in developed and developing countries alike. In the entire post-war period, they largely shaped domestic policies in developing countries. Development plans of even the most comprehensive type did not project much of a role for cities. Investment in urban areas was not a priority. This was paralleled in international assistance to developing countries. Both bilateral aid and multilateral aid avoided cities. At the World Bank, for instance,

urban loans never accounted for more than 15 % of total loans. The figure for the Asian Development Bank might be even smaller.

This neglect was perhaps particularly apparent in the area of transportation. Although urban transport accounts for a significant share of total transport in terms of passenger-km, transportation policies and investments were heavily concentrated on interurban transportation, not intraurban transportation. In plans, and even in pratice, railroads got the lion's share in transport investments: they play a minor role in urban transportation.

In some cases, it is as if this neglect of urban areas was part of a policy to control the growth of cities. If not much is done in and for cities, they will become less attractive, and rural to urban migration will be stopped or slowed down. Controlling this migration was a stated goal, and urban congestion or deterioration accepted as a means to reach it.

In this brief presentation, I will try argue against this view, and try to show first that cities are a major vehicle of economic development, and second that transportation is an essential element of urban efficiency, to conclude that sound urban transport policies can therefore contribute significantly to the economic development of a country.

2. CITIES AND ECONOMIC DEVELOPMENT

A fairly well know starting point is that incomes are higher in cities, particularly in large cities. This has always been the case in all countries. The magnitude of income differentials varies. It seems to be a function of a country's per capita income, and happens to be much larger in the less developed countries than in the more developed countries. In very poor countries, urban per capita income can be as much as two to three times as high as rural per capita income. In the more developed countries, the gap is much narrower, in the 20 % - 50 % range. This income differential is of course the main cause of rural to urban migration. The millions of peasants who have left and in many countries continue to leave the countryside to conglomerate in the cities do so of their own will, and do it in the hope of improving their lot. Some will not succeed (and we know that there are poor in our cities) but most of them will. They will secure a better paid job, obtain a better health care, and get a better access to education for their children. Cities are the passport for a better life.

Many people genuinely believe that cities ensure higher incomes to their inhabitants at the expense of the countryside. This is the exploitation thesis. According to this view, the taxes paid by rural areas are spent in the large cities,

and the source of urban wealth is to be found in this fiscal drain. This thesis does not resist close scrutiny and quantitative analysis.

The spatial allocation of the national budget is not an easy task, conceptually and statistically. It would not make sense, for instance, to allocate the proceeds of the corporate income tax to the large cities where the tax is collected, which is the place where a disproportionate share of large nation-wide enterprises are incorporated; this tax is borne by capitalists, workers and consumers, and has to be allocated to the areas where these groups of tax bearers are located. Similar delicate incidence studies have to made for every item of budgetary income and expenditure. This is a time-consuming effort, but one that can be undertaken, and one that L'OEIL, my research team at the University of Paris, has actually done for five large cities, including four cities in developing countries. Our findings are reported in table 1. In all cases, cities are net losers at the budget game.

Table 1: Budget-Induced Transfers Between Large Cities and the Rest of the Country

	Abidjan	Bangkok	Casablanca	Sao Paulo	Paris
Year	1984	1987	1982	1985	1984
Share of country pop. (%)	18	14	12	12	18
In % of national budget					
Contribution to budget	54	41	34	20	26
Gains (benef.) from budget	25	28	18	14	29
Gains (flow) from budget	34	35	21	9	21
Transfers (benefit)	25	13	16	6	7
Transfers (flow)	18	7	13	12	5
In US $					
Transfers (benefit) per cap.	200	160	400	90	870
Transfers (Flow) per cap.	160	80	330	160	630
In % of GDP					
Transfers (benefit)	5.3	2.5	6.5	7.4	1.7
Transfers (flow)	4.2	1.3	5.5	13.9	1.3

Source : L'OEIL.

There is nothing surprising, nor undesirable, in such subsidies from megacities. Because they are richer, large cities contribute more, on a per capita basis, to the budget (even if the tax system is proportional or mildly regressive). And this is justified, at least on an equity basis. What is surprising, however, is the reluctance of many people to recognize this simple and obvious fact. The hypothesis that cities would enjoy higher incomes because they are more aided should therefore be rejected.

The reason why incomes are higher in cities is simply that cities are more productive, and also that the ratio of labor force to total population is usually higher. Output per worker, but also per unit of private capital, and probably per unit of public capital (or infrastructure), is higher in cities than in the rest of the country. As a rule, productivity is a function of city size. The larger a city, the higher its productivity. This is well documented on the case of Paris, an eleven million people city which is by far the largest (in terms of output) European city. Global productivity, taking into account all production factors, is about 35 % higher than in the rest of France. Partial apparent surproductivity of labor is of the same order magnitude, whereas the surproductivity of private capital about 25 % and the surproductivity of infrastructure is around 80 %. Another way to put it is to say that it takes less workers, less capital and less infrastructure to produce a billion francs of value-added in Paris than in the rest of France. What is true of Paris is most certainly true of all other large cities. Data on global surproductivity is scarce, but data on labor surproductivity (which is not a bad proxy for global surproductivity), as presented in table 2, fully supports this assertion.

Table 2: Labor surproductivity, Selected Megacities, Circa 1990

	(in %)
Tokyo	+34
New York	+38
Osaka	+18
Paris	+35
Los Angeles	+31
London (South East)	+19
London (Greater London)	+12
Chicago	+26
Milan (Lombardia)	+17
Madrid	+11

Note: Labor productivity (P) is defined here as the value added outside agriculture (Y) divided by the labor force outside agriculture (L): P = Y/L. The surproductivity (S) of a city is the difference between the productivity of the megacity (Pm) and the productivity of the rest of the country (Pr) divided by the productivity of the rest of the country (Pr) : S = (Pm - Pr) / Pr.
Source: Calculations by Marie-Paule Rousseau, L'OEIL, University of Paris XII on the basis of Eurostat*, the* Statistical Yearbook of Japan*, and the* US City and County Data Book.

This higher productivity of cities has two major implications. First, a disproportionate share of the world output is produced in cities. Urban areas are much more imsortant in terms of value-added than in terms of population, both

globally and within any country. We figured out that the combined output of the 10 largest world cities in terms of GDP (namely Tokyo, New York, Osaka, Paris, Los Angeles, London, Chicago, Dusseldorf, San Francisco and Milan) was about equal to that of all less developed countries of Asia, Africa and Latin America.

Second, urban growth, particularly the growth of large cities, is a powerful engine of economic growth. People who move from low productivity areas to high or higher productivity areas automatically increase the overall productivity, and hence the production, of their country. In all rigor, this is only true when and if the marginal productivity of large cities is higher. The evidence on marginal productivity is even scarcer than the evidence on average productivity, but what little there is (on the case of Paris, for instance) suggests that the marginal productivity of large cities is indeed larger (than the marginal productivity of the rest of the country), and therefore that rural to urban migration are economically beneficial. This means that the growth of cities, particularly large cities, instead of being feared and lamented, when not repressed, should be welcome, and even encouraged. This is being increasingly recognized. The Government of India, a country which had for long not displayed much enthusiasm for urban growth, now "considers that the mega cities are the engines of national economic growth and generators of national wealth" (Ramachandran 1995).

3. URBAN TRANSPORT AND THE EFFICIENCY OF CITIES

This greater productive efficiency of large cities, however, is only *potential*. It is conditional upon the appropriate management of urban areas, and particularly upon the efficiency of the transport system.

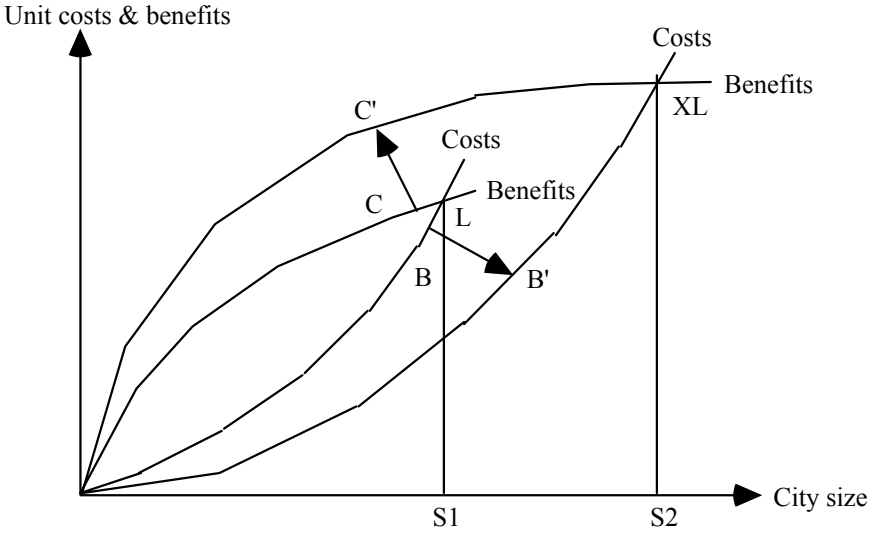
The claim that big cities are too big is often based on vague and difficult-to-measure concepts such as the quality of life (supposed to be lower in large cities) or the quality of human relationships (supposed to be poorer in large cities). But it can also be given more serious foundations, which can be traced back to a seminal paper by Alonso (1971). Urban benefits increase with city size in a less than proportional way, as shown in figure 1. Urban costs increase with city size in a more than proportional way, as is also indicated in figure 1. There comes a point at L where urban costs are greater than urban benefits: this points defines an optimal city size S1. In all rigor, it does it only if the benefits and costs curves are in marginal terms, as explained by Alonso (1971). But this does not matter much for the issue discussed here, which is that beyond a certain point, cities are too big.

This traditional view completely omits a key factor: management. Urban

benefits and urban costs are not merely a function of city size. They are also a function of city management. It is true that certain, probably many, cities in the world are too big -relative to their managerial capabilities. But some of these "oversized" cities are in fact quite small. Giving examples might be embarrassing, but we all know 100,000 or 200,000 inhabitants cities which are too large. Just as we know megacities which are under control, and are not too large. In terms of figure 1, the benefit curve can be moved upwards, and/or the cost curve downwards, as a result of efficient policies. Point L can therefore, by appropriate management, be moved to the right to XL, and consequently the optimal size of a city can be increased from S1 to S2. Because management can constantly shift the benefit and cost curves, and therefore the optimal city size, there is no optimal city size, and the concept is not very useful. What counts is not the size of a city, but its management. As a matter of fact, moving the benefit curve upwards and the cost curve downwards could be defined as the main task of urban management.

Big cities are not too big, but they are probably more difficult to manage than smaller cities. Magnifying the positive externalities associated with a city, and controlling the negative externalities which are also associated with it, is more complex in a 10 million people agglomeration that in a one million people agglomeration. That it is more complex does not mean that it cannot be done: there are also more resources to do it.

Figure 1: Urban Costs and Benefits as a Function of City Size



Another way to put it is to draw a distinction between potential productivity and effective productivity. The (effective) productivity of a city is equal to its potential productivity multiplied by what could be called an implementation ratio, lower than or equal to one. What increases with city size is potential productivity. But the implementation ratio, which is a function of management, can easily decrease with city size. If the implementation ratio decreases when the city grows, then the effective productivity might stagnate or even decrease. If this ratio remains constant or increases when the city grows, then the effective productivity will definitely increase.

Urban transportation happens to play a key role –probably the key role– in this relationship between potential and effective urban productivity. Why are large cities more productive? Nobody knows for sure, but a reasonable hypothesis is that large cities are more productive because they have larger labor markets. The *size of the labor market* at, say, 60 minutes, is defined as the number of workers to whom an enterprise, on average, can have access to in less than 60 minutes. It can also be defined as the number of jobs to which workers, on average, can have access to in less than 60 minutes. The justification for this hypothesis is twofold. First, the larger the labor market, the higher the probability for an enterprise to find exactly the workers it wants, and the higher for a worker the probability of finding exactly the job it wants. Then, a larger labor markets also justifies and facilitates specialization of workers and jobs, a well known way of increasing productivity. We are presently measuring the size of the labor market of various cities. Table 3 provides data on the three major Korean cities.

Table 3: Labor Market Size and Productivity, Seoul, Pusan & Daegu, 1992

	Population (in 1,000)	Labor market (in 1,000)	Productivity (1,000 w/worker)
Seoul[a]	19,112	2,658	13,984
Pusan	3,777	1,590	10,588
Daegu	2,226	755	9,932

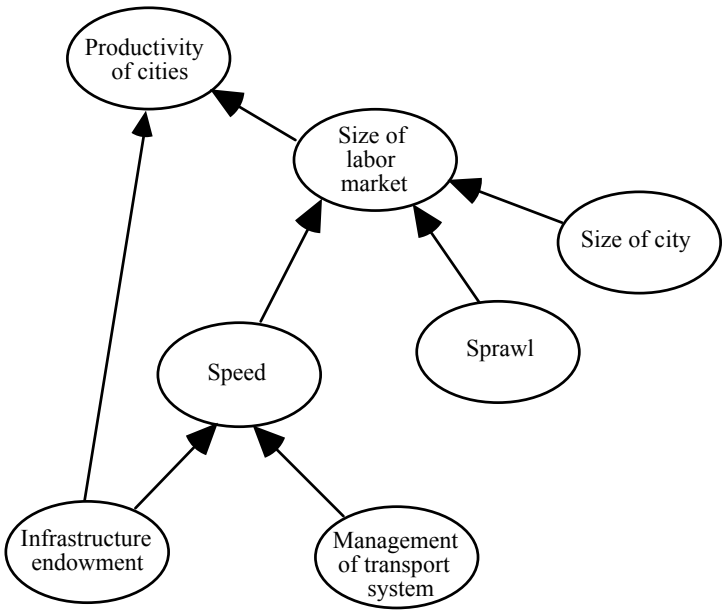
a *: Seoul is defined here as the city of Seoul, the city of Incheon and the Geongy province.*
Source: Unpublished calculations by M. Chang Woon Lee, PhD student at the University of Paris XII.

Three points are not enough to run regressions, and to "prove" anything. But the figures of table 3 suggest that the labor market size does not increase as fast as population, and that the larger the labor market of a given area, the higher the labor productivity.

Assuming there is a causal relationship between labor market size and productivity, what accounts for the size of the labor market? Three distinct factors, the three "S", which are represented in figure 2: Size, Sprawl, and Speed. One is obviously the overall population size of the agglomeration considered; but it is not the only one. A second explanatory variable of the size of the labor market (as defined here) is sprawl, or more precisely the relative location of jobs and households; all other things equal, the labor market size of a very dense city will be larger than that of a very dispersed city. The last one is speed, the efficiency of the transportation system, which is itself a function of the magnitude of the stock of transportation infrastructure and of the quality of the management of the transportation system.

Needless to say that the three "S" are not independent of each other. The growth of the city (Size) has obviously an impact upon the relative location of jobs and homes (Sprawl), which is also influenced by the transport system (Speed). The transport system, in turn, is in part determined by the spatial development of the city. Many of the papers presented at this conference will be devoted to an exploration of such links.

Figure 2 - Explaining the Surproductivity of Megacities



If this analysis is correct, urban transportation policies are a key element of development policies. Together with location policies, they determine the implementation ratio referred to above. If efficient, they make it possible for the large cities to fully realize their great productive potential. If not, we will have urbanization without having its benefits.

The entire conference will of course be devoted to a discussion of what "efficient transport policies" are, could be, should be. Let us simply here make a few points, on the basis of this analytical framework just presented, about the purpose, the means and the costs of "efficient transport policies".

The *purpose* of efficient transport policies is therefore to increase the size of the labor market in a given and growing urban area. It is to ensure that as many people as possible can have access to as many jobs as possible in a given area. It is not merely to reduce congestion.

Reducing congestion, all other things equal, would obviously contribute to enlarge the effective size of the labor market. But if congestion is reduced by changing "other things", such as dispersing jobs and people to the extreme, it can well lead to a shrinkage of the effective labor market, to the fragmentation of a large labor market into many small labor markets, thereby reducing, not increasing, the efficiency of the entire urban area. After all, there is no congestion in rural arons, but there is no high productivity either.

It is often said of proposed transport improvements that they are of no use because they don't reduce congestion. New roads will attract more vehicles and defeat their own purpose, and therefore need not be built, it is argued. This line of reasoning is very weak. It ignores the fact that part of the pent up demand will be satisfied, and that the effective labor market will probably be enlarged, as a result of the additional roads. The lack of a visible impact on congestion should therefore not be used as an argument against transport investments in urban areas.

The *means* of efficient urban transport policies will be much discussed in the coming days. They fall into two broad categories: transport infrastructure, such as Mass Rapid Transport Systems or roads, and transport management, such as pricing schemes or bus regulation. Which is best? Both are equally important and necessary, and it is unrealistic to believe that a policy could go very far on only one of these two legs. Because transportation is a service produced with both capital and labor, infrastructure without management is nothing; but, for the same reason, management without infrastructure is equally nothing. Because transport management is usually less capital-intensive and less costly than transport

infrastructure, it is particularly desirable for low income countries, which are capital-short. In particular, contracting out transportation services to harness the efficiency of the private sector and of competition, is a very promising course of action. On the other hand, transport management is more organization-intensive than transport infrastructure. Transport management is difficult to conceive, plan, implement and enforce, and may not be easy to develop in low income countries which are often as organization-short as they are capital-short. Contracting out, for instance, implies a complex and delicate mastery of biding and regulation processes, which cannot be assumed to be present in every developing country (and which is absent in quite a few developed countries as well). In addition, there are limits to what management can achieve, particularly in a growing area. There comes a point when a given stock of infrastructure, even if it is exploited in the best possible fashion, will become insufficient, and will have to be expanded if the effective size of the labor market is to be maintained or increased.

This raises the key issue of the *cost* of efficient transport policies, an issue that will also be hotly debated in the course of the coming days. A basic distinction must be drawn between the economic costs and associated benefits of transport improvements, and their financing. This is a standard and classical distinction, obvious to all economists, but one which is not yet familiar to all engineers, planners or politicians. A particular scheme may be economically desirable, but financially unbearable; it can be the other way round; it can also be both economically and financially attractive (although this fortunate case is rare); and there are of course many schemes which are neither economically desirable nor financially attractive. There are many unresolved problems associated with economic cost-benefit analysis, financing schemes, and the relation between the two.

As regards cost-benefit analysis, there are doubts that the standard procedures really capture all the benefits associated with urban transport infrastructure improvements. A Mass Transit investment, for instance, changes so much in an urban area, that assessment methods based on marginal modifications may not be entirely adequate. Some twenty years ago, for instance, the World Bank advised cities like Seoul or Singapore (and perhaps Hong-Kong) against building subways, because subways in these cities did not meet the test of cost-benefit analysis. These cities went along with their projects. They were right, in economic terms if not perhaps in financial terms. It is hard to imagine how these cities, where income and activity has been multiplied by a factor of six or seven over this twenty-years period, could have functioned and grown without a subway. The size of the labor market analysis sketched above suggests that the benefits of major transport improvements can be very large indeed. If transport investments

significantly increase the size of the labor market, and if this increase in size in turn increases labor productivity in the entire city, then the benefit/cost ratio of the investment is likely to be very high.

As regards financing schemes, there is a real problem arising from the fact that the benefits of most transport investments are often diffuse, in the nature of externalities. It is often neither technically feasible, nor economically desirable, to recoup these benefits. This is precisely why every effort should be made to internalize what can be internalized. This means recouping as much as possible land value improvements generated by transportation improvements, as has been done in Singapore. It also mean charging for the usage of transport investments or equipment whenever feasible.

Note in this respect that the higher productivity of large cities achieved through efficient transportation means higher incomes, and therefore a higher ability to pay transportation fares, on the part of both enterprises and inhabitants. Low transportation fares, if they lead to underinvestment or underutilization in transport infrastructure, are nobody's interest. The poor also stand to gain from increased fares that mean better transportation, greater productivity, more jobs, and higher wages.

As regards, the relationships between economic cost-benefit analysis and financial analysis, one must be aware of potential conflicts. Consider for instance a non congested infrastructure with a toll. The lower the toll, the greater the traffic, and the greater the economic benefit of the project. From an economic viewpoint, a zerotoll leads to a maximum benefit. From a financial viewpoint, it is nearly the opposite; a zero toll will mean a zero income; an increase in toll level will lead to an increase in toll income, up to a certain point, when a further increase in toll level produces a decline in revenues. The optimal economic toll will never be equal to the optimal financial toll.

The standard theory tells us that it is economic cost-benefit analysis that should prevail, because it takes into consideration the long-term interest of the country considered, and economically viable projects should therefore be undertaken, financed by the government if no private party is interested. It must be emphasized, in this respect, that large cities contribute heavily to central government taxes. Even if for equity reasons it can be accepted that they do not get back in government expenditures all that they contribute, large cities have a strong case for central government subsidies, particularly in the form of transport investments. Not only is it fair to the cities, but it is also to the interest of the country at large, and to the long term interest of the poorer sections of the country.

In short, "it pays" to undertake big urban transport projects. It pays in terms of economic development, and it pays in terms of government finance. Projects with a high economic rate of return, and this is the case of many urban transport projects, should therefore be financed.

This basically correct view, however ignores two important considerations, namely that government money cannot be assumed to be easily available, and secondly that government management (which comes with government money) cannot be assumed to be always efficient. In practice, therefore, some compromises will often have to be struck. In particular, in the rather frequent case of a project which is economically justified but financially unprofitable, if one wishes to contract out to a private enterprise, some government subsidy will be required, and justified. It will be required because no private enterprise will undertake a project which is not financially profitable. It will be justified because the project is economically desirable, because the private sector will contribute some of the financing, and because it is expected to contribute also some of its efficiency.

There is one case, however, in which economic and financial considerations can easily be reconciled: when there are negative externalities, such as congestion or pollution. In this case, it is both economically desirable and financially productive to impose fees and taxes. Such taxes will reduce congestion and pollution, to the benefit of society at large; and they will bring in much needed revenues.

4. CONCLUSION

We have tried to show that large cities in the developing world, when properly managed, can greatly contribute to economic growth. It is not by accident that the two most successful development stories of the past decades, namely Hong-Kong and Singapore, took place in city-states. We have also tried to show that "properly managed" means provided with an efficient transportation system. The efficiency of the transport system therefore appears as a key, probably the key, variable in determining the productivity of large cities, and beyond, the welfare of their country at large. If the transport system fails to turn a large agglomeration of people and enterprises into an effective labor market, then the potential of megacities will not be realized, and the enemies of large cities will be proven right. If, on the other hand, thanks to sufficient infrastructure and to efficient management, people and goods and ideas flow easily within the large cities of developing countries, then they will become the engines of growth that large cities –and only large cities– can be. Such is the challenge.

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Résumé

Cet article essaye de montrer en quoi les transports urbains contribuent au développement économique. Il montre d'abord comment les grandes villes contribuent au développement, du fait de leur plus grande productivité. Il critique la thèse de "l'exploitation" par les grandes villes, en montrant qu'elles sont au contraire des perdants nets au jeu du budget. Il propose une explication de cette sur-productivité urbaine : la taille effective des marchés de l'emploi, dont il propose une définition et quelques mesures. Cette taille s'explique elle-même par la taille de l'agglomération, par sa structure spatiale, mais aussi par l'efficacité de son système de transports. L'article en tire des implications relatives à la politique des transports urbains : elle ne doit pas tant chercher à réduire la congestion qu'à agrandir le marché effectif de l'emploi.

Resumen

Este artículo intenta mostrar en qué los transportes urbanos contribuyen al desarrollo económico. Muestra primero cómo las grandes ciudades contribuyen al desarrollo, a causa de una mayor productividad. Critica la tesis de "la explotación" por las grandes ciudades al mostrar que son al contrario verdaderos perdedores en el juego del presupuesto. Propone una explicación de esta sobre - productividad urbana : la dimensión efectiva de los mercados del empleo cuya definición y medidas algunas propone. Esta propia dimensión se explica con la extensión de la aglomeración, por su estructura espacial, pero también por la eficacia del sistema de transportes. El artículo muestra implicaciones tocante a la política de los transportes urbanos : no tiene tanto que procurar disminuir la congestión como aumentar el mercado efectivo del empleo.