The Costs of Urbanization in Developing Countries

The Costs of Urbanization in Developing Countries*

Johannes F. Linn
World Bank

I. Introduction

The rapid process of urbanization in many developing countries has given rise to concern regarding the costs of urbanization. A good example for the arguments made to support this concern is found in W. Arthur Lewis’s Janeway Lectures given at Princeton University in March 1977.

Urbanization is decisive because it is so expensive. The difference between the costs of urban development and rural development does not turn on comparing the capital required for factories and that required for farms. Each of these is a small part of total investment, and the difference per head is not always in favor of industry. The difference turns on infrastructure. Urban housing is much more expensive than rural housing. The proportion of children for whom schooling is provided is always much higher, at the stage where less than 60 percent of children are in school. The town has to mobilize its own hospital service, piped water supplies, bus transportation. In all these respects the towns require more per head in terms of quantity than rural areas, but even if quantities per head were the same, urban facilities would cost more in money terms than rural facilities. Rural people do more for themselves with their own labor in such matters as building houses, or working communally on village roads or irrigation facilities. When they hire construction workers they pay less, both because of a generally lower price level and because they are not faced with powerful construction unions. Rural people also do not hire architects.1

* The author is a senior economist, Development Policy Staff, World Bank. This paper was prepared as a background note for the World Development Report, 1979 (Washington, D.C.: World Bank, 1979). The author gratefully acknowledges the helpful comments of Shankar Acharya, Doug Keare, and Jacob Meerman, but remains responsible for any errors of fact or interpretation. The views expressed are the author’s and not necessarily those of the World Bank.


© 1982 by The University of Chicago. All rights reserved.
0013-0079 82 3003-0005$01.00
While these arguments are quite representative, the reasons for the concern over the costs of urbanization vary. One reason is that urbanization places a high financial burden on urban governments, which have to meet the rapidly rising demands for urban services. Another is the belief that urbanization and the associated financial costs are largely responsible for the growing international debt of developing countries. This is a prime concern of Lewis: "It is the fast pace of urbanization that makes a country grow short of capital rather than a dependence on know-how or on managerial expertise." A third reason is that the costs of urban growth—broadly defined to include not only financial but also economic costs, such as those arising from congestion and pollution—are thought to exceed those of rural growth, which is often interpreted as a prima facie case for judging urban development excessive on grounds of economic efficiency. Finally, there is an equity concern over relative rural-urban development costs, since rural areas are believed to subsidize the urban areas, creating a presumption of inequitable treatment of rural compared with urban dwellers.

For each of these concerns with urbanization costs—which might be categorized as fiscal, financial, efficiency, and equity concerns, respectively—one may be tempted to distinguish two dimensions: one is the contrast between urban and rural development costs, and the other is the contrast between the costs of development in large cities and those in medium-size cities or small towns. The first dimension is usually invoked when arguing in favor of more rapid rural development as compared with continued urbanization; the second dimension is focused on in the context of a discussion of optimal city size, which usually starts with the presumption that the large cities are growing too large and that instead smaller cities ought to be fostered. Actually, these two dimensions are not as clearly separable as is commonly thought. Rural development typically does not involve isolated dwellings but tends to involve settlement patterns based on villages or rural towns where densities can be quite high. For example, in Brazil only 10% of rural dwellings are estimated to be found in isolated locations or small clusters of fewer than 25 units. One is, in fact, confronted with a continuum of settlements in terms of size, and the decision about the point at which rural settlements become urban settlements is largely a matter of judgment. As a result, one needs to be careful in interpreting

---

2 Ibid., p. 35.
5 This is reflected in the diverging official definitions of urban settlements in different countries. In Colombia, e.g., any settlement with more than 1,500 inhabitants involving
urban-rural cost comparisons for different countries and from different sources, since they may reflect the costs of very different types of settlement patterns.

Similarly, cost figures for cities in different size classes may sometimes reflect rural rather than urban development costs. For example, the smallest city size class in a recent study of urbanization costs in Colombia comprises towns and villages of between 1,500 and 30,000 inhabitants. At the lower end of this class, settlements are probably much more rural than urban in character, especially if functional criteria are employed, such as occupational structure, value added by branch of activity, and so on. For this reason, it is generally preferable to refer to settlements of different size rather than to the urban-rural and large-small city size dichotomy.

The remainder of this paper discusses the major analytical issues involved in the concern with the costs of urbanization in developing countries and surveys the empirical evidence that can be marshaled to substantiate or refute the main hypotheses emerging from the analytical debate. Section II discusses the fiscal and financial aspects of urbanization costs; Section III deals with the concern over economic costs and the efficiency of urbanization; Section IV addresses the equity concerns; Section V concludes by summarizing the evidence presented in this paper.

II. Fiscal and Financial Costs of Urbanization

A. An Overview of the Issues

There are few, if any, urban governments in developing countries that do not bemoan the fiscal burden placed on them by the rapid growth in public expenditure required to meet the social and physical infrastructure needs of the expanding urban populations. Lewis has recently added a further concern by claiming that urban growth is responsible for the international indebtedness of developing countries.

There can be little doubt that local governments in urban areas tend to have higher per capita expenditures than local governments in predominantly rural areas. The same is generally true for local governments in large cities compared with local governments in smaller cities and towns. In Colombia, for example, per capita expenditure in 1971 by the local government in Bogotá (2.5 million inhabitants) was almost seven times the average per capita spending by the local government in

---

---

---

---

---
ernments of four municipalities falling between 50,000 and 90,000 inhabitants each (table 1). Some of these differences in local government spending may be offset by higher expenditures of national or provincial authorities in the rural areas and smaller towns, but, to the extent that careful studies of the distribution of total government spending have been carried out, they have confirmed that public expenditures are higher in urban than in rural areas and higher in large cities than in intermediate-size cities or small towns.\(^7\)

In contrast, the claim that urbanization is largely responsible for the international indebtedness of developing countries is considerably more doubtful. Lewis gives the following empirical support for his claim by drawing on nineteenth-century experience of the now developed countries: "In the nineteenth century the distinction between the European lenders and the rich borrowers turned on differences in rates of urbanization. Those whose urban populations were growing by less than 3 percent per annum lent (France 1.0, England 1.8, and Germany 2.5) and those whose urban populations were growing by more than 3 percent per annum borrowed (Australia 3.5, U.S.A. 3.7, Canada 3.9, Argentina 5.3)."\(^8\) For the now developing countries the picture is less clear. Low-income countries as a group had consistently high ratios of external public debt relative to GNP in 1970 and 1977 compared with

### TABLE 1

<table>
<thead>
<tr>
<th>City Size Class (1)</th>
<th>Population (in Thousands)</th>
<th>Average per Capita Expenditure</th>
<th>Average per Capita Own Revenue (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bogota</td>
<td>2,590</td>
<td>1,103</td>
<td>843</td>
</tr>
<tr>
<td>Group 1</td>
<td>500-1,500</td>
<td>821</td>
<td>662</td>
</tr>
<tr>
<td>Group 2</td>
<td>150-500</td>
<td>333</td>
<td>254</td>
</tr>
<tr>
<td>Group 3</td>
<td>90-150</td>
<td>185</td>
<td>150</td>
</tr>
<tr>
<td>Group 4</td>
<td>50-90</td>
<td>165</td>
<td>108</td>
</tr>
</tbody>
</table>

\(a\) This includes all locally raised taxes, user charges, and other revenues, except transfers from higher-level governments and borrowing.


\(a\) Lewis, p. 29.
middle-income countries, while experiencing rates of urban population growth equal to or below those of the middle-income countries (table 2). The correlation coefficient for the relationship between the debt-GNP ratio in 1970 and the urban population growth for 1960–70 is negative for a sample of 58 developing countries. Although the correlation coefficient between the debt-GNP ratio in 1977 and urban population growth for 1970–75 is positive for the same sample of developing countries, it is not statistically significant at the 5% confidence level.⁹

These tests are, of course, only a superficial check on the relationship between urbanization rates and international indebtedness. A more careful analysis would have to allow for the many other factors affecting international borrowing, but unfortunately no such analysis appears to have been carried out. It would also be of interest to investigate the distribution of foreign borrowing between different uses in the borrowing countries in order to establish what percentage of foreign funds is absorbed by urban infrastructure works. Again, such studies apparently have not been carried out to date, but they would probably have concluded that differential urban population growth rates are only one factor among many others explaining differential degrees of foreign indebtedness in developing countries. It is highly unlikely that they would corroborate Lewis’s hypothesis that the urban population growth rate is the primary determinant of international indebtedness.

This leaves the fiscal concern over urbanization costs, and it is this aspect which will be reviewed in some detail in the remainder of this section. The main question to be addressed is what, if any, public expenditures are avoidable by fostering rural rather than urban devel-

### Table 2

<table>
<thead>
<tr>
<th>External Public Debt and Urbanization in Developing Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EXTERNAL PUBLIC DEBT AS % OF GNP</strong></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Low-income countries</td>
</tr>
<tr>
<td>Middle-income countries</td>
</tr>
</tbody>
</table>


opment or the growth of smaller cities rather than that of larger ones. This is admittedly a very narrow perspective which does not consider costs other than fiscal costs and largely ignores the question of benefits. These dimensions of the problem will be taken up in the subsequent section.

When concern is expressed about the high fiscal costs of urbanization, the term "cost" is used as a synonym for public expenditure in support of urban development.10 This is unfortunate because it gives rise to misunderstandings. Total public expenditures are not only determined by the unit costs of the supply of public goods and services but also by the demand for these goods and services. Indeed, demand and supply determinants of public expenditures are easily confused when urbanization costs are discussed; and an attempt is, therefore, made here to disentangle them. This contributes to a better understanding of why it is that urbanization is "expensive" and to what extent an alternative development strategy can be expected to be less burdensome in fiscal terms.

B. Determinants of Demand for Public Services

1. Industrial and commercial service requirements. It is quite common for analysts to focus on the requirements of residential users of public goods and services when expressing concern over the fiscal or financial implications of urban growth.11 This neglects the fact that, for some public services, especially for public utilities, the share of services which are provided to industrial and commercial users can be quite significant. For example, for the case of water supply, Warford and Julius cite data for the capital city of an East African country where residential users accounted for only 40% of total water consumption.12 For electricity, the (unweighted) average share of household demand in urban areas of a sample of eight developing countries was found to be 36%; the rest was accounted for by productive uses, that is, commercial and industrial uses outside households.13 For telephones, residential users in Bogotá accounted for only 47% of all call units in 1972.14 The increasing demand for urban infrastructure is, thus, in large part directly related to the industrial and commercial activities carried out in urban areas and not exclusively to residential uses. To the extent that industrial activity is necessarily carried out in an urban

---

10 Public spending for defense, diplomacy, and similar outlays for nationwide objectives are generally not considered and will also be set aside in this note.
11 See, e.g., the first quotation from Lewis cited above.
context, industrialization will be accompanied by rising urban infrastructure requirements to service these industries.

Another point needs to be made here. The fact that certain public investments are made in urban areas does not necessarily mean that they are primarily or exclusively made in support of the urban economy. Investments in urban port facilities, warehousing, marketing facilities, and transport terminals may be crucial ingredients for a strategy of accelerated rural development. It would thus be overly simplistic to aggregate all public expenditure in urban areas and compare this with aggregate public expenditure in rural areas and to conclude that the former are made in support of urban development and the latter in support of rural development. Matters are simpler when one turns one's attention to public expenditures made to support households, although here, too, spillovers of benefits from one jurisdiction to another may occur (especially for health and education services), and thus assigning "on whose behalf" expenditures are made may cause some difficulty.

2. Household demand for public services. For any good or service, total demand depends on the number of consumers, on consumer incomes, on product prices, and on the nature of tastes and preferences. This is the case also for the demand of publicly provided goods and services. The ensuing paragraphs will discuss these determinants as they affect the requirements of public expenditure.

In the first instance, household demand for public goods and services is determined by the number of people at a particular location, whether rural, small town, or large city. The total number of people to be served in a country is only indirectly affected by the extent of urbanization or by the proportion of people living in large rather than small cities. In fact, to the extent that the urban environment encourages lower fertility, higher rates of urbanization would tend to reduce total national public expenditure requirements over time. Since, according to recent population projections for the period 1975–2000, almost 60% of the total population increment in the developing world will be located in urban areas, it is not surprising that public expenditure on urban goods and services will have to increase relative to those provided in rural areas.

Of course, population is not the only determinant of public spending; indeed, one of the primary questions commonly asked is whether it would not be possible to spend less per person if population growth took place in rural rather than urban areas or in a small town rather than a large city. Nevertheless, it is important to emphasize that popu-


lation is a crucial determinant of public service demand or requirements, wherever the people may be located. Moreover, since people tend to move to locations where they find jobs, population distribution and growth at different locations are very much determined by the location of jobs and thus by the pattern of industrialization. Ultimately, therefore, it is not possible to separate the costs of urbanization from the costs of industrialization. If industrialization is to proceed in developing countries, urbanization will also proceed; and the costs incurred in urbanization must be ascribed in large part to the decision of encouraging, or at least not discouraging, industrialization.

More at the heart of the debate on urbanization costs is the observation that the quantity and quality of public goods and services demanded or required by urban residents are greater on a per capita basis than that demanded by rural (or small-town) dwellers. One important cause for this is that average incomes in urban areas are higher than average incomes in rural areas and are higher in larger cities than in smaller urban areas. The income elasticity of demand for public services such as water supply and sewerage, electricity, telephones, garbage disposal, education, and health are known to be positive, and one would therefore expect that urban residents in general, and large-city residents in particular, would demand more of these services than the rural population. This positive income elasticity of demand is reflected in the willingness of residents to pay taxes and user charges which go to finance these services. In the United States, for example, studies have shown that income differentials between cities are the most important determinant of differential per capita expenditures by local authorities. No such studies have been carried out for developing countries, but in Colombia, for example, the per capita expenditures of municipal governments vary directly with per capita taxes and user charges paid by municipal residents (table 1). Given this importance of income as a determinant of public service demand, one may conclude that a policy geared to channel development and thus income growth away from larger cities to smaller towns or to rural areas would, at least in part, shift the demand for public services from the former to the latter locations. To the extent that urbanization costs are dependent on incomes, they are not avoidable by accelerating rural development or by favoring the development of smaller towns and cities.

19 One possibility, which is not discussed in the literature, is that the income elasticity for public services may increase with income. If this were the case—and there is no hard evidence available to this effect—then spreading development from high- to low-income groups (or areas) by accelerated rural or small-town development would reduce the overall demand for public services.
Of course, income is not the only determinant of household demand for public services. The price charged is also important. Where services are subsidized, demand will tend to be higher than where prices reflect costs of service provision. Whether these subsidies are financed by taxes on the residents of a particular jurisdiction, or by transfers from higher-level governments and thus by the general taxpayer, is largely irrelevant to the consumption decision by the subsidized consumer. However, it will affect the expenditure decision by the local government and thus the provision of services in a particular jurisdiction. Accordingly, transfers from higher-level governments to local governments in U.S. cities were found to be the other major determinant of per capita spending besides average income in the city.\(^2\) Subsidized service provision is common in developing countries in rural and urban areas alike. The absolute amounts of the subsidies tend to be higher in urban areas because more services are provided per person than in rural areas.\(^2\) However, it is not clear that rural areas are disadvantaged in terms of per unit of service consumed. In fact, for some services, especially the public utilities, rural consumers are often subsidized more heavily than urban consumers—provided they have access to the services at all. The reason is that they simply do not have the capacity to pay for the costs of service provision.\(^2\) Increased rural or small-town development, to the extent that it involves subsidized infrastructure provision, may therefore require as much (or more) per capita public outlays as does continued city growth, unless there are other demand or cost factors lowering expenditure requirements in rural areas and small towns.

Among such factors on the demand side may be lower expectations, lesser political articulation, and reduced demonstration effects in smaller (or rural) compared with larger settlements, thus raising public service demand in the latter above that in the former. A related aspect is that, as Lewis observes, rural dwellers may rely more on self-help than do urban households; but this point can be exaggerated. Poor urban residents do not employ architects and they are known to rely extensively on various types of self-help measures in constructing their homes (see, e.g., Vernez for a description of self-help housing construction in Bogotá).\(^2\) It is difficult to gauge the importance of these


\(^{21}\) See Selowsky (n. 7 above) for Colombia.

\(^{22}\) Meerman (n. 7 above) found that, in Malaysia, where public utility services are priced approximately at cost, poor rural households have often not sought utility connections, even where they could have been connected; Meerman surmises that this is due to inability or unwillingness to pay for service charges. Malaysia is, however, an exception rather than the rule in terms of pricing rural services at cost.

impacts on the demand for services in urban areas, but there is some reason to believe that they tend to be reinforced by officially set standards for housing and public services in urban areas, which are often patterned after standards found in industrialized countries and are beyond the poorer urban residents' ability to pay. Service provision for the poor at such standards requires subsidies if the intended beneficiaries are to be able and willing to purchase them, and the subsidies in turn create the impression of urban service provision as a bottomless pit, since fiscal resources are not adequate to meet even a fraction of the service requirements set at these standards for the entire population.

So far, the discussion has revolved around the question of whether urban residents place greater demands on governments than rural dwellers. The results of the analysis and the scanty empirical evidence available are that most of the differences on the demand side are due to the rapid population growth in urban areas, to the higher average income levels of urban compared with rural residents, and to the higher expectations of urban residents, which tend to be reinforced by publicly set standards. Only the last of these three factors, however, is one which truly distinguishes urban from rural dwellers, since higher rural population or income growth would also result in higher rural public service demands.24

C. Determinants of the Costs of Supplying Public Services
The questions to be addressed in this section are whether unit costs of public services are higher in urban than in rural areas and whether they are higher in large cities compared with medium-size cities and smaller towns. The major factors influencing unit costs of public services are input costs, the existence of economies or diseconomies of scale, the limitations on natural resource availability, and the existing public management and administration capacity. These aspects will be discussed in this section by reviewing the evidence on cost functions for specific services. In order to give a flavor of the complexity of the issues involved, water supply and sewerage services will be discussed in some detail. These happen to be the services for which the evidence on comparative service costs is most extensive; and yet, as will be seen, the conclusions which can be drawn remain extremely tentative.

1. Water supply and sewerage services.25 The provision of potable water falls into three stages: production, storage, and distribution. The cost of water production depends primarily on the accessibility of

24 The same arguments apply to the case where the more rapid growth of small cities is favored over that of the larger cities.
the water source, the level of treatment required given a desired quality of water, and the need for pumping. In principle, one would expect that, as more and more water needs to be produced for a growing settlement, the more readily and cheaply accessible sources of water are first utilized, while the more remote or deeper, and therefore more costly, sources are tapped subsequently. In Bogotá, for example, the recent Chingaza project required the construction of a dam and transmission of water over a considerable distance through mountainous terrain, whereas previously sources much closer to the city had provided sufficient water. In water treatment, technological economies of scale exist: large-size treatment plants show lower unit costs than plants of smaller size. However, since increasing density and city size result in higher pollution of groundwater and river sources, more treatment is required, thus tending to offset the cost gains from technological economies of scale. In Cali (Colombia), for example, the relatively clean water of the Cali River was exhausted some years ago, and therefore water had to be abstracted from the more polluted Cauca River, requiring much more extensive and costly treatment. Costs will also tend to rise if gravity-flow water has to be substituted for by pumped water, or if water is to be pumped from deeper wells. On the other hand, technological economies of scale in pumping may reduce costs as larger pumps are installed. The prevalent pattern in water production therefore appears to be that technological economies of scale tend to lower production costs as system size increases, while the natural limitations on the input of hydraulic resources tend to raise costs as the quantity produced increases with increasing settlement size.

In water storage, technological economies of scale again exist because the tank surface (and thus the need for construction inputs) increases less than in proportion with tank volume, and thus larger storage tanks tend to have smaller unit costs. However, the actual size of storage tanks may not increase as cities grow, because new tanks of similar size as the existing ones may be added to meet the increasing demand. Furthermore, storage tanks may have to be located on increasingly inaccessible or costly land, thus offsetting any economies of scale.

The costs of distribution tend to decline with increasing density because less piping per household is required to serve the denser population as compared with a lower-density settlement. However, as settlements expand in area, the length of transmission lines from the source may increase, and economies of scale, which could result from using larger pipes, may not be realized when new pipes are laid parallel

---

26 See Stanford University, Research Institute, "Cost of Urban Infrastructure for Industry as Related to City Size in Developing Countries: India Case Study" (Stanford, Calif., 1968), for engineering cost estimates in support of this contention.
to existing pipes rather than the existing pipes' being replaced by larger new pipes. Moreover, distribution costs may rise as a result of the inaccessibility of the terrain in which expansion of the cities takes place. For instance, the Colombian cities of Bogotá, Cali, and Medellín are surrounded by hillsides where capital costs of distribution networks tend to be higher and secondary pumping is frequently required. In Cartagena (Colombia), a number of low-income neighborhoods are located in swampy marshlands that make access extremely difficult and costly. Thus, offsetting cost factors are again at work, and although technological economies of scale may exist in distribution, these may not be in fact utilized or may be more than outweighed by increasing difficulty of access.

Similar arguments apply to sewerage services involving collection, treatment, and disposal. As with water distribution, higher density will tend to lower collection costs on technological grounds. But in a rapidly growing town or city, collection pipes of similar size will often have to be laid sequentially, and increasing difficulty of access and terrain may raise unit costs. For treatment and disposal, lower unit costs are associated with larger size of treatment plant on technological grounds. However, plants are generally built sequentially and therefore may not increase much in size. As settlements grow, the need for sewerage treatment is likely to increase. For example, some of the large Colombian cities (e.g., Bogotá, Cali, Cartagena) have now reached the threshold where treatment of sewerage has become necessary, and therefore a major cost increase is expected for sewerage services. An important additional element for sewerage costs is the choice of technology. Low-cost sanitation technologies such as pit latrines and low-cost septic tanks have generally not been favored by urban sanitary engineers, who have preferred the much more costly waterborne sewerage systems. As a result, urban sewerage systems have tended to involve much higher unit costs than rural or village systems, where low-cost technologies have generally been applied. A recent World Bank research study, however, has shown that low-cost technologies provide acceptable levels of sanitary waste disposal even in urban areas of developing countries, except for the very densely built-up central business districts where waterborne sewerage systems are required. A rural-urban unit cost ratio of 1:10 or more could, therefore, in principle be reduced to a cost differential of about 1:2.27

Summarizing these largely a priori arguments, one may conclude that water supply and sewerage systems typically involve technological economies of scale for given technologies, but the potential cost sav-

ings from increased size are counteracted by a number of factors: First, human settlements do not grow in discrete jumps but continuously over time. Thus, capacity must be added sequentially, frequently involving units of constant rather than increasing size. Second, as cities grow they tend to expand into areas which are more difficult and costly to service. Third, increased congestion and pollution, and reduced carrying capacity of the environment associated with increased density and city size, result in the need for more treatment at the source of water and more costly technologies of sewage disposal to ensure comparable levels of environmental quality.

Given the complexity of the cost structure of water supply and sewerage systems and the many different factors influencing these costs (many of which are dependent on very specific hydrological, geological, and geographic characteristics of a particular settlement), it is not surprising that comparative estimates of unit costs for settlements of different sizes are very difficult to make. Allowance must also be made for differences in quality of service, in capacity utilization, and many other factors, in order to avoid estimation biases. Usually, this is not done, and therefore any correlation between unit costs and settlement size may be quite spurious. On the other hand, engineering cost studies, such as the one carried out by the Stanford Research Institute for India, tend to show declining costs because they capture the impact of economies of scale and density but fail to allow for differences in accessibility of water resources, for differential needs for sewerage-treatment and disposal technologies, and for the fact that systems are built sequentially. As a result of these estimation difficulties, very few cost studies emerge with reliable conclusions regarding the impact of settlement size and density on water supply and sewerage costs. Even those that are reported below must be treated with considerable caution.

For rural-urban differences in water supply and sewerage costs, a recent review of international experience can be quoted:

On the basis of estimates by the World Bank and the World Health Organization (WHO), construction costs for urban water supply (with a
mix of house or yard connections and public standposts) are in the range of $50-150 in 1978 prices for each additional person served. A comparable range for simple piped systems in rural areas would be $30-50. Costs of waterborne waste disposal are, however, much higher: in towns and cities they may be as much as $600 per capita. Recent research by the World Bank has identified alternative sanitation technologies which may reduce this figure to below $100 and, in rural and urban-fringe areas, to less than $40.  

For Brazil, a recent World Bank study estimates an investment cost of $500 per urban dwelling for water and $650 for sewerage. For isolated rural dwellings, unit costs of $2,000 per water connection and $400 per sanitary installation were estimated, while for rural communities with 100-400 dwellings, water costs were estimated to range from $430 to $480 per dwelling and a latrine at a cost of $70 each. With the exception of isolated rural dwellings, these estimates confirm the conclusion of Saunders and Warford that per capita costs of sanitation in rural areas tend to be lower, provided one accepts that the quality of services is lower in rural areas—at least in terms of convenience to the user, if not in terms of safety of water supply and waste disposal. For cost differences in urban areas of different size, no general rules of thumb can be derived. Studies for Colombia appear to indicate that historically the relationship between city size and unit costs of water supply and sewerage services has been U-shaped in that country. For towns between 10,000 and 70,000 inhabitants per capita costs decline, while there is a gentle but statistically significant increase in unit costs for cities beyond 70,000. 

The conclusions which may be derived for unit costs of water supply and sewerage services are thus quite tentative. There are some indications that rural village water and sewerage supply costs per dwelling are lower than those in urban areas, mainly because lower-quality services are acceptable to policymakers and users in rural locations. For urban areas a U-shaped cost curve may apply at least in some countries, but this depends very much on the choice of technology, quality of service, and the availability of hydrological resources: none of these factors is necessarily systematically related to city size.


11 World Bank, Brazil Human Resources Special Report. The weighted average of rural supply costs in Brazil was calculated as $500-$740 per water connection and $100-$200 per latrine, assuming that only 10% of rural dwellings are located in very small communities.


2. Electricity. For electricity services, World Bank estimates indicate that average costs of serving rural areas (6¢–10¢ per kwh) are high compared with those in urban areas (2.5¢ per kwh). However, "costs are very sensitive to the level and growth of demand, the level of utilization, the distances between demand centers, and the difficulty of terrain."14 Moreover, as load factors and the level of demand rise, average costs decline very quickly in rural service. For urban areas, fewer studies of comparative service costs appear to have been carried out than for water supply and sewerage systems. For the United States, Hirsch cites Nerlove's 1961 study of electricity costs, which showed clear evidence of economies to scale on the basis of statistical data. These conclusions are confirmed for U.S. municipal electricity distribution systems by Hufbauer and Severn.15 It therefore comes as a surprise that, for a cross section of Colombian municipalities of medium and large size, Villamizar found increasing unit costs of electric services. This result is confirmed for Bogotá by an intemporal study by Linn.16 The reasons for this apparent existence of diseconomies of system to size in Colombia may have to do with differential input costs, especially labor and land (although the Bogotá study deflated costs by the general price level), or with different levels of capacity utilization, of efficiency in operation, and the like. Unfortunately, the studies cited do not permit a judgment on the validity of these presumptions.

On balance one would tend to conclude that, for electricity, technological economies of scale provide an overriding impact on unit cost, relative to other, possibly offsetting factors, since alternative quality and technology options are much more limited in the case of electricity than, say, in the case of water supply and sewerage. The data for Colombia provide some counter-indication for medium-size and large cities, but more empirical research would be required to verify these conclusions and to extend them to other developing countries.

3. Solid-waste disposal. The need for solid-waste disposal systems is largely absent in low-density rural settlements. Organic wastes can either be recycled as animal feed or be easily disposed of in village dumps which do not require a significant amount of public intervention. Nonorganic wastes can be either burned or dumped and buried, again without need for public intervention or environmental damage. In higher-density settlements, institutionalized waste disposal becomes a

---

14 World Bank, Rural Electrification, p. 5.
16 Linn, "Public Utilities in Metropolitan Bogotá."
necessity to avoid health and environmental damages. The range of
technologies available varies. Traditional low-cost technologies in-
volving private collection and disposal are quite common, especially in
the smaller and medium-size towns. As the examples of Cairo and
Alexandria (Egypt) and Medellin (Colombia) have shown, such tradi-
tional technologies can be operated efficiently even in large cities. Thus, modern, high-cost technologies do not need to be employed in
metropolitan areas. What empirical evidence is available for develop-
ing countries confirms the conclusion that urban solid-waste disposal
costs are largely invariant with city size on a per unit basis.

4. Transportation. There can be little doubt that transportation
places a heavy burden on government budgets in urban areas, and as
cities grow public expenditure on transportation also tends to grow—
whether more or less than in proportion to city size or population is,
however, not well established. Zahavi has collected data which permit
the tentative conclusion that average urban road density tends to rise
with city size and motorization, which would on balance require
greater than proportional increments in road infrastructure with city
growth.

More generally, and impressionistically, one may observe
that urban life requires longer and more costly trips to and from work
and more travel for purposes of shopping and recreation than does
rural life, at least at the low levels of income found in developing
countries. Increasing urban traffic densities, especially in the central
city districts and along major arteries, require heavy investment in
expansion of roadways or the provision of mass transit facilities, if
crippling congestion is to be avoided. Furthermore, traffic management
requires costly mechanical and labor inputs. Public expenditures for
transportation thus tend to expand rapidly with city size, but—and this
is important for the present context—it is extremely difficult to sepa-
rate demand from supply factors in searching for the determinants of
this expenditure growth.

Rapid increases in motorization, especially the use of the private
automobile, are taking place in response to income increases as much as
(or even more than) in response to increasing city size per se. Central
city congestion is in part the result of inadequate demand manage-
ment, since external costs of the use of congested streets are generally
not borne by the individual user. Thus, the costs incurred by public
agencies in providing transportation services under conditions of se-

---

47 See Linn, “Policies for Efficient and Equitable Growth of Cities in Developing
Countries”; Alfredo Sier-Younis, “Solid Waste Management in Developing Countries”
48 See Sier-Younis for Colombia.
49 Yacov Zahavi, “Travel Characteristics in Cities of Developing and Developed
vere congestion reflect an inefficient utilization of the system and an inefficient level of investment and can therefore not be judged representative for a situation where congestion costs are priced correctly and where public transport expenditures would certainly have to increase less rapidly in urban areas than is presently the case. Nevertheless, it may be that the unit costs of transport provision in urban areas tend to increase with size, particularly as input costs, such as labor and land, tend to be significantly higher in urban than in rural areas, and since congestion, even where reduced to efficient levels, tends to raise the investment and operating cost for transport infrastructure provision. A proof of this proposition is difficult to obtain because it is difficult to decide what is the "unit" of transportation (system mile, vehicle mile, passenger mile, and commuting time are some of the possible candidates), because supply and demand factors are so closely interrelated in determining transport expenditures, and because there are so many alternative technologies in use. Indeed, there appears to exist no study which explicitly addresses the question of how unit costs of transportation vary with settlement size or degree of urbanization. Typically, studies are addressed to evaluate total public per capita costs of providing transportation services, which, of course, reflect demand and supply factors. And even this type of study has been restricted to the developed countries. For developing countries there appears to exist no quantitative evidence even at this superficial level.

5. Education and health services. For health and education, increased settlement size and density can conceivably reduce unit costs of service provision. Particularly for the higher-level facilities, such as secondary and postsecondary education and for modern hospital facilities, a minimum size is required to permit economical operation. For more basic health and education services, much smaller units of operation are likely to provide the minimum efficient size. As a result, one would expect equal-quality services of basic health and education to be approximately equal in unit costs for rural and urban areas. Costs may be somewhat higher in rural areas to the extent that higher costs of logistical support are needed there and that higher salaries are required to draw qualified personnel from urban into rural areas. On the other hand, especially in the largest cities, land and labor costs may be higher than in the smaller towns. As regards higher-level education and health services, rural settlements and even smaller towns clearly do not

40 Prud'homme (n. 29 above), e.g., found that for France expenditures on highways increased more than in proportion with city population. For the United States, Hufbauer and Severn have reported unitary population elasticities of highway expenditures for a cross section of municipalities.

41 It has also been the experience in the health field that urban facilities tend to be better managed than rural facilities, thus contributing to lower urban than rural health costs. (Information provided by F. Golladay.)
provide the size or density of population at which unit costs reach a minimum. Therefore, the fact that these services are found mainly in the larger towns and in cities in part reflects a supply constraint. However, as with all other public services so far discussed, it is clear that demand differences and political allocation criteria—and the latter are particularly important for health and education—are major factors explaining the higher public expenditure levels in urban compared with rural areas.

Unfortunately, it is not possible to go far beyond these a priori statements on education and health costs, because data are again woefully lacking. For Colombian cities, Villamizar found that average per student costs of secondary education are lowest for medium-size cities, higher in the largest cities, and yet higher in the small towns. However, the differences in costs are only on the order of 5%, which—given the likely range of measurement error and the variation across cities—are not likely to be significant. These findings confirm, however, the common results for the United States reported by Hirsch. For health services in Colombia, Villamizar found that unit costs for doctors and dentists were highest in rural areas and lowest in the intermediate and large cities. For nurses, the lowest costs were encountered in small towns. Meerman found, for Malaysia, that the total unit cost of a rural clinic visit exceeds that of a hospital outpatient visit in urban areas by about 9%.

6. Other public services. Among the other public services, fire and police protection deserve special mention because these are services largely urban in nature and not commonly found in rural areas. They are required because of the scale and density of urban life, and their unit costs may increase with city size (e.g., sophisticated ladder and pumping trucks are required in large cities with tall buildings; police may require extensive motorization and communications equipment in the large cities). Data do not exist to support these hunches for developing countries: 42 in any case, urban governments in LDCs tend to spend minor amounts (probably too little) on fire protection, and the proportion of police time going into urban crime prevention as against other tasks (traffic management, political control, and national security) is difficult to ascertain.

Other urban service functions, commonly carried out by urban governments, such as provision of public markets and abattoirs, also play minor roles and to some extent serve the rural population as an outlet for its produce. Finally, urban administration, planning, and zoning involve public expenditures; since these services virtually do

42 For the United States, Hirsch (n. 18 above) reports studies which show constant unit costs for police protection and U-shaped unit cost curves for fire protection.
not need to be provided in rural communities, their costs are clearly higher in urban areas, but there may be economies of scale as cities grow and the execution of these services can be streamlined and made more efficient.43

III. Economic Costs and the Efficiency of Urbanization

The concern over rapid urbanization and large-city growth is not restricted to the fiscal and financial implications of this pattern of development. Policymakers and analysts alike frequently express concern regarding the high economic costs of urban development. To the extent that this concern is different from that regarding fiscal and financial costs, it generally derives from the high levels of congestion and pollution observed in the large cities. On the basis of the assumption that public service costs are higher in urban than in rural areas (or in large cities compared with small cities), and that congestion and pollution are reaching excessive levels, it is argued that observed urbanization rates are inefficient, and that cities, and especially the largest ones, are growing too large.

These arguments, however, ignore the economic benefits which urbanization conveys to firms and households, some of which are external to the decision maker.44 As a result, it is quite possible that the cities are too small, if private decisions are not corrected by public intervention. The proper question to ask is, therefore, whether the benefits from agglomeration in urban areas outweigh the costs of agglomeration, rather than focusing merely on the cost side.

Unfortunately, a comprehensive measurement of costs and benefits associated with urbanization is a difficult task. Nobody appears to have tried to sum individual costs and benefits, including negative externalities arising from congestion and pollution, and positive externalities associated with increased market size, improved communication, and so on. Problems of definition and measurement are serious enough to preclude this approach. Instead, a more circuitous route has been chosen. Mera, for example, found that there is a "positive correlation between the growth of the largest cities and economic development in developing countries," which he takes to support the hypothesis that "large cities are more productive and that the largest cities are

43 Housing is not addressed here as a major public service, since in most countries public housing per se plays a minor role and should continue to do so (see Linn, "Policies for Efficient and Equitable Growth of Cities in Developing Countries"). Instead, urban governments provide infrastructure and social services (which have been discussed), while the private sector tends to build the majority of housing units.

44 For example, a new investor will calculate (implicitly, at least) the benefits which he derives from being located in the city, but he will not consider the benefits which his decision conveys to others in terms of providing a greater market, employment opportunities, etc.
likely to be particularly more productive relative to others in a less developed country." This is, of course, a rather weak basis on which to judge the efficiency of urbanization and large-city growth. It might be more appropriate to conclude from Mera's empirical findings that there is no strong evidence that urbanization or large-city growth is detrimental to economic development. More sophisticated econometric studies of the productivity of large cities have been carried out for the United States, but they have "failed to identify an upper limit to the efficiency of large cities."

Indeed, there is good reason to assume that city size per se is only one of many variables determining the productivity of factors of production. As Richardson points out, the location of the city (e.g., relative to other cities) and its functions are other important determinants. As a result, it is not useful to talk about optimal city size in general terms, even if cost and benefit considerations are taken into account.

The main lesson to draw for purposes of policy is that controlling city size is rarely, if ever, the appropriate policy instrument to deal with apparent urban inefficiencies, such as congestion, pollution, public service subsidies, and so on. The appropriate policy intervention should instead focus directly on the sources of inefficiency, which would include the pricing of externalities through pollution and congestion charges and the pricing of urban services at cost rather than at subsidized rates.

IV. Equity Concerns with Urbanization Costs
A final reason for concern over urbanization costs is the belief that urbanization inflicts its costs unevenly across income groups. The most common variant of this concern is the view that rural households are made to bear a substantial share of the public costs of the urbanization process because of biases in the fiscal system which result in the extraction of a surplus from rural household income for the financing of urban infrastructure. These allegations are typically made where

---

46 Similarly weak are other studies cited by Mera which confirm the high correlation among urbanization, primacy, and income levels. Indeed, Renaud reports on a regression analysis for 109 countries indicating "that primacy declines with per capita GNP and that there is a great deal of instability in the primacy index at low income levels." Bertrand Renaud, "National Urbanization Policies in Developing Countries," Staff Working Paper no. 347 (Washington, D.C.: World Bank, 1979), pp. 129-30.
47 Ibid., p. 133.
49 A different concern regarding the distribution of the burden of urbanization costs is that many of the social costs of urban growth (e.g., congestion) are caused by the rich and borne by the poor within a city (e.g., Richardson).
analysts are arguing that an urban bias in public policy leads to excessive rates of urbanization and worsens the income distribution. But these allegations are rarely substantiated by hard evidence. The problem is that the empirical verification of the hypothesis is virtually impossible because of conceptual problems of identifying the incidence of costs and benefits of public intervention and because of sufficient data in most countries. The most ambitious exercises to date to ascertain the distributive impact of public expenditures in developing countries are found in the studies by Meerman and Selowsky cited previously.

For Malaysia, Meerman estimated that rural areas are actually most favored on a per capita basis by public expenditures, followed by the large cities, with the small urban areas being the least favored. Unfortunately, this finding for public expenditures cannot be contrasted with the incidence of taxation by area. In other countries, rural areas usually bear lower average tax burdens than urban areas, and this is probably also true for Malaysia. For this country, therefore, the common view that the countryside is subsidizing the cities, may, at least tentatively, be rejected. For Colombia, the picture is less clear. Selowsky shows that, for education and health services, subsidies per household are substantially larger in urban than in rural areas (some 100% higher in the case of health, and some 60% in the case of education). For health, moreover, per household subsidies increase with city size; the reverse is true, however, for education. For public utilities, Selowsky found that households in large cities have systematically better access to these services than is the case in smaller towns or rural areas. It was not possible, however, to establish the extent of subsidization, given the complex utility-pricing practices in Colombia. Matters are further complicated by the fact that Selowsky does not report any information on tax incidence. According to McLure, the average tax burden in urban areas is above that for rural areas, but for the urban poor it is marginally below that for the rural poor. On the basis of these findings, one might, very tentatively, conclude that, for Colombia, there is some reason to believe that rural households, and especially the rural poor, are disadvantaged relative to urban households in terms of the net impact of public tax and expenditure policies.

Having reviewed these findings, one is, however, left with the

---

Has some validity, especially in the case of automobiles (see, e.g., Linn, "Policies for Efficient and Equitable Growth of Cities in Developing Countries"). This issue is, however, not further pursued in this note.


question of what they imply for urbanization policies, even if one is willing to abstract from the severe limitations of the studies concerned. To the extent that urban areas are subsidized by the public sector, one may indeed want to correct the balance both on efficiency and on equity grounds. But this corrective action should not involve policies geared primarily to slow down the urbanization process; rather, the subsidies provided to urban dwellers should be reduced or eliminated by appropriate changes in taxation, user charges, and public expenditure policies. Indirectly, these policies may also affect relative rural-urban population growth rates, but if one judges by the empirical evidence on the determinants of rural-urban migration in developing countries, this impact is not likely to be very strong.

V. Summary and Conclusions
There are four common, but distinct, reasons for concern over the costs of urbanization in developing countries:

1. Fiscal. Urbanization places a heavy burden on governments as they have to meet the rapidly rising demands for urban services.

2. Financial. The high financial costs of urbanization are believed to be the prime cause of the heavy and growing international indebtedness of developing countries.

3. Efficiency. The economic costs of urbanization (including congestion and pollution costs) are taken to exceed those of rural growth; this in turn is taken as a basis for judging urban development excessive in terms of economic efficiency.

4. Equity. Rural households are thought to subsidize high urbanization costs.

This paper was organized around these four considerations, and its conclusions may be summarized accordingly.

Fiscal considerations. First, in the aggregate it is impossible to tell whether there are economies or diseconomies of scale or agglomeration in public service provision. Even service-specific cost relationships are subject to considerable doubt and are likely to vary extensively within and between countries. It is, therefore, impossible to derive an overall judgment about how aggregate public service costs vary with settlement size.

Second, the demand for public services and the politically determined investment decisions are such as to result commonly in higher average per capita service levels for most public services in larger compared with smaller settlements. It is predominantly for this reason, rather than because of higher unit costs, that per capita public expenditures in urban areas tend to be higher than in rural areas and that they tend to be higher in large than in small urban areas.
Third, one major determinant of the spatial and sectoral distribution of public spending is the higher population growth in urban compared with rural areas. Because of this more rapid population growth, urban areas face a more rapid expansion in public service requirements, irrespective of the unit costs or the level of per capita demand for these services.

Fourth, industrial and commercial users account for substantial shares of urban service demand, especially in the case of public utilities. Since industrial development and commercial development are inevitably located in urban rather than rural areas, it is not possible or useful to separate the fiscal costs of urbanization from those of industrialization.

In sum, industrialization, population growth, and increases in per capita income, all of which tend to be concentrated in urban areas, impose a rapidly growing fiscal burden on governments in developing countries. However, there is little reason to suspect that slowing down the urbanization process per se will reduce this burden unless it is accompanied by reduced rates of industrialization or reduced population and income growth.

Financial considerations. The claim that rapid urbanization is the primary cause of international indebtedness of developing countries is inaccurate and misleading. It is not supported by a direct, statistically significant relationship between urbanization rates and debt ratios in today's developing world. Even if such a statistical correlation existed, it would be a largely meaningless association since it is difficult, if not impossible, to separate urbanization from other elements of the development process, especially industrialization.

Efficiency considerations. Costs alone do not determine the optimum degree of urbanization or optimum size of cities. Benefits must also be accounted for. It is quite possible that, even if costs increase with urbanization, benefits increase even more. It has not been, and probably never will be, possible to establish empirically whether a turning point exists at which incremental costs of city growth exceed the incremental benefits. In any case, city size is not the only variable—and most certainly not the dominant one—determining the productivity of cities. Numerous other considerations, such as the location of the city and its functions within a particular national context, are likely to play a major role in determining how large and how fast a city can efficiently grow. Moreover, many of the apparent symptoms of urban inefficiency, in particular congestion and pollution, are due to inappropriate policies within the city rather than the result of inefficient city size or inefficiently high rates of urbanization. The appropriate policy response to such inefficiencies is the removal of policy biases
within cities, especially as regards public service subsidies and the failure to account for externalities, for example, through pollution and congestion charges.

*Equity considerations.* Recent empirical work has shown that the common presumption according to which rural dwellers subsidize urbanization costs is not necessarily correct. Even if, and where, this is the case, the cause lies not with urbanization costs per se but with inequitable (and probably inefficient) public pricing and tax policies. The correction of these policies, rather than direct intervention in the urbanization process, is therefore the appropriate response.