POPULATION DISTRIBUTION POLICY

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Recently interest in population distribution has risen to the point of considering unprecedented policies to influence distribution—between different regions, between rural and urban areas, between cities of various sizes, and between central city and suburb. A predecessor to current concern was concern with depressed areas, which led to instituting various regionally oriented programs in the sixties.

Concern has been heightened by dissatisfaction with the increasing concentration of population in larger cities. The physical environment is seen to be of low quality in larger cities. Crime, riots, and protest are most conspicuous in large cities. Some observers have emphasized the effects of housing segregation, zoning, and other impediments to movement leading to concentration of blacks and low-income groups in central cities. Meanwhile, fiscal problems have increased in cities. The view has become more widespread that the bad things happening in large cities must be caused by their largeness.

The first reaction of many economists to the idea of adopting a population distribution policy is to favor letting the market accomplish population distribution, that is, have no explicit policy. Most discussions of population distribution policy have been at the opposite pole, entirely ignoring the role of markets in achieving goals. There has been very little serious concern with the question of what markets do and do not accomplish.

Little is known about how specific government measures would influence population distribution and how much they would cost. Even less is known about the quantitative change that possible measures would bring about in population distribution.

This paper is concerned with how economics can be used in analyzing population distribution policy questions. After dealing briefly with why there are cities of different sizes, it considers possible reasons for attempting to influence where people live, including market externalities, institutional externalities, nonpriced goods, and national public goods. A quantitative approach to evaluation of policies is suggested. The examples used suggest how to evaluate efforts to disperse economic activity to areas outside the nation's larger cities and are especially relevant to rural development policy.

WHY CITY SIZE?

Almost as sure as the fact that we cannot explain why the existing distribution of city size occurs, is the prediction that the same general pattern of city sizes will continue to exist. The statistical regularity known as the rank-size has been observed for many counties and at many points in time. The regularity basically is that the number of cities with a given population varies inversely with the city population.

Among the few serious attempts to explain why cities of different sizes exist has been city hierarchy analysis. It is usually assumed that each city or town has a place within a hierarchy, trading only with a city which is the next order of size greater than it is in the hierarchy and with a group of smaller cities of next lower order which it serves. The analysis visualizes city activity to consist mainly of wholesaling and retailing and of processing of agricultural output or natural resource output.

Hierarchy analysis may explain a part of the variation in city sizes based on economies of scale in the various stages of distribution and processing. However, the assumption that a city trades only with cities immediately above or below it within one hierarchy is grossly at odds with reality. More usually, manufacturing output even from small towns is shipped to a variety of points in a national market. If hierarchies exist, there is a great deal of trading among hierarchies, with cities at a given level shipping to cities at many different levels in other hierarchies. Hierarchy models have not adequately dealt with this more pervasive trading.

Descriptive studies reveal some loose tendencies for economic structure to vary systematically with city size. A small town may have employment primarily in a limited complement of retail services, a larger town may be devoted primarily to offering a full retail complement, and still larger cities may offer varying degrees of wholesaling and manufacturing. As yet, no satisfactory operational analytical models are available to explain how different city types result from demand and cost assumptions.

An appealing hypothesis is that economies of scale and driving range of an hour or so for working and shopping lead to a minimum size viable town. A major idea based on this hypothesis is that policies should not attempt to foster growth of more centers than are consistent with this pattern. There has been much discussion of identifying the particular centers whose growth should be fostered. This emphasis stems partly from the notion that the automobile has increased travel distances, outmoding smaller centers which are in the

process of declining. Important as this policy guide is, it does not in itself constitute a population distribution policy. It only supplies a proviso to be followed in attempting to achieve other population distribution objectives.

Almost surely there is no one optimum size of center. The size will vary with the type of export activity. Also, for the so-called footloose industries there are economies of agglomeration which will continue to lead toward the existence of a few extremely large centers in the country. Bedroom communities and factories finding it economical to operate outside larger cities will continue to cause smaller towns to develop outside the centers. These smaller towns will have at least a partial retail complement for quick, daily shopping and in many cases some manufacturing. Water-oriented industries where there is still a sufficient local supply of labor, choosing sites away from growth centers, is a further example. In short, there are many reasons to continue to expect a gamut of sizes of cities and towns.

Although varying greatly among communities, on the average something like a half of employment is for goods exported from the community while the remainder is for goods and services locally consumed. The following industries are classified as export oriented: agriculture, forestry and fisheries, contract construction, and manufacturing and transportation industries. Due to the automobile, people can go farther to obtain the locally produced goods and services than formerly. This gives larger centers an advantage in rate of growth relative to outlying rural towns. We can continue to expect increasing centralization of local functions away from small rural towns toward larger centers.

There is a trend in the nation as a whole toward a growing importance of employment to produce goods and services for local use relative to employment to produce for export from a community. With rising real income, a *high income elasticity of demand* for services and items that must be produced locally rather than supplied over long distances leads to this trend.

POLICY RATIONALE

While progress is being made in understanding why people and jobs are located as they are, clearly there is a long way to go. Fortunately, population distribution policy does not require complete ability to predict the location of activity. Knowledge needed is that required to provide incentives that will achieve desired policy aims.

The present location of people and activities already reflects much about people's desires concerning where to live and their responses

to economic opportunities. The individual's task of balancing among alternatives of where he will live and work is partly accomplished by markets, and the entire performance of these markets does not have to be repeated in policy making. Recognition of this point helps direct the discussion of population distribution policy. However, a central concern of policy is that market incentives apparently fail to achieve the desired goals of our society.

Market failure in locational decisions is suggested by the fact that many undesirable effects associated with largeness of cities are environmental. Many causers of pollution and congestion do not pay the full costs of their acts. Such environmental effects provide the classic examples of market externalities.

Population congestion is a major environmental effect leading to increasing negative externalities as city size increases. However, there may be systematic positive as well as negative effects. Economies of scale may lead to positive externalities if the actions of one firm or individual reduce costs for others who do not pay for the actions. An example is the increased efficiency of communication when economic agents are close together. Another example is the expanded local labor market which includes persons with a wider variety of skills who can be hired without long delays when firms have a labor turnover.

Definitely, there are externalities connected with privately produced *unpriced* effects which technically are public goods consumed by local residents. Excitement, type of people encountered, impersonality of human relationships, and degree of crowding in various aspects of everyday life are examples. These may be positive or negative as town size changes, and may vary among people depending on their tastes. Since no person can sell these consequences, it is difficult to measure their importance in towns of various sizes.

For publicly supplied services of all kinds, there may be *institutional externalities.* Movement of people from one town to another or from central cities to suburbs affects the taxes by which education and other investments with significant returns are financed. A net increase in investment with positive returns is a positive externality associated with a change in the location of activity and vice versa.

A number of effects that may ensue from a change in population distribution are *public goods valued by people in the nation at large.* For example, it has been suggested that innovations are more likely to take place in a larger city. If so, benefits from the innovations due to increased city size are a positive eternality. Other examples of matters of concern to the nation at large are riots, income distribution

(which, since it is carried out in part at the local level, is affected by the geographic distribution of people by income class), degree of social and ethnic intermixing of people, and degree to which particular geographically oriented cultures are enhanced.

INSTRUMENTS

The effects that have been discussed need not be attacked through locational policies per se. An approach coming first to mind is to deal with the effects directly. For instance, in the case of air pollution, causers would be charged for damages or given other incentives to cut back on polluting. Tolls are among several measures that have been proposed to reduce traffic congestion. Externalities can and undoubtedly should be the focus of policy actions in their own right.

Two reasons may be noted why the direct approach is unlikely to be carried to the extent of completely eliminating externalities. First, those involved in the public decision-making process will not soon accept the approach. Second, the approach of directly eliminating externalities may be too costly to justify complete elimination in view of administrative difficulties, collection costs, and the like.

A guide to whether we should try to alter the distribution of population is provided by asking whether the effort will change external effects in a favorable way. For example, if polluting industrial activity is shifted from one part of the country to another with no change in polluting or other effects, little may be gained. Similarly, if a policy succeeds in shifting households from one place to another without altering the extent to which their travel and air polluting activities impose costs on others, no progress is made in reducing undesirable external effects.

A successful population distribution policy may either reduce unfavorable external effects or increase favorable ones. While effects connected with the environment may be negative, economies of scale and several other favorable effects may outweigh unfavorable externalities. Economies of scale, both external and internal, may be particularly pronounced for smaller communities, leading to gains over a certain range in encouraging enlargement of smaller centers.

In the cases of pollution and congestion, there are reasons for believing that the unfavorable external effects become progressively greater at larger city sizes. For both air pollution and traffic speed, the unfavorable effects are not so much related to total pollutants or total number of cars as they are related to their concentration. Even if growth of cities replicates patterns of residences and factories already existing in the cities, the unfavorable external effects are likely to

increase because proximity will increase concentration of pollutants and traffic. Another reason that growth of cities may increase undesirable external effects is that population tends to be denser in larger cities, due to incentives to build higher structures and otherwise economize on space. With people closer to one another, and factories as well, any given act of pollution will cause more harm because more individuals in a given locale within a city can be harmed.

APPROACHES TO POPULATION DISTRIBUTION

A number of ways to encourage redistribution could be considered. First, capital subsidies in the form of low interest rate loans would continue the use of tools already common in regional development programs. An innovation would be to gear the subsidies more explicitly to encouraging favorable changes in external effects. There would be no interest rate subsidy for the largest cities, and the subsidy for smaller cities would be determined by the extent to which an increase in city size would have net favorable external effects. Such considerations would give more specific guides than now exist concerning where to concentrate regional development efforts. Similarly, federal funds appropriated for public works to aid development of a particular region could be directed within the region according to these criteria.

Other possible approaches are subsidies for migration and subsidies or tax credits for job development geared to external effects associated with size of place. Still other possibilities include higher payroll taxes on existing or new employment according to size of city or some other locational criterion. A value added tax varying by location might be instituted. Still another possibility is a federal property tax geared to external effects by location. Ideally, the measures would be less crude than city size alone, since cities of the same size can have differing externalities depending on such things as industrial composition and how local climate affects the degree of harm from a given amount of pollutants.

Another possibility is to use locational criteria for federal expenditures, that explicitly include externality considerations. Because of the importance of federal government expenditures in the national economy, making population distribution a consideration in deciding on their location could have great immediate impact.

NUMERICAL EXAMPLES

Whether a population policy is desirable and how to design the instruments if a policy is adopted, depends importantly on the question: *How great* are externalities? Taking this question as central,

the present section will be concerned with quantitative analysis of population distribution issues.

A first example is provided by air pollution. Various measures of air pollution concentration are available. Using yearly average mean value of micrograms of suspended particulates per cubic meter, values in 1966 for the largest cities were: New York 134, Los Angeles 199, and Chicago 124. While the highest count occurred in a somewhat smaller city (Steubenville, Ohio, with 254) and in a few special cases large cities had relatively low counts (e.g., Honolulu with 35 and Miami with 49), there is a distinct tendency for the measure of air pollution to rise as a city's population increases. For nonurban areas, the modal value was 38 micrograms per cubic meter. The lowest value, 9, was in White Pines County, Nevada.

There has been considerable interest in measuring the deleterious effects of air pollution on land values. For Chicago, it has been estimated that an additional microgram per cubic meter of air detracts about $48 from sale price of a residential house and lot.

People making choices where to live take account of the desirability of different locations including environmental and other unpriced differences. The idea that they must be compensated for these differences through differentials in wage rates suggests that the wage rates might throw light on the over-all magnitude of effects, including not only pollution and congestion but other external effects in a city as well.

Money wages vary in a positive way with city size. As a town grows, money wages needed to attract labor are raised by greater commuting costs due to longer trips that must be made even in the absence of congestion. In turn, prices of locally consumed goods and services such as provided by retailing are raised due to the higher wage rate. The higher cost of the local goods then in turn further raises wage rates and so forth. If there were no externalities of any kind, these cost-of-living differences in wages would still exist. Increases in city size would simultaneously raise the cost of producing local goods and raise the wage rate needed to compensate labor for the higher cost of living. There would be no divergence between private and social gain in locational decisions. One would expect that money wages deflated by the local cost-of-living index would be the same in every locality. Any differences would be due to immobilities and not externalities.

As part of a study of cost-of-living differences among cities, Oded Izraeli has estimated the effects on money wages of city size remaining after taking account of the higher costs of the major purchased goods

and services as reflected in cost-of-living indexes. A preliminary estimate is that, even after allowing for these higher costs, an increase in population of a town by one person is associated with an increase in yearly wage income of $0.0001. This suggests that the estimate could give a comprehensive measure of not only pollution and congestion but also changes in the other external effects impinging on residents as city size varies.

For comparability with the earlier examples, consider a city of 1 million workers which might have a total population, counting dependents, of about 4 million. The increase in yearly wage income due to the externalities connected with population would then be $0.0001 times 4 million or $400 per year. This amounts to $1.60 per day or about 20 cents an hour.

CONCLUSION

Estimates indicate that adverse effects of externalities impinging on city residents are not negligible, but neither are they so large as to be likely to call for dismantling of cities. A 5 percent increase in the cost of hiring labor would probably make a city grow less rapidly than otherwise, since many labor-intensive firms on the margin between locating in the city and elsewhere would then find locations elsewhere more attractive. Since the large cities contain such a preponderance of the population, even a small effect in percentage terms on larger cities could greatly accelerate economic growth in rural areas.

Effects of national concern such as riots and income distribution will clearly remain difficult to place a value on even conceptually.

Major purposes of this paper have been to establish, first, that intelligent arguments can be made both for and against adopting explicit population distribution policies and, second, that in the event of a yes decision there would be intelligent ways to design the policies. The approach suggested here calls for considering how well markets perform in allocating resources between different locations. The essence of the approach is to consider the adequacy with which a policy introduces incentives to take account of effects neglected in market decisions. The approach calls for estimation of the external effects in quantitative terms. Even the crudest estimation of the effects is better than none.