NEGATIVE POPULATION GROWTH

THE NPG FORUM

Optimal City Size and Population Density for the 21st Century

by

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This is the eleventh in a series of NPG FORUM papers exploring the idea of optimum population—what would be a desirable population size for the United States? Without any consensus even as to whether the population should be larger or smaller, the country presently creates its demographic future by inadvertence as it makes decisions on other issues that influence population change.

The approach we have adopted is the "foresight" process. We have asked specialists in various fields to examine the connection between alternative population futures and national or social objectives, and how policy may influence population change. In this issue of the FORUM, Drs. Speare and White inquire whether the largest American cities have grown too large.

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— Lindsey Grant, Editor

Introduction

Within the United States, as in many other parts of the world, there are several large cities which seem to be constantly beset with problems of crime, congestion, pollution, and mismanagement. At times the mere population size of these areas seems to make them unmanageable. The City of New York, for example, had a population of about 7.3 million in 1988 within 302 square miles. Los Angeles had over 3 million within 465 square miles and Chicago had 3 million within 228 square miles. Each of these cities is surrounded by smaller cities and densely settled suburban area which bring the total in these metropolitan areas to 18.1 million for New York, 13.8 million for Los Angeles, and 8.2 million for Chicago.[1] Are such cities the combined product of outdated agglomeration economies and continued population growth, or is their current size justifiable in terms of greater efficiencies in the production of goods and services and the amenities offered to their inhabitants?

In this essay, we will reexamine the old arguments that larger scale leads to greater efficiency, reduced costs, and a better quality of life. We shall look at the environmental and social costs associated with different scales of settlement. We will also look at how people's perception of the desirability of a particular place and the perceived problems of that place vary with size. Finally, we will question the common view that population decline has negative consequences for cities.

There is much disagreement on the subject of optimal city size and we do not expect to arrive at a single type of urban settlement which is optimal or ideal for all persons. In a recent Gallup Poll, New York City received the largest number of votes for both the best city and the worst city in the U.S.[2] Its supporters pointed to the number of job opportunities, the shopping, and the cultural activities, while New York's detractors mentioned the high cost of living, crime and pollution. Which of these advantages and disadvantages are likely to continue into the next century and how is technology changing the relative advantages of large vs small cities? Before addressing this question, we will briefly summarize the history of city growth.

Current Population Distribution as a Result of History.

The current distribution of population in the United States reflects the history of settlement of the nation. The vast variations in population density are largely the result of the location of past economic opportunities and the establishment of self perpetuating migration streams. If the United States were being settled today, the distribution would probably be quite different.

Eight of the 10 largest metropolitan areas in the United States have central cities which developed in the 19th century.[3] These cities were primarily dependent upon water transportation and were located at major ports for sea transportation (such as New York, Boston and San Francisco) or at the junction of major rivers or lakes (such as Detroit and Chicago). These cities were all settled before automobiles and buses were available, and businesses and houses had to be close together to permit most people to travel on foot between them. The rivers along which they are located often divide the land and create barriers to land transportation.

Newer cities such as Dallas, Los Angeles and Phoenix were designed for automobile transportation and have fewer water barriers, although they can still have traffic jams due to population growth beyond what was anticipated in the design of highway systems. With the development of land transportation, fewer people need live near sea ports and high residential densities are not needed. Metropolitan areas developed in the past decade, such as Bradenton, Florida and Naples, Florida have much lower densities and are almost entirely suburban in character, lacking a dense core.

While the earlier history of the nation was one of growing population concentrations, the trends of the 1970s were in the direction of population deconcentration. John Long shows that population growth was greatest in the lowest density states and in the smallest places.[4] What caught people's attention were two observations. First, that nonmetropolitan growth exceeded metropolitan growth during the decade and second, that the largest metropolitan areas, those with over 1 million people, experienced absolute population decline during the decade. While central city decline had been observed in some cities since the 1930s, this was the first time that both cities and suburbs lost population in several areas. Since 1980, growth has been more even across size categories, while still favoring states with lower population densities.

One reason for the continued growth of some of the larger and older cities during the 1980s was the flow of immigrants from abroad to these cities. The recent upsurge in immigration, both legal and undocumented, has found its way disproportionately to larger urban areas. For example, in the 1980 census 94 percent of the foreign born population lived in metropolitan areas of one million or more, whereas only 75 percent of the general population did.[5]

During the 1970s, immigration accounted for one-third of the growth of all metropolitan areas, and a larger fraction in some of the largest areas.[6] Los Angeles, which grew 14 percent from immigration in the 1970s, would have lost population had there been no immigration and internal migration had remained the same. Immigration also kept population growth from declining or significantly reduced the decline in Boston, Chicago, New York and San Francisco. In the Washington, D.C. area, immigration accounted for almost all of the net growth.

In the 1980s, this urban concentration has continued. For the approximately 600,000 immigrants legally admitted to the United States in Fiscal Year 1987, the three largest metropolitan areas (New York, Chicago, and Los Angeles) accounted for about thirty percent of intended destinations (places of residence), whereas only about 10 percent of the general population lives in these places[7]. Nonmetropolitan destinations accounted for seven percent compared to 24 percent of residences for the population as a whole. Illegal immigration is also concentrated in urban areas (New York, Los Angeles, Houston, Miami), although there is substantial movement to rural agricultural areas, too. In sum, the admission of immigrants to the United States (as well as their unauthorized arrival) has served to make the distribution of population more concentrated than it would otherwise be.

Agglomeration Economies - Do the Old Arguments Hold?

One argument for the existence and development of cities rests on the notion of agglomeration economies. These economies are advantages in production that derive from the spatial proximity of producers of goods and services in an interrelated economy. By agglomerating, producers reduce the transportation costs of moving goods from one firm or stage of the production process to another.

Invocation of the agglomeration economy argument seemed to work well in explaining the development of the great industrial urban centers in the U.S. and elsewhere during the late 19th and early 20th century. In the production of durable goods (automobiles, appliances, and the like) it was advantageous for producers to congregate, and indeed, the growth of Chicago, Detroit, and Pittsburgh seem to bear this out.

Such agglomeration economies were also viewed to be operating in the service sector, where again, face-to-face contact through physical propinquity served to cut costs and foster the more rapid spread of ideas. The archetype here is the very dense clustering of financial services in the Wall Street area of lower Manhattan.

Throughout the twentieth century technological advances have chipped away at agglomeration economies. Improvement in roads and the shift toward truck from railroad car, and most recently, the development of high speed electronic communication have worked in this direction, promoting suburbanization and then enabling movement to even lower density settings, including smaller metropolitan areas and rural communities. Now an organization far from a major metropolis can have access instantly through telephone lines to the financial markets and other sources of news and information, just as it can deliver that information quickly and electronically. For this reason we have observed many of the so-called back offices of major financial institutions move out of the high rent downtown areas to suburban or exurban locations.

In addition to economies of agglomeration, there also exist diseconomies of agglomeration, increased costs or disadvantages associated with higher density and proximity. Congestion costs are the most frequently mentioned of these. (Pollution is another, discussed in the next section.) Proximity should reduce the cost of delivering goods and services by decreasing the length of transport needed, but traffic, the bane of the urbanite's daily travel routine, is perhaps the most obvious congestion cost. Indeed, data from U.S. censuses indicate that workers in larger metropolitan areas spend a longer time getting to work that in smaller metropolitan areas. Much of this difference is due to congestion; the remainder is due, ironically, to the greater physical distance to be covered in a larger, more agglomerated urban area.

These are the ideas, but what is the evidence? Is there an optimal city size? There appears to be no consensus on an exact optimum value for city population, but social scientists have tried to estimate the magnitudes and effects of agglomeration economies and diseconomies. As one might imagine, it is very difficult to disentangle the "true" effects of agglomeration on industrial productivity, congestion and pollution.

One attempt to estimate recent changes in agglomeration economies focussed on those industries which have provided one third of employment in production industries.[8] It found that the productivity advantages of large cities have declined. In a study using industrial data from the United States and Brazil, Vernon Henderson found that economies of scale in manufacturing were more due to localization (being near related activity) rather than to urbanization (size of place), *per se*.[9] Productivity improvement rose with size of place, but then declined. If technological change continues along the same line as it has in recent years, then any productivity advantage of large urban areas will continue to dissipate.

Still, one recent review of a number of empirical studies concluded that "despite these shortcomings and potential biases, the message from the empirical literature is clear: economies of proximity exist and exhibit considerable quantitative strength."[10]

We can see, then, that both economies and diseconomies of agglomeration are operating, and an accurate assessment of their overall effect requires the difficult task of estimating each. The question to ask for policy is whether or not the markets for goods and labor as currently constituted are adequate to maximize well-being, balancing the positive and negative aspects of urbanization. It is probably accurate to say that the market does much to promote an optimal location of firms and households, with each weighing individually the costs and benefits of agglomeration. If so the movement of the most mobile—large corporations and prosperous families—from the cities to their suburbs in recent decades would seem a judgement against high density.

It is also probably the case that the market does not capture all of these influences. Many people do not have a wide range of choice in the type of place where they live. They are restricted by the need to be within commuting range of an acceptable job based on their skills and interests and they must be able to afford housing.

The Environmental Costs of Large Population Concentrations.

Pollution of the environment results both from the concentration of population and from the way in which individuals and businesses act towards controlling potential sources of pollution. Even in low density rural areas, certain processes of mining and manufacturing can result in serious environmental problems. While the growth of population and incorporation of territory into townships or other political units can sometimes facilitate action to control pollution, as population growth continues, it more often increases the environmental problems.

Large population concentration usually requires higher costs per person for the maintenance of clean water and the safe removal of garbage. Air quality, in particular, may be difficult to maintain at high population densities if there is not a natural flow of air through the area. Some cities, such as Los Angeles, have particularly difficult problems dealing with air quality because air is often trapped.

It is somewhat difficult to measure the quality of the environment in different metropolitan areas because of the lack of sufficient monitoring sites or the lack of common means of measurement from one area to another. Air quality, for example, is often measured at only one site and the location of that site affects the level of the measurement. If measures from that site indicate poor air quality, there is no way of telling whether all persons in the metropolitan area breathe poor air or only those close to the monitoring site. According to one study, single site measures appeared to be adequate for small particle pollution, but not for larger particles, which varied more across metropolitan areas.[11]

The staff at Zero Population Growth have constructed an index of environmental pollution which combined measures of air quality, water quality, sewage treatment and hazardous waste.[12] This index showed that the environment in larger cities was poorer than that in smaller cities. There was a significant dividing line between central cities of 250,000 or more and smaller ones.

Smaller cities have two advantages in dealing with the environment. First, because of smaller size and typically lower density, they have less concentration of pollutants to deal with, other things being equal. Second, because they have a smaller and often more homogeneous population, they may have an easier time mobilizing support for programs to regulate and reduce pollution.

The Social Effects of Urban Scale

Much of the attention in the scholarly literature on the costs and benefits of urbanization has focused on economic criteria, as the discussion above does. Other important aspects of the costs and benefits of cities may be viewed from the social side. These include the relative distribution of income (or more generally resources) for urban areas, crime, anti-social behavior, and racial and ethnic conflict. In some sense these are also externalities or agglomeration diseconomies, just seen

through a sociological or psychological lens. Although many ad hoc theories exist, solid empirical evidence linking city size to these social disamenities is hard to come by.

Are the rich richer and the poor poorer in large cities compared to smaller ones? The statistical evidence is weak and mixed. Using data on income distribution for the 79 largest U.S. metropolitan areas,[13] we found that a ten percent increase in metropolitan population was associated with a .2 percent increase in income inequality. This is quite a modest relationship, but it does suggest that the distribution of income is more unequal in larger metropolitan areas. Up to about 1980 income inequality in the United States declined, despite increasing urbanization over much of this period.[14] It has risen since then. In 1980 the mean income deficit, the average amount of additional income needed for poor households to move out of poverty, was $3075 in the United States as a whole and $3014 for rural areas. New York, Los Angeles, and Chicago, the three largest metropolitan areas. recorded mean income deficits higher than the national average, but the deficit was lower than the national average in Boston, Cincinnati, Buffalo and Detroit.[15]

Whether the poor are worse off in large urban areas than in other places is more difficult to ascertain. Costs of living are higher, and so an equivalent amount of money may provide less in terms of goods and services compared to a rural area. For the individual poor person to be better off in the large city, there must be some factors which compensate, such as the chance of getting a better paying job (and moving out of poverty), other social services provided "in kind", lower transportation costs (no need to own a car) and the like. It is very difficult to get an accurate estimate of the net balance of these factors, because so many components are unmeasured.

Casual observation of the news media would suggest that large cities are the sites of more crime, personal danger, and other deviant behavior. The statistics bear this out. The rates of robbery and property crimes show the sharpest rise with urban size.[16] Certainly the recent wave of drug-related violence has been heavily concentrated in large cities. Historically, however, urban areas have not been appreciably disadvantaged with regard to murder rates, with rural areas having higher rates than small metropolises.

Crime is one indication of social alienation. There are several others, including school dropout rates, suicide, and teenage pregnancy. These problems are often worse in urban areas, particularly central cities. Among younger never married women (18-24 years of age), for instance, the rate of childbearing of central city residents was nearly 45 percent above the national rate, although it was still lower than the rate for corresponding women living in nonmetropolitan areas.[17] We also find that persons aged 20-24 residing in central cities are much more likely not to be high school graduates than their suburban counterparts, and the incidence of dropping out is slightly higher than for nonmetropolitan residents.[18] While in both of these cases some of the apparent central city—suburb-nonmetropolitan difference could be due to compositional influences (and movement out of the cities after the change in behavior), it is consistent with the notion that cities, particularly inner cities, do not foster mainstream behavior.

Another place to look for social differences is in the infant mortality rate, a statistic often quoted (and lamentably so for the United States) as an indication of level of development. While infant mortality rates do not tell us directly about behavior they do provide a window on how adequate the social service delivery system is. They also reflect some differences in social behavior. Maternal drug use, teenage parenthood, etc. all put infants at higher risk. In 1987 the United States had an infant mortality rate (IMR) of 10.1 deaths in the first year of life per 1000 live births. Most but not all of the top ten metropolitan areas show higher IMR in 1987. For the New York metropolitan area the figure was 11.7 (Brooklyn 13.9); Los Angeles 9.8; Chicago 12.5 (Cook County 13.8); San Francisco 7.6; Philadelphia 11.7 (City of Philadelphia 17.3); Detroit 12.1; Boston 7.2 (Suffolk County 11.9); Dallas 9.4; Houston 9.3; Washington, DC 11.0 (DC 19.3).[19] Clearly central city (county) areas show higher rates than their suburbs. Children born in more urban areas are disadvantaged for survival through childhood.

Racial and ethnic conflict is pronounced in cities, for urbanization brings into close proximity those of disparate backgrounds. We also observe that larger metropolises exhibit higher rates of segregation.[20] Certainly ethnic antagonism becomes manifest in big-city politics, where the race of the candidate matters greatly. It is important to note that urban areas also provide advantages to minorities. One school even argues that immigrant ethnic groups in particular form enclave economies, garnering local resources that tend to bolster the well-being of the group in the long run. In less diverse, less urbanized areas, a majority group may exert virtual hegemony over the minority in politics and economic life. As the history of race relations in the U.S. South reminds us, ethnic conflict and violence are not limited to large urban areas.

Despite the evidence of an association between city size and crime, income disparity, and ethnic conflict, one must ask the question, "Would changes in the scale of living produce changes in these outcomes?" In other words, we must determine whether these outcomes are simply the result of the composition of cities, or whether urbanization itself generates these phenomena. A subcultural theory of urbanism developed by Claude Fischer argues that there is an urban effect, which builds upon differences in composition. Because urban areas are large, they contain a critical mass of individuals who share a common disposition. Organized crime is one example; the arts provide another. Urban residence also allows one to achieve a greater degree of anonymity, facilitating socially deviant behavior.

Would decreases in urbanization reduce some of these negative social externalities? Probably yes, but only insofar as the differences were due to agglomeration per se. Compositional differences between urban and rural areas, and among cities of different sizes, are not likely to be removed merely by changes in the scale of living.

Where would People Live if they had a Choice?

The widescale population deconcentration of the 1970s touched off a lively debate on whether or not people were giving up the higher incomes and other benefits of large cities for the higher perceived quality of life in small towns and rural areas. Studies of residential preferences over the past 40 years have consistently shown that many people who live in large cities would prefer to live in smaller cities, towns or rural areas. However, most of those wishing to live in rural areas preferred them to be within 30 miles of a city over 50,000.[21] What seems to be preferred is a relatively small scale for one's immediate residential surroundings, but, at the same time, the availability of shopping, services, cultural and recreational opportunities associated with a metropolitan area.

The preference for smaller urban settlements can also be seen in the degree to which people in different size places are satisfied with the neighborhoods in which they live. The 1985 American Housing Survey asked a representative sample of Americans about their satisfaction with their neighborhood and perceived neighborhood problems. The results, which are shown in Table 1, indicate that satisfaction is greater in smaller and more suburban places and that residents of these places perceive fewer problems than those in cities. The differences are particularly strong for the perception of crime as a problem. While cities are often thought to offer better services in exchange for putting up with other problems, few people in any areas noted services as a problem and there was little difference by type of area.

Table 1
Satisfaction and Problems by Type of Place
(American Housing Survey 1985)

		Percentage Citing:					
Type of Place	Neighborhood Satisfaction*	Any Problem	Crime	Noise	Traffic	Litter	Poor Service
City, Large MSA	7.5	47.5	25.1	22.9	17.6	16.1	5.4
City, Small MSA	7.8	41.3	11.6	21.2	19.3	14.1	3.8
Suburb, Large MSA	8.2	39.1	9.3	20.4	23.6	11.5	4.8
Suburb, Small MSA	8.4	35.7	6.7	16.8	17.8	11.5	5.7
Other Urban Place	8.2	34.7	5.3	20.9	17.4	13.5	3.5
Rural	8.7	28.3	4.2	14.4	14.3	10.8	4.5

Note: Large MSA's are Metropolitan Statistical Areas or Consolidated Metropolitan Statistical Areas with populations of 1 million or more.
*Scale of 1 to 10

While race is often discussed in relation to city/suburb differences, blacks shared the same relative evaluation of satisfaction and problems as whites. With the exception of rural areas, which they did not rate better than small urban areas, blacks were also more satisfied in smaller and more suburban places than they were in larger places and central cities. While there is some tendency to associate the problems of large cities with the racial or ethnic composition of these cities, members of minority racial or ethnic groups appear to suffer at least as much from the problems in these areas as others do. It would appear that all races would be better off with smaller scale settlements.

Although data on preferences for different size communities would seem to suggest that we should be involved in a continuing process of population deconcentration, this has not been the case since around 1980. While the process of suburbanization continues within most metropolitan areas, there is no longer a net flow from metropolitan to nonmetropolitan areas.

To some extent the nonmetropolitan movement of the 1970s was self defeating. It redistributed people to counties adjacent to metropolitan areas, which then got redefined as metropolitan due to their movement; or it resulted in sufficient growth in and around small cities that they grew to metropolitan status.

Consequences of City Decline

In the past, the decline of population in cities and metropolitan areas has often been judged negatively. Bradbury, Downs, and Small, for example, list a host of problems associated with urban decline.[22] Frey and Speare show that metropolitan areas which declined between 1970 and 1980 had increasing proportions who were poor, increasing unemployment and declining house values.[23] They also found less satisfaction among residents of declining areas. However, not all consequences of past decline have been negative. The Pittsburgh Metropolitan Area, which has experienced population decline over the past four decades, was rated as the top city in the Places Rated Almanac in 1985 and in third place out of 333 metropolitan areas in 1989.[24] This rating was based on a combined set of ratings of jobs, housing, living costs, health, environment, education, arts, recreation and climate. In contrast, Houston which has been touted as a success in free-enterprise induced growth, had a score of 66. Fagen, who did a careful case study of Houston's growth, concludes that while growth may have satisfied business interests, the city now has serious problems of air, water and hazardous waste pollution, an inadequate education system and other serous problems.[25]

The perception that urban shrinkage leads to negative consequences is due to two facts which are usually associated with such declines. First, declining cities have usually experienced the loss of jobs and relatively high unemployment rates. Second, those who leave for better opportunities elsewhere are often younger workers with above average education and skills. While unemployed persons are somewhat more likely to move than those who are employed, they comprise only a small part of the migration stream from declining places and in general these cities end up with a population which has lower average education, a lower proportion of skilled workers, and a lower per capita income. This makes it harder for the city to compete for new jobs or to find tax revenues to pay for services for a population which has increased needs.

The cause of the problem is not population decline per se, but the loss of jobs and the selective out-migration of younger, more educated and better skilled persons. In the past, the natural increase rate has always been greater than zero, and population decline has occurred only where there has been substantial out-migration. We have not been able to observe what would happen if the decline occurred due to a negative rate of natural increase, that is a birth rate lower than the death rate. This would be a very different type of decline, one which would not change population composition, except in terms of average age. Since incomes tend to rise with age, the effects on the tax base ought to be positive and the demand for some of the most expensive urban services, schools and police to deal with teenage offenders, would be reduced.

Conclusion.

There are considerable advantages to smaller scale and lower density settlements. We believe that past economies which no longer hold, continued growth from natural increase, and immigration have acted to slow the deconcentration process. Nevertheless, deconcentration is likely to continue in the future because of lower costs in low density areas and preferences for living in lower density areas.

Natural increase, while low by international standards, continues to contribute to urban growth. Since 1950, natural increase has accounted for about two-thirds of the growth of metropolitan areas within constant boundaries.[26] In 1989, natural increase for the United States increased to 7.5 per 1000, the highest level since 1971. Rates of natural increase tend to be somewhat greater in large metropolitan areas because these areas have younger age distributions than nonmetropolitan areas and because of the concentration of immigrants and minority groups with higher than average birth rates in these cities. Thus, to the extent that population growth in large cities and metropolitan areas is associated with a lower quality of life, these problems would be reduced if overall population growth were lower.

Lower rates of fertility and immigration would make it easier to achieve lower population densities and would help to alleviate the congestion, air pollution and some other problems of large cities. If the reduction of population in large cities takes place gradually and through declines in natural increase and immigration, the negative consequences of decline ought to be avoided. In the long run, the poorer quality housing and other buildings can be removed and replaced with more open space and the quality of life for all should improve.

However, society should ensure that cities continue to attract all classes of people and that the opportunities which are offered in smaller scale areas are equally available to members of all groups, so that movement from the larger cities to smaller ones is not selective of certain classes of people as it has been in the past. If large city decline can be accomplished without a change in the composition of population and jobs, then the consequences of such a decline ought to be positive in the long run.

NOTES

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[17] Current Population Reports, *Fertility of American Women, 1988,* Table 2.

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[19] U.S. Office of Vital Statistics, *Vital Statistics 1987: Mortality* Table 2-10.

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[24] Richard Boyer and David Savageau, *Places Rated Almanac,* New York: Prentice Hall, 1985 and 1989.

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[26] Frey and Speare, op. cit. p. 51.

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