

From Centralization To Deconcentration: People and Jobs Spread Out

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From the beginning of the 20th century until the end of World War II, the United States experienced an important shift in the distribution of people and jobs. Both population and employment moved from rural to urban areas. In the postwar period, the United States has undergone three other important shifts in the distribution of people and jobs: the movement from the frostbelt to the sunbelt; the movement within metropolitan statistical areas (MSAs) from central cities to suburbs (suburbanization); and the

relatively faster growth of jobs and people in small and less dense MSAs (deconcentration). The first two regional shifts—frostbelt to sunbelt and city to suburbs—are well known. The third shift—deconcentration—is not so well known.¹

An article in an earlier *Business Review* showed that during the postwar period, employment growth favored the nation's less dense metro-

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¹Deconcentration refers to the slower growth of dense and large MSAs so that the proportion of total MSA population and total MSA employment in dense and large MSAs has declined while the proportion in less dense and smaller MSAs has increased.

politan areas, a trend referred to as the deconcentration of metropolitan employment.² Congestion, which results in higher living costs for households and increased production costs for firms, was undoubtedly a major factor in the relatively slower growth of the densest metropolitan areas. This article addresses three questions related to deconcentration: Has there been faster growth of jobs in smaller MSAs as well as less dense MSAs? Do we find the same trends for population as for employment? Is the experience in the frostbelt and sunbelt regions the same?

What we find is that just as jobs have grown less rapidly in MSAs where employment is dense than in MSAs where it is less dense, they have also grown less rapidly in MSAs with more total employment than in those with less. Population has also grown less rapidly in denser MSAs; however, this difference is not as pronounced as that for employment. Employment has spread out faster than population during the postwar period, suggesting that the proportion of the population that is employed grew faster in small and less dense MSAs than in the big and more dense MSAs.

Faster growth in less dense areas is not simply the result of movement to the sunbelt, where metropolitan areas are typically less dense.³ The postwar trend of slower growth of employment and population in the dense MSAs is found in both the frostbelt and the sunbelt. The same is true of large MSAs in the frostbelt; they grew slower than small frostbelt MSAs. However, in the sunbelt the large MSAs tended to grow faster than the small MSAs in the postwar period.

²See my 1998 article.

³To demonstrate this, we grouped the 297 MSAs used in this article into two regions: frostbelt and sunbelt. The frostbelt consists of 145 MSAs located in the New England, Mideast, Great Lakes, and Plains regions. The sunbelt consists of 152 MSAs located in the Southeast, Southwest, Rocky Mountain, and Far West regions.

These observations about the sunbelt suggest that it was density, not size, that limited how rapidly metropolitan areas grew in the second half of the 20th century.

JOBS GROW FASTER IN LESS DENSE AND SMALLER LOCATIONS

Within MSAs, jobs have generally grown faster in less dense suburban counties than in counties containing dense central cities. Called suburbanization, this shift to less dense areas within MSAs is a long-standing trend in the United States.⁴ A less well-documented trend is that employment has typically grown faster in less dense (and smaller) MSAs than in more dense (and larger) ones. A study that I did with Satyajit Chatterjee attributes much of the trend toward deconcentration of employment to the fact that it is more expensive to locate new jobs in MSAs where employment density is already high.⁵ Denser areas are closer to using the full capacity of local resources. In these areas, adding jobs and people burdens existing support

⁴In a 1972 study, Ed Mills presents evidence that suburbanization of manufacturing employment started long before 1950.

⁵See the paper by Chatterjee and Carlino. Much of the discussion in this article is based on another study with Satyajit Chatterjee; see Carlino and Chatterjee. The employment data are taken from the Census Bureau's *County Business Patterns* for six years: 1951, 1959, 1969, 1979, 1989, and 1996. The population data are obtained from censuses for 1950, 1960, 1970, and 1990. The official definition of a metropolitan area has changed several times since 1950; thus, this article looks at population and employment growth patterns for 297 MSAs, based on 1983 MSA definitions. In general, MSAs are statistical constructs used to represent integrated labor-market areas that consist of counties containing a central city of at least 50,000 people along with any contiguous counties if such counties meet certain economic criteria. Employment density is defined as establishment employment of an MSA divided by its square miles of land area; population density is population divided by square miles of land area.

systems, leading to increases in the cost of living. For example, most commuting to work involves trips to and from a metropolitan area's downtown and, more recently, its edge cities. As households locate near these large centers of economic activity to avoid long commutes, they bid up residential rents. Many firms are attracted to these locations, in part because of their accessibility to workers and customers, and competition among firms for these locations will increase business rents as well. Moreover, rents in an entire metropolitan area tend to be driven up when the number of households and firms in that area grows. In fact, the study by Chatterjee and Carlino found that those MSAs that had fewer jobs per square mile in 1951 were able to accommodate postwar employment growth more easily and thus attracted a larger share of new jobs.

Employment Density Has Become More Equal Within and Across MSAs. The regional shifts from city to suburbs and from dense to less dense MSAs have resulted in a more uniform spatial distribution of employment during the postwar period. With the help of the Theil index we can gauge inequality among MSA counties and summarize it in a single number. Zero on the Theil index equals perfect equality; as inequality increases, the index rises.⁶ For the nation, the index of total inequality for employment density declined 39 percent from 1951 to 1996 (Table 1A). It declined at only a slightly faster pace for MSA counties in the frostbelt than for those in the sunbelt.⁷

⁶See Chapter 3 in Edward Wolff's book for a review of the Theil index.

⁷The decline in the inequality index is greater for the nation (-39 percent) than it is for either the frostbelt (-31 percent) or the sunbelt (-28 percent). There was more inequality in the nation in 1951 than within the frostbelt or sunbelt because sunbelt MSAs taken together were less dense than frostbelt MSAs. Thus, the faster growth of the sunbelt led to less inequality in the postwar period.

The Theil index can be broken down to show inequality within MSAs and across MSAs. The within-MSA index summarizes differences in employment density among the counties within each MSA. If employment is distributed equally, the within-MSA index equals zero.⁸ The change in the index of inequality within MSAs is a rough measure of suburbanization, which occurs when jobs and people move from an MSA's most populous and densest county—the one that contains its central city—to its adjacent less dense and less heavily populated suburban counties. Similarly, the across-MSA index summarizes differences in MSA-wide density among the 297 MSAs included in our study. Again, the across-MSA index would equal zero if each MSA in the United States had the same MSA-wide employment density. We take the change in the index of inequality across MSAs as a measure of deconcentration, which occurs when the growth of jobs and population favors smaller and less dense MSAs.

The second and third lines of Table 1A give us an idea of how much of the reduction in inequality is due to suburbanization and deconcentration. For the nation, the index of inequality within MSAs fell 33 percent from 1951 to 1996. Suburbanization of jobs, a widely documented pattern in the United States, appears to have occurred at only a slightly faster pace in the frostbelt than in the sunbelt.⁹ The indexes of inequality across MSAs have also declined during the postwar period, reflecting deconcentration. For the nation, the index for employment density across MSAs declined 42

⁸The Theil indexes are computed as the sum of logarithms of the ratio of actual employment density in each county within an MSA to the MSA's average density.

⁹Suburbanization is understated, since county-level data are used in the analysis. Most counties that contain the central city of an MSA also contain suburbs that are near the central city. This understatement is of little concern to us, since deconcentration among MSAs, not suburbanization, is the main focus of this article.

TABLE 1: Suburbanization and Deconcentration of Employment

A. Inequality Indexes for Density of Metropolitan Employment									
Index/Year	Nation			Frostbelt Region			Sunbelt Region		
	1951	1996	Percent Change	1951	1996	Percent Change	1951	1996	Percent Change
Index of Total Inequality*	1.57	0.96	-39	1.41	0.97	-31	1.22	0.88	-28
Index of Inequality Within MSAs (Suburbanization)	0.52	0.35	-33	0.64	0.41	-36	0.46	0.31	-33
Index of Inequality Across MSAs (Deconcentration)	1.05	0.61	-42	0.77	0.56	-27	0.76	0.57	-25

B. Inequality Indexes for Total Metropolitan Employment									
Index/Year	Nation			Frostbelt Region			Sunbelt Region		
	1951	1996	Percent Change	1951	1996	Percent Change	1951	1996	Percent Change
Index of Total Inequality*	1.38	0.91	-34	1.35	0.85	-37	1.22	0.98	-20
Index of Inequality Within MSAs (Suburbanization)	0.77	0.50	-35	0.79	0.50	-37	0.74	0.49	-34
Index of Inequality Across MSAs (Deconcentration)	0.61	0.42	-31	0.55	0.35	-36	0.47	0.49	4

*Total index may not add up to sum of across and within indexes because of rounding.

percent from 1951 to 1996. This deconcentration of employment is not simply due to the faster growth of jobs in the sunbelt, where employment density was lower than in the frostbelt; less dense MSAs grew more rapidly than dense MSAs

within the sunbelt and within the frostbelt.

In the early 1950s, the frostbelt accounted for 71 percent of total metropolitan employment, while the sunbelt accounted for 29 percent. However, by the 1990s, total employment in metro-

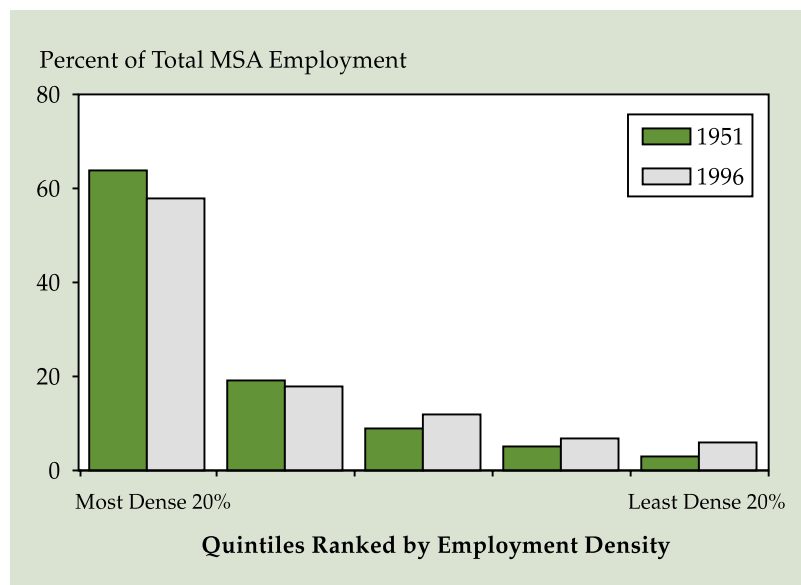
politan areas was evenly divided across the two regions. But the deconcentration of employment appears to have occurred at only a slightly faster pace in the frostbelt than in the sunbelt, as shown by the 27 percent and 25 percent declines in their respective across-MSA Theil indexes.

We can gain additional insight into the deconcentration of employment by grouping the 297 MSAs into five groups (quintiles) ranked from highest to lowest employment density. The top 20 percent of MSAs (or 60 most dense MSAs)

in 1951 accounted for 64 percent of total metropolitan employment. But the top 20 percent in 1996 accounted for only 58 percent of total metropolitan employment (Figure 1). Similarly, the employment share of the 60 MSAs in the next densest quintile fell from 19 percent in 1951 to 17 percent in 1996. In contrast, postwar employment growth has favored less dense MSAs. Between 1951 and 1996, employment shares of MSAs in the remaining three quintiles increased. In addition, there has been a considerable shift in employment from dense to less dense MSAs within the top quintile. For example, in 1951, the 30 densest MSAs accounted for 84 percent of total employment within the top quintile. By 1996, the share had fallen to 66 percent. Thus, a substantial part of the deconcentration indicated by the Theil index is accounted for by movements from dense to less dense MSAs within the top quintile.

Total Employment Has Also Become More Equally Distributed Within and Across MSAs. While we have identified an inverse relation-

FIGURE 1: Employment Shares Rise In Less Dense MSAs



ship between the *density* of employment in an MSA and subsequent employment growth, economists have more typically looked at the relationship between an MSA's *size* and its employment and population growth. Ranking MSAs by total employment yields markedly different results than ranking them by employment density (see *Size Versus Density*).¹⁰

Given these differences in the two rankings, do the findings that suburbanization and deconcentration proceeded at about the same rate in the frostbelt and sunbelt hold when we rank MSAs by total employment rather than by density of employment? The Theil index of inequality of total employment for the nation fell 34 percent from 1951 to 1996 (Table 1B). While the index of total inequality fell in both regions,

¹⁰In general, the correlation (based on the Spearman rank correlation) between the ranking based on MSA employment density and the ranking based on MSA employment size is only 0.53.

it declined significantly more in the frostbelt than in the sunbelt. A look at the components of the index based on total employment reveals that suburbanization took place at a slightly faster pace in the frostbelt than in the sunbelt and there was no deconcentration of total employment in the sunbelt. The changes in the index of inequality within MSAs were only slightly higher for the frostbelt than for the sunbelt. However, the index of inequality across MSAs declined 36 percent for the MSAs in the frostbelt; it increased 4 percent for MSAs in the sunbelt.

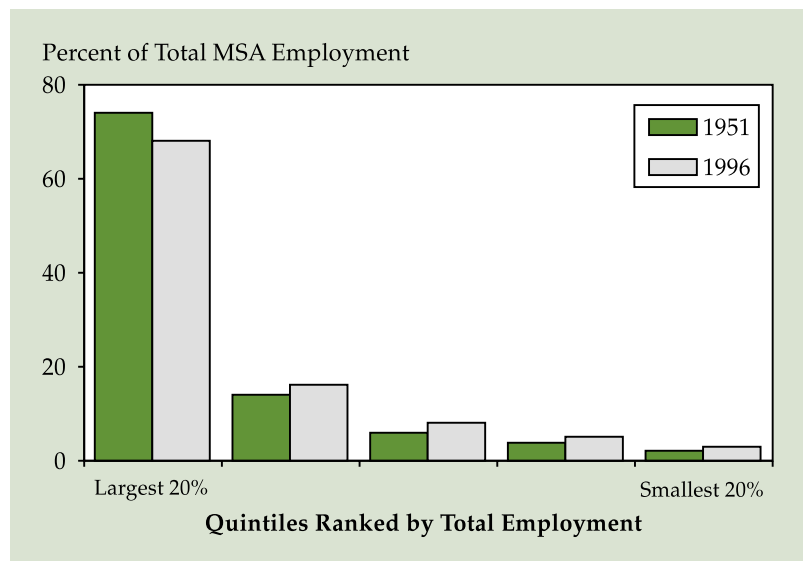
One reason our results for the sunbelt depend on whether we measure concentration by total employment or employment density is that large MSAs in this region are much less dense than their counterparts in the frostbelt. Average employment density for the 15 largest MSAs in the frostbelt is more than twice the average employment density for the 15 largest MSAs in the sunbelt.¹¹ Thus, congestion costs associated with growth tend to be lower in the large sunbelt MSAs than in the large frostbelt MSAs. In general, a much stronger correlation exists between employment density and total employment for

MSAs in the frostbelt (0.73) than for MSAs in the sunbelt (0.31).¹² Because frostbelt MSAs developed in the 19th century, the technologies of the times, especially transportation technologies, dictated compact metropolitan development. Sunbelt MSAs, on the other hand, are of more recent vintage; they spread out as they developed by taking advantage of greatly improved roads and automobile and truck transportation. The postwar trend of slower growth of employment in dense MSAs is found in both frostbelt and sunbelt. However, employment in the large MSAs in the sunbelt tended to grow faster than in small sunbelt MSAs. Thus, the differences in deconcentration based on total employment between the frostbelt and sunbelt suggest that density rather than size is driving deconcentration.

Again, we can gain additional insight by grouping MSAs according to quintiles, this time based on total employment. The 60 MSAs with the most employment in 1951 (top 20 percent) accounted for 74 percent of total metropolitan employment. But the top 20 percent in 1996 accounted for only 68 percent (Figure 2). As we found for employment density, employment

share has shifted toward smaller MSAs within the top quintile, when the quintiles are based on MSA employment. In contrast, the employment

FIGURE 2: Employment Shares Rise in Smaller MSAs



¹¹In 1996, there were 1152 jobs per square mile, on average, in the 15 largest MSAs in the frostbelt compared with 515 jobs per square mile, on average, in the 15 largest MSAs in the sunbelt.

¹²Based on the Spearman rank order correlation between MSA employment density and MSA total employment in each region.

share of the 60 MSAs in the next quintile increased from 14 percent in 1951 to 16 percent in 1996. In addition, the collective share of total employment of the remaining three quintiles rose from 26 percent to 32 percent. Thus, for the nation, employment became less concentrated whether we look at employment density or total employment, although the ranking based on total employment shows no deconcentration in the sunbelt.

POPULATION GROWS FASTER IN LESS DENSE LOCATIONS

Like employment, population has become more suburbanized and less concentrated during the postwar period; the less dense and less populated counties within MSAs and the less dense and less populated MSAs account for a greater share of population over time. But because population was already less concentrated than employment in the 1950s, the forces of suburbanization and deconcentration have not been as strong for population as for employment.

Population Density Has Become More Equal Within and Across MSAs. The index measuring total inequality of population density fell 28 percent for the nation from 1950 to 1990 (Table 2A). Total inequality essentially fell about the same amount in the frostbelt (18 percent) as in the sunbelt (17 percent). Density-based measures show that suburbanization of population appears to have occurred at a slightly slower pace in the sunbelt than in the frostbelt: the indexes of inequality for population density within MSAs fell 22 percent in the nation

and in the sunbelt and 27 percent in the frostbelt. The indexes for inequality across MSAs, reflecting population deconcentration, have also declined. For the nation, the index of inequality for population density across MSAs declined 29 percent. Density-based measures also show that deconcentration of population appears to have occurred at a somewhat faster pace in the sunbelt than in the frostbelt. In the early 1950s, 65 percent of the metropolitan population was in the frostbelt and only 35 percent in the sunbelt. Now the distribution is even. But as people have settled in the sunbelt, they have favored the less dense areas. Deconcentration nationally is not just the result of more people settling in the sunbelt rather than in the frostbelt; deconcentration has occurred within both regions.

For the nation, the 60 densest MSAs (top 20 percent) in 1950 accounted for 58 percent of total metropolitan population. The top 20 percent in 1990 accounted for 55 percent of total metropolitan population (Figure 3), a modest decline. But as with employment, population has shifted

FIGURE 3: Population Shares Tend to Rise in the Least Dense MSAs

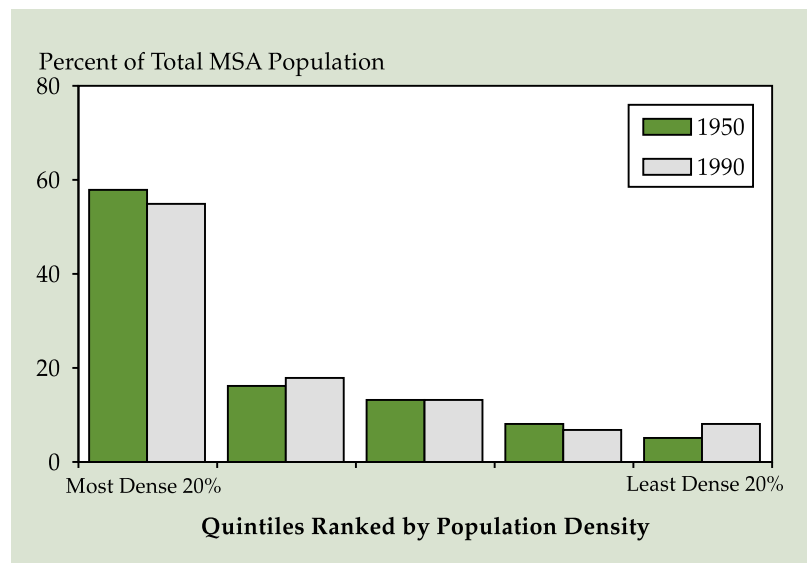


TABLE 2: Suburbanization and Deconcentration of Population

A. Inequality Indexes for Density of Metropolitan Population									
Index/Year	Nation			Frostbelt Region			Sunbelt Region		
	1950	1990	Percent Change	1950	1990	Percent Change	1950	1990	Percent Change
Index of Total Inequality*	1.03	0.74	-28	0.96	0.79	-18	0.77	0.64	-17
Index of Inequality Within MSAs (Suburbanization)	0.27	0.21	-22	0.37	0.27	-27	0.23	0.18	-22
Index of Inequality Across MSAs (Deconcentration)	0.75	0.53	-29	0.59	0.53	-10	0.55	0.45	-18

B. Inequality Indexes for Total Metropolitan Population									
Index/Year	Nation			Frostbelt Region			Sunbelt Region		
	1950	1990	Percent Change	1950	1990	Percent Change	1950	1990	Percent Change
Index of Total Inequality*	0.82	0.70	-15	0.87	0.67	-23	0.68	0.74	9
Index of Inequality Within MSAs (Suburbanization)	0.40	0.30	-25	0.46	0.33	-28	0.34	0.27	-21
Index of Inequality Across MSAs (Deconcentration)	0.42	0.40	-5	0.41	0.34	-17	0.33	0.46	39

*Total index may not add up to sum of across and within indexes because of rounding.

considerably to the less dense MSAs within the top quintile. In 1950, the 30 densest MSAs accounted for 81 percent of total population within the top quintile. By 1990, the share had fallen to 67 percent. Thus, a substantial part of the

deconcentration indicated by the Theil index is explained by movements to less dense MSAs within the densest quintile. In contrast, the 60 MSAs in the next quintile experienced the largest absolute increase in the number of people:

their share increased from 16 percent in 1950 to 18 percent in 1990. Although the population shares of MSAs in the next two quintiles were mostly unchanged, the population share of MSAs in the least dense quintile rose from 5 percent in 1950 to 7 percent in 1990. Thus, our findings for deconcentration when MSAs are ranked by population density are mostly consistent with the findings when MSAs are ranked by employment density.

But employment has undergone suburbanization and deconcentration at a faster pace than population during the postwar period. Why? In a sample of 18 MSAs, Ed Mills and Bruce Hamilton found that 70 percent of the jobs in these metropolitan areas in 1950 were in central cities, compared with 57 percent of the population. Mills and Hamilton found that between 1950 and 1980, suburbanization of jobs was somewhat faster than that of people, resulting in a reduction in central-city jobs per capita.¹³ Thus, one reason employment has undergone suburbanization at a faster pace during the postwar period is simply that within metropolitan areas, people were already more evenly distributed than employment. Before the war, firms tended to concentrate in an MSA's central business district (CBD) because the CBD offered access to transportation networks (e.g., ports, docks, and railroad sidings). Firms outbid workers for locations close to the CBD, so workers lived in the suburbs and commuted to the CBD. Improvements in truck transportation and urban roads in the postwar period made it more costly to "ship" workers than to ship their output so firms moved to the suburbs. Similarly, one reason that jobs grew faster in less dense MSAs is that in the early 1950s, population was already more evenly distributed across MSAs than was employment. Recall, for example, that in the early 1950s, the 60 densest MSAs accounted for 64 percent of

total metropolitan employment, compared with 58 percent of total metropolitan population.¹⁴

Total Population Has Become More Evenly Distributed Across MSAs in the Frostbelt but Not in the Sunbelt. The national index of total inequality in the distribution of population fell 15 percent from 1950 to 1990 (Table 2B). The Theil index based on total population for the MSAs in the frostbelt declined 23 percent, while the index for the MSAs in the sunbelt increased 9 percent.¹⁵ The change in indexes of inequality within MSAs indicates suburbanization of total population for the nation and both regions, although the suburbanization of population occurred at a somewhat faster pace in the frostbelt than in the sunbelt. The change in indexes of inequality across MSAs shows that, nationally, deconcentration of population is due to deconcentration within the frostbelt region as well as to a movement of population from the frostbelt to the sunbelt. The sunbelt's growing population continued to concentrate in large MSAs during the postwar period.

What explains the difference between the frostbelt and the sunbelt? In frostbelt MSAs, population density is highly correlated with size, so the faster growth of the less dense MSAs also meant faster growth of small MSAs. In the sunbelt, density is not highly correlated with size, and even the largest MSAs are much less dense than frostbelt MSAs, so people did not have to move to smaller sunbelt MSAs to enjoy lower density. Again, this suggests that density, not size, has been a key factor in deconcentration in the United States.

¹⁴Similarly, in the early 1950s, the 60 largest MSAs accounted for 74 percent of total metropolitan employment, compared with 66 percent of total metropolitan population.

¹⁵As with employment, the rank correlation between population density and total population is much weaker for the MSAs in the sunbelt (0.23) than for MSAs in the frostbelt (0.72).

¹³See Ed Mills and Bruce Hamilton (1994).

If we look at the population distribution for the nation, the 60 largest MSAs (top 20 percent) in 1950 accounted for 66 percent of total metropolitan population. The share accounted for by the 60 largest MSAs in 1990 fell only slightly, to 65 percent (Figure 4). Unlike employment density, total employment, and population density, the distribution of total population within the top quintile shows very little change. The drop in share among the largest MSAs was matched by the increase in population share for the 60 MSAs in the next quintile. The remaining, less dense quintiles' collective share of population was unchanged over this period.

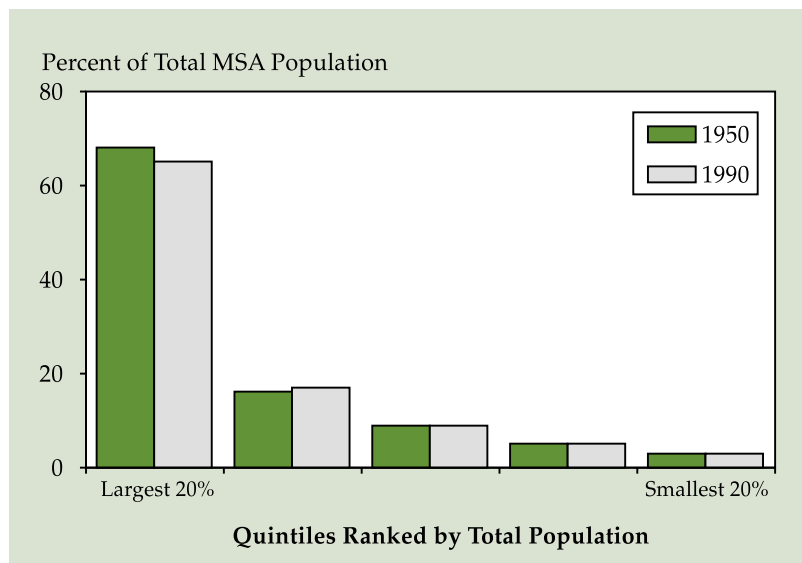
ACCOMMODATING FASTER DECONCENTRATION OF EMPLOYMENT

Earlier we pointed out that disparities in employment density evened out more than disparities in population density during the postwar period. One reason was that MSA population was already less concentrated than MSA employment at the end of World War II. Still, the only way for employment to spread out faster

than population is for the proportion of the population that is employed to rise at a relatively faster pace in the small and less dense MSAs. Two factors largely explain why the ratio of employment to population grew at a relatively faster pace in small and less dense MSAs than in large and more dense ones.

The first factor is that the ratio of working age population to total population rose at a relatively faster pace in the small and less dense MSAs. The proportion of the population that is working age fell from 1950 to 1960 as a result of the baby boom, but then began to rise as the first part of the baby-boom generation reached working age in the 1960s. On balance, the ratio of working age adults to total population in the nation increased from 75 percent in 1950 to 77 percent in 1990. In a sample of 134 metropolitan areas we found that postwar growth in the proportion of the working age population in the labor force was faster in less dense metro areas than in dense ones.¹⁶ We can summarize the differential growth in the proportion of the population that's working age by grouping the 134 metro areas into four groups (quartiles) based

FIGURE 4: Population Shares Change Only In Relatively Large MSAs



¹⁶The sample is limited to 134 MSAs because some areas that were classified as MSAs in 1983 were not classified as MSAs in 1950. In the 1950s fewer people graduated from high school than in later years; therefore, the working age population consisted of people 14 years and older. However, by 1960 the definition of working age changed to the population 16 years and older. The changing definition should not affect the across-MSA comparisons, since the 14 years and over definition applied to all MSAs in 1950.

on employment density. The proportion of the working age population in the labor force changed only slightly—from 77 percent to 78 percent—for the 33 densest MSAs in the top quartile. This proportion was unchanged at 76 percent for MSAs in the next densest quartile. However, the proportion of the population that's working age increased from 75 percent in 1950 to 77 or 78 percent in 1990 for the MSAs in the two least dense quartiles.

The second factor that explains greater deconcentration of jobs than of population is that the labor force participation rate (the fraction of the working age population that wants to work) increased faster in less dense MSAs. For example, younger workers may be moving from large and dense MSAs to small and less dense MSAs, leaving an older population behind. Many of these older people may be retirees who are not in the labor force. Thus, the labor force participation rate would grow relatively faster in the small and less dense MSAs.

In 1950, the participation rate stood at about 55 percent for all four quartiles of the 134 MSAs for which we have data, the same rate as in the nation. Labor force participation rates increased for the nation and for the MSAs in all four quartiles during the postwar period. For the nation, the participation rate rose from 55 percent in 1950 to 69 percent in 1990. However, during this period, the participation rate increased the least (10 percentage points) for the 33 densest MSAs in the first quartile while it increased more (12 to 13 percentage points) for MSAs in the remaining quartiles.

Thus, the proportion of the population that's working age and the labor force participation rate of the working age population both increased at a somewhat faster pace in the less dense MSAs than in the more dense MSAs, allowing differences in employment density to narrow more than differences in population density during the postwar period.¹⁷

SUMMARY

Researchers have looked at why some counties and MSAs have faster growth of population and employment than others. Typically, researchers who have looked at the relationship between MSA size and growth have had difficulty explaining differential growth. The evidence presented in this article suggests, however, that density is perhaps the most important factor in explaining county or MSA growth. Dense counties and dense MSAs grew less rapidly during the postwar period than their less dense counterparts. Congestion costs that eventually limit urban growth are more closely related to the density of a metropolitan area than to its size, and an ordering of MSAs based on size can differ widely from an ordering of MSAs based on density. Thus, the level of population or the level of employment in a metropolitan area seems less important as a determinant of future growth than an MSA's density.

That some of the slower growth observed for dense MSAs is related to the high costs associated with congestion suggests a role for city planners and policymakers. One way local planners can enhance growth in dense MSAs is by adding public infrastructure to reduce congestion. Similarly, in the faster growing, less dense MSAs, local planners need to make sure that the area's public infrastructure keeps in step with private growth. If local infrastructure is not growing fast enough, the area could become congested more rapidly. Such a situation could retard the growth of an area. Of course, public officials must take care that the benefits of adding infrastructure to a given MSA justify the cost of these projects.

¹⁷A rise in unemployment rates from 1950 to 1990 in dense MSAs relative to less dense MSAs could also contribute to greater deconcentration of jobs than population in less dense areas. According to the Bureau of Labor Statistics, data on unemployment rates are available for some MSAs beginning in 1969, but there are no consistently measured unemployment rates for MSAs for the years prior to that.

APPENDIX: Size Versus Density

Sometimes economists have looked at the size (population or number of jobs) of metro areas when considering the benefits and cost of urbanization. A study of urban areas in France and Japan by Jonathan Eaton and Zvi Eckstein finds that all cities grow at the same rate regardless of initial population size. Duncan Black and Vernon Henderson also find evidence of parallel growth of population in the United States in that the relative size distribution of cities was unchanged during the period 1900-50. Stephen Ehrlich and Joseph Gyourko find evidence that the size distribution of population in MSAs in the United States has changed very little since 1950.

The finding of parallel growth appears to offer evidence against the finding of convergent growth for employment and population density and for total employment, as discussed in this article. * But the cost of urban growth may be related to the density of development rather than some measure of the size of development, as in the studies cited above. The state of Nebraska and the San Francisco MSA have approximately the same number of people, but Nebraska has 20 people per square mile, and the San Francisco MSA has almost 1600. Thus, size alone may not be enough to gauge the costs of development. Population or employment density may be a better measure.

For some large MSAs (e.g., New York City, Chicago, Los Angeles, and Philadelphia MSAs), the ranking based on size is quite similar to the ranking based on density (see table at right). But, the rankings of MSAs based on size can differ markedly from their rankings based on density. For example, the Jersey City, New Jersey MSA ranked first in employment density in 1996, but it ranked 89th out of 297 MSAs in terms of the level of employment. The Trenton, New Jersey MSA ranked 135th in terms of total population, but 11th in terms of population density. The Las Vegas MSA ranked 46th in terms of total employment, but in terms of employment density, it ranked near the bottom of the distribution at 227th.

SIZE VERSUS DENSITY				
MSA	EMPLOYMENT (1996) Rank based on		POPULATION (1990) Rank based on	
	Employment Density	Total Employment	Population Density	Total Population
Jersey City, NJ	1	89	1	85
New York, NY	2	2	2	2
Chicago, IL	3	3	3	3
Anaheim, CA	4	11	4	14
Bergen-Passaic, NJ	5	36	5	34
San Francisco, CA	6	18	8	27
Los Angeles, CA	7	1	6	1
Nassau, NY	8	14	7	10
Boston, MA	9	6	9	7
Trenton, NJ	10	111	11	135
Newark, NJ	11	26	10	25
Bridgeport, CT	12	56	15	60
San Jose, CA	13	23	17	28
Lake County, IL	14	73	18	88
Cleveland, OH	15	19	16	24
Philadelphia, PA	16	5	13	4
Providence, RI	25	62	24	54
Elkhart, IN	50	156	101	212
El Paso, TX	75	96	42	81
Rochester, NY	100	51	100	44
La Crosse, WI	125	239	170	282
Lafayette, LA	150	163	174	182
Columbus, GA	175	169	167	167
Kankakee, IL	200	247	236	284
Las Vegas, NV	227	46	265	62
State College, PA	250	264	251	252
Eugene, OR	275	154	277	148
Casper, WY	297	295	297	295

*The closest that we come to a finding of parallel growth across MSAs is contingent upon using both population and MSA size. This is pretty much what the studies that find evidence of uniform population growth across MSAs have done.

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