

Monitoring the Metropolitanization Process

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Alternative approaches have led to different interpretations of the metropolitanization process in the United States. We identify and illustrate several methods and procedures for monitoring metropolitan–nonmetropolitan population change using the 1950–1980 U.S. decennial censuses. Two basic approaches are compared: constant area approaches and component methods. In addition, we assess the effects of changing metropolitan definitions on metropolitan–nonmetropolitan growth. The results clearly reveal that the underlying mechanics of metropolitanization not only are complex but have changed substantially during the 1950–1980 period. We conclude with observations regarding the use of these procedures in future research.

Introduction

The concentration of population and activities in and around large cities has been a basic process characterizing the American demographic landscape. Since the county-based metropolitan area concept was introduced in the 1950 Census of Population a great deal of research has documented the extent to which the U.S. has become a metropolitan nation. Interest in this aspect of population redistribution took a new turn in the 1970s when nonmetropolitan areas were found to be growing more rapidly than metropolitan areas, contrary to prior trends or theoretical expectations (Beale, 1975; Tucker, 1976). To the surprise of many observers, the metropolitan growth advantage reasserted itself again in the early 1980s (Beale and Fuguitt, 1986). Two such surprises in 15 years obviously underscores the need to continue efforts to better understand the metropolitan–nonmetropolitan component of U.S. population redistribution.

During the “nonmetropolitan turnaround” era of the 1970s, work focused on the growth and characteristics of nonmetropolitan areas and on the nature and size of metropolitan–nonmetropolitan migration streams and growth differentials (Fuguitt, 1985). A central issue was whether population shifts marked a fundamental realignment of U.S. settlement structure or simply represented a continuation of the metropolitanization process, albeit in a more diffuse form (Alonso, 1977; Hawley, 1978; Wardwell, 1977, 1980; Wilson, 1986). Simple answers have not been forthcoming. In fact, Forstall (1981) showed that nonmetropolitan areas grew more rapidly than metropolitan areas in the 1970s, yet paradoxically the metropolitan share of U.S. population actually increased from 69 percent

to 75 percent over the decade. This was because of the increase in the number of counties reclassified as metropolitan in the 1970s.

Any cursory examination of recent research on population redistribution reveals that approaches to the study of metropolitanization are indeed varied. What then is the connection, if any, between method and inference? In this article, we identify and illustrate several procedures for monitoring the process of metropolitan–nonmetropolitan population change and proportionate shifts in the metropolitan population. We compare two basic approaches: constant area approaches and component methods. In comparing metropolitan and nonmetropolitan growth rates, we may select a constant universe of areas (e.g., an unchanging set of metropolitan counties over a time interval) to examine metropolitan and nonmetropolitan growth. Alternatively, component methods involve disaggregating metropolitan population change into parts attributable to some fixed area and areas added or subtracted during the time interval.

Although computation of growth rates using the constant area approach is rather straightforward, two central issues remain problematic. First, given the ongoing process of metropolitan expansion, which universe of metropolitan areas should be used? That is, should counties be recognized as metropolitan according to designation at the beginning (e.g., Lichter, Fuguitt, and Heaton, 1985) or at the end of the period (e.g., Long, 1981; Long and DeAre, 1982)? Using a beginning-of-period designation means that nonmetropolitan figures include some counties that subsequently change status to metropolitan by the end of the decade. Since rapid growth may be associated with this shift, nonmetropolitan growth levels should be somewhat higher than if the metropolitan–nonmetropolitan designation is made at the end of the period. Indeed, shortly after the 1970s turnaround was discovered, a common reaction was to consider the more rapid nonmetropolitan growth as primarily concealed metropolitanization (U.S. Bureau of the Census, 1974).

Second, if change is measured over successive intervals (such as decades), should the same fixed area be used throughout, thus retaining a *constant* universe of metropolitan counties for each interval? If so, for which year should we classify counties as metropolitan or nonmetropolitan? Or as an alternative to using a constant universe for successive intervals, perhaps a new or *current* constant area should be used, reclassifying counties as metropolitan or nonmetropolitan at the beginning or end of each interval? Each approach has less than obvious implications for the analysis of metropolitan–nonmetropolitan growth; and each is capable of rendering results that provide quite different inferences about the metropolitanization process.

With the component approach, the metropolitan population gains through (a) *internal growth* within areas *initially* classified as metropolitan, (b) *expansion* by the addition of areas (counties) peripheral to existing metropolitan areas, and (c) *emergence* of new metropolitan areas. How has the contribution of each component to metropolitan population growth changed over time? Evidence, for example, that b and c have assumed an increasing share of metropolitan growth may suggest a more diffuse pattern of metropolitanization. Parallel processes of internal growth, expansion, and emergence may also describe nonmetropolitan population growth and decline processes. That is, nonmetropolitan population may grow or decline within existing areas but also lose to, and occasionally gain from, counties from metropolitan areas.

Component approaches, particularly those that document relative contributions of each component noted above, are indeed rare. Hawley, Duncan, and Goldberg (1964), for example, distinguished between a “constant criteria” approach and other fixed or constant area approaches. The former refers to metropolitan (nonmetropolitan) growth over time that reflects both internal growth and growth due to the addition of territory through expansion and emergence. The extent of metropolitan growth due to reclassification of counties from nonmetropolitan to metropolitan status may be considerable. Not surprising, this is due in

part to the fact that counties reclassified from nonmetropolitan to metropolitan are generally among the fastest growing (Brown, 1979).

Both the constant area and component approaches are also affected by official changes in the *definition* or criteria for attaining metropolitan status. Redefinition has thus become another potentially significant source of metropolitan growth, and the results of any analysis may depend on which definition is used. Definitions have changed several times since 1950, liberalizing the criteria for metropolitan designation. Whether the more liberal 1980 criteria have resulted in a classification that is a distortion of the meaning of metropolitan (Beale, 1984) or represent an improved means to identify areas centered around major population nodes may be debated. Many of the new metropolitan areas lack attributes (e.g., commercial television stations) generally assumed to be part of any "metropolis." Yet it could be argued that a progressive liberalization of criteria is consistent with assumptions about the ongoing transition to a more diffuse urban settlement pattern. Regardless of viewpoint, efforts to document changes in the share of metropolitan growth attributable to redefinition are noticeably lacking, a situation we propose to remedy here.

Consequently, we present various approaches to the measurement of population change and the process of metropolitanization as well as discuss the issues involving their use. With census data for the United States from 1950 through 1980, we then show how inferences are affected by alternative metropolitan and nonmetropolitan county designations (e.g., beginning or end of period), using the metropolitan definition current at each decade as well as two different series based on unchanging metropolitan criteria. We conclude with observations on the use of these procedures in future research on metropolitanization.

Data Source and Metropolitan Definitions

The basic units of analysis are 3,088 counties and county equivalents for the entire United States. Independent cities are combined with adjacent counties in Virginia, and 14 combinations of Alaskan Districts provide comparable county equivalents going back to 1950. Metropolitan area equivalents based on counties (NECMAs) are used in New England for standard metropolitan statistical area (SMSA) comparability with the rest of the country. County population figures for 1950, 1960, 1970, and 1980 and 1983 are used to obtain the various metropolitan and nonmetropolitan totals. To obtain comparable percentage change figures for each time interval, the 1983 populations are projected to 1990 by applying the 1980–1983 annualized growth rates to the exponential function. This is a computational convenience and not a prediction of what the growth percentages will be.

Because one objective is to assess the effects of changing metropolitan criteria on the metropolitanization process, the following is a brief summary of changes in the metropolitan definition since 1950 (Federal Committee on Standard Metropolitan Statistical Areas, 1981):

1. *1949 criteria* (1950 census): Should include a city of at least 50,000.
2. *1958 criteria* (1960 and 1970 censuses): A pair of contiguous cities is permitted if together they have at least 50,000 population, with the smallest at least 15,000 in size.
3. *1971 criteria*: The 50,000 qualification may be met by a city of at least 25,000 plus adjacent incorporated and census-defined unincorporated places, each with a density of at least 1,000 per square mile.
4. *1980 criteria* (1980 census and unchanged to the present): The 50,000 qualification may be met by a census-defined urbanized area. The SMSA may contain within its boundaries a city of less than 25,000; but if the city is less than 50,000, the total SMSA population must be at least 100,000.

In addition to these changing criteria, there are rules for determining whether a peripheral county (or township in New England) should be designated as metropolitan.

These rules have also changed over time, most recently since 1980; and since 1960 they have included information on commuting between the central and peripheral counties.

Growth rates are calculated here using several universes of metropolitan and nonmetropolitan counties that vary according to year of metropolitan definition (see preceding changes in metropolitan criteria) and year of metropolitan designation (i.e., the years counties are or would be classified as metropolitan using a particular metropolitan definition). Table 1 provides data describing county universes with various combinations of definition and designation.

The first two columns of Table 1 provide the number of counties designated as metropolitan or nonmetropolitan in 1950, 1963, 1974, and 1983 according to the definitions (i.e., criteria) current at those times. The latter three dates include counties made metropolitan on the basis of commuting data from the censuses of 1960, 1970, and 1980, respectively. Because they reflect results of the most recent censuses, these designations are arguably more appropriate than those at the time when each census was taken. Over this period, the number of metropolitan counties increased from 273 to 714. Correspondingly, the number of nonmetropolitan counties dropped from 2,815 to 2,374 (out of a total of 3,088 counties and county equivalents).

In addition to calculating metropolitan growth rates on the basis of current definitions, we calculate rates using two unchanging definitions with which to classify counties.¹ First, for each decade, counties are designated as metropolitan or nonmetropolitan according to the 1958 definition, that is, only if their SMSA meets the criteria as of 1958. As indicated in the middle two columns of Table 1, this definition designates five more counties as metropolitan in 1950 than does the definition current at that time (i.e., 1950). As expected,

Table 1. Designation of Counties as Metropolitan or Nonmetropolitan by Type of Metropolitan Definition, 1950–1983

Date of designation	Definition of metropolitan					
	Current ^a		1958 rules ^b		1980 rules ^b	
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
1950	273	2,815	278	2,810	301	2,787
Reclassified metropolitan, 1951–1963	136	-136	131	-131	144	-144
1963	409	2,679	409	2,679	445	2,643
Reclassified metropolitan, 1964–1974	220	-220	195	-195	205	-205
1974	629	2,459	604	2,484	650	2,438
Reclassified metropolitan, 1975–1983	134	-134	87	-87	113	-113
Reclassified nonmetropolitan, 1975–1983	-49	49	-46	46	-49	49
1983	714	2,374	645	2,443	714	2,374

Note: Total number of counties = 3,088.

^a Metropolitan definition current at date of designation of counties.

^b The 1958 and 1980 rules were used at each date of designation to determine whether or not an SMSA was included.

there are 25 fewer counties in 1974 and 69 fewer in 1983 than under the definitions current at each time. This is obviously a result of the liberalization of criteria for attaining metropolitan status.

Second, counties have been classified through the 1950–1983 period according to the 1980 criteria.² Using the constant 1980 definition (see criteria 4), which has considerably less-stringent criteria for achieving metropolitan status, increases the universe of metropolitan counties for the analysis of growth in the 1950s and 1960s (see Table 1, last two columns).

Monitoring Metropolitan–Nonmetropolitan Population Change

Constant Area Approaches

Over a single decade, the constant area approach involves identifying counties as metropolitan or nonmetropolitan either at the beginning or at the end of the decade. In comparing growth over a series of time periods, a further question is whether to (a) use the universe of metropolitan counties at the beginning (or end) of each decade or (b) classify the same counties as metropolitan throughout the series. The former has been termed a “floating” definition, in that the universe of counties designated metropolitan (or nonmetropolitan) changes for each decade (Hall and Hay, 1980).

For ease of presentation, we distinguish the constant area approaches as follows:

1. *Floating constant area*—(a) beginning-of-period designation of metropolitan and nonmetropolitan counties; (b) end-of-period designation of metropolitan and nonmetropolitan counties.
2. *Fixed constant area*—same designation of counties over a series of decades, which may be beginning, ending, or some intervening date.

In Table 2, metropolitan–nonmetropolitan growth differentials for each decade since 1950 are provided based on these three constant area approaches. Counties are designated as metropolitan or nonmetropolitan as of 1950, 1963, 1974, and 1983 using a current definition (top), a 1958 definition (middle), and a 1980 definition (bottom). By reading across rows, one can compare metropolitan and nonmetropolitan change over the four decades using the same universe of counties (i. e., fixed constant area approach). By reading down the principal diagonal of each panel, one can compare changing growth rates using the floating area/beginning-of-period designation. Finally, by reading down the first off-diagonal below, one obtains a floating constant area/end-of-decade designation approach.

Data in Table 2 indicate that metropolitan growth is, in general, higher if we use the fixed constant area approach based on the 1983 designation of metropolitan status (line 7 of each section) than if we use a fixed constant area approach based on earlier years. Indeed, metropolitan rates tend to be lowest if we use a 1950 fixed constant area (line 1 of each section), because counties redesignated as metropolitan in the intervening period have high rates of growth. Nevertheless, the fixed constant area, regardless of year of metropolitan designation or definition, shows the turnaround to more rapid nonmetropolitan population growth during the 1970s.

The two floating measures also reveal expected differences. End-of-period designations (first off-diagonal of each panel) have slightly higher metropolitan and somewhat lower nonmetropolitan growth levels than corresponding beginning-of-decade designations (principal diagonal). Again, this is a result of the reclassification of rapidly growing counties to metropolitan status during the decade. Neither floating measure, however, emphasizes the increase in nonmetropolitan growth rates from the 1960s to the 1970s as much as the 1974 or 1983 fixed constant area approaches. Indeed, both floating measures (regardless of definition) indicate that nonmetropolitan growth was lower in the 1960s than the 1950s. In

Table 2. Percentage Change for Counties Classified as Metropolitan or Nonmetropolitan, United States, 1950-1990

Date of designation and status	1950-1960	1960-1970	1970-1980	1980-1990 ^a
Current Definition ^b				
1950				
Metropolitan	25.2	15.0	5.6	8.7
Nonmetropolitan	9.8	10.9	20.3	14.2
1963				
Metropolitan	26.4	16.4	8.1	10.3
Nonmetropolitan	6.2	7.8	18.2	12.5
1974				
Metropolitan	26.3	17.1	9.9	11.3
Nonmetropolitan	3.0	4.3	15.7	10.4
1983				
Metropolitan	26.0	17.2	10.5	11.6
Nonmetropolitan	1.3	2.5	14.4	9.3
1958 Definition ^c				
1950				
Metropolitan	25.2	15.0	5.7	8.7
Nonmetropolitan	9.7	10.9	20.4	14.2
1963				
Metropolitan	26.4	16.4	8.1	10.3
Nonmetropolitan	6.2	7.8	18.2	12.5
1974				
Metropolitan	26.2	16.9	9.6	11.1
Nonmetropolitan	3.9	5.1	16.2	10.8
1983				
Metropolitan	26.1	17.0	10.1	11.5
Nonmetropolitan	3.1	4.2	15.1	9.7
1980 Definition ^c				
1950				
Metropolitan	25.4	15.3	6.1	9.0
Nonmetropolitan	8.8	10.3	20.4	14.2
1963				
Metropolitan	26.4	16.5	8.5	10.3
Nonmetropolitan	5.0	6.9	18.1	12.5
1974				
Metropolitan	26.1	17.0	9.9	11.2
Nonmetropolitan	2.6	4.0	16.0	10.6
1983				
Metropolitan	26.0	17.2	10.5	11.6
Nonmetropolitan	1.3	2.5	14.4	9.3

^a 1980-1990 change is a projection based on county 1980 census and 1983 estimates used to make the 3 1/4-year change figures comparable with previous 10-year periods.

^b Metropolitan definition current at date of designation of counties.

^c The 1958 and 1980 rules were used at each date of designation to determine whether or not an SMSA was included.

previous research, the observed monotonic increase in nonmetropolitan growth across the decades through 1980, using a fixed area designation, led to a conclusion that the turnaround was already under way in the 1960s (Beale and Fuguitt, 1978). When one considers, however, successive metro-nonmetro designations reflecting the process of

metropolitanization since 1950, the 1960s is seen as the era of slowest nonmetropolitan growth.

These data nevertheless indicate that the widely documented turnaround of the 1970s and the return to metropolitan concentration in the 1980s are not simply products of the way counties are designated as metropolitan or nonmetropolitan. Further, gleaming such a conclusion from all three sections of the table should be reassuring to some. The liberalization of criteria for achieving metropolitan status apparently has not significantly altered inferences about changing relative rates of metropolitan and nonmetropolitan growth over the 1950–1980 period. Fixed and floating constant approaches yield generally similar conclusions whether a current metropolitan definition is used or whether the counties are classified on the basis of a 1958 or 1980 definition.

Components of Growth Approach

The second major method for examining metropolitan and nonmetropolitan change is to account explicitly for the population of counties shifting between metropolitan and nonmetropolitan categories. Metropolitan growth can be calculated with the end-of-decade count including the population of the new counties added less counties subtracted during the decade. We will simply call this *total change*.

In Table 3 we partition total change into internal growth (based on a floating constant area/beginning-of-period designation) plus two components of change due to area added or subtracted. That is,

$$\begin{aligned} \text{total change} = & \text{constant area change (beginning-of-period designation)} \\ & + \text{change over time in counties transferred} \\ & + \text{initial population in counties transferred.} \end{aligned}$$

These components can be obtained for both metropolitan and nonmetropolitan areas. Each term can be expressed as a component of total percentage change and may be either positive or negative, depending on internal growth and the net shift of counties added and subtracted.³ Because counties are usually reclassified to metropolitan areas, the components for area added here are positive for metropolitan and negative for nonmetropolitan areas.

The results of the components analysis are shown in Table 3. As before, the analysis is based on the definitions current at each time as well as the constant 1958 and 1980 definitions. How have the components of population growth and decline changed over time, and what do they tell us about the metropolitanization process?

For 1950–1960, with the definitions current at each time, the 1960 population of the counties added to the metropolitan category between 1950 and 1963 was 11.5 percent of the initial metropolitan population (col. 1). This metropolitan population increase due to reclassification plus the percent change in the initial area (25.2) equals the total change (36.7). Conversely, despite the fact that the initial nonmetropolitan population (in 1950) increased by almost 10 percent, nonmetropolitan total change for 1950–1960 was –5.1 percent due to substantial population losses from reclassification (–14.9 percent).

By the 1970s, total metropolitan growth was less than one-half the level of the 1950s (bottom panel, col. 1). This overall decline in growth is in part due to a parallel decline in initial area growth from 25 percent to less than 10 percent. Although the absolute magnitude of the component for area added is smaller in the 1970s than the 1950s, it accounts for a larger share of total growth (about 40 percent) than was true in the 1950s.⁴

On the nonmetropolitan side, the negative effect of the area subtracted is about equal in magnitude in the 1950s and the 1970s but somewhat larger in the 1960s. Change in the initial area is lowest in the 1960s and highest in the turnaround decade of the 1970s. Thus the total nonmetropolitan change is lowest (–13.2) in the decade just before the turnaround,

Table 3. Components of Metropolitan and Nonmetropolitan Change, Including Area Transferred Over Each Period, by Metropolitan Definition, United States, 1950–1960, 1960–1970, 1970–1980

Components of change	Definition					
	Current ^a		1958 rules ^b		1980 rules ^b	
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
1950–1960						
Total	36.7	-5.1	35.8	-4.2	36.5	-6.5
Constant area ^c	25.2	9.8	25.2	9.7	25.7	8.8
Area transferred	11.5	-14.9	10.6	-13.9	10.8	-15.3
Growth over period	3.3	-4.3	3.2	-4.2	2.8	-4.0
Initial population	8.2	-10.6	7.4	-9.7	8.0	-11.3
1960–1970						
Total	27.6	-13.2	25.3	-8.9	24.8	-10.2
Constant area ^c	16.4	7.8	16.4	7.8	16.5	6.9
Area transferred	11.2	-21.0	8.9	-16.7	8.3	-17.1
Growth over period	2.2	-4.2	1.8	-3.3	1.7	-3.4
Initial population	9.0	-16.8	7.1	-13.4	6.6	-13.7
1970–1980						
Total	15.5	0.2	12.7	8.2	14.1	3.9
Constant area ^c	9.9	15.7	9.6	16.2	9.9	16.0
Area transferred	5.6	-15.5	3.1	-8.0	4.2	-12.1
Growth over period	1.1	-3.1	0.8	-2.0	1.0	-2.9
Initial population	4.5	-12.4	2.3	-6.0	3.2	-9.2

^a Metropolitan definition current at date of designation of counties.

^b The 1958 and 1980 rules were used at each date of designation to determine whether or not an SMSA was included.

^c Constant area at beginning of period designation. See text.

because of both lower initial area growth and a greater magnitude of loss due to area transferred. This total increased to slightly more than zero in the 1970–1980 period, so the metropolitan–nonmetropolitan differential during the nonmetropolitan turnaround still strongly favors the metropolitan side when area changes are taken into account.

The next two columns present the same analysis with the 1958 definition applied over the entire period. The initial area growth components are similar to those using the current definition. For 1950–1960, the components for area added are also almost identical to those generated using the current definition, but they are somewhat smaller thereafter. Total nonmetropolitan loss is still greatest in the 1960–1970 period. The total growth differential favoring metropolitan areas is much smaller for 1970–1980 ($12.7 - 8.2 = 4.5$) than under the current definition (15.3).

The last two columns of Table 3 are based on a “retrojection” of the metropolitan definition of 1980. Again, the overall results for the 1950–1960 decade are little different from either the current or 1958 definition. Metropolitan growth due to area transferred is, however, slightly lower during each decade using a 1980 definition rather than a current definition. By retrojecting the 1980 definition, more metropolitan areas are designated at earlier times, thus lowering the number of counties shifting to metropolitan status during the last two decades.

Regardless of definition (current at each time, constant 1958, or constant 1980), only a small fraction of the growth due to area transferred is from population increase during the time period. Nevertheless, these areas are growing rapidly. If one takes the initial population of the new area as the base, the new areas grew at rates ranging from 25 percent to 44 percent

across all years and definitions (data not shown). These rates are considerably higher than corresponding metropolitan growth rates within the initial area.

As we have shown, rapidly growing counties that change status are included as nonmetropolitan initial area growth under the beginning-of-period approach. To what extent do these counties contribute to nonmetropolitan growth? This question can be answered by the following decomposition of *total change* using an end-of-period approach:

$$\begin{aligned} \text{total change} &= \text{constant area change (end-of-period designation)} \\ &+ \text{initial population in counties transferred during the period.} \end{aligned}$$

By adding constant area (beginning-of-period) growth and growth over the period in areas transferred, we obtain growth in the end-of-period area. For the 1970–1980 period (current definition), for example, end-of-period area growth is $9.9 + 1.1 = 11.0$ for metropolitan areas and $15.7 - 3.1 = 12.6$ for nonmetropolitan areas (Table 3, bottom panel, cols. 1 and 2). The latter computation means that only 3.1 of the 15.7 percent nonmetropolitan population increase in the 1970s was in counties that had become metropolitan by the end of the period. This contrasts with the 1950s and 1960s, when almost one-half of the nonmetropolitan growth in the initial areas was in counties that were in the process of becoming metropolitan. Before 1970 much of the growth in nonmetropolitan areas could be considered “incipient” metropolitan growth.

Metropolitanization and Changes in Percentage Metropolitan

To this point, metropolitan–nonmetropolitan growth differentials have been considered in terms of the shifts of counties to and from metropolitan status. To conclude the analysis, we now turn directly to an examination of the metropolitanization process, here defined as an increase in the percentage of the U.S. population classified as metropolitan.

The top panel of Table 4 shows the percentage metropolitan for 1950–1990 with counties grouped by year of metropolitan designation, using the official metropolitan definition at the beginning of each decade. Numbers in a row refer to the same counties; for example, 57.4 percent of the 1980 population lived in counties that were designated by the government as metropolitan in 1950. The 1990 figure, based on a projection of the population estimates of 1983, provides comparison of growth tendencies in the early part of this decade with previous decades. The main diagonal of this panel (cols. 1–4) shows the percentage metropolitan based on designations and definitions of each time.

A comparison of the three panels shows that the effects of the different metropolitan definitions are perhaps less than might have been anticipated. Indeed, the bottom panel reveals that the 1980 rules yield an equal or only slightly higher percentage metropolitan for each cell than the 1958 rules or those current at each time. Higher percentages generally would be expected with the 1980 rules, since this definition retrojects more liberal rules than were true prior to that year. Likewise, the 1958 definition has slightly higher percentages in the 1950 row and lower percentages in the 1980 row. The effect of the difference in definition is largest in 1980, when the percentage metropolitan was 76.0 but would have been 72.8 under the 1958 rules. The overall pattern of increase to 1970 and decline to 1980 across rows and unbroken increase down the diagonal is found, however, regardless of the definition employed. That is, the turnaround produced a demetropolitanization in 1970–1980 using any constant area (across rows), but not if new areas are added.

The percentages in Table 4 also provide the opportunity to compare metropolitanization with and without the addition of territory. To illustrate, consider the first two numbers in the first two rows. The difference between diagonal percentages, $65.1 - 56.5 = 8.6$, measures the degree of metropolitanization over the 1950–1960 period. The first row difference, $59.7 - 56.5 = 3.2$, is the metropolitanization within a constant area, whereas the

Table 4. Percentage Metropolitan by Census Year and Year of Metropolitan/Nonmetropolitan Distinction, for Selected Metropolitan Definitions, United States, 1950–1980

Definition and year of classification	Census year				
	1950	1960	1970	1980	1990 ^a
Current definition ^b					
1950	56.5	59.7	60.5	57.4	56.2
1963	61.1	65.1	66.8	64.8	64.4
1974	66.6	71.0	73.3	72.3	72.4
1983	69.7	74.1	76.6	76.0	76.4
1958 definition ^c					
1950	56.8	60.0	60.9	57.8	56.6
1963	61.1	65.1	66.8	64.8	64.4
1974	65.5	70.0	72.0	70.8	70.9
1983	67.1	71.3	73.7	72.8	73.1
1980 definition ^c					
1950	58.6	62.0	63.0	60.0	58.9
1963	63.3	67.5	69.3	67.5	67.0
1974	67.6	71.9	74.2	73.2	73.3
1983	69.7	74.1	76.6	76.0	76.4

^a The 1990 figures are based on a projection based on county 1980 census and 1983 population estimates to make the time intervals comparable.

^b Metropolitan definition current at date of designation of counties.

^c The 1958 and 1980 rules were used at each date of designation to determine whether or not an SMSA was included.

second column difference, $65.1 - 59.7 = 5.4$, is the increase in the percentage metropolitan due to the area transferred. These two components sum to the total degree of metropolitanization. The latter component can also be divided into parts for growth over the period and initial population of the area transferred. The difference between the two numbers in the first column, $61.1 - 56.5 = 4.6$, is the effect of the initial area transferred. The effect of growth in the area transferred is the second-order difference, $(65.1 - 59.7) - (61.1 - 56.5) = 0.8$. Such components are given in Table 5 over the three time periods for each set of definitions.⁵ Of course, the effect due to new metropolitan areas added in the 1980s decade cannot yet be gauged.

Total change figures in the top row of each panel of Table 5 (col. 1) show the most rapid metropolitanization in the 1950s, a slight decline from this level in the 1960s, and a sharp decline in the 1970s. This is due in part to temporal declines in initial metropolitan area growth (col. 2). Indeed, growth within the constant area indicates a nonmetropolitan turnaround (demetropolitanization) regardless of definition, with a negative value in the 1970s. Constant area change estimated for 1980–1990 is positive again but will be much smaller than in the 1950s and 1960s if the extrapolation of the 1983 data is an appropriate assumption of future growth to 1990.

In each panel, it is also apparent that total area added (col. 3) contributes more than initial area growth to metropolitanization. The contribution due to area added is smaller, however, in the 1970s than in the two earlier periods for each definition series. Subcomponents of the area transferred show that most (usually 80–90 percent) of this change is due to population in the initial area, with the remainder due to the growth of these new counties over the decade.

Inferences about the character of metropolitanization, however, may depend on whether the territory added represents new SMSAs or is peripheral growth around existing

Table 5. Decomposition of Change in Percentage Metropolitan by Metropolitan Definition, 1950–1960, 1960–1970, 1970–1980

Definition and time interval	Total change	Initial area change	Area added		
			Total (a + b)	Initial increment (a)	Increment change (b)
Current definition ^a					
1950–1960	8.6	3.2	5.4	4.6	0.8
1960–1970	8.2	1.7	6.5	5.9	0.6
1970–1980	2.7	-1.0	3.7	3.3	0.4
1980–1990 ^c		0.4			
Definition of 1958 ^b					
1950–1960	8.6	3.2	5.4	4.3	1.1
1960–1970	6.9	1.7	5.2	4.7	0.5
1970–1980	0.8	-1.2	2.0	1.7	0.3
1980–1990 ^c		0.3			
Definition of 1980 ^b					
1950–1960	8.7	3.4	5.3	4.5	0.8
1960–1970	6.4	1.9	4.5	4.1	0.4
1970–1980	2.3	-1.1	3.4	2.9	0.5
1980–1990 ^c		0.4			

Note: Total change is calculated as initial area change + total area added.

^a Metropolitan definition current at date of designation of counties.

^b The 1958 and 1980 rules were used at each date of designation to determine whether or not an SMSA was included.

^c The 1990 figures are based on a projection based on county 1980 census and 1983 population estimates to make the time intervals comparable.

SMSAs. That is, metropolitan territory may be added through (a) *expansion* (the portion of change in areas transferred that is due to addition of new counties to the periphery of existing metropolitan areas) and (b) *emergence* (the portion of change in areas transferred that is due to addition of new metropolitan areas). These components of growth are reported in Table 6 and indicate that expansion was a significant source of metropolitanization in the 1950s and 1960s. The emergence of new metropolitan areas was also an important source of change in the 1950s (2.8 percent) and became *the* major source of change in the 1960s and 1970s.

Conclusion

We have reviewed alternative approaches used to evaluate metropolitan–nonmetropolitan population growth and proportionate metropolitan change in the U.S. During the brief

Table 6. Components of Change in the Percentage of the Population That Is Metropolitan

Additive components	1950–1960	1960–1970	1970–1980
Total change	8.6	8.2	2.7
Internal growth	3.2	1.7	-1.0
Expansion	2.6	2.5	0.7
Emergence	2.8	4.0	3.0

30-year period between 1950 and 1980, the metropolitan share of the U.S. population increased from 56.5 percent to 76.0 percent. Indeed, despite the resurgence of growth in nonmetropolitan areas during the 1970s, the metropolitanization process continued apace. As we have illustrated, the underlying mechanics of metropolitanization not only are complex but have changed substantially during this period.

Changing metropolitan status continues to plague the analysis of population trends in metropolitan and nonmetropolitan areas and remains a problem that defies easy solutions. Despite this, however, one comforting aspect of the analysis reported here is the robustness of U.S. population trends, at least those since 1950; fundamental population shifts have been revealed regardless of approach adopted. Any differences in substantive conclusions across the various approaches appear to be largely a matter of degree rather than kind. For example, the nonmetropolitan population turnaround of the 1970s was not an artifact of method of metropolitan designation (i.e., floating constant or fixed constant area approach). Much of the nonmetropolitan growth was internally driven, rather than due to growth in areas that were subsequently reclassified as metropolitan. At the same time, metropolitan growth was fueled largely by expansion at the peripheries of existing metropolitan areas and the emergence of new metropolitan areas. Paradoxically, the continuing process of U.S. metropolitanization has gone hand in hand with an increasingly diffuse pattern of population settlement.

In comparing metropolitan and nonmetropolitan growth, the conceptual and procedural difficulties due to metropolitan reclassification are further compounded by changing official definitions of metropolitan. Recent changes in the criteria for metropolitan designation, however, although affecting somewhat the components of growth, appear to have little effect on substantive conclusions regarding metropolitan and nonmetropolitan growth. Debates about the appropriateness of criteria for metropolitan designations may be muted because, at least in the aggregate analyses here, differences in conclusions resulting from different definitions of metropolitan are minimal.

The results do not lend themselves to easy recommendations for the adoption of one approach over another. The main advantage of the fixed constant area approach is its adherence to a basic principle in the analysis of population change: Change over a time interval is measured for the same territorial units at the beginning and the end of the interval. Yet an obvious disadvantage of this approach is that strict adherence to the same universe means that the concept of "metropolitan" necessarily becomes more ambiguous as territorial units change in character (i.e., become more or less metropolitan) over the period of study. Alternatively, the floating constant and components approaches violate the principle of maintaining a constant territory, yet each seems better suited to the reality that territorial units (here, counties) change with time. The components approach is also useful in showing how metropolitan growth becomes more or less diffuse over time.

In sum, the simple statement that the metropolitan share of the population has increased by 20 percentage points since 1950 belies a complex process, one that is not easily understood using conventional methods. It is a process involving growth within areas and redesignation of areas on the basis of social and demographic change. The various approaches presented here should not only sensitize us to some measurement issues but cast additional light on the mechanics of the metropolitanization process in general.

Notes

¹ Unfortunately, we are unable to make any kind of adjustment for changes in the rule for adding peripheral counties. The definition current at each time for determining the peripheral counties around the SMSAs must be used, though the actual SMSAs included are according to the 1958 and the 1980 constant definitions. In making the constant 1958 metropolitan classification, we retained metropolitan areas in the few cases in which an area might meet the requirements in at least one census but fail to do so at a later census (e.g., when a central city

declines in population to less than 50,000). Consequently, counties only shift from nonmetropolitan to metropolitan in all three data series, except for the approximately 50 former peripheral metropolitan counties dropped by the Office of Management and Budget for the 1983 designation, either because the new rules they established were more stringent or because commuting levels had actually declined.

² Richard Forstall has identified SMSAs that would have been designated in earlier censuses had the 1980 criteria been in effect, using an urbanized area delineation for smaller cities prepared by Jerome Picard. Forstall kindly made this classification available to us, and we modified it by adding and subtracting the peripheral counties according to the metropolitan designations of 1983, 1974, and 1963 for SMSAs eligible according to the 1980 rules in 1980, 1970, and 1960, respectively.

³ More formally, this can be expressed as

$$P_2A - P_1B = (P_2B - P_1B) + (P_2C - P_1C) + P_1C, \quad (1)$$

where P_2A is metropolitan (nonmetropolitan) population at the end of the decade, P_1B is metropolitan (nonmetropolitan) population at the beginning of the decade in the area metropolitan at the beginning, P_2B is the population at the end of the decade in the area metropolitan (nonmetropolitan) at the beginning of the decade, P_2C is the new metropolitan (nonmetropolitan) population at the end of the decade in the area added minus that in any area subtracted, and P_1C is the new metropolitan (nonmetropolitan) population at the beginning of the decade in the area added minus that in any area subtracted.

Dividing each term in equation (1) by the initial population P_1B yields

$$\frac{P_2A - P_1B}{P_1B} = \frac{P_2B - P_1B}{P_1B} + \frac{P_2C - P_1C}{P_1B} + \frac{P_1C}{P_1B}. \quad (2)$$

Multiplying each of the terms in equation (2) by 100 provides the three additive components of total percentage change in population.

⁴ As discussed in Data Source and Metropolitan Definitions and note 1, shifts of counties over the first two time periods were all from nonmetropolitan to metropolitan. For the third time period, 77 counties with 6.9 million people in 1980 moved from nonmetropolitan to metropolitan status, but 49 non-central city counties with 1.3 million people were shifted in the other direction because of change in rules or in their metropolitan character, or both. This departure from earlier practice had little effect on the results, however. Retaining these counties as metropolitan results in a 1970–1980 metropolitan total growth of 16.4 and an area added component of 6.5 instead of the 15.5 and 5.6 shown in the left section of Table 3.

⁵ This is essentially the same decomposition as shown for metropolitan change in the last section, except that instead of a common denominator of metropolitan population at the beginning of the interval, each term representing the beginning of the period has the beginning total population (metropolitan plus nonmetropolitan) and each representing the end of the period has the total population as of the end of the period.

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