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## ABSTRACT

Investigating the distinction between submetropolitanization and decentralization of industry, the "Datafile for National Sample of Nonmetropolitan Counties" (a 10 percent national sample, involving 205 counties) was employed to test the following hypotheses: (1) the nearer the county to a Standard Metropolitan Statistical Area (SMSA), the higher the level of manufacturing activities; (2) the higher the level of activities, the higher the degree of concentration, density, and number of residents working in services; (3) the larger the size of the surrounding metropolitan population, the higher the levels of density, population concentration, and service employed residents in the rural county; (4) the closer the rural county to SMSA, the greater the net migration; (5) the larger the size of the surrounding metropolitan population, the higher the level of net migration in the rural county; (6) the more isolated the county, the greater the importance of size of the largest city in attracting jobs and providing residences and affecting positively further growth. Data derived from the County Business Patterns (1947, 1959, and 1970) and U.S. Censuses (1950, 1960, and 1970) were used to measure: number of county jobs, number of plants, and average plant size (manufacturing indicators) and density, concentration, and number of residents working in services (urbanization indicators). It was concluded that submetropolitanization would characterize industrialization trends.

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## THE INDUSTRIALIZATION OF NONMETROPOLITAN COUNTIES: "SUBMETROPOLITANIZATION" VERSUS DECENTRALIZATION

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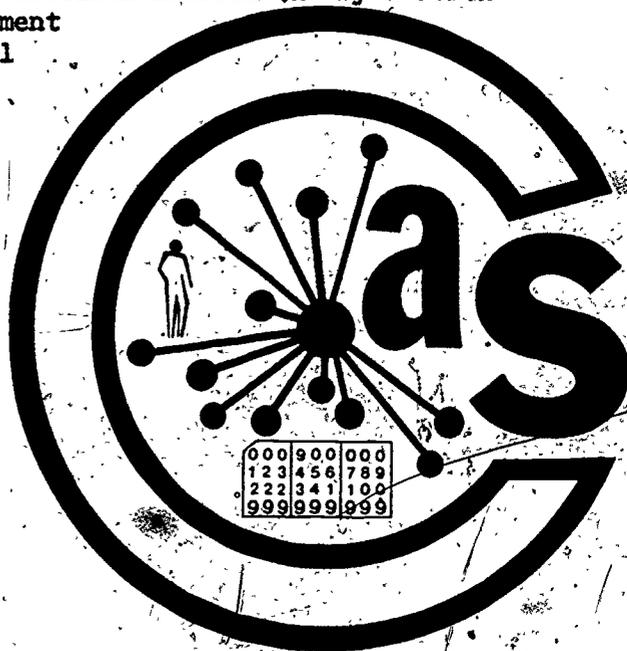
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## Introduction

Ever since the Industrial Revolution, the increase in the level of industrialization of any community has been followed by fundamental changes in the productive relation of that community (e.g., Moore, 1963, 1966; Beck, 1972; Beck and Summers, 1973). These changes include a higher division of labor and an increased share of the labor force employed in wage-earning jobs. A major result of these changes has been the need to concentrate the population in highly dense nuclei, generating what has been known as the urbanization process.

This does not mean that the only outcome is in terms of industrial employment. There is a multiplicative effect of the industrial development which depends on the exportable characteristics of the produced goods, and is reflected in the growing up of the service sector (Morrill, 1970:158).

The "urbanization process" describes the expansion of the urban centers toward the rural hinterland, with the emergence in it of urban traits or characteristics. This process is seen to coincide with one of concentration and growth, culminating with the implementation of "urbanism" in the affected area, that is a qualitative change in the life of the respective human community.

It is not the intention of this work to speculate about the desirability of one or another way of life. Neither is it to enter into the polemic about the accuracy of the theoretical constructs that the literature the field utilizes (L. Wirth, 1938; O. Lewis, 1965; R. Redfield, 1947; O. D. Duncan and A. J. Reiss, Jr., 1956).

Rather our starting assumption will be that there is an implicit agreement about the irreversibility of the current trend: the increasing concentration and growth of some population centers, to meet the needs of the rationalization of the productive activities, whether they are agricultural, extractives, manufacturing or services, through the application of new technologies, and as a consequence, the increasing of the degree of urbanization. An additional factor is the growing importance of the leisure activities with their remarkable effect on the development of the service sector.

Accepting the existence of such a technological development, the role played by the industrial sector as a main source for the creation of wealth in a modern society, and its association with the urbanization process, the next step will be to test if that association remains unchanged when it is analyzed in the context of different ecological situations. If the answer is a change in the association pattern it will be one of the basic supports for the hypotheses defined later in this paper.

#### The Framework of the Analysis

An analysis of the forces involved in the location of the current population growth in the United States is not a simple one. On one hand, the economic forces that determine the location of the productive activities are highest-benefit oriented. This means that firms will consider all the economic components (transportation, labor market, taxation, financial opportunities, etc.) to choose the best plant location. On the other hand, the labor force involved in the productive

activities at the different levels will have its own preferences for the kind of living environment it prefers. These include preferences for types of climate, direct contact with nature, or the kind of services and amenities that the urban life provides. Finally, the political apparatus will have its own criteria for selecting development best suited to the needs of the country, and they will be reflected in various legislative activities.

It is difficult to infer which of these forces will determine the outcome of the new population location in the United States. But before making any kind of prediction of what is going to happen in the near future, it will be instructive to examine what has been occurring during the last two decades.

There are two major interpretations of the predominant trends of current population distribution. The two are not necessarily contradictory but stress quite different aspects of reality. On one hand, the Commission on Population Growth and the American Future considers the actual location of the current population growth as mainly occurring in the metropolitan areas. This viewpoint is supported in several published reports (i.e., The Report of the Commission on Population Growth and the American Future-1972; Population Distribution and Policy-Vol. V), in which extensive research is presented dealing with the different aspects of the population growth and distribution.

Tables 1 and 2 present some evidence for what has been stated in the previous paragraph. The predominance and strength of the Metropolitan Areas is seen very clearly in the data presented in Table 1. The only exception is the Northeast region which includes

Table 1: U.S. Population Change Between 1960 and 1970 by Residence (percentages)

	<u>All Regions</u>	<u>Northeast</u>	<u>Northcentral</u>	<u>South</u>	<u>West</u>
United States	13.4	9.1	11.0	13.5	24.2
Metropolitan Areas	17.0	7.3	17.3	21.7	27.8
Inside Central Cities	1.5	-3.3	1.1	2.8	8.9
Outside Central Cities	33.5	17.4	35.7	46.8	44.0
Nonmetropolitan Areas	7.1	16.2	1.8	5.9	15.0

Source: Peter A. Morrison, "Population movements: Where the public interest and private interests conflict," in the Commission and the American Future, FIVE, Population Distribution and Policy, Ch. 2, Part I, p. 39, Table-1.

Table 2: U.S. Population 1970 Change and Distribution

	Population in 1970 (thousands)	Percent Changes		Percent of the Entire Population	
		1950-60	1960-70	1960	1970
States by percent in SMSAs in 1960					
Less than 15	5,290	3.9	3.6	2.7	2.6
15-24	9,429	7.6	9.7	4.8	4.6
25-49	39,252	10.3	8.1	20.3	19.3
50-74	65,859	25.9	16.9	31.6	32.4
75-84	37,799	17.0	12.0	18.5	18.6
85 and over	45,583	24.3	16.1	22.0	22.4

Source: Irene B. Taeuber, "The changing distribution of the population of the U.S. in the twentieth century," in the Commission on Population and the American Future, FIVE, Population Distribution and Policy, Ch. 2, Part I, p. 39, Table 1.

New York City and its consolidated area. Moreover, Table 2 shows two important facts that have a strong linkage with the theoretical model to be developed in the following pages: 1) the evidence that an overwhelming percentage (73.4) of the population lives in states having more than fifty percent of their 1960 population living in SMSAs, and 2) the growth pattern for 1950-1970 is superior in those more metropolitanized states, whether it happened within the SMSAs or outside, in the nonmetropolitan communities.

The second interpretation comes from those who see the decentralization of manufacturing jobs as an unquestionable fact (Beale, 1969; Dean, 1973; Haren, 1970; Patrick, 1973; Smith, 1971; Stuart, 1971), and interpret decentralization as the third stage of an historical process involving: 1) the growth of the central cities; 2) the suburbanization of population and industry; and 3) the decentralization of industry including the eruption of urbanites in the rural communities (Summers et al., 1975). In reference to this last stage, there is concern for the possibility of negative effects in the host communities, despite the optimistic predictions of those who regard industrial development as the most viable alternative for developing the economically lagging rural areas (Summers et al., 1975).

#### An Alternative Approach, and Some Literature Supporting It

The alternative explanation that this paper tries to provide is to interpret the nonmetropolitan movement of industry as two processes depending upon the distance that, the new industry, is

from the nearest SMSA. The evidence for the appropriateness of such viewing comes from the comparison of two pieces of recent research.

A joint analysis of the work done by Summers et al. (1975) dealing with the effects of the "rural invasion," and the paper written by C. Haren (1970) about the rural industrial growth of the 1960s, gives an appropriate response to that question. On one hand, it is true that:

"Between 1960 and 1970 manufacturing employment in metropolitan areas grew 4 percent but 22 percent in nonmetropolitan areas." (Summers et al., 1975:ii).

On the other hand it is no less true that for the period 1962-1969 the percentage of employment growth for large areas was 16.7 and 26.0 for the small ones, as is shown in Table 3. The only possible conciliation of both must be found in Haren's definitions of "large" and "small" labor market areas:

"Area delineations of 162 of the 193 large labor market areas match and those another 21 partly match Standard Metropolitan Statistical Area (SMSA) designations by the U.S. Bureau of the Budget as of May 1, 1967. The remaining 10 consist of labor market, trade, service, and government centers that are important regionally but do not meet the basic criterion (50,000 population) for SMSA qualification." (Haren, 1970:432).

It might well happen that the disparity between these positions would disappear after a careful analysis of the role played by those "21 partly SMSA and the remaining 10," in Haren's definition. The "partly metropolitan" must be contiguous to an SMSA, by definition. So, their growth can be considered an extension of metropolitan growth. The other 10 are "important regionally" which, most likely, means they are important nonmetropolitan areas.



Table 3: Manufacturing Employment, 1962 and 1969, and Annual Gain, Large and Small Labor Market Areas in the United States

	<u>Employment</u>		<u>Annual Gain</u>			<u>Total Gain</u>	
	<u>1962</u>	<u>1969</u>	<u>Number</u>	<u>Rate</u>	<u>Allocation</u>	<u>Number</u>	<u>Rate</u>
	(Thousand)	(Thousand)	(Thousand)	(Percent)	(Percent)	(Thousand)	(Percent)
Large	12,113	14,141	290	2.4	63	2,028	16.7
Small	4,502	5,673	167	3.7	37	1,171	26.0
Total	16,615	19,814	457	2.7	100	3,199	19.2

Source: Claude C. Haren, "Rural industrial growth in the 1960s" American Journal of Agricultural Economics 52-August 1970, p. 432.

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Summarizing what can be inferred from the previous analysis, an important part of the total gain in manufacturing jobs by the large market areas (16.7%), from 1962 to 1969, has to be attributed to the gain in counties contiguous to SMSAs, and the regionally important nonmetropolitan areas (Haren, 1970) in order to fit with the total gain (4.0%) in manufacturing jobs by the SMSA, from 1960 to 1970 (Summers et al., 1975).

Consistent with this interpretation is the following quotation from Till:

"What little general research has been done on employment changes on the county level has not separated nonmetropolitan counties contiguous to SMSA counties from the more distant ones." (Till, 1972:6)

Therefore, viewing the decentralization of industry as a unitary process runs the risk of serious oversimplification. What is regarded as a single process may be two quite distinct processes, each with its own origins and consequences for the communities involved. Thus, it is important to make a distinction between what we shall call sub-metropolitanization of industry and decentralization of industry. The former denotes the movement of industry to communities which are still within the sphere of metropolitan dominance and is correctly understood as an extension of the historically antecedent process of suburbanization. The awareness of the existence of such submetropolitanization process is not our personal contribution. Although in terms of population rather than industry W. Alonso and E. Medrich, among others, have written that:

"Suburban and exurban diffusion are proceeding very rapidly, and many urban scholars think that the SMSA boundaries cut off substantial population that is functionally associated with the metropolis." (W. Alonso and E. Medrich, 1972:231)

Decentralization of industry indicates location of industry in communities outside the sphere of immediate metropolitan dominance.

The logic supporting the emergence of these two processes, submetropolitanization and decentralization, rests on the assumption that the traditional site selection criteria of highest-benefit-oriented firms remain operative. It proceeds with the assertion that firms vary in the benefit attached to criteria such as economics of agglomeration (Morrill, 1970:82) nearest to markets, and skill level of the resident labor pool. Thus, we conclude that an important number of firms will be led to site selections which lie within the sphere of immediate metropolitan dominance. By application of the same logical argument one may expect firms with different weights attached to the criteria of site selection find locations outside the metropolitan dominance sphere more attractive. This suggests that those firms locating in communities far removed from metropolitan areas differ in significant ways from those choosing sites in the near hinterland. For example, the former are more likely to be capital intensive while the latter tend to be labor intensive. There are undoubtedly other important different consequences for the host communities in terms of economic and demographic considerations.

Moreover, communities differ in economic and demographic characteristics according to their location vis-a-vis metropolitan centers.

The Ecological Assumptions

The present analysis incorporates the concept of urban system, with city networks and subsequent dominance and dependency relations

which imply, to a certain extent, a hierarchical order (Bogue, 1950), and the development of economies of scale (Olmstead and Smolensky, 1973:7). But it goes further in that it searches for the limits of metropolitan dominance with respect to industrial decentralization.

Thus, as a preliminary support for the following assumptions is relevant to quote here J. Friedman and J. Miller:

"The idea of an urban field is similarly based on the criterion of interdependency. It represents a fusion of metropolitan spaces and nonmetropolitan peripheral spaces centered upon core areas of at least 300,000 people and extending outwards from these core areas for a distance equivalent to two hours' driving over modern throughway systems (approximately 100 miles with present technology)." (J. Friedman and J. Miller, 1970:56)

The degree of isolation of a rural county, determined by the distance to the nearest SMSA, acts in an opposite direction to the sphere of influence of the system dominated by the central city of the nearest SMSA (CC-SMSA) (O. D. Duncan 1961:550-551).

At one end of the isolation scale are the submetropolitan counties which, because of their nearness, depend upon metropolitan centers to fulfill many of their normal service demands. But nearness is only a reflection of the comparatively superior range and quality of services offered within the metropolitan boundaries against which these counties are weak competitors. This is illustrated in the case of shopping facilities, museums, theaters, hospitals, etc. (Haren, 1970:434). However, there are other kinds of services, for example, recreational clubs, some educational institutions, military camps, etc. that need and benefit from open spaces available in those counties. Another possible functional.

specialization of submetropolitan counties is the residential. This is the case known as the bedroom-communities.

An intermediate possibility, in terms of degree of isolation, is that the county though being a part of the whole system dominated by the central city of the SMSA is far enough (within 50 to 100 miles) to have a different kind of dependency on the SMSA. The lower limit shows that it is out of the range of the commuting activities in either direction. But, at the same time, it is assumed that drawing the upper limit at a point that can be reached in a normal two hours trip, the residents of those counties can use very easily some of the advantages of the near SMSA. Such a possibility affects itself to the configuration of the area (Till, 1972:42), at the time when a firm has to decide the ideal location for its plant. The upper limit represents in Friedman and Miller's work (1970:56) the limit of intensive weekend and seasonal use of the present periphery.

The population size, and its different manifestations (i.e., density, size of the largest place in the county), is assumed to affect the potential of future economic development, especially in the cases of isolated counties. The size of the largest city in the county is associated with the importance of its role within the system since size will determine its position in the hierarchical scale (Bogue, 1950:13; Berry and Horton, 1970:64 & 169), and therefore, the role it is going to play in the economy of scale that the urban system develops as a whole.

Another ecological factor which must be considered is the size of the SMSA. The extent of domination over the hinterland is seen

as highly associated with the size of the SMSA's population. In approximate terms, it can be said that the larger the SMSA, the more likely that a more complex social interaction with the hinterland can be expected (Hawley, 1936; Schore, 1957).

All these aspects fit into an interpretation of the urban system according to the so-called central place theory. Agreeing with Morrill (1970:61-78) that, although rejecting the geometric interpretation as an iron rule, the theory can be accepted as an attempt at systematizing the most important factors in the decision-making process about location of industry, services, and residence, such as the monopoly location of shopping centers, activities regularly spaced, and individual minimizing the distance travelled to satisfy their desires.

Summarizing the previous ideas more succinctly: the different ecological factors are considered as the main causes for the development of two distinct processes, in which the industrial activity affects the urbanization process at two clearly different levels.

### The Hypotheses

In analyzing the association between industrialization (level of manufacturing activity) and urbanization it is expected that the relationship will be affected quantitatively and qualitatively by intervening factors. These expectations are expressed in terms of six major hypotheses:

Hypothesis 1. The nearer the county is to an SMSA, the higher the level of manufacturing activities.

This reflects the predominance of the industrial location in the counties contiguous to SMSAs and is related to the subsequent difference between the submetropolitanization process and the incipient industrial decentralization.

According to Thompson (1965:443), the industrial location is still very much linked to the consumption market, which is another way of referring to the large urban communities. This, among others, explains the basic ideas that support the present hypothesis.

The level of manufacturing activities can be measured by the number of jobs in manufacturing, the number of industrial plants, and the average plant size. Their association with the distance to the nearest SMSA will show the chances of supporting this hypothesis.

Hypothesis 2. . The higher the level of manufacturing activities, the higher the degree of concentration, density, and the number of residents working in services.

One exception must be pointed out: the closer the county is to an SMSA, the weaker the relationship between residents working in services and level of manufacturing activities.

Density, concentration of population in places over 2,500 inhabitants and number of residents working in services are used to measure the level of urbanization. (Wirth, 1938; Fischer, 1972; Schnore, 1961; Gibbs and Martin, 1962; Olmstead and Smolensky, 1973) and its relationship with the level of manufacturing activities.

In a sense the present hypothesis is an extension of the previous one. It means that if the first hypothesis is confirmed it will produce

the effect of higher density and concentration in those places with higher level of manufacturing activities nearest to the SMSA. If confirmed, it will provide further evidence of the submetropolitanization process.

Besides that, it can be said with Thompson (1965:446) that the creation of new jobs in manufacturing will produce new jobs in services, but it must be added that the proximity to an SMSA will distort such relationships, since proximal counties may supply their need for new services from the already existent supply in nearby SMSA. Thus, sub-metropolitan rural counties will become more and more dependent on the near SMSA.

Hypothesis 3. The larger the size of the surrounding metropolitan population, the higher the levels of density, population concentration, and residents employed in services, in the rural county.

In the previous hypotheses level of manufacturing activities and proximity to an SMSA have been the main contributors to the development of the submetropolitanization process. In the present hypothesis there is an attempt to measure the extent to which the size of the neighboring metropolitan population is an important factor that also contributes to the distinction between submetropolitanization and decentralization.

It is postulated that the size of the nearby metropolitan population will affect in a distinctive way those rural counties having common boundaries with the SMSAs as of 1970 Census Population definition. This means that new SMSAs after 1970 are ignored. The reason is very

simple: the analysis spans the 1950-70 period. The requirement of common boundaries implies the recognition that the SMSA's expansion moves in the direction of the established boundaries and going beyond them in the long run. This is precisely the effect that we wish to measure here.

In this connection, Bogue (1950:47-48) considers it important to measure the effect, on any county, of being located in the zone between two SMSAs. The hypothesis being studied explicitly recognizes such eventuality.

But the most definite support for this hypothesis comes from the concept of "urban field" (J. Friedman and J. Miller, 1972:56).

Hypothesis 4. The closer the rural county is to an SMSA, the greater the amount of the net migration.

In other words, the explanation for increased net migration must be found in the dominant effect of the SMSA or at least the combination of it with the increase in manufacturing jobs.

There are serious reservations about the generalized assumption that the number of new jobs, as a consequence of the increase in manufacturing activity, has a positive effect on net migration. But if the distance from the rural county to the nearest SMSA is controlled, an initial weak association might become stronger. An effect of distance on the attraction of new settlers and the outmigration rate will offer another proof for the existence of the submetropolitanization process.

In considering the effect of new industrial locations in rural areas, it is necessary to distinguish the kind of industry in question

(Garrison, 1974; Till, 1974). Industries vary in terms of their incentives attracting migrants. For example, low wage industries are less likely to lead to net migration than are high wage industries.

Hypothesis 5. The larger the size of the surrounding metropolitan population, the higher the level of net migration in the rural county.

This hypothesis is complementary to the previous one. Here the size of the neighboring metropolitan population is considered as the pole of attraction for new immigrants. Thus, being contiguous to a large metropolitan area increases the probability of larger numbers of immigrants. Moreover, part of the immigration into the SMSA may spill over into surrounding counties.

Hypothesis 6. The more isolated the county is, the greater the importance of the size of the largest city in attracting jobs and providing residence sites, and therefore affecting positively further population growth.

It has been stated that the primary purpose of this paper is to ascertain the existence of two different processes: submetropolitani- zation and decentralization, the first being overwhelmingly more important in magnitude than the second. In a sense, the previous hypoth- eses have been paying more attention to the former. This last one tries to deal with what is considered as an important factor in the decentralization process.

The size of the main city in a submetropolitan county is not necessarily associated with the growth pattern of the county population.

since the growth pattern in those counties will be affected by the various job and service supplies of the contiguous metropolitan counties (CC-SMSA included) with which they maintain a relationship of dependency. The case in the isolated counties will be different. In the latter case the degree of association between manufacturing activity and population growth should be higher. However, it has to fulfil one condition: that the population of the main city surpasses a minimum size (Bogue, 1950; Fuguitt, 1972; Gibbs, 1966; Thompson, 1965; Till, 1972).

An extensive literature has been produced dealing with the size threshold required for classifying a city as a potential growth pole (Berry, 1968; Haren, 1972; Duncan et al., 1956; Morrill, 1970). Generally, little or no growth pole potential is seen for cities smaller than 200,000 inhabitants. Obviously, by definition, all potential growth poles are already SMSAs and thus exclude any nonmetropolitan city or county. However, Fuguitt (1972) considers that:

"Larger non-metropolitan [cities], then, should not be dismissed as potential growth centers in any program to promote the growth of established places." (Fuguitt, 1972:125)

And so, the same rationale that has been applied to the larger potential growth centers could be applied also to the larger cities of rural counties, though with some logical limitations as a consequence of their dependent status.

#### Variables and Indicators

The indicators used to measure the "level of manufacturing activities" are: 1) number of jobs in manufacturing in the county, 2) number of manufacturing plants, and 3) average plant size.

The first two were obtained from the County Business Patterns<sup>1</sup> for 1947, 1959 and 1970. As far as is known such data for 1950 and 1960 are not available. The third indicator results from the division of the first measure by the second.

In order to simplify the model it has been assumed that the road distance from the rural counties (largest city in county as a reference point) to the nearest CC-SMSAs remained constant over the 1950-1970 period, and that the most representative measure should be that computed for 1960 as a middle point in time. The information has been obtained from the Standard Highway Mileage Guide, Rand McNally, 1966; Ayer Directory of Publications, Philadelphia, 1974; and Official State Highway Department Maps, 1972-1973.

The indicators of urbanization are: 1) density, 2) concentration, and 3) residents working in services. The first is a more precise way of measuring the population growth in terms of urbanization, since the physical size of the counties varies tremendously. The indicator of concentration follows the U.S. Bureau of the Census definition of urban places. With respect to the number of residents employed in services, it is assumed that the development of the service sector is one of the aspects of urbanization, and that most of the residents working in services work in the county. The more urbanized an area becomes, the more services are provided in it. If the residents working in services have their place of work outside the limits of the county, it means that they have made a positive evaluation of the residential desirability of that county, which is another source of urbanization.

The source used for these three indicators is the U.S. Census of Population for 1950, 1960 and 1970.

It is important to make explicit the criteria for measuring the "metropolitan population" as a variable influencing the urban development of the contiguous rural counties. Two characteristics must be fulfilled to consider the population as metropolitan in terms of the present analysis: 1) contiguity and 2) metropolitanity.

A rural county will be considered contiguous to a SMSA when they hold a common boundary as defined in the Rand McNally Commercial Atlas and Marketing Guide, 106th edition, 1975. The reason for this definition lies in our concern for the effect of the SMSA on its contiguous counties. Some of these counties are the ones that may not have been contiguous during the complete period under study. Still, they had an SMSA moving in their direction which achieved contiguity, as the 1975 outcome shows.

The condition of being considered as SMSA is fulfilled in those cases that are defined as such in the 1970 Census of Population.

A variation of the indicator, "number of jobs in manufacturing," is the net creation of new manufacturing jobs during a decade. It is shown by the indicator: "increase in manufacturing employment" for 1950-60 and 1960-70 periods.

Net migration for a specific period (decade) is the final balance of immigration minus outmigration. The source for such information is the Bureau of the Census, Current Population Reports, November, 1962 and June, 1971 issues, corresponding respectively to the 1950-60 and 1960-70 periods.

The size of the largest city in the nonmetropolitan counties was taken from the U.S. Census of Population, 1950, 1960 and 1970.

Finally, a variable used to measure the extent to which a county functions as a residential place (residential suitability) is obtained from the difference between the number of members of the labor force residing in the rural county and the number of jobs in the same county. Obviously the figure obtained through this procedure is a type of lower limit (the smallest actual figure possible of number of people residing and not working in the county), since it is assumed that most of the jobs that the county provides are assigned to residents. In case of an extensive practice of commuting from other surrounding counties the actual figure should increase.

The data pertaining to the number of jobs in the rural county comes from the County Business Patterns, 1951, 1959, and 1970. The data about number of residents in the labor force are obtained from the U.S. Census of Population, 1950, 1960, and 1970. It is important to emphasize the time lag between the data for 1950 and 1960. It could be a source of inaccuracy unless the results were considered as general trends rather than very accurate figures. In any case, the 1970 data are not affected by this problem.

#### The Data

Empirical tests of the hypotheses have been performed using the "Datafile for National Sample of Nonmetropolitan Counties".<sup>2</sup> It is a ten percent stratified sample of counties of the U.S. in 1950 with nonmetropolitan status at that time. Counties with nonmetropolitan

status in 1950 were first grouped according to U.S. Census Region (see Appendix A). Within each region counties were assigned numbers randomly. Then a ten percent sample was selected using a table of random numbers. These resulted in a sample containing 279 counties. This sample permits generalization to regions.

However, there are some limitations in the data. Among the 279 counties there were 74 that had to be excluded because of missing data in the variables being used. In two cases (i.e., King William County and Washington County, both in Virginia) there were independent cities formed within their boundaries with the result that data reported for these counties were not comparable to the data from other counties. Both counties were eliminated from the analysis. In other cases the data for certain variables in some states (e.g., Georgia, Texas) were reported for several counties grouped together. At other times the official reason given for missing data was confidentiality. Finally, one case of sampling-error was found: Kenton County, Kentucky, which had SMSA status in 1950, and therefore had to be excluded. In total, this means that almost a 26.52% "non-response error" is introduced. However, despite these limitations, it was felt that the adjusted data set was adequate for testing the hypotheses proposed herein. The overall adjustment is shown in Table 4.

In general, the analysis has been done across the time without looking for the linkages of the variables in one period of time with possible effects in the following.

There are two exceptions: 1) when the relationship involves measurement of increases (or decreases over time (i.e., Net Migration, Increase

Table 4: Sampling Adjustment

	<u>Before Removing</u>		<u>After Removing</u>	
	<u>74 Observations</u>	<u>%</u>	<u>74 Observations</u>	<u>%</u>
National Sample:				
Ring 1	97	34.8	69	33.7
Ring 2	118	42.3	94	45.8
Ring 3	64	22.9	42	20.5
Total	279	100.0	205	100.0
Region 1	14	5.0	14	6.8
Region 2	130	46.6	78	38.0
Region 3	97	34.8	81	39.5
Region 4	38	13.6	32	15.6

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in Manufacturing Jobs, Increase in Population, in a decade) and 2) when an attempt is made to measure the effect of a given condition (i.e., size of the largest city in the county) on the future development of the counties.

A major dimension of the empirical investigation is the analysis of the different "rings," in which it is expected that one will find distinctive relationships<sup>3</sup>.

Findings

The first issue to be considered is the distribution of non-metropolitan industry. Can the pattern of rural industrial location be described as "decentralization" or is it better seen as "submetropolitanization"? The expectation is that the latter description is more informative; that there is a negative relationship between distance from CC-SMSA and industrialization.

If the hypothesis is correct, most of the manufacturing jobs and plants should be located in the first ring. Besides that, if there is a selective discrimination manifested by the size of the plant, the closest ring to CC-SMSA should be the one with largest average plant size.

To ascertain whether or not these are the actual conditions of the industrial location pattern, the mean number of jobs in manufacturing, number of plants and average plant size, by rings, were calculated and are reported in Table 5.

The 1970 pattern of manufacturing employment supports the view of submetropolitanization. Ring 1, which is closest to the CC-SMSA,



Table 5: Mean Values for Level of Manufacturing Indicators  
by Rings, 1947; 1959; 1970.

		<u>Ring 1</u>	<u>(*)</u>	<u>Ring 2</u>	<u>(*)</u>	<u>Ring 3</u>	<u>(*)</u>
Manufacturing Employment	1947	2,470	52	1,640	35	623	13
	1959	2,709	51	1,886	36	679	13
	1970	3,673	53	2,477	35	843	12
Number of Plants	1947	43	42	38	37	21	21
	1959	53	44	44	36	24	20
	1970	55	44	44	36	25	20
Average Plant Size	1947	46	45	31	30	25	24
	1959	45	44	35	35	21	21
	1970	61	44	48	35	28	21

(\*): Percentage of each Ring in the whole Ring's figure obtained by addition of the three averages, for every year.

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has the largest percentage of nonmetropolitan manufacturing employment. The level of manufacturing employment decreases with increasing distance from CC-SMSA. This pattern of decreasing manufacturing activity also holds for the other two indicators: number of plants and average plant size.

There remains the possibility of a change in the trends concerning the industrial location, which can be examined by comparison of the situation in 1947, 1959, and 1970. Turning again to Table 5, the number of manufacturing jobs in Ring 1 is stable, any change being in the direction of a higher share of the absolute figure (from 52% in 1947 to 53% in 1970). In contrast Ring 3 lost 1% during the same period. In 1947 the average number of jobs in manufacturing for the Ring 1 counties was four times the average number of jobs in Ring 3. In 1970 it is slightly more than four times. The percentage in Ring 2 is constant over the period. Thus, the general pattern has been one of stability over the period of investigation.

In the case of the average number of plants per county, there is a clear predominance of the counties included in Ring 1. Over the period 1947-70 there is a slight increase in the dominant position of Ring 1.

With respect to the size of the plants, it can be seen that the second Ring becomes the destination of larger plants during the last two decades. This growth in the plant size in Ring 2 occurs during the same time when plant sizes are decreasing in Ring 3. However, in terms of absolute size, Ring 1 is still the site of more than 40% of the "large" plants.

Additionally, examination of the percentage increase in manufacturing activities over the period indicates that: 1) Whereas the increase in number of jobs in manufacturing, from 1947 to 1970 is 48.7% in Ring 1, and 51.0 in Ring 2, it is 35.3 in Ring 3; 2) The number of plants increases 27.9% in Ring 1, 15.8% in Ring 2 and 19.0% in Ring 3, and finally; 3) The increase in average plant size is 32.8% in Ring 1, 54.8 in Ring 2 and 12.0% in Ring 3.

These percentages demonstrate that the industrialization process is visibly more important in Ring 1, with Ring 2 becoming a further continuation of that predominance. As a consequence, the differentials between Rings 1 and 2 are decreasing while between them and Ring 3 they clearly are increasing.

In sum, the hypothesized inverse relationship between distance from CC-SMSA and level of manufacturing activity is supported by both the pattern of industrial distribution and trends in industrial location.

The second issue--the influence exerted by the CC-SMSA on nonmetropolitan development may be seen in ways other than industrial location.

Hypothesis 2 examines the effects of distance from CC-SMSA on the relationship between level of manufacturing activities and urbanization. It is expected that metropolitan dominance will be most evident in Ring 1 and the least in Ring 3. This gradient of effect should manifest itself by the existence of a stronger correlation between industrialization and urbanization indicators in Ring 1 than in Ring 3.

In order to assess the hypothesized effect, the three indicators of industrialization (number of manufacturing jobs, number of manufacturing plants and average plant size) were correlated with the three measures of urbanization (concentration or percent of people living in places over 2,500 inhabitants, density and number of residents working in services) within each ecological ring.

In 1950 there was a clear differentiation between the first two Rings and Ring 3. For every indicator of level of manufacturing activity except one, the correlations with the three indicators of urbanization are indisputably stronger in the first two than in the third. The exception occurs with the correlation between residents in services and average plant size. Since jobs in service are a consequence of urbanization, and not just industrialization, the demand for services is metropolitan in scope. Therefore, the correlation between number of residents working in services and level of manufacturing activity in Ring 1 counties should be interpreted cautiously, since the whole greater metropolitan region is not being observed.

In 1960 a similar pattern is observed but some changes begin to emerge. First, the correlation between the three indicators of level of manufacturing activities and residents working in services starts to move in the direction predicted in a previous paragraph. That is to say, the smallest correlation occurs in Ring 1, because in this ring, as the population increases, the number of service jobs are not just a consequence of industrialization but a combination of it

with the service supplies of the neighboring metropolitan counties where the residents of the nonmetropolitan counties can work on a commuting basis.

Second, the average plant size has its highest correlations with urbanization in Ring 2, as a general pattern. This means that it is in counties 50 to 100 miles from the CC of the SMSA where the size of the plant becomes most relevant in terms of affecting the level of urbanization.

Finally, in 1970 the relationship between number of manufacturing jobs and concentration and density are stronger in Rings 1 and 2 than in 3. In the case of relating number of manufacturing jobs and residents in services, again the result agrees with the predicted weaker relationship in Ring 1. For number of manufacturing plants the pattern generally follows that in 1950; stronger relationships in Ring 1 and 2 than in 3 no matter which urbanization indicator is used.

Two additional patterns are evident in Table 6 which bear on this hypothesis. In Ring 3 only, there is no correlation between indicators of industrial development and population concentration in any of the three years. However, there is an increasing correlation between industrial development and density. Again, this occurs only in Ring 3. The combination of these two facts suggests that industrial development in Ring 3 is associated with population increases which settle either in the open country or in small villages when their presence does not transform the hamlet into an urban place.

Moreover, during these two decades the trend in correlations between industrial development and urbanization indicators is one

of declining strength in Rings 1 and 2, which the opposite trend is observed in Ring 3. The degree of urbanization of counties within 100 miles of an SMSA appears to be increasing determined by factors other than level of manufacturing activities. To the contrary, in the more remote counties manufacturing activity is becoming more important as a determinant of urbanization.

These results clearly support the hypothesis that there are strong differences in the pattern of association between industrialization and urbanization across nonmetropolitan ecological rings centered on SMSAs. These differences provide important support for concluding that two different processes--decentralization and sub-metropolitanization--are in operation as a result of ecological factors.

Hypothesis 3 sets forth the idea that the population size of metropolitan areas accelerates the process of urbanization in contiguous nonmetropolitan counties. It is an extension of the previous hypothesis in that it presumes the presence of forces in addition to industrialization (i.e., size of the surrounding metropolitan population) which are relevant to urbanization. If nearby metropolitan areas serve as potential markets for the industrial output of non-metropolitan industry, especially those located in the immediate environs, size of the SMSA should be related to the level of manufacturing activity in nearby nonmetropolitan counties as well.

Thus, if size of the metropolitan population actually reinforces the submetropolitanization process in contiguous nonmetropolitan counties, one may expect to find a positive relationship between size and

Table 6: Correlations Between Level of Manufacturing Activities<sup>a</sup> and Concentration, Density and Residents Working in Services. National Sample, Total and By Rings, 1950, 1960, 1970<sup>b</sup>

	1950		1960		1970	
	Concentration	Residents in Services	Concentration	Residents in Services	Concentration	Residents in Services
<b>Number of Manufacturing Jobs:</b>						
Ring 1	.555	.786	.483	.760	.395	.716
Ring 2	.560	.726	.508	.791	.433	.794
Ring 3	.270*	.462	.208*	.542	.195*	.668
Total	.473	.762	.426	.782	.344	.772
<b>Number of Manufacturing Plants:<sup>c</sup></b>						
Ring 1	.543	.592	.483	.760	.420	.731
Ring 2	.554	.699	.508	.791	.485	.750
Ring 3	.159*	.395	.208*	.542	.267*	.409
Total	.464	.649	.432	.695	.398	.738
<b>Average Plant Size:<sup>c</sup></b>						
Ring 1	.333	.546	.325	.419	.253**	.271**
Ring 2	.558	.526	.460	.454	.275	.490
Ring 3	.247*	.388**	.188*	.472	.184*	.656
Total	.384	.541	.333	.484	.227	.437

<sup>a</sup> Computed as of County Business Patterns, 1947, 1959 and 1970.

<sup>b</sup> Percentage of people living in places over 2,500 inhabitants.

<sup>c</sup> All the entries in the table are contemporaneous correlations.

\*The correlations marked \* are not statistically significant at a .05 level.

\*\*The correlations marked with \*\* are not statistically significant at a .01 level.



the indicators of urbanization as well as the indicators of industrialization.

From Table 7 it is not possible to reach a definitive conclusion since the size of the correlations are small to moderate for all of the entries. And for two indicators they are nonsignificant in all three years. Still some insights can be extracted: 1) density and residents working in services become more correlated with size of the metropolitan population over the period under study. The former does so to a major extent; 2) the number of manufacturing jobs in the nonmetropolitan counties decreases or at least remains almost uncorrelated with the size of the metropolitan population. On the other hand, the number of manufacturing plants shows a slight increase in its correlation with population size in 1960, which remains stable in 1970; and, 3) studying the impact of the size of the metropolitan population in the following decades it can be inferred that the density of the submetropolitan counties is positively related with it. Similar case is the evolution over time of the correlation between the size of the metropolitan population and the number of residents in the submetropolitan counties working in services. As the actual fact is that size of the metropolitan population increases over the period it is possible to assume that part of the increasing demand on services, that such growing pattern is going to produce, will be fulfilled by the members of the submetropolitan communities. On the other hand, the impact of the metropolitan population growth, on those indicators of industrialization that show statistical significance in their relationship, does not present any relevant change.

Table 7: Correlations of the Size of the Contiguous Metropolitan Population with the Indicators of Urbanization and Industrialization, National Sample 1950, 1960 and 1970

		<u>Size of the Contiguous Metropolitan Population</u>		
		<u>1950</u>	<u>1960</u>	<u>1970</u>
Concentration	1950	.084 (.446)*	.082 (.454)	.078 (.479)
	1960	.058 (.600)	.059 (.592)	.060 (.587)
	1970	.030 (.788)	.030 (.782)	.031 (.775)
Density	1950	.314 (.003)	.303 (.005)	.291 (.007)
	1960	.365 (.001)	.357 (.001)	.348 (.001)
	1970	.420 (.000)	.423 (.000)	.427 (.000)
Residents Working in Services	1950	.400 (.000)	.402 (.000)	.406 (.000)
	1960	.267 (.014)	.276 (.011)	.285 (.008)
	1970	.416 (.000)	.426 (.000)	.439 (.000)
Number of Manufacturing Jobs	1947	.265 (.014)	.253 (.019)	.240 (.027)
	1959	.320 (.003)	.311 (.004)	.302 (.005)
	1970	.257 (.018)	.254 (.019)	.251 (.021)
Number of Manufacturing Plants	1947	.355 (.001)	.349 (.001)	.343 (.001)
	1959	.445 (.000)	.442 (.000)	.438 (.000)
	1970	.440 (.000)	.440 (.000)	.439 (.000)
Average Plant Size	1947	.024 (.828)	.014 (.896)	.008 (.946)
	1959	-.021 (.846)	-.030 (.787)	-.035 (.748)
	1970	-.043 (.698)	-.046 (.675)	-.046 (.678)

\*The figures within parentheses correspond to the t test significance levels.

It cannot be said that there is no relationship between the size of the metropolitan population and the indicators of urbanization and industrialization. With the exception of concentration and average plant size which do not present a significant relationship, the other four show actual correlations though the level of those correlations is not really high. And, as the metropolitan population grows over time the urbanization of the submetropolitan counties goes in the same direction, whereas the number of jobs in manufacturing does not show change and the number of industrial plants reaches its highest positive correlation in 1959 declining after that point as the size of the metropolitan population continues to grow.

Therefore, from the previous analysis can be extracted that even admitting the impact of the size of metropolitan population as one of the forces that produces the differences in the two ecological instances being studied in this paper, the importance of such impact is limited, especially in terms of accelerating the industrialization process of the submetropolitan counties.

The fourth issue--it is expected that proximity to an SMSA is positively related to the net migration of the nonmetropolitan counties.

In the framework of our analysis, which sees proximity to an SMSA as an important determinant of the industrial migration process, the differential creation of job opportunities may be expected to generate differences in net migration. Since those opportunities are more abundant in the metropolitan counties and their neighboring nonmetropolitan counties, the expectation is of a far higher net migration in the

submetropolitan counties rather than in the remote counties.

The data in Table 8 reveal a clear pattern which is consistent with the present hypothesis. There is a migratory process from the most isolated toward the submetropolitanized counties which becomes stronger in the 1960s. It may be interpreted as an indication of the superior attraction of the metropolis over its hinterland.

Holding in mind the fact these are nonmetropolitan counties, it is instructive to note the alteration between decades in the pattern by rings. In the 1950s all three rings had negative net migration experiences, the amount increasing with distance from nearest SMSA. However, during the 1960s only the most remote counties continued to have negative net migration ( $\bar{X} = -1,900$ ). Counties in Rings 1 and 2 show a turnaround in migration with the submetropolitan counties showing a stronger positive attraction ( $\bar{X} = 1,062$ ) than the interstitial counties ( $\bar{X} = 518$ ). This net migration pattern is parallel to the industrial location pattern and therefore is consistent with the logic of our hypothesis.

In order to examine directly the stated hypothesis we turn to an examination of the association between industrial activity and net migration, controlling for proximity of the county to an SMSA. Table 9 reports the relationship between number of manufacturing jobs in 1947 and 1959 and the net migration of the following decades. The result is striking in that no association is found.

In an effort to further explore the presumed relationship, we expanded the data by allowing the increase in manufacturing jobs to replace the absolute number of manufacturing jobs (Table 10). Some slight changes are detected (some significant correlations and a

Table 8: Average Net Migration by Rings: 1950-60 and 1960-70

	<u>1950-60</u>	<u>1960-70</u>
Whole Sample		
Ring 1	-1,417	1,062
Ring 2	-1,718	518
Ring 3	-1,804	-1,900

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Table 9: Correlations Between Number of Manufacturing Jobs (1947 and 1959) and Net Migration in the Following Decade (1950-60 and 1960-70), National Sample by Rings

<u>Number of Manu- facturing Jobs</u>	<u>Net Migration</u>	
	<u>1950-60<sup>a</sup></u>	<u>1960-70<sup>b</sup></u>
United States Sample		
Ring 1	-.124 (.309) <sup>c</sup>	-.119 (.328)
Ring 2	.036 (.732)	.096 (.356)
Ring 3	.092 (.561)	-.269 (.085)

<sup>a</sup>This column shows the correlation between Number of Manufacturing Jobs in 1947 and Net Migration in 1950-60.

<sup>b</sup>This column shows the correlation between Number of Manufacturing Jobs in 1959 and Net Migration in 1960-70.

<sup>c</sup>The figures within parentheses represent the t test significance level.

Table 10: Correlations Between Increase in Manufacturing Jobs<sup>a</sup> and Net Migration, National Sample by Rings, 1950-60, 1960-70

Increase in Number of Manu- facturing Jobs	Net Migration	
	1950-60	1960-70
United States Sample		
Ring 1	.242 (.045) <sup>b</sup>	.085 (.485)
Ring 2	.230 (.026)	.092 (.379)
Ring 3	-.109 (.492)	.111 (.484)

<sup>a</sup>The Increase in Manufacturing Jobs is computed as from 1947 to 1959 and from 1959 to 1970, respectively.

<sup>b</sup>The figures within parentheses represent the t test significance level.

certain homogeneity in Rings 1 and 2 for 1950-60) but basically the situation remains unaltered. There is no evidence that net migration is significantly related to level of manufacturing activity.

The fifth issue--size of the metropolitan population is considered to be a factor attracting immigrants to the fringe areas of the SMSA. Since it has been observed that creation of new jobs in manufacturing is not adequate to account for the net migration, the decisive factor in net migration, has to be sought in alternative directions. One plausible alternative could be that the attraction of the city is a combination of actual job opportunities, potential job opportunities (many times only in the mind of the immigrant), and the attractiveness of the convenient services that the city offers to the whole immigrant family.

To examine the empirical support for such a plausible alternative the correlation coefficients were computed for the association

between: a) size of nearest SMSA population, 1950 and net migration

50-60:  $r = .404$  ( $p < .000$ )

b) size of nearest SMSA population, 1960 and net migration

60-70:  $r = .475$  ( $p < .000$ )

Clearly there is a significant correlation, although the size of the correlations is not very relevant. In any case, as the metropolitan population size increases from 1950 to 1960 the correlation with net migration moves in the same direction. Therefore, some sort of specific effect of the metropolitan dominance is detected in the submetropolitan counties.

The sixth hypothesis deals with the notion that one of the distinctions between the two industrial dispersion processes is the role played by the size of the largest city within the county. It is our expectation that the closer the county is to CC-SMSA, the less important that role will be.

The expectation is based on the assumption that the size of the largest city will play an important role in the attraction of new manufacturing jobs. Through employment multipliers, its influence will be transmitted to indicators of urbanization. It is expected that this process will be evident particularly in Ring 3 but less so in Ring 1, since there its role is counter-balanced by the dominance of the metropolitan area.

Table 11 shows the correlation values of the population of the largest city in the nonmetropolitan counties with the subsequent changes in manufacturing employment, residential suitability, number of residents working in services and population growth.

The effect of the size of the largest city as a pole of attraction for manufacturing jobs has little support during the 1950s. During the 1960s, the evidence becomes stronger but the levels of association are low. It is worthy of note that the association is stronger in Ring 2 than in Ring 1 (.461 versus .294).

In the 1950s in terms of residential suitability (use of the county as a residential place but not as a working place) there is not a clear difference between the first and the third Rings in the role played by the largest city in the county; both cases are more important than the case of Ring 2. In the 1960s there are some changes:

Table 11: Correlation Matrices - National Sample

Ring	Population of Increase in Largest City Manufacturing in the County Jobs			Increase in Population			Residential Suitability			Residents Working in Services		
	1950	1950-60	1960	1950-60	1950-60	1960	1950-60	1950-60	1960	1950-60	1950-60	1960
Population of Largest City in the County, 1950	1											
	1											
	1											
Increase in Manufacturing Jobs, 1950-60	-.165 (.175)*	1										
	.209 (.043)	1										
	-.016 (.920)	1										
Increase in Population, 1950-60	.465 (.000)	.153 (.209)	1									
	.356 (.000)	.313 (.002)	1									
	.527 (.000)	-.133 (.402)	1									
Residential Suitability, 1960	.704 (.000)	-.123 (.315)	.758 (.000)	1								
	.416 (.000)	.294 (.004)	.519 (.000)	1								
	.691 (.000)	-.172 (.274)	.607 (.000)	1								
Residents Working in Services, 1960	.587 (.000)	-.005 (.968)	.449 (.000)	.697 (.000)	1							
	.773 (.000)	.411 (.000)	.694 (.000)	.651 (.000)	1							
	.860 (.000)	-.078 (.624)	.670 (.000)	.881 (.000)	1							

Continued on next page.

Table 11: Continued

	Ring	Population of Largest City in the County, 1960	Population of Largest City in the County, 1960	Increase in Manufacturing Jobs, 1960-70	Increase in Population, 1960-70	Residential Suitability, 1970	Residents Working in Services, 1970
Population of Largest City in the County, 1960	1	1					
	2	1					
	3	1					
Increase in Manufacturing Jobs, 1960-70	1	.294 (.014)	1				
	2	.461 (.000)	1				
	3	.254 (.105)	1				
Increase in Population, 1960-70	1	.323 (.000)	.409 (.000)	1			
	2	.447 (.000)	.308 (.003)	1			
	3	.467 (.002)	.414 (.006)	1			
Residential Suitability, 1970	1	.666 (.000)	.184 (.129)	.599 (.000)	1		
	2	.302 (.003)	.207 (.046)	.453 (.000)	1		
	3	.815 (.000)	.416 (.006)	.546 (.000)	1		
Residents Working in Services, 1970	1	.817 (.000)	.259 (.032)	.593 (.000)	.941 (.000)	1	
	2	.736 (.000)	.474 (.000)	.790 (.000)	.553 (.000)	1	
	3	.913 (.000)	.416 (.006)	.571 (.000)	.962 (.000)	1	

\*The figures within parentheses are the t test significance levels.

1) in Ring 3, the size of the largest city becomes very highly correlated with the residential suitability of the county; 2) in Rings 1 and 2 the relationship becomes weaker, but still comparatively more important in Ring 1 than in 2.

The variable "residents working in services" (for 1960 and 1970) may be seen as a partial indicator of the employment multiplier effects as well as the "division of labor." There is a fairly strong and positive correlation between growth in population and the number of workers involved in service industries. This is true for both 1960 and 1970 and all three nonmetropolitan rings. Given this relationship, the association between the largest city in the county and the service sector labor force may be seen as an indicator of future urbanization in the county.

In the 1950s, the further the county was from the CC-SMSA the stronger the correlation between size of the largest city in the county and number of residents working in services.

It is difficult to conclude from what has been said that the position of the largest city in the nonmetropolitan county is such as stated in the hypothesis. It is true that the role of the largest city seems to be more important in Ring 3, both in the 1950s and the 1960s, more as a center of service and residence supplies than as a center of attraction of new manufacturing jobs. Only Ring 2 shows a slight association between the size of the largest city in the increase in manufacturing jobs. A possible interpretation of the situation is that, whereas in Ring 1 and 3 the role of the city is predominantly that of supplying services and residential facilities,

in one case for the metropolitan neighbors, in the other for the small surrounding communities, in Ring 2 any population development of the largest city will rely more on new industrial activities and vice versa.

Basically, looking at the effect of the size of the largest city in the county over the attraction of new manufacturing jobs, the hypotheses do not find any support. On the other hand, if what is analyzed is the relationship between the former and the number of residents in services, the response fits with hypothesis for 1950s but becomes less clear though it still supports the hypothesis in 1960s. It appears that one of the main roles of the largest city in the counties of Ring 3 is as a residential center for workers who commute to surrounding counties.

#### Conclusions and Policy Implications

To categorize counties as metropolitan and nonmetropolitan runs the risk of oversimplification hiding the distinctive conditions that typify several subcategories of the latter. Ignoring them will lead to misinterpretation of the effects of current population policy as well as failures in the formulation of new policies.

The present study has attempted to determine whether such distinctive conditions exist when one considers the influence of important ecological factors on industrialization and population distribution processes. The results lead to an affirmative answer:

- 1) If we consider the industrial location pattern, it is very clear that the submetropolitan counties have become more industrialized than the more remote counties, from 1947 to 1970, both in terms of absolute figures and in terms of percent.

of increase.

- 2) If we consider the relationship between level of manufacturing activity and urbanization controlling for distance from the nearest SMSA, the general patterns in Rings 1 and 2 are very much alike and differentiated from the pattern of Ring 3.
- 3) Net migration plays an important role in future population distribution and at the same time is negatively related to the distance from the county to the central city of the nearest SMSA. This means that submetropolitan and remote counties present different migratory incidence and therefore an increase in the gap shown by the population distribution in both cases is foreseen.

These general conclusions support the argument for the existence of two distinct processes of nonmetropolitan industrial location. Once that fact has been established is important to consider the motivations, interests and manner of participation of significant "actors" in these processes. There are three "actors" we wish to consider:

- 1) The individuals as such, as members of domestic economies, or as members of either the urban or the rural communities;
- 2) the firms represented by their managers, and finally
- 3) the policy makers as members of the political structure.

If it is true that there is a tendency for urbanites to flee from the city, it is no less true that their dependency on wage work as the main source of income does not allow them to live far away from their places of work. Besides, one must not overlook the fact

that historically cities have been important centers of consumption for both individuals and domestic economies. Thus, urban growth is stimulated and sustained by both productive and consumptive advantages inherent in them.

In terms of the present analysis the fleeing process is reflected in the important development of ecological zones within the 1-50 miles and 51-100 miles rings. The latter has become increasingly important in the last decade. Reinforcing the effects of the centrifugal movement from the central city there is an opposite movement, but with the same point of destination: i.e., from the isolated counties to the fringe of the metropolitan area. Some of the immigrants remain in the fringe territory, while some move further toward the core of the metropolitan area. These transformations gain momentum as new technologies develop and generate higher living standards.

One of the components of the population growth process in the nonmetropolitan counties is net migration. The foregoing analysis indicates that there is a concentration of immigrants in zones nearby the SMSAs. What is not known is the origin of such immigrants. Neither is it clear whether they are attracted by the new industrial job opportunities. The results of our analysis seem to indicate that they are not, but the actual fact is unknown. It is possible that the lack of association between industrialization and population growth is a consequence of multiplicative effects of new industrial jobs and the degree of dominance exerted by the Central City of an SMSA on the contiguous counties. But since the lack of association is

common among the different ecological zones (rings), further research is needed to clarify what actually is happening. A different explanation should be needed to deal with the more isolated counties: e.g., a possible counteracting effect of a continued stream of outmigration which the creation of new job opportunities fails to halt because of the outmigrants lack of skill to apply for those jobs and an emergent immigration stream of workers qualified for the new jobs.

The reason for taking into account the different ecological effects in the industrialization process has very much to do with evaluating existing policy about the impact of increasing manufacturing activities in the process of population distribution, and in a further extent in formulating new policy in that field.

Another important issue is the attitude of outmigrants about desirable solutions for their future welfare. Do they prefer to remain in their counties of origin? And in case of an affirmative answer, which is the best way of dealing with the problem of unemployment. In other words, do the rural communities consider industrialization as a desirable good? To answer that question research is needed, which attempts to measure not only the public opinion in the counties but the views of leaders who are going to participate in the decision-making process at the time the communities decide their goals.

But still, there is reason to ponder whether the community decision, whatever it is, will affect the final verdict of the entrepreneurs who control the industrial firms.

Firms try to obtain maximum benefit in locating new factories, and they will look carefully at the different components of the cost-benefit equation. At a national level, doing so will induce many firms to locate new plants nearby the urban centers. There are two powerful reasons:

- 1) the proximity to the consumption markets, and
- 2) the accessibility to the labor force supply.

However, there are some characteristics that can produce a split in the decision-making process about the location of new industries:

- 1) the lack of organized unionism,
- 2) the lack of skillful jobs, and
- 3) the predominance of labor intensive kind of activities in the new plant.

These factors could lead a firm to consider the possibility of looking for areas where the cheap manpower is available.

Those last three characteristics contribute to the recognition that a more detailed analysis must be done at a regional level, and even at a state level, which might show important differences within the national pattern. There is an extensive literature agreeing with the need of such research (Berry and Horton, 1970; Fuguitt, 1972; Morrill, 1973; Summers et al., 1975; Till, 1973). As a comparison, the basic reasoning shown in the previous paragraphs is the same that provokes the expatriation of numerous firms to other counties where the conditions are more in consonance with interests of the corporations.

Finally, the political actors will have their criteria for choosing the most adequate development programs to promote the general

welfare of the country. These are reflected in various legislative actions: e.g., The Economic Opportunity Act of 1964, Economic Development Act of 1965, and Rural Development Act of 1972. These pieces of legislation are based on the hypothesis that any policy encouraging the industrialization of depressed rural areas is going to stop the outmigration process, improve rural living conditions and, at the same time solve to a certain extent the problem of overpopulation that endangers the standard of living of the growing metropolis. Empirical confirmation of this logic is not available.

Therefore, despite Congressional efforts to deal with those problems, and despite the preferences of the individuals and small communities, the powerful interest of the firms within the framework of a free-market economy will dominate the final decision in the progress of industrial location and consequent population growth. If the economic system needs accumulation of capital as its main source of survival, such accumulation will be found more and more in the economies of scale built up within urban systems. Systems that have been reinforced with the population movements of the last decades. From this perspective it is difficult to foresee a significant decentralization of industry in the years to come, rather it is more probable that submetropolitanization of industry will characterize the trend of industrial location.

## FOOTNOTES

<sup>1</sup>The original title of the publication for 1947 was "Business Establishments Employment."

<sup>2</sup>A project under the direction of Gene F. Summers in the Center of Applied Sociology, Department of Rural Sociology, University of Wisconsin-Madison, and supported by the College of Agricultural Life Sciences of the same university and the North Central Regional Center for Rural Development, Ames, Iowa.

<sup>3</sup>Rings are defined as: Ring 1, when the distance from the CC-SMSA to the largest city in the nonmetropolitan county is smaller than 51 miles; Ring 2, if the distance is between 51 and 100 miles; Ring 3, if the distance is larger than 100 miles.

## Appendix A: Census Regions of the U.S.A.

<u>Region</u>	<u>States</u>
1. Northeast	Maine New York Pennsylvania New Jersey
2. South	Maryland West Virginia Virginia Kentucky Tennessee N. Carolina S. Carolina Texas Oklahoma Arkansas Louisiana Mississippi Georgia Florida Alabama
3. North Central	North Dakota South Dakota Nebraska Kansas Minnesota Iowa Missouri Wisconsin Illinois Michigan Indiana Ohio
4. West	Washington Oregon California Idaho Nevada Montana Arizona Colorado New Mexico

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