SHIFTS IN CORPORATE HEADQUARTERS, 1957-1983

by

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This thesis is dedicated to my parents

Dr. Stuart A. Bessler and Helen M. Bessler

and to Leslie J. Bryant

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ABSTRACT

Many demographic, economic and social changes have taken place in the United States during the post World Ware II era, and, collectively, these changes have resulted in a dramatic transformation of the national space economy. One aspect of this transformation has been a decentralization in the locations of corporate headquarters.

Through the use of Fortune 500 data, this empirical, descriptive study examines geographic shifts in headquarters locations during two adjacent time periods, 1957-1970 and 1970-1983. As the geographic shifts are twofold: interregional and intraregional, the scale of analysis will range from census divisions to standard metropolitan statistical areas, to central cities.

Three main hypotheses, relating population change to headquarters relocations are examined during the two periods for both inter- and intraregional shifts, and Spearman Rank Coefficients are derived relating these two variables.

Finally, this thesis identifies those census regions and central cities which have undergone major changes in their corporate headquarters composition both in terms of increase and decreases for each of the three years 1957,

1970, and 1983. Furthermore, the use of a Markov-Chain Model allows rough estimations of the Future Spatial distribution of corporate headquarters.

CHAPTER 1

INTRODUCTION

Many demographic, economic, and social changes have taken place in the United States during the post World War II era, and, collectively, these changes have resulted in a dramatic transformation of the national space-economy. The once dominant northern core region has experienced decreasing growth rates (measured in per capita terms) in several economic indicators over a number of years. Furthermore, concurrent with this stagnation felt in the North, there has been an increase in the growth rates of the same indicators in the nation's periphery.

As will be discussed in the next chapter, three of the most important changes during this postwar era have been experienced in the areas of: (1) population, (2) transportation and communication, and (3) technology. Collectively, these changes have resulted in a decentralization of both manufacturing employment and industrial capital, and extensive research has been devoted to those topics (Moriarty, 1981; Howell, 1975; Sternlieb and Hughes, 1975; Burns, 1977; Rees, 1978). However, very little

research has focused on the spatial redistribution of corporate headquarter units during the same recent period.

This thesis is an empirical, descriptive study of the relocation of United States corporate headquarters during the post World War II era. In particular, this thesis examines geographic shifts in headquarters locations during two adjacent time periods: 1957-1970 and 1970-1983.

This thesis is primarily concerned with the shifts in spatial distributions of both corporate headquarter units and corporate headquarter-controlled employees and with how these geographic shifts have correlated with the geographic shifts in the United States population during the same period. As a result, the thesis emphasizes the following longitudinal trends: (1) the numbers of corporate headquarters in specified areas; and (2) the numbers of total employees controlled by those headquarters. The geographic shifts examined are twofold: interregional and intraregional. Therefore, the scale of analysis will range from census divisions to Standard Metropolitan Statistical Areas (SMSAs) to central cities.

All the data utilized in this thesis have come from the Fortune 500 magazine. Because only the top 500 firms (in terms of assets) are listed, firms may enter anywhere on the list, or disappear just as quickly. Firms which enter the list in a specific year will be known as births, 2

while those which disappear will be known as deaths. Neither birth nor death implies anything except the existence or the lack thereof on the list.

In addition, where this thesis looks at these hypotheses during two distinct periods (1957-1970 and 1970-1983) the year 1970 is arbitrarily chosen as a midpoint, and no special consideration should be assigned to this year.

Throughout this thesis, three major hypotheses and several minor ones will be examined. The first of these major hypotheses is that areas {either census divisions, standard metropolitan statistical areas (SMAS) or central cities} which have undergone large increases in population will also have undergone large increases in both the number of corporate headquarters and corporate headquarter controlled employees.

Second, it is expected that areas which experienced large population gains will have also experienced:

1. a large in-migration of corporate headquarters and employees;
2. a large number of new headquarters and employees being born within said area;
3. few out-migrations from the area; and
4. few deaths occuring within the area.

Third, it is expected rates of redistribution (migration) were higher during the post-1970 era, than from 1957-1970. The reasons for expecting each of these

hypotheses to be true will be discussed as they appear in the text.

Finally, this thesis will identify those census regions and central cities which have undergone major changes in their corporate headquarters composition, both in terms of increases and decreases for each of the three years 1957, 1970, and 1983. Furthermore, this thesis will extrapolate the data to the year 1996 in order to determine the direction of future trends in the location and migration of corporate headquarters.

CHAPTER 2

LOCATION FACTORS: A LITERATURE REVIEW

There has been extensive research conducted concerning the theory of industrial location and the important factors which influence the decision where firms locate their production units.

Perhaps the first to put forth a general theory of industrial location was Alfred Weber in 1909. His text was translated into English in 1929 as Theory of the Location of Industries. Webers general theory was developed to apply to any political, cultural, or economic system, and is based on a series of assumptions which permitted simplification of the analysis. Weber's overall objective was "to determine the minimum-cost location for a manufacturing plant" (Wheeler and Muller, 1981). The three major location factors, according to Weber, are transport cost, labor cost, and agglomeration. Weber's general theory of industrial location, however, contain a number of shortcomings which limit its application in explaining manufacturing location. Many of these shortcomings are a result of his basic assumptions, and because of these shortcomings, many others have developed theories of their own.

Whereas Weber viewed location as a result of geographic differences in the cost of producing and delivering a product to the market, others, such as August Losch (1954), focused on spatial variation in sales potential. Losch developed a theory based on maximum profit, believing that "in a free economy, the correct location of the individual enterprise lies where the net profit is greatest" (Losch, 1954). Whereas Weber believed location was based on a the least-cost theory, Losch believed that location was based on the area of greatest money profit.

Walter Isard (1956) attempted to develop a general theory of location by integrating works of both Weber and Losch, as well as others. In his book Location and the Space Economy (1956), Isard linked location theory to the general theory of economics through a substitution principle. "In economic theory, labor can be substituted for capital, for example: likewise, the selection of a manufacturing site from among alternative locations can be viewed as substituting expenditures among the various production factors such that the best site is chosen" (Wheeler and Muller, 1981).

David Smith (1971) recognized the complexity of industrial decisions, and developed his theory by assuming a profit motive, similarly to Losch. Smith's model, however, unlike those before him, "allows the incorporation of

suboptimal behavior into industrial location theory and therefore is more in step with the increasingly recognized noneconomic factors of importance in the industrial location theory" (Wheeler and Muller, 1981).

A more recent contribution to the theory of location came in 1972 in Michael Webber's Impact of Uncertainty on Location. Webber realized that the previous theories all shared a common assumption, that of perfect knowledge of alternatives and complete information. Webber introduced a theory of uncertainty, realizing that "actual firms simply have to operate with educated guesses about alternative and future conditions" (Wheeler and Muller, 1981).

Uncertainty can affect location in a variety of ways. For example, usually new firms have more uncertainty than older firms, and therefore tend to invest smaller amounts of capital. Because of the uncertainty and smaller initial investments of capital, new firms tend to be smaller and to locate in or near large cities to obtain necessary external services.

Although these theories all differ in their modes of analysis, they are all similar in that they attempt to explain locational choices through a variety of factors. The most important factors in determining industrial location are material locations and prices, market locations,

energy sources, cost and availability of labor, government influence, and sites and services.

Factors of Location

Materials and Markets

The degree of attraction exercised by raw materials varies widely depending on the material itself, the process that uses it, and the technology available for distribution and utilization. For example, if the material utilized undergoes a great weight loss upon being converted to the finished product, the industry would be attracted to the point of material production. By doing so, transport costs on useless waste matter are avoided. An example of the type of industries which tend to locate near the raw materials is the manufacturing of beet sugar, for the weight of raw sugar extracted is about one-eighth of the weight of materials used. Further examples are: pulp and paper weigh about two-fifths of the pulp wood used; butter, cheese, and manufactured milk weigh about one-sixth the weight of raw materials, and the weight of pig iron produced from a blast furnace is about one-third that of the materials.

The degree of perishability of the material is also an important consideration in location. A perishable material, or one which travels badly, naturally attracts

the processes using it. For example, fruit and vegetable-canning are often found near the sources of supply.

The value of the raw material is also significant, for a material of high value such as wood can more readily bear the cost of transport than can a material of low value per unit of weight such as copper ore. Transport costs add less proportionately to the cost of material of higher value than one of lower value. Therefore, industries utilizing high-value materials are not tied as tightly to the site of raw materials as those industries which utilize low value materials.

Other factors of materials which influence location include the possibility of using substitute materials and/or the number of materials involved. For example, the electronics industries use numerous materials, none of which are significantly weight-losing or perishable and which are required in relatively small quantities. In this industry, materials exert little if any influence on location.

The attractions of a market location have become very significant for many modern industries. As with the raw materials, the influences of markets depends upon several factors.

First, an increase in weight or bulk or fragility in the product tends to cause the producer to seek a

location near the main market. Again, transport costs will be lower by producing the product near the market. Industries of this type are often those which add water to their product. For example, almost every large American city has a Coca-Cola bottling plant. Also, in the bakery processes, there is an increase of weight, bulk, and perishability, and therefore bakeries are strongly market oriented.

A high degree of perishability in a product also makes a market location attractive. Many foodstuffs are perishable, and the makers of such are preferably located close to the consumer. Other goods are perishable in a different sense and are closely tied to their major market. Local newspapers for example, are of relative little value outside their own locality, and are thus closely tied to their local market.

The production of relatively cheap commodities, to whose selling price transfer costs can add substantially, also makes a market location preferable. Cement manufacturing, for example, is relatively cheap, but also heavy. Transport costs therefore greatly increase the selling price as the distance between the plant and market increases.

The size of the market area is another consideration. For example, if the market is concentrated and specialized, it is to the manufacturer's benefit to be located

in or near that market. Thus, the manufacturer of textile machinery is usually found in or near textile centers. Similarly, the farm machinery industry in the United States is located with access to the best market area in mind, the Midwest.

Conversely, if the market is widespread and costs of distribution add appreciably to total costs, the industries serving it are commonly widespread also. Again, examples include the baking, bottled beverages, and ice industries.

Energy Sources

Three broad categories of industry based on the role of energy supplies have been devised by Estall and Buchanan (1961). The first of these are those industries in which fuel and power costs are of relatively little importance in location. In these industries, the quantities used are relatively small, or if the quantities are large, the cost of energy is minimal compared to the cost of raw materials or access to markets. Industries of this type include transportation equipment, leather and leather goods, electrical machinery, and printing and publishing.

At the other end of the spectrum, there are the few processes where energy supplies remain a dominant

consideration in location. This is the case with most electrometallurgical and electro-chemical processes.

Between two extremes come a whole range of processes in which fuel and power costs may influence the location choice in varying degrees. (Examples include blast furnaces and steel works, and industries of cement and bricks, clay refractory and glass containers.) For these processes, the raw material procurement or the marketing of the product must be weighed against energy supplies.

Labor

A supply of labor is obviously fundamental to all manufacturing processes, but the importance of labor in location decisions varies widely from industry to industry. Industries which are very labor intensive and thus tied very closely to where a suitable labor supply exists, include apparel and related products, leather industries, textile mills, fabricated metal products.

Firms where the real cost of labor is not of comparable importance are not indifferent to labor considerations. All firms generally consider three features of labor, including: (1) geographic variations of labor cost, (2) geographical variation in labor supply, and (3) the geographical distribution of labor with specific skills.

Some labor cost variations are not only a question of differing wage levels but also include such factors as labor attitudes, turnover, and absenteeism, as well as the possibility of having to compete with other firms in the vicinity for available labor. Attitude is a very important factor of labor. Often militant trade unions become established in older industrial areas, at times causing worker-management relations to become strained. Such an environment may not be attractive to firms seeking a new location, nor are they attractive to new firms just beginning.

The size of the town was also found to affect labor costs, and not only because of the wage differential between large and small centers. Some firms prefer to locate in smaller centers, where there are often lower rates of labor turnover (fewer alternative jobs exist), lower rates of absenteeism, and generally favorable attitudes.

Geographical variation in labor supply are also significant. Large labor concentrations are often attractive to industries, for in a large population the firm is more likely to find the particular type of employee which suits their needs best. Large labor concentrations also provide a market for the manufacturer of consumer goods, and thus two very important factors, supply of employees, and demand for the product, can be satisfied by locating in large centers.

The complementary labor pool available (age and sex) is also very important. Male and female labor are often found together for obvious reasons. Therefore an area with a large percentage of industries employing primarily male labor may be a very favorable place to establish an industry employing mainly female labor. "In the United States such a situation is often held to be the original cause of the location of the silk and rayon industries in the eastern Pennsylvania region" (Estall and Buchanan, 1961).

Finally, the need for special skills is a further important factor in explaining industrial location. Some industries still call for a high degree of manual skill. These processes "often tend to concentrate at the point where the industry first grew up, and this naturally attracts newcomers in the business" (Estall and Buchanan, 1961).

Government Activities

In addition to the previously discussed internal influences of location, there are a few external influences which should be discussed briefly. One of the most important external influence is surely the activities of central governments.

Government generally affects industrial location through laws such as those relating to hours of work, minimum wages, minimum ages of workers, etc. Often differences from one state to another can play a role in locational decisions. For example, in New England, it was illegal to employ women after six p.m. until comparatively recently, while in the southern states they could be employed on night shifts. "The less restrictive laws in the south constituted a strong attraction to some firms, especially in the cotton textile industry" (Estall and Buchanan, 1961).

The effects of differential taxation by states also may affect locational decisions. For example, Massachusetts has heavy local taxes, and very few industrial firms are located there.

Communication and Contacts - Factors for Corporate Headquarters

Many of the factors which have been discussed to this point gain importance when applied to manufacturing plants. Factors such as labor, markets, and transportation have collectively begun to alter the space economy for the post World War II era by making previously inaccessible or unprofitable sites attractive to manufacturing plants.

The question, however, remains as to what locational factors affect the location of corporate headquarters. In order to discuss these factors we must first look

at the functions of these headquarters. Basically, the head or corporate offices of multi-plant enterprises are concerned with the general long-term rather than with the day-to-day operations of the firm. In other words, the head office is involved with such aspects as negotiations, contract acquisitions, lobbying with government and other public officials, etc.

Tornquist (1968) has argued that these important contacts "cannot be maintained with adequate efficiency by letters and telecommunications but demand direct personal contact between personnel." That these contacts often demand the personal attendances highly expert personnel is perhaps bound up with the fact that contacts in many cases involve considerable elements of what may be called problem-solving, planning, keeping an eye out on the course of events, pulse feeling, and reconnaissance. The contacts often take the form of talks and discussions in which personal effort is of great importance.

This sentiment is echoed by Goddard (1971): "In the case of office location, the principal inputs and output often consist of information flows and these clearly are an important cost item in the location equation, particularly when these flows demand personal contact by telephone or face to face meetings."

Finally, some people emphasize the likely continuing importance of face-to-face contact for certain types of business contacts for which the costs are likely to remain high (Tornquist, 1970).

The need for contacts, especially face-to-face, has been exhibited in the spatial distribution of headquarters in the past. These face-to-face contacts are maintained, developed, and utilized more often and with better results when head offices agglomerate in information-rich locations. Therefore, the top central functions of modern business enterprises show a very strong tendency to concentrate in a few major metropolitan complexes; often, though not always (New York is the case in point), these are national capitals (Lloyd and Dickens, 1977).

This is often cited as the reason headquarters have tended to aggregate in certain specific cities and regions. For example, in 1957, 131 or 26 percent of all 500 headquarters were located in New York's central city. Even as late as 1973, 22 percent of the top 500 headquarters were located in the New York central city limits.

Therefore, whereas many changes have occurred in the national space economy which have collectively resulted in a decentralization of location of manufacturing plants, with respect to headquarters, there are still factors which pull towards aggregation. As we shall see in the course of

this thesis, however, the ties to these location factors (contacts and communications) have been loosened in recent years.

Sites and Services

The last of the important locational factors is the need for specific sites and services by different industry types. Many industrial processes require a large area of level land for a single-story layout, and an otherwise very promising general location may be ruled out for the lack of such an area. In other industries, where the equipment imposes heavy loads upon the foundation of the building may be limited by the local geology.

The availability of services may also be a considerable factor in actual site choice. "A prospective manufacturer will be encouraged by the suitable provision of such things as electric power and water supplies, adequate refuse disposal, (and) efficient fire and police services..." (Estall and Buchanan, 1961).

With the knowledge of which factors have been historically important in the location of industries, it is now possible to examine three major types of change which have occurred in the post World War II era. These changes have collectively acted to reduce the relative importance of most of the historical location factors, except for the

availability of labor and markets. These changes have taken place in the areas of population, transportation and communication and technology.

Changes

Population

Two major trends have characterized the United States population during the postwar era. The first of these is sheer growth in numbers. The population of the nation increased over 45 percent from roughly 152 million people in 1950 to over 226 million in 1980 (U.S. Bureau of Census). Similarly, during this same period the labor force grew from 62 million to 102 million people, while disposable income increased almost 300 percent from 362 billion dollars to over 1000 billion dollars (1972 prices) (U.S. Department of Commerce, 1981). Also, the rise in female labor has caused a very dramatic change in the economic and social composition in the U.S., by not only increasing the labor force in terms of numbers, but also by increasing the amount of families with two wage earners.

Second, the geographic distribution of the population has also changed. Recent change, moreover, has been primarily in the opposite direction of earlier population flows. During the 1920s and 1930s, the general population flows were (1) from the southern latitudes to northern

ones; and, (2) from rural areas and small communities to large urban cities. During the postwar era, the flows have tended to become (1) a general north-to-south migration; and, (2) a general out-migration from central cities (Wardwell, 1980). For example, over the twenty year time period span 1960 to 1980, the Northeast and North Central Regions experienced changes in resident population of 9.8 percent and 12.2 percent respectively, compared to 46.2 percent and 53 percent for the south and west regions, respectively. Furthermore, the percentage increase (0.2%) from 1970 to 1980 of population residing in the central cities of SMSAs was far less than that for areas outside central cities and other nonmetropolitan areas (15.2% and 15.1%)(U.S. Bureau of Census).

Transportation and Communication

As the population has grown and the concentration of population has shifted, transportation and communication systems have also grown and expanded in order to efficiently service the population shifts. The construction of the interstate highway system, along with extensive state road systems, increased the total miles of highway almost 16 percent from 3,313,000 miles in 1950 to almost 4,000,000 in 1980.

Due in part to the increased amount of disposable income, as well as a better and more efficient road network, there has been a rise in reliance upon private motor vehicles. In 1960 there were 342 vehicles in use per 1,000 people, compared to almost 500 vehicles per 1,000 people in 1980.

The increase in private vehicle use, both in commuting and in the transportation of goods to and from the work place, has resulted in a decreasing emphasis on the nation's railroad industry. The use of railroads decreased almost 54 percent from 1960 to 1980 (Wardwell, 1980).

The postwar era has also seen major changes in the communication network of the United States. In terms of numbers, telephones in operation increased almost 50 percent from 1965 to 1975. Similarly, the number of television receivers in use increased about 35% over the same period (Moriarty, 1981).

Technology

Two major changes in technology during the postwar era in the United States have been noted by Noyelle (1983:287) and a third by Wardwell (1980). Noyelle first identifies the increased usage of assembly lines in manufacturing, "...which has made large-scale production of cheap consumer goods possible" (Noyelle, 1983).

Furthermore, Noyelle suggests that the development of computer and communication technologies has pushed forward tremendously the capacity of management to control large and widely dispersed operations.

The third major technological change during the postwar era has been the improvement in the nation's airline industry. Government deregulations of ticket cost and an increase in the number of airports both contributed to the 400 percent increase in average number of passenger miles witnessed between 1960 and 1980.

Although these changes have been at work for decades, their effects are just now being recognized. "The empirical manifestation of these forces is seen in the changing spatial pattern of sector employment shifts and industrial decentralization" (Noyelle, 1983).

As mentioned previously, collectively, the changes have resulted in a decentralization of both manufacturing employment and industrial capital.

Manufacturing Employment: An Historical Overview

The geographic redistribution of manufacturing employment in the United States is best understood when looked at two ways: (1) Interregional manufacturing employment shifts, and (2) Intraregional manufacturing employment shifts.

Interregional Shifts

As a region progresses through stages of development, a change occurs in the main employment sectors of the regional economy. This is known as the internal growth theory (Wheeler and Muller, 1981). This regional specialization is reflected in a shift from a high dependence on employment in primary and secondary sectors to an increasing dependence on employment in the tertiary sector. The economy of a region, once based primarily on agriculture, mining, fishing, etc., begins to change by local application of technology. The economy will generally move away from almost exclusive trade in agricultural items to trade in manufactured items. "At first, these may be simply processed agricultural products, but eventually a point is reached at which additional growth in per capita income is not used chiefly to purchase agricultural items, but instead to obtain manufactured goods" (Wheeler and Muller, 1981). Thus the region shifts slowly from an agricultural to an industrial base. With the change from an agricultural to an industrial base, there is an increased need for the tertiary services. Because of this shift in employment, manufacturing employment is likely to grow or stagnate in a region merely because of the region's stage of development.

Thus a region such as the West is likely to gain in manufacturing employment as the region develops, while in previously well-developed regions such as the Northeast, manufacturing employment is likely to be less important as the region stagnates. This is exactly what has been occurring. "The dominance of the North. . .has been on the wane for a considerable period of time as new manufacturing growth has dispersed. . .through the country" (Moriarty, 1981).

This trend has also affected different types of industries at different rates. By looking at location quotients for the 20 (2-digit SIC coded) major industries in relation to each region's total manufacturing labor force, Moriarty found that the industries could be classified into four groups.

The first group of industries are those found in nearly the same proportion as the total manufacturing employment within a region. Since these industries are nearly equally distributed in each of the nine census divisions, market orientation seems to be their most important locational criterion. These industries -- including paper products, printing, and stone, clay, and glass products -- can be expected to grow in regions and census divisions where both population and businesses are expanding.

The second group of industries consists of those "which had been fairly concentrated in some regions and underrepresented in others, but in recent years have. . . become more equally distributed in proportion to the region's total manufacturing labor force" (Moriarity, 1981). A trend toward greater market orientation on the part of some industries -- including food products, chemicals, machinery, and plastic products, -- can be expected to move into the regions which are now relatively deficient in these industries. At the same time, those regions in which these industries are now already concentrated can expect relative decreases in the near future, with respect to total manufacturing employment.

The third group of industries is those "that traditionally have concentrated in certain regions of the country because of comparative advantages, and continue to do so" (Moriarity, 1981). Industries of this group, including tobacco products, textiles, lumber, and petroleum, -- have close orientations to a specific location factor. The factors which influence the locations of these industries consist of such items as raw materials and/or low cost, experienced labor. The benefits of locating near these factors for the firm are purely economic, primarily in the sense of lower production costs. Employment growth in many of these industries is likely to be small or even declining due to

such factors such as increased automation or competition from imports. These industries are not likely to undergo any substantial shift in location in the near future as their processing tends to remain to the material sources.

The fourth group of industries -- including apparel, furniture, instruments, and miscellaneous products -- is "those that were more concentrated in certain regions in the past, but recently have exhibited a tendency to concentrate in other regions" (Moriarity, 1981). Many of these industries have begun to look for low wage areas such as the south for relocation.

Intraregional Shifts

Occurring simultaneously with interregional shifts have been intraregional shifts. For example, in 1929, 78 percent of the nation's manufacturing employment (by employees) was located in metropolitan areas, with 54 percent of the total being located in central cities proper. By 1954, the metropolitan areas accounted for nearly the same proportion (76%) of the total, yet only 42 percent was located in central cities (Moriarty, 1981).

The average percentage of the total labor force residing in nonmetropolitan areas that was employed in manufacturing has also been increasing. The proportion of the labor force residing in nonmetropolitan areas employed

in higher-wage industry nearly doubled between 1950 and 1970, while the portion of low-wage manufacturing workers increased only slightly" (Moriarity, 1951). Overall, average total employment increased 13 percent in rural areas compared to only 7 percent in the metropolitan areas between 1970 and 1975. One factor which has played a major role in intraregional areas as well as in interregional areas is usage of the assembly line by manufacturers. This move towards a horizontal rather than vertical orientation has caused a shift in land requirements for firms. Firms have begun to move towards areas of lower density, where larger lots of land are available at lower costs.

This intraregional shift is best described through the concept of centrifugal and centripetal forces (Colby, 1983); (Kitagawa and Bogue, 1955). Centrifugal forces are those which tend to cause centralization of industrial locations, while centripetal forces tend to cause decentralization of industrial locations. Katagawa and Bogue (1955) developed a list of both centrifugal and centripetal forces.

Centrifugal forces seem to be related specifically to four main factors: land, stage of industrial development, type of industry, and government influences.

The land can influence location through centrifugal forces in a variety of ways. For example, a central city

located in rough, hilly terrain may have little if any land suitable for factory sites. Conversely, if the city is located along a major transportation route (i.e., a river or railroad) then manufacturing may spread out for long distances. Well designed freeways also free industries from central city binds in the same manner of a river or railroad.

Often, high land value within the city may result in industries locating outside the city. This theory of economic rent-bid has been discussed thoroughly by Alonso (1960).

The labor force within the city or nearby suburban areas can act as a centrifugal force, as a substantial rural or suburban labor force may tempt industrialists to move their factories to suburban sites.

The stage of industrial development acts as a centrifugal force in two main ways. Cities which have had little previous manufacturing and are now attracting more development may not have physical room for the firms within the central cities. Similarly, as the older manufacturing operations close down, often time, the land is converted to parking or non-manufacturing uses, rather than rehabilitating the building to accept other manufacturing uses.

The type of industry acts as a centrifugal force. "Certain types of manufacturing, such as oil refineries,

steel mills, meat packing plants, and aircraft factories with test-flying fields, may create nuisances to such a degree that location beyond the city's boundaries is imperative" (Yeates and Garner, 1976). Furthermore, the large horizontal, rather than vertical, space requirements for new manufacturing firms often eliminates central city locations due to cost or space.

Finally, government influences can act as centrifugal forces. For example, "some metropolitan areas experienced much of their manufacturing growth with the development of plants during World War II, and were thus subject to government policy of avoiding concentrations" (Yeates and Garner, 1976). Furthermore, zoning within the central city proper may not yield itself to manufacturing, thus "forcing" industries into suburban or rural areas where zoning is more relaxed.

Centripetal forces can similarly be classified into the same four categories as centrifugal forces.

Land can act as a centripetal force for location. The central city which is located in rough hilly terrain may contain the only land suitable for manufacturing. Similarly, swamps and/or flooding may keep industries within central cities. The waterfronts mentioned under centrifugal forces can also act as a centripetal force if they are located inside the city's boundaries. Examples of

this include the waterfronts in such cities as San Francisco or Boston.

Cheap labor located in slum areas of central cities may act as a centripetal force if the firm can utilize this unskilled labor.

The stage of industrial development may also act as a centripetal force. "Some cities founded as industrial centers grew up around factories, thus producing a centralized pattern of manufacturing (Yeates and Garner, 1976).

The type of industry can act as a centripetal force as well as a centrifugal force. For example, certain industries including jewelry or garment seek central locations in order to be near supplies or a market.

Finally, zoning may act as a centripetal force if early adoption of a zoning program that made liberal provisions for manufacturing occurred.

Clearly, there are a variety of factors which can act as either centripetal or centrifugal forces. The direction of the force depends upon such aspects as land, labor, government influence, as well as the specific industry type.

Industrial Decentralization

Along with the growth of new market areas brought about in part by the directional flow of past migration

routes, at least two other factors have been identified by Moriarty, as being important for industrial decentralization. These factors are (1) innovations in transportation, communication and technology, and (2) changes in the availability of the labor force.

Technological Changes

As a causal effect, innovations during the U.S. postwar era in both the transportation and communication systems have resulted in lower cost increases in these systems than the cost increases associated with labor. In areas where other costs such as labor are low enough to more than offset the additional transportation and communication costs associated with long distance control, firms can operate at lower costs.

Space-transforming innovations (Feller, 1975) have also been a mechanism through which decentralization has occurred, by making previously remote locations accessible to markets, materials, and external economies.

Technological changes in the field of communications, especially in the computer industry, have allowed firms more freedom of choice as to where to locate. With information, data, and graphics easily transmitted between distant locations, "some industries can control production

processes at distant plant locations through telecomputer linkages" (Moriarity, 1981).

Labor Force Availability

Perhaps the most important single cause of industrial decentralization has been the availability of the labor force.

> Whereas transportation and communication innovations provided the mechanism that increased the supply of formerly inaccessible sites, it was industries' need for low cost production factors, labor more than anything else, that caused the demand for these peripheral sites to accelerate (Moriarity, 1981).

The large demand for peripheral rather than core sites can be partly explained through the Product Cycle Model (Vernon, 1966). The product cycle model postulates that changes in regional employment in a particular industry are related to the three stages that a product evolves through its life cycle.

The first stage -- innovation -- is one where a product is designed, manufactured and marketed in a particular region before being introduced to extraregional national markets. During this stage, plant facilities are expanded in the local region, with production being dependent on skilled craftsmen.

The second stage -- maturation -- is characterized by export growth expanding to a level where "the

construction of extraregional plants using the latest production technology provides a better return on investment than expansion of facilities in the local region" (Moriarity, 1981). Semi- skilled workers begin to replace the skilled craftsman as innovations and automation reduce the human skills necessary to produce the product.

The final stage -- standardization -- is one in which low cost locations become increasingly important for the expansion of new plant facilities. By utilizing the extraregional low-skilled labor made possible by standardizing the product, import products become competitive in the local region. The result of importation to the local region, rather than exportation from the local region, is that the employment engaged in the manufacturing of the product in the local region declines. Thus the locational shifts of many decentralizing industries are related to the standardization of production processes as their product design stabilizes.

Other decentralizing shifts are not related as much to the product cycle as "to accelerating labor costs and poor worker productivity or attitude in the core of the regions" (Moriarity, 1981). For example, the flow of immigrants which provided a substantial part of the productive workers in the North has dried up, and the workforce

in these areas is generally older than that of the nation as a whole (Howell, 1975; Sternlieb and Hughes, 1975).

Furthermore, attitudes in the workforce are beginning to change. "More people have excellent educations and a larger proportion of workers are unwilling to work at blue collar jobs. . .many northern workers prefer white collar jobs and have a poor attitude toward manual work" (Moriarity, 1981). Industries have responded to this shift in attitudes by being attracted to areas where workers both possess the necessary skills and are willing to work productively for lower wages and benefits.

Past Studies

What has been discussed up to this point are the general locational trends which have occurred in the post-war era in the U.S. I have discussed how changes in population, technology, transportation and communication have interacted to help cause a decentralization of both manufacturing employment and industrial location. The question of shifting corporate headquarters locations still remains. How have they reacted to these changes, and how is that reaction reflected in the changing spatial patterns of location?

Very few studies have been conducted which have dealt with the relocation of U.S. corporate headquarters.

Noyelle (1983), for one, has looked at the rise of advanced services (i.e., distributive, retail and consumer, non-profit, and public sector) together with their locational aspects. Malecki (1981), on the other hand, has looked at recent trends in the location of industrial research and development (R & D) facilities. Burns (1977) and Rees (1976) have each examined the headquarter locations of industrial firms. Although these studies all concentrate on different components of the economy, all attempt to describe changes in the locational aspects of firms.

All five studies are of a longitudinal nature; that is, the authors all look at changes in the locational aspects of firms over a number of years. Noyelle, after identifying six major groups of services based on the type of outputs and the institutional settings under which these services are provided, looks at changes in their employment rates and GNP percentages over the years 1947-1977. Burns looks at the change in the numbers and locations of head offices over the years 1960-1970. Rees uses the years 1967-1975 to compare changes in the location of manufacturing employment, while Malecki uses the years 1965-1975 to explain aggregate patterns of industrial R & D location.

The data, though coming from different sources, are of a similar nature. Two studies -- those of Noyelle and Burns -- use data published in Fortune Magazine in the form

of 'The Fortune 500' and 'The Service 500.' Malecki, however, utilizes data from the Industrial Research Laboratories of the United States. Rees, though, uses data published both in Fortune Magazine as well as in the Bureau of Census: Enterprise Statistics 1972, Census of Manufacturing.

The studies also differ slightly in their units of analysis. Noyelle uses cities or centers which are defined by their functional outputs, and the changes therein; while Burns, Rees, and Malecki all use SMSAs as well as central cities as their units of analysis. Even with these minor differences in source and scope, their findings are quite comparable to one another.

Noyelle (1983), when discussing the diversified advanced service centers (i.e., New York, Los Angeles, Chicago, and San Francisco) and their responses to the economic shifts previously discussed states, "national... diversified advanced service centers have usually been characterized both by strong losses in their once important manufacturing sectors, and by a considerable rebuilding of their economic bases." Empirical work by Burns showed a net loss of eleven (8.5%) headquarter offices in New York City from 1960 to 1970. For a different period, (1968-1974), "New York City lost forty of its Fortune 500 firms" (Rees, 1976).

When the entire New York SMSA is considered, Burns cites a percentage loss of almost 12 percent in terms of the number of Fortune 500 firms. Malecki shows a percentage loss of over 16 percent in the number of R & D facilities during the years between 1965-1975.

At the other end of the spectrum, "the functional nodal centers, (e.g., Milwaukee and Toledo) have usually experienced low growth. . .that they have barely managed to balance by employment gains in central offices of industrial firms or in other advanced services" (Noyelle, 1983).

Empirical work by Burns shows a net gain of 3 (50.0%) headquarter offices between 1960 and 1970 in Milwaukee. For the Milwaukee SMSA, Burns shows a net gain of 4 (57.1%) offices. During the years 1965 to 1975, Malecki's data yields a percentage gain of 19.5 in the number of industrial R & D facilities.

Toledo, another functional nodal center, shows a similar trend, with Burns reporting a net increase of one office headquarter in both Toledo and the Toledo SMSA. For industrial R & D in the Toledo SMSA, Malecki shows an increase of over 100 percent in terms of the number of R & D facilities; from 11 in 1965 to 23 in 1975.

One other point discussed previously in the section entitled "Intraregional Shifts", is reinforced by Burns. Over the ten year period 1960-1970, the number of head

offices of the 500 largest industrial corporations located within SMSA's remained fairly constant -- 472 versus 473. The Central Cities of these SMSAs suffered a loss of almost 6 percent in number of firms, while the remaining peripheral areas within the SMSA (excluding the central cities) increased their number of firms by almost 40 percent.

Finally, it is interesting to note one other finding brought out by these studies: the difference in the losses of Fortune 500 firms suffered by New York City between the sets of years 1960-1970 and 1967-1975. These figures of 11 and 40, respectively, suggest that this decentralization has been increasing in magnitude during more recent years. This is reinforced, to a degree, by Wheeler and Brown, who in their study of the South found that most of the increases in the numbers of corporate headquarters had occurred between 1970 and 1983.

Summary

In this chapter traditional factors of location have been discussed. It has been shown that many factors have roots that extend back in time to the pre-industrial period in the United States.

Recent changes in technology, communication, as well as other economic sectors, have been examined to show how

they have acted collectively to weaken the ties to these historically important factors of location.

Finally, in this chapter, some studies which have dealt with the subject of decentralization of headquarters has been discussed. However, there remains considerable room for the exploration of how corporate headquarters have reacted to changes in the traditional factors of location. This will be the main subject for the following chapters.

CHAPTER 3

INTERREGIONAL SHIFTS -- OVERVIEW

This chapter examines the geographic distribution of two phenomena: industrial headquarters and their accompanying employees, both on an interregional basis. In the first section of the chapter, a longitudinal study of the geographic distribution of corporate headquarters and their employees will be undertaken. Specifically, two questions are addressed: which census divisions have tended to have large numbers of corporate headquarters located within them, both past and present; and which regions have experienced large relative change in terms of the number of headquarters during the three time periods of 1957-1970, 1970-1983, and 1957-1983.

After the discussion concerning the headquarters, the same questions will be examined in light of the spatial distribution of the number of employees within the corporate headquarters. Finally, using the results of these two studies, this chapter will address the following specific hypothesis:

> Hypothesis 3.1 Census divisions which experienced rapid population growth are expected to experience net increases in the number of corporate headquarters and their accompanying employees.

The reasoning for this hypothesis is clear. Many of the changes in the postwar era have collectively acted to reduce the importance of many of the historically important factors of location, such as transportation costs. This effectively has increased the relative importance of population, both for labor supply and as a market for outputs. Therefore, it is expected that headquarters will relocate in response to population.

Headquarters

The numbers of headquarters as well as their associated control of employees in each of the nine census divisions were gathered from Fortune 500 lists for each of the three years and can be found in Table 1. Relative changes in the number of headquarters for each of the three time periods have been calculated and can be found in Table 2.

Numbers of Headquarters

1957. The numbers of headquarters in the census divisions ranged from a high of 218 in the Middle Atlantic Division to a low of 4 in the East South Central), representing an overall spread of 42.8 percent. Second to the Middle Atlantic, the East North Central contained 147 of the 500 headquarters. The combination of these two major

Table 1. Numbers of Corporate Headquarters and Percent of Total, by Census Division, by Year

REGION	YEAR 1957	1970	1983
Pacific	37 (7.4%)	47 (9.4%)	50(10.0%)
Mountain	5 (1.0%)	4 (0.8%)	6 (1.2%)
West North Central	31 (6.2%)	35 (7.0%)	30 (6.0%)
West South Central	16 (3.2%)	15 (3.0%)	34 (6.8%)
East North Central	147(29.4%)	150(30.1%)	136(27.2%)
East South Central	4 (0.8%)	5 (1.0%)	7 (1.4%)
Middle Atlantic	218(43.6%)	190 (38.1%)	142(28.4%)
South Atlantic	23 (4.6%)	25 (5.0%)	41 (8.2%)
New England	19 (3.8%)	28 (5.6%)	54(10.8%)
TOTAL	500(100.0%)	499* (100.0%)	500 (100.0%)

Source: Fortune 500 list

*One Headquarter located in Puerto Rico

Table 2. Percentage Changes in the Numbers of Headquarters, by Census Divisions, by Time Period

REGION	YEAR 1957-1970	1970-1983	1957-1983
Pacific	27.0	6.0	35.1
Mountain	-20.0	50.0	20.0
West North Central	12.9	-14.3	-3.2
West South Central	-6.3	126.7	112.5
East North Central	2.0	-9.3	-7.5
East South Central	25.0	40.0	75.0
Middle Atlantic	-12.8	-25.3	-34.9
South Atlantic	8.7	64.0	78.3
New England	47.4	92.9	184.2

divisions accounted for over 70.0 percent of the headquarters during 1957.

1970. The number of headquarters in the nine census divisions ranged from a high of 190 in the Middle Atlantic to a low of 4 in the Mountain Division. The combination of the number of headquarters located within the East North Central (150) and those in the Middle Atlantic accounted for over 68.1 percent of the 499 headquarters located in the United States during 1970 (one headquarter during 1970 was located in Puerto Rico).

1983. The number of headquarters in the census divisions ranged from a high of 142 in the Middle Atlantic to a low of 6 in the Mountain Division. The combination of the headquarters in the Middle Atlantic with those in the second highest division, the East North Central (136), accounted for over 55.0 percent of the 500 headquarters in the United States during 1983.

Relative Changes

1957-1970. During the years 1957-1970, all census divisions experienced relative change in the numbers of headquarters located within them (Table 2). During each time period, the major percentage increases occurred in the New England, Pacific, and the East South Central census divisions. The major percentage losses were noted in the

Mountain, Middle Atlantic, and West South Central census divisions. In total, six divisions had positive relative changes in the numbers of corporate headquarters, while three divisions had negative relative changes.

1970-1983. During the more recent time period of 1970-1983, the major relative increases in the numbers of headquarters took place in the West South Central New England, and South Atlantic census divisions. The major relative losses in the numbers of headquarters occurred in the Middle Atlantic, West North Central, and the East North Central census divisions. In total, six divisions had a positive relative change during 1970 to 1983 with respect to the number of headquarters, while three had negative relative change. Notice, however, that these are not the same six divisions which increased during 1957-1970, and therefore, are also not the same divisions which had negative change. For example, the West South Central division which had posted a negative percent change during 1957-1970, posted a large positive percent change during 1970-1983. The same held true (in reverse) for the West North Central Division.

1957-1983. Over the entire twenty-six year period, the major positive relative changes were located in the New England, West South Central, and East South Central census divisions. The major relative losses in terms of

headquarter numbers were found in the Middle Atlantic, East North Central, and West North Central census divisions. These three divisions were the only ones which had a net negative percent change from 1957-1983 with respect to the number of headquarters.

Employees

Number of Employees

1957. As can be seen from Table 3, the number of headquarter-controlled employees in the nine census divisions ranged from a high of 4,460,000 for the Middle Atlantic to a low of 32,800 for the East South Central. Following the previous format, the combination of the highest two totals, the Middle Atlantic and the East North Central, accounted for over 80 percent of the 9,082,600 headquarter-controlled employees during 1957.

1970. The number of headquarter-controlled employees during 1970 ran from the Middle Atlantic's high of 6,726,400 to the Mountain Division's low of 67,500. The combination of the Middle Atlantic and East North Central accounts for over 75 percent of the total number of headquarter-controlled employees during the year 1970.

1983. The highest percentage of headquarter controlled employees continued to be found in the Middle Atlantic (4,807,900), but the lowest percentage was once

Table 3. Numbers and Percentage of Headquarter-Controlled Employees by Census Division, By Year.

REGION	YEAR 1957	1970	1983
Pacific	658,100 (7.2%)	1,186,300 (8.1%)	1,086,400 (7.7%)
Mountain	35,600 (0.4%)	67,500 (0.5%)	84,000 (0.6%)
West North Central	303,600 (3.3%)	676,200 (4.6%)	921,700 (6.6%)
West South Central	120,300 (1.3%)	377,000 (2.6%)	551,700 (3.9%)
East North Central	2,870,500 (31.6%)	4,307,500 (29.5%)	4,042,700 (28.8%)
East South Central	32,800 (0.4%)	114,400 (0.8%)	75,700 (0.5%)
Middle Atlantic	4,460,600 (49.1%)	6,726,400 (46.1%)	4,807,900 (34.2%)
South Atlantic	367,600 (4.1%)	546,000 (3.7%)	819,900 (5.8%)
New England	233,500 (2.6%)	604,400 (4.1%)	16,661 (11.9%)
TOTAL	9,082,600 (100.0%)	14,607,300 (100.0%)	14,056,100 (100.0%)

again located in the East South Central (75,700). The combination of the Middle Atlantic with the East North Central continued to decline (as in 1970), and by 1983, these two divisions accounted for only about 63 percent of the total 14,056,100 headquarter-controlled employees in 1983.

Relative Changes

Before discussing the relative changes in the number of headquarter-controlled employees, an important point should be made. Unlike the number of headquarters which remained somewhat stable at around 500, the number of headquarter-controlled employees fluctuated considerably over time. Therefore, rather than looking at positive and negative percent change, as was the case with the number of headquarters, this section will discuss the percentage changes as compared to the overall percentage changes experienced by the total number of headquarter-controlled employees.

1957-1970. During the first time period, 1957-1970, the overall percentage change in the number of headquarter-controlled employees was 60.8 percent (Table 4). Census divisions with percentage change far exceeding that of the overall included the East South Central, the West South Central, and New England. The South Atlantic, East North Central and Middle Atlantic were three census

Table 4. Percentage Changes in the Numbers of Headquarters Controlled Employees, by Census Division, by Time Period

REGION	TIME PERIOD 1957-1970	1970-1983	1957-1983
Pacific	+80.3	-8.4	+65.1
Mountain	+89.6	+24.4	+136.0
West North Central	+122.7	+36.3	+203.6
West South Central	+213.3	+46.3	+358.6
East North Central	+50.1	-6.1	+40.8
East South Central	+248.8	-33.8	+130.8
Middle Atlantic	+50.8	-28.5	+7.8
South Atlantic	+48.8	+50.2	+123.0
New England	+154.8	+175.7	+613.5
OVERALL	+60.8	-3.8	+54.8

divisions with increases less than that of the overall. In total, six of the nine census divisions had a greater relative change in the numbers of headquarter-controlled employees than the overall, while three experienced less.

1970-1983. During the second time period, 1970-1983, the overall relative percentage change in the number of headquarter-controlled employees decreased 3.8 percent. Five of the nine census divisions had relative change greater than that of the overall, including New England, the South Atlantic and West South Central. The four census divisions with relative change less than that of the overall included the East South Central, the Middle Atlantic, and the Pacific.

1957-1983. Over the entire twenty-six year period, the overall relative percent change in the number of headquarter-controlled employees increased 54.8 percent. Seven of the nine census divisions had relative percentage changes greater than the overall, including New England, the West South Central and the West North Central. The two divisions with relative change below that of the overall were, not surprisingly, the Middle Atlantic and the East North Central.

Spearman's Rank Coefficients

With this preliminary analysis in mind, it is now possible to begin the testing of hypothesis 3.1.

> Hypothesis 3.1 Census divisions which experienced rapid population growth are expected to experience net increases in the number of corporate headquarters and their accompanying employees.

Table 5 lists the changes which occurred in the population for the nine census divisions during all three years. The data in Tables 2, 4, and 5 were then ranked so that Spearman's Rank Correlation Coefficients could be calculated. The formula for calculating Spearman's Rank Correlation Coefficient is:

$$R_s = 1 - \frac{6\ d^2}{n^3 - n}$$

where:

R_s = Spearman's Coefficient

d = the differences between the paired rankings for each census division

n = number of pairs of rankings (9).

The coefficients derived from this equation range from a low of -1 (perfect negative correlation) correlation to +1 (perfect positive correlation). The coefficients derived can be found in Table 6. A significance test was also

Table 5. Percent Change in the Population, by Census Division, by Time Period

REGION	TIME PERIOD 1957-1970	1970-1983	1957-1983
Pacific	25.11	19.90	50.01
Mountain	20.81	37.30	65.04
West North Central	6.01	5.30	11.60
West South Central	14.00	22.90	40.10
East North Central	11.11	3.60	15.10
East South Central	6.25	14.60	21.70
Middle Atlantic	8.87	-1.11	7.70
South Atlantic	18.10	20.50	42.30
New England	12.68	4.30	17.50
TOTAL	13.30	11.50	26.33

Table 6. Spearman Rank Correlation Coefficients Derived From the Percentage Change in Variables Listed in Tables 2, 4, 5, by Time Period.

	1957-1970		1957-1970			1957-1983		
	Headquarters-Controlled Employees	Population	Headquarters-Numbers	Headquarters-Controlled Employees	Population	Headquarters-Numbers	Headquarters-Controlled Employees	Population
1957-1970								
Headquarters Numbers	.283	-.083	.133		-.208	.483		-.033
Headquarters-Controlled Employees		-.300		.150	.283		.283	.017
Population			.483	.250	.633*	.333	-.017	.850*
1970-1983								
Headquarters Numbers				.650*	.633*	.916*		.583*
Headquarter-Controlled Employees					.267		.667*	.150
Population						.466	.400	.883*
1957-1983								
Headquarters Numbers							.717*	.457
Headquarter-Controlled Employees								.183

*Indicates statistical significance at the 90% confidence level, 7 degrees of freedom.

conducted, yielding a significant r value of 0.583 at the 90 percent confidence level for seven degrees of freedom.

Examination of Table 6 brings out several interesting points which warrant further discussion. Before undertaking this discussion, however, the following points must be kept in mind. Henceforth in this discussion, the time period 1957-1970 will be referred to as Period One, and the time period of 1970-1983 will be referred to as the Overall Time Span. Furthermore, rather than continuously using the phrase "the Spearman Rank Correlation Coefficient of the percentage change in the number of headquarters (headquarter-controlled employees)", the term "headquarter (headquarter-controlled employee) coefficient" will be substituted. The discussion to follow will first be concerned with the coefficients of different components during the same time period, and will then commence with a comparison of coefficients of similar components during different time periods.

Comparing Period One coefficients with each other, interesting results are apparent. First, the negative coefficients located in cells 1,2 and 2,2 suggest that absolutely no positive correlation exists between either the percentage change in population and headquarter numbers nor between the percentage change in population and headquarter-controlled employees. Secondly, the low coefficient

found in cell 1,1 (r=0.283) suggests that while the relationship between the change in employees and the change in headquarter-controlled employees was positive, it was not strong.

When Period Two coefficients are studied, a very different situation arises. Unlike Period One, the coefficient in cell 4,5 (r=0.633) (statistically significant at the 90% confidence level) suggests that a very strong correlation did exist during the later period between the population growth in census divisions and the change in the number of corporate headquarters. Also, the high coefficient in cell 4,4 (r=0.650) suggests that the redistribution of both headquarters and headquarter-controlled employees were similar in nature, an observation quite different than that of Period One.

Comparing the Overall Time Span components within themselves, a high statistically significant correlation of r=0.717 (4,4) between the change in headquarters and the change in headquarter-controlled employment is immediately noted. A somewhat weaker relationship (r=0.457) was found to exist between the change in corporate headquarters and the change in population. Also, a weak positive correlation (r=0.183) was found to exist between the change in corporate-controlled employment and the change in population in the nine census divisions.

The best place to begin the discussion of similar components during different periods is with the population coefficients. The coefficients of r=0.633 (Period One vs. Period Two), r=0.850 (Period One vs. Overall Time Span) and r=0.883 (Period Two vs. Overall Time Span) (all statistically significant) all suggest that the U.S. population was more or less geographically redistributed throughout the nine census divisions. The lowest of these, that between the Period One vs. Period Two population, suggests that there was some amount of change in which divisions were growing at the quickest rates: those with the major increases during the first period were not necessarily the same as during the second period.

This observation is further advanced through the data in Table 5. Here, for example, we note that although the Pacific Division had the largest relative change in population during Period One, during the second period the Pacific had the fourth highest relative change in population. Similarly, the West South Central Division, with the fourth highest percentage change in population during Period One, had the second highest percentage change in population during Period Two. Divisions which experienced a higher rate of growth during Period One than during Period Two included the Pacific, West North Central, East North Central, Middle Atlantic, and New England census

divisions. The reverse was true for the other four divisions: Mountain, West South Central, East South Central, and South Atlantic.

With respect to the number of headquarters, the coefficients of r=0.133 (Period One vs. Period Two), show that very different locational behavior was being exhibited by headquarters during two periods. They simply were not redistributing throughout the nine census divisions in the same way during Period One and Period Two. This is further advanced through the data in Table 3. For example, the Pacific Division which had a percentage increase of 27.0 percent (the second highest change) had the sixth highest change during 1970-1983. Similarly, the Mountain Division which had the lowest percentage change in number of corporate headquarters during 1957-1970, had the fourth highest change during 1970-1983.

Finally, with respect to the number of headquarter-controlled employees, the coefficient of r=0.150 (Period One vs. Period Two) suggests the same situation as was found with the number of corporate headquarters. This trend is also further advanced through the data in Table 4, with such census divisions as the South Atlantic and East South Central. Thus, the situations occurring in Periods One and Two can be summarized as follows:

During Period One all evidence points to a situation where the population was growing and dispersing without a corresponding growth and shift in either the number of corporate headquarters or of the number of headquarter-controlled employees. Perhaps more interesting was the low correlation coefficient (r=0.283) between the change in the number of headquarters and the change in the number of headquarter-controlled employees. This indicates that internal growth of headquarters employment was occurring at a sufficient rate to "overshadow" the associated increases or decreases of employees for firms which relocated or reached the 500 threshold. This is furthermore evident in the fact that during 1957-1970, headquarter-controlled employment increased 60.8 percent, while the number of headquarters held constant at 500, while the overall change in population was 13.3 percent.

During Period Two, strong correlations existed between the change in headquarters and the change in their associated employees (r=0.650) and between the change in headquarters and the change in population (r=0.633). A weaker correlation existed between the change in corporate headquarter-controlled employees and the change in population (r=0.267). During this period, therefore, the population continued to grow and disperse, but with a strong corresponding growth and dispersal in the number of corporate

headquarters and a weaker correlation with the change in the number of corporate headquarter-controlled employees. The strong relationship between the change in corporate headquarters and the change in the number of corporate headquarter-controlled employees also suggests that during this period, the internal growth of firms began to slow, and no longer "overshadowed" the associated increases or decreases of employees for the headquarters which either did relocated or reached the 500 threshold.

Finally, one other point is very interesting. The coefficient r=0.483, between the Period One change in population and the Period Two change in the number of corporate headquarters although not statistically significant, suggests that during the second period not only were headquarters reacting to the current population change but also were perhaps reacting to past population change, and that some amount of a "catch-up" mode was evident in this trend.

Returning to hypothesis 3.1:

> Census divisions which experienced rapid population growth are expected to experience net increases in the number of corporate headquarters and their accompanying employees.

It does appear that this hypothesis holds true, at least in part, if we examine the overall period. Obviously, the hypothesis does not hold true during Period One, but as previously discussed, Period One seems to have set the stage

for Period Two, and therefore they both need to be included in the overall testing of the hypothesis.

Even with the large amount of internal growth in the number of employees controlled by corporate headquarters, this hypothesis holds true (although very weakly) with regards to the change in employees but there was a definite relationship between the number of corporate headquarters moving to or reaching 500 threshold in census divisions experiencing high rates of population growth.

Although this chapter has touched on the phenomenon of the redistribution of corporate headquarters, it leaves unanswered several important questions. For example, from where and to where are shifts occurring? At what speed (or how quickly)? Are the rates of movement different indifferent periods? Why? These questions will be addressed in the next chapter.

CHAPTER 4

INTERREGIONAL SHIFTS -- COMPONENTS

This chapter continues to examine the interregional changes in the spatial distribution of corporate headquarters. As discussed previously, there appears to be a fair correlation between the interregional spatial redistribution of population and the spatial redistribution of corporate headquarters.

However, in the previous chapter, there was no consideration of exactly what this redistribution consisted of. During any time period, three different possibilities exist for any headquarters in it. That is, headquarters can (1) stay in the same geographic division (or relocate within the same division); (2) relocate from one division into another division; or (3) "die," that is, be replaced by another headquarter on the 500 list. A headquarter which is referred to as "dead" means only that this headquarter failed to meet the 500 threshold in the second year of the period. It does not imply that the firm no longer exists but that the assets of the firm no longer meet the minimum threshold of the 500 list. Similarly, a "birth" refers to the firm which replaced the firm that died.

Again, this is not to imply that the firm did not exist before, only that its assets previously did not meet the minimum threshold of the 500 list. Therefore, in order to further clarify the changes and components of the spatial redistribution the following hypotheses will be tested:

> Hypothesis 4.1. Census divisions experiencing large percentage increases in population are expected to be those divisions which had:
>
> (a) large relative numbers of headquarters actually migrating to them, and
>
> (b) large numbers of births occurring in them.
>
> Conversely, those census divisions with small increases (or decreases) in population are expected to be those divisions which had:
>
> (c) large relative numbers of headquarters migrating from them, and
>
> (d) large numbers of deaths occurring in them.

Again, the reasoning for these hypotheses is that headquarters will follow the population, to have both supply of labor and a market for their products. Similarly, headquarters are expected to leave divisions where the population has declined, for the same reasons.

The second part of this chapter will be a discussion of the rates of redistribution of corporate headquarters through the use of a Markov-Chain Model. Included in the discussion will be the answers to such questions as from where and to where the headquarters have redistributed, including the "births" and "deaths", at what rate

these have been occurring, and the differences in rates of growth in the number of corporate headquarters in census divisions between Period One and Period Two. In this discussion, hypothesis 4.2 will be tested.

> Hypothesis 4.2(a) The rates of redistribution of corporate headquarters through census divisions will be higher during the period of 1970-1983 than during the period of 1957-1970.

> Hypothesis 4.2(b) Individual rates of growth in the numbers of corporate headquarters in each census division for 1970-1983 will be quickest in those divisions where the rate of population growth was quickest.

Finally, through the use of a Markov-Chain Model, a brief discussion of the possible spatial distribution of corporate headquarters in the year 1996 will be undertaken.

Component Change

Before discussing the data in Tables 7 to 9, some preliminary explanation is warranted. The second column, headed 1957 Number or 1970 Number, refers to the number of headquarters located within each region at the start of the time period, and is used primarily as a means of obtaining a consistent relative change for the four other components in the tables.

Second, these tables do not take into consideration any headquarters migration within the same region. This topic will be discussed at length in following chapters.

Table 7. Changes in Numbers of Headquarters by Type of Change and Census Division, 1957-1970.

REGION	1957 NUMBER	BORN	DIED	IN-MIGRATION	OUT-MIGRATION	1970 NUMBER
Pacific	37	25	18	3	0	47
Mountain	5	3	4	1	1	4
West North Central	31	14	6	0	4	35
West South Central	16	8	10	2	1	15
East North Central	147	47	44	3	3	150
East South Central	4	3	2	0	0	5
Middle Atlantic	218	54	79	3	6	190
South Atlantic	23	14	11	0	1	25
New England	19	12	7	4	0	28
TOTAL	500	180	181	16	16	499

Table 8. Changes in the Numbers of Headquarters by Type of of Change and Census Division, 1970-1983.

REGION	1970 NUMBER	BORN	DIED	IN-MIGRATION	OUT-MIGRATION	1983 NUMBER
Pacific	47	24	18	1	4	50
Mountain	4	4	3	1	0	6
West North Central	35	7	14	2	0	30
West South Central	15	21	5	3	0	34
East North Central	150	35	47	2	4	136
East South Central	5	3	1	0	0	7
Middle Atlantic	190	31	59	3	23	142
South Atlantic	25	17	6	5	0	41
New England	28	17	5	14	0	54
TOTAL	499	159	158	31	31	500

Table 9. Changes in the Numbers of Headquarters by Type of Change and Census Division, 1957-1983.

REGION	1957 NUMBER	BORN	DIED	IN-MIGRATION	OUT-MIGRATION	1983 NUMBER
Pacific	37	35	21	2	3	50
Mountain	5	5	4	1	1	6
West North Central	31	14	14	1	2	30
West South Central	16	25	12	5	0	34
East North Central	147	54	65	4	4	136
East South Central	4	5	2	0	0	7
Middle Atlantic	218	55	110	2	23	142
South Atlantic	23	29	14	3	0	41
New England	19	30	10	15	0	54
TOTAL	500	252	252	33	33	500

Changes in Components

1957-1970. From Table 7, during this first period, 16 (3.2%) corporate headquarters relocated, while 181 (36.2%) died. With respect to migration, the New England (+21.1%) and Mountain Census Divisions (+20.0%) had the largest relative change over their base number, while the Mountain (-20.0%) and West North Central Census Divisions (-12.9%) had the largest decreases from their base number. Since these are increases or decreases from a base number, it is possible for a division (Mountain) to occur in both situations.

With respect to births, the East South Central (+75.0%) and Pacific Census Divisions (+67.6%) had the largest relative increases over their base number while the Mountain (-80.0%) and the West South Central Census Divisions (-75%) had the largest decrease from their base number due to deaths.

With this preliminary data analysis completed, the discussion will now give attention to the hypotheses. All relevant Spearman Rank Correlation Coefficients are located in Table 10.

Beginning with Hypothesis 4.1(a):

> Hypothesis 4.1. Census divisions experiencing large percentage increases in population are expected to be those divisions which had:
>
> (a) large relative numbers of headquarters actually migrating to them, and

Table 10. Spearman Rank Correlation Coefficients Derived From the Changes in Variables Listed in Tables 7, 8, 9, by Time Period.

	1957-1970				1970-1983				1957-1983			
	Out-Migration	In-Migration	Born	Died	Out-Migration	In-Migration	Born	Died	Out-Migration	In-Migration	Born	Died
1957-1970 Out-Migration		.117	-.583*	-.042	-.038*							
In-Migration			-.017	-.333		.596						
Born				.517			.417					
Died								.053				
Population	-.017	.467	.333	.600*	.204	.479	.525	.200				
1970-1983 Out-Migration						-.250	-.413	.296				
In-Migration							.654	.071				
Born								-.150				
Died												
Population					.321	.463	.833	.300				
1957-1983 Out-Migration										-.158	-.642	-.167
In-Migration											.717	.583
Born												.550
Died												
Population									.075	.467	.467	.817

*Indicates statistical significance at the 90% confidence level, 7 degrees of freedom.

(b) large numbers of births occurring in them.

Conversely, those census divisions with small increases (or decreases) in population are expected to be those divisions which had:

(c) large relative numbers of headquarters migrating from them, and

(d) large numbers of deaths occurring in them.

Examination of Table 10 shows coefficients of r=0.467 (Period One), r=0.463 (Period Two), and r=0.467 (Overall). All three of these coefficients point to positive correlations between the change in population redistribution and the in-migration of corporate headquarters to those census divisions. However, the correlation is not significant at the 90 percent level, as the minimum significant r value at the 90 percent confidence level is r=0.571.

Hypothesis 4.1(b):

Individual rates of growth in the numbers of corporate headquarters in each census division for 1970-1983 will be quickest in those divisions where the rate of population growth was quickest.

The correlation coefficients between these two components yielded values of r=0.333 (Period One), r=0.833 (Period Two), and r=0.467 (Overall). Although the first period coefficient was not as strong as the others, the Period Two coefficient was quite strong, as was the Overall. Although only the Period Two value was strongly significant, it does appear that a correlation exists between

those census divisions which had a large percentage increase in population and those census divisions which experienced a large number of births.

Hypothesis 4.1(c):

> Census divisions with a large percentage increase in population are expected to, in all time periods have a negative correlation with those census divisions which had a large relative number of headquarters migrating from them.

Examination of Table 10 shows coefficients of r=-0.017 (Period One), r=-0.321 (Period Two), and r=0.075 (Overall). This hypothesis, therefore, does not seem to hold true. It does not appear that headquarters have been migrating away from census divisions with smaller percentage gains in population. Most likely there are other locational factors which are keeping the headquarters where they are. These may be such things as an already established markets, or it may be that the headquarter is tied to a number of plants which in turn are tied to their location based on raw materials (see factors of location, Chapter 2).

Hypothesis 4.1(d):

> Census divisions with a large percentage increase in population are expected to, in all time periods have a negative correlation with those census divisions which had a large relative number of headquarter 'deaths' occurring.

The correlation coefficients between these two components yielded values of r=0.600 (Period One), r=0.300 (Period Two), and r=0.817 (Overall). These coefficients

were expected to be negative, and, therefore, there is no statistically significant negative correlation between those census divisions with a large percentage increase in population and those with a large number of deaths occurring. However, two of the values were statistically significant in a positive mode. What has probably happened here is that the older headquarters which have "died" have in reality just been replaced on the list by the births. Keeping in mind that there was a strong correlation between population change and births, it would follow that these "births" are replacing headquarters in the same division to which they were "born". This would explain the high positive value of "r" for the "deaths".

Before discussing the ramifications of the above findings, some of the other interesting correlations which were found to exist will be discussed.

First, with respect to Period One components, a strong (although not statistically significant) positive correlation was found between births and deaths (r=0.517) suggesting a fair amount of replacement (i.e., one headquarters cost reaching threshold, thus "replacing" another) within census divisions. A strong statistically significant negative correlation (r=-0.583) was found between outmigration and births while a weaker positive correlation (r=0.333) was found between out-migration and deaths.

Correlations were found between (1) out-migration and deaths; (2) in-migration and births; and (3) out-migrations and in-migrations.

With respect to Period Two Components, a strong statistically significant positive correlation was found between in-migrations and births (r=0.654), and a weaker positive correlation was found between out-migration and deaths (r=0.296). A fairly strong negative correlation was found between out-migration and births (r=-0.413) and a weaker negative correlation was found between out-migration and in-migration (r=-0.250).

Little, if any, correlation was found between in-migration and deaths or births and deaths. The latter of these shows the lesser amount of replacement occurring in the second time period as compared to the first.

Overall, from 1957-1983, strong, statistically significant positive correlations were found between (1) in-migration and births (r=0.717); and (2) in-migration and deaths (r=0.583). A strong, statistically significant negative correlation was found between out-migration and births (r=-0.642). Weaker (not statistically significant) correlations were found between (1) births and deaths (r=0.550); (2) out-migration and in-migration (r=-0.158); and between out-migration and deaths (r=-0.617).

Finally, it was noted that a positive correlation existed between in-migration for Period One and in- migration for Period Two, as well as between births for Period One and births for Period Two, while no correlation was noted between out-migration for Period One and out- migration for Period Two, or between deaths for Period One and deaths for Period Two.

With all this in mind, the following summaries by time period can be developed:

Period One. 1957-1970. This period seems to be one where the following trends were occurring:

(1) Headquarters were being born in census divisions where out-migration was minimal and where population was increasing.

(2) Headquarters were also being born in census divisions where deaths were occurring, suggesting a replacement factor not noted in Period Two.

(3) Headquarters were not migrating from regions where deaths were occurring.

(4) Census divisions experiencing a high rate of in-migration did not correspond to areas with a low rate of out-migration.

(5) Population change seems to positively affect where headquarters moved to and were born in, but has a minimal impact on where firms are moving from or dying in.

Period Two. 1970-1983. During this period, the following trends appear to be occurring:

(1) Headquarters were being born in census divisions where the population underwent a large percentage

increase. The correlation value of r=0.833 was considerably larger than the r=0.333 during Period One.

(2) Headquarters were also being born in census divisions which experienced a large amount of in-migration which in turn was occurring in census divisions where the population was undergoing large percentage increases.

(3) Unlike Period One, headquarters did seem to migrate from those census divisions experiencing high rates of death.

(4) During this second period, there was a much larger correlation between those census divisions experiencing high rates of in-migration and those with high rates of out-migration.

(5) The change in population during Period Two not only effects the same components as during Period One (births and in-migration) but also where firms are migrating from.

It is evident, therefore, that the behavior of headquarters during Period One was not the same as was exhibited in Period Two. Population change during Period One did not have the same effect on the Period One components as it did on those of the second period. Again, the same situation as was found in the previous chapter seems to be true. The period of 1957-1970 was one of the population growing and dispersing with minimal reaction by the headquarters, while during Period Two, headquarters were not only reacting to the current population change, but also reacting to the previous population change. For example, higher correlations were found between the Period One population and Period Two in-migration (r=0.479) than

between Period One population and Period One in-migration (r=0.467). The same held true between Period One population and Period Two births (r=0.525), and between Period One population and Period One births (r=0.517). Once again, the notion of Period Two being a period where a large amount of reaction to previous population changes is reinforced.

Finally, it was noted that those census divisions experiencing high rates of in-migration during Period One continued to do so during Period Two. The same held true for births. However, no correlation existed between the census divisions experiencing high rates of out-migration during Period One and Period Two nor between those census divisions with high death rates during Period One and Period Two.

Rates of Component Change

In the following section the rates of redistribution of corporate headquarters through the nine census divisions will be examined. Specifically, some of the topics examined will include: (1) from which and to which census divisions have major shifts occurred, and (2) how these rates may have changed over time. The following hypotheses will be tested in this section:

4.2(a) The overall rates of redistribution of corporate headquarters were quicker

during the period 1970-1983 than during 1957-1970.

4.2(b) Individual rates of growth in the numbers of corporate headquarters in each census division for 1970-1983 were quickest in those divisions where the rate of population growth was quickest.

The basis for these hypotheses is that many of the technological changes which have transformed the national space-economy, as well as lessening the importance of some traditional locational factors, occurred in the later part of the study years 1957-1983.

Finally, this chapter will end with a brief discussion of the possible spatial distribution of corporate headquarters through the nine census divisions in the year 1996.

Major Shifts

In order to test the above hypotheses, a probability matrix was devised on the movements of corporate headquarters for each of the time periods. The matrices can be found in Tables 11 and 12. Some explanation of these tables is necessary before continuing.

To begin with, rows refer to the first year of the period, while columns refer to the last. For example, the West North Central Division had 31 headquarters located therein in 1957. Between 1957 and 1970, the following occurred with respect to these headquarters: (1) one

Table 11. Probability Matrix of Corporate Headquarter Relocations by Census Divisions, 1957-1970

	1970										
	Pacific	Mountain	West North Central	West South Central	East North Central	East South Central	Middle Atlantic	South Atlantic	New England	DEATHS	TOTAL
Pacific	.514									.486	37
Mountain	.200									.800	5
West North Central		.032	.677	.032	.065					.194	31
West South Central				.313			.063			.624	16
East North Central				.007	.680		.014			.299	147
East South Central						.500				.500	4
Middle Atlantic	.009						.611		.018	.362	218
South Atlantic					.044			.478		.478	23
New England									.632	.368	19
BIRTHS	53.2 25	45.0 3	40.0 14	53.3 8	31.3 47	60.0 3	28.4 54	56.0 14	42.0 12		
TOTAL	47	4	35	15	150	5	190	25	28		

Table 12. Probability Matrix of Corporate Headquarter Relocations by Census Divisions, 1970-1983.

	1983										
	Pacific	Mountain	West North Central	West South Central	East North Central	East South Central	Middle Atlantic	South Atlantic	New England	DEATHS	TOTAL
Pacific	.532				.021		.043	.021		.383	47
Mountain		.250								.750	4
West North Central			.600							.400	35
West South Central				.667						.333	15
East North Central				.007	.660		.007	.013		.313	150
East South Central						.800				.200	5
Middle Atlantic	.005	.005	.011	.011	.005		.568	.011	.074	.310	190
South Atlantic								.760		.240	25
New England									.821	.179	28
BIRTHS	24	4	7	21	35	3	31	17	17		
TOTAL	50	6	30	34	136	7	142	41	54		

headquarter (3.2% of the 31) relocated to the Mountain Division; (2) one headquarter (3.2%) relocated to the West South Central Division; (3) two headquarters (6.4%) relocated to the East North Central Division; and (4) six headquarters (19.4%) died. Therefore, 21 (67.7%) of the 31 corporate headquarters located in this division in 1957 were still there in 1970. These shifts can all be found by reading across the two for the West North Central.

By reading down the column for the West North Central, it is observed that no other headquarters relocated to this division. However, during the time period, fourteen new corporate headquarters reached the 500 threshold, thus making a total of thirty-five corporate headquarters located in this division in 1970.

1957-1970. From Table 11 it is observed that the major shifts occurring during Period One were from:

(1) The Mountain Division to the Pacific.

(2) The West North Central Division to the East North Central.

(3) The West South Central Division to the Middle Atlantic.

(4) The South Atlantic Division to the East North Central.

(5) The Middle Atlantic to New England.

Furthermore, it is noted that the largest percentage loss due to deaths occurred in the Mountain (80.0%),

West South Central (62.4%), and the East South Central (50.0%) census divisions. In terms of the number of births, it is observed that 75.0 percent of the 1970 total of headquarters in the Mountain Division were due to births, with 60.0 percent for the East South Central and 56.0 percent for the South Atlantic.

1970-1983. From Table 12 it is observed that the major shifts occurring during Period Two were from:

(1) The Middle Atlantic to the New England.

(2) The Pacific to the Middle Atlantic.

(3) The Pacific to the East North Central.

(4) The Pacific to the South Atlantic.

The largest percentage of loss due to deaths during this period occurred in the Mountain (75.0%), West North Central (43.2%) and Pacific (38.3%) census divisions; while 66.7 percent of the 1983 total number of headquarters located in the Mountain Division were due to births, with 61.8 percent for the West South Central and 48.0 percent for the Pacific.

Clearly, once again, a very different behavior of headquarters during these two periods is being exhibited. With this background information it is possible to discuss hypothesis 4.2(a) which states:

> The overall rates of redistribution of corporate headquarters will be quicker during the period 1970-1983 than during 1957-1970.

The easiest way to test this hypothesis is by using the data from Table 7. By adding the total in-migration, out-migration, births and deaths, then dividing that number by two (to eliminate double counting), it is seen that during 1957-1970, 196.5 or approximately 197 changes occurred, or in other words, this time period had a redistribution factor equal to 39.4 percent (197/500). Calculating similarly the second time period yields a redistribution factor of 38.0 percent. Therefore, the hypothesis does not hold true. A more rapid rate of redistribution of corporate headquarters on a interregional basis was observed during the period 1957-1970 than the period 1970-1983.

A closer examination reveals some explanation as to why this hypothesis did not hold true. Considering just the number of births and deaths first, it is noted that during the first period, 181 corporate headquarters (36.2%) died. This is quite a bit higher than the second period's rate of 31.7 percent. The exact opposite held true for the number of migrations. During 1957-1970, sixteen migrations occurred, compared to thirty-one during 1970-1983. Therefore, with respect to the migration of corporate headquarters, the rate was more rapid during the second period than during the first. Conversely, the opposite is true with respect to deaths. Since the number of deaths is considerably higher than the number of migrations during both

years, the combination of both births and deaths with the migration act to negate the hypothesis.

However, these are overall rates for all census divisions. The question still remains, however, as to the individual divisions themselves which have experienced rapid rates in the growth of corporate headquarters during the second time period. For this, hypotheses 4.2(b) is utilized.

> Individual rates of growth in the numbers of corporate headquarters in each census division for 1970-1983 will be more rapid in those divisions where the rate of population growth was quickest.

In order to test this hypothesis, a Markov-Chain Model was developed using 1957-1970 redistribution probabilities (Table 11) in order to obtain an expected number of corporate headquarters. This expected number would equal the actual number if the rates of growth of corporate headquarters in that census division were the same during Period Two as Period One.

The formula used was:

$$NE_j = \{P_{ij}N_{ij}+B$$

where:

n = the number of relocations occurring to division j

P_{ij} = probability of relocation from i to j

N_i = number of headquarters in division i at start of time period

B = number of births expected (based on past time period)

NE_j = number of headquarters expected in division j in predicted year.

For example, to predict the expected number of headquarters in the Pacific division in the year 1983:

NE = 0.514 (47) + 0.200 (4) + 0.009 (190) + 25

= 51.668 or 52

where:

0.514 = probability of staying in the Pacific Division

47 = number of headquarters in Pacific, 1970

0.200 = probability of relocation from Mountain Division to Pacific

4 = number of headquarters in Mountain, 1970

0.009 = probability of relocation from Middle Atlantic to Pacific

190 = number of headquarters in Middle Atlantic, 1970

25 = number of births expected during 1970-1983, based upon number born 1957-1970.

The number of headquarters expected in 1983 can be found in Table 13. As mentioned earlier, if the actual number equals the expected number, then the rates of growth in terms of corporate headquarters during the two periods were equal. However, if the actual number of headquarters is greater than the expected number, the rate during the

Table 13. Expected and Actual Number of Corporate Headquarters by Census Division for 1983.

REGION	EXPECTED	ACTUAL	PERCENT
Pacific	52	50	-2 (-3.85)
Mountain	4	6	+2 (+50.00)
West North Central	38	30	-8 (-21.05)
West South Central	15	34	+19 (+126.67)
East North Central	152	136	-16 (-10.53)
East South Central	6	7	+1 (+16.67)
Middle Atlantic	173	142	-31 (-17.92)
South Atlantic	26	41	+15 (+57.69)
New England	33	54	+21 (+63.64)

second period was quicker than that of the first. Conversly, a slower rate during the second period would result in the actual number of headquarters being less than the expected.

From Table 13 the divisions which experienced a more rapid rate of growth in corporate headquarters resulting in a larger number of corporate headquarters than expected included the Mountain, West South Central, East South Central, and South Atlantic census divisions, while the other divisions experienced a slower rate of corporate headquarter growth, thus resulting in a smaller number of corporate headquarters than expected.

With respect to population growth, the divisions experiencing a quicker rate of growth during the second period as compared to the first included the Mountain, West South Central, East South Central and South Atlantic Divisions.

Spearman's Rank Correlation Coefficients were computed between these two components, yielding a statistically significant coefficient equal to r=0.583, sufficiently high enough to believe that hypothesis 4.2(b) holds true, that the individual rates of growth in the numbers of corporate headquarters in census divisions were more rapid in those census divisions where the rate of population growth was quickest.

Finally, by using the same basic Markov-Chain Model for 1970-1983 data, it is possible to give a general forecast for the year 1996 of the spatial distribution of corporate headquarters on an interregional basis.

From Table 14 over the period 1983-1996, the largest relative growth in the number of corporate headquarters are expected in the West South Central (+35.3%), New England (+31.5%), South Atlantic (+26.8%) and East South Central (+28.6%) census divisions. The largest relative decreases in the numbers of corporate headquarters over this period are expected in the Middle Atlantic (-19.7%), West North Central (-13.3%), and East North Central (-7.4%) census divisions.

During this time period, the East North Central is expected to surpass the Middle Atlantic as being the major census division for corporate headquarters. It is expected that the Mountain Division will continue to have the least number of corporate headquarters of all the census divisions.

Table 14. Expected Numbers and Percent Changes in the Spatial Distribution of Corporate Headquarters, 1996.

REGION	NUMBER EXPECTED	% GROWTH EXPECTED 1983-1986
Pacific	50	0.0
Mountain	6	0.0
West North Central	26	-13.3
West South Central	46	+35.3
East North Central	126	-7.4
East South Central	9	+28.6
Middle Atlantic	114	-19.7
South Atlantic	52	+26.8
New England	71	+31.5

CHAPTER 5

INTRAREGIONAL SHIFTS -- OVERVIEW

In the previous chapter, some of the spatial characteristics of corporate headquarters and the spatial distribution of their associated employees were discussed on a interregional basis. The location of headquarters and their employees were discussed in an historical content. Interregional shifts in these components and the rates of these shifts were discussed, as were as some of the differences in behavior exhibited by the components between 1957-1970 and 1970-1983.

It therefore follows that in this chapter a study of the same topic will be undertaken on an intraregional basis. Rather than locations by divisions, locations within divisions will be discussed. Similarly, intraregional shifts and rates rather than interregional shifts and rates will be examined. Finally, a similar discussion, concerning differences in behavior between the two time periods, will be undertaken.

The chapter begins with a discussion concerning location quotients with respect to headquarters-controlled employees for both SMSAs and central cities; and continues

with a longitudinal study of the geographic distribution of headquarters and headquarter-controlled employees, concluding with a discussion of correlations between components similar to that in Chapter Three. Along the way, hypothesis 5.1 will be examined.

Location Quotients

Perhaps the easiest method of identifying areas of high specialization is through the use of location quotients (LQ). The location is a type of ratio between two local measurements and the national average. Location quotients can be manipulated for almost any benchmark activity (Alexander, 1958; Leigh, 1970) which in the case of this study is headquarters employment.

The general formula used in determining location quotients for both SMSAs and central cities was

$$LQ_{ij} = \frac{r_{ij}/r_i}{s_{ij}/S_i}$$

where

r_{ij} = level of activity in region j

r_i = level of activity in benchmark region, (usually the nation)

S_{ij} = level of benchmark activity in region j

S_i = level of benchmark activity in benchmark region

Specifically, for the location quotients devised, the

"activity" is manufacturing employment, and the benchmark activity is population.

Therefore, a location quotient greater than one indicates an area which is unusually specialized with respect to headquarters employment. The higher the location quotient, the higher the degree of specialization, with respect to headquarter-controlled employees.

Furthermore, it has been suggested that when location quotients greater than one occur, the "surplus" activity which the location quotient identifies can be considered a basic activity within that area, and thus channels income to the area. Conversely, location quotients less than one represent non-basic activities within the area (Leigh, 1970).

Using the formula presented, location quotients were computed for a series of SMSAs as well as for their accompanying central cities for the years 1957, 1970, and 1983. Before doing so, several decisions were made concerning the use of data, including the following:

(1) In order for an SMSA to have a location quotient computed, the SMSA must have had a 1980 population greater than 500,000 people and at least one headquarters listed on the 500 list for one of the three years.

(2) Many SMSAs have had either an increase or a decrease during the years 1957-1983. In order to have comparable results, all SMSA boundaries were adjusted to reflect the 1983 boundaries, resulting often in either an addition to or of the population with the published census figure.

(3) Since population figures are most readily available from the United States census at ten-year intervals, the 1957 location quotients were computed using 1960 population figures, while the 1983 location quotients were computed with 1980 population figures. In total, location quotients were derived for 65 SMSAs and 64 central cities. (Only 64 SMSAs had LQs figured in 1957. The Charlotte-Gastonia, North Carolina SMSA had one HQ listed in 1957, but no employment figure is listed. Only 64 central cities were computed, as the Nassau-Suffolk SMSA has no central city.)

(4) Much of the data in this discussion is expressed in terms of rank order. This refers to how high the location quotients are compared to others in the same category. For instance, the highest location quotient in the largest sized SMSAs was New York, New York-New Jersey; and is referred

to as the number one ranking (#1). The second highest ranking, Detroit, Michigan, is referred to as merely #2, etc.

(5) Due to the complexity of attempting to analyze a series of simultaneous changes occurring in the location quotients for over 130 central cities and SMSAs, little attempt will be made to explain the causes of the findings. This first section is meant only to be a descriptive analysis as to what has happened, not necessarily why. Explanation will come about in the following sections, where an in-depth study was undertaken on just fourteen SMSAs and their central cities.

Changes in Rank Leadership

Central Cities. Table 15 lists those central cities with location quotients greater than 1.25, indicating a high degree of specialization. Since location quotients are greatly dependent upon population, the central cities are placed into four categories based upon their 1980 population. Category One consists of those central cities with a 1980 population greater than 750,000, Category Two, between 500,000 and 750,000, Category Three, between 300,000 and 500,000, and Category Four, less than 300,000.

Table 15. Central Cities with Location Quotients Greater Than 1.25. By Year and Population.

SIZE CLASS	1957		1970		1983	
>750,000 (1980) n=12	Detroit, MI	10.66	Detroit, MI	9.51	Detroit, MI	10.47
	New York, NY	8.10	New York, NY	8.34	New York, NY	5.16
	San Francisco-Oakland, CA	3.64	Chicago, IL	3.29	Chicago, IL	3.91
	Chicago, IL	3.18	San Francisco-Oakland, CA	2.70	Ft. Worth-Dallas, TX	2.79
	Philadelphia, PA	1.51	Ft. Worth-Dallas, TX	2.37	San Francisco-Oakland, CA	2.35
			Philadelphia, PA	1.40	Houston, TX	2.23
					Long Beach-Los Angeles, CA	1.32
500,000-750,000 n=16	Cleveland, OH	4.84	Cleveland, OH	7.09	Minneapolis-St. Paul, MN	10.59
	Seattle-Everett, WA	3.14	Minneapolis-St. Paul, MN	5.33	Cleveland, OH	8.32
	Minneapolis-St. Paul, MN	2.32	Seattle-Everett, WA	1.88	Seattle-Everett, WA	2.49
	Boulder-Denver, CO	1.72	Boston, MA	1.69		
	San Jose, CA	1.51	San Jose, CA	1.48		
	Milwaukee, WI	1.27	Milwaukee, WI	1.43		
	Boston, MA	1.27				
300,000-500,000 n=19	Pittsburgh, PA	17.00	Pittsburgh, PA	12.54	Pittsburgh, PA	22.83
	Greensboro, Winston-Salem, Highpoint, NC	5.70	St. Louis, MO	7.05	St. Louis, MO	15.74
	Toledo, OH	5.24	Greensboro, Winston-Salem, Highpoint, NC	6.42	Greensboro, Winston, Salem, Highpoint, NC	8.48
	St. Louis, MO	3.70	Toledo, OH	5.67	Toledo, OH	6.36
	Nashville-Davidson, TN	1.98	Cincinatti, OH	3.14	Atlanta, GA	4.99

Table 15 - Continued

	Cincinatti, OH	1.97	Providence, Wardwick, Pawtucket, RI	2.62	Cincinatti, OH	3.61
	Providence, Wardwick, Pawtucket, RI	1.85	Portland, OR	2.25	Providence, Wardwick, Pawtucket, RI	2.10
			Nashville-Davidson, TN	2.11		
			Honolulu, HI	1.50		
	Wilmington, DE	25.19	Wilmington, DE	24.28	Wilmington, DE	42.12
	Akron, OH	17.77	Akron, OH	16.97	Hartford, CN	22.90
	Allentown-Bethlehem, Easton, PA	15.64	Allentown, Bethlehem, Easton, PA	9.11	Akron, OH	17.14
	Richmond, VA	4.54	Dayton, OH	8.22	Rochester, NY	11.3
<300,000	Dayton, OH	4.07	Rochester, NY	7.73	New Brunswick, Perth Ambor, Sayerville, NJ	11.31
8n=17	Rochester, NY	3.24	New Brunswick, Perth Ambor, Sayerville, NJ	4.70	Allentown, Bethelehem, Easton, PA	6.61
	New Brunswick, Perth Ambor, Sayerville, NJ	2.59	Richmond, VA	2.85	Dayton, OH	5.91
	Syracuse, NY	1.33	Syracuse, NY	1.33	Richmond, VA	5.16

Beginning with Category One, it was observed that very little change in the rank ordering of the central cities occurred over the years. Detroit, Michigan and New York, New York-New Jersey, were #1 and #2 for all three years. San Francisco-Oakland, California, which was #3 in 1957, dropped to #4 in 1970, and did not make the list in 1983. Dallas-Ft. Worth, Texas, which was not on the list in 1957, entered at #5 in 1970 and #4 in 1983. Philadelphia, Pennsylvania-New Jersey, which made the list in both 1957 and 1970, failed to do so in 1983, while both Houston, Texas and Los Angeles-Long Beach, California only made the list in 1983.

The second category of central cities (500,000-750,000) was interesting in that Cleveland, Ohio; Seattle-Everett, Washington; and Minneapolis-St. Paul, Minnesota topped the list all three years, the overall number of central cities with location in 1983, these three cities were the only ones on the list.

Central cities in the third size category (300,000-500,000) did have some turnover in their rank ordering. Although Pittsburgh, Pennsylvania led the list in all three years, Greensboro, Winston-Salem, and Highpoint, North Carolina and Toledo, Ohio (#2 and #3 respectively during 1957) dropped to #3 and #4 respectively in 1970 and

1983, while St. Louis, Michigan which had been #4 in 1957, rose to #2 in both 1970 and 1983.

Finally, in the category of the smallest central cities (less than 300,000), turnover in the rank leadership also occurred. Wilmington, Delaware ranked #1 all three years; while Akron, Ohio's position, which had been #2 in 1957 and 1970 dropped to #3 in 1983, was filled by Hartford, Connecticut, a newcomer to the lists in 1983. The central cities of Allentown, Bethlehem, and Easton, Pennsylvania; Richmond, Virginia; and Dayton, Ohio all generally slipped in their positions through the years while Rochester, New York; New Brunswick, Perth-Amboy, and Sayerville, New Jersey, all generally increased their positions.

SMSAs. Table 16 lists those SMSAs with location quotients greater than 1.25. Again, due to the large influence of population upon a location quotient, the SMSAs are placed into three categories based upon their 1980 population. Category One consists of those SMSAs with a 1980 population greater than 2,000,000, Category Two, between 1,000,000 and 2,000,000, and Category Three less than 1,000,000.

With respect to the first category (greater than 1,000,000) it was found that, similar to the first category of central cities, little change in rank ordering

Table 16. SMSAs with Location Quotients Greater Than 1.25. By Population and Year.

SIZE CLASS	1957		1970		1983	
	New York, NY	6.72	New York, NY	7.25	New York, NY	5.42
	Detroit, MI	5.47	Detroit, MI	4.85	Detroit, MI	4.83
>2,000,000 (1980)	Pittsburgh, PA	4.38	Pittsburgh, PA	2.71	Pittsburgh, PA	4.28
	Chicago, IL	1.97	Minneapolis-		Minneapolis-	
n=16			St. Paul, MN	2.03	St. Paul, MN	3.26
	San Francisco- Oakland, CA	1.53	Chicago, IL	1.93	St. Louis, MO	3.03
	St. Louis, MO	1.35	St. Louis, MO	1.91	Chicago, IL	2.62
					Boston, MA	1.48
	Cleveland, OH	1.90	Cleveland, OH	2.31	Cleveland, OH	2.62
1,000,000 2,000,000	Seattle-					
	Everett, WA	1.75			Newark, NJ	2.54
n=20	Milwaukee, WI	1.39			San Jose, CA	2.13
	Akron, OH	8.52	Akron, OH	6.88	Akron, OH	6.12
	Allentown, Bethelehem,		Wilmington, DE	3.91	Wilmington, DE	5.65
	Easton, PA	6.19	Allentown, Bethlehem,		Hartford, CN	5.19
	Wilmington, DE	5.82	Easton, PA	3.26	Greensboro, Winston-Salem,	
	Greensboro, Winston-Salem,		Greensboro, Winston-Salem,		Highpoint, NC	3.60
<1,000,000	Highpoint, NC	2.68	Highpoint, NC	3.02	New Brunswick, Perth Ambor,	
n=29	Toledo, OH	2.40	Toledo, OH	2.85	Sayerville, NJ	2.93
	Richmond, VA	2.16	Dayton, OH	2.50	Toledo, OH	2.85
	Hartford, CN	2.10	Rochester, NY	2.38	Rochester, NY	2.82
	Dayton, OH	1.49	Hartford, CN	1.64	Allentown, Bethlehem,	
	Rochester, NY	1.29	Nashville- Davidson, TN	1.35	Easton, PA	2.08
					Richmond, VA	1.79
			Richmond, VA	1.30	Dayton, OH	1.45

occurred. In fact, New York, New York-New Jersey; Detroit, Michigan; and Pittsburgh, Pennsylvania-New Jersey had the highest location all three years. San Francisco-Oakland, California; was the only SMSA present in the 1957 rankings which did not make the list during either 1970 or 1983. Minneapolis-St. Paul, Minnesota, while not present on the 1957 list, made both of the others, while Boston, Massachusetts joined the list only in 1983.

More variability was noted in the second category, (1,000,000-2,000,000). Cleveland, Ohio topped the list all three years while Seattle, Everett, Washington; and Milwaukee, Wisconsin; both which had a high degree of specialization in 1957, failed to make the list in either 1970 or 1983. Cleveland, Ohio was the only SMSA with a location quotient greater than 1.25 in 1970; Newark, New Jersey; and San Jose, California joined the list in 1983.

Somewhat between these two extremes was the variability found in the rank ordering of the smallest size category. Perhaps the most interesting change in the rankings was the general decline in Allentown, Bethlehem, Easton, Pennsylvania: from #2 in 1957 to #3 in 1970 to #8 in 1983; coupled with the general increase of Hartford, Connecticut from #7 in 1957 to #8 in 1970, and up to #3 in 1983.

Change in Location Quotients

Central Cities. Table 17 lists the means and standard deviations for the location quotients of all four categories of central cities. Three of the four categories had a positive increase in the mean location quotient for the period 1957-1970, the exception being the largest-size category, which experienced a decrease of 0.8 percent. The second category of central cities had an increase of 22.0 percent, up to 1.33 in 1970 from 1.09 in 1957. The third category increased 1.8 percent, up to 4.49 from 4.41.

The overall change in the mean location quotients over the period 1957-1970 increased 7.0 percent, up to 2.74 in 1970 from 2.56 in 1957.

The period 1970-1983 was similar to 1957-1970 in one respect but differed in another. Similar to the first period, the category of the largest size central cities had a decrease in its mean location quotient (-0.8%). However, the general trend exhibited during the first period, that being generally smaller increases in mean location quotients for smaller central cities, reversed during 1970-1983. Whereas the average location quotients for Category Two central cities increased 24.1 percent (1.65 vs. 1.33) those for the third category increased

Table 17. Mean Location Quotients and Standard Deviations for Central Cities (CC), by Population and Year

SIZE CLASS		YEAR 1957	1970	1983
CC with 1980 Population > 750,000	x	2.52	2.50	2.48
	0	3.45	3.22	2.99
CC with 1980 Population 500,000-750,000	x	1.09	1.33	1.65
	0	1.90	2.04	3.14
CC with 1980 Population 300,000-500,000	x	2.17	2.51	3.67
	0	3.99	3.28	6.11
CC with 1980 Population < 300,000	x	4.41	4.49	7.23
	0	7.58	6.97	11.36
OVERALL	x	2.56	2.74	3.89
	0	4.82	4.42	7.21

46.2 percent (3.67 vs. 2.51) and those for the smallest category increased 61.0 percent (7.23 vs. 4.49).

The overall change in the mean location quotients over the period 1970-1983 increased 42.0 percent, up to 3.89 in 1983 from 2.47 in 1970.

As would be expected in light of the above discussions, three of the four categories of central cities had increases in the mean location quotient over the entire period of 1957-1983. Again, the exception came in the mean location quotient for the largest categories of central cities, which decreased 1.6 percent. The largest increase in mean location quotients was in the third category (9.3%), followed by Category Four (63.9%). The smallest positive increase in the means was in the second category (51.4%).

Over the entire twenty-six-year period, 1957-1983, the overall change in the mean location quotients increased 52.0 percent, from 2.56 in 1957 to 3.89 in 1983.

Table 18 lists the increases and decreases in location quotients for central cities by census division. During Period One, 28 (43.8) of the 64 location quotients increased vs. 20 (31.3%) decreases, while during 1970-1983, there were 36 (56.3%) increases vs. 19 (29.7%) decreases. Over the entire period, 32 (50.0%) of the location quotients increased, vs. 23 (35.9%) decreases.

Table 18. Numbers of Location Quotients Undergoing Change by Type of Change (+, -, 0) and Time Period.

REGION (N)	1957-1970 +	-	0	1970-1983 +	-	0	1957-1983 +	-	0
Pacific (9)	3	4	2	3	4	2	4	4	1
	.33	.45	.22	.33	.45	.22	.44	.44	.12
Mountain (3)	1	1	1	1	1	1	1	1	1
	.33	.33	.33	.33	.33	.33	.33	.33	.33
West North Central (4)	2	2	0	3	1	0	2	2	0
	.50	.50	0	.75	.25	0	.50	.50	0
West South Central (6)	3	2	1	5	1	0	3	3	0
	.50	.33	.17	.83	.15	0	.50	.50	0
East North Central (11)	6	3	2	8	2	1	6	4	1
	.55	.27	.18	.73	.18	.09	.55	.36	.09
East South Central (4)	3	1	0	2	2	0	2	2	0
	.75	.25	0	.50	.50	0	.50	.50	0
Middle Atlantic (11)	4	4	3	3	6	2	3	5	3
	.36	.36	.28	.27	.55	.18	.27	.45	.27
South Atlantic (13)	3	3	7	10	0	3	9	1	3
	.23	.23	.54	.77	0	.23	.69	.08	.23
New England (3)	3	0	0	1	2	0	2	1	0
	1.00	0	0	.33	.67	0	.67	.33	0
TOTAL	28	20	16	36	19	9	32	23	9
	.44	.31	.25	.56	.30	.14	.50	.36	.14

The census divisions which had the greatest percentage of location quotients increasing during Period One were New England at 100.0 percent and the East South Central at 75.0 percent, while during the second period, the West South Central at 83.3 percent, and the South Atlantic at 76.9 percent had the greatest percentage of location quotients increasing. Finally, over the entire period, the South Atlantic at 69.2 percent and New England at 66.7 percent had the greatest percentage.

Conversely, the greatest percentage of location quotients which decreased during Period One were found in the West North Central, 50.0 percent; and the Pacific 44.4 percent, while during Period Two - New England decreased 66.7 percent and the Middle Atlantic decreased 54.5 percent. Over the entire period, the West North Central, West South Central, and East South Central census divisions all had 50.0 percent of the location quotients decrease.

SMSAs. Table 19 lists the means and standard deviations for the location quotients of all three categories of SMSAs. Two of the three categories of SMSAs had a positive increase in the mean location quotient for the period 1957-1970, the exception being the smallest size category, -11.3 percent. This decrease was strong enough to influence the overall change in mean location quotients

Table 19. Mean Location Quotients and Standard Deviations for SMSAs by Population and Year.

REGION		YEAR 1957	1970	1983
SMSAs with 1980 Population > 2,000,000	x	1.64	1.68	1.96
	0	2.05	1.92	1.72
SMSAs with 1980 Population 1,000,000-2,000,000	x	0.51	0.52	0.68
	0	1.90	2.04	3.14
SMSAs with 1980 Population < 1,000,000	x	1.33	1.18	1.31
	0	2.10	1.60	1.85
OVERALL	x	1.15	1.10	1.28
	0	1.81	1.51	1.62

over the period 1957-1970, which decreased 4.3 percent. This decrease occurred despite a 2.4 percent increase for Category One SMSAs and a 2.0 percent increase for Category Two SMSAs.

All three categories had increases in the mean location quotient during the second period (1970-1983), and these increases were considerably larger than those of the first period. The largest category of SMSAs mean location quotient increased 16.7 percent, Category Two increased 30.8 percent; while the smallest size category of SMSAs increased 11.0 percent. Overall, the mean location quotient of SMSAs increased 16.4 percent.

Over the entire twenty-six year period (1957-1983), the mean location quotients for all SMSAs increased 11.3 percent. The mean location quotient for the largest size SMSAs increased 19.5 percent, the second category increased 33.3 percent, and the smallest category decreased 1.5 percent.

From Table 20 it is possible to draw a few more observations. Over the first period, 29 (45.3%) of the SMSAs had increases in their location quotients vs. 27 (42.2%) decreases; during the second period there were 37 (57.85) increases vs. 23 (35.9%) decreases. Over the entire period, 31 (48.4%) of the location quotients increased vs. 28 (43.8%) decreases.

Table 20. Numbers of Location Quotients Undergoing Change by Type of Change (+, -, 0) and Time Period.

REGION (N)	1957-1970 +	-	0	1970-1983 +	-	0	1957-1983 +	-	0
Pacific (9)	4	4	1	5	4	0	7	2	0
	.44	.44	.12	.56	.44	0	.78	.22	0
Mountain (3)	1	1	1	1	1	1	1	1	1
	.33	.33	.33	.33	.33	.33	.33	.33	.33
West North Central (4)	3	1	0	3	1	0	3	1	0
	.75	.25	0	.75	.25	0	.75	.25	0
West South Central (6)	3	2	1	4	2	0	3	3	0
	.50	.33	.17	.67	.33	0	.50	.50	0
East North Central (11)	4	6	1	6	4	1	4	6	1
	.36	.55	.09	.55	.36	.09	.36	.55	.09
East South Central (4)	3	1	0	2	2	0	2	2	0
	.75	.25	0	.50	.50	0	.50	.50	0
Middle Atlantic (11)	5	7	0	6	6	0	3	8	1
	.42	.58	4	.50	.50	0	.25	.67	.08
South Atlantic (12)	4	4	4	8	2	2	6	4	2
	.33	.33	.33	.66	.17	.17	.50	.33	.17
New England (3)	2	1	0	2	1	0	2	1	0
	.67	.33	0	.67	.33	0	.67	.33	0
TOTAL	29	27	8	37	23	4	31	28	5
	.45	.42	.13	.58	.36	.06	.48	.44	.08

The census divisions with the greatest percentage of SMSA location quotients increase during Period One were the West North Central and New England. During the second period, the West North Central and West South Central census divisions increased while over the entire period the Pacific, West North Central, and New England census divisions had the greatest percentage of SMSA location quotients increase.

Finally, it is interesting to note the number of SMSAs which had location quotients greater than 1.25. For example, in 1957, 37.5 percent of the largest SMSA location quotients were greater than 1.25, compared to 15.0 percent in the second category and 31.0 percent in the smallest category. In 1970, these percentages read 37.5 percent, 5.0 percent, and 34.5 percent while in 1983 the percentages were 43.8 percent, 5.0 percent, and 34.5 percent. By far the largest overall increase of the entire period was in the largest category.

To summarize a few of the previous findings:

1. Very little change occurred in the rank ordering of central cities and SMSAs based upon their location quotients of manufacturing employment. When change did occur, however, it occurred in the central cities and SMSAs which had smaller

populations rather than in larger population zones.

2. The overall mean location quotients during the overall period for central cities increased 51.9 percent. It was found that this increase occurred occurred primarily during the second period (42.0%) as compared to the first period (7.0%). Only the largest central cities exhibited a decrease in their degree of specialization (-1.6%).

3. As would follow from (2), a greater number of central cities increased their location quotients during the second period (56.3%) as compared to the first (43.8%).

4. Certain census divisions have had a higher tendency for their central cities to increase their degree of specialization while others have had a tendency to decrease. During the first period, central cities in the New England and East South Central census divisions had the greatest percentage of location quotients increasing while those in the West North Central division had the highest percentage of decreasing location quotients. During the second period, the West

South Central and South Atlantic census division had the greatest percentage of increasing location quotients, while the New England and the Middle Atlantic census divisions had the highest percentage of decreasing location quotients.

5. The overall mean location quotients during the overall period for SMSAs increased 11.3 percent. However, a close examination leads to the conclusion that this increase occurred primarily during the second period. In fact, the decrease in average location quotients (-4.3%) noted during the first period suggests that during this time a general decrease in degree of specialization was occurring. This decrease was offset during the period 1970-1983, when the average location quotient increased 16.4 percent. The greatest increase in degree of specialization occurred in those SMSAs who had a 1980 population between 1,000,000 and 2,000,000, although this category had the lowest percentage of SMSAs with location quotients greater than 1.25.
6. Similar to the trend above, when the number of SMSAs increasing their location quotient are

looked at we see a greater number of SMSAs increasing over the second period (57.8%) than during the first period (45.3%). Again it appears as though a higher degree of specialization was occurring in the latter period than during the former.

7. The SMSAs of certain census divisions have had a tendency to increase in the degree of specialization while others have had a tendency to decrease. During the first period, the West North Central and the East South Central census divisions were the large "gainers" while the East North Central and New England census divisions were the "losers". During the second period, the West North Central central division continued to have SMSAs with increasing location quotients, joined by substantial increases in the West South Central and New England census divisions. Overall from 1957-1983, the Pacific, West North Central and New England census divisions tended to contain SMSAs which had increasing location quotients, while the Middle Atlantic and East North Central census divisions tended to contain SMSAs with decreasing location quotients.

8. Location quotients of central cities run considerably higher than those location quotients for SMSAs. There are several possible reasons for this, but the primary reason has to do with size of the geographic unit. All other things being equal, the smaller the geographic units (i.e., central cities vs. regions) the greater the range of location quotients. This is because the location quotient is scale-dependent on two counts, the first being the size of the geographic units and the second being how narrowly the categories of activities are broken down. Another possibility has to do with population change within the geographic unit itself. For example, the majority of jobs located within central cities in 1957 remained there through 1983. Generally, however, the populations with SMSAs increased at a higher rate than did those populations located within central cities proper. Knowing that the majority of jobs located within central cities in 1957 remained there through 1983 not only helps to explain why central cities tend to have larger location quotients but also why the increases in location

quotients for central cities are generally larger than those for the SMSAs proper.

As mentioned earlier, this section served as a descriptive longitudinal study of the changes which have occurred in the location quotients of SMSAs and central cities. The rest of this chapter will be devoted to an in-depth study of the changes which have occurred in corporate headquarters and headquarter-controlled employees in a series of fourteen SMSAs and their central cities.

Components

This next section of the chapter will examine two spatial phenomena, the distribution of corporate headquarters and that of their accompanying employees. Unlike Chapter Two, where these spatial distributions discussed were on an interregional basis, in this section they will be discussed in light of intraregional redistribution, specifically in terms of central cities and SMSAs. This section will start with a longitudinal study of the geographic distribution of headquarters and employees. Here, the questions of which central cities (SMSAs) have tended to have large numbers of headquarters (employees) located within them, both past and present and which central

cities (SMSAs) have experienced large relative change in terms of the numbers of the components will be discussed.

The results of this study will be utilized in the examination of hypothesis 5.1.

> Hypothesis 5.1 Central cities and SMSAs which experienced rapid population growth are expected to experience net increases in the number of corporate headquarters and their accompanying employees.

The numbers of headquarters as well as their associated control of employees in each of the 14 SMSAs and central cities used in this section were totaled from Fortune 500 lists for each of the three years and can be found in Tables 21-22. Relative percent changes for the three time periods have also been calculated and can be found in Tables 23 and 24. One note should be mentioned concerning these tables. All the data values listed for an SMSA do not include anything located in the central city proper. The same holds true for Table 25, which is the percent change of population by central cities and SMSAs.

Headquarters

1957. The number of headquarters in central cities during 1957 ran from a high of thirteen for New York to a low of four in Cincinnati, an overall spread of 41.3 percent. Second to New York, Chicago contained forty-four corporate headquarters. The combination of

Table 21. Numbers of Corporate Headquarters by Central City (CC) and SMSA, by Year.

SMSA	NUMBER OF HEADQUARTERS 1957 CC	1957 SMSA	1970 CC	1970 SMSA	1983 CC	1983 SMSA
New York, NY	131	9	116	9	69	14
Chicago, IL	44	5	36	13	26	20
Detroit, MI	15	2	8	4	3	9
Pittsburgh, PA	23	1	15	0	15	0
Philadelphia, PA	14	7	11	3	6	4
Cleveland, OH	16	0	15	1	10	2
St. Louis, MO	11	1	9	2	9	0
Minneapolis-St. Paul, MN	8	0	11	1	12	1
Los Angeles-Long Beach, CA	10	3	12	9	9	6
Milwaukee, WI	7	2	9	2	5	3
San Francisco-Oakland, CA	14	0	10	2	9	2
Boston, MA	5	1	5	2	2	8
Dallas-Ft. Worth, TX	7	0	7	0	12	0
Cincinnati, OH	4	0	5	0	4	0
TOTAL	309	32	269	48	191	69
% Total Firms	62.0	6.4	53.8	9.6	38.2	13.8
RATIO SMAS/CC	1:10.32		1:5.60		1:2.77	

Table 22. Numbers of Corporate-Controlled Employees by Central City (CC) and SMSA, by Year.

SMSA	NUMBER OF EMPLOYEES 1957 (x100) CC	SMSA	1970 (x100) CC	SMSA	1983 (x100) CC	SMSA
New York, NY	31697	896	47579	4737	22654	8012
Chicago, IL	5672	469	7967	1616	7296	4014
Detroit, MI	9009	1960	10330	5124	7816	5343
Pittsburgh, PA	5202	126	4690	0	6004	0
Philadelphia, PA	1533	498	1955	490	853	937
Cleveland, OH	1839	0	3432	150	2961	266
St. Louis, MO	1406	49	3155	114	4423	0
Minneapolis-St. Paul, MN	936	0	2852	13	4171	63
Los Angeles-Long Beach, CA	1125	1588	2474	3723	4423	1853
Milwaukee, WI	478	418	737	349	486	309
San Francisco-Oakland, CA	2041	0	2088	236	1483	194
Boston, MA	448	283	776	552	366	2169
Dallas-Ft. Worth, TX	600	0	2111	0	2230	0
Cincinnati, OH	502	0	902	0	864	0
TOTAL	62488	6287	91048	17104	66030	23160
% Total Emp.	68.80	+6.92	62.33	11.71	46.98	16.48
RATIO SMSA/CC	1:9.94		1:5.32		1:2.85	

Table 23. Percentage Changes in the Numbers of Corporate Headquarters by Central City (CC) and SMSA, by Time Period.

SMSA	1957 - 1970 CC	1957 - 1970 SMSA	1970 - 1983 CC	1970 - 1983 SMSA	1957 - 1983 CC	1957 - 1983 SMSA
New York, NY	-12.12	0	-40.52	+55.56	-47.73	+55.56
Chicago, IL	-18.18	+160.00	-27.78	+53.85	-40.91	+300.00
Detroit, MI	-46.67	+100.00	-62.50	+125.00	-80.00	+350.00
Pittsburgh, PA	-34.78	-100.00	0	0	-34.78	-100.00
Philadelphia, PA	-21.43	-57.14	-45.45	+33.33	-57.14	-42.86
Cleveland, OH	-6.25	*	-33.33	+100.00	-37.50	*
St. Louis, MO	-18.18	+100.00	0	-100.00	-18.18	-100.00
Minneapolis-St. Paul, MN	+37.50	*	+9.09	0	+50.00	*
Los Angeles-Long Beach, CA	+20.00	+200.00	-25.00	-33.33	-10.00	+100.00
Milwaukee, WI	+28.57	0	-44.44	+50.00	-28.57	+50.00
San Francisco-Oakland, CA	-28.57	*	-10.00	0	-35.71	*
Boston, MA	0	+100.00	-60.00	+300.00	-60.00	+700.00
Dallas-Ft. Worth, TX	0	0	+71.43	0	+71.43	0
Cincinnati, OH	+25.00	0	-20.00	0	0	0
OVERALL	-13.23	+50.00	-29.00	+43.75	-38.39	+115.63

*Percent change incaluable due to data values

Table 24. Percentage Changes in the Numbers of Corporate-Controlled Employees by Central City (CC) and SMSA, by Time Period.

SMSA	1957 - 1970 CC	1957 - 1970 SMSA	1970 - 1983 CC	1970 - 1983 SMSA	1957 - 1983 CC	1957 - 1983 SMSA
New York, NY	+50.11	+428.68	-52.39	+69.14	-28.53	+794.20
Chicago, IL	+40.46	+244.56	-8.42	+148.39	+28.63	+755.86
Detroit, MI	+14.66	+161.43	-24.34	+4.27	-13.24	+172.60
Pittsburgh, PA	-9.84	-100.00	+28.02	0	+15.42	-100.00
Philadelphia, PA	+27.53	-1.61	-56.37	+91.22	-44.36	+88.15
Cleveland, OH	+86.62	*	-15.91	+77.33	+61.01	*
St. Louis, MO	+124.40	+132.65	+40.19	-100.00	+214.58	-100.00
Minneapolis-St. Paul, MN	+204.70	*	+46.25	+384.62	+345.62	*
Los Angeles-Long Beach, CA	+119.91	+134.45	+78.78	-50.23	+293.16	+16.69
Milwaukee, WI	+54.18	-16.51	-34.06	-11.46	+1.67	-26.08
San Francisco-Oakland, CA	+2.30	*	-28.98	-17.80	-27.34	*
Boston, MA	+73.21	+95.05	-52.84	+292.93	-18.30	+666.43
Dallas-Ft. Worth, TX	+251.83	0	+5.64	0	+271.67	0
Cincinnati, OH	+79.68	0	-4.21	0	+72.11	0
OVERALL	+45.70	+172.05	-27.48	+35.41	+5.67	+268.38

*Percent change incaluable due to data values

Table 25. Percentage Changes in the Population of Central City (CC) and SMSA, by Time Period.

SMSA	1957 - 1970 CC	1957 - 1970 SMSA	1970 - 1983 CC	1970 - 1983 SMSA	1957 - 1983 CC	1957 - 1983 SMSA
New York, NY	+1.45	+17.15	-10.43	+1.32	-9.13	+18.70
Chicago, IL	-5.17	+35.25	-26.68	+13.47	-15.36	+53.47
Detroit, MI	-9.50	+27.51	-20.39	+7.88	-20.39	+37.56
Pittsburgh, PA	-13.94	+4.44	-18.49	-2.19	-29.85	+2.16
Philadelphia, PA	-2.69	+22.60	-13.36	+5.55	-15.70	+29.41
Cleveland, OH	-14.29	+27.08	-23.58	+0.89	-34.50	+28.21
St. Louis, MO	-17.04	+28.02	-27.18	+7.98	-39.59	+38.23
Minneapolis-St. Paul, MN	-7.68	+52.31	-13.86	+20.61	-19.48	+83.69
Los Angeles-Long Beach, CA	+12.49	+19.96	+4.86	+7.57	+17.89	+29.04
Milwaukee, WI	-3.27	+27.73	-11.28	+10.83	-14.18	+41.56
San Francisco-Oakland, CA	-2.76	+31.89	-5.47	+9.84	-8.08	+44.87
Boston, MA	-8.05	+13.39	-12.18	-2.49	-19.25	+10.56
Dallas-Ft. Worth, TX	+8.58	+62.41	+4.15	+47.84	+24.45	+140.11
Cincinnati, OH	-9.95	+21.72	-14.82	+8.98	-23.30	+32.65
TOTAL	-1.12	+25.07	-9.65	+8.44	-10.66	+35.62

these two major cities accounted for 56.8 percent of the total 310 headquarters located within these fourteen central cities.

The numbers of headquarters in SMSAs ran from a high of nine in New York to a low of zero, of which there were several. The Philadelphia SMSA contained seven corporate headquarters in 1957, the second highest total. Combining New York and Philadelphia accounts for 50.0 percent of the thirty-two headquarters located in SMSAs during 1957.

1970. The number of headquarters in central cities during 1970 ran from a high of 116 for New York to a low of five in both Boston and Cincinnati. Chicago continued to have the second highest total, thirty-six, which when added to New York's total accounts for over 45 percent of the total 269 corporate headquarters located within central cities in 1970.

The number of headquarters in SMSAs ran from a high of thirteen in Chicago to a low of zero. New York and Los Angeles-Long Beach each had nine headquarters in their SMSAs. Combining the top two total therefore accounts for 45.8 percent of the total forty-eight corporate headquarters located in SMSAs in 1970.

1983. The number of headquarters in central cities during 1983 ran from a high of sixty-nine for New

York to a low of two for Boston, an overall spread of 35.1 percent. Second to New York, Chicago had twenty-six headquarters. Combining these two major cities accounted for 49.7 percent of the total 191 corporate headquarters located in central cities in 1983.

The number of headquarters in SMSAs ran from a high of twenty in Chicago to a low of zero. New York, with fourteen headquarters had the second highest total. The combination of Chicago and New York accounted for 49.3 percent of the total 69 corporate headquarters located in SMSAs in 1980.

Employees

1957. The number of corporate headquarter- controlled employees ran from a high of 3,169,700 in New York to a low of zero in Boston, Massachusetts. Although Chicago had the second highest number of headquarters in 1957, Detroit, Michigan (900,000) had the second highest total of headquarter-controlled employees in 1957. The combination of New York and Detroit accounts for over 65 percent of the total 6,248,800 employees in central cities in 1957.

The number of headquarter-controlled employees located in SMSAs during 1957 ran from a high of 196,000 in Detroit to a low of zero. The Los Angeles-Long Beach SMSA

contained the second highest total of headquarter-controlled employees (158,800). These two SMSAs accounted for over 55 percent of the total headquarter employees located in SMSAs during 1957.

1970. The number of headquarter-controlled employees located in central cities in 1970 ran from a high of 4,757,900 in New York to 73,300 for Milwaukee. Detroit continued to have the second highest total of corporate headquarter-controlled employees during 1970 (1,033,000).

The combination of New York and Detroit accounted for over 63 percent of the total 9,104,800 headquarter controlled employees located in central cities during 1970.

During 1970 the number of headquarter-controlled employees located in SMSAs ran from a high of 512,400 for Detroit to a low of zero. Unlike 1957, when Los Angeles-Long Beach SMSA had the second highest total, New York in 1970 had the second highest total at 473,700. The top two SMSAs therefore account for over 57.0 percent of the total 1,710,400 headquarter-controlled employees located in SMSAs in 1970.

1983. The number of headquarter-controlled employees located in central cities during 1983 ran from a high of 2,265,400 in New York to a low of 36,600 in Boston. Detroit had the second highest total of corporate

headquarter-controlled employees (781,600) located in central cities in 1983. New York and Detroit together account for over 45 percent of the total number of controlled employees (6,603,000) located in central cities in 1983.

The number of headquarter-controlled employees located in SMSAs during 1983 ran from a high of 801,200 in New York to a low of zero. The Detroit SMSA had the second highest total (534,300). These two SMSAs accounted for 57.6 percent of the total 2,316,000 headquarter-controlled employees located in SMSAs in 1983.

Component Change

Before discussing the relative changes of the previously reported data, one clarification must be made concerning Tables 23 and 24. The asterisks noted in these tables arise from the data in Tables 21 and 22. Many SMSAs did not contain any corporate headquarters and thus no corporate headquarter-controlled employees. Therefore no percent change can be calculated with these SMSAs. For the purpose of ranking, an SMSA which went from zero to two headquarters would be ranked higher than one which went from zero to one, which in turn would rank higher than one which went from one to two headquarters.

Headquarters

1957-1970. During the first period, major positive changes with respect to the number of headquarters located in central cities were found to be in Minneapolis-St. Paul, +37.5 percent; Milwaukee, +28.6 percent; and Cincinnati, +25.0 percent. Major negative changes were noted in Detroit, -46.7 percent; Pittsburgh, -34.8 percent; and San Francisco-Oakland, -28.6 percent. In total, four central cities increased their number of corporate headquarters' two had no change, while eight had overall decreases.

A very different trend was noted with respect to the number of headquarters located in SMSAs. The major relative positive changes were noted in San Francisco (*); Cleveland (*); and Minneapolis-St. Paul (*). Only two SMSAs experienced negative change - Pittsburgh (-100.0%) and Philadelphia (-57.1%). In total, eight SMSAs increased their number of corporate headquarters, four had no change, and two had overall decreases with respect to the number of corporate headquarters located in SMSAs.

1970-1983. Over the second time period, relative positive changes with respect to the number of headquarters located in central cities were found in Dallas-Ft. Worth, (+71.4%) and Minneapolis-St. Paul (+9.1%), while

the major losses were noted in Detroit (-62.5%), Boston (-60.0%), and Philadelphia (-45.5%). In total, two of the central cities increased their number of headquarters, two had no change, and ten decreased.

Similar to the first period, a very different trend was noted with respect to the number of headquarters in SMSAs. The major relative positive changes were noted in the SMSAs of Boston (+300.0%), Detroit (+125.0%), and Cleveland (+100.0%). Interestingly, two of these SMSAs (Boston and Detroit) were mentioned above as having very large overall decreases in the number of headquarters located in these central cities. This topic will be addressed in later chapters. Two SMSAs experienced negative change with respect to the number of headquarters located therein -- St. Louis (-100.0%) and Los Angeles-Long Beach (-33.3%). Altogether, seven SMSAs increased their number of headquarters, five had no change, and only two had negative changes in the numbers of headquarters.

1957-1983. Over the entire period, positive percent changes with respect to the number of headquarters in central cities were found only in Dallas-Ft. Worth (+71.4%) and Minneapolis-St. Paul (+50.0%), while major relative negative changes occurred in, among others, Detroit (-80.0%), Boston (-60.0%), and Philadelphia, (-57.1%). In total, two of the central cities increased

their overall number of corporate headquarters, one had no change, and eleven decreased.

As expected from earlier findings, a very different trend was noticed with respect to the number of headquarters in SMSAs. The major relative positive changes were noted in Cleveland (*0-2), San Francisco-Oakland (*0-2), and Minneapolis-St. Paul (*0-1) (*Percent change incalculable due to data values).

Three SMSAs experienced negative change with respect to the number of corporate headquarters -- Pittsburgh (-100.0%), St. Louis (-100.0%), and Philadelphia (-42.9%). In total, nine SMSAs increased their number of headquarters, two had no change, and three had overall decreases with respect to the number of headquarters.

Employees

As mentioned previously, unlike the number of headquarters, which remained somewhat constant at 500, the number of headquarter-controlled employees fluctuated over time. Therefore, rather than discussing the changes in terms of being positive or negative, this discussion will examine the percent change as compared to the overall percent change exhibited by the total fourteen central cities and SMSAs.

1957-1970. From Table 24, during the first period the overall percentage change in the number of headquarter-controlled employees for the set of fourteen central cities increased 45.7 percent. Central cities with relative increases far exceeding that of the overall included Dallas-Ft. Worth (+251.8%), Minneapolis-St. Paul (+204.7%), and St. Louis (+124.4%). Central cities with a percent change below the overall included Pittsburgh, (-9.8%), San Francisco-Oakland (+2.3%), and Detroit (+14.7%). It is also interesting to note that these were also the three central cities which experienced the largest relative negative change with respect to the number of headquarters during the same time period.

The overall percent change in the number of controlled employees in the fourteen SMSAs increased 172.1 percent. This figure was exceeded by, among others, San Francisco-Oakland (*), Cleveland (*), and Minneapolis-St. Paul (*). SMSAs with relative percent change below that of the overall included Pittsburgh, (-100.0%), Milwaukee, (-16.5%), and Philadelphia, (-1.6%). In total, five of the SMSAs had a percent change greater than the overall while nine had percent changes less than the overall.

1970-1983. During the second period, the overall percent change in the number of headquarter-controlled employees for the fourteen central cities decreased 27.5

percent. Central cities exceeding this included Los Angeles-Long Beach (+78.8%), Minneapolis-St. Paul (+46.3%), and St. Louis (+40.2%). Central cities with relative change below the overall included Philadelphia, (-56.4%), Boston (-52.8%), and New York -52.4%. In total, nine central cities had a percent change greater than the overall, while five had less.

The overall percent change in the number of controlled employees in the fourteen SMSAs increased 35.4 percent. This figure was exceeded by, among others, Minneapolis-St. Paul (+384.6%), Boston (+292.9%), and Chicago (+148.4%). SMSAs with relative percent change less than that of the overall included St. Louis (-100.0%), Los Angeles-Long Beach (-50.2%), and San Francisco-Oakland (-17.8%). In total, six of the SMSAs had a percent change greater than the overall, while eight of the SMSAs had less.

1957-1983. Over the entire period, the overall percent change in the number of headquarter-controlled employees in the central cities increased 5.7 percent. Central cities with percent changes exceeding the overall included Minneapolis-St. Paul (+345.6%), Los Angeles-Long Beach (+293.3%), and Dallas-Ft. Worth (+271.7%). Central cities with a relative change less than that of the overall included Philadelphia (-44.4%), New York (-28.5%),

and Boston (-18.3%). In total, eight central cities had percentage change greater than the overall while six had less.

The overall change in the number of headquarter-controlled employees for the fourteen SMSAs increased 268.4 percent. Cleveland (*), San Francisco-Oakland (*), and Minneapolis-St. Paul (*), were among those SMSAs who had relative change greater than the overall. SMSAs with relative change less than the overall included Pittsburgh (-110.0%), St. Louis (-100.0%), and Milwaukee (-26.1%). In total, six SMSAs had percent change greater than the overall and eight had less.

Spearman's Rank Coefficients

With these preliminary findings described, it is now possible to return to hypothesis 5.1.

> Hypothesis 5.1 Central cities and SMSAs which experienced rapid population growth are expected to experience net increases in the number of corporate headquarters and their accompanying employees.

Tables 23, 24, and 25 list the changes which have occurred in central cities and SMSAs with respect to the number of headquarters, headquarter-controlled employees, and population, respectively. This data was then ranked in order so that Spearman Rank Correlation Coefficients could be calculated. The same formula and general format that were found in Chapter Two will be used here, except

that the statistically significant coefficient is .481 at the 90 percent level for 12 division factors.

From Table 26, beginning with Period One coefficients for central cities, the first thing noticed in the high statistically significant correlation (0.732) between the numbers of headquarters and headquarter-controlled employees. The same was found for SMSAs, which during Period One had a coefficient of 0.864, also statistically significant. These by themselves are not surprising as one would expect that the redistribution of employees would correlate well with the redistribution of headquarters. However, remember these correlations did not exist between these two components during Period One on an interregional basis (Chapter Three). Similarly high coefficients were noted between these two components during all time periods.

Continuing with Period One Correlations, it is interesting to note the low correlations between the number of headquarters and population, and the number of controlled employees and population (0.198 and 0.055). This is similar to what was found on an interregional basis in Chapter Two. It appears, therefore, that with respect to central cities, the headquarters and employees were not redistributing as the population was.

Table 26. Spearman Rank Correlation Coefficients Derived From the Changes in Variables Listed in Tables 21, 22, and 25, by Time Period.

	1957-1970					
	CENTRAL CITIES			SMSA		
	Headquarter	Employees	Population	Headquarter	Employees	Population
1957-1970						
CENTRAL CITIES						
Headquarters		.732*	.198	.152		
Employees			.055		.096	
SMSA						
Headquarters					.864*	.425
Employees						.311
1970-1983						
CENTRAL CITIES						
Headquarters						
Employees						
SMSA						
Headquarters						
Employees						
1957-1983						
CENTRAL CITIES						
Headquarters						
Employees						
SMSA						
Headquarters						
Employees						

Table 26 - Continued

	1970-1983					
	CENTRAL CITIES			SMSA		
	Headquarter	Employees	Population	Headquarter	Employees	Population
1957-1970						
CENTRAL CITIES						
Headquarters	.202	.251	.332			
Employees	.441	.508*				
SMSA						
Headquarters				.025	.078	.234
Employees				.212	.234	
1970-1983						
CENTRAL CITIES						
Headquarters		.753*	.604*	-.744*		
Employees			-.130	-.332		
SMSA						
Headquarters				.648*	-.345	
Employees					-.116	
1957-1983						
CENTRAL CITIES						
Headquarters						
Employees						
SMSA						
Headquarters						
Employees						

Table 26 - Continued

	1957-1983					
	CENTRAL CITIES			SMSA		
	Headquarter	Employees	Population	Headquarter	Employees	Population
1957-1983 CENTRAL CITIES Headquarters Employees						
SMSA Headquarters Employees						
1970-1983 CENTRAL CITIES Headquarters Employees						
SMSA Headquarters Employees						
1957-1983 CENTRAL CITITES Headquarters		.811*	.130	-.243		
Employees			-.112		.233	
SMSA Headquarters					.880*	.133
Employees						.064

During the same time, however, but with respect to SMSAs, coefficients of 0.425 and 0.311 were obtained. Here, it therefore does appear that a correlation existed (although not statistically significant) between the redistribution of headquarters and employees, and the redistribution of population.

During the second period, with respect to central cities, a very high coefficient was noted between the number of headquarters and population. However, no significant correlation was noted between the number of employees and population. This suggests that even though the numbers of headquarters, and their change over time, correlate well; the numbers of employees do not. This finding is also similar to that found on an interregional basis during the same time.

Somewhat different results were obtained between the change in headquarter numbers and the change in population for SMSAs during Period Two. This coefficient, -0.345 suggests that the change in the numbers of headquarters was inversely proportional to the change in population, a fact which runs counter intuition. Similarly, a weak negative coefficient was noted between the change in controlled employees and the change in population.

Finally, with respect to the Overall Period, the statistically significant correlations found to exist were

between the change in headquarters and the change in controlled employees (0.811 for central cities, 0.880 for SMSAs, both statistically significant). No significant correlations were found between either (1) the change in population; or, (2) the change in controlled employees and the change in population.

From the above, it appears hypothesis 5.1 does not hold true. Over the postwar era, on an intraregional basis, there has not been a correlation between growth in population and growth in either the number of headquarters or the controlled employees. Remember, a similar hypothesis did hold true on an interregional basis.

Before leaving this discussion, a few more coefficients were derived in order to examine two additional questions: (1) were the changes in these components similar from one period to another; and (2) is there a correlation between the changes in components for central cities and their SMSA. These coefficients can be found in Table 26.

A strong negative correlation (statistically significant) was found between the change in headquarters in the central cities and the change in some for the accompanying SMSA for Period Two. It appears, therefore, there have been headquarters moving from central cities into the surrounding SMSAs. The same held true to a

lesser extent between the controlled employees in central cities and the controlled employees in SMSAs.

A correlation also existed between the change in headquarter-controlled employees in central cities in Period One and Period Two; suggesting that the central cities which experienced the greatest change during Period One continued to do so during Period Two. Much weaker correlations were found between (1) the change in headquarters in central cities for Period One and Period Two; and (2) between the controlled employees in SMSAs for Period One and Period Two. No correlation was found between the change in headquarters in SMSAs during Period One and Period Two; which suggest a very different behavior being exhibited by headquarters in SMSAs than that in central cities.

To summarize some of the findings concerning the two time periods:

During Period One, central cities tended to lose headquarters while SMSAs tended to gain. However, from Table 26 it does not appear that this phenomenon is fully explained by firms actually leaving the central cities to the surrounding SMSAs. Had this been the case, a large negative coefficient would have been expected, rather than the 0.152 derived.

Also during this time, both central cities and SMSAs increased their number of headquarter-controlled employees. However, remember that during this time the overall growth in controlled employees increased 60.8 percent. Therefore, with respect to the 'overall' growth in employees, the central cities actually 'lost' employees, while the SMSAs were actually gaining them. As before, it does not appear that this phenomenon is fully explained by employees leaving the central cities to the surrounding SMSAs.

During the second period, somewhat different behavior was exhibited. The central cities still tended to lose headquarters, while the SMSAs continued to gain. Unlike Period One, however, it appears that this phenomenon can be partly explained by headquarters actually leaving central cities for the surrounding SMSAs.

With respect to the number of controlled employees during Period Two, the central cities decreased their total, while the SMSAs increased theirs. Similar to the above, this can be partly explained as a direct trade-off between central cities and SMSAs.

Regressing a bit, if similar components at different times are compared, it is noted that the only strong correlation was found between the number of employees in Period One and Period Two, for central cities; suggesting

those central cities with major changes in employees during the first period continue to do so during the second.

Over the entire period, central cities tended to lose headquarters, while SMSAs tended to gain. This is partly explained through trade-off, but not to the extent of Period Two. Central cities, in relation to the overall change in employees, tended to lose employees, while the SMSAs tended to gain. Again, this is only partly explained by trade-offs.

Although this chapter examines the phenomenon of the intraregional redistribution of headquarters and employees, it does not answer many of the questions concerning same. As shown above, these changes are only partly explained through direct trade-offs between central cities and SMSAs. From where and to where have redistributions occurred if not from direct trade-offs? Furthermore, how quickly are the rates of redistribution occurring? These will be some of the main questions addressed in the next chapter.

CHAPTER 6

INTRAREGIONAL SHIFTS - COMPONENTS

This chapter continues the discussion developed in the previous chapter concerning intraregional changes in the spatial distribution of corporate headquarters. It was found in the previous chapter that no significant correlation existed between the redistribution of population and the redistribution of corporate headquarters on an intraregional basis. However, this discussion did not take into consideration just how the redistribution of headquarters developed. Similar to Chapter Four, this section will look at the components of change. Because there has been an out-migration of population from the central cities to SMSAs, it is expected that new headquarters ("births") will be occurring in the SMSAs in order to utilize the population either as a labor force or a market area. For the same reasons, it is expected that some existing headquarters will also migrate from the central city to the SMSA. Because of the "replacement factor" discussed in Chapter Four, it is expected that many of the "deaths" occurring will be found in the SMSAs. Deaths are also expected in the central cities, either as a result of

labor or market. One final factor which leads to this hypothesis (at least with respect to deaths) has to do with the internal growth theory discussed in Chapter Two. It was discussed that manufacturing employment may grow or stagnate in an area depending upon that area's stage of development. Therefore, cities such as New York or Pittsburgh which have undergone great internal growth are expected to be losing employment in the manufacturing sector as employment shifts to the tertiary sector. In order to further the understanding of what exactly has occurred with respect to headquarters redistributed on an intraregional basis, the following hypotheses will be tested:

Hypothesis 6.1

> Central cities and SMSAs with large percentage increases in population are expected to be the same central cities and SMSAs which had (a) large relative numbers of headquarters actually migrating to them, and (b) large numbers of births occurring in them. Conversely, those central cities and SMSAs with small increases (or decreases) in population are expected to be the same, (c) large relative numbers of headquarters migrating from them, and (d) those central cities and SMSAs with large numbers of deaths occurring in them.

Hypothesis 6.2

> Retention rates for both central cities and SMSAs are expected to be greater during 1957-1970 than during 1970-1983.

Hypothesis 6.3

> Central cities are expected to have lower retention rates than SMSAs during all time periods.

After discussing each of these hypothesis, the phenomenon of retention rates (the propensity of both central cities and SMSAs to retain headquarters will be examined.

Because many of the changes (especially technological changes) which have acted to reduce the historically important factor of location have occurred recently, hypothesis 6.2 is expected to hold true. Furthermore, because of previous work in this chapter which suggests that central cites were losing headquarters (either by "death" or out-migration) than were SMSAs, hypothesis 6.3 is expected to hold true.

Toward the end of this chapter, an examination of the rates of distribution through the use of a Markov-Chain Model will be undertaken. Included in this discussion will be comments concerning from where and to where the headquarters have redistributed at what rate this has been occurring, and if different rates of distribution have been exhibited during different time periods. It is in this section that hypothesis 6.4 will be examined.

Hypothesis 6.4

The rates of redistribution of headquarters through central cities will be quicker during 1970-1983 than during 1957-1970.

Finally, through the use of the same Markov model, a brief discussion of the projected spatial distribution of headquarters in the year 1996 will be undertaken.

Component Change

Before discussing the data in Tables 27-29, some explanation as to their contents is necessary. Similar to Tables 27-29, the column titled 1957N (1970N) refers to the number of headquarters located within each central city (SMSA) at the start of the time period, and is used only as a means of obtaining consistent relative change for the components.

Secondly, it must be kept in mind that the data reported for SMSAs do not include anything which may be located within the central city. Similarly, headquarters which have relocated elsewhere within the same SMSA will not be counted in the column headed "number moved to."

Finally, the asterisks noted in these tables arise from of the fact that many SMSAs did not contain any headquarters in 1957, and thus, percent change is incalculable. For the sake of ranking, the same procedure outlined in Chapter Five will be used.

Changes in Components

1957-1970. From Table 27, a total of 16 (5.2% of the 310 headquarters previously located in central cities

Table 27. Numbers of Headquarters Undergoing Specific Types of Change, by Central City (CC) and SMSA, 1957-1970.

REGION		1957 NUMBER	BORN	DIED	IN-MIGRATION	OUT-MIGRATION
New York, NY	CC	131	31	38	3	13
	SMSA	9	1	6	1	6
Chicago, IL	CC	44	11	18	4	3
	SMSA	5	6	1	0	3
Detroit, MI	CC	15	0	3	4	0
	SMSA	2	0	1	0	3
Pittsburgh, PA	CC	23	4	12	0	0
	SMSA	1	0	0	1	0
Philadelphia, PA	CC	14	1	4	1	1
	SMSA	7	0	5	0	1
Cleveland, OH	CC	16	5	6	0	0
	SMSA	0	1	0	0	0
St. Louis, MO	CC	11	1	3	0	0
	SMSA	1	1	0	0	0
Minneapolis-St. Paul, MN	CC	8	6	1	2	0
	SMSA	0	1	0	0	0
Los Angeles-Long Beach, CA	CC	10	6	5	1	2
	SMSA	3	7	1	1	1
Milwaukee, WI	CC	7	5	2	2	1
	SMSA	2	0	1	0	1
San Francisco-Oakland, CA	CC	14	2	8	0	2
	SMSA	0	2	0	0	0
Boston, MA	CC	5	1	1	0	0
	SMSA	1	1	0	0	0
Dallas-Ft. Worth, TX	CC	7	3	4	0	1
	SMSA	0	0	0	0	0
Cincinnati, OH	CC	4	1	1	0	1
	SMSA	0	1	0	0	0
TOTAL	CC	310	77	106	27	16
	SMSA	-31	21	15	3	15

Table 28. Numbers of Headquarters Undergoing Specific Types of Change by Central City (CC) and SMSA, 1970-1983.

REGION		1970 NUMBER	BORN	DIED	IN-MIGRATION	OUT-MIGRATION
New York, NY	CC	116	15	34	30	2
	SMSA	9	2	2	0	5
Chicago, IL	CC	36	6	11	7	2
	SMSA	13	5	5	0	7
Detroit, MI	CC	8	0	2	3	0
	SMSA	4	4	2	0	3
Pittsburgh, PA	CC	15	2	4	0	2
	SMSA	0	0	0	0	0
Philadelphia, PA	CC	11	1	5	1	0
	SMSA	3	1	1	0	1
Cleveland, OH	CC	15	2	5	2	0
	SMSA	1	1	0	0	0
St. Louis, MO	CC	9	0	2	0	2
	SMSA	2	0	2	0	0
Minneapolis-St. Paul, MN	CC	11	4	3	1	1
	SMSA	1	0	0	1	1
Los Angeles-Long Beach, CA	CC	12	2	5	1	1
	SMSA	9	2	4	1	0
Milwaukee, WI	CC	9	1	5	0	0
	SMSA	2	1	0	0	0
San Francisco-Oakland, CA	CC	10	4	4	1	0
	SMSA	2	2	2	0	0
Boston, MA	CC	5	0	2	1	0
	SMSA	2	5	0	0	1
Dallas-Ft. Worth, TX	CC	7	6	3	0	2
	SMSA	0	0	0	0	0
Cincinnati, OH	CC	5	0	1	0	0
	SMSA	0	0	0	0	0
TOTAL	CC	269	43	86	47	12
	SMSA	48	23	18	2	18

Table 29. Numbers of Headquarters Undergoing Specific Types of Change by Central City (CC) and SMSA, 1957-1983.

REGION		1957 NUMBER	BORN	DIED	IN-MIGRATION	OUT-MIGRATION
New York, NY	CC	132	26	60	32	3
	SMSA	9	5	6	1	5
Chicago, IL	CC	44	11	23	8	2
	SMSA	5	9	2	0	8
Detroit, MI	CC	15	0	7	5	0
	SMSA	2	4	1	0	4
Pittsburgh, PA	CC	23	5	15	0	2
	SMSA	1	0	0	1	0
Philadelphia, PA	CC	14	1	8	2	1
	SMSA	7	1	4	1	1
Cleveland, OH	CC	16	3	8	1	0
	SMSA	0	2	0	0	0
St. Louis, MO	CC	11	2	5	0	1
	SMSA	1	0	1	0	0
Minneapolis-St. Paul, MN	CC	8	7	2	1	0
	SMSA	0	0	0	0	1
Los Angeles-Long Beach, CA	CC	10	5	7	1	2
	SMSA	3	5	1	1	0
Milwaukee, WI	CC	7	3	4	2	1
	SMSA	2	0	0	0	1
San Francisco-Oakland, CA	CC	14	5	9	2	1
	SMSA	0	2	0	0	0
Boston, MA	CC	5	1	3	1	0
	SMSA	1	6	0	0	1
Dallas-Ft. Worth, TX	CC	7	8	5	0	2
	SMSA	0	0	0	0	0
Cincinnati, OH	CC	4	1	1	0	0
	SMSA	0	0	0	0	0
TOTAL	CC	310	78	157	55	15
	SMSA	31	34	15	4	23

in 1957) moved into central cities during the first period while 27 (8.7%) moved away. The largest relative increases in the base numbers of central cities (in migration) were found in Cincinnati 25.0%), and Los Angeles-Long Beach, (20.0%).

With respect to movement away from SMSAs (out-migration) the largest changes in base numbers (known as relative factors) were found in Milwaukee (28.6%), Detroit (26.7%), and Minneapolis-St. Paul (25.0%).

A very different trend was exhibited by the SMSAs during the same time. During the first period, a total of 15 (48.4%) headquarters moved to SMSAs while only three (9.7%) moved away. The largest relative factors with respect to in-migration for SMSAs were found in Detroit (150.0%), New York (66.7%), and Chicago (60.0%). With respect to movement from SMSAs, the largest relative factors were found in Pittsburgh (100.0%), Los Angeles-Long Beach (33.3%), and New York (11.1%). These were the only SMSAs (from the sample) with out-migration from the SMSA.

During Period One, a total of 77 (24.8%) headquarters were "born" within central cities limits while 21 (64.5%) died. The largest relative factors with respect to births were found in Minneapolis-St. Paul (75.0%), Milwaukee (71.4%), and Los Angeles-Long Beach (60.0%). With respect to deaths, the largest relative factors were found

in San Francisco-Oakland (57.1%), Dallas-Ft. Worth (57.1%), and Pittsburgh (52.2%).

The SMSAs of these central cities during 1957-1970 exhibited a different trend with respect to both births and deaths. During this time, a total of twenty-one (64.5%) headquarters were born within SMSAs while fifteen (48.4%) died. Although the latter figure is considerably higher than the same figure for central cities, the important point to consider is the percent difference between births and deaths. For central cities this was -9.7 percent while for SMSAs, +16.1 percent.

The largest relative factors with respect to births were found in the SMSAs surrounding the following central cities: San Francisco-Oakland (*), Minneapolis-St. Paul (*), and Cleveland (*). Conversely, the largest relative factor with respect to deaths were found in Philadelphia (71.4%), New York (66.7%), Detroit (50.0%), and Milwaukee (50.0%).

1970-1983. During the second period, 1970-1983 (Table 28), a total of twelve (4.5%) headquarters moved into central cities; while a total of forty-seven (17.5%) moved out. The largest relative factors with respect to in-migration were found in Dallas-Ft. Worth (28.6%), St. Louis (22.2%), and Pittsburgh (13.3%). With respect to out-migration, the largest relative factors were found in

Detroit (37.5%), New York (28.9%), and Boston (20.0%). Here the internal growth theory seems to be influencing out-migration.

SMSAs during this time period continued their tendency to exhibit a very different trend. Eighteen (37.5%) headquarters moved into SMSAs while only two (4.2%) moved out. Largest relative factors with respect to movement into SMSAs were found in Minneapolis-St. Paul (100.0%), Detroit (75.0%), and New York (53.8%) (percent change incalculable due to data values). With respect to out-migration, the only relative factors found were in the SMSAs surrounding the following cities: Minneapolis-St. Paul (100.0%), and Los Angeles-Long Beach (11.1%).

During the second time period, a total of forty-three (16.0%) headquarters were "born" within central city limits while eighty-six (32.0%) died. The largest relative factors with respect to births were found in Dallas-Ft. Worth (85.7%), San Francisco-Oakland (40.0%), Chicago (16.7%), and Los Angeles-Long Beach (16.7%). With respect to deaths, the largest relative factors were found in Pittsburgh (93.3%), Milwaukee (55.6%), and Philadelphia (45.5%). Again, these deaths seem to be related to the internal growth theory (see Chapter 2).

Not surprisingly, the trend was reversed for SMSAs. During the second period, twenty-three (47.8%)

headquarters were born in SMSAs, while eighteen (37.5%) died. The largest relative factors with respect to births were found in Boston (250.0%), and in San Francisco-Oakland, Detroit, and Cleveland all with SMSAs of 100.0 percent. With respect to deaths, the largest relative factors were found in St. Louis (100.0%), San Francisco-Oakland (100.0%), and Detroit (50.0%).

1957-1983. From Table 29 over the entire period of 1957-1980, fifteen headquarters (4.5%) moved into central cities while fifty-five (17.7%) moved out. The largest relative factors with respect to in-migration were found in Dallas-Ft. Worth (28.6%), Los Angeles-Long Beach (10.0%), and Milwaukee (14.3%). (With respect to out-migration: Detroit, 33.3%; Milwaukee, 28.6%; and New York, 24.2%.)

During the overall period, twenty-three (74.2%) firms moved into SMSAs vs. four (12.9%) which moved out. The SMSAs of Minneapolis-St. Paul (*), Detroit (200.0%), and Chicago (160.0%) SMSAs had the largest relative factors with respect to in-migration. Pittsburgh (100.0%), Los Angeles-Long Beach (33.3%), and Philadelphia (14.3%), had the largest relative factors with respect to out-migration.

A total of seventy-eight (25.2%) corporate headquarters were born within central city limits over the

period 1957-1983 vs. 157 (50.6%) deaths. The largest relative factors with respect to births were found in the SMSAs of Dallas-Ft. Worth (114.3%), Minneapolis-St. Paul (87.5%), and Los Angeles-Long Beach (50.0%). The SMSAs of Dallas-Ft. Worth (71.4%), Los Angeles-Long Beach (70.0%), and Pittsburgh (65.2%), had the highest relative factor with respect to deaths.

During the overall period a total of thirty-four (109.7%) corporate headquarters were born in SMSAs while fifteen (48.4%) died. Again, the data point to very different trend being exhibited by SMSAs. The SMSAs with the highest relative factor with respect to births included Cleveland (*), San Francisco-Oakland (*), and Boston (600.0%). The SMSAs with the highest relative factor with respect to deaths included St. Louis (100.0%), New York (66.7%), and Philadelphia (57.1%).

With this preliminary descriptive study completed, it is possible to turn attention to the hypotheses being examined. Similar to previous chapters, these hypotheses will be examined through the use of Spearman Rank Correlation Coefficients. All pertinent correlations are found in Tables 30-32.

Hypothesis 6.1a

Central cities and SMSAs with large percentage increases in population are expected to be the same

Table 30. Spearman Rank Correlation Coefficients for Central Cities, Derived From the Variables Listed in Tables 27, 28, 29, by Time Period.

	1957-1970				1970-1983				1957-1983			
	Out-Migration	In-Migration	Born	Died	Out-Migration	In-Migration	Born	Died	Out-Migration	In-Migration	Born	Died
1957-1970												
Out-Migration		.209	.248	-.275	.412							
In-Migration			.535*	.074		.133						
Born				-.088			.245					
Died								.213				
Population	.255	.537	.144	.407	.100	.134	.484*	.087				
1970-1983												
Out-Migration						-.315	-.170	-.143				
In-Migration							.398	-.304				
Born								.088				
Died												
Population					-.096	.073	.349	.199				
1957-1983												
Out-Migration										-.235	-.237	-.056
In-Migration											.413	.667*
Born												.346
Died												
Population									.276	.504*	.586*	.555*

*Indicates statistical significance at the 90% confidence level, 12 degrees of freedom.

Table 31. Spearman Rank Coefficiencies by Variables for SMSA by Year Period.

	1957-1970				1970-1983				1957-1983			
	Out-Migration	In-Migration	Born	Died	Out-Migration	In-Migration	Born	Died	Out-Migration	In-Migration	Born	Died
1957-1970												
Out-Migration		.451	.236	.452	.664							
In-Migration			.079	.966		.543						
Born				-.164			.314					
Died								.457				
Population	-.213	.022	.278	-.109	.391	.158	.091	.230				
1970-1983												
Out-Migration						.535	.165	.362				
In-Migration							.277	.210				
Born								.251				
Died												
Population					.453	.123	-2919	.126				
1957-1983												
Out-Migration										.036	.119	.473
In-Migration											.246	.314
Born												.157
Died												
Population									-.346	.200	-.086	.033

Table 32. Correlation Coefficients for Central Cities and SMSAs, Derived From the Variables Listed in Tables 27, 28, 29, by Time Period.

	1957-1970				1970-1983				1957-1983			
	Out-Migration	In-Migration	Born	Died	Out-Migration	In-Migration	Born	Died	Out-Migration	In-Migration	Born	Died
1957-1970												
Out-Migration	.229	.770	-.096	.725								
In-Migration		.049	.156	.123								
Born			.379	.001								
Died				.037								
Population												
1970-1983												
Out-Migration					.321	.748	.695	.332				
In-Migration						.075	-.568	.273				
Born							-.228	-.084				
Died								.065				
Population												
1957-1983												
Out-Migration									.144	.755	.464	.286
In-Migration										-.370	.413	.207
Born											-.270	-.442
Died												-.163
Population												

central cities and SMSAs which had large relative numbers of headquarters actually migrating to them.

With regard to the central cities, the Spearman Rank Coefficients yielded values of 0.537 (Period One), 0.73 (Period Two), and 0.504 (Overall). Since two of the values exceed the critical r value of 0.481 (90% level), it appears that a correlation existed during the first period while by the second period, the correlation had diminished in strength. Therefore, the hypothesis 6.1a seems to hold true for central cities.

With regards to SMSAs, values of 0.022, 0.123, and 0.200 were derived. Although none of the period values are statistically significant, the overall value suggests that a correlation existed between those SMSAs increasing in population and those SMSAs experiencing high rates of immigration, but the correlation is much less than was found on the central city level.

Hypothesis 6.1b

Central cities and SMSAs with large percentage increases in population are expected to be the same central cities and SMSAs which had large numbers of births occurring in them. Conversely, those central cities and SMSAs with small increases (or decreases) in population are expected to be the same.

The values of the Spearman Rank Coefficients (SRC) for central cities read 0.144 (Period One), 0.349 (Period Two) and 0.586 (Overall). Therefore, hypothesis 6.1 seems to hold true, especially when the overall value is

considered, as only the overall value is statistically significant. It is very interesting to note that this correlation was much stronger during Period Two than during Period One; the exact opposite was found in hypothesis 5.1(a). Further examination yielded an SRC of 0.484 between Period Two births and Period One population changes. This is similar to the situation found in Chapter Four. There it was found on an interregional basis that during Period Two, headquarters were being born in divisions which had previously undergone large population growth. The same situation, but on an intraregional basis was found to exist here.

With respect to the SMSAs, SRC values of 0.278, -0.291 and -0.086 were found. The hypothesis does not hold true with respect to SMSAs.

Hypothesis 6.1c

> Central cities and SMSAs with large percentage increases in population are expected to be the same central cities and SMSAs which had large relative numbers of headquarters migrating from them.

With respect to central cities, the coefficients yielded had values of 0.255, -0.096, and 0.276 overall. If this hypothesis (6.1c) were to have held true, these coefficients would all have been negative and statistically significant. It appears that there is no negative correlation between those central cities with

large population increases and those having a large out-migration of headquarters.

With respect to SMSAs, the values of the coefficients read -0.213, 0.453, and -0.346 overall. (Although not statistically significant, the hypothesis seems to hold true [6.1c] with the exception of Period Two). The value for the second period (0.453) can be partly explained by the fact that during the period only two headquarters moved away from the SMSAs, one from Minneapolis-St. Paul and the other from Los Angeles-Long Beach, neither of which experienced large population gains during the second period.

Hypothesis 6.1d

> Central cities and SMSAs with large percentage increases in population are expected to be the same central cities and SMSAs which had those central cities and SMSAs with large numbers of deaths occurring in them.

With respect to central cities, SRC yielded values of 0.407, 0.199, and 0.555. Again, if this hypothesis had held true, negative values would be expected. Not only did the hypothesis not hold true as expected, but strong positive correlations were found to exist. One possible explanation of this result will be discussed later in this chapter.

The hypothesis does not hold true for SMSAs either, as SRC values were -0.109, 0.126, and 0.033.

Before discussing the ramifications of the above, several other SRC correlations found to exist must be mentioned. (Beginning with Period One variables for central cities, a strong positive, and statistically significant, correlation was found between the number of headquarters being born into the central city, and the number of headquarters which moved into that central city [0.533]). A weaker (negative) correlation was found to exist between the number of headquarter deaths in a central city and the number of headquarters migrating from that central city. This is the exact opposite situation as births and in- migration, suggesting that deaths and out-migration are not occurring together within central cities.

With respect to headquarters, strong correlations were found between the in-migration and deaths (0.966) and between in-migration and out-migration (0.451). Both of these coefficients point to a form of "replacement". That is, headquarters are moving into areas where they are dying and/or also moving out.

With respect to Period Two variables for central cities, a fairly strong positive correlation (not statistically significant) was found between in-migration and births (0.398). While fairly strong negative correlations

were found between in-migration and deaths, and out-migration and in-migration, the opposite situation was found with regards to SMSAs during the same period.

With regard to SMSAs, a strong positive correlation was found between out-migration and in-migration, again suggesting a form of "replacement". However, it should be mentioned that often (especially with SMSAs) the numbers of these components are quite small, and these results should be taken only at face value.

Overall, with respect to central cities, strong positive correlations were found between in-migration and births and in-migration and death. With respect to SMSAs, a high correlation was found to exist between the out- migration and death.

Finally, with respect to central cities, a strong positive correlation was noted between Period One out-migration and Period Two out-migration, while a weaker correlation was found to exist between the births in Period One and Period Two. With respect to SMSAs, all components had correlations between Period One and Period Two. It appears, therefore, that many of the trends begun in Period One continued through the second, especially with respect to SMSAs.

With these hypotheses now tested and the data thus examined, the following summaries by time period can be

formed to discuss the differences between central cities and SMSAs.

Period One, 1957-1970

This period is one in which the following things were occurring in central cities:

1. Headquarters were being born in central cities which were experiencing high rates of in-migration, and the number of births were not related to population change. Furthermore, no replacement of births and deaths was noted.
2. Headquarters were migrating into central cities whose population were increasing, but headquarters were not migrating away from central cities experiencing stagnating growth. Similar to the above, no replacement was noted between the in-migration and deaths.

In SMSAs, the following seem to be occurring:

1. Unlike central cities, firms were not being born into SMSAs experiencing high rates of in-migration, and were somewhat related to population change. Similar to central cities, there was no replacement noted between births and deaths.
2. Unlike central cities, headquarters were not migrating into SMSAs experiencing high rates of

growth, and headquarters did not tend to migrate away from SMSAs experiencing stagnating growth (similar to central cities). Unlike central cities, there was a very high replacement noted between the in-migration and deaths.

Period Two, 1970-1983

This period seems is one in which the following things were occurring in central cities:

1. Headquarters were being born into central cities experiencing high rates of in-migration (similar to Period One), but births were related to population change (different from Period One). Also, births during the second period were occurring in central cities which had previously undergone large percentage change in populations. Once again, no replacement was noted between births and deaths.
2. Headquarters were not migrating into central cities experiencing high rates of growth (different from Period One), and headquarters were not migrating from central cities experiencing stagnating growth (similar to Period One).

In SMSAs, the following seems to have occurred:

1. Unlike central cities, headquarters were not being

born in SMSAs experiencing high rates of growth (similar to SMSAs during Period One) nor were headquarters positively related to population change (different from Period One). Also, unlike central cities, there seems to be replacement between births and deaths occurring in the SMSAs (different from Period One).

2. Similar to central cities, headquarters were not moving into regions experiencing high rates of growth and headquarters did not tend to migrate from SMSAs experiencing stagnating growth (similar to Period One). Unlike central cities, some replacement between in-migration and deaths was occurring, although to a lesser extent than during Period One.

One other point examined in this chapter was that of the propensity of headquarters to migrate from central cities into the immediately surrounding SMSA. Spearman Rank Coefficients were run between the out-migration from central cities and the in-migration of SMSAs. The values were found to all be extremely high and statistically significant: 0.770 for Period One, 0.748 for Period Two, and 0.755 Overall. These coefficients point to a definite trend of headquarters leaving central cities and migrating to the surrounding SMSA.

This discussion has pointed out the differences in headquarter behavior with regard to both central cities and SMSAs, as well as the trade-offs between them. Both central cities and SMSAs had different behavior exhibited towards them during the two periods, and both were different from each other.

Rates of Component Change

The next section of this chapter will examine two additional aspects of corporate headquarters relocation on an intraregional aspect. These two aspects are (1) retention rates, and (2) the actual shifts occurring.

Retention Rates

The retention rate of central cities or SMSAs is basically a measure of the propensity of the central city to "retain" headquarters once they are located within same. For example, if city A had ten headquarters within its limits in 1957, but by 1970 three headquarters had moved away, then city A's retention rate during 1957-1970 would be 70.0. One note on methodology should be mentioned with respect to retention rates: in order for the headquarter to be counted for calculations, it must have existed in both the beginning and ending years of the period. This effectively eliminates any problem with birth and deaths, thus making retention rates a factor of

relocation only. Through the use of retention rates, the following hypotheses will be tested:

Hypothesis 6.2

> Retention rates for both central cities and SMSAs will be greater during the 1957-1970 period than during 1970-1983.

Hypothesis 6.3

> Central cities are expected to have lower retention rates than SMSAs during all time periods.

Retention rates have been calculated by time periods for the set of 14 central cities and their SMSAs, and can be found in Tables 33 and 34.

During the period 1957-1970, the central cities had an overall retention rate of 87.2 as compared to 76.5 for SMSAs. Seven central cities had retention rates of 100.0, while the major losses (smaller retention rates) were found in the central cities of Milwaukee, 60.0; Detroit, 66.7; and Minneapolis-St. Paul, 71.4. With respect to SMSAs, five had retention rates of 100.0, while the major losses were noted in Pittsburgh, 0.0; Los Angeles-Long Beach, 50.0; and Milwaukee, 50.0.

From 1970-1983, the central cities had an overall retention rate of 75.1 as compared to 93.3 for SMSAs. Seven central cities had retention rates of 100.0 while major losses were noted in Detroit, 50.0; New York, 63.4; and Boston, 66.7. With respect to SMSAs, seven had

Table 33. Retention Rates and Movements by Corporate Headquarters into SMSAs From Central Cities, by Time Period.

	1957-1970			1970-1983			1957-1983		
	1957 N	N to SMSA	RR	1970 N	N to SMSA	RR	1957 N	N to SMSA	RR
New York, NY	94	5 (8.5)	81 (86.2)	82	3 (3.7)	52 (63.4)	72	6 (8.3)	40 (55.6)
Chicago, IL	26	2 (7.7)	22 (84.6)	25	6(24.0)	18 (72.0)	21	6(28.6)	13 (61.9)
Detroit, MI	12	3 (25.0)	8 (66.7)	6	3(50.0)	3 (50.0)	8	4(50.0)	3 (37.5)
Pittsburgh, PA	11		11(100.0)	11		11(100.0)	8		8(100.0)
Philadelphia, PA	10		9 (90.0)	6	1(16.7)	5 (83.3)	6	1(16.7)	4 (66.7)
Cleveland, OH	10		10(100.0)	10		8 (80.0)	8		7 (87.5)
St. Louis, MO	8		8(100.0)	7		7(100.0)	6		6(100.0)
Minneapolis-St. Paul, MN			5 (71.4)	8		8(100.0)	7		5 (71.3)
Los Angeles-Long Beach, CA	5		4 (80.0)	7		6 (85.7)	3		2 (66.7)
Milwaukee, WI	5	1 (20.0)	3 (60.0)	4		4(100.0)	3	1(33.3)	1 (33.3)
San Francisco-Oakland, CA	6		6(100.0)	5		5(100.0)	5		3 (60.0)
Boston, MA	4		4(100.0)	3	1(33.3)	2 (66.7)	2	1(50.0)	1 (50.0)
Ft. Worth-Dallas TX	3		3(100.0)	4		4(100.0)	2		2(100.0)
Cincinnati, OH	3		3(100.0)	3		3(100.0)	3		3(100.0)
TOTAL	204	11 (5.4)	177(87.2)	181	14(7.7)	136 (75.1)	154	19(12.3)	98 (63.6)

Table 34. Retention Rates and Movements by Corporate Headquarters into Central Cities From SMSAs, by Time Period.

	1957-1970			1970-1983			1957-1983		
	1957 N	N to SMSA	RR	1970 N	N to SMSA	RR	1957 N	N to SMSA	RR
New York, NY	3	1(33.3)	2 (66.7)	7		7(100.0)	2	1(50.0)	1 (50.0)
Chicago, IL	4		4(100.0)	8		8(100.0)	3		3(100.0)
Detroit, MI	1		1(100.0)	2		2(100.0)	1		1(100.0)
Pittsburgh, PA	1		0 (0.0)	0		N/A	0		N/A
Philadelphia, PA	2		2(100.0)	2		2(100.0)	3		2 (66.7)
Cleveland, OH	0		N/A	1		1(100.0)	0		N/A
St. Louis, MO	1		1(100.0)	0		N/A	0		N/A
Minneapolis-St. Paul, MN	0		N/A	1	1(100.0)	0 (0.0)	0		N/A
Los Angeles-Long Beach, CA	2	1(50.0)	1 (50.0)	5		4 (80.0)	2	1(50.0)	1 (50.0)
Milwaukee, WI	2		1 (50.0)	2		2(100.0)	2		2(100.0)
San Francisco-Oakland, CA	0		N/A	0		N/A	0		N/A
Boston, MA	1		1(100.0)	2		2(100.0)	1		0 (0.0)
Ft. Worth-Dallas TX	0		N/A	0		N/A	0		N/A
Cincinnati, OH	0		N/A	0		N/A	0		N/A
TOTAL	17	2(11.8)	13 (76.5)	30	1 (3.3)	28 (93.3)	14	2(14.3)	10 (71.4)

retention rates of 100.0, while the only losses noted were in Minneapolis-St. Paul, 0.0; and Los Angeles-Long Beach, 80.0.

Finally, over the entire period, 1957-1983 central cities had an overall retention rate of 63.6 as compared to 71.4 for SMSAs. Four central cities had retention rates of 100.0, while major losses were noted in Milwaukee, 33.3; Detroit, 37.5; and Boston, 50.0. With respect to SMSAs, three had retention rates of 100.0, while major losses were noted in Boston, 0.0; New York, 50.0; and Los Angeles-Long Beach, 50.0.

Returning to Hypothesis 6.2:

> Retention rates for both central cities and SMSAs will be greater during 1957-1970 than during 1970-1983.

With respect to central cities, the hypothesis did hold true: during the first period, a retention rate of 87.2 was noted as compared to 75.1 during the second. The hypothesis did not hold true for SMSAs, which had a retention rate of 76.5 during the first period as compared to 93.3 for the second.

Returning to hypothesis 6.3:

> Central cities are expected to have lower retention rates than SMSAs during all periods.

This hypothesis did not hold true as it is written. During the first period, central cities had an

overall retention rate of 87.2 as compared to 76.5 for SMSAs. The hypothesis did hold true for both the second period (75.1 vs. 93.3) and for the overall (63.6 vs. 71.4).

In the final section of this chapter, a closer look at the rates of redistribution of headquarters will be undertaken. Specifically, the discussion will center on from which and to which central cities (SMSAs) major shifts have occurred as well as how these rates may have changed over time. For the same reasons that hypotheses 6.2 and 6.3 were expected to hold true, hypotheses 6.4 and 6.5 should also. During this discussion, the following hypothesis will be looked at:

Hypothesis 6.4

> The overall rates of redistribution of headquarters will be quicker during 1970-1983 than during 1957-1970 for both central cities and SMSAs.

Finally, this section will end with a brief discussion of the possible spatial distribution of headquarters in central cities and SMSAs in the year 1996.

Major Shifts

In order for these hypotheses to be tested, probability matrices were devised similar to those in Chapter Three. These matrices can be found in Table 35-38.

Table 35. Probability Matrix of Corporate Headquarter Relocations by Central Cities, 1957-1970.

	New York, NY	Chicago, IL	Detroit, MI	Pittsburgh, PA	Philadelphia, PA	Cleveland, OH	St. Louis, MO	Minneapolis-St. Paul, MN	Los Angeles-Long Beach, CA	Milwaukee, WI	San Francisco-Oakland CA	Boston, MA	Dallas Ft. Worth, TX	Cincinatti, OH	Elsewhere	Died	Total 1957
New York, NY	.610														.009	.290	131
Chicago, IL	.023	.500													.068	.409	44
Detroit, MI			.533												.267	.200	15
Pittsburgh, PA				.478												.522	23
Philadelphia, PA	.071				.643											.286	14
Cleveland, OH						.625										.375	16
St. Louis, MO							.727									.273	11
Minneapolis-St. Paul, MN		.125						.625							.125	.125	8
Los Angeles-Long Beach, CA									.400		.100					.500	10
Milwaukee, WI										.428					.286	.286	7
San Francisco-Oakland, CA											.429					.571	14
Boston, MA												.800				.200	5
Dallas-Ft. Worth, TX													.429			.571	7
Cincinnati, OH														.750		.250	4
Elsewhere	.014	.009			.005				.009	.005	.005		.005	.005			221
Birth	31	11	0	4	1	5	1	6	6	5	2	1	3	1			
TOTAL 1970	116	36	8	15	11	15	9	11	12	9	10	5	7	5	231		

Table 36. Probability Matrix of Corporate Headquarter Relocations by SMSAs, 1957-1970.

	New York, NY	Chicago, IL	Detroit, MI	Pittsburgh, PA	Philadelphia, PA	Cleveland, OH	St. Louis, MO	Minneapolis-St. Paul, MN	Los Angeles-Long Beach, CA	Milwaukee, WI	San Francisco-Oakland CA	Boston, MA	Dallas Ft. Worth, TX	Cincinatti, OH	Elsewhere	Died	Total 1957
New York, NY	.222														.111	.667	9
Chicago, IL	.023	.800														.200	5
Detroit, MI			.50													.50	2
Pittsburgh, PA				.0												.0	1
Philadelphia, PA					.286											.714	7
Cleveland, OH						.0										.0	0
St. Louis, MO							1.00									.0	1
Minneapolis-St. Paul, MN								.0								.0	0
Los Angeles-Long Beach, CA									.333						.333	.333	1
Milwaukee, WI										.50						.50	2
San Francisco-Oakland, CA											.0					.0	0
Boston, MA												1.00				.0	1
Dallas-Ft. Worth, TX													.0			.0	0
Cincinnati, OH														.0		.0	0
Else	.013	.006	.006	.0	.002	.0	.0	.0	.0	.002	.0	.0	.0	.0			469
Birth	1	6	0	0	0	1	1	1	7	0	2	1	0	0			
TOTAL 1970	9	13	4	0	3	1	2	1	9	2	2	2	0	0	452		

Table 37. Probability Matrix of Corporate Headquarter Relocations by Central Cities, 1970-1983.

	New York, NY	Chicago, IL	Detroit, MI	Pittsburgh, PA	Philadelphia, PA	Cleveland, OH	St. Louis, MO	Minneapolis-St. Paul, MN	Los Angeles-Long Beach, CA	Milwaukee, WI	San Francisco-Oakland CA	Boston, MA	Dallas Ft. Worth, TX	Cincinatti, OH	Elsewhere	Died	Total 1957
New York, NY	.448	.009		.009			.017		.009						.216	.292	116
Chicago, IL	.028	.50													.167	.305	36
Detroit, MI			.375												.375	.25	8
Pittsburgh, PA				.733											.0	.267	15
Philadelphia, PA					.455										.090	.455	11
Cleveland, OH						.533							.067		.067	.333	15
St. Louis, MO							.778									.222	9
Minneapolis-St. Paul, MN		.125						.727								.273	11
Los Angeles-Long Beach, CA									.50						.083	.417	12
Milwaukee, WI										.444						.456	9
San Francisco-Oakland, CA											.50				.10	.40	10
Boston, MA												.40			.20	.40	5
Dallas-Ft. Worth, TX													.571			.429	7
Cincinnati, OH														.6	.2	.2	5
Elsewhere	.004	.004		.004									.004				231
Birth	15	6	0	2	1	2	0	4	2	1	4	0	6	1			
TOTAL 1970	69	26	3	15	6	10	9	12	9	5	9	2	12	4	309		

Table 38. Probability Matrix of Corporate Headquarter Relocations by SMSAs, 1970-1983.

	New York, NY	Chicago, IL	Detroit, MI	Pittsburgh, PA	Philadelphia, PA	Cleveland, OH	St. Louis, MO	Minneapolis-St. Paul, MN	Los Angeles-Long Beach, CA	Milwaukee, WI	San Francisco-Oakland CA	Boston, MA	Dallas Ft. Worth, TX	Cincinatti, OH	Elsewhere	Died	Total 1957
New York, NY	.778															.222	9
Chicago, IL		.615														.385	13
Detroit, MI			.500													.500	4
Pittsburgh, PA				1.00												0	0
Philadelphia, PA					.667											.333	3
Cleveland, OH						1.00										0	1
St. Louis, MO							.0									1.00	2
Minneapolis-St. Paul, MN								.0							1.00	0	1
Los Angeles-Long Beach, CA									.444						.111	.444	9
Milwaukee, WI										1.00						0	2
San Francisco-Oakland, CA											.0					1.00	2
Boston, MA												1.00				.0	2
Dallas-Ft. Worth, TX													1.00			.0	0
Cincinnati, OH														.0		4	0
Elsewhere	.011	.025	.007	0	.002	0	0	.002	.0	.0	0	.002	0	0			
Birth	2	5	4	0	1	1	0	0	2	1	2	5	0	0		452	
TOTAL 1970	14	20	9	0	4	2	0	1	6	3	2	8	0	0	431		48

1957-1970. To summarize from Table 35, it is observed that the major shifts occurring during this period with respect to headquarters in central cites were:

1. 26.7 percent of the headquarters in Detroit went elsewhere. (Elsewhere is defined as any place besides the 14 central cities (SMSAs).
2. 28.6 percent of the headquarters in Milwaukee went elsewhere.
3. 12.5 percent of the headquarters in Minneapolis-St. Paul went elsewhere.
4. 12.5 percent of the headquarters in Minneapolis-St. Paul went to Detroit.

Furthermore, the largest percentage loss due to deaths occurred in San Francisco-Oakland (57.1%), Dallas-Ft. Worth (57.1%), Pittsburgh (52.2%) and Los Angeles-Long Beach (50.0%).

For headquarters located in SMSAs during the first period (Table 36), the major shifts occurring were:

1. 100.0 percent of the headquarters in the Pittsburgh SMSA moved to the Los Angeles-Long Beach SMSA.
2. 33.3 percent of the headquarters in Los Angeles-Long Beach moved elsewhere.
3. 22.1 percent of the headquarters in New York moved elsewhere.

The largest percentage in loss due to deaths occurred in the Philadelphia SMSA (71.4%), the New York SMSA (66.7%), the Detroit SMSA (50.0%), and the Milwaukee SMSA, (50.0%).

1970-1983. Very different results are obtained when the matrices from 1970-1983 (Table 37) are looked at. The major shifts occurring with respect to headquarters in central cities were:

1. 37.5 percent of the headquarters in Detroit moved elsewhere.
2. 21.6 percent of the headquarters in New York moved elsewhere.
3. 20.0 percent of the headquarters located in Boston moved elsewhere.
4. 20.0 percent of the headquarters in Cincinnati moved elsewhere.

Milwaukee (45.6%), Philadelphia (45.5%), and Los Angeles-Long Beach (41.7%), suffered the greatest percentage loss due to deaths during 1970-1983, with respect to central cities.

For headquarters located in SMSAs (Table 38) during 1970-1983, the only shifts occurring were:

1. 100.0 percent of the headquarters in Minneapolis-St. Paul moved elsewhere.

2. 11.1 percent of the headquarters in Los Angeles-Long Beach moved elsewhere.

With this background description of changes in mind, it is now possible to turn attention to hypothesis 6.4:

> The overall rates of redistribution of headquarters will be quicker during 1970-1983 than during 1957-1970 for both central cities and SMSAs.

The easiest way to examine this hypothesis is by using the data in Tables 27 and 28. By using the same formula as was presented in Chapter Four for redistribution coefficients, the following was discovered. During 1957-1970, a redistribution coefficient of 36.5 was found for headquarters in central cities compared to 43.5 for those in SMSAs.

The same calculations for 1970-1983 yielded a redistribution coefficient of 34.9 for headquarters in central cities and 31.8 for SMSAs.

The hypothesis, therefore, does not hold true. During the first period, the coefficient of relocation for headquarters in central cities was 36.5 vs. 43.5 for those in SMSAs. The hypothesis held true for the second period only, with values reading 43.5 (central cities) vs. 31.8 (SMSAs).

However, these are overall rates for both central cities and SMSAs. The question of central cities (SMSAs)

themselves remains. Which have experienced rates of growth in headquarters during the first or second period, and have these rates changed over time? These questions were examined through the use of a Markov-Chain Model as in Chapter Four. Using the same equation and logic developed there, the answers to these questions become apparent.

Table 39 lists the expected number of headquarters in both central cities and SMSAs for 1983, as well as the actual number present in each. From this table, the central cities which experienced the quickest rates of growth as compared to what was previously exhibited, and thus expected; included: Dallas-Ft. Worth (71.4%), Pittsburgh (36.4%), and St. Louis (12.5%). Those central cities with rates of growth below what was exhibited included: Boston (-60.0%), Milwaukee (-50.0%), and New York (-35.5%).

With respect to SMSAs, those which experienced a quicker rate of growth in headquarters during the second period over the first included: Boston (160.0%), Philadelphia (100.0%), and Detroit (80.0%). Those SMSAs which experienced a slower rate of growth with respect to headquarters during the second period as compared to the first included: St. Louis (-100.0%), Minneapolis-St. Paul (-50.0%), and San Francisco-Oakland (-50.0%).

Table 39. Expected and Actual Number of Corporate Headquarters Located in Central Cities and SMSAs, 1983.

	CC			SMSA		
	Expected	Actual	(%)	Expected	Actual	(%)
New York, NY	107	69	-35.5	9	14	+55.6
Chicago, IL	32	26	-18.8	19	20	+5.3
Detroit, MI	4	3	-25.0	5	9	+80.0
Pittsburgh, PA	11	15	+36.4	0	0	---
Philadelphia, PA	9	6	-33.3	2	4	+100.0
Cleveland, OH	14	10	-28.6	2	2	0
St. Louis, MO	8	9	+12.5	3	0	-100.0
Minneapolis-St. Paul, MN	13	12	-7.7	2	1	-50.0
Los Angeles-Long Beach, CA	13	9	-30.8	10	6	-40.0
Milwaukee, WI	10	5	-50.0	2	3	+50.0
San Francisco-Oakland, CA	9	9	0	4	2	-50.0
Boston, MA	5	2	-60.0	3	8	+1.60
Dallas-Ft. Worth, TX	7	12	+71.4	0	0	---
Cincinatti, OH	6	4	-33.5	0	0	---
TOTAL 1970	248	191	-23.0	61	69	+13.11

Finally, by using the same basic Markov-Chain Model for 1970-1983 data, it is possible to predict the general spatial distribution of headquarters in the year 1996 (Table 40), all other things being equal.

Over the period 1983-1996, the largest relative growth in the number of corporate headquarters with respect to central cities is expected to be in Minneapolis-St. Paul (25.0%), and Dallas-Ft. Worth (25.0%). All other central cities are expected to have slower rates of growth, led by Detroit (-66.7%), Boston (-50.0%), and Milwaukee (-40.0%).

SMSAs which are expected to undergo strong positive relative growth in the number of headquarters includes San Francisco-Oakland (100.0%), Boston (75.0%), and Cleveland (50.0%). The only SMSA which is expected to lose corporate headquarters is Los Angeles-Long Beach (-16.7%).

Table 40. Expected Numbers and Percentage Changes of Corporate Headquarters for Central Cities (CC) and SMSAs, 1996.

	CC		SMSA	
	Expected	% Growth	Expected	%Growth
New York, NY	48	-30.4	18	+28.6
Chicago, IL	21	-19.2	24	+20.0
Detroit, MI	1	-66.7	12	+33.0
Pittsburgh, PA	15	--	0	--
Philadelphia, PA	4	-33.3	5	+25.0
Cleveland, OH	7	-30.0	3	+50.0
St. Louis, MO	8	-11.1	0	--
Minneapolis-St. Paul, MN	15	+25.0	1	--
Los Angeles-Long Beach, CA	7	-22.2	5	-16.7
Milwaukee, WI	3	-40.0	4	+33.3
San Francisco-Oakland, CA	9	--	4	+100.0
Boston, MA	1	-50.0	14	+75.0
Dallas-Ft. Worth, TX	15	+25.0	0	0
Cincinnati, OH	3	-25.0	0	0
TOTAL	157	-17.8		90

CHAPTER 7

SUMMARY

This thesis has been an empirical, descriptive study of the relocation of U.S. corporate headquarters during the post World War II era. It has been primarily concerned with the shifts in spatial distributions of both corporate headquarter units and corporate headquarter-controlled employees, and how these geographic shifts have correlated with the geographic shifts in the United States population during the same period.

The thesis encompassed seven chapters including Chapter 1 as the Introduction. Chapter 2 set the stage for this thesis by first discussing the historically important locational factors, and, secondly, how the changes which have occurred in population, transportation, and technology in the U.S. since World War II, have acted collectively to reduce the importance of many of these factors. A brief literature review of previous studies was also included in this chapter.

The remainder of this thesis has been devoted to three main hypotheses all concerned with the relationship between population change and the change in the number of

corporate headquarters on both an inter and intraregional basis. These relationships were looked at during two different year periods, 1957-1970 and 1970-1983, both of which had very different results.

During the first period, on an interregional basis, it was found that the population was growing and dispersing through the nation without corresponding growth or shifts in the number of corporate headquarters. However, during the second period the growth in population did affect and correspond with the redistribution of corporate headquarters.

A very similar situation occurred on an intraregional basis. Although during the first period central cities tended to lose corporate headquarters, while SMSAs tended to gain, these changes did not seem to be population dependent. During the second period, a very high correlation existed between population change and the change in the spatial distribution of corporate headquarters.

With respect to the components of change on an interregional basis (during the first period), it was found that headquarters were born in regions where either out-migration of population was minimal, or actually increasing, but an out-migration of population had a minimal impact on where firms moved from. Similar results were found

during the second period on an interregional basis, except that firms were found to be migrating from areas with large population losses.

On an intraregional basis, it was found that headquarters were not migrating to areas where population was greatly increasing, and was therefore not population dependent. A similar situation occurred during the second period.

A significant correlation, however, was noted which pointed out that headquarters did tend to migrate from central cities into surrounding SMSAs. This is most likely the resultant of lower land costs, greater land availability, and/or partially population dependent.

On the average, more hypotheses tended to hold true during the later period than the first, suggesting perhaps that the processes between population growth and corporate headquarters is ongoing with a form a lay effect.

In terms of census divisions, it was found that the Middle Atlantic contained the largest proportion (43.6%) of the 500 corporate headquarters in 1957, and continued to do so during 1970 and 1983 (35.1% and 28.4%, respectively). The decreases, however, have been such that by 1996 it is expected that the East North Central

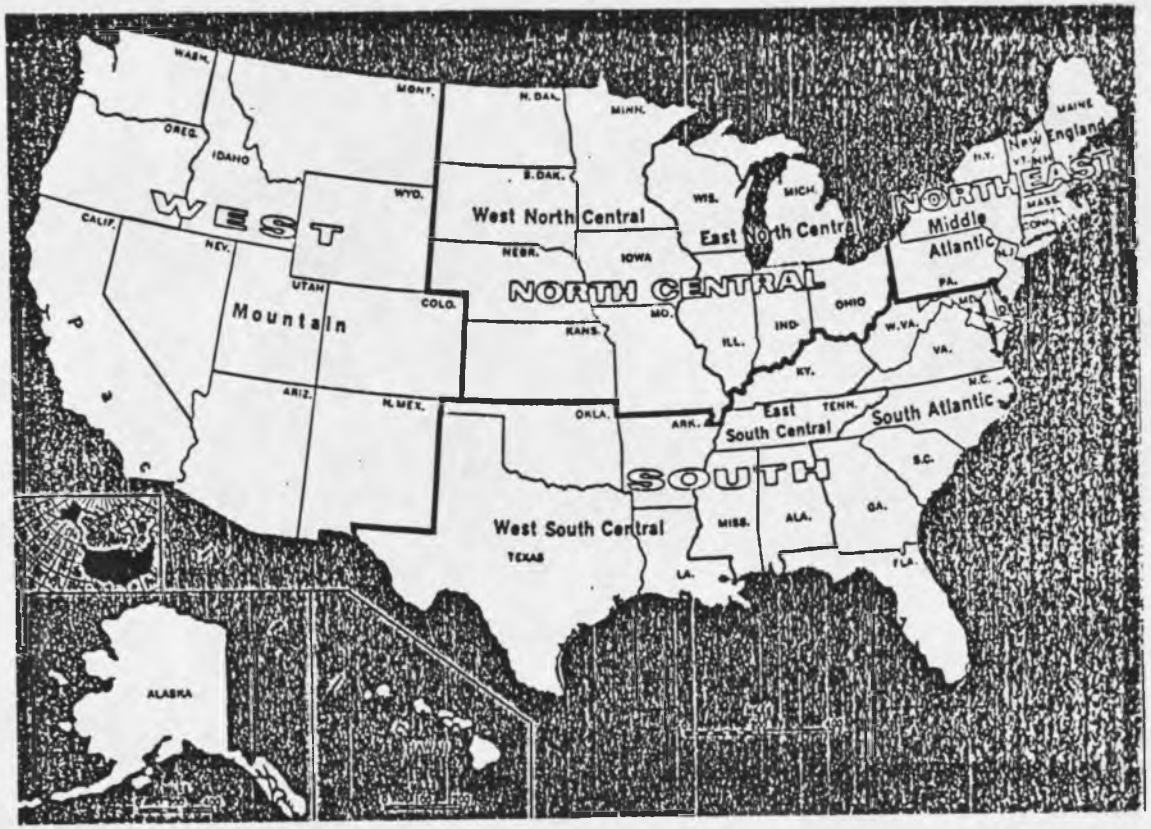
(second highest total 1957, 1970, 1983) will contain the largest proportion (35.2%).

Similarly, in terms of central cities New York, New York, contained the greatest numbers of headquarters during all three years, followed by Chicago, Illinois. This same order (New York, New York, followed by Chicago, Illinois) is expected to continue into 1996 (Table 40).

This thesis has explored many questions concerning the redistribution of corporate headquarters in the United States post World Ware II era. However, there is considerable work which still needs to be conducted in order to further the body of knowledge. Further studies could include the influence of government on relocation (i.e., taxes, laws, and wages). Furthermore, specific changes such as the large out-migration from the Middle Atlantic Division into the New England Division should be studied in-depth in order to understand the processes and consequences as well as the mitigating circumstances. Finally, a similar study based on service headquarters rather than manufacturing headquarters should be conducted to determine the disparities and similarities between the behaviors of these different industry types.

APPENDIX A

Figure A.1 Census Divisions and Regions, 1980.



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