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Master's degree in Geography-Urban Studies

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**LOCATION OF SERVICE INDUSTRIES
IN THE UNITED STATES, 1977-1987**

BY

Qun Jiang

A THESIS

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

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ABSTRACT

LOCATION OF SERVICE INDUSTRIES IN THE UNITED STATES, 1977-1987

BY

Qun Jiang

This study examines the changing patterns of employment in service industries in the United States from 1977 to 1987. The study shows that the South and the West regions exhibited strong concentrations of service employment. Many service industries continue to grow in large metropolitan areas and some have grown in small metropolitan areas. This study also examines the effect of a set of determinants on the location of service industries to explain variations in location patterns of service industries. These determinants are population size, per capita income, and population growth. The study indicates that population size and per capita income are two important determinants. The spatial and temporal variations of the effects of these two variables are observed. The findings indicate that in spite of advanced development in technologies, agglomeration economies continue to be an important determinant of service location.

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CHARTER I

INTRODUCTION

This study examines the changing patterns of employment in service industries in the United States from 1977 to 1987. The study's objectives are twofold: (1) to examine the location patterns of service industries at the state and metropolitan levels; and (2) to analyze the effects of a set of determinants on the location of service industries.

Research on service industries have found that there is a growing share of employment and output in services compared to manufacturing. The structural shifts of these employment trends have exhibited profound consequences for the U.S. regional economy (Beyers. et al, 1985; Noyelle. et al, 1983; and O'hUallachain, 1989). While this development has been taking place, our understanding of the locational patterns of service industries is still limited because of the size and diversity of the service sector. This study specifically addresses the spatially and temporally varying effects of a set of location determinants on the location of service industries. The specific objectives are: (1) to examine the trends in the location of consumer and producer service industries at the state level, and in a group of large and small metropolitan areas, and (2) to analyze the spatial and

temporal changes in the location of service industries in response to the level of agglomeration economies, demand or purchasing power, and growth or propensity to consume goods and services in an economy.

1.1 BACKGROUND: INDUSTRIAL TRANSFORMATION IN THE UNITED STATES

Since the 1970s, the United States economy has experienced a rapid structural transformation. Two coincident phenomena epitomize this transformation: (1) a shift of economic prosperity across the country; and, (2) an uneven growth of employment engaged in various industrial sectors (Kamer, 1988; Noyelle. et al, 1983). For example, the economic decline in one region (e.g., Snowbelt) has been offset by the prosperity in other regions (e.g., Sunbelt). Similarly, decline in some sectors (e.g., manufacturing and mining sectors) has been offset by growth in other sectors (e.g., the service sector) (Estall, 1991; Kurtzman, 1988).

The decline in the manufacturing sector was exemplified by the reduction in its share of total employment. The number of workers employed in manufacturing remained remarkably stable in the twenty-year period 1966-1986 (19,214,000 in 1966 and 19,189,000 in 1986) but its share of the total American labor force has dropped considerably from 27 percent in 1955 to 16 percent in 1986. The manufacturing share of nonfarm employment in the private sector fell from 37 percent in 1960 to 24 percent in 1985. In 1953, manufacturing generated one out of every three nonfarm jobs, but accounted for only one in

five in the 1980s. Manufacturing's share of the Gross National Product, measured in current dollars, has also declined from 30 percent in 1955 to 17 percent in 1989 (Hamrin, 1988; Kamer, 1988; World Bank, 1993).

Meanwhile, the service industries (using a broad definition in this paragraph) have steadily expanded during this period. Thus, service industries have been the dominant component of the Gross National Product. In 1989, the service sector accounted for 69 percent of the Gross National Product in the United States. The workers engaged in service industries accounted for 75 percent of total employment in 1986; for a year-end total of 76.2 million jobs. The vast majority of new jobs created in the past thirty years have been in services. From 1959 to 1985 manufacturing jobs increased by 2 million (17 million to 19 million) and service industries jobs increased by 30 million (21 million to 51 million). Of the 2.7 million new jobs created in 1986, service industries accounted for 2.6 million (Castells, 1989; Hamrin, 1988). Hence, the United States' economy is shifting from an economy driven by manufacturing to one in which services are of central importance.

Researchers commonly assume that the changes described above associate with four forces which work within the economy: (1) changes in the foundation and structure of the global economy; (2) greater use of cost-efficient technology and elaborate transportation systems; (3) increasing size of the market and changes in consumer demand; (4) the relative

inability of the U.S. industries and products to compete effectively in an integrated global market (Agnew, 1987; Daniels, 1985 and 1991; Hamrin, 1988; Healey and Ilbery, 1990; Noyelle et al., 1983).

Since World War II, the structure of the global economy has experienced a significant change. One of the main features of this global economic change is the increasing interdependence between regions and nations. With the emergence of a new international division of labor, the processes of economic production have shifted from national economies to the world economy. Furthermore, considerable reductions have been made in the demand for minerals, metals, and forest products, as less are required for a given level of output in older products, and the new high-technology (micro-chip) industries make use of few raw materials. Capital flows rather than trade in goods, have played a decisive role in the development of the world economy. Multinational corporations and banks have become truly global, spreading world-wide and penetrating to newly developing countries. While relocating lower level assembly functions so as to benefit particularly from the cheap labor within developing countries, high rank offices and research and development functions are maintained in the core areas of developed countries. Standardized production processes have permitted such global shifts in manufacturing activities. This global restructuring of economic activities has affected the geography of employment opportunities in both developed and developing countries

(Healey and Ilbery, 1990).

Rapid advances in technology, especially in communication and computer techniques, alter the traditional location factors of economic activities. New types of transportation and communication technology underpin the growth, diversification and changing locations of industry. Transport has become faster, cheaper, more flexible, able to carry more perishable and bulkier loads. With the advent of lighter, compact and high value-added products such as pocket calculators or microcomputers, transport has become an "enabling" rather than a "determining" factor in location decisions (Daniels, 1985; Noyelle et al., 1983). Better communications, too, make cities, regions or nations more accessible to each other across the globe for all kinds of business transactions, improving contact between people for decision-making, and the exchange of information or money. Firms become gradually footloose in their locations.

The market demand in the United States has expanded enormously during the postwar years. In part this has been a response to increases in population, but the major cause has been a rapid increase in spending power. Between 1950 to 1987, the American population grew by nearly 60 percent (from 152.3 million to 243.9 million); GNP, in constant 1982 dollar values, rose 16 times faster (from 288.3 billion dollars to 4,524.3 billion dollars) (U.S. Bureau of the Census, 1990). The rising income levels among most sections of the population had a profound influence on the patterns of consumer

expenditures. When the basic necessities of life are assured, people are free to use their discretionary incomes to fulfill their convenience needs. Use of some convenience goods, such as microwave ovens, increased peoples' free time.

The increasing discretionary income and discretionary time resulted in shifting the focus of consumption away from necessities and convenience goods toward goods and services emphasizing life-style and personal identity. Such an emphasis stimulates a need for product differentiation. In a small market, the extent of product differentiation is limited because the production company has to sacrifice some profits because of economies of scale. An impressive growth of population makes product differentiation possible since large markets provide demand sufficient to support a larger number of differentiated products.

For decades, the U.S. has dominated the world economy. Since the 1970s, its global economic leadership has significantly declined. Its ability to compete globally has seriously eroded. Japan has surpassed the U.S. in one major industry after another. The U.S. merchandise trade balance has deteriorated both in absolute terms and as a percentage of GNP. Also, the U.S. has experienced steady across-the-board loss in world market share of industrial exports covering all major sectors. Six factors are frequently cited for the decline in the competitiveness of American industry:

(1) the significant decline in the relative productivity in the United States;

(2) the shift of technological leadership, especially in non-defense development, from the U.S. to other countries, such as Japan and Germany;

(3) the high cost of capital in the United States;

(4) the increased investment of US-based multinational corporations (MNCs) abroad;

(5) the increased openness of the U.S. economy and increased competition from foreign MNCs, such as those in Japan, Germany and from East Asia's "dragons"; and

(6) the economic drain of defense spending and the costs of military intervention outside the United States (Agnew, 1987; Hamrin, 1988).

Since the service industries have come to occupy an important role in the United States economy in terms of their share of total employment, there is a growing interest in the location pattern of service industries because of the potential role of services in economic development (Coffey and Polese, 1987; Daniel, 1982; Illeris, 1991; Kirn, 1987; Monnoyer and Philippe, 1991; O'hualachain, 1989; O'hualachain and Reid, 1991; Price and Blair, 1989; and Sui and Wheeler, 1993). While, most studies have concentrated their analyses on descriptions of the location of service industries, very few have examined statistically the determinants of the location patterns of service industries. Furthermore, the diversity of service industries activities have limited our understanding of the dynamics of service location characteristics because most studies on the

determinants of service growth have treated the service sectors as homogenous.

1.2 THE PURPOSE OF STUDY

The purpose of this study is to analyze the spatial and temporal changes in the location of service industries at both the state and metropolitan levels. During the mid-1970s to mid-1980s, the U.S. economy experienced significant changes. The recession of 1980-1981 and increasing international competition affected the growth of manufacturing industries. However, certain types of services exhibited significant growth during this period (Bailly et.al, 1988; O'hUallachain, 1989; Sui and Wheeler, 1993). In this study, three groups of service industries (retail trade; finance, insurance, and real estate (FIRE); and business services) are selected for analysis because these three groups experienced substantial growth between 1977 and 1987 compared to other service industries.

The analysis at the state level will provide a basic overview of the performances of the service sector. However, metropolitan areas have experienced tremendous growth in the service sector especially in producer services (those services mainly involved in providing their output to other firms as inputs for further production). Hence, the analysis of service locations will be conducted at the metropolitan level also.

First, the locational specialization of service

industries and the growth trends in service industries will be analyzed. Second, the spatially and temporally varying associations of the location of service activities with a set of location determinants will be examined at both the state and metropolitan levels. The determinants are surrogates of supply-side and demand-side factors affecting service locations. They are the agglomeration economies, market size and the potential of establishing market niches. At the state level, spatial variation in the effects of the above location factors will be examined across the four U.S. regions: Northeast, the NorthCentral¹, the South and the West.

At the metropolitan level, variation in the effects of the location determinants will be examined across 40 large and 38 small metropolitan areas. The temporal variation of the effects of location factors on service industries at the metropolitan level will be examined separately for large and small metropolitan areas. Two sets of samples of metropolitan areas are selected from a current listing of metropolitan statistical areas (MSAs) in the County and City Data Book (U.S. Bureau of the Census, 1988). The first set is forty MSAs with 1,000,000 or more population in October 1986 selected to represent large metropolitan areas. The second set is thirty-eight metropolitan areas with 120,000 or less population selected to represent small metropolitan areas. The rationale for selecting large metropolitan areas is that

¹This region was officially changed to "Midwest" by the U.S. Census Bureau after the 1980 Decennial census.

most services are concentrating in large metropolitan areas; and the rationale for selecting small metropolitan areas is that these areas may have the potential to attract service industries. To maintain comparability, the 1986 components of MSAs are used in both time periods. Employment, population and income data are collected based on these MSAs' components (county and cities) to avoid the possible effects of boundary changes. Those MSAs where their components consist of part of a county were dropped from the sample because of the difficulty of data collection and data consistency and comparability. Finally, a sample containing 40 metropolitan areas with populations ranging from 8,473,400 to 1,041,400 and another containing 38 metropolitan areas with populations ranging between 117,200 to 62,900 were used in this study (for a complete list of these two samples see Appendix 1).

CHAPTER II

DEFINITION, DETERMINANTS AND LOCATION OF SERVICE INDUSTRIES

This chapter first discusses the definition and classification of service industries. Secondly, it examines theories that explain the location of service activity. Finally, it reviews previous empirical studies that have contributed to the understanding of the geography of service industries. This review provides a conceptual and theoretical basis for the analysis of the location pattern of service industries used in this thesis.

2.1 DEFINITION AND CLASSIFICATION OF SERVICE INDUSTRIES

During the past two decades, much has been written concerning with the definition of service industries. Because of the heterogeneity of service activities, the definition and classification of service industries remain unclear. For example, there is still no commonly accepted definition of services, nor is there an agreement on which divisions or sub-sectors should be included for consideration:

"The nature of services, their distinction from commodities, and the question of how to value them in relation to the total production of the economy are all issues that have been debated since the beginning of modern economics and, indeed, in some respects, through the ages" (Kravis et al., 1982, p.129).

The simplest and the most traditional approach for defining services is to identify the service sector in terms of what it is not (Aanestad, 1988; Fuchs, 1968; Gershuny and Miles, 1983; Ochel and Wegner, 1987). Following this approach, service industries are usually defined as the whole non-goods producing portion of the economy (Aanestad, 1988). More precisely, services are those "activities which are relatively detached from material production and which as a consequence do not directly involve the processing of physical materials" (Marshall et al., 1988, p.11). This broad concept of service industries generally excludes agriculture, manufacturing, mining, and construction. However, this exclusion is not accepted by every researcher. Some studies exclude these sectors; others include construction in the service industries (Daniels, 1982; Riddle, 1986). Even within the works of the same author, variations in definition and classification are evident, especially in connection with "producer services" (Coffey and Polese, 1987).

Some have argued that an adequate definition of service industries should articulate the essence of service activities that all such industries share instead of only listing industrial categories (Ochel and Wegner, 1987; Riddle, 1986). Many authors contend that services are fundamentally different from goods and both belong to different logical categories (Daniels, 1985; Fuchs, 1968; Gershuny et al., 1983; Marshall et al., 1988; Sabolo, 1975). But what are the general characteristics allowing a clear-cut definition of service

industries and their separation from the processing of physical materials? Different authors provide different views but none alone sets forth a precise answer.

Some suggest that whereas the quantity of physical material incorporated in goods or the number of goods produced can be calculated exactly, the "quantity" of service can only be measured in terms of the duration and intensity of the service function supplied to the user. Hence, services are intangible or immaterial. Whereas goods can be exchanged and transferred between economic units, services can only be produced by one economic unit for another and are consumed simultaneously with the production. Thus, services are ephemeral and cannot be stockpiled. Whereas the process of goods production is characterized as using heavy capital equipment and complex technologies, the process of service production is perceived as being mostly labor-intensive and less exposed to technical progress than goods production (Nusbaumer, 1987; Ochel and Wegner, 1987; Petit, 1986).

Other authors argue that these properties are not usually sufficiently marked to establish a clear distinction between services and other activities (Marshall, 1988; Riddle, 1986; Walker, 1985). They argued that some services also handle materials or maintain equipment; some service productions, like computer tape, can in fact be stored and their value may extend over long periods; some services, like communications and distribution services, are clearly capital-intensive; and the development of technology, especially innovations in

communications technology, has changed necessity of face-to-face contact between customers and suppliers which used to be essential.

The literature on service industries also presents numerous classification systems of service. Some definitions are functionally oriented (Browning and Singelmann, 1975; Noyelle and Stanback, 1983; U.S. Dept. of Commerce, 1984). The function oriented classifications usually group service activities by taking into account their functional similarity. However, different views of the service industries have resulted in different divisions being included for measurement. Table 2.1 shows differences among major function oriented classification systems.

Given that there is no universal and comprehensive classification scheme and each scheme is appropriate for specific research needs, the U.S. Census Bureau's system as defined in table 2.1 is used for this study.

2.2 CONCEPTUAL FRAMEWORK: LOCATION OF ECONOMIC ACTIVITY

The bulk of the literature on service industries applies the neoclassical approach. This approach has been extensively used as a basis for geographical studies of a theoretical and explanatory nature, although it has its own limitations. It rests on the assumptions of economic rationality and profit maximization.

Supply oriented and demand oriented development theories are derived from the neoclassical approach. Supply oriented

Table 2.1: Function-oriented Classification Systems

Browning and Singelmann (1978)

1. Distributive services: transportation, communication, wholesale and retail trade;
2. Producer services: finance, insurance, other business services (accounting, engineering, advertising, legal services, R and D);
3. Social services: health, education, welfare services, government;
4. Personal services: hotel and restaurants, repair, entertainment, personal care and domestic services;

Noyelle and Stanback (1984)

1. Distributive services: transport and communication, wholesale trade;
2. Complex of corporate activities: central administrative offices, finance, insurance, private non-profit organization;
3. Non-profit services: health, education;
4. Retail trade;
5. Mainly consumer services: hotels and restaurants, personal services, repair, entertainment, domestic services;
6. Government;

U.S. Census Bureau (U.S. Dept. of Commerce, 1984)

1. Transportation, communication, utilities;
 2. Wholesale trade;
 3. Retail trade;
 4. Finance, insurance, and real estate (FIRE);
 5. Services (personal and business);
-

development theories emphasize the importance of capital, labor, and other factors of production in creating more output and income (Richardson, 1979; Shaffer, 1989). In this theory, the output of a region is a function of its capital, labor and technology. As an economic unit operating in a free market economy, the growth of output or income of a region comes from an increase in the size and quality of its labor force and amount of capital accumulated, adoption of new technology, and reallocation of capital or labor to more productive uses within the region.

The neoclassical theories are usually used to explain the concentration of specialized professional labor in high order (also called advanced) producer services, such as FIRE and business services. Professional human capital, data banks, libraries and documentation centers (human, scientific and cultural resources in general) strengthen the tendency toward spatial concentration of those activities demonstrating a high intensity of social, scientific and technical knowledge and know-how as well as of highly skilled human capital (Illeris, 1991).

Demand oriented development theories suggest that local growth results from an external or national demand for locally produced goods and services. If a region has a comparative cost advantage in the production and distribution of a good or service demanded in the external market, then the region will attract the capital and labor necessary to produce the good and service (Shaffer, 1989). The most explicit demand

oriented regional development theory is the export base theory. It explains the economic growth/decline of a city or region in terms of the nature and size of its basic activities (Richardson, 1969; Shaffer, 1989). The local economy is subdivided into two major sectors: export or basic sector and non-basic sector. The former includes all industries for which effective demand is external to that area. The export sector brings dollars into the region because someone outside the region purchases goods and services produced in the region. The latter includes those residentiary industries which meet a demand mostly internal to the area, i.e. supply the resident population.

Export base theory contends that the growth of a region depends on the vigor of its export industries. The critical force in the regional economic development is external demand, as well as its ability to supply capital and labor or to use technology. Therefore, the level of activity in the basic sector is set by forces outside the area, and changes in that level will result in changes in non-basic sector; and hence in total employment and population within that region. Increases in demand for products of the basic sector will lead to the increases of total activity within the area. Many scholars viewed the growth of service activities and employment as a function of economic growth and, more precisely, of per capita income. This demand-based interpretation was fully theorized in most studies, where the greater income elasticity of the demand for services, compared to goods, was considered a key

determinant of growth of service industries (Daniels, 1985; Martinelli, 1991).

The spatial dimension is a major factor in understanding the activities of the service industries. Geographers are traditionally interested in the factors that influence location pattern. Critical to the development and scope of economic activities are the centrality of location, the size and spatial distribution of the population served, consumer accessibility, and the impact of the other environmental factors (competition, transportation system, public policy and governmental regulation, etc.) (Lloyd et al., 1990; Richardson, 1969). Thus, "traditional location theory, with its emphasis on transport and labor costs as well as the importance of agglomeration, should not be regarded as inappropriate in respect to service activities." (Price et al., 1989, p.75). Some scholars have suggested a basic division between location studies of consumer-oriented services and producer services based on their respective determinants (Healey and Ilbery, 1990; Marshall, 1988).

The concentration of industry in a geographic area is created by location factors such as labor and transport costs as well as agglomeration factors. The former influences the broad patterns of industrial location, and the latter concerns the scale of operation in a particular community. There are three types of agglomeration economies (Chapman and Walker, 1991; and Smith, 1981). The first is scale economies. It is about the relationship between a firm's scale and its

production costs. It generally states that up until some production level, average costs will go down as firm size increase. If firm size is expanded beyond a point, known as the optimal scale, then per unit costs will begin to rise, leading to diseconomies of scale. The second is localization economies which allow independent small business to gain by locating near to each other. According to Smith (1981, p.60): "the areal concentration of industrial activity often provides firms with collective benefits that they would not be able to enjoy in an isolated location." When a new firm chooses to locate among other firms that are engaged in making the same or complementary products, a pool of skilled and varied labor may reduce training costs for each firm. If such a location is in a large city or industrial region, these firms also benefit from the existence of an established infrastructure and an even wider group of business. These are urbanization economies.

For producer services, the major function relies on providing and exchanging information. "The volume, variety and importance of these linkages to individual producer services will determine the significance which they attach to ease of contact with appropriate sources" (Daniels, 1982, p.34). Ease of contact relates to the time taken to attend meetings and accessing information will tend to group or cluster managerial and professional people together. Thus, "the location pattern that evolves is one in which the largest clusters in the most contact-rich (information-rich)

environments will attract a disproportionate share of any additional producer services introduced into the system" (Daniels, 1982, p.34). Clearly, the benefits of agglomeration are cost advantages that do not accrue to firms in isolated locations. Larger urban economies may offer favorable sites for the location of activities even though certain costs, typically rents and wage rates, may be somewhat higher than in smaller places and non-urban locales.

While agglomeration theory provides some ideas in explaining the location of firms relying on linkage with other activities, Central Place Theory offers insight into the concepts of hierarchical distribution of services (Daniels, 1985; and Noyelle et al., 1984). Central place theory focuses on the economic determinants of the size, location and ultimately the spatial organization of services. It treats the spatial arrangement of activities which serve directly to the consuming public in surrounding market area, or hinterland. Settlements which provide goods and services for those in the surrounding area are defined as "central places". Such central place type goods and services may be thought of as being hierarchically ordered in terms of market size necessary to provide the demand needed to enable each activity to attain necessary economies of scale and operate with an acceptable return. The logic of this theory is that those activities that require small markets ("low level" activities) will locate in numerous small central places; those that require large markets will locate in a smaller number of

larger central places at greater distance from one another. Each higher order of central place will not only include those activities that require a hinterland market of its given size, but also incorporate all of services found in the lower order central places since these will also be required by the residents of the higher order centers. Thus, the more complex and specialized the service, the more likely it is to be found in only the very largest central places where it can gain access to a market of sufficient size. Here size is a major variable in examining a metropolitan economic structure. Size permits the attainment of market thresholds sufficient for external economies to come into being through the functioning of specialized establishment. Moreover, size support a broader diversity of specialized activities.

Many empirical studies confirmed the basic principles of central place theory (Berry, 1988; Everson and Fitzgerald, 1969; Scott, 1964; Marshall, 1969). It is found that both a higher level of specialization and a greater diversity of available specialization in the large city environment than in the small. It should be apparent that the theory is especially relevant to an interpretation of the location and spatial organization of consumer services (Daniel, 1985; Marshall, 1988). However, the basic concepts of the theory also remain valid to interpret the location and spatial organization of producer services, especially, in terms of the regional distribution of population as the most important explanatory variable (Illeris, 1991).

2.3 DETERMINANTS OF LOCATION OF SERVICE INDUSTRIES

Studies on the spatial trends of the service sector have shown that at the global scale and national scale employment in services increases with the degree of sophistication of an economy. Service industries are unevenly distributed, and most services (producer services in particular) are urban based. Therefore, urbanization and services are clearly related (Healey and Ilbery, 1990; Price and Blair, 1989).

Healey and Ilbery (1990) summarize the recent changes in the nature and location of retailing. Like most consumer services, retailing tends to be located in relation to the distribution of population. Compared to traditional retailing, modern retail industries have been going through a revolution in terms of organization, methods of selling, and use of technology. Eventually these changes impact on their locational patterns. One of the revelations has been the development of planned large shopping centers and malls. Development of these shopping centers has contributed to the decentralization of retailing in the America. The major locational trend affecting retail patterns has been the relative decline of the central area as the locus of retailing activity and relative growth of retailing in suburban and out of town locations. Among the five reasons for the suburbanization of retailing, the most fundamental in accounting for retail decentralization has been the shift in the population to the suburbs.

An economic structure of a region is determined to a

great extent by a set of demand and supply factors. The rapid growth of employment in the service sector has resulted both from supply factors and from changes in the pattern of demand for services. The existing literature on industrial and labor economics and industrial geography proposes that a combination of forces explains the relatively fast growth of producer services. These forces include: (1) the growth of firms leading to growth of subcontracting of services as economic specialization increases; (2) changes in the composition of final demand with increases in personal and corporate income, and expansion of markets; (3) sectoral variation in worker's productivity growth as product differentiation; and (4) the changing role of technology, telecommunications in particular. (Castells, 1989; Daniels, 1985; Gershuny and Miles, 1983; Hepworth 1990; Ochel and Wegner, 1988; Riddle, 1986).

O'hUallachain has examined the forces influencing service sector location in the United States. He documented locational forces and patterns of twenty-seven fast growing service industries for 264 MSAs during the period 1977-1984. He identified six forces that favored spatial concentration of service industries: (a) a market penetration effect causing large cities to experience the largest absolute job growth; (b) rapid technological change in products and process leading to a reassertion of the product life cycle emphasis on agglomeration due to demand for skilled labor; (c) a business climate of government deregulation that has created market uncertainty and increased reliance on external economies of

scale; (d) institutional and infrastructure constraints that favor established industry locations; (e) increasing efficiency in communications systems allowing markets to be served at increasing distance; and (f) the emergence of many specialized small service enterprises that rely on external economies generated in large urban areas. He tested two agglomeration effects, urbanization and localization economies, by using regression models that related employment and establishment growth to MSA size and initial level of employment in a local industry. Employment size was used to measure the effects of industry-specific localization economies and size of the local labor force was measured by the MSA size and was interpreted as a general measure of the market penetration effect and of urbanization economies. He found that forces of specialized labor needs and local inter-industry linkages were more important than influence of local economic size(MSA size), that is, places that had large employment in a given producer service sector in 1977 had large absolute employment growth in the 1977-84 time period. He also concluded that MSA size has greater influence on establishment growth than on employment growth and little decentralization of producer service had occurred within the nation's metropolitan areas (O'hUallachain, 1989).

The previous research on the locational pattern of service industries in the United States used different study time periods, different kind of regions, and a different kinds of industry groupings for analyses. Noyelle and Stanback

focused on the broadest service sectors in larger SMSAs for the 1959-1976 time period (Noyelle and Stanback, 1983). Kirn examined employment trends in a sample of 96 metropolitan and nonmetropolitan areas distributed all over the United States for the 1958-1977 time period (Kirn, 1987). O'hUallachain and Reid investigated locational and growth patterns of business and professional services in 305 SMSAs for 1976-86 (O'hUallachain and Reid, 1991). Beyers addressed regional patterns of producer services growth among the 183 Bureau of Economic Analysis (BEA) Economic Areas² for the 1974-85 time period (Beyers, 1991). Sui and Wheeler investigated the change in the location of primary office activities between 1985-90 for 98 metropolitan areas (Sui and Wheeler, 1993). Given the differences in study time periods, industry grouping for analyses, and study location or sampled areas among these various studies, there is little reason to expect identical findings.

Noyelle and Stanback found that large SMSAs in the United States had quite different industrial structures. They classified SMSAs into four broad categories: (a) diversified service centers; (b) specialized service centers; (c) production centers; and (d) consumer oriented centers. They

²"The BEA Economic Areas are nodal functional are delineated to facilitate regional economic analysis. Each area consists of an economic node -- a metropolitan statistical area (MSA), or similar area, that serves as a center of economic activity -- and the surrounding counties that are economically related to the center, but not to the extent necessary to qualify as MSA counties" (U.S. Bureau of the Census, 1984, p.163).

found that there existed a strong spatial and functional link between major corporate headquarters and the growth of jobs in producer services and that this link followed a cumulative and circular process over time. They found little evidence showing decentralization of producer services within the set of large SMSAs they examined in the United States (Noyelle and Stanback, 1983).

Kirn examined the general growth and spatial change in the U. S. service sectors over the 1958-67 and 1967-77 time periods for four sets of places: (a) large SMSAs; (b) small SMSAs; (c) large nonmetropolitan areas; and (d) small nonmetropolitan areas. He found there were locational variations among service industries in terms of growth in employment; that is, growth in FIRE was fastest in the smallest nonmetropolitan areas, and least in the larger places. Business services experienced more rapid growth in the small SMSAs and large nonmetropolitan areas compared to the large SMSAs, while legal services showed relatively strong growth in larger SMSAs. Professional services experienced strong relative growth in small SMSAs and large nonmetropolitan areas during 1958-1967, but showed slow growth in SMSAs during 1967-1988. He found that services were evenly distributed over time and noted a movement of service down the urban hierarchy (Kirn, 1987).

O'hUallachain and Reid examined the locations and growth patterns of business and professional services in selected American metropolitan areas. Their analysis confirmed Noyelle

and Stanback's finding that business and professional services located predominantly in large metropolitan areas. In terms of changes in location patterns, they noted that a decentralization of business and profession services down the urban hierarchy was selective (O'hUallachain and Reid, 1991).

Beyers's work (1991) specifically addressed regional patterns of growth in the BEA regions. His paper supported the observation of Noyelle and Stanback and O'hUallachain (1989) regarding the lack of decentralization within the producer service sector. His analysis concluded that producer services had exhibited negligible deconcentration from metropolitan areas over the past decade, but there had been modest redistribution of employment among areas. Meanwhile, large metropolitan areas captured the majority of the new producer service jobs over the past decade.

Sui and Wheeler's (1993) research measured changes in the distribution of primary occupied office space (referring to those office buildings occupied by large corporation headquarters, financial institutions, and business and professional services) among metropolitan centers during 1985-1990 and the changing correspondence between primary occupied office space and population, respectively. Their finding confirmed Noyelle and Stanback's hypothesis that primary occupied office space concentrated in a relatively small number of the large metropolitan areas in the United States. They also concluded that there was a trend toward more spatial dispersion from 1985 to 1990. However, their result rejected

a hypothesis of greater growth in the Sunbelt. They concluded that the Sunbelt-Snowbelt conceptualization is insufficient to explain the complex changing pattern of the new metropolitan service economy.

These analyses confirmed the notion of concentration of producer service industries in the large metropolitan areas in the United States, but have produced contrasting views of trends in the growth of producer service employment. Noyelle and Stanback found that producer service employment in metropolitan areas experienced relatively rapid growth as American cities underwent structural economic transformation, but the size of metropolitan areas was not related to the strength of growth of service industries. Kirn's work suggested that the growth in nonmetropolitan areas was strong and the size of place was related to growth of service industries. Although Beyers and O'hUallachain seemed to support Noyelle and Stanback's hypotheses, it is still not easy to evaluate their degree of verification, because of difference in methodology and selected sectors being used.

Major debate on the location pattern of service industries continues over whether changes in telecommunications and information technology will allow the location of service industries to disperse (Gottmann, 1983; Hepworth, 1985). Arguments have been made in support of the dispersal option. Arguments have also been posed in support of the notion of concentration (Daniels, 1986; Gillespie and Robins, 1989; Gottmann, 1983; Hepworth, 1989; Marshall and

Bachtler, 1984). In order to meet the increasing demand of external market and maintain frequent contact with each other, high-order services concentrate in metropolitan areas. The operation of a firm in a large city may become more costly as it grows in terms of its relative cost of living and its ability of produce effectively. The reaction of the firm may be to seek locations where operation can be more flexible if the use of telecommunication can provide the information needed for work. The less urbanized regions are becoming attractive locations since low order services have a tendency toward dispersion (Bailly, et al. 1987; Gillespie and Green, 1987; Sui and Wheeler, 1993). These analyses provided some guidance on the spatial dimensions as well as some of the causes of the recent expansion of producer service. However, because of differences in methodology and time period being analyzed, it is not an easy task to generalize conclusions on the changing patterns of growth of service industries.

The above studies suggested that major determinants of service activities involve supply side and demand side factors. Service activities prefer agglomeration economies. Localization economies permit backward and forward linkage, that is, proximity to suppliers and clients as well as competitors. The factors used in this study to analyze the location of service industries are the size of population, population growth and per capita income. Size of population is a surrogate for economic size/market size. Population growth represents market potential, that is, the probability

of establishing a niche within a growing economy. Per capita income measures propensity to consume.

Central place theory provides us some clues about the distribution of service activities. It can be expected that services growth patterns have primarily reflected population and income shifts as well as population growth. It can also be expected that consumer services will be more evenly distributed at the national scale. Producer services will be especially prominent in central regions which enjoy the comparative advantages endowed by their accessibility to other firms.

In this study, it is expected that the location of service industries will be positively associated with size of population, rate of population growth, and per capita income. It is also expected that the effect of the factors will vary across areas and over time.

CHAPTER III

LOCATION MODELS OF SERVICE INDUSTRIES

In this chapter, the location of service industries is analyzed at the state and metropolitan levels. The metropolitan-level analysis is conducted for a set of large and small metropolitan areas in order to explain variations in the association between the location of service industries and their determinants in two different groups of metropolitan areas. All the analyses are conducted for three groups of service industries: retail trade, FIRE, and business services. Among business services, SIC73 (Business Services) and SIC89 (Engineering, Accounting, Research, and Management Services) are considered separately. Furthermore, spatial variation across the U.S. regions between the location of service industries and their determinants is analyzed using state-level data. Temporal variation in the association between the location of service industries and their determinants is analyzed at both the state and metropolitan levels (large and small metropolitan areas). The temporal analysis is conducted between the time periods, 1977 and 1987.

3.1 LOCATION MODELS OF SERVICE INDUSTRIES

Studies on service industries suggest that the location

of service industries is influenced by the combined effects of the size of local and regional markets, the growth of firms, increases in personal and corporate income, product differentiation, and changing role of technology. In this study, size of population size (POP), population growth rate (PGR), and per capita income (INC) are used to explain the level of employment in a particular service sector. The model is estimated for four service industries: retail trade; finance, insurance and real estate; business services; and engineering, accounting, research, and management services; the latter two sectors are SIC73 and SIC89, respectively.

The model for the location of service industries is specified as follows:

$$SIL = a + bPOP + cINC + dPGR + e \quad (1)$$

where, SIL = total employment in service industry i

POP = the population size of the study area

INC = per capita income

PGR = population growth rate

e = the error term

In this study, population size is used as a surrogate for the market size, permitting economies of scale and profitable thresholds for businesses.

Per capita income measures propensity to consume. It is expected that rising income levels would change the patterns of consumption and increase the demand for both goods and services.

Population growth rate indicates the economic dynamics of

the area and hence market growth potential. The study expects that the growth of population would stimulate the demand for service industries. Service industries will wish to locate in growth centers rather than in economically stagnant areas. Equation(1) is estimated at the state level and for large and small metropolitan areas.

3.2 SPATIAL AND TEMPORAL VARIATIONS IN THE LOCATION MODEL

This section presents the spatial and temporal variations in the association between the location of service industries and their determinants.

Spatial variation: In order to examine the spatial variation in the effects of the determinants on the location of service industries at the state-level, three dummy variables, D1, D2 and D3, are used based on the four U.S. census regions:

U.S. Regions	Dummy Variables		
	D1	D2	D3
West	1	0	0
NorthCentral	0	1	0
South	0	0	1
Northeast	0	0	0

The parameters (a, b, c, and d) of equation (1) are redefined as follows for state-level analysis:

$$a = a_0 + a_1D1 + a_2D2 + a_3D3 \quad (2)$$

$$b = b_0 + b_1D1 + b_2D2 + b_3D3 \quad (3)$$

$$c = c_0 + c_1D1 + c_2D2 + c_3D3 \quad (4)$$

$$d = d_0 + d_1D1 + d_2D2 + d_3D3 \quad (5)$$

These redefined parameters are substituted in equation(1) to obtain the following model:

$$\begin{aligned} \text{SIL} = & a_0 + a_1D1 + a_2D2 + a_3D1 + b_0\text{POP} + b_1D1\text{POP} + \dots \\ & + d_3D3\text{PGR} + e \end{aligned} \quad (6)$$

Equation(6) is estimated using a stepwise regression procedure. If any of the coefficients associated with interaction terms (b_1 , b_2 , b_3 , c_1 , c_2 , c_3 , or d_1 , d_2 , d_3) are significant in the estimation process, then, the model will show spatially varying association between the location of service industries and its determinants.

Temporal variation: In order to test the temporal variation in the effects of the determinants on the location of service industries, the parameters of equation(1) are redefined as function of t , a dummy variable.

$$a = a_0 + a_1t \quad (7)$$

$$b = b_0 + b_1t \quad (8)$$

$$c = c_0 + c_1t \quad (9)$$

$$d = d_0 + d_1t \quad (10)$$

where t is equal to zero for the first time period 1977 and 1 for the second time period 1987. The temporal model is obtained by substituting equations(7), (8), (9), and (10) in equation(1):

$$\begin{aligned} \text{SIL} = & a_0 + a_1t + b_0\text{POP} + b_1t\text{POP} + c_0\text{INC} + c_1t\text{INC} + d_0\text{PGR} + \\ & d_1t\text{PGR} + e \end{aligned} \quad (11)$$

Equation(11) is estimated at the state-level and separately for large and small metropolitan areas using stepwise regression procedures. If in the estimation process, any

coefficient associated with the interaction term (b_1 , c_1 , and/or d_1) is significant, then the model will exhibit temporally varying association between the location of service industries and its determinants.

3.3 DATA

The source of employment data are obtained from County Business Patterns, a Census Bureau publication (U.S. Bureau of the Census 1978, 1988). Data are published for the nation, states and individual counties for 4-digit industrial categories. Some exact data are not disclosed for small places with only a few industries, rather an employment range is provided. In these cases, the average employment figure is used.

Population data are collected from Census of Population:1970 (U.S. Bureau of the Census, 1970), Current Population Reports (U.S. Bureau of the Census, 1980 and 1989), Statistical Abstract of the United States (U.S. Bureau of the Census, 1991). The data on personal income are acquired from Survey of Current Business (U.S. Bureau of Economic Analysis, 1978, 1990, 1991a, 1991b).

CHAPTER IV

ANALYSES AND RESULTS

The data analysis is presented in two parts. First, the spatial distribution and locational change of service industries is examined. Second, the results of the location models presented in Chapter III are discussed.

4.1 LOCATION OF SERVICE INDUSTRIES

In 1977, total U.S. employment was 65 million. It increased to 85 million by 1987, an increase of 32 percent (Table 4.1). Retail trade, FIRE, and services employment grew faster than aggregate national employment, expanding by 37.60 percent, 47.25 percent, and 71.69 percent, respectively. Employment in business service (SIC73 and SIC89) grew three times faster relative to total employment growth in the United States. Manufacturing employment incurred a negative growth during this time period.

In terms of the share of total employment, services went up from being the number two American industry in 1977 to number one in 1987, replacing manufacturing. The increase in percentage share of services was from 21.64 percent in 1977 to 28.24 percent in 1987. In contrast, the share of manufacturing declined by 8 percentage points from 30.22

Table 4.1 Change of Employment in the Manufacturing and Service Industries in the U.S.: 1977-1987

	Employment (1987) (1)	Percent share (2)	Employment (1977) (3)	Percent share (4)	Change '77 to '87 (5)	(2-4)
Total	85483804	n/a	64975580	n/a	31.56	n/a
MFG	19002692	22.23	19638852	30.22	-3.24	-7.99
Retail	18416653	21.54	13384271	20.60	37.60	0.94
FIRE	6727313	7.87	4568788	7.03	47.25	0.84
Services	24140054	28.24	14059994	21.64	71.69	6.60
SIC73	4994188	5.84	2307384	3.55	116.44	2.29
SIC89	1445446	1.69	670425	1.03	115.60	0.66

Source: U.S. Bureau of the Census, 1978 and 1988. County business patterns: 1977 and 1987. Washington, D.C.: GPO.

percent in 1977 to 22.23 percent in 1987. The other industries maintained their rank during the ten-year period. Retail and FIRE industries showed marginal changes between the ten-year period in terms of their share of total employment in the United States. The changes in the share of total employment from 1977 to 1987 for these two service industries ranged from 0.84 to 0.94. In sum, the U.S. structural transformation which started in the early 1970s maintained similar trends during 1977-1987 (Kamer, 1988; Noyelle. et al., 1983).

4.11 Location of service industries in regions and states

Table 4.2 presents the share of employment in service industries and change in the percentage share between 1977 and 1987 in four U.S. regions. In both 1977 and 1987, the South region exhibited the highest locational share of U.S. employment in every industry category. The West region accounted for the smallest share of U.S. employment in every industry category in both 1977 and 1987. The Northeast region ranked the second highest in the share of U.S. employment in FIRE, SIC73, and SIC89 in both 1977 and 1987. The NorthCentral region ranked second highest in the share of total employment, employment in service industries (SIC40 to SIC89), and retail industry in 1977, but its share of total service industries in 1987 was below the Northeast region.

In terms of change in percentage of share between 1977 and 1987, the Northeast and NorthCentral regions did not increase their respective share in the industry categories

**Table 4.2 Change of Employment in Service Industries in the
U.S. regions: 1977-1987**

Regions	Percent Share (1977)¹					
	P1	P2	P3	P4	P5	P6
NE	23.92	24.40	21.38	27.68	27.70	26.39
NC	27.88	24.40	27.78	24.98	22.99	22.62
S	30.41	29.77	31.31	28.23	28.27	29.22
W	18.46	20.13	2.023	19.78	21.76	22.31

Regions	Percent Share (1987)¹					
	P1	P2	P3	P4	P5	P6
NE	23.16	23.86	20.77	27.54	25.77	25.34
NC	24.63	23.60	24.77	22.47	21.16	18.73
S	32.17	31.60	33.94	29.60	30.98	32.46
W	19.45	20.28	19.76	19.73	21.86	23.05

Regions	Change in Percent Share (1977-1987)²					
	C1	C2	C3	C4	C5	C6
NE	-0.76	-0.54	-0.61	-0.14	-1.93	-1.05
NC	-3.25	-2.80	-3.01	-2.51	-1.83	-3.89
S	1.76	1.88	2.63	1.37	2.71	3.24
W	0.99	0.15	-0.47	-0.05	0.10	0.74

Table 4.2(continued) Change of Employment in Service Industries in the U.S. regions: 1977-1987

Regions	Change in Employment (1977-1987) ³					
	G1	G2	G3	G4	G5	G6
US	31.56	52.93	37.60	47.25	116.44	115.60
NE	27.40	49.52	33.63	46.63	101.33	106.98
NC	16.28	36.72	22.68	32.45	99.20	78.49
S	39.14	62.59	49.15	59.44	137.24	139.53
W	38.62	54.01	34.39	46.85	117.46	122.68

- 1: P1 = percentage share of total U.S. employment
P2 = percentage share of total U.S. service employment
P3 = percentage share of total U.S. Retail employment
P4 = percentage share of total U.S. FIRE employment
P5 = percentage share of total U.S. SIC73 employment
P6 = percentage share of total U.S. SIC89 employment
- 2: C1 = growth in percentage share of total U.S. employment
C2 = growth in percentage share of total U.S. service employment (SIC40 to SIC89)
C3 = growth in percentage share of total U.S. Retail employment
C4 = growth in percentage share of total U.S. FIRE employment
C5 = growth in percentage share of total U.S. SIC73 employment
C6 = growth in percentage share of total U.S. SIC89 employment
- 3: G1 = growth in total employment
G2 = growth in total service employment (SIC40 to SIC89)
G3 = growth in Retail employment
G4 = growth in FIRE employment
G5 = growth in SIC73 employment
G6 = growth in SIC89 employment

noted in Table 4.2. While the NorthCentral region showed a large net loss in location share, the South exhibited a large net gain in every industry. The West had positive growth in total employment, total service industries (SIC40 to SIC89), SIC73, and SIC89, but demonstrated a negative change in retail and FIRE industries.

In terms of growth in employment between 1977 and 1987, the South was the fastest growing region. The growth in every industry in the South exceeded the national average. The West region ranked second in terms of growth. The growth in every industry except retailing in the West exceeded the national average. The NorthCentral region showed the slowest growth among all region. The growth in every industry in NorthCentral and Northeast failed to keep pace with the national average (Table 4.2).

In sum, the spatial distribution of the service industries at the regional level demonstrates that the present locational changes in service industries is leading to their increasing concentration in the South and West. The rate of capital investment and rate of population growth in the South had been consistently high since 1960s. The South and West experienced a relative increase in the proportion of the population employed, and an increase in relative earnings, while the NorthCentral and Northeast regions experienced an opposite trend (Browne et al. 1980).

In 1977, regional differences among states in the share percentage of total U.S. employment can be noted (Table 4.3).

California, New York, Texas, and Florida exhibited top four states with highest concentrations in total employment, total service industries (SIC40 to SIC89), retail trade, FIRE, SIC73, and SIC89. Wyoming, Vermont, North and South Dakotas, and Delaware were the bottom five states with lowest regional concentrations in every industry. Such regional patterns in the share of total U.S. employment can also be noted in 1987 (Table 4.4). The regional concentrations in the share of total U.S. employment at state level present the patterns similar to the U.S. population distributions.

In terms of locational shift in service industries between 1977 and 1987, the patterns of growth in the share of U.S. employment varied across industries as well as across states (Table 4.5). California and Florida were the top two states with strong positive growth in every industry category. Illinois, New York, Pennsylvania, Ohio were the bottom four states with negative growth in every industry category. Georgia exhibited positive growth in total employment, total service employment (SIC40 to SIC89), and retail industry. Arizona exhibited strong positive growth in total employment, total service employment (SIC40 to SIC89), FIRE, SIC73, and SIC89. Delaware exhibited strong positive growth in FIRE, SIC73, and SIC89. Virginia, Maryland and Massachusetts exhibited strong positive growth in SIC73 and SIC89. North Carolina and Connecticut exhibited strong positive growth in SIC73 and SIC89, respectively. Michigan exhibited negative growth in every industry except SIC73.

**Table 4.3 Percentage Share of Employment in Service Industries
in the U.S. states: 1977**

Areas	Percent Share (1977)					
	P1	P2	P3	P4	P5	P6 ⁽⁹⁾
NEW ENGLAND	6.19	6.03	5.82	6.40	5.41	6.13
CONNECTICUT	1.67	1.54	1.44	2.14	1.54	1.05
MAINE	0.43	0.39	0.44	0.34	0.14	0.35
MASSACHUSETTS	3.01	3.13	2.90	3.02	3.13	4.10
NEW HAMPSHIRE	0.39	0.35	0.42	0.33	0.18	0.23
RHODE ISLAND	0.48	0.41	0.41	0.40	0.35	0.28
VERMONT	0.21	0.21	0.21	0.16	0.07	0.13
MID ATLANTIC	17.72	18.37	15.57	21.28	22.29	20.26
NEW JERSEY	3.48	3.45	3.24	3.10	4.19	3.22
NEW YORK	8.50	9.62	7.15	13.23	12.92	10.81
PENNSYLVANIA	5.75	5.31	5.18	4.95	5.18	6.24
E.N. CENTRAL	20.28	18.44	19.47	17.51	16.96	15.92
ILLINOIS	6.01	5.96	5.74	6.52	6.43	5.59
INDIANA	2.60	2.15	2.54	2.02	1.41	1.42
MICHIGAN	4.15	3.62	3.94	3.07	3.27	3.87
OHIO	5.31	4.72	5.03	4.08	4.38	3.64
WISCONSIN	2.20	2.00	2.22	1.82	1.45	1.40
W.N. CENTRAL	7.60	7.96	8.31	7.46	6.03	6.70
IOWA	1.26	1.26	1.41	1.17	0.76	0.81
KANSAS	1.01	1.01	1.13	0.93	0.62	0.78
MINNESOTA	1.90	2.01	2.06	1.88	1.73	1.69
MISSOURI	2.30	2.37	2.27	2.22	2.18	2.41
NEBRASKA	0.68	0.76	0.82	0.83	0.57	0.64
N. DAKOTA	0.22	0.28	0.32	0.22	0.09	0.18
S. DAKOTA	0.23	0.27	0.31	0.21	0.09	0.19
E.S. CENTRAL	5.62	4.84	5.33	4.41	3.45	3.93
ALABAMA	1.47	1.25	1.38	1.19	0.94	1.17
KENTUCKY	1.32	1.17	1.35	0.96	0.73	0.90
MISSISSIPPI	0.85	0.69	0.79	0.64	0.35	0.65
TENNESSEE	1.97	1.72	1.82	1.62	1.44	1.22

**Table 4.3 Percentage Share of Employment in Service Industries
in the U.S. states: 1977 (continue)**

Areas	Percent Share (1977)					
	P1	P2	P3	P4	P5	P6 ^(*)
W.S. CENTRAL	9.70	9.78	10.18	9.01	9.69	10.41
ARKANSAS	0.81	0.69	0.79	0.57	0.41	0.52
LOUISIANA	1.60	1.65	1.68	1.40	1.66	1.60
OKLAHOMA	1.14	1.16	1.28	1.03	0.88	1.11
TEXAS	6.14	6.28	6.43	6.02	6.74	7.18
S. ATLANTIC	15.10	15.10	15.80	14.80	15.12	14.88
DELAWARE	0.30	0.27	0.29	0.25	0.33	0.17
D. C.	0.46	0.70	0.38	0.76	1.16	1.31
FLORIDA	3.60	4.32	4.55	4.60	4.19	3.53
GEORGIA	2.23	2.19	2.25	2.10	2.14	1.99
MARYLAND	1.72	1.97	2.08	1.89	2.77	2.57
N. CAROLINA	2.66	2.07	2.22	1.98	1.46	1.71
S. CAROLINA	1.29	0.93	1.10	0.86	0.66	0.86
VIRGINIA	2.10	2.09	2.26	1.94	2.17	2.32
WEST VIRGINIA	0.69	0.57	0.66	0.43	0.25	0.41
MOUNTAIN	5.52	6.16	6.61	5.44	5.54	6.88
ARIZONA	0.93	1.03	1.18	0.99	1.00	1.02
COLORADO	1.24	1.38	1.46	1.34	1.32	1.74
IDAHO	0.34	0.35	0.40	0.28	0.34	0.32
MONTANA	0.27	0.31	0.37	0.24	0.14	0.32
NEVADA	0.36	0.48	0.37	0.25	0.35	0.28
NEW MEXICO	0.42	0.48	0.55	0.38	0.55	0.71
UTAH	0.55	0.58	0.63	0.49	0.44	0.56
WYOMING	0.17	0.17	0.20	0.13	0.08	0.20
PACIFIC	12.94	13.97	13.62	14.35	16.22	15.43
CALIFORNIA	10.31	11.19	10.69	11.65	13.75	12.43
OREGON	1.07	1.11	1.20	1.03	0.84	1.10
WASHINGTON	1.56	1.68	1.73	1.66	1.62	1.90

(*):
P1: Total employment;
P2: Total Services;
P3: Retail trade;
P4: Finance, insurance, and real estate (FIRE);
P5: SIC73;
P6: SIC89.

**Table 4.4 Percentage Share of Employment in Service Industries
in the U.S. states: 1987**

Areas	Percent Share (1987)					
	P1	P2	P3	P4	P5	P6^(*)
NEW ENGLAND	6.60	6.55	6.32	7.11	6.62	7.72
CONNECTICUT	1.72	1.64	1.52	2.27	1.78	1.52
MAINE	0.46	0.41	0.50	0.37	0.23	0.35
MASSACHUSETTS	3.22	3.38	3.04	3.39	3.77	4.71
NEW HAMPSHIRE	0.51	0.47	0.55	0.48	0.33	0.45
RHODE ISLAND	0.47	0.43	0.45	0.41	0.37	0.52
VERMONT	0.24	0.22	0.25	0.18	0.15	0.16
MID ATLANTIC	16.55	17.31	14.45	20.43	19.15	17.62
NEW JERSEY	3.63	3.73	3.26	3.54	4.43	3.42
NEW YORK	7.93	8.72	6.45	12.48	10.24	9.29
PENNSYLVANIA	4.99	4.86	4.74	4.41	4.47	4.90
E.N. CENTRAL	17.52	16.46	17.37	15.43	15.50	13.37
ILLINOIS	4.94	4.95	4.68	5.58	4.97	4.08
INDIANA	2.26	1.98	2.33	1.67	1.54	1.42
MICHIGAN	3.73	3.43	3.76	2.74	3.63	3.40
OHIO	4.57	4.25	4.54	3.75	3.91	3.18
WISCONSIN	2.02	1.85	2.05	1.68	1.45	1.27
W.N. CENTRAL	7.12	7.14	7.40	7.03	5.66	5.36
IOWA	1.02	1.01	1.12	1.04	0.67	0.56
KANSAS	0.95	0.90	0.99	0.90	0.65	0.64
MINNESOTA	1.93	1.95	1.97	1.87	1.77	1.55
MISSOURI	2.18	2.17	2.13	2.04	1.80	1.98
NEBRASKA	0.60	0.64	0.67	0.77	0.58	0.42
N. DAKOTA	0.21	0.23	0.26	0.19	0.09	0.12
S. DAKOTA	0.22	0.23	0.26	0.22	0.10	0.10
E.S. CENTRAL	5.34	4.72	5.44	4.14	3.73	3.90
ALABAMA	1.40	1.21	1.38	1.08	0.95	1.17
KENTUCKY	1.23	1.12	1.37	0.92	0.77	0.88
MISSISSIPPI	0.77	0.63	0.77	0.59	0.36	0.43
TENNESSEE	1.96	1.76	1.92	1.55	1.65	1.42

**Table 4.4 Percentage Share of Employment in Service Industries
in the U.S. states: 1987 (continue)**

Areas	Percent Share (1987)					
	P1	P2	P3	P4	P5	P6^(*)
W.S. CENTRAL	9.53	9.58	10.20	9.42	8.72	9.76
ARKANSAS	0.78	0.66	0.79	0.55	0.38	0.44
LOUISIANA	1.38	1.41	1.53	1.26	1.13	1.21
OKLAHOMA	1.01	1.00	1.14	0.94	0.72	0.89
TEXAS	6.36	6.50	6.74	6.66	6.48	7.22
S. ATLANTIC	17.27	17.30	18.30	16.05	18.54	18.81
DELAWARE	0.32	0.31	0.31	0.36	0.37	0.22
D. C.	0.46	0.64	0.31	0.63	0.94	0.84
FLORIDA	4.78	5.29	5.69	5.37	5.32	5.20
GEORGIA	2.68	2.55	2.77	2.30	2.52	2.35
MARYLAND	1.96	2.21	2.12	2.10	3.18	3.10
N. CAROLINA	2.81	2.26	2.64	1.91	1.98	1.86
S. CAROLINA	1.30	1.06	1.30	0.94	1.00	0.89
VIRGINIA	2.43	2.50	2.57	2.10	2.99	3.99
WEST VIRGINIA	0.52	0.48	0.60	0.35	0.23	0.35
MOUNTAIN	4.91	5.24	5.44	4.62	5.08	5.56
ARIZONA	1.33	1.37	1.48	1.36	1.44	1.57
COLORADO	1.37	1.46	1.48	1.51	1.49	1.67
IDAHO	0.30	0.30	0.35	0.23	0.23	0.33
MONTANA	0.24	0.27	0.31	0.20	0.13	0.21
NEVADA	0.50	0.59	0.45	0.34	0.45	0.52
NEW MEXICO	0.45	0.52	0.57	0.38	0.75	0.63
UTAH	0.58	0.59	0.61	0.49	0.52	0.49
WYOMING	0.14	0.14	0.18	0.11	0.07	0.14
PACIFIC	14.55	15.04	14.32	15.11	16.78	17.49
CALIFORNIA	11.80	12.27	11.35	12.53	14.53	14.89
OREGON	1.03	1.04	1.14	0.91	0.81	0.87
WASHINGTON	1.71	1.74	1.83	1.67	1.44	1.74

(*):
P1: Total employment;
P2: Total Services;
P3: Retail trade;
P4: Finance, insurance, and real estate (FIRE);
P5: SIC73;
P6: SIC89.

Table 4.5 Growth in Percentage Share of Employment in Service Industries in the U.S. states: 1977-1987

States	Percent Share					
	C1	C2	C3	C4	C5	C6 ^(*)
NEW ENGLAND	0.411	0.521	0.502	0.710	1.212	1.591
CONNECTICUT	0.044	0.103	0.083	0.130	0.249	0.469
MAINE	0.021	0.017	0.067	0.026	0.086	0.004
MASSACHUSETTS	0.212	0.256	0.137	0.369	0.638	0.617
NEW HAMPSHIRE	0.117	0.113	0.134	0.152	0.143	0.228
RHODE ISLAND	-0.010	0.018	0.046	0.010	0.029	0.237
VERMONT	0.028	0.012	0.036	0.023	0.078	0.037
MID ATLANTIC	-1.167	-1.064	-1.118	-0.845	-3.147	-2.647
NEW JERSEY	0.153	0.276	0.020	0.443	0.246	0.209
NEW YORK	-0.563	-0.894	-0.704	-0.751	-2.683	-1.521
PENNSYLVANIA	-0.757	-0.446	-0.434	-0.536	-0.710	-1.334
E.N. CENTRAL	-2.757	-1.978	-2.098	-2.079	-1.461	-2.551
ILLINOIS	-1.075	-1.001	-1.058	-0.939	-1.461	-1.501
INDIANA	-0.334	-0.172	-0.214	-0.346	0.124	0.008
MICHIGAN	-0.420	-0.178	-0.177	-0.332	0.358	-0.463
OHIO	0.746	-0.471	-0.486	-0.324	-0.474	-0.459
WISCONSIN	-0.182	-0.157	-0.164	-0.138	-0.009	-0.128
W.N. CENTRAL	-0.482	-0.819	-0.914	-0.431	-0.371	-1.343
IOWA	-0.240	-0.253	-0.294	-0.137	-0.082	-0.257
KANSAS	-0.061	-0.108	-0.137	-0.028	0.030	-0.141
MINNESOTA	0.033	-0.059	-0.088	-0.015	0.037	-0.142
MISSOURI	-0.117	-0.201	-0.147	-0.182	-0.380	-0.430
NEBRASKA	-0.076	-0.119	-0.152	-0.058	0.016	-0.223
N. DAKOTA	-0.012	-0.040	-0.053	-0.024	-0.004	-0.063
S. DAKOTA	-0.009	-0.038	-0.044	0.013	0.011	-0.086
E.S. CENTRAL	-0.252	-0.113	0.110	-0.274	0.272	-0.035
ALABAMA	-0.064	-0.036	0.005	-0.115	0.011	0.004
KENTUCKY	-0.092	-0.048	0.016	-0.039	0.040	-0.017
MISSISSIPPI	-0.082	-0.068	-0.016	-0.047	0.009	-0.226
TENNESSEE	-0.015	0.039	0.105	-0.073	0.211	0.203

Table 4.5 Growth in Percentage Share of Employment in Service Industries in the U.S. states: 1977-1987(continue)

States	Percent Share					
	C1	C2	C3	C4	C5	C6 ^(*)
W.S. CENTRAL	-0.167	-0.202	0.017	0.404	-0.971	-0.653
ARKANSAS	-0.027	-0.031	-0.001	-0.024	-0.026	-0.084
LOUISIANA	-0.225	-0.242	-0.154	-0.133	-0.526	-0.391
OKLAHOMA	-0.132	-0.153	-0.144	-0.086	-0.160	-0.219
TEXAS	0.216	0.224	0.316	0.647	-0.259	0.042
S. ATLANTIC	2.171	2.193	2.500	1.249	3.415	3.931
DELAWARE	0.023	0.037	0.012	0.113	0.041	0.050
D. C.	0.005	-0.060	-0.070	-0.131	-0.211	-0.470
FLORIDA	1.180	0.972	1.136	0.769	1.137	1.664
GEORGIA	0.402	0.358	0.517	0.200	0.383	0.360
MARYLAND	0.240	0.243	0.043	0.212	0.409	0.531
N. CAROLINA	0.148	0.197	0.407	-0.067	0.520	0.152
S. CAROLINA	0.014	0.129	0.202	0.076	0.340	0.030
VIRGINIA	0.329	0.408	0.315	0.154	0.821	1.674
WEST VIRGINIA	-0.171	-0.089	-0.062	-0.078	-0.023	-0.061
MOUNTAIN	-0.616	-0.923	-1.175	-0.815	-0.460	-1.326
ARIZONA	0.398	0.338	0.300	0.368	0.432	0.548
COLORADO	0.128	0.084	0.023	0.172	0.169	-0.065
IDAHO	-0.041	-0.052	-0.052	-0.052	-0.107	0.008
MONTANA	-0.032	-0.050	-0.057	-0.042	-0.013	-0.111
NEVADA	0.140	0.111	0.083	0.091	0.105	0.242
NEW MEXICO	0.026	0.037	0.025	0.006	0.200	-0.078
UTAH	0.031	0.014	-0.016	-0.003	0.085	-0.072
WYOMING	-0.027	-0.026	-0.024	-0.016	-0.011	-0.002
PACIFIC	1.608	1.066	0.703	0.762	0.562	2.059
CALIFORNIA	1.493	1.080	0.658	0.872	0.777	2.456
OREGON	-0.034	-0.071	-0.058	-0.116	-0.039	-0.235
WASHINGTON	0.149	0.057	0.103	0.005	-0.176	-0.162

(^{*)}: C1: Total employment;
C2: Total Services;
C3: Retail trade;
C4: Finance, insurance, and real estate (FIRE);
C5: SIC73;
C6: SIC89.

**Table 4.6 Growth of Employment in Service Industries in the
U.S. regions: 1977-1987**

States	Growth of Employment (1977-1987)					
	G1	G2	G3	G4	G5	G6^(a)
U.S.	0.32	0.53	0.38	0.47	1.16	1.16
NEW ENGLAND	0.40	0.66	0.49	0.64	1.65	1.72
CONNECTICUT	0.35	0.63	0.46	0.56	1.50	2.12
MAINE	0.38	0.60	0.59	0.58	2.51	1.18
MASSACHUSETTS	0.41	0.65	0.44	0.65	1.60	1.48
NEW HAMPSHIRE	0.71	1.02	0.82	1.15	2.84	3.33
RHODE ISLAND	0.29	0.60	0.53	0.51	1.35	2.97
VERMONT	0.49	0.62	0.60	0.69	3.48	1.78
MID ATLANTIC	0.23	0.44	0.28	0.41	0.86	0.87
NEW JERSEY	0.37	0.65	0.38	0.68	1.29	1.30
NEW YORK	0.23	0.39	0.24	0.39	0.72	0.85
PENNSYLVANIA	0.14	0.40	0.26	0.31	0.87	0.69
E.N. CENTRAL	0.14	0.37	0.23	0.30	0.98	0.81
ILLINOIS	0.08	0.27	0.12	0.26	0.67	0.57
INDIANA	0.15	0.41	0.26	0.22	1.35	1.17
MICHIGAN	0.18	0.45	0.31	0.31	1.40	0.90
OHIO	0.13	0.38	0.24	0.36	0.93	0.88
WISCONSIN	0.20	0.41	0.27	0.36	1.15	0.96
W.N. CENTRAL	0.23	0.37	0.22	0.39	1.03	0.72
IOWA	0.07	0.22	0.09	0.30	0.93	0.47
KANSAS	0.24	0.37	0.21	0.43	1.27	0.77
MINNESOTA	0.34	0.48	0.32	0.46	1.21	0.98
MISSOURI	0.25	0.40	0.29	0.35	0.79	0.77
NEBRASKA	0.17	0.29	0.12	0.37	1.23	0.40
N. DAKOTA	0.25	0.31	0.15	0.31	1.08	0.41
S. DAKOTA	0.26	0.31	0.18	0.57	1.44	0.16
E.S. CENTRAL	0.26	0.49	0.40	0.38	1.33	1.14
ALABAMA	0.26	0.49	0.38	0.33	1.19	1.16
KENTUCKY	0.22	0.47	0.39	0.41	1.28	1.12
MISSISSIPPI	0.19	0.38	0.35	0.36	1.22	0.41
TENNESSEE	0.31	0.56	0.46	0.41	1.48	1.52

Table 4.6 Growth of Employment in Service Industries in the U.S. regions: 1977-1987 (continued)

States	Growth of Employment (1977-1987)					
	G1	G2	G3	G4	G5	G6 ^(*)
W.S. CENTRAL	0.29	0.50	0.38	0.54	0.95	1.02
ARKANSAS	0.27	0.46	0.37	0.41	1.03	0.81
LOUISIANA	0.13	0.30	0.25	0.33	0.48	0.63
OKLAHOMA	0.16	0.33	0.22	0.35	0.77	0.73
TEXAS	0.36	0.58	0.44	0.63	1.08	1.17
S. ATLANTIC	0.50	0.75	0.59	0.60	1.65	1.73
DELAWARE	0.41	0.73	0.43	1.13	1.43	1.78
D. C.	0.33	0.40	0.12	0.22	0.77	0.39
FLORIDA	0.75	0.87	0.72	0.72	1.75	2.17
GEORGIA	0.55	0.78	0.69	0.61	1.55	1.55
MARYLAND	0.50	0.72	0.40	0.64	1.48	1.60
N. CAROLINA	0.39	0.68	0.63	0.42	1.93	1.35
S. CAROLINA	0.33	0.74	0.63	0.60	2.27	1.23
VIRGINIA	0.52	0.83	0.57	0.59	1.98	2.71
WEST VIRGINIA	-0.01	0.29	0.25	0.20	0.97	0.84
MOUNTAIN	0.17	0.30	0.13	0.25	0.98	0.74
ARIZONA	0.88	1.03	0.72	1.02	2.10	2.32
COLORADO	0.45	0.62	0.40	0.66	1.44	1.08
IDAHO	0.16	0.30	0.20	0.20	0.48	1.21
MONTANA	0.16	0.29	0.16	0.21	0.96	0.41
NEVADA	0.82	0.89	0.69	1.01	1.82	3.04
NEW MEXICO	0.40	0.65	0.44	0.49	1.95	0.92
UTAH	0.39	0.57	0.34	0.47	1.58	0.88
WYOMING	0.10	0.29	0.22	0.29	0.89	0.50
PACIFIC	0.48	0.65	0.45	0.55	1.24	1.44
CALIFORNIA	0.51	0.68	0.46	0.58	1.29	1.58
OREGON	0.27	0.43	0.31	0.31	1.07	0.70
WASHINGTON	0.44	0.58	0.46	0.48	0.93	0.97

(*):
G1: Total employment;
G2: Total Services;
G3: Retail trade;
G4: Finance, insurance, and real estate (FIRE);
G5: SIC73;
G6: SIC89.

Overall, states in the traditional manufacturing belt have the least growth in the share of total U.S. employment. These states not only lost their manufacturing base, but also suffered from slow growth in the service industries. The overall performance of their regional economies and large population base may contribute to the fast growth in service industries in these large states. The concentration of metropolitan areas and traditional high-income may be the two major factors which contributed to fast growth in the business service industries in the states like Virginia, Maryland, Massachusetts, and Connecticut.

In terms of change in employment among states between 1977 and 1987 (Table 4.6), New Hampshire, Arizona, and Nevada were the fastest growing states. Employment growth in every industry category in these three states exceeded the national average. West Virginia, Iowa, and Illinois were the slowest growing states in total employment. Iowa, Illinois, Wyoming, and West Virginia were the slowest growing states in total service employment (SIC40 to SIC89). Iowa, Nebraska, Illinois, and Montana were the slowest growing states in retail industries. Idaho, West Virginia, Montana, Indiana, and Iowa were the slowest growing states in FIRE. Louisiana, Idaho, Illinois, and New York were the slowest growing states in SIC73.

4.12 Location of service industries in metropolitan areas

In terms of change in percentage share between 1977 and 1987, large metropolitan areas exhibited positive growth in

total employment, total service industries (SIC40 to SIC89), FIRE, and SIC89, but showed negative growth in retail and SIC73. Small metropolitan areas exhibited negative growth in all industries except SIC73. In terms of growth in employment between 1977 and 1987, the average growth in total employment, retail, FIRE, SIC73, and SIC89 in large metropolitan areas exceeded the national average. The average growth in total employment, total service industries (SIC40 to SIC89), retail, FIRE, and SIC89 in small metropolitan areas was not only slower than those in large metropolitan areas but also slower than the national average. Only the average growth of employment in SIC73 in small metropolitan areas exceeded the national average and the average growth rate for large metropolitan areas. This indicates that besides a more widespread distribution of business services (SIC73), others are contributing to an increase in the already high degree of spatial concentration. The locational preference of the service industries for large centers and major growth centers is evident.

4.2 REGRESSION RESULTS: LOCATION MODELS

The correlations between the independent variables at the state and metropolitan levels in 1987 are shown in Table 4.8. Pearsons correlation coefficients showed that the independent variables are not collinear.

4.21 Location of service industries: state level analyses

The location model specified in equation(1) is estimated

**Table 4.7 Change of Employment in Service Industries in the
U.S. large and small metropolitan areas: 1977-1987**

Areas	Percent Share (1977)¹					
	P1	P2	P3	P4	P5	P6
Large	1.12	1.21	1.08	1.36	1.63	1.44
Small	0.0412	0.0393	0.0452	0.0315	0.0200	0.0309

Areas	Percent Share (1987)					
	P1	P2	P3	P4	P5	P6
Large	1.16	1.24	1.07	1.39	1.51	1.45
Small	-0.0022	-0.0024	-0.0016	-0.0050	0.0039	-0.0068

Areas	Change in Percent Share (1977-1987)²					
	C1	C2	C3	C4	C5	C6
Large	0.0342	0.0274	-0.0087	0.0332	-0.1146	0.0091
Small	-0.0022	-0.0024	-0.0016	-0.0050	0.0039	-0.0068

- 1: P1 = percentage share of total U.S. employment
P2 = percentage share of total U.S. service employment
P3 = percentage share of total U.S. Retail employment
P4 = percentage share of total U.S. FIRE employment
P5 = percentage share of total U.S. SIC73 employment
P6 = percentage share of total U.S. SIC89 employment

- 2: C1 = growth in percentage share of total U.S. employment
C2 = growth in percentage share of total U.S. service employment (SIC40 to SIC89)
C3 = growth in percentage share of total U.S. Retail employment
C4 = growth in percentage share of total U.S. FIRE employment
C5 = growth in percentage share of total U.S. SIC73 employment
C6 = growth in percentage share of total U.S. SIC89 employment

Table 4.7 Change of Employment in Service Industries in the U.S. regions: 1977-1987 (continued)

Areas	Growth of Employment (1977-1987)³					
	G1	G2	G3	G4	G5	G6
US	31.56	52.93	37.60	47.25	116.44	115.60
Large	44.82	9.23	40.17	65.40	122.96	135.59
Small	26.32	4.02	33.05	27.38	164.78	82.69

3: G1 = growth in total employment
 G2 = growth in total service employment (SIC40 to SIC89)
 G3 = growth in Retail employment
 G4 = growth in FIRE employment
 G5 = growth in SIC73 employment
 G6 = growth in SIC89 employment

Table 4.8 Pearsons Correlation Coefficients
State level

Variables			
Variables	POP	INC	PGR
POP	-	0.27 (0.05)	0.03* (0.80)
INC		-	-0.08* (0.56)
PGR			-

Metropolitan level

Variables

Variables	POP	INC	PGR
POP	-	0.53 (0.001)	0.05* (0.63)
INC		-	0.03* (0.79)
PGR			-

* not statistically significant at 0.05 level

using regression analysis for total employment in four industry sectors: retail trade (RET), finance, insurance, and real estate (FIRE), and two business services (SIC73 and SIC89). The results are shown below with t-value indicated in parentheses:

$$\text{RET} = - 118156 + 0.07\text{POP} + 771.4\text{PGR} + 7.93\text{INC} \quad (12)$$

(-3.54) (70.33) (1.93) (3.54)

$$\text{FIRE} = - 152749 + 0.03\text{POP} - 347.40\text{PGR} + 9.53\text{INC} \quad (13)$$

(-3.52) (22.88) (-0.67) (3.27)

$$\text{SIC73} = - 144040 + 0.02\text{POP} + 106.69\text{PGR} + 8.62\text{INC} \quad (14)$$

(-6.12) (32.21) (0.38) (5.46)

$$\text{SIC89} = - 38684 + 0.006817\text{POP} + 129.12\text{PGR} + 2.22\text{INC} \quad (15)$$

(-4.76) (29.75) (1.33) (4.07)

The locational determinants included in the states initial model accounted for more than 90 percent variation in all four service sectors, respectively. The signs of the coefficients for population and income were positive and the regression coefficients for population and income were statistically significant. The effects of population growth rate on FIRE, SIC73, and SIC89 were not statistically significant. The positive and significant effect of population size (POP) on location of service industries suggests that spatial agglomerations provide opportunities for economic linkages and hence attract location of service industries. The positive and significant effect of income (INC) suggests that high level of income strengthens the force of demand on service industries, thus, encourages the tendency toward spatial concentration of the service industries.

4.22 Location of service industries: metropolitan level analyses

Equation(1) is also estimated for a group of large and small metropolitan areas for four service sectors, respectively. The results are shown below with t-values indicated in parentheses:

Large metropolitan areas

$$\text{RET} = - 11749 + 0.0653\text{POP} + 18209\text{PGR} + 2.6642\text{INC} \quad (16)$$

(-0.342) (29.99) (0.643) (1.458)

$$\text{FIRE} = - 82675 + 0.0508\text{POP} - 11504\text{PGR} - 3.1193\text{INC} \quad (17)$$

(-1.496) (11.58) (-0.252) (1.06)

$$\text{SIC73} = - 92689 + 0.0348\text{POP} - 2774\text{PGR} + 4.7452\text{INC} \quad (18)$$

(-3.988) (18.915) (0.145) (3.834)

$$\text{SIC89} = - 29073 + 0.0095\text{POP} + 6316\text{PGR} + 1.4799\text{INC} \quad (19)$$

(-3.337) (13.718) (0.878) (3.189)

The locational determinants included in the large metropolitan location models explained 80 percent (FIRE) to 94 percent (retail) variations in the dependent variables. The population size (POP) is the most statistically significant determinants of service location in all case. The associations between the level of income (INC) and service location is positive and significant for SIC73 and SIC89. However, the effects of level of income on retail and FIRE are not statistically significant. The associations between population growth and service location is positive except for FIRE and SIC73. High growth regions are not necessarily attracting high levels of FIRE and SIC73.

Small metropolitan areas

$$\text{RET} = - 1880.54 + 0.0599\text{POP} - 664.62\text{PGR} + 0.52\text{INC} \quad (20)$$

(-1.78) (4.372) (-0.348) (3.098)

$$\text{FIRE} = - 2605.32 + 0.0171\text{POP} + 705.39\text{PGR} + 0.1953\text{INC} \quad (21)$$

(-1.791) (2.35) (0.695) (2.171)

$$\text{SIC73} = - 2886.98 + 0.011\text{POP} + 1426.26\text{PGR} + 0.211\text{INC} \quad (22)$$

(-2.133) (1.631) (1.511) (2.522)

$$\text{SIC89} = - 883.72 + 0.0038\text{POP} + 650.07\text{PGR} + 0.0585\text{INC} \quad (23)$$

(-3.417) (2.956) (3.603) (3.657)

The locational determinants included in the small metropolitan location models explained 25 percent (FIRE) to 56 percent (SIC89) variations in the dependent variables. Population size and the level of income are statistically significant determinants of service location. The association between the level of income and service location is positive. The effect of PGR on the location of business services (SIC73 and SIC89) is statistically significant. However, the effect of PGR is not a statistically significant determinant of the location of retail and finance, insurance and real estate services. The associations between population growth and service location is positive except for RET. Strong market opportunities due to localization economies and growth of income help explain the location of service industries in small metropolitan areas.

The location models for large metropolitan areas show that high growth regions are not necessarily attracting high levels of producer services. The location models for small metropolitan area show that high growth regions are not necessarily attracting high levels of consumer-oriented

services. The level of demand is a significant determinant of service location in small metropolitan areas, however, its effect is only significant for business services locations (SIC73 and SIC89) in large metropolitan areas.

The positive and significant effect of population size on the location of service industries both at the state level and at the metropolitan level confirms the research hypothesis that service activities prefer agglomeration economies. The large size of population increased the locational attraction of the region for service activities; and initiate a simultaneous rise in the demand for more producer services. At both state and metropolitan levels, population size presented the same effects on the location behaviors for consumer-oriented services.

The positive and significant effect of per capita income on the location of service industries suggested that higher demand and healthy regional economies tended to attract service industries into the region. This conclusion is generally valid at the state and small metropolitan levels, but it is not the case for retailing and FIRE for large metropolitan areas.

The results of location models demonstrated the trends in the effects of the location determinants on service industries. Similarities and differences in the influence of these location determinants on service industries in the U.S. regions and in the metropolitan areas are examined in the following section.

4.23 Spatial variation

The spatial model, Equation(6), is estimated using stepwise regression procedure for four groups of service industries. The results are shown as follows with t-values in parentheses:

$$\begin{aligned} \text{RET} = & -137795 - 314141\text{D3} + 0.0675\text{POP} + 0.006345\text{D1POP} \\ & (-4.503) \quad (-2.2) \quad (42.95) \quad (3.61) \\ & + 0.006210\text{D2POP} + 0.012204\text{D3POP} + 10.4013\text{INC} \quad (24) \\ & (3.045) \quad (4.93) \quad (5.986) \end{aligned}$$

$$\begin{aligned} \text{FIRE} = & -92483 + 0.039035\text{POP} - 0.00855\text{D1POP} \\ & (-2.53) \quad (20.44) \quad (-3.96) \\ & - 0.01167\text{D2POP} - 0.011188\text{D3POP} + 5.3115\text{INC} \quad (25) \\ & (-4.68) \quad (-4.70) \quad (2.13) \end{aligned}$$

$$\begin{aligned} \text{SIC73} = & -76767 - 86277\text{D3} + 0.026131\text{POP} - 0.005844\text{D2POP} \\ & (-3.23) \quad (-2.40) \quad (39.69) \quad (-5.416) \\ & - 0.00565\text{D3POP} + 4.3369\text{INC} + 6.7473\text{D3INC} \quad (26) \\ & (-4.178) \quad (2.717) \quad (2.729) \end{aligned}$$

$$\begin{aligned} \text{SIC89} = & -20987 - 28159\text{D3} + 0.0068\text{POP} + 0.000799\text{D1POP} \\ & (-2.66) \quad (-2.34) \quad (26.84) \quad (2.534) \\ & - 0.00195\text{D2POP} + 1.310\text{INC} + 1.8064\text{D3INC} \quad (27) \\ & (-5.009) \quad (2.495) \quad (2.228) \end{aligned}$$

The above equations yield R^2 -value greater than 0.95. Regional variations are observed in the effects of population size and per capita income (Table 4.9). The associations between per capita income and the location of SIC73 and SIC89 exhibits spatial variation. The effect of INC is significant in the South for SIC73 and SIC89. The associations between population size and the location of retail, FIRE, SIC73, and SIC89 show spatial variation. Population growth rate (PGR)

does not enter the stepwise regression for all the four service industries at the state level. The effect of the demand factor on business services (SIC73 and SIC89) as demonstrated by the effect of INC is significantly large in the South compared to other regions. The effect of agglomeration as demonstrated by the effect of population size varies from industries to industries. The effect is relatively small in the Northeast region for retail and FIRE and in the NorthCentral region for business services (SIC73 and SIC89). The result of the spatial expansion suggests that the South is experiencing fast growth of per capita income due to a favorable climate and inflow of investment capital.

4.24 Temporal variation

State level analyses

The temporal model Equation(11) is estimated for the four groups of service industries. The results are presented below with t-values in parentheses:

$$\begin{aligned} \text{RET} = & - 64012 - 55345t + 0.0623\text{POP} + 0.0114t\text{POP} \\ & (-4.150) \quad (-3.124) \quad (55.165) \quad (7.615) \\ & + 854.77\text{PGR} + 7.9465\text{INC} \\ & (2.662) \quad (4.025) \end{aligned} \quad (28)$$

$$\begin{aligned} \text{FIRE} = & - 18523 - 141396t + 0.0254\text{POP} + 0.00559t\text{POP} \\ & (-2.325) \quad (-3.836) \quad (19.683) \quad (3.214) \\ & - 9.7190t\text{INC} \\ & (3.918) \end{aligned} \quad (29)$$

$$\begin{aligned} \text{SIC73} = & - 68773 - 68347t + 0.01364\text{POP} + 0.01019t\text{POP} \\ & (-7.662) \quad (-6.366) \quad (20.103) \quad (11.322) \\ & + 802307\text{INC} \\ & (6.873) \end{aligned} \quad (30)$$

Table 4.9 Spatial variation in the location of service industries across U.S. regions in 1987: regression results

<u>Dependent Variable: RET</u>				
<u>Regions</u>	<u>W</u>	<u>NC</u>	<u>S</u>	<u>NE</u>
Intercept	-137795	-137795	-451936	-137795
POP	0.07385	0.07371	0.07970	0.06750
INC	10.4013	10.4013	10.4013	10.4013
PGR	-	-	-	-

Dependent Variable: FIRE

<u>Region</u>	<u>W</u>	<u>NC</u>	<u>S</u>	<u>NE</u>
Intercept	-92483	-92483	-92483	-92483
POP	0.047585	0.040705	0.040223	0.039035
INC	5.3115	5.3115	5.3115	5.3115
PGR	-	-	-	-

Dependent Variable: SIC73

<u>Region</u>	<u>W</u>	<u>NC</u>	<u>S</u>	<u>NE</u>
Intercept	-76767	-76767	-163044	-76767
POP	0.026131	0.020287	0.020481	0.026131
INC	4.3369	4.3369	11.0842	4.3369
PGR	-	-	-	-

Dependent Variable: SIC89

<u>Region</u>	<u>W</u>	<u>NC</u>	<u>S</u>	<u>NE</u>
Intercept	-20987	-20987	-49146	-20987
POP	0.007599	0.004850	0.006800	0.006800
INC	1.3100	1.3100	2.1164	1.3100
PGR	-	-	-	-

$$\begin{aligned}
 \text{SIC89} = & -16072 - 18460t + 0.003585\text{POP} + 0.003266t\text{POP} \\
 & (-5.53) \quad (-5.30) \quad (16.31) \quad (11.20) \\
 & + 2.0477\text{INC} \quad (31) \\
 & (5.28)
 \end{aligned}$$

The above equations yield R^2 -values greater than 0.90. The dummy variables t and the cross products of the dummy variables t with population size and per capita income are statistically significant in the stepwise regression. Therefore, temporal variation in the operation of the causal forces on service industries exists. Table 4.10 shows that the effects of population on RET, FIRE, SIC73 and SIC89 are significantly higher in the second time period. The effects of income on FIRE are significant in the second time period. The effects of income on RET, SIC73 and SIC89 do not change over time. However, in the second time period, high levels of demand do not associate with the location of FIRE. This suggests that the level of local demand may not always attract high level producer service industries which may depend extensively on their export markets. The location of these service industries are more often influenced by agglomeration economies permitting face to face contacts, competition and exposure to new export markets.

Temporal model: Large metropolitan areas

The estimated equations of the temporal models for U.S. large metropolitan areas are shown as follows with t -value shown in parentheses:

$$\begin{aligned}
 \text{RET} = & 1416.59 + 0.0582\text{POP} + 2.215\text{INC} + 0.0063t\text{POP} \quad (36) \\
 & (0.125) \quad (25.36) \quad (2.58) \quad (2.05)
 \end{aligned}$$

Table 4.10 Regression coefficient for service industries in states: The temporal model

Dependent Variable: RET

	1977	1987
Intercept	-64012	-119357
POP	0.0623	0.0737
INC	7.9465	7.9465
PGR	854.77	854.77

Dependent Variable: FIRE

	1977	1987
Intercept	-18523	-159919
POP	0.0254	0.03099
INC	-	-9.7190
PGR	-	-

Dependent Variable: SIC73

	1977	1987
Intercept	-68773	-137220
POP	0.01364	0.02383
INC	802307	802307
PGR	-	-

Dependent Variable: SIC89

	1977	1987
Intercept	-16072	-24532
POP	0.003585	0.005851
INC	2.0477	2.0477
PGR	-	-

$$\text{FIRE} = -28672 + 0.041473\text{POP} + 0.0090t\text{POP} \quad (37)$$

(-3.768) (12.878) (2.848)

$$\begin{aligned} \text{SIC73} = & -46179 - 43782t + 0.02219\text{POP} + 0.0126t\text{POP} \\ & (-5.835) \quad (-4.259) \quad (14.903) \quad (6.108) \\ & + 4.6212\text{INC} \quad (38) \\ & (5.14) \end{aligned}$$

$$\begin{aligned} \text{SIC89} = & -12076 - 13906t + 0.005108\text{POP} + 0.004265t\text{POP} \\ & (-4.133) \quad (-3.664) \quad (9.289) \quad (5.589) \\ & + 1.38226\text{INC} \quad (39) \\ & (4.164) \end{aligned}$$

The above equations yield R^2 -values greater than 0.80. The dummy variable t and cross product of dummy variable t with population size is statistically significant in the stepwise regression. Table 4.11 shows that the effects of income on RET, SIC73 and SIC89 have been stable over time. The results of the temporal expansion also show that the effects of population on RET, FIRE, SIC73 and SIC89 are slightly higher in the second time period, implying that agglomeration economies have become more important in affecting the large metropolitan locations of retail, FIRE, and business service industries.

Temporal model: Small metropolitan areas

The temporal model Equation(11) is estimated for small metropolitan areas. The results are shown as follows with t -values in parentheses:

$$\begin{aligned} \text{RET} = & 2700.01 + 0.0371\text{POP} + 0.0169t\text{POP} \quad (32) \\ & (3.33) \quad (4.136) \quad (5.69) \\ R^2 = & 0.53 \quad F \text{ Value} = 40.97 \end{aligned}$$

$$\begin{aligned} \text{FIRE} &= -1276.92 - 982.81t + 0.1686\text{INC} + 0.0179\text{POP} \quad (33) \\ &\quad (-1.97) \quad (-2.087) \quad (2.67) \quad (3.925) \\ R^2 &= 0.25 \quad F \text{ Value} = 8.16 \end{aligned}$$

$$\begin{aligned} \text{SIC73} &= 339.02 - 3226.58t + 1423.99\text{PGR} + 0.011t\text{POP} \\ &\quad (3.52) \quad (-3.16) \quad (2.269) \quad (2.193) \\ &\quad + 0.211t\text{INC} \quad (34) \\ &\quad (3.394) \\ R^2 &= 0.48 \quad F \text{ Value} = 16.67 \end{aligned}$$

$$\begin{aligned} \text{SIC89} &= -215.889 - 635.61t + 668.26\text{PGR} + 0.056\text{INC} \\ &\quad (-3.154) \quad (-4.739) \quad (5.025) \quad (5.414) \\ &\quad + 0.0037t\text{POP} \quad (35) \\ &\quad (3.563) \\ R^2 &= 0.62 \quad F \text{ Value} = 29.55 \end{aligned}$$

As seen in equations(32) to (35), R^2 -value for equations of Retail and SIC89 industries are greater than 0.50, but below 0.50 for equations of FIRE and SIC73. The dummy variable t and cross products of dummy variable t with population size and per capita income are statistically significant in the stepwise regression. Table 4.11 shows that the effects of population on RET, SIC73 and SIC89 are slightly higher in the second time period, implying that agglomeration economies have become more important in affecting small metropolitan locations of retail and business service industries. The effects of income on SIC73 are significantly higher in the second time period. This suggests that the growth of incomes and the growth of business services may become mutually reinforcing. High-income occupations use business services. By paying high wages, intermediate users of services give rise to increased household consumption. High per capita income contributes to the concentration of

these business services employment.

Table 4.11 Regression coefficient for service industries in metropolitan areas: The temporal model

Areas	Large metropolitan		Small metropolitan	
	Time Period			
	1977	1987	1977	1987
<u>Dependent Variable: RET</u>				
Intercept	1416.59	1416.59	2700.01	2700.71
POP	0.05820	0.06450	0.03710	0.04400
INC	2.21500	2.21500	-	-
PGR	-	-	-	-
<u>Dependent Variable: FIRE</u>				
Intercept	-28672	-28672	-1276.92	-2259.73
POP	0.041473	0.050473	0.017900	0.017900
INC	-	-	0.168600	0.168600
PGR	-	-	-	-
<u>Dependent Variable: SIC73</u>				
Intercept	-46179	-89961	339.02	-2887.56
POP	0.02219	0.03479	-	0.01100
INC	4.62120	4.62120	-	0.21100
PGR	-	-	1423.99	1423.99
<u>Dependent Variable: SIC89</u>				
Intercept	-12076	-25982	-215.89	-851.50
POP	0.005108	0.009473	-	0.00370
INC	1.382260	1.382260	0.05600	0.05600
PGR	-	-	668.260	668.260

CHAPTER V

CONCLUSIONS

The purpose of this study was to analyze the spatially and temporally varying associations between the locations of service industries and a set of determinants in the United States. The analysis of the changing patterns of location of service industries at the regional and state levels indicate that the South and the West continue to have strong concentrations of service employment. These concentrations were stimulated by strong population base and greater-than-average gains in per capita income. The Northeast region maintains its position in the overall patterns. The NorthCentral region had its difficulty in attracting service industries as it lost its traditional manufacturing base. During 1977 to 1987, service industries became relatively evenly distributed among regions as some highly concentrated states experienced relatively slow growth.

In addition to centralization occurring within metropolitan areas, there are indications of producer services being attracted to the small metropolitan areas as result of filtering down the metropolitan hierarchy. Some of these trends are leading to a more widespread distribution of producer services, such as SIC73, others are contributing to

an increase in the already high degree of spatial concentration exhibited by many producer services, such as retail and FIRE.

The location analysis indicates that at state level, population size and per capita income are the two important determinant variables. The spatial and temporal variations of the effects of population size and per capita income are observed. The effects of the demand factor on the business services (SIC73 and SIC89) is demonstrated by the effect of per capita income. This effect is larger in magnitude in the South compared to the other regions. The effects of population size on retail service, FIRE, SIC73 and SIC89 are significantly higher in the second time period. The effect of per capita income on FIRE is significant in the second time period.

At the metropolitan area level, both population size and per capita income are important determinants in affecting metropolitan location of service industries. The results of this study also indicate that the effects of population size and per capita personal income on location of service industries not only varied from time to time and from regions to regions, but also across the industry sectors.

In spite of advanced development in technologies, proximity to agglomeration economies, such as customers, suppliers and competitors, remains important in the location of service industries. Access to skilled labor and information continues to be important for producer services.

Proximity to skilled professionals reduces the costs to the organization of finding the right mix of labor talent. The shift to the more prosperous areas largely reflects the growth in demand which these areas are generating, while the continued attraction of the large metropolitan areas is influenced, in part, by the growth of large business service organizations. The location of the most advanced metropolitan areas also contributes to their attraction as does the ease of face-to-face contact with customers, suppliers and other organizations. Spatial proximity helps organizations clarify information.

In case of decentralization, for example, to small metropolitan areas, the main factor has been the increase in demand for producer services. This increase in demand has allowed smaller metropolitan areas to generate the thresholds to support high order services. The growth of large service corporations and their expansion strategies also stimulate these firms to look for new markets. In order to establish their presence in distant markets, large service corporations are increasingly opening branches. Decentralization has also been made easier by the development of locational hierarchies in large business and the improvements in telecommunications which have enabled the more standardized work processes which requires little face-to-face contact to be relocated in smaller settlements and suburban areas.

Current studies based on employment data cannot fully reveal if the decentralization trend can bring about the

diffusion of advanced producer services to peripheral regions. It is possible that not all employers in a producer service, such as FIRE, SIC73, or SIC89, are engaging in high order activities. It is also possible more routine and less-skilled operations have been separated and decentralized to cheaper labor areas. Branch offices are often operational agencies or just "sales" branches, where most "intermediate" service inputs are imported from headquarters. This generates little local contribution to the final service value added. Therefore, future work needs to examine locational patterns of service industries based on employment data as well as occupational information in order to understand the economic impact of growth in service industries.

APPENDIX 1. SELECTED METROPOLITAN AREAS

Small Metropolitan Areas:

Albany GA MSA
 Bellingham WA MSA
 Bismarck ND MSA
 Bloomington IN MSA
 Burlington NC MSA
 Casper WY MSA
 Columbia MO MSA
 Cumberland MD-WV MSA
 Danville VA MSA
 Dubuque IA MSA
 Elmira NY MSA
 Enid OK MSA
 Fayetteville-Springdale
 Florence SC MSA
 Gadsden AL MSA
 Glens Falls NY MSA
 Grand Forks ND MSA
 Great Falls MT MSA
 Hagerstown MD MSA
 Iowa City IA MSA
 Jackson TN MSA
 Kokomo IN MSA
 La Crosse WI MSA
 Lawrence KS MSA
 Midland TX MSA
 Rapid City SD MSA
 Rochester MN MSA
 San Angelo TX MSA
 Santa Fe NM MSA
 Sheboygan WI MSA
 Sherman-Denison TX MSA
 Sioux City IA-NE MSA
 State College PA MSA
 Victoria TX MSA
 Wausau WI MSA
 Williamsport PA MSA
 Wilmington NC MSA
 Yuba City CA MSA

Large Metropolitan Areas:

Anaheim-Santa Ana CA PSMA
 Atlanta GA MSA
 Baltimore MD MSA
 Bergen-Passaic NJ PMSA
 Chicago IL PMSA
 Cincinnati OH-KY-IN PMSA
 Cleveland OH MSA
 Columbus OH MSA
 Dallas TX PMSA
 Denver CO PMSA
 Detroit MI PMSA
 Fort Lauderdale-Hollywood
 -Pompano Beach FL PMSA
 Fort Worth-Arlington TX PMSA
 Houston TX PMSA
 Indianapolis IN MSA
 Kansas City MO-KS MSA
 Los Angeles-Long Beach CA PMSA
 Miami-Hialeah FL PMSA
 Milwaukee WI PMSA
 Minneapolis-St. Paul MN-WI MSA
 Nassau-Suffolk NY PMSA
 New Orleans LA MSA
 New York NY PMSA
 Newark NJ PMSA
 Oakland CA PMSA
 Philadelphia PA-NJ PMSA
 Phoenix AZ MSA
 Pittsburgh PA PMSA
 Portland OR PMSA
 Riverside-San Bernardino CA
 PMSA
 Sacramento CA MSA
 St. Louis MO-IL MSA
 Salt Lake City-Ogden UT MSA
 San Antonio TX MSA
 San Diego CA MSA
 San Francisco CA PMSA
 San Jose CA PMSA
 Seattle WA PMSA
 Tampa-St. Petersburg-Clearwater
 FL MSA
 Washington DC-MD-VA MSA

BIBLIOGRAPHY

- Aanestad, James M. 1988. "Statistical Data on Service." In United States Service Industries Handbook. pp. 155-172. Edited by Wray O. Candilis. New York, NY: Praeger Publishers.
- Agnew, John A. 1987. The United States in the world-economy: a regional geography. - (A Geography of the world-economy; v.1). New York, NY: Cambridge University Press.
- Bailly, A. S., Mailat, D., and Coffey W.J. 1987. "Service activities and regional development: some European examples". Environment and Planning A. May 19(5):653-668
- Berry, Brian J. L. 1988. Market centers and retail location. Englewood Cliffs, NJ: Prentice-Hall, Inc..
- Beyers, W. B. et al. 1985. "The service sector: a growing force in the regional export base". Economic Development Commentary. Fall 9(3):3-7.
- Beyers, William B., 1991. "Trends in the producer services in the USA: the last decade". in Services and metropolitan development: international perspective. pp 146-172. Edited by Daniels, P. W.. New York, NY: Routledge, Chapman and Hall, Inc..
- Browne et al. 1980. "Regional investment patterns". New England Economic Review. July/August:5-23.
- Browning, H. L. and Singelmann, J. 1978. "The transformation of the U.S. labor force: the interaction of industry and occupation". Politics and Society. 8(3-4):481-509.
- Bryant, C. et al. 1984. Regional economic development. Ontario: University of Waterloo, Department of Geography.
- Castells, Manuel. 1989. The informational city. Massachusetts: Basil Blackwell Inc..
- Chapman, Keith and Walker, David F. 1991. Industrial location: principles and policies. Massachusetts: Basil Blackwell Inc..

- Coffey, W. J., and Polese, M. 1987. "Trade and location of producer services: a Canadian perspective". Environment and Planning A. May 19(5):597-611.
- Daniels, P. W. 1991. "Service sector restructuring and metropolitan development: processes and prospects". in Services and metropolitan development: international perspective. pp 1-25. Edited by Daniels, P. W.. New York, NY: Routledge, Chapman and Hall, Inc..
- Daniels, P. W. 1985. "The geography of services". Progress in Human Geography. September 9(3):442-451.
- Daniels, P. W. 1985. Service industries: a geographical appraisal. New York, NY: Methuen & Co..
- Daniels, P.W. 1982. Service industries: growth and location, Cambridge, MA: Cambridge University Press.
- Drennan, M. P. 1989. "Information intensive industries in metropolitan areas of the United State of America". Environment and Planning A. December 21(12):1603-1618.
- Estall, Robert. 1991. "New roles in old regions." in Global Change and Challenge: geography for the 1990s. pp 118-138. Edited by Bennett, R. J. and Estall, R. C.. New York, NY: Routledge, Chapman and Hall, Inc..
- Everson, J. A. and Fitzgerald, B. P. 1969. Settlement Patterns. London: Longman Inc..
- Fuchs, V. R. 1968. The service economy. New York, NY: National Bureau of Economic Research.
- Gershuny, J. I., and Miles, I. D. 1983. The new service economy. New York, NY: Praeger Publishers.
- Gillespie, A., and Robins, K., 1989. "Geographical inequalities: the spatial bias of the new communications technologies". Journal of Communication. Summer 39(3): 7-18.
- Gottmann, J. 1983. The coming of the transactional city. College Park, MD: University of Maryland Institute of Urban Studies.

- Hamrin, R. D. 1988. America's new economy: the basic guide. New York, NY: Franklin Watts.
- Healey, M. J. and Ilbery, B.W. 1990. Location and change: perspectives on economic geography. New York, NY: Oxford University Press.
- Hepworth, M. 1985. "The geography of technological change in the information economy". Regional Studies. May 20(5):407-424.
- Hepworth, M. E. 1989. Geography of the information economy. London: Belhaven Press.
- Illeris, Sven. 1991. "Location of services in a service society". in The changing geography of advanced producer services: theoretical and empirical perspective. pp 91-107. Edited by Peter W. Daniels and Frank Moulaert. Irvington, NY: Belhaven Press.
- Kamer, Pearl M. 1988. The U.S. economy in crisis: adjusting to the new realities. New York, NY: Praeger Publishers.
- Kirn, T. J. 1987. "Growth and change in the service sector of the U.S.: a spatial perspective". Annals of the Association of American Geographers. September 77(3): 353-372.
- Kravis, I. B., Heston, A. and Summers, R. 1982. World product and income: international comparisons of real gross product. Baltimore, MD: Johns Hopkins University Press.
- Kurtzman, Joel. 1988. The decline and crash of the American economy. New York, NY: W. W. Norton and Company.
- Lloyd, Peter E. and Dicken, Peter. 1990. Location in space: theoretical perspectives in economic geography. 3rd ed. New York, NY: HarperCollins Publishers, Inc..
- Marshall, J.N. 1988. The changing organization of modern western society: a geographical appraisal of service activities. Geographisches Institute, Eidgenossische Technische Hochschule, Zurich.
- Marshall, J. N., and Bachtler, J. F. 1984. "Spatial perspectives on technological changes in the banking sector of the United Kingdom". Environment and Planning A. April 6(4):437-450.
- Marshall, J. N. et al. 1988. Service and uneven development. New York, NY: Oxford University Press.

- Marshall, J. U. 1969. The Location of Service Towns. Toronto: University of Toronto, Department of Geography, Research Publication No. 3.
- Martinelli, Flavia. 1991. "A demand-orientated approach to understanding producer services". in The changing geography of advanced producer services: theoretical and empirical perspective. pp 15-29. Edited by Peter W. Daniels and Frank Moulaert. Irvington, NY: Belhaven Press.
- Monnouer, Marie-Christine and Philippe, Jean. 1991. "Localization factors and development strategies of producer services". in The changing geography of advanced producer services: theoretical and empirical perspective. pp 108-117. Edited by Peter W. Daniels and Frank Moulaert. Irvington, NY: Belhaven Press.
- Noyelle, T. J. and Stanback, T. M. 1984. The economic transformation of American cities. Totowa, NJ: Rowman & Allanheld Publishers.
- Nusbaumer, Jacques. 1987. The service economy: lever to growth. Boston, MA: Kluwer Academic Publishers.
- Ochel, W., and Wegner, M. 1987. Service economic in Europe: opportunities for growth. Colorado: Westview Press.
- O'hUallachain, Breandan. 1989. "Agglomeration of services in American metropolitan areas". Growth and Change. Summer 20(3):34-49.
- O'hUallachain, Breandan, and Reid, Neil. 1991. "The location and growth of business and professional services in American metropolitan areas, 1976-1986". Annals of the Association of American Geographers, 81(2):254-170.
- Petit, Pascal. 1986. Slow growth and the service economy. New York, NY: St. Martin's Press.
- Price, D. G., and Blair, A. M. 1989. The changing geography of the service sector. London: Belhaven Press.
- Richardson, Harry W. 1969. Regional Economics: location theory, urban structure, and regional change. New York, NY: Praeger Publishers, Inc..
- Richardson, Harry W. 1979. Regional economics. Urbana, IL: University of Illinois Press.
- Riddle, D.I. 1986. Service-led growth: the role of the service sector in world development. New York, NY: Praeger Publishers, Inc..

- Sabolo, Y. 1975. The service industries. Geneva: International Labor Office.
- Scott, Peter. 1964. "The hierarchy of central places in Tasmania". Australian Geographer. March 9(3):134-147.
- Shaffer, Ron. 1989. Community economics. Ames, Iowa: Iowa State University Press.
- Smith, David M. 1981. Industrial location: a economic geographical analysis. (2nd edition). New York, NY: John Wiley and Sons, Inc..
- Sui, Daniel Z. and Wheeler, James O. 1993. "The location of office space in the metropolitan service economy of the United State". Professional Geographer. February. 45(1):33-43.
- U.S. Bureau of the Census, 1978. County business patterns: 1977. Washington, D.C.. GPO.
- U.S. Bureau of the Census, 1980. "Estimates of the population of counties and metropolitan areas: July 1, 1977 and 1978". Current Population Reports: population estimates and projections, series P-25, No.873. Washington, D.C.. GPO.
- U.S. Bureau of the Census, 1990. Statistical Abstract of the United States: 1990 (110th edition) Washington, D.C.. GPO.
- U.S. Bureau of the Census, 1989. "County population estimates: July 1, 1988, 1987 and 1986". Current Population Reports: population estimates and projections, series P-26, No.88-A. Washington, D.C.. GPO.
- U.S. Bureau of the Census, 1988. County business patterns: 1987. Washington, D.C.. GPO.
- U.S. Bureau of the Census, 1984. Proceedings of the national geographic areas conference: putting it together for 1990. Washington, D.C.. GPO.
- U.S. Bureau of Economic Analysis, 1991a. "Gross State Product by Industry, 1977-89". Survey of Current Business. December 71(12):43-58.
- U.S. Bureau of Economic Analysis, 1991b. "County and Metropolitan Area Personal Income, 1987-89". Survey of Current Business. April 71(4):35-58.

- U.S. Bureau of Economic Analysis, 1990. "State Personal Income, 1987-89: Revised Estimates". Survey of Current Business. August 70(8):27-28.
- U.S. Bureau of Economic Analysis, 1981. "County and Metropolitan Area Personal Income". Survey of Current Business. April 61(4):41-63.
- U.S. Bureau of Economic Analysis, 1978. "Per Capital Income by State in 1977". Survey of Current Business. August 58(8):15.
- Walker, Richard A. 1985. "Is there a service economy? the changing capitalist division of labor". Science and Society. Spring 48(1):42-83.
- World Bank. 1993. World Development Report 1993: investing in Health. New York, NY: Oxford University Press.

- Sabolo, Y. 1975. The service industries. Geneva: International Labor Office.
- Scott, Peter. 1964. "The hierarchy of central places in Tasmania". Australian Geographer. March 9(3):134-147.
- Shaffer, Ron. 1989. Community economics. Ames, Iowa: Iowa State University Press.
- Smith, David M. 1981. Industrial location: a economic geographical analysis. (2nd edition). New York, NY: John Wiley and Sons, Inc..
- Sui, Daniel Z. and Wheeler, James O. 1993. "The location of office space in the metropolitan service economy of the United State". Professional Geographer. February. 45(1):33-43.
- U.S. Bureau of the Census, 1978. County business patterns: 1977. Washington, D.C.. GPO.
- U.S. Bureau of the Census, 1980. "Estimates of the population of counties and metropolitan areas: July 1, 1977 and 1978". Current Population Reports: population estimates and projections, series P-25, No.873. Washington, D.C.. GPO.
- U.S. Bureau of the Census, 1990. Statistical Abstract of the United States: 1990 (110th edition) Washington, D.C.. GPO.
- U.S. Bureau of the Census, 1989. "County population estimates: July 1, 1988, 1987 and 1986". Current Population Reports: population estimates and projections, series P-26, No.88-A. Washington, D.C.. GPO.
- U.S. Bureau of the Census, 1988. County business patterns: 1987. Washington, D.C.. GPO.
- U.S. Bureau of the Census, 1984. Proceedings of the national geographic areas conference: putting it together for 1990. Washington, D.C.. GPO.
- U.S. Bureau of Economic Analysis, 1991a. "Gross State Product by Industry, 1977-89". Survey of Current Business. December 71(12):43-58.
- U.S. Bureau of Economic Analysis, 1991b. "County and Metropolitan Area Personal Income, 1987-89". Survey of Current Business. April 71(4):35-58.
- U.S. Bureau of Economic Analysis, 1990. "State Personal Income, 1987-89: Revised Estimates". Survey of Current

Business. August 70(8):27-28.

U.S. Bureau of Economic Analysis, 1981. "County and Metropolitan Area Personal Income". Survey of Current Business. April 61(4):41-63.

U.S. Bureau of Economic Analysis, 1978. "Per Capital Income by State in 1977". Survey of Current Business. August 58(8):15.

Walker, Richard A. 1985. "Is there a service economy? the changing capitalist division of labor". Science and Society. Spring 48(1):42-83.

World Bank. 1993. World Development Report 1993: investing in Health. New York, NY: Oxford University Press.

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