Policy Research Center

Research Paper No. 44

The Importance of the Central City to the Regional and National Economy: A Review of the Arguments and Empirical Evidence

Keith R. Ihlanfeldt

College of Business Administration
Georgia State University
Atlanta, Georgia

June 1994

Georgia State University

Carl V. Patton	President
Cleon Arrington	Vice-President for Research and Information Technology

College of Business Administration

John D. Hogan	Dean

Policy Research Center

Roy Bahl	Director
Jorge L. Martinez	Associate Director
David L. Sjoquist	Associate Director
Ronald G. Cummings	Noah Langdale Chair
Francis W. Rushing	Bernard A. and Eugenia A. Ramsey Chair

Senior Associates

Shomu Banerjee
Chris Bollinger
Carol Ann Dalton
Julie L. Hotchkiss
Keith R. Ihlanfeldt
Robert E. Moore
Rubin Saposnik
Bruce Seaman
Paula E. Stephan
Mary Beth Walker
Sally Wallace
Thomas L. Weyandt, Jr.
Loren Williams

Graduate Research Assistants

Harold Ball	Barbara Edwards	Fitzroy Lee	Joe Timmerman
Raja Bhandarkar	Steve Everhart	Steven Maguire	Wen Tsui
Jamie Boex	Dagny Falk	Robert McNab	Rong Zhang
David Bowes	Chris Geller	James Murphy	
Adam Chen	Anne Gilbert	Glenwood Ross	
Jenny Chen	David Green	Sal Sehili	
Robbie Collins	Richard Hawkins	Mark Thompson	

Staff

David Sandt	Assistant Director - Administrative
Curtis Augustin	Systems Analyst
Angela Y. Harris	Microcomputer Software Technical Specialist
Wayne Parrish	Administrative Specialist
Helen Rosier	Microcomputer Software Technical Specialist
Arthur D. Turner	Microcomputer Software Technical Specialist
Rosetta Smith	Senior Administrative Secretary
Chayne Johnson	Student Assistant

About the Author...

Dr. Keith Ihlanfeldt is Professor of Economics and a Senior Associate of the Policy Research Center at Georgia State University. His recent research has focused on minority employment opportunities within central cities, state economic development and tax incentives, and the relationship between transportation infrastructure and employment densification. He has published numerous journal articles on urban economic issues and serves on the editorial boards of two regional economics journals.

FOREWORD

For most of the 1980s, central cities became the forgotten part of the American inter-governmental fiscal system. As interest in policy directed towards poor individuals slackened, so did interest in poor central cities. There seems to be some revival in concern about the position of central cities in American life, but the new policy thrust seems less based on income distribution concerns than on economic development concerns. That is, the role of cities in stimulating national economic growth.

In this paper, Professor Keith Ihlanfeldt reviews the literature on this important subject and puts the arguments in context. This review does point to significant linkages in city and suburban economies, but as might be expected, points out significant gaps in knowledge about how these linkages contribute to overall economic growth.

Keith Ihlanfeldt is Professor of Economics and Senior Research Associate in the Policy Research Center. This paper was originally prepared for the National Urban Policy Report of the Department of Housing and Urban Development. Professor Ihlanfeldt would like to acknowledge the assistance of David Sjoquist, Roy Bahl, and Bruce Seaman in preparing this paper.

Roy Bahl
Atlanta GA
June 26, 1994

EXECUTIVE SUMMARY

The rapid suburbanization of jobs and people and in particular the maturation of "edge cities" have led to a debate that started in the popular press, which then spread to the academic community, over the importance of the central city to the regional economy. A number of authors have argued that suburbs are no longer dependent on the central city. The relationship between central cities and their surrounding suburbs is seen as competitive rather than complimentary. The implication is that the destiny of suburban communities lies in their own hands and is not tied to the fortunes, or more appropriately the misfortunes, of their central cities. Others have argued that central cities and surrounding suburban areas remain closely interconnected. The fortunes of suburban communities are tied to those of their central cities and the policy implication is that both city and suburbs could improve their welfare through cooperative actions to arrest urban decline. The purpose of this paper is to review the arguments that have been made on both sides of the above debate. Evidence that has a bearing on the validity of each argument is also reviewed.

There are many good arguments that can be made that suggest central cities and their surrounding suburbs are interdependent. First, the economic fortunes of suburbs may be tied to those of their central cities to the extent that outsiders' perceptions of the region are influenced by conditions prevailing within the core. Second, because of their location or their history, central cities may contain amenities that are valued throughout the region. Third, individual central cities may provide a "sense of place" that is valued not only by the residents living within these central cities but also by outsiders. Fourth, the fiscal problems endemic to a declining

central city may raise tax burdens in suburban areas and thereby retard economic development. Unfortunately, there has been virtually no empirical investigation of these hypotheses.

Another argument in favor of interdependence is that central cities offer unique agglomeration economies that define an important and specialized role for the central city in the regional economy. In particular, the compactness of central business districts is believed to minimize the cost of face-to-face exchange, which serves to attract higher order office functions. The paper reviews the evidence on this issue and concludes that the central city has the advantage in providing face-to-face agglomeration economies, but the "uniqueness" of these economies seems to be eroding over time.

Also reviewed are those studies that purport to show that the economies of central cities and their surrounding suburbs are interdependent, without identifying the source(s) of this interdependence. These studies include: (1) correlations between central city and suburban growth rates, (2) estimates of a structural model that relates city and suburban growth, (3) earnings of suburban residents working in central cities, and (4) estimates of the relationship between city employment growth and the value of suburban housing. Each of these studies has important methodological limitations which are discussed in the paper. However, the better work strongly supports the interdependence hypothesis.

The paper concludes by making some suggestions for future research.

TABLE OF CONTENTS

LIST OF TABLES

THE IMPORTANCE OF THE CENTRAL CITY TO THE REGIONAL AND NATIONAL ECONOMY: A REVIEW OF THE ARGUMENTS AND EMPIRICAL EVIDENCE

Keith R. Ihlanfeldt

I. INTRODUCTION

In the postwar period, population and employment have been growing rapidly in suburban areas, while most central cities have been declining or growing slowly. As a result, both population and employment have become heavily suburbanized. Fifty-seven percent of MSA residents and 70 percent of MSA jobs were located in central cities in 1950. Today, central cities contain only about 37 percent of MSA residents and 45 percent of MSA jobs (Mieszkowski and Mills, 1993). The rapid suburbanization of jobs and people and in particular the maturation of "edge cities" (Garreau, 1994) have led to a debate that started in the popular press, which then spread to the academic community, over the importance of the central city to the regional economy. A number of journalists (Turque and Washington, 1991; Louisville Courier Journal, 1991; Philadelphia Inquirer, 1991; Garreau, 1991) and academics (Hartshorn and Muller, 1989; Fishman, 1987) have argued that suburbs are no longer dependent on the central city. The relationship between central cities and their surrounding suburbs is seen as competitive rather than complimentary. The implication is that the destiny of suburban communities lies in their own hands and is not tied to the fortunes, or more appropriately the misfortunes, of their central cities. Others (Persky, et al., 1991; Savitch, et al., 1993; Voith, 1992; Ledebur and Barnes, 1992) have argued that central cities and surrounding suburban areas remain closely interconnected. The fortunes of suburban communities are tied to those of their central cities and the policy implication is that both city and suburbs could improve their welfare through cooperative actions to arrest urban decline.[1]

The purpose of this paper is to review the arguments that have been made on both sides of the above debate. Evidence that has a bearing on the validity of each argument is also reviewed.

Before overviewing the contents of this paper it is convenient to briefly identify the five sources of interdependence that allegedly link the economies of central cities and their surrounding suburbs. First, the economic fortunes of suburbs may be tied to those of their central cities to the extent that outsiders' perceptions of the region are influenced by conditions prevailing within the core. Second, because of their location or their history, central cities may contain amenities that are valued throughout the region. Third, individual central cities may provide a "sense of place" that is valued not only by the residents living within these central cities but also by outsiders. Fourth, the fiscal problems endemic to a declining central city may raise tax burdens in suburban areas and thereby retard economic development. Finally, central cities may offer unique agglomeration economies that define an important and specialized role for the central city in the regional economy.

The first four sources of central city - suburb interdependence are dealt with in the next section. The issue of agglomeration economics is treated separately in Section III. Agglomeration economies receive special attention for three reasons. First, much more has been written on agglomeration economies in comparison to the other factors. Second, these economies are commonly identified as the primary factor that define the economic importance of central cities. Third, empirical evidence on agglomeration economies exists, while we were unable to find evidence, either pro or con, that relates to the quantitative significance of the other possible sources of interdependence. Section IV reviews a number of statistical studies that purport to

show that central cities and suburbs are interdependent. These studies make no attempt to identify the source(s) of this interdependence, only that it exists. The paper concludes with a summary and suggestions for future research.

II. IMAGE EFFECTS, TAX BURDENS, AMENITIES, and SENSE OF PLACE

A declining central city may reduce employment and population growth in surrounding suburban areas if the image that outsiders have of the region is molded by their knowledge of social problems prevailing within the core. Voith (1992) quotes from *The Economist* (November 2, 1991) to illustrate this position:

> Nowhere is the separation of [the city and suburbs] so destructive ... as in Detroit ... It is becoming obvious that Detroit's troubles cannot be contained. Company headhunters, even in the distant suburbs, find it difficult to lure top-notch talent to a place with such a negative image.

Negative image effects may arise for two distinct reasons. First, people may ascribe central city problems to suburban areas, either out of ignorance or the expectation that these problems will eventually spread beyond central city boundaries. Second, outsiders may anticipate that sooner or later if they move to a region whose central city is plagued by significant problems they will be asked to pay more taxes. This expectation may have grown in recent years as the Federal Government has shifted more responsibility to state and local governments to solve their own social problems.

Unfortunately, there is no empirical evidence on the quantitative significance of image effects. This is somewhat surprising, since it would certainly be possible with existing data and methods to relate the population or employment growth of suburbs or regions to measurable

central city problems. In particular, it would be of considerable interest to determine the impact of high central city crime rates.

In addition to being related to image effects, the possibility that a higher level of government (i.e., the county or the state) will be required to play a larger role in addressing the fiscal and social problems of the central city implies not only higher taxes for suburban residents, but also less economic development in suburban areas. After conducting an extensive review of the empirical literature on firm location, Bartik (1991) concludes that higher state and local taxes discourage economic growth. The literature suggests that this is especially true if higher taxes are used for welfare expenditures.

Turning to amenities as a source of interdependence, the historical development of central cities has frequently left them with natural or man-made assets that may be valued throughout the region or even the nation. For example, virtually every central city has either a waterfront park or historical district that could not be easily reproduced in the suburbs. As noted by Voith (1992), "If a declining city provides fewer or less attractive regionally valued amenities, it will render the entire region less desirable." He emphasizes that an erosion in the value of central city amenities may cause suburban properties, especially these with good accessibility to the central city, to appreciate less in value. In the jargon of economists, unique central city amenities are public goods that yield benefits which spillover into the surrounding suburbs. Once again, however, while this source of central city - suburban interpendence is plausible, if not obvious, no one has estimated inter-area hedonic wage of housing price equations that would reveal its quantitative significance. Moreover, central city amenities have not been included as independent

variables in migration or quality-of-life studies, at least not those that would be considered unique to the central city.

The amenities identified above were considered to be tangible in nature. Another type of central city amenity that may have value to people living elsewhere is intangible. Bolton (1989, 1992) has argued that people attach value to a "sense of place," which he defines as "a sense of community and co-operation that is shaped by a particular geographical setting, including the natural and built environment, culture, and past history." A recognition of sense of place leads to two arguments in favor of arresting central city decline. First, population out-migration accompanying central city decline erodes the sense of place, and therefore the exiting individual produces negative externalities on those central city residents who are left behind. Second, the sense of place that exists within a particular central city, say Atlanta, may have value not only to Atlantans but also to people elsewhere. Bolton suggests that outsiders may be willing to pay for the preservation of sense of place within Atlanta because they want the option to move to Atlanta. In addition to this "option value," he identifies "pure existence value" and "donor preferences" as other reasons why outsiders may have an interest in preserving Atlanta's sense of place. Pure existence value is a concept popular in environmental economies and in the present context refers to the value people may attach to sense of place in Atlanta for no other reason than they believe it is worthwhile. Donor preferences may be relevant to the sense of place if "donors put a positive value on the recipients continuing to consume in their existing place, and on their enjoying the benefits of an ongoing community."

Bolton relates his sense of place concept to the debate over "place prosperity" versus "people prosperity." He laments the fact that place-specific policies have become less popular

and argues that these policies are justified to help preserve a sense of community in places where it already exists (for example, central cities).

As in the case of tangible amenities, empirical work on the importance of sense of place to either insiders or outsiders does not exist. Bolton explores the measurement problems associated with the latter at length, acknowledging the difficulties. Nevertheless, he remains optimistic and offers some excellent suggestions for empirical research.

In summary, all of the sources of central city -- suburban interdependence discussed in this section undoubtedly play a role in linking the welfares of people residing in the two areas. The unresolved issues are the importance of these links in both an absolute and relative sense and how this importance has changed over time in response to the suburbanization phenomenon.

III. AGGLOMERATION ECONOMIES

This section is divided into two parts. Section A presents the arguments that have been advanced -- both pro and con -- that relate to the proposition that central cities provide unique agglomeration economies that define an important and highly specialized role for these cities in the regional and national economy. Section B reviews the empirical evidence that has a bearing on the arguments presented in Section A.

A. The Arguments

Pro

The source of potential interdependency between central city and suburban economies that has received the greatest attention among urbanologists is agglomeration economies. One of the best definitions of agglomeration economies has been provided by Nickolas Kaldor (1970):

> ...nothing else but the existence of increasing returns to scale -- using that term in the broadest sense -- in processing activities. These are not just the economies of large-scale production, commonly considered, but the cumulative advantages accruing from the growth of industry itself -- the development of skill and know-how; the opportunities for easy communication of ideas and experience; the opportunity of ever-increasing differentiation of processes and of specialization in human activities.

Agglomeration economies are commonly broken down into two types: localization economies and urbanization economies. Localization economies are production cost savings that accrue to firms from locating close to other firms in the same industry or a related industry. Urbanization economies occur if production costs of firms decline as the aggregate level of economic activity expands within an area. Urbanization economies differ from localization economies in that urbanization economies generate benefits for all firms, not just firms in a particular industry. Because of their more compact development, central cities are thought to have an advantage over suburban areas in both localization and urbanization economies.

Regardless of their type, agglomeration economies occur for three principal reasons: labor market economies, scale economies in the production of intermediate inputs, and communication economies (O'Sullivan, 1993). Labor market economies cause localization economies because when firms within a given industry concentrate within an urban area these firms have access to a common pool of trained labor, which enables firms to reduce the search and training costs associated with hiring new workers. In the case of urbanization economies, a big city has a labor market so large that it can offer not merely a large number of employment agencies but also some that specialize in finding particular kinds of personnel. However, since workers are generally highly mobile within metropolitan areas, a firm can realize labor market economies regardless of whether it locates in the central city or the suburban ring. Therefore, it is hard to

make the case that agglomeration economies that arise from labor assembly particularly favor central cities.[2]

In contrast to labor market economies, the other two reasons for agglomeration economies are alleged to clearly favor central cities. The locational advantage of central cities arises from the fact that both scale economies in intermediate inputs and communication economies involve inter-firm face-to-face contact, which can occur at lower cost within the central city, and in the case of offices especially within the central business district, where physical distances between firms are the shortest. By clustering around a common supplier who can produce at a high enough level of output to achieve scale economies, firms can save on input costs. The classic example of agglomeration economies due to scale economies in the production of intermediate inputs is provided by the concentration of the ladies' garment industry in New York City. "The industry in New York is large enough to provide a profitable local market for a host of specialized suppliers. Thus, without incurring the risks and costs of carrying large inventories, the garment manufacturer who locates in New York gains ready access to a full line of the inputs needed in a trade where style requirements change rapidly and speed and flexibility are crucial" (Heilbrun, 1987). As the garment example suggests, demanders and suppliers frequently must interact face-to-face in the design or fabrication of the intermediate input; hence, central cities are said to have a locational advantage.

Scale economies in intermediate inputs also help to explain urbanization economies. For example, manufacturing companies may choose to locate their headquarters within downtown CBDs or edge cities in order to minimize the costs of face-to-face contact with their suppliers of corporate services, such as their lawyer, banker, or accountant.

Communication economies refer to the exchange of ideas, augmentation of human capital, and diffusion of technology that comes from face-to-face interactions, both formal and informal, among workers from different firms. Communications economies are considered to be related to the rate of technical change:

> To the extent that proximity increases the rate at which new technologies are developed, the agglomeration of economic activity may generate productivity growth through its effect on the rate of technical change. It is in this way that Jacobs (1969) suggests that cities may serve as the engines of growth -- the endogenous source of productivity growth -- for nations (Beeson, 1992).

The importance of physical proximity to intellectual progress and thereby economic growth has recently resurfaced in the "new regional economies" literature (Glaeser, 1993). This literature is in the tradition of neoclassical growth theory. According to this theory, economic growth depends on the quality and quantity of labor, the quality and quantity of capital, and technical knowledge. Cities are hypothesized to expedite the transfer of knowledge and the creation of knowledge which affects the growth factors identified by the neoclassical model, in particular the quality of labor and technical change. Much of this literature follows Jacobs (1969) by emphasizing that dense urban environments can lead to unexpected combinations of seemingly unrelated ideas which may provide the most important leaps forward in knowledge.

According to some authors (Persky, et al. 1991), the importance of communication economies as a source of economic growth is magnified by the shift from "goods-producing" to "information-processing" industries at the national level. This is the basis for the argument that central cities are making a growing contribution to the growth of the national economy, despite the massive suburbanization of jobs and people documented in Section I.

Face-to-face interactions associated with communication economics and scale economics in intermediate inputs are believed to be especially important in office industries. "The convenience of face-to-face contacts for the exchange of limited, ephemeral information has long been recognized by geographers and planners as an important force shaping the location and construction of office employment" (Clapp, 1993). However, the importance of face-to-face contact is believed to vary among different types of offices and within offices among different types of activities. Regarding the former, urban economists have argued that higher-order offices will outbid lower-order offices for the most central locations. Higher-order offices include corporate headquarters, banks, and other financial activities, accounting and law firms, all of which are complementary in providing high-level business services that require frequent daily contact between firms. Lower-order offices, which are less dependent on face-to-face interaction, would include small firms and branch offices catering to local businesses and individual households. Because higher-order offices have historically concentrated within central cities and CBDs, these locations are sometimes said to be the "command and control centers" of their regional economies.

Activities within offices can also be distinguished by their differential need for inter-firm face-to-face contact. On this basis, office activities are dichotomized into front and back office components. According to the "decoupling hypothesis," advances in communication technology (in particular, electronic mail) have enabled firms to spatially split their operations. Back office operations involving paper processing rather than face-to-face contact have moved to the suburbs where rents and wages are lower, while executives remain within the central city.

Based upon the above arguments, the central city and suburban office markets are viewed as distinctly different, with high-level corporate activities concentrated in the city and low-level business and consumer services as well as back office operations relegated to the suburbs. There therefore exists functional divisions of economic responsibility between the two areas that make them highly complementary and interdependent.

Con

Those who argue against the proposition that central cities play a unique role in the regional economy based on agglomeration economies make two points. First, that the widespread suburbanization of office development during the last 15 years signals the completion of an economically autonomous outer city or edge city, which provides the same (if not better) opportunities for agglomeration economies as the central city. The following three quotes are from an urban historian, a tandem of urban geographers, and an urban economist, respectively. While each quote basically expresses the same sentiment, they compliment one another and enrich our understanding of the central city-suburbs independence position because each reflects a different disciplinary perspective:

> Without anyone planning or forecasting it the simultaneous movement of housing, industry, and connected development to the outskirts has created perimeter cities that are functionally independent of the urban core. In complete contrast to the residential or industrial cities of the past, these new cities contain along their superhighways all the specialized functions of a great metropolis (Fishman, 1987).

> During the past two decades, as the nation's postindustrial economy and society emerged and began to mature, American metropolitan regions experienced a profound transformation in their structural and functional organization. The industrial-era metropolis, characterized by a dominant central-city core and a girdling ring of residential suburbs, turned inside out and split asunder in this period. With surprising speed in the 1970s and 80s, suburbs have evolved from a loosely-organized "bedroom community" into a full-fledged "outer city," characterized by metropolitan-level employment and activity concentrations and

> functional shifts that amount to nothing less than the achievement of suburban economic, social, and geographic independence from the nearby central city that spawned these satellite settlements several decades ago (Hartshorn and Muller, 1986).
>
> The 1980s, however, has seen the economic bases of suburbs develop and diversify. As a result, suburbs are increasingly successful in attracting the full range of advanced services away from central cities. Everything from corporate headquarters and urban universities to centers of high culture and sports and entertainment complexes gravitate easily to new suburban locations. Viewed as an economic landscape, we find a restructuring of the economies within many central cities that has left them simply one among several nodal points in a dispersed metropolitan economy. As central cities now compete with their suburbs for the full range of advanced services, modern suburbs can no longer be regarded as derivative and dependent (Hicks, 1987).

The second argument made against the proposition that central cities offer unique agglomeration economies is that advances in telecommunications technology will soon eliminate the need for central cities since technology makes it possible to transact business without requiring face-to-face contact. The following quote from Pascal (1987) is representative of this position:

> The era of the computer and the communications satellite is inhospitable to the high-density city. Clerical and record keeping functions have already begun to deurbanize. The distant suburbs and small towns of the U. S. are dotted with highly computerized complexes performing bookkeeping, billing, and archival tasks for banks and insurance companies. The newly emerging technologies will soon begin to provide excellent substitutes for face-to-face contact, the chief remaining raison d'etre for the traditional city.

Pascal applied the law of entropy to conclude that there will be a tendency toward complete areal uniformity in employment and population density. A similar theme was expressed earlier by Webber (1968) who believed that as a result of technical changes "the glue that once held the spatial settlement together is now dissolving, and the settlement is dispersing over ever widening terrains."

On the other side of the telecommunications issue there are two counter-arguments. First, Clapp (1983) has identified several problems that must be addressed before assuming that telecommunications can be substituted for face-to-face contact:

> The social and psychological acceptance of two-way video communication is far from assured (Short et al, 1976); there may well be a long process of change in human behavior as this new technology is integrated. The preliminary evidence suggests that face-to-face contact is viewed as warmer (that is, more enjoyable) than telecommunications. Therefore, a certain among of spatial clustering is virtually assured as man, a social animal, elects to enjoy proximity to his own kind.
>
> Existing technology cannot reproduce all of the nuances of facial expression, body attitude, and ambiance which are routinely part of face-to-face contact. This suggests that some personal contact for high-level negotiation and planning-meetings will always be necessary; however, the bulk of office jobs probably do not depend on these nuances. They may, however, depend on lines of authority or personal suasion which will be difficult to reproduce with telecommunications. One of the grave difficulties for public policy toward office relocation is how to hold constant the quality and quantity of the output of office activities.
>
> Another problem is related to the capital equipment necessary for extensive use of telecommunications. Many firms must have receiving/sending facilities. Furthermore, transmission infrastructure (for example, satellites and associated facilities) must be put in place. These capital investments will delay extensive implementation of telecommunications.
>
> Legal problems also hamper the introduction of telecommunications. Many economic transactions are evidenced by signed documents (for example, bank drafts); original signatures are often required by law. The transportation of these documents is a major spatial problem. For example, banks and brokerage houses cluster around clearing facilities, which rapidly exchange financial documents. The time value of money provides an incentive for proximity to the clearing house.

Mills (1992) has also questioned whether conveying information electronically will ever be a good substitute for face-to-face information exchange. He draws a distinction between unambiguous and ambiguous information: "Ambiguous information is information that requires an interactive and convergent set of exchanges before the final exchange can be consummated."

While the final exchange or agreement can be efficiently transmitted electronically, the interactive convergence to a solution requires face-to-face exchange.

The second counter-argument to the notion that telecommunications will reduce the economic importance of central cities maintains that some central cities will prosper in the transformed environment. According to Moss (1987), "cities that are centers for information -- intensive services (e.g., accounting, advertising, banking, law, management consulting, publishing) are likely to benefit from the greater use of sophisticated information and telecommunications technologies." He predicts that these cities will become international information centers that will provide business services to a global marketplace: "The face-to-face activities that occur in these cities have not been made obsolete by new technology; rather, technology has extended the geographic reach of the individuals and firms that transact business in these world capitals." However, while this may be true, there is the issue of how many cities are destined to become communication centers. On this point, Netzer (1977) has argued that:

> ...face-to-face contact demanding activities will concentrate in a few cities: there will be winners and losers, as some cities fare very badly indeed while some hold their own, or better. Clearly, cities that are located in regions that are expanding are likely to do better than cities located in declining regions, other things being equal. Also, within a given region, those face-to-face activities are likely to flourish in places that are perceived to be congenial places to live: Boston and San Francisco thus have an advantage over most other large cities for this reason.

B. The Evidence

Empirical investigations of the above arguments are sparse. There is insufficient research to settle the debate over the uniqueness of central city agglomeration economies. Nevertheless, enough evidence exists to reach some tentative conclusions. The available evidence falls into two categories. First, there are results that pertain to specific hypotheses. Second, various data

sources can be used to investigate the spatial distribution of different types of jobs between central city and suburban areas. If central cities offer unique agglomeration economies that cause them to specialize in performing certain functions for the regional economy, then the industrial and occupational mix of employment should differ between cities and their suburbs.

Regarding specific hypotheses, there is evidence on the importance of face-to-face contacts as a locational determinant. On other hypotheses, there is little or no evidence available. The latter are considered first.

Two of the most important and divergent hypotheses that relate to the economic importance of central cities are that central city agglomeration economies represent a unique and important source of economic growth and that advances in telecommunications technology render central cities obsolete. Regarding the former, there are studies that have empirically investigated the relationship between agglomeration economies and productivity growth, but none of these studies tests the hypothesis that the agglomeration economics offered by central cities represent a unique source of growth. Beeson (1987) found that technological change and productivity growth are higher in states which contain one of the nation's largest 20 SMSAs. Fogarty and Garofalo (1988) concluded from their study of manufacturing industries that productivity growth is higher in large SMSAs. Finally, Henderson's (1988) results indicate that labor productivity within selected industries increases with the volume of the industry's output produced within the metropolitan area. While none of these studies focus explicitly on central cities, they all suggest that agglomeration economies do contribute to economic growth. This is at least consistent with the possibility that central cities make an important contribution to growth and perhaps are even

"engines of growth", because their compact development allows for particularly strong agglomeration economies.

While many authors have speculated on the impact of telecommunications on urban form (Chinitz, 1984; Downs, 1985; Kellerman, 1984), empirical evidence is virtually nonexistent. Only Kutay (1986) has provided such evidence, and his results are of limited value. Based upon a survey questionnaire of the 50 largest firms headquartered in downtown Pittsburgh, he found that these firms are more likely to have decentralized their office activities if they use sophisticated telecommunications technology and if they indicated that telecommunications will have an influence on their future location decisions.

If face-to-face meetings are not an important determinant of office location, the argument that central cities offer unique agglomeration economies is severely weakened. Long et al. (1984) included face-to-face contacts as an independent variable explaining office location. The number of face-to-face meetings by professional employees (but not other employees) was found to influence location in the expected way. Ihlanfeldt and Raper (1990) argued that if face-to-face contacts are important then proximity to support services (i.e., financial, legal, and business services) should exert a stronger locational pull on new independent office firms than new branches, since the former are more dependent on outside suppliers. Using information on the location of new office firms in Atlanta, they found that among twenty explanatory variables the strongest predictor of the location of independents is proximity to support services, while for branches such proximity is unimportant.

Whether or not office firms prefer CBD locations because of superior face-to-face agglomeration economies has been investigated by Clapp (1980) and Ihlanfeldt (1992). Clapp

found that office rents declined with distance between the office and downtown after controlling for other factors. One interpretation of this result is that firms are willing to pay more for closer in locations because these locations offer savings on face-to-face contacts. Clapp (1993) notes, however, that distance might proxy for other factors such as availability of land for commercial construction. Ihlanfeldt provides a similar piece of evidence that may be more definitive. He found for the Pittsburgh, Detroit, and Boston metropolitan areas that the wage rates of workers increase as the distance between the CBD center and the job site declined, after controlling for many individual characteristics related to worker productivity. This evidence lends support to the hypothesis that firms who locate closer in can afford to compensate their workers for higher commuting costs because of savings that result from face-to-face agglomeration economies.

In summary, the findings on face-to-face contacts are consistent with two conclusions: (1) face-to-face contacts influence office location, and (2) the costs of making these contacts are lower for firms locating within or closer to the CBD.

The argument that central cities perform a specialized function within the regional economy based upon face-to-face agglomeration economies implies a difference in the mix of jobs between central cities and their surrounding suburbs. Since head offices and higher-order corporate services are assumed to be most dependent on face-to-face contacts, information-processing jobs should be concentrated within central cities. The ideal source of data to investigate this issue is the *Journey-to-Work* data from the 1990 Census, which has not yet been released by the Census Bureau. However, there are a number of alternative sources of data that are relevant and worth considering: (1) the 1980 *Journey-to-Work* data, (2) *County Business*

Patterns, (3) the Atlanta Regional Commission's *Annual Employment Survey*, and (4) data from the Bureau of Economic Analysis.

The 1980 *Journey-to-Work* data provides the distribution of employment between central cities and suburbs by type of employment (see Table 1). Of the 11 sectors represented, finance, insurance, and real estate (FIRE) has the largest number of workers who could be considered "information-processors". FIRE, therefore, is expected to have the strongest locational orientation in favor of central cities. Indeed, the FIRE sector is found to have more of its jobs located in central cities (63%) than any other sector. Also, FIRE accounts for a higher percentage of the jobs in central cities than those within the suburbs: 8.2 percent of city jobs are in FIRE, while only 5.3 percent of suburban jobs are in this sector.

Table 2 presents data compiled by Mills and Hamilton (1994) from *County Business Patterns* on central city employment in New York, Philadelphia, and Boston for selected years up to 1989. These cities were selected because their boundaries are the same or similar to those of the central county. While this Table cannot be used to make central city/suburbs comparisons, it does show how the composition of central city employment has changed over time. Moving across the columns for the various years clearly documents the massive losses of manufacturing jobs suffered by these cities. Largely offsetting these losses, however, have been gains in the number of information-processing jobs. Among the five sectors represented, information-processing is by far the largest employment sector in all three cities in 1989.

Although for only one metropolitan area, the employment data from the Atlanta Regional Commission, which is the regional planning body for the central Atlanta region, are unique in that employment is broken down by industry and area (CBD, rest of the central city, and suburbs)

for 1980 and 1990. The changes that occurred during the 1980s in the spatial distribution of jobs can therefore be studied. Atlanta is an interesting case to consider, since it is frequently identified as a "command and control center" for not only the metropolitan area but also the southeast region. As Table 3 indicates, FIRE employment increased in both the CBD (+441 jobs) and the rest of the central city (+3,308 jobs) between 1980 and 1990. However, the growth in FIRE employment outside the city was many times larger (+37,964), which caused the percentage of the metropolitan area's FIRE employment located in the central city to decline from 43.6 percent in 1980 to 30.9 percent in 1990. Even if we allow for the possibility that many of the FIRE jobs located in the suburbs represent routine consumer banking and real estate services, the phenomenal suburban growth of this sector suggests a substantial increase in information processing.

Stanback (1991) analyzes Bureau of Economic Analysis data for 14 large metropolitan areas. His results lead him to conclude that "employment gains in central cities have tended to focus on FIRE and other services, whereas gains in the suburbs have taken place over a broader front. Nevertheless, suburban employment gains have also been substantial in FIRE and other services..." He also found that in the magnate suburban counties located within his sample of metropolitan areas there were significant agglomerations of corporate service activity by 1986. In fact, corporate services account for a higher proportion of total employment in these suburban counties than in their respective central cities. Moreover, wage levels in corporate services tended to be higher in the suburbs than within central cities, which suggests a higher level of information processing in comparison to routine back office operations is occurring in the suburbs.

What conclusions can be drawn from the above evidence on the types of jobs located in cities and suburbs regarding the proposition that central cities offer unique face-to-face agglomeration economies? Clearly, information-processing jobs are attracted to central cities, which at a minimum suggests these economies exist within central cities. Otherwise, why would these firms be willing to incur the otherwise high production costs associated with a central city location. Nevertheless, the growth of information-processing employment in the suburbs indicates that central cities may be losing their location advantage over time. As Stanback (1991) notes:

> But the growth and maturation of the suburbs -- especially insofar as the suburban development process has been strengthened by the development of magnet centers -- must, of necessity, alter the relationship between central city and suburbs. In the new relationship, it would appear that central cities may become more vulnerable to competition, at least in those activities for which their comparative advantage is marginal.

Other evidence that would be useful in resolving the debate over the uniqueness of central city agglomeration economies would come from an analysis of where central city and suburban companies obtain their corporate (i.e., financial, business, and professional) services. If suburban companies rely on central city-based corporate services, this would suggest that the suburbs are not independent of the central city and that central cities do provide agglomeration economies that are not matched in suburban settings. Recently, Swartz (1992) completed the first analysis of corporate service linkages in large metropolitan areas. He focused on major companies located within the New York, Chicago, and Los Angeles consolidated metropolitan statistical areas using data from the *Corporate Finance Bluebook*. The *Bluebook* includes the name and location of the outside service providers of major U. S. companies. He restricted his investigation to five services: actuarial consulting, auditing, banking, investment banking, and legal services. The

results of the study are presented in Table 4. The companies located in central cities rely heavily on service providers within the same city. The reliance of central city companies on central city service firms varies from 67 percent for investment-banking to 90 percent for legal counsel. But what about suburban companies? *They also depend primarily on their region's central city for corporate services.* The services that come least and most frequently from the central city are actuarial consulting and legal services, respectively. Fifty-three percent of the suburban firms use central city actuarial consultants, while 71 percent of these firms go to central cities for legal services. Based on these and other results, Swartz reached the following conclusion:

> Despite their ample supplies of office space, the suburbs of the nations's three largest CMSAs -- New York, Los Angeles, and Chicago -- do not constitute a self-sufficient outer city economically autonomous from the central city. Suburban office centers do not house the full range of business activities found within the central city. Although suburbia contains more major companies than the central cities contain, these companies tend to be smaller and more likely to be in manufacturing when compared to their central city counterparts. A majority of these suburban companies remain dependent on their metropolitan area's central city for financial and professional services. Reliance on the central city increases with the size of the suburban companies. Conversely, extremely few companies from the central city go to the suburbs to obtain theses services.
>
> These findings from a study of intrametropolitan linkages do not, however, suggest that the suburbs are simply low-cost areas for basic data-processing and other back-office functions. Except for the Chicago area, where suburban companies rely almost exclusively on the city of Chicago for corporate services, a significant proportion -- usually 15% to 35% -- of suburban-based companies do depend on suburban-based firms for their service needs. Such intrasuburban linkages are especially common for smaller companies.

Swartz's conclusions are consistent with those drawn from the employment by location data sources; namely, the central city has the advantage in providing face-to-face agglomeration economies, but the "uniqueness" of these economies seems to be eroding over time.

IV. ADDITIONAL EVIDENCE

In addition to the evidence reviewed above on agglomeration economies, there are four other types of evidence that can be found in the literature that has dealt with the issue of whether central cities and suburbs are independent or interdependent: (1) correlations between central city and suburban growth rates, (2) estimates of a structural model that relates city and suburban growth, (3) earnings of suburban residents working in central cities, and (4) estimates of the relationship between city employment growth and the value of suburban housing.

Correlations have been estimated between central cities and their surrounding suburbs for population growth, income growth, employment growth, and the growth in house values. A positive correlation would suggest that central cities and their suburbs are interdependent, while no correlation or a negative correlation would suggest that suburbs are essentially independent of the central city. As discussed in detail below, all of the correlations that have been estimated between city and suburban growth rates using data from the last two decades have been positive. These results, however, should be interpreted as only weakly suggestive of interdependence and not very informative. First, positive correlations may arise if central cities and their suburbs are subject to common external forces. For example, a city and its suburbs are undoubtedly influenced by regional factors, such as climate, inputs costs, and product demands. Second, even if the positive correlations are not a statistical artifact and are the result of some type of causality, neither the direction nor the magnitude of the effect can be determined. Hence, correlation evidence cannot be used to address the fundamental issue of the importance of the central city to the regional economy.

Savitch and his colleagues present correlations in two separate articles (1992, 1993). In the first article, only scatterplot diagrams are presented based upon data from 22 MSAs. From the plots they conclude that population growth (measured between 1990 and 1980) and per capita income (measured in 1987) are correlated between central cities and their suburbs. They also plot suburban population growth against the ratio of suburban to central city per capita income. A negative relationship is observed, which suggests that population growth in greater in these suburbs where the income disparity between the city and the suburbs is smaller.[3] The regression line, however, does not fit the data very well. In their second article, they use a larger sample of MSAs (56) and report estimated correlation coefficients and R^2*s* along with the scatterplot diagrams. They find that the correlation between the level of suburban per capita income and central city per capita income is .32 (R^2 = .10) and .46 (R^2 = .21) in 1979 and 1987, respectively. The use of levels rather than changes is problematic, since nominal rather than real income is used. The observed positive correlations, therefore, may simply reflect inter-regional differences in the cost-of-living. They also present a scatterplot which shows the price of office space is highly correlated between central cities and their suburbs. According to the authors, "With a correlation of nearly .86, we can appreciate how a rise or fall in downtown office space can impact suburban economies." In light of the limitation of correlation analyses cited above and the fact that nominal rents are used, this statement is unwarranted.

Voith also presents correlations in two separate papers (1992, 1993a). In the first he correlates central city and suburban population growth, income growth, and employment growth. The population and income growth rate correlations are computed for the 1960s, 1970s, and 1980s. In the case of both variables he finds that the correlations have increased over time. For

example, the correlation between city and suburban population growth is -.57 for the 1960s, .57 for the 1970s, and .51 for the 1980s. His explanation for this change is that "suburbanization became increasingly difficult as development drove up land and public infrastructure costs and as congestion became a problem in the suburbs as well as the city. Continued suburban growth has become increasingly dependent on the overall desirability of the region, rather than simply the lower cost associated with moving into underdeveloped and uncongested areas." However, in his second paper he acknowledges that the increases in the correlations over time might also imply greater independence. If suburbs have changed to become more like central cities, it is likely that the two areas are more similarly affected by external forces. The correlation coefficient reported between central city and suburban employed growth (measured over the period 1976 - 1986) is .70. The correlations reported in his second paper are for population growth, real per capita income growth, and the growth in real average house prices. These correlations are estimated from a much broader sample than those in his first paper, but the results are qualitatively the same.

Voith's second paper also reports the results obtained from estimating a structural model that relates city income growth to suburban growth in income, population, and house values. Voith's model, which is estimated by nonlinear two-stage least squares, is an attempt to go beyond correlation to determine causality. He finds that city income growth has a strong positive effect on suburban income growth, house value appreciation, and population growth. Unfortunately, he is not able to identify the city equations, so we do not learn if suburban income growth similarly effects central cities. Moreover, to augment his sample size he uses growth rates calculated for each of the last three decades for each metro area, but he does not investigate

whether the strength of the central city effects on the suburbs have changed over time. Few people would argue that suburbs were independent of their central cities in the 1960s or even in the 1970s. The issue is what is true today in light of the relatively recent maturation of edge cities (Garreau, 1994). Despite these shortcomings, Voith's results are the strongest evidence to date in favor of the interdependence hypothesis.

Information on the earnings of suburban residents working in central cities has been provide by Persky et al. (1991) and Savitch et al. (1993). Table 5 reproduces the table presented by the first group of authors. For the seven cities studied, suburban commuter earnings as a percentage of all income earned within the central city ranges from 45 percent for New Orleans to 70 percent for Washington D. C. (see Column 2). Based upon these numbers, Persky et al. conclude that "Cities remain of fundamental importance as a source of income to suburban residents." But in a strict sense this inference cannot be drawn from the numbers in Column 2. If the city economy is small relative to the suburban economy, suburban commuters may earn a high percentage of city income but earn a small percentage of the total earnings of all suburban residents. The correct numbers to look at are in Column 3, which gives suburban commuter earnings as a percentage of the earnings of all suburban residents. Here the percentages are much smaller, ranging from a high of 46 percent for San Francisco to a low of 19 percent for St. Louis. Nevertheless, these numbers still suggest that the city is important to the suburbs. The more interesting issue, however, is how the percentages in Column 3 might be changing over time. Another issue is if the central city were left to decline, what would happen to commuters' jobs? Would they disappear or would they simply move to the suburbs?

Savitch makes the same error as Persky by focusing on the percentage of income earned in central cities that goes to suburban residents. Only these numbers are presented to make their case in favor of suburban dependence on the central city.

In addition to the work of Voith reviewed above, he has estimated hedonic price equations using a sample of single-family dwelling located in a suburban county (Montgomery) of the Philadelphia MSA (Voith, 1993b). Separate equations are estimated for the years 1970 to 1988. The equations include a dummy variable for whether the dwelling is located in a census tract offering CBD-oriented train service. He found that large premiums are associated with such service and that these premiums are highly correlated with lagged employment growth in the City of Philadelphia. These results lead him to conclude that the central city economy in an important factor in the overall wealth of suburban communities: "From a policy perspective, these findings suggest that suburban communities may not be able to isolate themselves from the consequences of central city decline, and in fact, that suburban communities may benefit substantially from a growing central city." This conclusion may be too strong, however, since his results only show that suburban properties with rail access are affected by the health of the central city. In most suburbs, the value of these properties would represent a small percentage of the aggregate value of housing.

V. CONCLUSIONS

What conclusions can be drawn from this review of the literature that has dealt with the issue of whether suburbs have become independent of their central cities? First, it is clear that there are significant linkages between central cities and their surrounding suburbs. Suburban-based companies depend heavily on central city suppliers of corporate services and many highly-

paid suburban professionals earn their living from central city jobs. Face-to-face agglomeration economies influence firm location decisions and central cities, especially CBDs, have an advantage over suburban areas in offering these economies. Second, the maturation of the suburbs and especially "edge cities" have made these areas more competitive with central cities and less dependent and derivative. Third, even without supporting evidence, the arguments against the proposition that telecommunications will severely erode the role of the central city in the regional economy are persuasive. The future as envisioned by Pascal and others of areal uniformity in population and employment density is a long way off, and in fact may never materialize until the cost of transporting people becomes trivial. Fourth, the hypothesis that cities make an important contribution to regional and national economic growth is attractive. Information exchange can occur more efficiently in dense urban environments and there is evidence that spatial concentration of economic activity is related to technological progress. Unfortunately, however, there is no empirical research that has focused explicitly on central cities as possible "engines of growth." Finally, there is obviously much more work that needs to be done. The most promising area for future inquiry would be to focus explicitly on the relationship(s) between central city decline and metropolitan or suburban growth. Voith (1993a) has already demonstrated that structural models that test for causality can be constructed and estimated. Much can be learned by refining these models, such that they capture causal flows in both directions between cities and suburbs, changes in these relationships over time, and differences among metropolitan areas.

ENDNOTES

1. Since disparities in the economic growth of central cities and suburbs have existed for quite some time, it is interesting to speculate on why it took so long for the independent versus interdependent debate to emerge. One possibility is that big city mayors have turned to the interdependence argument in their appeal for the restoration of federal aid to central cities (see, for example, Louisville Courier-Journal, 1991), which may have stimulated journalists to think about the issue. Another possibility is suggested by Garreau (1994), who has argued that it wasn't until the 1980s that edge cities began to rival central cities as employment centers.

2. Even if labor market economies do favor central cities, some economists (see, for example, Mills [1992]) have questioned their importance as a source of agglomeration economies. Labor market economies may only be significant in urban areas that have unemployed or underemployed workers with the needed skills.

3. A similar result is reported by Ledebur and Barnes (1992), who found that the employment growth of the metropolitan area is positively correlated with city per capita income as a percentage of suburban per capita income.

REFERENCES

Beeson, P. 1992. "Agglomeration Economies and Productivity Growth." In *Sources of Metropolitan Growth*, ed. Edwin S. Mills and John F. McDonald. New Brunswick: Center for Urban Policy Research, Rutgers University.

_____. 1987. "Total Factor Productivity and Agglomeration Economies in Manufacturing." *Journal of Regional Science* 27: 183-200.

Bartik, Timothy J. 1991. *Who Benefits from State and Local Economic Development Policies?* Kalamazoo, MI: W. E. Upjohn Institute for Employment Research.

Bolton, Roger. 1992. "Place Prosperity vs. People Prosperity Revisited: An Old Issue with a New Angle." *Urban Studies* 29: 185-203.

_____. 1989. "An Economic Interpretation of a Sense of Place." Research Paper 130, Department of Economics, Williams College, Williamstown, MA.

Chinitz, B. 1984. "The Influence of Communications and Data Processing Technology on Urban Form." In *Research in Urban Economics*, ed. R. D. Ebel and J. P. Ross. Greenwich, Conn.: JIA Press Inc.

Clapp, John M. 1993. *Dynamics of Office Markets: Empirical Findings and Research Issues.* Washington, DC: The Urban Institute Press.

_____. 1983. "A Model of Public Policy Toward Office Relocation." *Environment and Planning* A.15: 1299-1309.

_____. 1980. "The Intrametropolitan Location of Office Activities." *Journal of Regional Science* 20(3): 387-399.

Downs, A. 1985. "Living with Advanced Telecommunications." *Society* 23(1): 26-34.

Fishman, R. 1987. *Bourgeois Utopias: The Rise and Fall of Suburbia.* New York: Basic Books.

Fogarty, M. and G. Garofalo. 1988. "Urban Spatial Structure and Productivity Growth in the Manufacturing Sector of Cities." *Journal of Urban Economics* 23: 60-70.

Garreau, Joel. 1994. "Edge Cities in Profile." *American Demographics*, February: 24-34.

_____. 1991. *Edge City: Life on the New Frontier.* New York: Doubleday.

Glaeser, Edward L. 1993. "Cities, Information, and Economic Growth." Paper presented at Regional Growth and Community Development Conference, Office Policy Development and research, U. S. Department of Housing and Urban Development.

Hartshorn, Truman A. and Peter O. Muller. 1989. "Suburban Downtowns and the Transformation of Metropolitan Atlanta's Business Landscape." *Urban Geography* 10: 375-395.

_____. 1986. *Suburban Business Centers: Employment Expectations*. Final Report for U. S. Department of Commerce, EDA.

Heilbrun, James. 1987. *Urban Economics and Public Policy*. New York: St. Martin's Press.

Henderson, J. V. 1986. "Efficiency of Resource Usage and City Size." *Journal of Urban Economics* 19: 47-90.

Hicks, Donald P. 1987. "Urban Policy in the U. S.: Introduction." *Urban Studies* 24: 439-446.

Ihlanfeldt, Keith R. 1992. "Intraurban Wage Gradients: Evidence by Race, Gender, Occupational Class, and Sector." *Journal of Urban Economics*. 32: 70-91.

_____. and Michael D. Raper. 1990. "The Intrametropolitan Location of New Office Firms." *Land Economics* 66: 182-198.

Jacobs, Jane. 1969. *The Economy of Cities*. New York: Vintage Books.

Kaldor, N. 1970. "The Case for Regional Policies." *Scottish Journal of Political Economy* 17: 337-347.

Kellerman, A. 1984. "Telecommunications and the Geography of Metropolitan Areas." *Progress in Human Geography* 8(2): 222-246.

Kutay, A. 1986. "Effects of Telecommunications Technology on Office Location." *Urban Geography* 7(3): 243-257.

Ledebur, Larry C. and William R. Barnes. 1992. *Metropolitan Disparities and Economic Growth: City Distress and the Need for a Federal Local Growth Package*. Washington DC: National League of Cities.

Long, Sharon K., Ann D. Witle, Helen Tauchen, and Wayne Archer. 1984. "The Location on Office Firms." University of North Carolina, School of Business. Draft.

Louisville Courier-Journal. 1991. "On Self-Sufficiency." November 18.

Mieszkowski, Peter and Edwin S. Mills. 1993. "The Causes of Metropolitan Suburbanization." *The Journal of Economic Perspectives*. 7(3): 135-148.

Mills, Edwin S. and Bruce W. Hamilton. 1994. *Urban Economics*. New York: Harper Collins College Publishers.

Mills, Edwin S. 1992. "Sectoral Clustering and Metropolitan Development." In *Sources of Metropolitan Growth*, ed. Edwin S. Mills and John F. McDonald. New Brunswick: Center for Urban Policy Research, Rutgers University.

Moss, Mitchell L. 1987. "Telecommunications, World Cities, and Urban Policy." *Urban Studies* 24: 534-546.

Netzer, D. 1977. "The Economic Future of Cities: Winners and Losers." *New York Affairs* 4(4): 81-93.

O'Sullivan, Arthur. 1993. *Urban Economics*. Homewood IL: Irwin.

Pascal, Anthony. 1987. "The Vanishing City." *Urban Studies* 24: 597-603.

Persky, Joseph and Elliott Sclar, and Wim Wiewal. 1991. *Does America Need Cities? An Urban Investment Strategy for National Prosperity*. Washington DC: Economic Policy Institute.

Philadelphia Inquirer. 1991. "Editorial." July 14.

Savitch, H. V. and Daniel Sanders and David Collins. 1992. "The Regional City and Public Partnerships." In *In the National Interest: The 1990 Urban Summit*, ed. Ronald Berkman, et al. New York: Twentieth Century Fund Press.

_____ and John P. Markham. 1993. "Ties That Bind: Central Cities, Suburbs, and the New Metropolitan Region." *Economic Development Quarterly* 7(4): 341-357.

Schwartz, Alex. 1992. "Corporate Service Linkages in Large Metropolitan Areas: A Study of New York, Los Angeles, and Chicago." *Urban Affairs Quarterly* 28(2): 276-296.

Stanback, Thomas M. 1991. *The New Suburbanization: Challenge to the Central City*. Boulder CO: Westview Press.

Turque, Bill and Frank Washington. 1991. "Are Cities Obsolete?" *Newsweek*. September 9: 42-45.

Voith, Richard P. 1993a. "Does City Income Growth Increase Suburban Income Growth, House Value Appreciation, and Population Growth?" Working Paper No. 93-27, Federal Reserve Bank of Philadelphia.

_____. 1993b. "Changing Capitalization of CBD-Oriented Transportation Systems: Evidence from Philadelphia 1970-1988." *Journal of Urban Economics* 33: 361-376.

_____. 1992. "City and Suburban Growth: Substitutes or Complements?" *Business Review*. Federal Reserve Bank of Philadelphia, September/October: 21-33.

Webber, M. M. 1968. "The Post-City Age." *Daedalus* 97(4): 1091-1110.

TABLE 1

Distribution of Employment Between Central Cities and Suburbs By Type of Employment, 1980

	Employment in SMSAs (1,000)	Employment in Central Cities (1,000)	Percent in Central Cities	Percent in Suburbs
Total	67,728	35,698	53	47
Manufacturing	15,190	7,060	46	54
Professional and Related Services	14,067	7,966	57	43
Retail trade	10,905	5,330	49	51
Transportation, Communication, Utilities	5,083	3,095	61	39
Finance, Insurance, Real Estate	4,634	2,926	63	37
Public Administration	3,780	2,343	62	38
Construction	3,673	1,716	47	53
Business and Repair Services	3,124	1,700	54	46
Whole Trade	3,069	1,706	56	44
Other Industries	2,173	779	36	64
Personal Services	2,031	1,077	53	47

Source: U.S. Bureau of the Census, Journey to Work, PC80-2-6D (Washington, D.C.: U.S. Government Printing Office, 1984), Table 1.

TABLE 2

Central-City Employment in Three U.S. Cities; by Sector, for 1953, 1970, 1980, and 1989 (Figures in Thousands)

	Number of Jobs				Percentage of Total			
Central City and Sector	**1953**	**1970**	**1980**	**1989**	**1953**	**1970**	**1980**	**1989**
New York								100%
Total employment[a]	2,977	3,350	2,866	2,048	100%	100%	100%	100%
Agriculture and mining	5	5	5	3	..*	..*	..*	..*
Mfg. and construction	1,176	971	650	268	40	29	23	13
Retail and wholesale	805	779	596	355	27	23	21	17
Selected services								
Information processing[b]	646	1,172	1,302	1,284†	22	35	45	63
Other services	344	424	314	138†	12	13	11	7
Philadelphia								
Total employment[a]	788	772	628	614	100	100	100	100
Agriculture and mining	0.7	0.7	0.5	0.8	..*	..*	..*	..*
Mfg. and construction	398	291	171	111	51	38	27	18
Retail and wholesale	206	180	134	136	26	23	21	22
Selected services								
Information processing[b]	98	220	271	323†	12	28	43	53
Other services	85	81	52	42†	11	10	8	7
Boston (Suffolk County)								
Total Employment[a]	402	465	437	520	100	100	100	100
Agriculture and mining	2	0.9	0.5	0.5	..*	..*	..*	..*
Mfg. and construction	130	105	77	53	32	23	18	10
Retail and wholesale	132	111	82	85	33	24	19	16
Selected services								
Information processing[b]	87	194	232	341†	22	42	53	66
Other services**	51	55	46	41†	13	12	11	8

Sources: U.S. Department of Commerce, Bureau of the Census, *County Business Patterns*, selected years; Occupation by Industry statistics, 1970, 1980 (Washington, D.C.: Government Printing Office).
Reproduced from: Edwin Mills and Bruce Hamilton, *Urban Economics* (New York: Harper Collins, 1994), p.84.

[a]Total classified employment and industry subcategories, excluding government employees and sole proprietors.
[b]Service industries (excluding government, retail, and wholesale) in which more than one-half the employees hold executive, managerial, professional, or clerical positions.
*Less than 1. †Finance, Insurance, and Real Estate; and "Services." **Transportation and public utilities and unclassified establishments.

TABLE 3

Employment Within the Atlanta Region, 1980 and 1990

	Central City	CBD	Rest of Central City	Suburbs	Region[1]
Total Employment	355526	93029	262497	538106	893632
1980	355526	93029	262497	538106	893632
	(39.8)[2]	(10.4)	(29.4)	(60.2)	
1990	391812	104149	287663	1018188	1410000
	(27.8)	(7.4)	(20.4)	(72.2)	
Construction					
1980	12831	2712	10119	35437	48268
	(26.6)	(5.6)	(21.0)	(73.4)	
1990	11859	1607	10252	50841	62700
	(18.9)	(2.6)	(16.4)	(81.1)	
Manufacturing					
1980	48986	6721	42265	84437	133423
	(36.7)	(5.0)	(31.7)	(63.3)	
1990	36054	6227	29827	114346	150400
	(24.0)	(4.1)	(19.8)	(76.0)	
Retail					
1980	30155	9366	20789	114199	144354
	(20.9)	(6.5)	(14.4)	(79.1)	
1990	32906	8927	23979	224894	257800
	(12.8)	(3.5)	(9.3)	(87.2)	
Wholesale					
1980	46020	4134	41886	36305	82325
	(55.9)	(5.0)	(50.9)	(44.1)	
1990	48692	6624	42068	89508	138200
	(35.2)	(4.8)	(30.4)	(64.8)	

TABLE 3
(Continued)

	Central City	CBD	Rest of Central City	Suburbs	Region[1]
Services					
1980	84694	22150	62544	96155	180849
	(46.8)	(12.2)	(34.6)	(53.2)	
1990	119131	32735	86396	228169	347300
	(34.3)	(9.4)	(24.9)	(65.6)	
TCU[3]					
1980	32430	10726	21704	50049	82479
	(39.3)	(13.0)	(26.3)	(60.7)	
1990	29644	6290	23354	96456	126100
	(23.5)	(5.0)	(18.5)	(76.5)	
FIRE[4]					
1980	31181	12029	19152	40306	71487
	(43.6)	(16.8)	(26.8)	(56.4)	
1990	34930	12470	22460	78270	113200
	(30.9)	(11.0)	(19.8)	(69.1)	
Government					
1980	68627	25069	43558	78836	147463
	(46.5)	(17.0)	(29.5)	(53.5)	
1990	77869	29267	48602	127931	205800
	(37.8)	(14.2)	(23.6)	(62.2)	

Source: Author's calculations based on data from The Atlanta Regional Commission.

[1]The region is the City of Atlanta plus nine inner suburban counties. This region accounted for 92% of all jobs located in the 20-County MSA in 1990.
[2]Numbers in parentheses are the percentage of the region's jobs located in the designated area.
[3]TCU = Transportation, Communication, and utilities.
[4]FIRE = Finance, insurance, and real estate

TABLE 4

Service Provider Locations for Companies in New York, Los Angeles, and Chicago -- Percentage of Companies Using Selected Financial and Professional Services

	Client Location							
	Total		New York CMSA		Los Angeles CMSA		Chicago CMSA	
Service Provider Location	Central City	Suburbs/ Satellite Cities	Central City	Suburbs/ Satellite Cities	Central City	Suburbs/ Satellite Cities	Central City	Suburbs/ Satellite Cities
Actuarial consultant								
Within central city	73.9	53.1	69.2	39.2	88.9	71.4	73.9	73.8
Within same suburban/satellite city municipality	NA	4.9	NA	6.3	NA	5.7	NA	1.5
Elsewhere within same suburban/satellite city county	NA	7.0	NA	10.5	NA	2.9	NA	1.5
Elsewhere within metropolitan area	14.1	16.9	13.7	21.0	2.8	5.7	23.9	13.8
Outside metropolitan area	12.1	18.1	17.1	23.1	8.3	14.3	2.2	9.2
(Number of companies)	199	243	117	143	36	35	46	65
Auditor								
Within central city	88.2	56.4	84.5	37.7	95.5	61.8	91.4	88.4
Within suburban/satellite city municipality	NA	7.3	NA	11.4	NA	5.1	NA	1.2
Elsewhere within same suburban/satellite city county	NA	13.2	NA	14.7	NA	22.8	NA	2.9
Elsewhere within metropolitan area	5.1	14.5	6.4	24.9	3.3	3.7	3.6	2.9
Outside metropolitan area	6.6	8.6	9.1	11.4	1.1	6.6	5.0	4.6
(Number of companies)	527	643	297	334	90	136	140	173
Bank								
Within central city	86.0	67.1	89.1	55.9	69.0	62.0	92.8	91.2
Within suburban/satellite city municipality	NA	7.8	NA	11.5	NA	6.6	NA	1.9
Elsewhere within same suburban/satellite city county	NA	5.8	NA	7.7	NA	6.6	NA	1.9
Elsewhere within metropolitan area	3.0	7.4	2.5	13.3	5.7	3.3	1.8	0.0
Outside metropolitan area	11.0	11.8	8.4	11.5	25.3	21.5	5.4	5.0
(Number of companies)	437	566	239	286	87	121	111	159
Investment Bank								
Within central city	67.4	67.0	96.1	91.1	26.9	27.0	42.2	54.0
Within suburban/satellite city municipality	NA	2.1	NA	3.0	NA	2.7	NA	0.0
Elsewhere within same suburban/satellite city county	NA	0.6	NA	0.0	NA	2.7	NA	0.0
Elsewhere within metropolitan area	2.7	1.5	1.3	3.0	11.5	0.0	0.0	0.0
Outside metropolitan area	29.9	28.9	2.6	3.0	61.5	67.6	57.8	46.0
(Number of companies)	147	188	76	101	26	37	45	50

TABLE 4
(continued)

	Client Location							
	Total		New York CMSA		Los Angeles CMSA		Chicago CMSA	
Service Provider Location	Central City	Suburbs/ Satellite Cities	Central City	Suburbs/ Satellite Cities	Central City	Suburbs/ Satellite Cities	Central City	Suburbs/ Satellite Cities
Legal Counsel								
Within central city	89.7	70.7	92.6	67.8	81.4	57.3	89.1	87.2
Within suburban/satellite city municipality	NA	3.5	NA	4.9	NA	1.8	NA	2.3
Elsewhere within same suburban/satellite city county	NA	8.6	NA	5.3	NA	23.6	NA	2.3
Elsewhere within metropolitan area	2.0	4.9	0.9	8.2	7.1	3.6	1.0	0.0
Outside metropolitan area	8.3	12.3	6.5	13.9	11.4	13.6	9.9	8.3
(Number of companies)	387	488	216	245	70	110	101	133

SOURCE: National Register Publishing Co. (1990).
NOTE: NA is an abbreviation for not applicable.

Reproduced From: Alex Swartz (1992), "Corporate Service Linkages In Large Metropolitan Areas: A Study of New York, Los Angeles, and Chicago." Urban Affairs Quarterly, Vol. 28, No. 2, December, pages 286-287.

TABLE 5

The Earnings of Suburban Residents Working in Central Cities, 1989

Metro Area	Suburban Commuter Earnings (millions, 1989 $)	Suburban Commuter Earnings All City Earnings	Suburban Commuter Earnings All Suburban Resident Earnings
Baltimore	$7,938	59.2%	31.4%
Denver	7,609	60.8	40.8
New Orleans	3,521	45.2	39.1
Philadelphia	11,333	46.4	21.4
St. Louis	5,920	66.5	19.3
San Francisco	11,011	48.1	46.0
Washington	18,402	70.5	22.0

Source: U. S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Measurement Division, unpublished data. These metropolitan areas are chosen only because they each have a central city which coincides with their central county boundaries. Suburban commuter earnings measures the *gross* outflow of earnings from the central city, i.e., earnings from jobs located in the central city held by residents of the suburbs and other noncity residents. Note that some "commuter earnings" may accrue to individuals living outside the metropolitan area altogether. All city earnings includes earnings from all jobs located in the central city regardless of who holds them. All suburban resident earnings are the earnings of residents of the suburban ring of the Metropolitan Statistical Area (MSA) or Primary Metropolitan Statistics Area (PMSA) regardless of where they work.

Reproduced from: Joseph Persky, Elliot Sclar, and Wim Wiewel (1991). *Does America Need Cities.* Washington DC: Economic Policy Institute, p. 13.

C:\RESEARCH\RESCHPAP.44
(c:\papers\ clinton.ki and clinton.tab)

Reprint Series

No. 1 State and Local Government Finance: Was There a Structural Break in the Reagan Years?; *Growth and Change 19: 30-48 (1988);* Roy Bahl and William Duncombe.

No. 2 Property Tax Financing, Renting, and the Level of Local Expenditures; *Southern Economic Journal 55: 424-431 (1988);* Jorge Martinez-Vazquez and David L. Sjoquist.

No. 3 The Distribution of Income, Incomplete Information and the Rank and Pareto Criteria; *Public Choice 59: 195-202 (1988);* Rubin Saposnik.

No. 4 The New Urban Fiscal Economics; *Research in Urban Economics, Vol. 7, (1988), pp. 1-40;* Roy Bahl.

No. 5 Measures of Scientific Ouput and the Age-Productivity Relationship; *Handbook of Quantitative Studies of Science and Technology (1988);* Paula E. Stephan and Sharon E. Levin.

No. 6 The Jamaican Flat Rate Income Tax; *Proceedings of the Eightieth Annual Conference of the National Tax Association - Tax Institute of America; Pittsburgh, Pa., 11/87, pp. 121-128;* Roy Bahl.

No. 7 Intra-Metropolitan Variation in Earnings and Labor Market Discrimination: An Econometric Analysis of the Atlanta Labor Market; *Southern Economic Journal, Vol. 55, #4, (April 1989);* Keith R. Ihlanfeldt.

No. 8 The Impact of Job Decentralization on the Economic Welfare of Central City Blacks; *Journal of Urban Economics 26: 110-130 (1989);* Keith R. Ihlanfeldt and David L. Sjoquist.

No. 9 Compensation Policy and Firm Performance: An Annotated Bibliography of Machine-Readable Data Files; *Industrial and Labor Relations Review, Vol. 43, Special Issue (Feb 1990);* Julie L. Hotchkiss.

No. 10 Age and Research Productivity of Academic Scientists; *Research in Higher Education, Vol. 30, (1989);* Sharon G. Levin and Paula E. Stephan.

No. 11 Measuring Inequality Change in an Economy With Income Growth; *Journal of Development Economics 32 (1990) 205-210;* Robert E. Moore.

No. 12 Job Accessibility and Racial Differences in Youth Employment Rates; *The American Economic Review, Vol. 80, No. 1, (March 1990);* Keith R. Ihlanfeldt and David L. Sjoquist.

No. 13 Inflation and the Real Growth of State and Local Government Expenditures; *AEA Papers and Proceedings (May 1990);* Roy Bahl and Jorge Martinez-Vazquez.

No. 14 The Intrametropolitan Location of New Office Firms; *Land Economics, Vol. 66, No. 2 (May 1990)* Keith Ihlanfeldt and Michael D. Raper.

No. 15 States and the Financial Condition of Cities; *Proceedings of the Eighty-Second Annual Conference of the National Tax Association - Tax Institute of America, Atlanta, Georgia, 11/89, pp. 81-85;* Roy Bahl.

No. 16 The State and Local Fiscal Outlook: What Have We Learned and Where Are We Headed? *National Tax Journal, Vol. XLIII, No. 3 (September 1990), pp. 321-42;* Roy Bahl and David L. Sjoquist.

No. 17 The Relative Effects of Unemployment Insurance Parameters on Search Strategy; *Economics Letters 35: 95-98 (1991);* Julie L. Hotchkiss.

No. 18 Publishing Productivity in the Earth Sciences; *Eos, Vol. 71, No. 43 (October 23, 1990), pp. 1173-1182;* Sharon G. Levin and Paula E. Stephan.

No. 19 Tax Structure and Tax Compliance; *The Review of Economics and Statistics, Vol. LXXII, No. (November 1990), pp. 603-613;* James Alm, Roy Bahl, and Matthew N. Murray.

No. 20 Research Productivity Over the Life Cycle: Evidence for Academic Scientists; *The American Economic Review, Vol. 81, No. 1 (March 1991), pp. 114-132*; Sharon G. Levin and Paula E. Stephan.

No. 21 Can Trade Liberalization Lead to an Increase in Poverty in Central America?; *The Journal of Economic Development, Vol. 15, No. 2 (December 1990), pp. 83-92*, Robert E. Moore.

No. 22 The Revelation of Neighborhood Preferences: An N-Chotomous Multivariate Probit Approach*; *The Journal of Housing Economics, Vol. 1, (1991), pp. 33-59*, Thomas P. Boehm and Keith R. Ihlanfeldt.

No. 23 The Effects of the Social Choice Rule on Local Fiscal Variables: A General Equilibrium Approach, *Regional Science and Urban Economics, Vol. 21, (1991), pp. 31-54*, J. M. Pogodzinski and David L. Sjoquist.

No. 24 The Effect of Job Access on Black and White Youth Employment: A Cross-sectional Analysis, *Urban Studies, Vol. 28, No. 2 (1991), pp. 255-265*, Keith R. Ihlanfeldt and David L. Sjoquist.

No. 25 Tax Base Erosion in Developing Countries, *Economic Development and Cultural Change, (1991), pp. 849-872*, James Alm, Roy Bahl and Matthew N. Murray.

No. 26 Inequality in Scientific Performance: Adjustment for Attribution and Journal Impact, *Social Studies of Science, Vol. 21, No. 2, (1991), pp. 351-363*, Paula E. Stephan and Sharon G. Levin.

No. 27 Relationships Among Market Work, Work Aspirations, and Volunteering: The Case of Retired Women, *NonProfit and Voluntary Sector Quarterly, Vol. 20, No. 2, (Summer 1991), pp. 225-236*, Paula E. Stephan.

No. 28 A Test of Strategic Trade Policy in the Semiconductor Industry: The Impact of Japanese Policy on U.S. Firms, *International Economic Journal, Vol. 4, No. 1, (Spring 1990), pp. 97-108*, Robert E. Moore.

No. 29 Collective Choice on a Set of Games, *Osaka Economic Papers, Vol. 40, No. 3-4, (March 1991), pp. 227-232*, Rubin Saposnik.

No. 30 A Time Series Analysis of Disaggregate U.S. Unemployment, *Journal of Macroeconomics, Vol. 13, No. 4, (Fall 1991), pp. 701-711*, Julie L. Hotchkiss.

No. 31 The Role of Space in Determining the Occupations of Black and White Women, *Regional Science and Urban Economics, Vol. 21, (1991), pp. 295-315*, Keith R. Ihlanfeldt and David L. Sjoquist.

No. 32 School Finance Reform and Impact on Property Taxes, *Significant Property Tax Issues, (1990), pp. 163-171*, Roy Bahl, David L. Sjoquist, and W. Loren Williams.

No. 33 The Definition of Part-Time Employment: A Switching Regression Model with Unknown Sample Selection, *International Economic Review, Vol. 32, No. 4, (1991), pp. 899-917*, Julie L. Hotchkiss.

No. 34 Municipal Capital Maintenance and Fiscal Distress, *The Review of Economics and Statistics, (1991), Vol. LXXIII, No. 1, pp. 33-39*, Mary Bumgarner, Jorge Martinez-Vazquez, and David L. Sjoquist.

No. 35 The Effect of State Personal Income Tax Differentials on Interstate Competition, *State Tax Notes, (December 23, 1991) pp. 594-597*, Sally Wallace.

No. 36 On the Rank, Generalized Lorenz and Overtaking Criteria for Evaluating Stochastic Income Regimes, *Southern Economic Journal, Vol. 28, No. 3, (January 1992) pp . 583-592*, Rubin Saposnik and Roger Tutterow.

No. 37 An Examination of Cost Economies in the United States Life Insurance Industry, *The Journal of Risk and Insurance , Vol. LIX, No. 1, (March 1992) pp. 72-103,* Martin F. Grace and Stephen G. Timme.

No. 38 Withholding Position and Income Tax Compliance: Some Experimental Evidence, *Public Finance Quarterly, Vol. 20, No. 2, (April 1992) pp. 152-174,* Jorge Martinez-Vazquez, Gordon B. Harwood and Ernest R. Larkins.

No. 39 Intraurban Wage Gradients: Evidence by Race, Gender, Occupational Class, and Sector, *Journal of Urban Economics, Vol. 32, (1992) pp. 70-91,* Keith Ihlanfeldt.

No. 40 Tax Reform 1986 and Marginal Welfare Changes for Labor, *Southern Economic Journal, Vol 59, No. 1, (July 1992) pp. 39-48,* Sally Wallace and Michael Wasylenko.

No. 41 City Finances and the National Economy, *Journal of Federalism, Vol. 22 (Summer 1992) pp. 49-66,* Roy Bahl, Jorge Martinez-Vazquez, and David L. Sjoquist.

No. 42 Central City - Suburban Fiscal Disparities; *Public Finance Quarterly, Vol. 20 No. 4, October 1992, pp.420-432;* Roy Bahl, Jorge Martinez-Vazquez, and David L. Sjoquist.

No. 43 Local Governments and the Current Recession; *Proceedings of the Eighty-Fourth Annual Conference on Taxation of the National Tax Association - Tax Institute of America, Columbus OH, (1992), pp. 10-17;* Roy Bahl, Jorge Martinez-Vasquez, and David L. Sjoquist.

No. 44 The Economics of Alabama's Proposed Tax Reform; *Alabama Law Review, Vol. 43, No. 3 (Spring 1992), pp. 601-653;* Roy Bahl.

No. 45 Economic Change and Fiscal Planning: The Origins of the Fiscal Crisis in New York State; *Public Administration Review, Vol. 52, No. 6 (November/December 1992), pp. 547-558;* Roy Bahl and William Duncombe.

No. 46 Search Duration and Intermediate, Transitional Work; *Proceedings of the 44th Annual Winter Meetings, Industrial Relations Research Association.* IRRA, 1992; *pp. 630-36;* Julie L. Hotchkiss.

No. 47 The Level of Development and GSP Treatment -- An Empirical Investigation into the Differential Impacts of Export Expansion; *Journal of World Trade, Vol. 26, No. 6, (December 1992), pp. 19-30;* Robert E. Moore.

No. 48 Using Microsimulation Models for Revenue Forecasting in Developing Countries; *Public Budgeting and Financial Management 5 (1) (1993), pp. 159-86;* Roy Bahl, Richard Hawkins, Robert E. Moore, and David L. Sjoquist.

No. 49 Intra-Urban Job Accessibility and Hispanic Youth Employment Rates; *Journal of Urban Economics, 33 (1993), pp. 254-271;* Keith R. Ihlanfeldt.

No. 50 Alternative Tax Regimes in a Local Public Good Economy; *Journal of Public Economics , 50 (1993), pp. 115--141;* J. M. Pogodzinski and David L. Sjoquist.

No. 51 Audit Selection and Income Tax Underreporting in the Tax Compliance Game; *Journal of Development Economics, Vol. 42 (1993), pp. 1-33;* James Alm, Roy Bahl, and Matthew N. Murray.

No. 52 The Effects of State Personal Income Tax Differentials on Wages; *Regional Science and Urban Economics, 23 (1993), pp. 611-28;* Sally Wallace.

No. 53 Age and the Nobel Prize Revisited; *Scientometrics Vol. 28, No. 3 (1993), pp. 387-99;* Paula E. Stephan and Sharon G. Levin.

No. 54 The Relative Effects of Unemployment Insurance Parameters on Transitional Labor Supply Decisions; *Eastern Economic Journal, Vol. 20, No. 1, (Winter 1994);* Julie L. Hotchkiss and Robert E. Moore.

No. 55 Fiscal Decentralization and Intergovernmental Transfers in Less Developed Countries; *Publius: The Journal of Federalism, Vol. 24 (Winter 1994), pp. 1-19;* Roy Bahl and Johannes Linn.

No. 56 Substitution Effects in CVM Values; *American Journal of Agricultural Economics, Vol. 76 (May 1994), pp. 205-214;* Ronald G. Cummings, Phillip T. Ganderton, and Thomas McGuckin.

No. 57 Hypothetical Surveys and Real Economic Commitments; *Land Economics, Vol. 70, No. 2 (May 1994), pp. 145-154;* Helen R. Neill, Ronald G. Cummings, Phillip T. Ganderton, Glenn W. Harrison, and Thomas McGuckin.

No. 58 A Note on Majorization Theory and the Evaluation of Income Distributions; *Economics Letters, 42 (1993), pp. 179-183;* Rubin Saposnik.

No. 59 Managing Water Resources in Georgia: Lessons from Experiences in the Western States; *Journal of Agribusiness, Vol. 11 No. 2 (Fall 1993), pp. 85-100;* Ronald G. Cummings.

Research Paper Series

No. 1 *The Black Youth Unemployment Problem*, Keith R. Ihlanfeldt and David L. Sjoquist, August 1989.

No. 2 *Multiple Modes of Tax Evasion with Differential Penalties and Probabilities of Detection*, Jorge Martinez-Vazquez, August 1989.

No. 3 *The Economic Status of Black Atlantans*, David L. Sjoquist, August 1989.

No. 4 *Professional Tax Preparers' Role in Income Tax Compliance: Some Randomized Response Evidence from Tax Preparers*, Gordon B. Harwood, Ernest R. Larkins, and Jorge Martinez-Vazquez, January 1990.

No. 5 *Intraurban Wage Gradients: Evidence by Race, Occupational Class, and Sector* Keith R. Ihlanfeldt, March 1990.

No. 6 *A Contagion Model of Underclass Neighborhoods*, Jorge Martinez-Vazquez and Rubin Saposnik, April 1990.

No. 7 *Concepts, Measurement, and Analysis of the Underclass: A Review of the Literature*, David L. Sjoquist, April 1990.

No. 8 *The Relative Effects of Unemployment Insurance Parameters on Temporary Labor Supply Decisions*, Julie L. Hotchkiss, September 1990. Not available.

No. 9 *An Analysis of Georgia's Sales Ratio Study: A Description and Critique of Procedures*, Willis Sheftall and David L. Sjoquist, September 1990.

No. 10 *Empirical Tests for Strategic Trade Policy: The Case of the Semiconductor Industry*, Robert E. Moore, November 1990.

No. 11 *The Revelation of Neighborhood Preferences: An N-Chotomous Multivariate Probit Approach*, Thomas P. Boehm and Keith Ihlanfeldt, November 1990.

No. 12 *The Stage of Development and the Nature and Magnitude of Export Related Growth*, Julie L. Hotchkiss, Robert E. Moore, and Mark Rockel, November 1990.

No. 13 *A Disequilibrium Approach to the Demand and Supply for State and Local Government: A Time Series Analysis*, Roy Bahl, Michael Jordan, and Jorge Martinez-Vazquez, November 1990.

No. 14 *Part-Time Status and Hourly Earnings: Specification Issues*, Julie L. Hotchkiss, March 1991.

No. 15 *Search Duration and Intermediate, Transitional Work*, Julie L. Hotchkiss, April 1991.

No. 16 *Tax Administration in Developing Countries with Particular Reference to Road User Taxation*, Roy Bahl, May 1991.

No. 17 *Withholding Position and Income Tax Compliance: Some Experimental Evidence,* Gordon B. Harwood, Ernest R. Larkins, and Jorge Martinez-Vazquez, August 1991.

No. 18 *Intra-Urban Job Accessibility and Youth Employment Rates*, Keith R. Ihlanfeldt, August 1991.

No. 19 *The Level of Development and GSP Treatment: An Empirical Investigation into the Differential Impacts of Export Expansion*, Robert E. Moore, August 1991.

No. 20 *The Effect of Transitional Employment on the Duration of Search and Subsequent Wage Gains*, Julie Hotchkiss, September 1991.

No. 21 *The Nexus of Tax Administration and Tax Policy in Developing Countries*, Roy Bahl and Jorge Martinez-Vazquez, October 1991.

No. 22 *An Examination of Cost Economies in the United States Life Insurance Industry*, Martin F. Grace and Stephen G. Timme, February 1992.

No. 23 *Using a Randomized Response Methodology to Collect Data for Tax Compliance Research*, Gordon B. Harwood, Ernest R. Larkins and Jorge Martinez-Vazquez, February 1992.

No. 24 *China's Fiscal Reform: A Cross-Provincial Analysis,* Penelope Prime, March 1992.

No. 25 *Trade and Tax Policy in Egypt*, Jorge Martinez-Vazquez, May 1992.

No. 26 *Trends in the World Economy: Implications for Fiscal Choices,* Roy Bahl, June 1992.

No. 27 *Strategies for Designing Economic Education Programming for the Commonwealth of Independent States,* Francis W. Rushing and Thomas McKinnon, July 1992.

No. 28 *The Underground Atlanta Project: An Economic Analysis,* David L. Sjoquist and Loren Williams, July 1992.

No. 29 *Female Labor Supply With A Discontinuous, Non-Convex Budget Constraint: Incorporation Of A Full-Time Wage Differential,* Susan L. Averett and Julie L. Hotchkiss, August 1992.

No. 30 *Housing Segregation and the Wages and Commutes of Urban Blacks: The Case of Atlanta Fast-Food Restaurant Workers,* Keith R. Ihlanfeldt, August 1992.

No. 31 *Spatial Mismatch and the Commutes, Employment, and Wages of Young Puerto Ricans Living in New York,* Keith R. Ihlanfeldt, September 1992.

No. 32 *Local Income Taxation: An Answer to the Base - Broadening Problem?* David L. Sjoquist and Sally Wallace, October 1992.

No. 33 *Using Peer-Related Non-Sensitive Questions to Attain Equality of Means in Randomized Responses,* Gordon B. Harwood, Ernest R. Larkins, and Jorge Martinez-Vazquez, December 1992.

No. 34 *Gender Compensation Differentials in Jamaica,* Julie L. Hotchkiss and Robert E. Moore, March 1993.

No. 35 *The Incidence of Tax Evasion: A Review of the Issues,* Jorge Martinez-Vazquez, July 1993.

No. 36 *The Spatial Distribution of Black Employment Between the Central City and the Suburbs,* Keith R. Ihlanfeldt and Madelyn Young, July 1993.

No. 37 *Value and Illegal Behavior* , Bruce Seaman, September 1993.

No. 38 *Intergovernmental Fiscal Relations in Bulgaria,* Jorge Martinez-Vazquez, September 1993.

No. 39 *Criminal Behavior In General Equilibrium: Who Benefits From Crime?* Jorge Martinez-Vasquez and Bruce A. Seaman, September 1993.

No. 40 *Discrimination Through Payment of Full-Time Wage Premiums,* Susan L. Averett and Julie L. Hotchkiss, November 1993.

No. 41 *The Challenge of Expenditure Assignment Reform in Russia,* Jorge Martinez-Vazquez, February 1994.

No. 42 *Race and the Structure of Local Government,* Jorge Martinez-Vazquez, Mark Rider, and Mary Beth Walker, May 1994.

No. 43 *Progressive Income Taxation, Intertemporal Elasticity of Substitution and Aggregation Bias,* Hamid Bastin and Jorge Martinez-Vazquez, June 1994.

No. 44 *The Importance of the Central City to the Regional and National Economy: A Review of the Arguments and Empirical Evidence,* Keith R. Ihlanfeldt, June 1994.

Policy Research Center
College of Business Administration
Georgia State University
Atlanta, Georgia 30303-3083
Telephone No.: (404) 651-3990
Fax: (404) 651-3996

The Policy Research Center was established in 1988 with the objective of creating a national center of excellence in the study of economic and social policy. The Center draws on faculty resources from throughout the university in carrying out this research program and provides training for students interested in a career in policy research and teaching. The research mandate includes domestic U.S. issues and studies of the international economy.