



**Neighborhood
Characteristics Matter**

When Businesses Look for a Location

**Christopher H. Wheeler
Federal Reserve Bank of St. Louis**

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Christopher H. Wheeler
Senior Economist
Federal Reserve Bank of St. Louis

Christopher H. Wheeler is a senior economist in the Research Division of the Bank. He previously was an assistant professor of economics at Tulane University in New Orleans. Wheeler received his doctoral and master's degrees in economics from the University of Wisconsin-Madison in 1998 and 1995, respectively, and his bachelor's degree in economics from Colby College in Waterville, Maine, in 1993. His areas of research include economic growth, labor economics, macroeconomics, and urban and regional economics.

The views expressed here are those of the author and not necessarily those of the Federal Reserve Bank of St. Louis or the Federal Reserve System. The report is also available online at www.stlouisfed.org/community/other_pubs.html.

Table of Contents

Summary	5
Introduction	7
Description of the Data	8
Basic Trends in Business Establishment Growth	9
The Importance of Neighborhood Development	10
Basic Determinants	12
Proximity to People	
Local Population Characteristics	
Crime	
Local Government Taxation and Expenditure	
Existing Business Activity	
Differences by Industry	19
Cross-Sectional Location of Industries	
Industry-Specific Growth Patterns	
A Look at Four Metro Areas in the Federal Reserve's Eighth District	31
Little Rock	
Louisville	
Memphis	
St. Louis	
Conclusions	45
Appendix	47
Endnotes	48

Summary

Business activity within any local market tends to be unevenly distributed: Some neighborhoods simply attract more activity than others. Economic development within a neighborhood also tends to have a direct impact on a number of measures of well-being among its residents. For this simple reason, we stand to benefit from a better understanding of the processes by which neighborhoods grow or decline.

This study seeks to augment our current knowledge of neighborhood development by identifying neighborhood-level characteristics that accompany rising (or declining) economic activity. To that end, we explore the pattern of business establishment growth between 1998 and 2002 for a sample of more than 15,000 ZIP codes throughout 361 U.S. metropolitan areas. The primary findings can be summarized as follows:

- (1) During the sample time period, ZIP codes with fewer residents, workers and businesses, as well as lower population, employment and business densities per square mile, attracted greater numbers of business establishments. The pattern suggests that businesses tend to target less congested parts of a metropolitan area. This finding is consistent with the long-standing trend for population and employment in U.S. metropolitan areas to decentralize.
- (2) ZIP codes with higher per capita incomes tend to grow faster. This trend may indicate that businesses like to locate in areas with high levels of demand for their goods and services.
- (3) Neighborhoods with larger percentages of highly educated residents (bachelor's degree or more) tend to attract greater numbers of businesses. Given that this association holds even after accounting for a neighborhood's per capita income, this finding suggests that businesses like to have a pool of highly educated workers nearby, possibly because it facilitates the hiring process or because college graduates may have an especially high propensity to consume.
- (4) A higher fraction of individuals between 25 and 44 years of age tends to be associated with greater business establishment growth. This result holds even after accounting for a ZIP code's per capita income and education. Hence, it may suggest that relatively young workers tend to consume more, just as college graduates might. To the extent that people between the ages of 25 and 44 tend to live in less populated suburban areas, possibly because they have young children, it may also capture some of the effects found regarding population, employment and business density (i.e., the desire to locate in uncongested, suburban locations).
- (5) Higher rates of crime and unemployment strongly deter business expansion.
- (6) Levels of per capita local government expenditure show mixed correlations with business establishment growth. Spending for primary and secondary education, police and fire protection, highways, and water and sewerage utilities are positively associated with business expansion, suggesting that public infrastructure and services are important to attracting economic activity. Expenditures for housing and community development, by contrast, are negatively associated with business growth, although this association likely reflects the fact that relatively poor neighborhoods with high rates of crime and joblessness tend to receive more spending for housing and community development per capita than wealthier areas.
- (7) Per capita property and sales tax revenue is positively associated with overall business establishment growth. These correlations may simply reflect the fact that neighborhoods with higher per capita incomes, more educated populations and greater levels of spending on public goods and services (e.g., primary and secondary education) tend to attract greater numbers of businesses.

- (8) When the analysis is considered separately for each of 16 industries, we notice a striking degree of variety in the extent to which the above-stated conclusions hold. Manufacturing, construction and wholesale trade, for instance, seek very different neighborhoods than do professional, technical and scientific services or employers in finance and insurance, and arts, entertainment, and recreation.

An examination of ZIP code growth patterns for the metropolitan areas of Little Rock, Louisville, Memphis and St. Louis are then explored in light of the findings.

Introduction

Cities in the United States have exhibited tremendous variety in their rates of growth over the past several decades. Some, particularly those in the southern and western regions of the country, have grown rapidly, whereas others have expanded at much slower rates. Between 1994 and 2002, for example, the metropolitan areas of Atlanta, Charlotte, Denver, Phoenix, Salt Lake City and San Diego all saw their total numbers of nonfarm business establishments rise by more than 20 percent. On the other hand, Detroit, Pittsburgh, Philadelphia and St. Louis each experienced less than 10 percent growth.

What these aggregate numbers fail to reveal, however, is a striking degree of variance within each metropolitan area. That is, within any metro area in the country, regardless of whether it is a fast-grower or a slow-grower, there are areas that have grown rapidly in recent years and areas that have not. In St. Louis, for example, the metropolitan area can be divided into approximately 226 ZIP codes.¹ From 1994 to 2002, growth rates of business establishments among this collection of ZIP codes ranged from -50 percent to 200 percent. In terms of raw numbers of business establishments added or lost, the figures extend from -407 to 531.² Similar levels of heterogeneity characterize the experiences of Little Rock (-250 to 294 businesses), Louisville (-192 to 341 businesses) and Memphis (-174 to 445 businesses).

To be sure, this pattern of growth and decline within the same local market is a matter of great concern. Local government officials, for example, are concerned with the economic well-being of the neighborhoods they represent as well as the viability of their operations in the event economic activity was to diminish. Similarly, businesses care about the continued profitability of operating in a particular locale, and residents are concerned with the convenience, safety and overall desirability of the places they inhabit.

A particularly germane topic to this rather broad issue of neighborhood development is the decline of historical downtowns in the

United States. Between 1930 and 2000, eight of the 10 largest cities (not metro areas) in the United States (based on 1930 population) saw their populations decrease: Chicago, Philadelphia, Detroit, Cleveland, St. Louis, Baltimore, Boston and Pittsburgh. Only New York City and Los Angeles experienced net growth during this time. St. Louis, famously, witnessed a particularly staggering loss of population, as the number of residents fell from more than 820,000 in 1930 to fewer than 350,000 in 2000.³ City officials in many metropolitan areas are understandably concerned about these trends because their ability to function depends heavily on the amount of economic and residential activity within city borders. Declining numbers of residents and businesses make it increasingly difficult for local governments to collect revenue and provide public services.

These problems are not merely confined to those individuals who live or operate in a downtown region. Empirical evidence also suggests that the success of an entire metropolitan region (in terms of its potential for rising income and employment levels) may be tied directly to the health of a central city.⁴ Hence, the residents of an entire metropolitan area may have reason to be interested in the state of a downtown area.

Despite the importance of neighborhood-level economic growth, few economists have conducted formal statistical work on the topic. There are not many analyses in the urban economics literature, for example, on patterns of business growth within metropolitan areas among geographic units at the sub-county level.⁵ This study seeks to do just that by looking at the growth of business establishments within ZIP codes in U.S. metropolitan areas. Quite simply, the aim of the analysis is to determine the types of characteristics that fast-growing (or slow-growing) ZIP codes possess. It should, therefore, be emphasized that the topic of downtown revitalization is not of principal interest in this study. The goal is to look at a broad array of geographic areas within a metropolitan area rather than focus on the comparison between a downtown and its suburban fringe. At the same time, some of the

issues involved with that particular topic are undoubtedly related to those explored here.

Description of the Data

Because the focus of this study is economic development at the neighborhood level, the analysis relies on data at a very fine level of geographic disaggregation. The finest detail for which a broad array of both economic and demographic data are available is the ZIP code, which is a geographic unit created by the U.S. Postal Service. In terms of total land area covered, ZIP codes tend to be relatively small. The median land area and population for the more than 15,000 ZIP codes used in this study is 23 square miles and 6,800 residents. Both figures are considerably smaller than those describing counties in this country. In 1990, for instance, the 3,142 counties (both urban and rural) in the United States had a median land area of 615 square miles and a median population in excess of 22,000 residents.⁶

This study also emphasizes the growth of neighborhoods within metropolitan areas as opposed to small towns and rural regions. The majority of the U.S. population, more than 80 percent, resides in a metropolitan area. As a result, the growth of neighborhoods within the nation's urban centers is clearly an important topic for a great many people. This does not imply that issues of rural growth are unimportant—only that the current emphasis on urban areas is warranted. Moreover, while the results presented in this report might not apply directly to nonurban areas, some of the basic principles established may still apply when considering the development of rural neighborhoods.

Data describing ZIP codes in the United States are available from a number of sources. Information about the number of business establishments across metropolitan ZIP codes is derived from ZIP Code Business Patterns (ZBP), which is compiled by the Census Bureau. The ZBP data files report total numbers of establishments and employees, as well as the breakdown of the totals by detailed industry for every ZIP code in the country.⁷ For the purposes of this study,

three years of ZBP data are used in the statistical work described below: 1994, 1998 and 2002.

These data are then combined with data from the U.S. Census of Population and Housing, as compiled by Geolytics Inc. These data provide basic demographic information, such as race, gender, income and education, at the approximate ZIP code level.⁸

Crime data are taken from the FBI's Unified Crime Reports for the years 1994 and 2000.⁹ These figures provide information on the number of various types of crimes, including robbery, aggravated assault, burglary, larceny, motor vehicle theft and an overall index.¹⁰

Information about local government finances comes from the 1997 Census of Governments.¹¹ The information available in these data files includes data from county and municipal governments (aggregated to the county level) covering aggregate revenues (including those from taxes) and aggregate expenditures, as well as more limited data on the amounts associated with specific categories. On the revenue side, those categories include property taxes, general sales taxes and individual income taxes. Expenditure categories cover primary and secondary education, fire protection, hospitals, highways, police protection, housing and community development, parking facilities, water utilities, electric utilities, gas utilities, public transit utilities, and sewerage and solid waste management.¹²

Unfortunately, these government finance statistics are not available at the ZIP code level because local government jurisdictions do not always conform well to a U.S. Postal Service-based geography. Crime and local government finance data are, however, available at the county level (or among county equivalent units, such as independent cities), which allows the approximation of each ZIP code's crime and local government finance data using that of its corresponding county.

Summary statistics describing the basic data used are reported in Table A1 of the Appendix. Due to problems associated with missing data, not all of these quantities are available for

Table 1
Growth of Business Establishments in the United States: 1998 – 2002

Industry	Change in Number of Establishments	Rate of Growth in Number of Establishments (%)
All	258,948	3.7
Utilities	2,542	16
Construction	18,029	2.6
Manufacturing	-21,908	-6
Wholesale trade	-16,814	-3.7
Retail trade	12,556	1.1
Transportation and warehousing	8,981	4.8
Information	18,038	15
Finance and insurance	38,171	9.3
Real estate, and rental and leasing	30,736	10.5
Professional, scientific and technical services	85,135	12.4
Management	5,705	13.1
Admin. support and waste management	-7,336	-2.1
Educational services	8,857	13.7
Health care and social assistance	54,132	8.3
Arts, entertainment and recreation	7,581	7.4
Accommodation and food service	20,899	3.8
Other services	21,397	3

every ZIP code; so the number of observations used to calculate these statistics differs from one quantity to another.

Basic Trends in Business Establishment Growth

Between 1998 and 2002, the number of business establishments in the United States expanded by more than a quarter of a million, rising from 6.9 million to 7.2 million. This represents an increase of approximately 4.3 percent. The majority of this growth took place in urban areas. While the 316 largest metropolitan areas accounted for approximately 81 percent of all business establishments in 1998, that figure had risen to 81.5 percent by 2002.¹³ Evidently, metro areas have been more successful in attracting business activity than rural areas in recent years.

In addition, different regions of the country have experienced different rates of population and employment growth over the past several decades. In particular, states in the western and southern regions of the nation have outpaced those in the North and East. The same general trend is true of business establishment growth between 1998 and 2002. Nevada, Utah, Colorado, Arizona, Idaho and Florida, for example, all witnessed growth in their numbers of business establishments in excess of 7 percent. Michigan, Indiana, North Dakota, Ohio, Iowa and Connecticut, by contrast, experienced rates of growth of less than 1 percent.¹⁴

Business establishment growth also varied significantly across industries. A breakdown of business establishment growth rates and level changes appears in Table 1. Because 1998 to 2002 represents primarily an expansionary phase of the national economy (the recession of 2001 officially lasted from March to November

of that year), most of the numbers in the table are positive. Still, a few sectors ended with fewer businesses in 2002 than they had in 1998: manufacturing, wholesale trade, and administrative support and waste management.

These latter two observations—namely, that different regions within the country and industries have shown very different growth trends in recent years—suggest that the analysis needs to account for these differences. The estimation strategy described later attempts to do so.

The Importance of Neighborhood Development

The importance of economic growth and development for improving the living standards of communities is widely recognized. Growth in the numbers of jobs and businesses tends to be accompanied by a number of desirable outcomes, not the least of which is a rise in real incomes. This relationship has been shown to hold at both the aggregate national level, where economies are defined as countries, as well as in more local terms, where economies are typically defined as states, metropolitan areas or cities.¹⁵

Does this relationship also hold among smaller geographic units? That is, do individuals benefit from the rise of economic activity within their ZIP codes? The answer to this question is not, on the surface, obvious because workers often live and work in different ZIP codes. A worker's well-being, therefore, may not be tied directly to the neighborhood in which he or she resides, but rather to the amount of growth taking place within his or her local labor market (e.g., the entire county or metro area). As long as there are some neighborhoods growing, workers living within an acceptable commuting distance ought to benefit.

To explore this matter, we examine the relationship between the change in the number of business establishments in a ZIP code and a variety of economic and social outcomes within that same ZIP code. These outcomes include the growth of the median house value,

the growth of the median residential rent, the growth of per capita income, the growth of average household income, the change in the unemployment rate, the change in the fraction of the local population with at least a bachelor's degree and the change in the number of various types of crime per capita.

Although they do so only imperfectly, these measures are designed to provide some idea about how the well-being of a neighborhood changes as it gathers more economic activity. House values and residential rents, for example, are measures of personal wealth. They, along with the two income measures, quantify the (average) financial welfare of a neighborhood. The unemployment rate tracks the ability of a neighborhood's residents to find work. Given that highly educated individuals tend to confer numerous benefits to their communities in terms of productivity and civic engagement, the percentage of a ZIP code's residents with a bachelor's degree or more can be viewed as a measure (albeit somewhat crude) of a neighborhood's desirability. Crime is a considerable social ill and, therefore, also quantifies the well-being of a neighborhood's residents.

Due to data limitations and the decennial nature of the U.S. Census of Population and Housing, the time periods over which these changes are measured do not match up perfectly. In particular, the growth of business activity is measured between 1994 and 2002, the crime data covers 1994 to 2000 and all other variables run from 1990 to 2000.¹⁶ We simply assume that there is sufficient overlap in these time frames to allow a direct comparison of these variables.

Throughout, the results control for the overall growth rate of the metropolitan area in which each ZIP is located.¹⁷ Doing so accounts for the fact that some ZIP codes might experience faster growth simply because they are located in a rapidly growing metro area. They also control for the fact that some metropolitan areas may have had a different experience than others with respect to each outcome. Some metro areas, for example, may simply have experienced larger increases in their per capita

incomes or housing values or seen smaller drops in unemployment and crime than others.

The results appear in Table 2. From them, we see that increases in business activity tend to be accompanied by statistically significant increases in income, both measured on a per capita and a per household basis.¹⁸ As the number of establishments in a ZIP code increases by 100, the estimate in the table suggests that rates of per capita and per household income growth rise by three to four percentage points.

Business activity also correlates significantly with the fraction of a ZIP code's resident population accounted for by college graduates, suggesting that highly educated workers are drawn to neighborhoods with large amounts of economic activity. The estimate from Table 2 suggests that an increase of 100 establishments in a ZIP code's level of business activity corresponds to a two percentage point increase (e.g., 10 percent to 12 percent) in its fraction of residents with a bachelor's degree or more. This result also likely reflects the fact that ZIP codes with large numbers of highly educated residents tend to attract business activity. This latter finding is described in greater detail later.

Greater numbers of business establishments in a ZIP code tend to be associated with lower rates of unemployment. The estimated association indicates that an additional 100 businesses tend to be accompanied by two-tenths of a percentage point drop (e.g., 5 percent to 4.8 percent) in the rate of unemployment among a ZIP code's resident population.

This result may reflect the idea that, while many workers can and do take jobs in neighborhoods other than the one in which they live, some require greater proximity to their places of work. With limited transportation opportunities, for example, workers may not be able to access jobs far away from where they live. Hence, few job opportunities nearby may be associated with the inability of these individuals to find and secure jobs.

Such a notion is similar to the well-known "spatial mismatch" hypothesis, which is often attributed to the economist John Kain.¹⁹

Table 2
Effects of Establishment Growth on ZIP Code Characteristics

ZIP Code Characteristic	Estimated Coefficient	Standard Error
Median house value	0.0035	0.0035
Median residential rent	0.001	0.001
Per capita income	0.0004*	0.00005
Average household income	0.0003*	0.0001
Unemployment rate	-0.00002*	0.000003
Percent w/ bachelor's degree	0.0002*	0.00001
Crime index per 1,000 residents	-0.003*	0.0007
Assaults per 1,000 residents	-0.0003*	0.0001
Burglaries per 1,000 residents	-0.0004*	0.0002
Larcenies per 1,000 residents	-0.002*	0.0004
Auto thefts per 1,000 residents	-0.0004*	0.0001
Robberies per 1,000 residents	-0.00003	0.00009

Note: Estimated associations between changes in ZIP code characteristics between 1990 and 2000 (1994 and 2000 for the six crime variables) and the change in the number of business establishments between 1994 and 2002.

** denotes statistical significance (with respect to the hypothesis that the coefficient is equal to zero) at 10 percent or better. Heteroskedasticity-consistent standard errors are reported.*

According to this idea, high rates of unemployment in inner cities, particularly among racial minorities, are associated with the movement of employment from traditional downtowns to the suburbs. By moving jobs from one part of a metro area to another, residents in the declining areas are denied access (or face greater barriers) to employment opportunities and experience higher rates of joblessness as a result. A fair amount of evidence has been documented by economists in recent years to support this idea.²⁰ Clearly, the negative association between unemployment and business growth reported in Table 2 is consistent with the spatial mismatch hypothesis.

We also find significant associations with several of the crime rates, which is an interesting finding, at least in part, because the relationship between economic activity and crime has proved unclear in previous research.²¹ From a theoretical perspective, the connection between the two is ambiguous. Greater

economic activity may be associated with less crime because larger amounts of activity might directly deter certain criminal acts. Bustling areas might, for example, attract higher levels of security and law enforcement or simply possess greater numbers of witnesses than economically stagnant neighborhoods. On the other hand, economic activity also provides a target for criminals. There is, after all, more to steal in an economically vibrant area than in a less active one.

Here, the results clearly show a strong negative association between four of the crime measures and the change in the number of establishments within a ZIP code. A 100-establishment rise in the number of businesses locating in a ZIP code correlates with decreases of roughly 0.03 assaults, 0.04 burglaries, 0.2 larcenies and 0.04 auto thefts per 1,000 residents. It is also associated with a drop of nearly 0.3 crimes overall (as measured by the crime index) per 1,000 residents. Although small in magnitude, all of these findings are significant in a statistical sense. That is, we are able to conclude confidently that the correlations are negative rather than positive or equal to zero. On the other hand, one of the crime rates, robberies per 1,000 residents, does not show a statistically significant association with establishment growth. Still, the estimated correlation is negative, suggesting that this type of crime may also decrease as local economic activity increases. On the whole, the evidence favors the idea that neighborhood development helps reduce local crime rates.

Although positive, the estimated associations between establishment growth and both median house value and median residential rent are not significant. This result could indicate that, although ZIP codes that experience strong business establishment growth may be, on net, more desirable as residential locations—thus leading to an increase in house prices and rents—the effect is weak because there are mitigating factors. ZIP codes with large amounts of economic activity may also have a great deal of congestion or pollution, which might limit any rise in real estate values. Alternatively, rapidly expanding ZIP codes may also be those on the fringes of cities where land is plentiful. This

would allow the supply of housing to keep up with any increases in demand, thereby keeping house prices and land rents relatively stable.

In general, a fair amount of evidence suggests that the well-being of a neighborhood is significantly linked to the extent of business activity it accumulates over time. The amount of growth within a ZIP code, therefore, does influence the residents of that ZIP code independently of the economic conditions present within the surrounding metropolitan area.

Basic Determinants

At this point, we explore what drives business establishment growth across metropolitan ZIP codes in the United States. In particular, we attempt to answer the following question: What are the characteristics of ZIP codes that accumulate large amounts of business activity?

Although straightforward, this question is extremely complicated because there are a potentially unlimited number of basic neighborhood features that could influence business location decisions. What is more, many of these characteristics might not even be directly quantifiable. In this study, we look at a wide array of observable characteristics in an effort to sketch a basic picture of the types of neighborhoods that attract businesses. Admittedly, such a picture is incomplete because we are unable to account for everything that matters. Nonetheless, the results reported in the following pages should, at a minimum, provide some useful information that augments our understanding of the local development process.

This part of the study focuses on the growth of business establishments between 1998 and 2002, rather than 1994 and 2002, which we considered earlier. This approach is taken for two reasons. First, many of the characteristics that we correlate with establishment growth are only identified in the latter part of the 1990s. Because our estimation strategy involves the statistical comparison of changes in total numbers of businesses within a ZIP code and that ZIP code's characteristics at the beginning of the

time frame, we are forced to look only at establishment growth beyond the late 1990s.²² Second, because we attempt to account for differences in the location patterns of different industries, we need to use an industrial classification scheme that is consistent over time. Industries in the ZBP data, unfortunately, are grouped using the Standard Industrial Classification system between 1994 and 1997, but the North American Industry Classification System thereafter. For these reasons, we look at establishment growth beginning in 1998.²³

Proximity to People

More than anything else, businesses rely on people to accomplish their daily tasks. People provide both the labor required for the production of goods and services and the ultimate demand for those products. It is, therefore, plausible that businesses would want to set up near concentrations of people to allow easy access for both workers and consumers.

On the other hand, with highly populated, dense areas come congestion and higher prices for land. In addition, neighborhoods with large populations may be primarily residential, which may place legal or other restrictions on the extent to which business activity can grow. The relationship between population and economic activity, therefore, is theoretically ambiguous.

The data, as it happens, reveal an insignificant relationship between resident population and the change in the number of businesses between 1998 and 2002. Although negative, the estimated association reported in Table 3 indicates that the connection between ZIP code population and business establishment growth is statistically negligible. This means that we cannot rule out the possibility that population might have no effect whatsoever on business growth.

At the same time, the estimated association between establishment growth and the number of residents per square mile in a ZIP code is statistically important. To be sure, the implied association is rather small in real terms. The

Table 3
Determinants of Business Growth:
Population Levels

Characteristic	Coefficient	Standard Error
Population	-0.000008	0.00005
Population per square mile	-0.0005*	0.0002

* denotes statistical significance (with respect to the hypothesis that the coefficient is equal to zero) at 10 percent or better. Heteroskedasticity-consistent standard errors are reported.

coefficient in Table 3 suggests that, as population density increases by 1,000 people per square mile in the cross section (e.g., comparing a ZIP code with a density of 1,000 residents per square mile to one with a density of 2,000 residents per square mile), a ZIP code experiences 0.5 fewer business startups over the next four years.

Again, this negative correlation is consistent with the notion that businesses seek less congested, less expensive parts of town in which to operate. It may also simply indicate that residential and business activities tend to locate in different neighborhoods (i.e., a larger population or population density would indicate that a ZIP code is primarily residential). Still, the magnitude of this correlation is extremely small. Whatever the underlying explanation, these results suggest that the extent of the local population—either measured in raw terms or per unit of land area—is not a very important characteristic in explaining where business establishments locate.

Local Population Characteristics

Location decisions on the part of businesses may also depend upon the characteristics of a neighborhood's resident population. For example, employers may seek neighborhoods with high levels of income because high income may be associated with high demand. This study examined the relationship between the number of newly created businesses and the following four basic features of the local neighborhood: per capita income, percent of resident

Table 4
Determinants of Business Growth:
Population Characteristics

Characteristic	Coefficient	Standard Error
Per capita income	0.0004*	0.0001
Fraction w/ bachelor's degree	25.6*	5.5
Fraction 25-44 years of age	106.6*	13.1
Unemployment rate	-115.5*	12.1

* denotes statistical significance (with respect to the hypothesis that the coefficient is equal to zero) at 10 percent or better. Heteroskedasticity-consistent standard errors are reported.

population with a bachelor's degree or higher, fraction of resident population between 25 and 44 years of age, and unemployment rate. All four of these variables turn out to be significantly associated with business growth.

Beginning with per capita income, the estimated correlation reported in Table 4 suggests that higher average income does indeed correspond to greater numbers of business startups (and/or fewer failures). On average, as per capita income rises by \$5,000, there are an additional two business establishments created over the next four years. This is particularly interesting because, even after accounting for the average income of the surrounding metropolitan area, the average income of a ZIP code is important for explaining business development. As suggested above, this finding is consistent with the idea that businesses like to locate in areas where the demand for their goods and services is expected to be particularly high.

Establishment growth is also higher in neighborhoods with higher fractions of highly educated individuals. ZIP codes with greater numbers of residents with at least a bachelor's degree tend to accumulate a greater number of business establishments than ZIP codes with fewer college graduates. The association reported in Table 4 indicates that an additional 2.56 establishments are created (on net) in a ZIP code as the fraction of residents with at least a bachelor's degree rises by 10 percentage points (e.g., from 15 percent to 25 percent). This association may simply reflect the same

thing that the per capita income association demonstrated: Employers like to set up in neighborhoods where disposable income is likely to be high. College-educated individuals, after all, tend to earn more than less-educated individuals.

To see if this is the entire explanation, we estimated a version of the statistical model that controls for both the college fraction and the per capita income of a ZIP code. The results, interestingly, suggest that, even after having accounted for the average level of income in a neighborhood, the fraction of the local population that is college-educated is a significant predictor of business growth. In fact, the estimated association barely changes when per capita income is included into the analysis. Therefore, there appears to be some direct association between education and economic growth, independent of the level of income.

What explains this association? One possibility relates to the rise in the demand for skilled (i.e., highly educated) workers in recent decades.²⁴ As employers have increasingly sought college-educated workers, they may have chosen to locate increasingly in labor markets with large numbers of these workers present. While there is some evidence of this trend across U.S. metropolitan areas, (i.e., highly educated cities have grown faster over the past several decades), the results here suggest that a similar mechanism may be operating *within* metro areas.²⁵ Locating in a neighborhood with large numbers of educated residents may facilitate the search for highly skilled employees. Another possible explanation is that college graduates have strong preferences for goods and services offered by industries that happen to have grown particularly rapidly in recent years (e.g., restaurants). Therefore, the economic composition of highly educated neighborhoods may consist primarily of rapidly growing sectors. A third possibility is that college graduates simply spend more on consumer goods than less-educated individuals with the same income. So, keeping average income in a neighborhood fixed, highly educated ZIP codes may simply have more demand for goods and services.

Businesses also tend to locate in neighborhoods with relatively young populations. A larger fraction of residents between 25 and 44 years of age tends to be accompanied by greater numbers of business establishments. In particular, the estimated correlation suggests that 10.6 additional businesses are established when the fraction of the population between 25 and 44 rises by 10 percentage points (e.g., 10 percent to 20 percent). This correlation, which is particularly sizable, may also be indicative of a perceived demand effect. Like the college-educated and those with high incomes, relatively young people may be particularly active consumers.

It is also possible that this association reflects the education-growth correlation described previously. After all, given the rise in U.S. educational attainment over the past century, younger cohorts tend to have completed more schooling than older cohorts. A larger fraction of the population between 25 and 44 may simply represent a larger fraction of the resident population with a bachelor's degree or more. To explore this possibility, we estimated the association between business establishment growth and the fraction of the population between 25 and 44 while controlling for the influence of education and per capita income. The resulting association was essentially the same as what is reported in Table 4. Thus, business establishments tend to flock to neighborhoods with relatively young populations, independent of education and income.

Finally, unemployment has a strong negative correlation with business growth. As the rate of unemployment within a ZIP code rises by one percentage point (e.g., 5 percent to 6 percent), there are 1.15 fewer establishment startups over the next four years. This result is particularly informative because, when combined with the negative association between business growth and the change in the unemployment rate, it suggests that a neighborhood can find itself in a poverty trap. That is, ZIP codes with high rates of joblessness tend to have slower business growth, which leads to higher unemployment. Higher unemployment, again, reinforces slower business growth, and so on.²⁶

Table 5
Determinants of Business Growth: Crime

Characteristic	Coefficient	Standard Error
Crime index per 1,000 residents	-0.21*	0.04
Assaults per 1,000 residents	-1.9*	0.3
Burglaries per 1,000 residents	-1.6*	0.2
Larcenies per 1,000 residents	-0.2*	0.05
Auto thefts per 1,000 residents	-2.1*	0.23
Robberies per 1,000 residents	-3.8*	0.55

* denotes statistical significance (with respect to the hypothesis that the coefficient is equal to zero) at 10 percent or better. Heteroskedasticity-consistent standard errors are reported.

Crime

Criminal activity is a social ill. It creates fear and uncertainty, and exposes individuals and businesses to losses in terms of both assets that might be stolen or damaged as well as resources that must be devoted to securing and protecting those assets. The presence of crime in a neighborhood, therefore, likely serves as a barrier to economic activity.

Statistically, however, the relationship between crime and business growth has proved to be somewhat elusive. On the one hand, crime may reduce economic activity by driving up the costs an employer must pay to operate. Hence, we should see a negative relationship between criminal activity and business growth. On the other hand, rising economic activity might induce greater criminal activity because rising income and wealth may increase the number of potential targets of crime (e.g., greater numbers of new cars on the streets). This result may produce a positive statistical association between crime and economic activity.

Such ambiguity is not at all present in the ZIP code data used here. Table 5 reports the associations between business establishment growth and six measures of criminal activity—an overall index that measures the total number of reported crimes, assaults, burglaries, larcenies, auto thefts and robberies. These are all expressed as numbers of crimes per 1,000 residents. Each one is significantly negative,

Table 6
Determinants of Business Growth:
Government Taxation and Expenditure

Characteristic	Coefficient	Standard Error
Primary and secondary education expenditures per capita	0.0004*	0.0001
Fire protection expenditures per capita	0.008*	0.002
Hospital expenditures per capita	-0.00004	0.0002
Highway expenditures per capita	0.002*	0.001
Police protection expenditures per capita	0.003*	0.001
Housing and community development expenditures per capita	-0.013*	0.007
Public parking expenditures per capita	-0.16	0.14
Water utilities expenditures per capita	0.003*	0.001
Electric power utilities expenditures per capita	-0.00001	0.0003
Gas utilities expenditures per capita	-0.001*	0.0008
Public transit utilities expenditures per capita	-0.007	0.005
Sewerage and solid waste management	0.004*	0.001
Expenditures per capita		
Property taxes per capita	0.0006*	0.0002
Sales taxes per capita	0.002*	0.0008
Individual income taxes per capita	-0.0006	0.001

* denotes statistical significance (with respect to the hypothesis that the coefficient is equal to zero) at 10 percent or better. Heteroskedasticity-consistent standard errors are reported.

indicating that higher rates of crime tend to be followed by substantially fewer numbers of new business startups.²⁷

Robberies constitute the crime category with the largest association with subsequent growth. As the number of robberies per 1,000 residents in a ZIP code increases by one, the number of business establishments that can be expected to locate in that ZIP code over the next few years drops by nearly four. Auto thefts, assaults and burglaries also show large associations. In each case, increasing the number of crimes reported per 1,000 residents by one decreases business growth by approximately two establishments over the next four years. The number of larcenies per 1,000 residents and the overall number of all types of crime, given by the index, both

show somewhat smaller associations (reducing their numbers by one increases the number of establishments by two-tenths), but both are significant predictors of business activity.

Collectively, this evidence suggests that crime plays an extremely important role in business location patterns in cities. Clearly, employers seek the parts of a city where crime tends to be relatively infrequent. Interestingly, given the evidence reported previously that increasing numbers of business activity within a neighborhood also tend to lead to less criminal activity, we see a vicious/virtuous cycle mechanism with respect to crime, just as we did with unemployment. High crime deters business growth, which tends to lead to higher crime and so on. As with unemployment, then, the consequences of high levels of criminal activity are particularly serious.

Local Government Taxation and Expenditure

Local governments—such as municipalities, cities and counties—also influence the environment in which businesses operate, in part through their policies regarding taxation and expenditure. However, how employers view various types of tax and expenditure policies is not altogether straightforward. Taxes represent a cost of doing business and could have a negative effect on economic activity, all else constant. However, tax revenue is often spent to maintain public infrastructure and services (e.g., roads, public utilities, education) that directly or indirectly have an impact on an employer’s ability to perform its daily operations. Therefore, high levels of taxation and expenditure could either deter business growth (if employers care relatively more about low rates of taxation) or enhance it (if employers are more concerned about revenue being spent to maintain local public goods).

Table 6 reports the association of changes in the number of business establishments in a ZIP code with 12 local public expenditure categories, all expressed in per capita terms.²⁸ A number of them are positive and important in a statistical sense. Higher levels of per capita

expenditures devoted to primary and secondary education, fire and police protection, highways, water utilities, and sewerage and solid waste management all correspond to greater numbers of businesses being established over time within a ZIP code. Their significance suggests that, on average, employers place a great deal of importance on local governments providing these types of amenities to a neighborhood.

Furthermore, these findings change little when we control for several of the characteristics shown previously to be important for explaining business growth. In particular, even after accounting for the fraction of a ZIP code's residents with a college degree and their average income, higher levels of expenditure per capita on these six categories correspond to larger numbers of establishments added over the next four years.

The basic conclusion that these quantities matter is similar to that commonly drawn by researchers of economic development in low- and moderate-income neighborhoods: that the maintenance of public services and infrastructure (e.g., police, roads, schools, sanitation) is crucial for preserving the economic vitality of an area. In a recent summary article on entrepreneurship in low-income areas, Timothy Bates suggests that there may be a cumulative causation element to the financing of public goods.²⁹ As the level of economic activity in a neighborhood declines, so does the local tax base, which makes the provision of public goods more difficult. Additionally, as the local physical infrastructure deteriorates, so does the willingness of employers to remain there. When these businesses leave, the tax base declines further, making the neighborhood even less attractive as a business locale.

Why is expenditure on primary and secondary schooling significant as a predictor of business growth? One might suspect that this correlation is picking up the associations between economic activity and both education and per capita income described above. Again, ZIP codes with high levels of average income and large fractions of their resident populations with a bachelor's degree tend to accumulate business

activity faster than low-income, less-educated ZIP codes. Neighborhoods with relatively well-educated, high-income residents also likely place a great deal of importance on the education of their children. If that is indeed the case, they might tend to live in neighborhoods that devote a large amount of government revenue to the funding of primary and secondary school operations. However, given that the association between primary and secondary education expenditures and business growth holds even after controlling for a ZIP code's income and education, it is unlikely that this is the entire explanation. This association might reflect a positive association between spending on education and spending on some of the other public services, particularly those that correlate positively with business growth.

In Table 6, we see several expenditure categories that do not seem to predict the growth of business establishments very well. Per capita expenditures on hospitals, public parking facilities, electric power utilities and public transit have essentially no association with the subsequent growth of business activity.

Two of the variables, however, produce significantly negative associations: per capita expenditures for gas utilities and per capita expenditures for housing and community development. While there is no obvious explanation for the first result, one might conjecture that the second stems from the concentration of housing and community development expenditures in low-income areas. That is, neighborhoods that receive large amounts of spending for development purposes might also have a number of characteristics that run contrary to the growth of business establishments: high rates of unemployment and crime, and low levels of per capita income and education.

In fact, when per capita community development expenditures are correlated simultaneously with the crime index per capita, with the unemployment rate, with the fraction of residents with a bachelor's degree or more, and with per capita income, we see that ZIP codes with higher levels of expenditures on community development are indeed characterized

Table 7
Determinants of Business Growth:
Existing Business Activity

Characteristic	Coefficient	Standard Error
Businesses	-0.002	0.003
Businesses per square mile	-0.011*	0.002
Employment	-0.0004*	0.0002
Employment per square mile	-0.0004*	0.0002

* denotes statistical significance (with respect to the hypothesis that the coefficient is equal to zero) at 10 percent or better. Heteroskedasticity-consistent standard errors are reported.

by higher unemployment and crime, but fewer college graduates.

When we look at the association between community development expenditures and business growth—after controlling for unemployment, the overall crime index, education, and income—we find that it remains negative, but is no longer statistically meaningful.

Given the importance of a number of these expenditure categories, it is not surprising that two of the tax revenue categories, per capita revenues from property taxes and from sales taxes, correlate positively (and significantly) with the expansion of business activity. Tax revenues from these two sources undoubtedly constitute a significant portion of the funds available for local governments to spend on public services. As more revenue per resident is collected, greater amounts can be spent per capita as well.

As with many of the quantities already considered, these two particular associations do not seem to reflect the effects of education and income. That is, because one would expect to see higher revenues in neighborhoods with highly educated or high-income households, the association between per capita sales tax revenue, property tax revenue and business growth might represent the influence of education and income. After accounting for the influence of the college-completion rate and average household income, we find that both of these tax revenue variables are significantly and positively associated with business growth.

The final revenue variable, individual income tax revenue per capita, does not correlate significantly with business growth. Although the estimated association is negative, its magnitude is too small to determine whether there is any effect, positive or negative, on business activity.³⁰

Existing Business Activity

There are a number of reasons to suspect that employers may also want to situate themselves near other employers. First, there may be benefits to clustering in areas where customers do their shopping (e.g., malls) or where large numbers of workers already go to work (e.g., office parks). Second, employers may want to be close to the companies with which they do business because proximity reduces the cost of transporting goods and people. Third, there may be a variety of advantages associated with seeing the operations of other businesses. Proximity allows businesses to learn from and keep tabs on competitors. It may also allow businesses to develop new products or enhance their day-to-day operations by observing a wide array of economic activity.

The economic historian Paul Bairoch suggests that “the diversity of urban activities quite naturally encourages attempts to apply or adopt in one sector (or in one specific problem area) technological solutions adopted in another.”³¹ All of these reasons suggest that new business startups may be especially prevalent in neighborhoods with large numbers of existing businesses.

Table 7 reports the estimated associations between changes in the total number of business establishments and both the initial number of establishments and total employment in a ZIP code. The findings suggest that, contrary to the ideas just described, there tends to be a negative association between the existing amount of economic activity in a neighborhood and its subsequent rate of expansion in business activity. Both associations are negative, although only the correlation with the existing total employment in a ZIP code is statistically important. What is more, the magnitudes of the correlations are rather small. In particular,

they suggest that increasing the number of businesses by 100 or the number of workers by 1,000 only reduces the number of newly created businesses by, at most, 0.4 over the next four years.

Similar results emerge when the existing amount of economic activity is quantified in density terms (i.e., the number of business establishments and workers per square mile of land area in a ZIP code). Recall, density may better capture how congested and, therefore, how costly (in either monetary or non-monetary terms) a particular neighborhood is for an employer. In this case, the density of business establishments and total employment are significant predictors of subsequent growth; but here, too, the implied magnitudes of the coefficients in Table 7 are small. They suggest that an increase of 10 businesses (or 100 workers) per square mile does not even reduce the number of newly created businesses by one over the next several years.

On the whole, these results tend to suggest that business establishment growth is greatest in those parts of the city that are relatively unpopulated by firms and workers. This finding, of course, mimics the results shown in Table 3, which demonstrated a negative association between business growth and resident population. While this earlier result may indicate that ZIP codes tend to be either residential or commercial (i.e., large populations would indicate that a ZIP code is mostly residential; hence, few businesses would locate there), the negative association between business growth and existing economic activity seems to suggest that employers look for areas that are relatively unpopulated by people or businesses. This result is consistent with the long-standing trend for economic and residential activity in metropolitan areas to decentralize.³²

Differences by Industry

Not all business establishments are engaged in the same line of work. Retail outlets tend to be concerned with very different activities than those in manufacturing. The types of

environments that each category of establishment seeks may, therefore, differ significantly from one industry to another. This section looks at how economic activities of various types tend to gravitate toward different parts of a metropolitan area.

Cross-Sectional Location of Industries

Consider how the industrial composition of a ZIP code varies with the following seven quantities: population, population per square mile, employment, employment per square mile, average household income, the college-educated fraction and the unemployment rate. To describe how industrial composition changes with each of these characteristics, Table 8 shows whether the proportion of the total number of businesses belonging to each of 16 broad industrial sectors increases significantly (+), decreases significantly (-), or shows no statistically important relationship (0) as each characteristic becomes larger.³³

The results indicate that different types of economic activity do indeed tend to accumulate in different types of neighborhoods. ZIP codes with large numbers of residents, for example, tend to see greater proportions of their businesses engaged in retail trade, real estate and health care/social assistance. Business-oriented ZIP codes (i.e., those with large numbers of workers), tend to see larger fractions of their economic activity accounted for by real estate; wholesale trade; finance and insurance; professional, scientific, and technical services; and health care/social assistance. Industries like utilities, construction, manufacturing, and transportation and warehousing see their importance within a neighborhood decline as income and educational attainment rise, whereas information, and arts, entertainment and recreation all become more heavily represented as income and education increase.

Industry-Specific Growth Patterns

Different types of business activities evidently flock to different types of neighborhoods, implying that a single ZIP code cannot

Table 8
Industrial Composition and Basic Neighborhood Characteristics

Industry	Population	Population per Square Mile	Employment	Employment per Square Mile	Per Capita Income	Percent Bachelor's Degree	Unemployment Rate
Utilities	-	-	-	-	-	-	0
Construction	-	-	-	-	-	-	-
Manufacturing	-	-	-	-	-	-	+
Wholesale trade	-	-	+	0	-	-	+
Retail trade	+	+	0	-	-	-	+
Transportation and warehousing	-	-	-	-	-	-	0
Information	-	-	0	+	+	+	-
Finance and insurance	0	-	+	+	+	+	0
Real estate, and rental and leasing	+	+	+	+	+	+	+
Professional, scientific and technical services	-	-	+	+	+	+	-
Management	-	-	+	+	+	+	+
Admin. support and waste management	-	-	-	0	+	+	-
Educational services	-	0	-	-	0	+	+
Health care and social assistance	+	+	+	-	-	+	+
Arts, entertainment and recreation	-	-	-	0	+	+	-
Food and accommodation services	-	+	-	-	-	-	+

+ indicates a significantly positive relationship between the share of businesses in a ZIP code accounted for by a particular industry and the variable at the top of the column.

- denotes a significantly negative relationship.

0 represents a statistically insignificant association.

provide the optimal location for all employers. Some may want to locate in a densely populated business district within a downtown area. Others may seek relatively uninhabited areas where land is both plentiful and inexpensive. This notion suggests that the analysis conducted above, in which businesses of all types were treated identically, may be missing some important details with respect to which types of businesses can be expected to accumulate in which types of neighborhoods.

To address this matter, we repeat all of the estimation performed above for 16 industry groupings (listed in Table 8), so that each industry's association with each variable can be estimated individually. In addition to the 31 characteristics considered in Tables 3 to 7, we include four more: total employment and the total number of businesses *within the same industry* located in the ZIP code, both in terms of raw levels and numbers of workers and businesses per square mile of land area. These variables are different from total employment and the total number of business establishments (Table 7), which include all types of economic activities. Differentiating between the effects of overall economic activity as opposed to "same-industry" economic activity may offer some idea about whether certain industries like to cluster their activities. The results are reported in Tables 9A-9D.

The growth of utilities providers—which include employers engaged in power generation and distribution, gas distribution, sewerage and water systems—shows a positive association with measures of residential and economic activity. ZIP codes with larger populations, numbers of workers and existing business establishments tend to see more utility providers established over the next several years. Interestingly, neighborhoods with higher rates of crime also see greater numbers of utilities firms created, although the estimated associations are small.

More than anything, this result may indicate that utilities providers tend to situate themselves in highly populated areas where they have large numbers of customers (residential or

commercial) to serve. Because criminal activity may also be somewhat higher in more populous areas than in less populous areas, we tend to see a positive association between crime and the growth of utilities providers. It may also indicate that crime does not provide a major deterrent for this particular industry. Most of the remaining variables—including education, income, unemployment rate and measures of local government finance—do not show strong associations with the growth of utilities.

Employers engaged in residential and commercial construction activity (building, developing, contracting) show a somewhat different pattern of neighborhood location. These types of establishments tend to avoid locating in populous neighborhoods and ZIP codes with large amounts of economic activity already present (existing numbers of workers and businesses). They also avoid locating in neighborhoods with high levels of average income, small fractions of relatively young residents (i.e., those between 25 and 44), high crime rates or high rates of joblessness. On the contrary, construction firms tend to locate in neighborhoods with high per capita levels of expenditure on highways, police and fire protection, and water and sewerage utilities.

These results give the sense that construction companies tend to target the outskirts of a metropolitan area, where public services are still provided (and tax revenue is relatively plentiful, at least in a per capita sense), but where existing economic activity and rates of crime are limited.

A similar set of results characterizes the location of manufacturing, which covers the production of a wide array of goods, including food items, textiles, petroleum, chemicals, drugs, electrical machinery, automobiles and aircraft (among many others). Manufacturing activity tends to grow in ZIP codes with low rates of crime and unemployment, low population levels and densities, and relatively little existing economic activity (employment and businesses). Growth of manufacturing activity is also positively associated with per capita income, primary and secondary education expenditures per capita and tax revenues (both

Table 9A
Determinants of Business Growth: Industry-Specific Results

Characteristic	Utilities	Construction	Manufacturing	Wholesale Trade
Population	0.000006* (0.000001)	0.00001 (0.00001)	-0.0001* (0.00001)	-0.00005* (0.00001)
Population per square mile	-0.000001 (0.000003)	-0.00009* (0.00002)	-0.0002* (0.00004)	-0.00014* (0.00003)
Per capita income	0.000001 (0.000004)	-0.00004* (0.00001)	0.00002* (0.00001)	-0.00005* (0.00001)
Fraction w/ bachelor's degree	0.01 (0.22)	-3.5* (0.58)	-0.8 (0.6)	-5.5* (0.75)
Fraction 25-44 years of age	2.4* (1.2)	9.8* (1.6)	-12.8* (3.1)	-8.7* (2.8)
Unemployment rate	1.31 (0.95)	-16.3* (1.6)	-17.9* (2.7)	-16.1* (3.1)
Crime index per 1,000 residents	0.004* (0.001)	-0.052* (0.005)	-0.05* (0.004)	-0.06* (0.006)
Assaults per 1,000 residents	0.02 (0.012)	-0.32* (0.05)	-0.47* (0.055)	-0.39* (0.06)
Burglaries per 1,000 residents	0.018* (0.008)	-0.32* (0.03)	-0.23* (0.02)	-0.33* (0.03)
Larcenies per 1,000 residents	0.0055* (0.002)	-0.066* (0.009)	-0.064* (0.005)	-0.09* (0.01)
Auto thefts per 1,000 residents	0.0257* (0.01)	-0.42* (0.03)	-0.37* (0.025)	-0.45* (0.04)
Robberies per 1,000 residents	0.04* (0.02)	-0.76* (0.08)	-0.96* (0.1)	-0.92* (0.09)
Primary and secondary education expenditures per capita	-0.000001 (0.000003)	0.0001* (0.00002)	0.00004* (0.00001)	0.00004* (0.00001)
Fire protection expenditures per capita	0.00006 (0.00007)	0.001* (0.0005)	-0.0009 (0.0006)	-0.0004 (0.0005)
Hospital expenditures per capita	-0.000003 (0.000003)	-0.00005* (0.00003)	-0.00007 (0.00006)	-0.00006 (0.00004)
Highway expenditures per capita	-0.000001 (0.00002)	0.0004* (0.0002)	0.00006 (0.0001)	0.0001 (0.0001)
Police protection expenditures per capita	0.000003 (0.00003)	0.0007* (0.0002)	-0.0005* (0.0003)	-0.0003 (0.0002)
Housing and community development expenditures per capita	0.00006 (0.0001)	-0.002* (0.0007)	-0.01* (0.004)	-0.009* (0.002)
Public parking expenditures per capita	-0.00 (0.004)	-0.04* (0.02)	-0.02* (0.008)	-0.1* (0.02)
Water utilities expenditures per capita	-0.00002 (0.00003)	0.0005* (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)
Electric power utilities expenditures per capita	-0.00001 (0.00001)	-0.00008 (0.00006)	0.00005* (0.00003)	-0.00001 (0.00005)
Gas utilities expenditures per capita	-0.00001 (0.00002)	-0.00005 (0.0001)	-0.0001 (0.0001)	0.00007 (0.0001)
Public transit utilities expenditures per capita	-0.000003 (0.0001)	-0.001* (0.0004)	-0.007* (0.002)	-0.004* (0.001)
Sewerage and solid waste management expenditures per capita	-0.000001 (0.00003)	0.0007* (0.0003)	-0.0005 (0.0003)	-0.0003 (0.0002)

Table 9A (cont'd)
Determinants of Business Growth: Industry-Specific Results

Characteristic	Utilities	Construction	Manufacturing	Wholesale Trade
Property taxes per capita	-0.000005 (0.000004)	0.0001* (0.00003)	0.00007* (0.00002)	0.00005* (0.00002)
Sales taxes per capita	0.000004 (0.00003)	0.0005* (0.0002)	0.0005* (0.0003)	0.0004* (0.0002)
Individual income taxes per capita	-0.00002 (0.00002)	-0.0003* (0.00002)	-0.0013* (0.0008)	-0.0009* (0.0005)
All businesses	0.0003* (0.0001)	-0.002* (0.0003)	-0.007* (0.001)	-0.008* (0.0007)
All businesses per square mile	0.00004 (0.00005)	-0.001* (0.0002)	-0.003* (0.001)	-0.002* (0.0007)
Businesses in same industry	0.11 (0.13)	0.02* (0.004)	-0.13* (0.02)	-0.07* (0.01)
Business in same industry per square mile	0.07 (0.08)	-0.09* (0.02)	-0.1* (0.03)	-0.008 (0.006)
All employment	0.00002* (0.000007)	-0.0001* (0.00001)	-0.0003* (0.00004)	-0.0004* (0.00003)
All employment per square mile	0.000003 (0.000002)	-0.00003* (0.00001)	-0.00007* (0.00004)	-0.00007* (0.00003)
Employment in same industry	0.001* (0.0006)	0.0004 (0.0004)	-0.002* (0.0003)	-0.004* (0.0005)
Employment in same industry per square mile	0.0002 (0.0002)	-0.00009* (0.00002)	-0.006* (0.001)	-0.0013* (0.0007)

* denotes statistical significance (with respect to the hypothesis that the coefficient is equal to zero) at 10 percent or better. Heteroskedasticity-consistent standard errors are reported in parentheses.

sales and property) per capita. These results—combined with the negative correlation with expenditures for housing and community development, public transit and public parking, which tend to be concentrated in relatively poor neighborhoods or downtown locations—suggest that more-suburban locations are where manufacturers tend to locate.

Wholesale trade includes employers engaged in the transfer of finished goods from the producer to the final seller. Wholesalers, therefore, deal with an array of manufactured items. The pattern of growth of wholesalers, perhaps not surprisingly, mimics that of manufacturers and businesses in construction. Growth of these types of business establishments tends to be higher in ZIP codes with low levels of population and employment (i.e., few jobs are located there), low rates of crime and unemployment (among residents who live there), and low levels of income and education.

Many of the correlations with the local government expenditure variables lead to a similar conclusion. The same three variables that produced negative associations with manufacturing growth (housing and community development, public transit, parking) do so for wholesale trade, too. Evidently, wholesale businesses seek locations toward the fringes of a metro area.

Retail trade is a sector of the economy that, quite simply, involves the sale of goods to consumers. As such, this sector is quite heterogeneous (e.g., food, electronics, furniture, cars, clothing). Because the primary interest of retailers is selling to households, one might suspect that retail establishments would want to follow residential activity. That conclusion is borne out in the data: The association with population is positive and statistically important.

Moreover, retailers also tend to locate in ZIP codes with larger numbers of college graduates,

Table 9B**Determinants of Business Growth: Industry-Specific Results**

Characteristic	Retail Trade	Transportation and Warehousing	Information	Finance and Insurance
Population	0.00003* (0.00001)	0.00002* (0.000003)	0.00004* (0.000004)	0.0001* (0.00001)
Population per square mile	0.00003 (0.00003)	-0.00003* (0.000008)	0.00002 (0.00001)	-0.00005 (0.00005)
Per capita income	0.00005* (0.00001)	-0.00001* (0.000005)	0.00004* (0.00001)	0.0002* (0.00003)
Fraction w/ bachelor's degree	5.4* (0.9)	-0.7* (0.34)	4.8* (0.47)	14.6* (1.4)
Fraction 25-44 years of age	19.4* (2.6)	3* (1.1)	14.9* (1.7)	4.4 (5.1)
Unemployment rate	-21* (2.4)	-3.9* (1)	1.2 (1.6)	-36.7* (7.3)
Crime index per 1,000 residents	-0.049* (0.007)	-0.006* (0.003)	0.018* (0.004)	-0.03* (0.01)
Assaults per 1,000 residents	-0.31* (0.06)	-0.07* (0.02)	0.09* (0.04)	-0.31* (0.09)
Burglaries per 1,000 residents	-0.34* (0.04)	-0.03* (0.018)	0.07* (0.02)	-0.2* (0.05)
Larcenies per 1,000 residents	-0.07* (0.01)	-0.007 (0.004)	0.03* (0.006)	-0.03 (0.03)
Auto thefts per 1,000 residents	-0.33* (0.05)	-0.03* (0.018)	0.07* (0.02)	-0.27* (0.06)
Robberies per 1,000 residents	-0.54* (0.1)	-0.1* (0.04)	0.23* (0.06)	-0.56* (0.17)
Primary and secondary education expenditures per capita	0.00003* (0.00002)	0.00001* (0.000007)	0.000004 (0.000007)	0.00004 (0.00003)
Fire protection expenditures per capita	0.0007* (0.0004)	0.0002 (0.0002)	0.0005* (0.0003)	0.0009 (0.0009)
Hospital expenditures per capita	0.00001 (0.00003)	-0.000004 (0.00001)	0.00002 (0.00002)	0.00001 (0.00007)
Highway expenditures per capita	0.0002 (0.0002)	0.0001* (0.00006)	0.00004 (0.00006)	0.0002 (0.0002)
Police protection expenditures per capita	0.0003* (0.0002)	0.00006 (0.00008)	0.0003* (0.0001)	0.0003 (0.0005)
Housing and community development expenditures per capita	0.0001 (0.001)	-0.001* (0.0004)	0.003* (0.001)	-0.0002 (0.005)
Public parking expenditures per capita	-0.01 (0.02)	0.005 (0.009)	0.02* (0.01)	-0.05 (0.04)
Water utilities expenditures per capita	0.00006 (0.0002)	0.0002* (0.0001)	-0.00002 (0.0001)	0.0003 (0.0003)
Electric power utilities expenditures per capita	-0.00007 (0.00006)	0.000003 (0.00002)	-0.00001 (0.00002)	0.00003 (0.00007)
Gas utilities expenditures per capita	-0.0002 (0.0003)	-0.00008 (0.00007)	0.00005 (0.00007)	0.0002 (0.0001)
Public transit utilities expenditures per capita	0.0007 (0.0007)	-0.0007* (0.0002)	0.002* (0.0006)	-0.0003 (0.003)
Sewerage and solid waste management expenditures per capita	0.0003 (0.0002)	0.00004 (0.00008)	0.0003* (0.0001)	0.0004 (0.0005)

Table 9B (cont'd)
Determinants of Business Growth: Industry-Specific Results

Characteristic	Retail Trade	Transportation and Warehousing	Information	Finance and Insurance
Property taxes per capita	0.00004* (0.00002)	0.00002* (0.00001)	0.000007 (0.00001)	0.00006 (0.00005)
Sales taxes per capita	0.00002 (0.0001)	0.00009 (0.00006)	-0.00002 (0.0001)	0.0002 (0.0004)
Individual income taxes per capita	0.0002 (0.0002)	-0.0002* (0.0001)	0.0003 (0.0002)	0.0002 (0.0008)
All businesses	-0.002* (0.0005)	-0.0004* (0.0002)	0.003* (0.0004)	0.002 (0.001)
All businesses per square mile	-0.0002 (0.0003)	-0.0004* (0.0001)	0.0008* (0.0003)	-0.003 (0.002)
Businesses in same industry	-0.02* (0.003)	-0.015 (0.02)	0.04* (0.02)	-0.02 (0.03)
Business in same industry per square mile	-0.004 (0.003)	-0.05* (0.01)	0.014* (0.008)	-0.02* (0.008)
All employment	-0.0001* (0.00003)	-0.00001 (0.00001)	0.0002* (0.00002)	0.00009 (0.00006)
All employment per square mile	-0.000014* (0.000008)	-0.00001* (0.000005)	0.00002* (0.00001)	-0.00007 (0.00008)
Employment in same industry	-0.001* (0.0002)	0.00006 (0.0002)	0.001* (0.0003)	-0.0008 (0.0009)
Employment in same industry per square mile	-0.0007* (0.0003)	-0.001* (0.0003)	0.00009 (0.00006)	-0.0004 (0.0003)

* denotes statistical significance (with respect to the hypothesis that the coefficient is equal to zero) at 10 percent or better. Heteroskedasticity-consistent standard errors are reported in parentheses.

higher levels of per capita income, and larger fractions of residents between 25 and 44 years of age. As with many of the industries already discussed, crime and unemployment appear to deter retail activity, as do existing levels of economic activity (employment and businesses). While retailers may, therefore, seek locations with large residential populations, they tend to avoid neighborhoods with large concentrations of commercial activity.

Among the government finance and expenditure variables, the statistically significant associations are all positive: property tax revenue, primary and secondary education expenditures, and police and fire protection expenditures. These results may suggest that retailers select locations in which government-provided services and infrastructure are relatively abundant.

The combined sector of transportation and warehousing includes business establishments engaged

in air, rail, water, truck transportation and storage. It seems that employers in this industry would have a high demand for land or empty space and would tend to locate in areas that are relatively uninhabited. This conclusion emerges clearly from the data. ZIP codes with greater amounts of existing employment and business activity, as well as higher population densities, tend to see fewer employers in this sector locate there over the next several years. Crime and unemployment appear to deter business growth in this particular industry, as do high levels of education and income (although not strongly).

The associations with the local government expenditure variables also largely suggest locations other than densely populated, relatively poor, downtown areas. Associations with public transit and public parking expenditures are negative; those with highways and water utilities expenditures are positive. The positive

Table 9C**Determinants of Business Growth: Industry-Specific Results**

Characteristic	Real Estate and Rental and Leasing	Professional, Scientific, Tech. Services	Management	Admin. Support and Waste Management
Population	0.00008* (0.000005)	0.0002* (0.00001)	0.000009 (0.000005)	-0.00003* (0.000006)
Population per square mile	0.00005* (0.00002)	0.00006* (0.00003)	-0.00002* (0.00001)	-0.0002* (0.00003)
Per capita income	0.00006* (0.00001)	0.0002* (0.00003)	0.00001 (0.00001)	-0.0001* (0.00001)
Fraction w/ bachelor's degree	6.3* (0.53)	25.1* (1.2)	1.4* (0.72)	-8.2* (0.61)
Fraction 25-44 years of age	8.9* (1.6)	32.4* (4)	-0.55 (2.1)	-3.1* (1.9)
Unemployment rate	-12.3* (1.4)	-29.2* (3.6)	-3.1* (1.8)	-8.8* (1.7)
Crime index per 1,000 residents	-0.008* (0.004)	0.01 (0.01)	-0.004 (0.006)	-0.05* (0.005)
Assaults per 1,000 residents	-0.1* (0.04)	-0.13 (0.09)	-0.06 (0.05)	-0.32* (0.05)
Burglaries per 1,000 residents	-0.08* (0.02)	-0.07 (0.05)	-0.02 (0.03)	-0.23* (0.03)
Larcenies per 1,000 residents	-0.003 (0.006)	0.05* (0.01)	0.0005 (0.01)	-0.07* (0.007)
Auto thefts per 1,000 residents	-0.1* (0.02)	-0.06 (0.06)	-0.05* (0.03)	-0.29* (0.03)
Robberies per 1,000 residents	-0.11* (0.06)	0.1 (0.14)	-0.14* (0.07)	-0.67* (0.07)
Primary and secondary education expenditures per capita	0.00002* (0.00001)	0.00005* (0.00003)	0.00004 (0.00004)	0.00006* (0.00001)
Fire protection expenditures per capita	0.0006* (0.0003)	0.002* (0.0007)	0.0007 (0.0006)	0.0002 (0.0003)
Hospital expenditures per capita	0.00002 (0.00004)	0.00007 (0.00007)	-0.00002 (0.00002)	0.000002 (0.00003)
Highway expenditures per capita	0.0002 (0.0001)	0.0004 (0.0002)	0.0003 (0.0003)	0.0003* (0.0001)
Police protection expenditures per capita	0.0003* (0.0001)	0.001* (0.0004)	0.0003 (0.0003)	0.00001 (0.0002)
Housing and community development expenditures per capita	0.001 (0.001)	0.007* (0.003)	-0.00008 (0.0005)	-0.007* (0.001)
Public parking expenditures per capita	-0.007 (0.01)	0.05* (0.03)	0.009 (0.02)	-0.03* (0.015)
Water utilities expenditures per capita	0.0001 (0.0001)	0.0006* (0.0003)	0.0003 (0.0004)	0.0005* (0.0002)
Electric power utilities expenditures per capita	-0.00002 (0.00006)	0.00004 (0.0001)	-0.00001 (0.00002)	0.0001* (0.00003)
Gas utilities expenditures per capita	0.00006 (0.0001)	0.0002 (0.0002)	-0.0009 (0.0006)	-0.00009 (0.0001)
Public transit utilities expenditures per capita	0.0005 (0.0006)	0.003* (0.002)	-0.0002 (0.0003)	-0.004* (0.0008)

Table 9C (cont'd)
Determinants of Business Growth: Industry-Specific Results

Characteristic	Real Estate and Rental and Leasing	Professional, Scientific, Tech. Services	Management	Admin. Support and Waste Management
Sewerage and solid waste management expenditures per capita	0.0004* (0.0002)	0.001* (0.0004)	0.0005 (0.0005)	0.00008 (0.0002)
Property taxes per capita	0.00003* (0.00001)	0.00008* (0.00004)	0.00005 (0.00005)	0.00008* (0.00002)
Sales taxes per capita	0.00005 (0.0001)	-0.00004 (0.0003)	0.0003 (0.0003)	0.0004* (0.0001)
Individual income taxes per capita	0.0003 (0.0003)	0.0009 (0.0006)	-0.0001 (0.0001)	-0.0006 (0.0004)
All businesses	0.002* (0.0004)	0.009* (0.001)	0.0003 (0.0004)	-0.006* (0.0003)
All businesses per square mile	-0.0002 (0.0003)	0.0006 (0.001)	-0.0001 (0.0001)	-0.002* (0.0005)
Businesses in same industry	0.01 (0.009)	0.04* (0.007)	0.12* (0.05)	-0.12* (0.01)
Business in same industry per square mile	-0.007 (0.006)	-0.002 (0.003)	-0.01 (0.02)	-0.04* (0.01)
All employment	0.00006* (0.00002)	0.0003* (0.00005)	0.00001 (0.00002)	-0.0003* (0.00002)
All employment per square mile	-0.00001 (0.000008)	-0.000008 (0.00002)	-0.000005 (0.000005)	-0.00007* (0.00003)
Employment in same industry	-0.0002 (0.0008)	0.001* (0.0004)	0.0002 (0.0004)	-0.002* (0.0002)
Employment in same industry per square mile	-0.0004 (0.0002)	-0.0002* (0.0001)	-0.00003 (0.00005)	-0.0008* (0.0002)

* denotes statistical significance (with respect to the hypothesis that the coefficient is equal to zero) at 10 percent or better. Heteroskedasticity-consistent standard errors are reported in parentheses.

association with property tax revenue per capita may also suggest that more-suburban locations are desired by producers in this industry.

Information is a fairly heterogeneous industry, including a number of activities ranging from publishing to television and radio broadcasting to information services and data processing. This industry shows a very different pattern of location than the industries considered thus far.

To begin, businesses in this industry tend to locate in neighborhoods with large amounts of existing activity: population, employment, total number of businesses as well as number of businesses within the information industry. In addition, there are strong positive associations between employment and business density (i.e., numbers per square mile) and the growth

of information-based firms. These results suggest that neighborhoods in economically active areas are particularly important for this type of business. Moreover, the associations with crime rates, housing and community development expenditures, public transit expenditures and public parking expenditures are all positive, and the association with the unemployment rate is insignificant, suggesting that this industry may tend to locate in downtown areas.

It is important to note that the positive associations with many of the crime rates should not be interpreted as indicating that crime attracts producers in this industry. Rather, it most likely reflects a positive association between crime and some characteristics that information-based firms desire (e.g., large numbers of workers and businesses nearby). At the same

Table 9D**Determinants of Business Growth: Industry-Specific Results**

Characteristic	Educational Services	Health Care, Social Assistance	Arts, Entertainment, Recreation	Accommodation and Food Services
Population	0.00002* (0.000002)	0.0002* (0.00001)	0.000001 (0.000003)	0.00006* (0.000006)
Population per square mile	0.00001 (0.00001)	0.0001* (0.00002)	0.00005* (0.00002)	0.00008* (0.00003)
Per capita income	0.000003 (0.000004)	0.00007* (0.00001)	0.00003* (0.00001)	0.00006* (0.00001)
Fraction w/ bachelor's degree	1.4* (0.2)	7.9* (0.7)	2.7* (0.35)	6.9* (0.5)
Fraction 25-44 years of age	2.3* (0.6)	7.9* (1.8)	5.4* (1.2)	16.3* (1.7)
Unemployment rate	-0.8 (0.6)	-14.9* (1.7)	-1.4 (0.9)	-11.7* (1.5)
Crime index per 1,000 residents	0.001 (0.002)	0.008 (0.005)	0.0005 (0.002)	-0.005 (0.005)
Assaults per 1,000 residents	0.012 (0.018)	0.035 (0.05)	0.05* (0.02)	-0.04 (0.05)
Burglaries per 1,000 residents	0.004 (0.01)	-0.007 (0.03)	-0.008 (0.01)	-0.08* (0.03)
Larcenies per 1,000 residents	0.003 (0.004)	0.025* (0.009)	-0.002 (0.003)	-0.004 (0.007)
Auto thefts per 1,000 residents	0.006 (0.01)	-0.019 (0.0346)	0.002 (0.01)	-0.03 (0.03)
Robberies per 1,000 residents	0.023 (0.026)	0.12 (0.08)	0.07* (0.03)	0.08 (0.07)
Primary and secondary education expenditures per capita	0.0000001 (0.000005)	0.00002 (0.00001)	-0.000002 (0.000005)	-0.0000004 (0.00001)
Fire protection expenditures per capita	0.0001 (0.0001)	0.0009* (0.0003)	0.0004* (0.0002)	0.0006* (0.0003)
Hospital expenditures per capita	-0.000002 (0.00001)	-0.00001 (0.00003)	0.00001 (0.00002)	0.00005* (0.00003)
Highway expenditures per capita	0.00001 (0.00005)	0.0001 (0.0001)	0.00005 (0.00006)	0.0001 (0.0001)
Police protection expenditures per capita	0.00006 (0.00006)	0.0004* (0.0001)	0.0001* (0.00008)	0.0001 (0.0001)
Housing and community development expenditures per capita	0.0007* (0.0004)	0.002* (0.0008)	0.003* (0.001)	0.002 (0.002)
Public parking expenditures per capita	0.002 (0.006)	0.02 (0.02)	0.006 (0.006)	0.02 (0.01)
Water utilities expenditures per capita	-0.00003 (0.00008)	0.0002 (0.0002)	-0.0001 (0.0001)	0.00004 (0.0002)
Electric power utilities expenditures per capita	-0.00004* (0.00002)	-0.00004 (0.00004)	-0.00002 (0.00002)	0.00006 (0.00004)
Gas utilities expenditures per capita	-0.00009 (0.0002)	0.00005 (0.0003)	-0.0002 (0.0002)	-0.0001 (0.0002)
Public transit utilities expenditures per capita	0.0004* (0.0002)	0.001* (0.0005)	0.002* (0.0005)	0.002 (0.001)
Sewerage and solid waste management expenditures per capita	0.0001 (0.0001)	0.0005* (0.0002)	0.0002* (0.0001)	0.0002 (0.0002)

Table 9D (cont'd)
Determinants of Business Growth: Industry-Specific Results

Characteristic	Educational Services	Health Care, Social Assistance	Arts, Entertainment, Recreation	Accommodation and Food Services
Property taxes per capita	0.0000003 (0.000007)	0.00003 (0.00002)	-0.00001 (0.00001)	-0.000001 (0.00001)
Sales taxes per capita	-0.00002 (0.00004)	0.00005 (0.0001)	-0.0002* (0.00007)	-0.0002 (0.0001)
Individual income taxes per capita	0.0001 (0.0001)	0.0002 (0.0002)	0.0003* (0.0002)	0.0004 (0.0003)
All businesses	0.0005* (0.0001)	0.004* (0.00003)	0.0009* (0.0003)	0.001* (0.0005)
All businesses per square mile	-0.00002 (0.00009)	-0.00008 (0.0002)	0.0003 (0.0002)	0.0004 (0.0004)
Businesses in same industry	-0.01 (0.01)	0.03* (0.003)	0.07* (0.03)	0.001 (0.007)
Business in same industry per square mile	-0.01 (0.01)	-0.003 (0.004)	0.02 (0.02)	0.004 (0.01)
All employment	0.00002* (0.000006)	0.0001* (0.00002)	0.00002* (0.00001)	0.00008* (0.00002)
All employment per square mile	-0.000002 (0.000003)	-0.00001* (0.000004)	0.000004 (0.000006)	0.00002 (0.00001)
Employment in same industry	0.0003* (0.0001)	0.0005* (0.0001)	0.001* (0.0006)	0.0002 (0.0002)
Employment in same industry per square mile	0.0002 (0.0002)	-0.0002 (0.0001)	0.0001 (0.0002)	0.0002 (0.0003)

* denotes statistical significance (with respect to the hypothesis that the coefficient is equal to zero) at 10 percent or better. Heteroskedasticity-consistent standard errors are reported in parentheses.

time, the growth of businesses in this industry also tends to be greater in neighborhoods with larger fractions of the population who are between 25 and 44 years of age and possess a bachelor's degree.

Finance and insurance encompasses banks and other financial institutions, investment-related institutions (e.g., mutual funds) and insurance providers. The growth of businesses in this sector only shows significant associations with a few characteristics: population, per capita income, education, crime and the number of existing finance and insurance businesses per square mile. In particular, more populous areas with higher income, more college graduates and less crime tend to see faster growth in this sector. ZIP codes with lower densities of existing businesses in this industry also see somewhat faster growth over time. These results suggest that these business establishments tend

to locate in suburban neighborhoods with large numbers of highly educated, financially well-off residents.

The next sector, real estate and rental and leasing, includes real estate agents, brokers, appraisers, lessors, property managers and consumer-goods rental establishments (e.g., cars, equipment, videos). The estimated associations show that employers in this sector tend to locate in ZIP codes with large amounts of both residential and economic activity. Population, population per square mile, employment and total numbers of businesses all correlate positively and significantly with the number of new business establishments created over the next four years. Evidently, businesses in real estate and in rental and leasing services tend to thrive in neighborhoods with large amounts of existing activity.

Moreover, the positive associations between business growth in this industry and the college-completion fraction, per capita income, primary and secondary education expenditures, and property taxes—along with the negative associations with the unemployment rate and many of the crime indicators—suggest that employers in this industry avoid downtown locales.

The next category of employers—professional, scientific and technical services—covers establishments engaged in (among other things) legal services, accounting, engineering and architectural services, computer systems design, consulting and research.

Two neighborhood-level characteristics that show especially strong associations with the growth of businesses in this sector are the fraction of population with a bachelor's degree or more and the fraction between 25 and 44 years of age. To the extent that the majority of workers in these industries are relatively young and highly educated, this pattern would be consistent with the idea that employers engaged in professional, scientific and technical services seek locations where workers or potential workers reside.

In addition, this sector grows in neighborhoods with large amounts of either residential or business activity. Higher population, population density, employment and numbers of businesses—both overall and just within the same industry—all contribute to greater numbers of newly created establishments over the next few years, whereas the unemployment rate contributes negatively.

Interestingly, while many of the public expenditure and taxation variables also show significantly positive associations with business growth in this industry (e.g., primary and secondary education, police and fire protection, water utilities, public transit, public parking), there is little association with crime. None of the crime rates shows a statistically important negative association with the expansion of business in this industry, suggesting that business activity in the professional, scientific and technical services is not strongly deterred by criminal activity.

The management sector refers to establishments that serve as the headquarters for companies. There are actually very few characteristics in Table 9C that show much association with these types of businesses, suggesting that there is no readily discernible pattern of location.

Management-related establishments do seem to locate in ZIP codes with highly educated residents, although the association is small in magnitude. Similarly, higher rates of joblessness and two of the crime categories, auto thefts and robberies, correlate negatively with the growth of these types of businesses. However, compared to the association of these variables with those estimated for some of the other industries (e.g., construction, manufacturing, finance and insurance), the magnitudes are small.

One variable that is significant is the number of businesses in the same industry. That is, much as with the professional, technical and scientific services, there appears to be a localization effect describing the growth of management-related establishments. This particular industry seems to cluster its activities, although the characteristics of the neighborhoods in which those clusters form evidently vary a great deal.

Administrative support and waste management includes businesses such as temporary help agencies and call centers as well as employers providing security, janitorial, landscaping and waste disposal services.

These types of establishments resemble construction and wholesale trade in terms of their location patterns. In particular, ZIP codes with large amounts of existing residential and commercial activity, measured either by employment or businesses, as well as higher per capita incomes and more educated residents, see slower growth of these establishments. Moreover, the strong negative association with crime rates and public expenditures on housing and community development, parking and public transit suggest that administrative support and waste management businesses locate on the outskirts of metropolitan areas rather than core areas.

The category of educational services includes primary and secondary schools, colleges and

universities, technical and trade schools, and music and art schools. Much as with the management sector described above, employers in this industry do not show a particularly clear pattern with respect to their location decisions within a metropolitan area. There is some indication that educational institutions tend to locate in ZIP codes with large resident populations, high proportions of college graduates and people between 25 and 44 years of age, as well as ZIP codes with larger amounts of economic activity (businesses and employment). However, none of these associations is especially strong. Indeed, given that rates of crime and joblessness do not appear to be related to the growth of educational institutions, this sector seems rather flexible with respect to its location in a metro area.

Health care and social assistance refers to hospitals, nursing care facilities, child and youth services, community food and housing services (e.g., shelters), and vocational rehabilitation. Overwhelmingly, business establishments in this broad sector locate in ZIP codes with large amounts of residential and economic activity. Population, population density, employment and the total number of businesses—either within the health care sector or otherwise—all show strong, positive associations with expansion of business activity in this industry. While some of the remaining associations suggest that reasonably well-off areas attract health care establishments—the associations with education are positive, the unemployment rate is negative—others indicate that the pattern is not that simple. Indeed, none of the crime rates show significantly negative associations with business growth. Moreover, the positive association between growth and local government expenditures per capita on police protection, fire protection, housing and community development, and public transit suggest that health care establishments locate in a diverse set of environments.

The arts, entertainment and recreation industry encompasses performing arts, museums, spectator sports, amusement parks, casinos and bowling alleys.

As one might expect, these types of businesses tend to accumulate in ZIP codes with higher

levels of per capita income as well as greater numbers of relatively young and educated residents. They also locate in areas with large numbers of other businesses nearby.

The associations between the change in the number of business establishments between 1998 and 2002 and total employment and the total number of businesses (either within the arts, entertainment and recreation sector or not) are strongly positive. Such findings suggest that these types of businesses have a preference for large, dense, downtown areas. This conclusion is also supported by the fact that none of the crime rates, nor the unemployment rate, shows significantly negative associations with the growth of this sector.

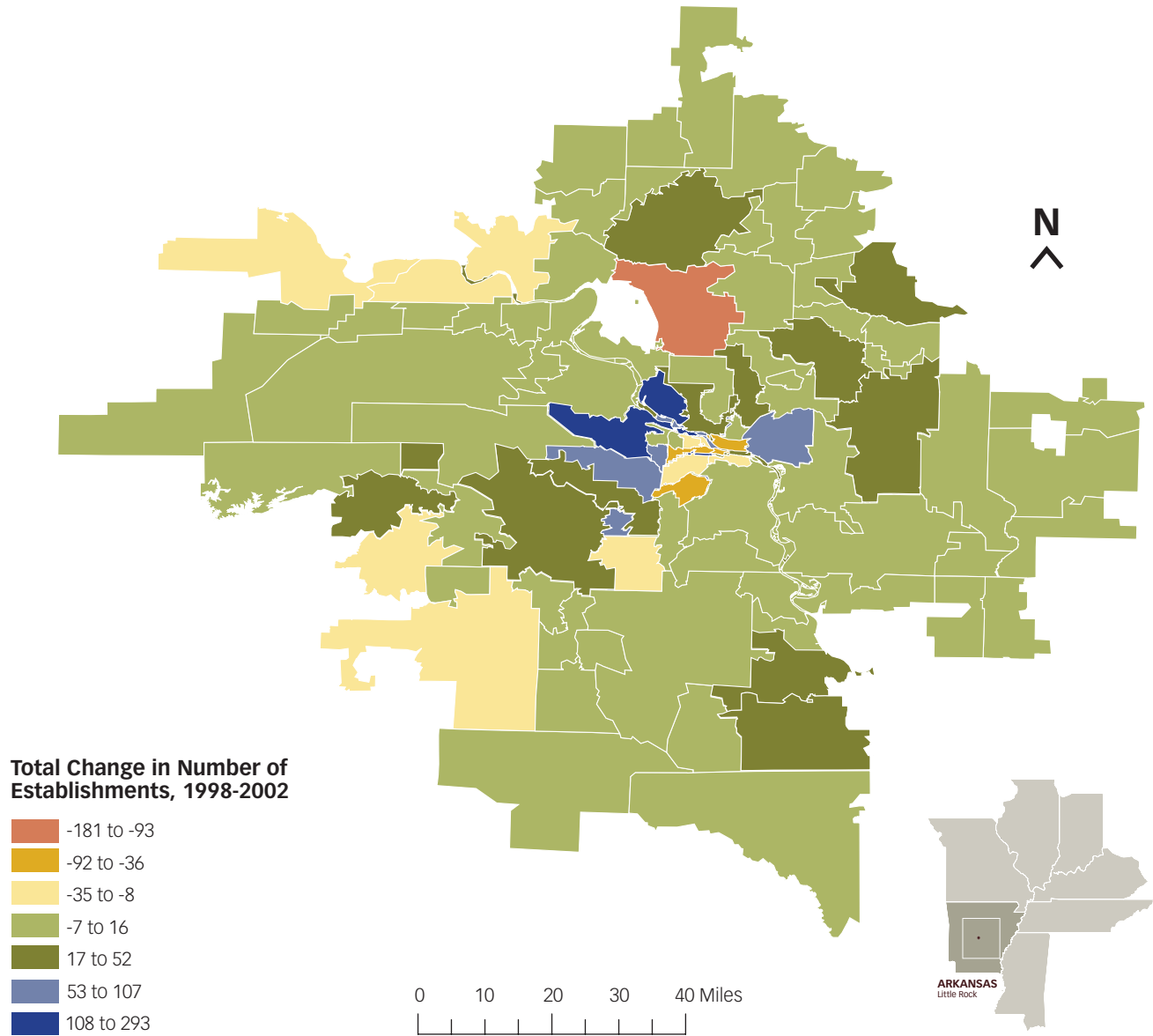
In addition, two likely indicators of a downtown locale—expenditures on public transit and for housing and community development—show positive associations with the growth of these types of businesses.

The final sector, accommodation and food services, covers hotels, motels, bars and restaurants. These types of establishments evidently gravitate toward areas with strong demand: high population (both in terms of raw levels and in terms of residents per square mile), high employment, high per capita income, large fractions of college-educated and relatively young residents, and low rates of unemployment. Associations with crime rates are largely insignificant, although most are negative, and one—the association with the number of burglaries—is statistically important. These correlations do not imply that crime is a strong deterrent for these types of businesses, although they do suggest that the growth of hotels and restaurants would likely benefit from reduced rates of crime locally.

A Look at Four Metro Areas in the Federal Reserve's Eighth District

We now turn our attention to the recent experiences of four metropolitan areas within the

Figure 1
 Little Rock Total Change in Number of Establishments, 1998–2002



Source: U.S. Census Bureau, ZIP Code Business Patterns

Federal Reserve’s Eighth District: Little Rock, Louisville, Memphis and St. Louis.

Little Rock

Between 1998 and 2002, the typical ZIP code in Little Rock saw its total number of business establishments increase by 10.25, but ZIP-code-level changes in the number of establish-

ments ranged between -120 and 136. Figure 1 provides a map of Little Rock to offer some insight into where, from a purely geographic perspective, this growth took place. From it, we see a pattern that turns out to be quite common among metropolitan areas over this time period: ZIP codes within the central part of the metro area tended to lose establishments; the areas lying just beyond those central ZIP

Table 10A
Summary Characteristics of ZIP Codes in Little Rock
by Establishment Growth Quartile

Variable	Mean of Bottom Quartile	Mean of Second Quartile	Mean of Third Quartile	Mean of Top Quartile
Change in the number of establishments, 1998-2002	-32.5	0.9	8.9	61.2
Population	15,771.8	4,485.6	7,663	16,288.9
Employment	9,917.4	689.7	3,109.1	5,364.5
Business establishments	495.9	65.7	186.4	384.6
Land area (square miles)	63.5	90.9	46.8	79.3
Per capita income	18,083.8	17,092.4	20,791.1	21,363.6
Fraction w/ bachelor's degree	0.198	0.1	0.205	0.241
Fraction 25-44 years of age	0.33	0.28	0.286	0.321
Unemployment rate	0.085	0.043	0.038	0.033
Crime index per 1,000 residents	56.6	27.8	53.2	60.2
Assaults per 1,000 residents	4	1.7	3.2	3.7
Burglaries per 1,000 residents	9.7	4.9	8.4	9.9
Larcenies per 1,000 residents	36.6	18.3	36.2	40.3
Auto thefts per 1,000 residents	4.4	2.4	3.9	4.5
Robberies per 1,000 residents	1.3	0.3	1	1.3
Primary and secondary education expenditures per capita	1,233.9	1,221.6	1,133.8	1,116.4
Fire protection expenditures per capita	70.9	31.2	69.4	86
Hospital expenditures per capita	203.3	203.3	203.3	203.3
Highway expenditures per capita	109.5	125.6	105.5	108.2
Police protection expenditures per capita	149.1	86.7	139.8	160.1
Housing and community development expenditures per capita	84.2	56	65.3	77.7
Public parking expenditures per capita	2.8	2.8	2.8	2.8
Water utilities expenditures per capita	123.5	76.1	121	134.8
Electric power utilities expenditures per capita	160.6	204.3	218.8	178.3
Gas utilities expenditures per capita	--	--	--	--
Public transit utilities expenditures per capita	30.3	30.3	29.8	29.7
Sewerage and solid waste management expenditures per capita	145.2	75.7	142.2	148.5
Property taxes per capita	264	171.5	241.4	272
Sales taxes per capita	228.6	129.5	228.3	236.4
Individual income taxes per capita	--	--	--	--

Table 10B**Average Change in Number of Business Establishments in Little Rock by Industry and Establishment Growth Quartile**

Industry	Mean of Bottom Quartile	Mean of Second Quartile	Mean of Third Quartile	Mean of Top Quartile
Utilities	0.7	0	1	0
Construction	-2.9	1.7	0.5	7.1
Manufacturing	-3.8	-0.4	-0.6	1.3
Wholesale trade	-4.9	0.6	0.7	3.1
Retail trade	-6.2	-1.6	-1.6	6.5
Transportation and warehousing	-0.08	0	1	0.6
Information	2.9	-1.3	0	1.2
Finance and insurance	0.5	-0.6	3.1	5.3
Real estate, and rental and leasing	-0.4	0.5	1.6	3.7
Professional, scientific and technical services	1.8	2.3	4.8	6.2
Management	0.8	0	-0.3	0.7
Admin. support and waste management	-4.6	-1.4	0	3.1
Educational services	-0.4	-1	-0.8	0.2
Health care and social assistance	-8	2	2.5	8.9
Arts, entertainment and recreation	-1.2	0.3	-0.6	1
Food and accommodation services	-2.9	-0.2	-0.44	4.7

codes grew rapidly; and the far outer fringes grew at rates somewhere between these two.

To get a better sense of the differences between the neighborhoods that accumulated business activity and those that lost it, consider Table 10A. It shows the average values for a number of basic characteristics taken across ZIP codes in four categories: the bottom 25 percent of growers (the bottom quartile), the 25th to 50th percentiles (the second quartile) of growers, the 50th to 75th percentiles (the third quartile) of growers, and the fastest 25 percent of growers (the top quartile).

In Little Rock, ZIP codes in the bottom quartile suffered an average loss of 32.5 business establishments between 1998 and 2002, whereas the average changes among the next three quartiles were increases of, respectively, 0.9, 8.9 and 61.2 establishments. What is most evident from the statistics in the table is that the top and bottom quartiles (i.e., the fastest-

and slowest-growing ZIP codes) tend to be relatively large in terms of population and employment, whereas the middle quartiles tend to be much smaller. ZIP codes in the middle quartiles average populations between 4,000 and 8,000, whereas the top and bottom quartiles have populations in excess of 15,000 on average. Neighborhoods with high levels of existing activity, therefore, have either accumulated or lost the most economic activity in Little Rock.

As one might expect from the fact that the middle two quartiles are somewhat smaller in population, employment and business activity, crime rates and unemployment rates also tend to be lower. These features may account for the superior growth performance of these ZIP codes when compared with those in the bottom quartile.

What are the advantages of ZIP codes in the top quartile? Although crime rates are the

highest among the four categories in the table, the fastest-growing ZIP codes have the highest per capita incomes, the greatest concentration of college graduates and the lowest rates of unemployment. These features, again, are strongly positively associated with the growth of businesses in a number of different sectors.

Some information about the types of businesses that either entered or left each of the four quartiles is provided in Table 10B. Although the results do not correspond perfectly to those established above regarding industry-specific location patterns, many are quite intuitive. Industries like construction, manufacturing, wholesale trade, retail trade, and administrative support and waste management exhibited large losses in the bottom quartile of ZIP codes. These industries, again, tend to avoid neighborhoods with large populations and current economic activity as well as with high rates of crime and unemployment. Many of these characteristics are present in the bottom quartile of ZIP codes in Little Rock.

At the same time, most of these industries expanded in the top quartile of ZIP codes, which, although similar to the bottom quartile in terms of raw size and rates of crime, tend to be more residential than commercial (i.e., greater population, smaller employment) and more suburban (i.e., larger land area), which tends to attract retail trade as well as wholesalers and construction companies. In addition, as mentioned previously, the top quartile also has higher levels of income and education and substantially lower levels of unemployment, which helps explain why the fastest-growing neighborhoods added businesses in finance and insurance; professional, scientific and technical services; health care and social assistance; and accommodation and food services. The information sector exhibited growth among both the bottom and top quartiles. This result is rather intuitive in light of the results from Table 9B, which indicate that this industry gravitates toward neighborhoods with high levels of activity (population, employment, businesses) and is not significantly deterred by crime or unemployment.

Louisville

On average, ZIP codes in Louisville gained 5.8 establishments between 1998 and 2002. The range, however, extended from -125 to 146. In terms of the average growth by quartile, the bottom 25 percent of ZIP codes lost 30.5 establishments during this time period, whereas the next three quartiles witnessed changes of -1.2, 4.1 and 47.1 businesses.

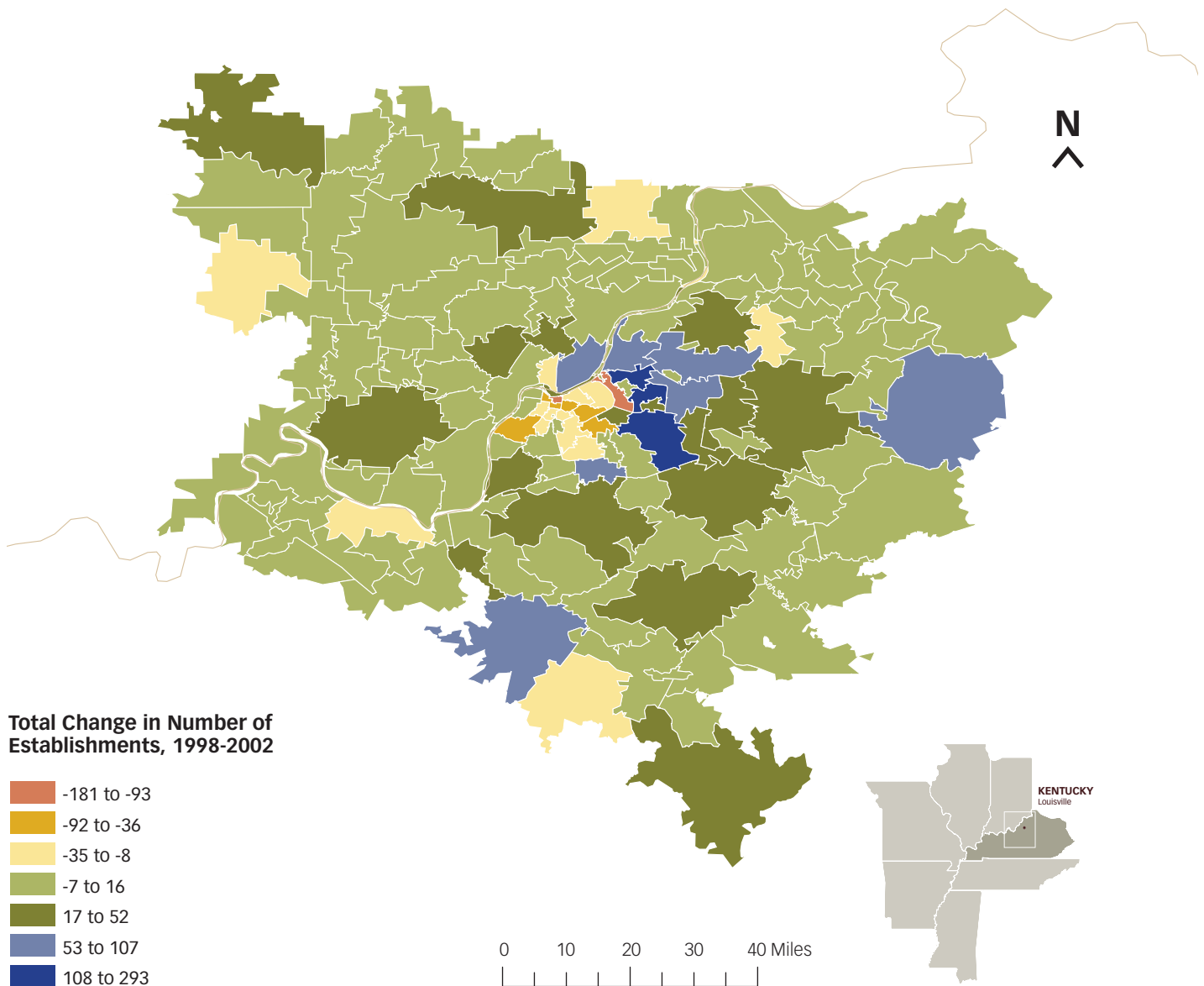
The map of Louisville shows the geographic pattern of business growth between 1998 and 2002 (Figure 2). As with Little Rock, ZIP codes near the central part of the metropolitan area lost the greatest numbers of establishments. The largest gains were seen in the ZIP codes on the immediate outskirts of this central area, especially to the east.

The characteristics describing ZIP codes in each of these quartiles appear in Table 11A. From them, it is apparent that the basic features describing Louisville's fast-growing and slow-growing ZIP codes closely resemble those of Little Rock. In particular, the bottom quartile consists of neighborhoods that tend to be large in terms of population, but especially with respect to existing economic activity (businesses and employment). Given that ZIP codes cover relatively small amounts of land area, these neighborhoods are also dense. In addition, they have high rates of crime and unemployment (on average 6.6 percent), and exhibit somewhat smaller levels of local government spending on items such as education and highways.

The middle quartiles, by contrast, possess significantly less residential and commercial activity; and, at the same time, are spread out over larger amounts of land. They also tend to have much less educated populations and lower levels of income per capita, but also lower rates of crime and joblessness.

Much like the bottom quartile, the top quartile of growers consists of ZIP codes with high levels of both residential and commercial activity, although here the emphasis lies with the former rather than the latter. Just as with Little Rock, the fast growers are more residentially oriented than commercially oriented. These

Figure 2
 Louisville Total Change in Number of Establishments, 1998–2002



Source: U.S. Census Bureau, ZIP Code Business Patterns

neighborhoods also tend to encompass large amounts of land area and, so, have lower densities than neighborhoods in the bottom quartile. Although in Louisville the top quartile also exhibits relatively high crime rates, it also has the highest level of per capita income, the largest fraction of college graduates in the population and the lowest rates of unemployment (on average, 3.2 percent).

A breakdown of business growth by industry for Louisville appears in Table 11B. The patterns here also mirror those seen in Little Rock. The bottom quartile of ZIP codes saw large losses among those sectors that tend to gravitate toward relatively suburban locations: construction, wholesale trade, retail trade, and administrative support and waste management. Within the top quartile of ZIP codes, the

Table 11A
Summary Characteristics of ZIP Codes in Louisville
by Establishment Growth Quartile

Variable	Mean of Bottom Quartile	Mean of Second Quartile	Mean of Third Quartile	Mean of Top Quartile
Change in number of establishments 1998-2002	-30.5	-1.2	4.1	47.1
Population	16,464.8	4,664.5	5,420.4	17,996.9
Employment	10,964.1	1,276.8	1,266.5	6,384.2
Business establishments	521.1	82.8	97.7	430.7
Land area (square miles)	20.6	33.9	38.4	57.4
Per capita income	19,977.8	16,392.9	19,811.2	24,299.7
Fraction w/ bachelor's degree	0.185	0.093	0.141	0.247
Fraction 25-44 years of age	0.308	0.301	0.304	0.315
Unemployment rate	0.066	0.055	0.04	0.032
Crime index per 1,000 residents	44.8	31.9	38.4	44
Assaults per 1,000 residents	4.6	2.2	2.7	3.7
Burglaries per 1,000 residents	8.6	5.7	6.7	8.4
Larcenies per 1,000 residents	24.3	19.9	24.8	25.5
Auto thefts per 1,000 residents	5	3	3.1	4.5
Robberies per 1,000 residents	2	0.8	0.8	1.6
Primary and secondary education expenditures per capita	1,124	1,841.6	1,659.5	1,238.5
Fire protection expenditures per capita	110.4	68.6	70.8	98.4
Hospital expenditures per capita	797.3	1,077.2	1,029.3	907.1
Highway expenditures per capita	75.3	157.9	131.2	88.5
Police protection expenditures per capita	180.9	105.3	101.9	150
Housing and community development expenditures per capita	115.8	60.6	56.7	99.4
Public parking expenditures per capita	11.9	12	6.4	10.1
Water utilities expenditures per capita	162.3	100.8	74.5	120.6
Electric power utilities expenditures per capita	--	204.4	--	--
Gas utilities expenditures per capita	--	--	--	--
Public transit utilities expenditures per capita	83.4	83.9	83.9	83.9
Sewerage and solid waste management expenditures per capita	347.7	198.1	168.1	281.1
Property taxes per capita	650.1	945	920.1	700
Sales taxes per capita	--	--	--	--
Individual income taxes per capita	485.5	207	125.8	347.6

Table 11B
Average Change in Number of Business Establishments in Louisville
by Industry and Establishment Growth Quartile

Industry	Mean of Bottom Quartile	Mean of Second Quartile	Mean of Third Quartile	Mean of Top Quartile
Utilities	-0.2	-0.3	0.4	0.08
Construction	-7.8	-1.2	-0.8	6.6
Manufacturing	-2.7	-0.06	0.1	-0.4
Wholesale trade	-6.5	-0.14	0.05	-1.7
Retail trade	-6.2	0.17	0.16	2.2
Transportation and warehousing	-0.6	1.2	-0.1	1.2
Information	0.6	-0.1	0	1.4
Finance and insurance	0.2	0.2	1.3	7.9
Real estate, and rental and leasing	0.25	0.9	1.2	3.7
Professional, scientific and technical services	-1.7	0.4	1.6	8.4
Management	-1.2	-0.2	1.5	2.2
Admin. support and waste management	-4.7	-0.8	0.05	3.2
Educational services	0.4	0	0.3	1.1
Health care and social assistance	1.4	1.1	3	6.3
Arts, entertainment and recreation	0.3	0.4	-0.3	0.2
Food and accommodation services	-1	0	0	4.3

largest gains in the number of business establishments were among finance and insurance; professional, scientific and technical services; and health care and social assistance. All of these businesses tend to flock toward neighborhoods with large numbers of college graduates and low rates of unemployment. They also (at least in the case of professional services and health care) tend not to be strongly deterred by crime.

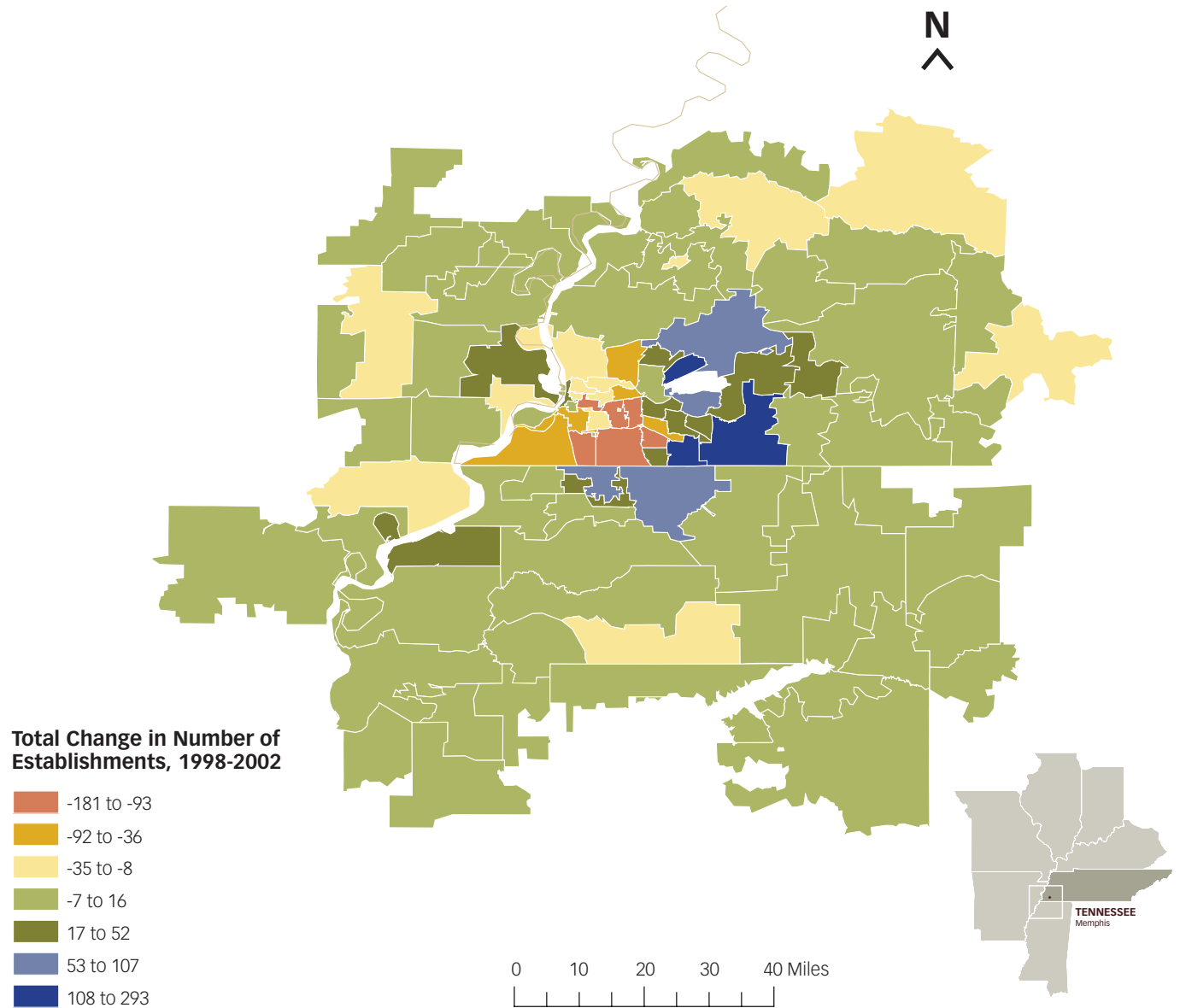
Memphis

Neighborhoods in Memphis showed the slowest average growth in the number of business establishments between 1998 and 2002. The average across the 73 ZIP codes in the Memphis sample was only 0.34. Again, however, this statistic hides the fact that changes ranged from a loss of 181 businesses to a gain of 237. The map of Memphis in Figure 3 shows the same basic pattern of business growth that we have

already seen in the other two metropolitan areas: large declines in the central part of the metro area; large increases immediately beyond the central area; moderate growth in the remaining (primarily outermost) fringes.

Across the four quartiles, the average change in the number of businesses is quite varied (Table 12A). Among the slowest-growing ZIP codes, the typical change between 1998 and 2002 was a loss of 70 establishments. For the next three quartiles, the average changes were -4.6, 7.7 and 64.7. The basic pattern seen for both Little Rock and Louisville occurs here, too. The slowest-growing 25 percent of ZIP codes tends to have the characteristics of downtown areas: high population, high employment (commuters) and business activity levels; small land areas; high rates of crime and unemployment (among residents in the area); and modest levels of income and education, which likely reflects a heterogeneous resident population.

Figure 3
 Memphis Total Change in Number of Establishments, 1998–2002



Source: U.S. Census Bureau, ZIP Code Business Patterns

The two middle quartiles, by comparison, are again much smaller. Population and employment levels are less than a third of the size of the bottom quartile's values. ZIP codes in the middle quartiles are also much larger in terms of land area, possess lower incomes and have substantially lower rates of college completion, unemployment and crime. This information suggests that these are neighborhoods on the

outskirts of the metropolitan area.

Based on population, employment and the number of businesses, the fastest-growing 25 percent of ZIP codes tends to fall between the bottom quartile and the middle two. Average population and employment are relatively large, but not as large as the slowest growing ZIP codes. Crime rates also lie between those at

Table 12A
Summary Characteristics of ZIP Codes in Memphis
by Establishment Growth Quartile

Variable	Mean of Bottom Quartile	Mean of Second Quartile	Mean of Third Quartile	Mean of Top Quartile
Change in number of establishments 1998-2002	-70	-4.6	7.7	64.7
Population	30,421.2	8,522.3	8,558.8	18,390.9
Employment	13,915.8	2,018.7	2,227.9	9010
Business establishments	633.6	138.1	152.3	436.3
Land area (square miles)	23	101.9	85.5	37.3
Per capita income	17,416.8	14,444.9	15,069	27,444
Fraction w/ bachelor's degree	0.184	0.099	0.089	0.318
Fraction 25-44 years of age	0.325	0.272	0.284	0.332
Unemployment rate	0.113	0.064	0.073	0.029
Crime index per 1,000 residents	74.6	48.7	50.5	63.6
Assaults per 1,000 residents	5.6	4.8	4.6	5.6
Burglaries per 1,000 residents	18.2	11.3	12.2	14.7
Larcenies per 1,000 residents	35.4	25.2	25.8	31.3
Auto thefts per 1,000 residents	10.2	5.1	5.5	8.1
Robberies per 1,000 residents	4.5	1.7	1.9	3.2
Primary and secondary education expenditures per capita	1,437.8	1,276.7	1,492.8	1,955.2
Fire protection expenditures per capita	142.6	63.5	74.3	143.5
Hospital expenditures per capita	347.5	347.5	347.5	347.5
Highway expenditures per capita	77.3	151.3	145.8	209.6
Police protection expenditures per capita	279.1	161.6	177.7	313.2
Housing and community development expenditures per capita	152.9	51.9	84.4	104.2
Public parking expenditures per capita	0.2	0.2	0.2	0.2
Water utilities expenditures per capita	117.7	74.6	92.4	127
Electric power utilities expenditures per capita	892.1	768.3	640.1	841.3
Gas utilities expenditures per capita	398	203.9	201	365.7
Public transit utilities expenditures per capita	64.5	64.5	64.5	64.5
Sewerage and solid waste management expenditures per capita	103.6	86.9	106.9	123
Property taxes per capita	1,058	555.5	740.6	1146
Sales taxes per capita	319.3	211.8	210.9	354.3
Individual income taxes per capita	--	--	--	--

Table 12B**Average Change in Number of Business Establishments in Memphis by Industry and Establishment Growth Quartile**

Industry	Mean of Bottom Quartile	Mean of Second Quartile	Mean of Third Quartile	Mean of Top Quartile
Utilities	0	0	-0.2	0
Construction	-7.3	-3.1	-0.6	0.6
Manufacturing	-4.6	-0.7	0.6	0
Wholesale trade	-11.9	0.2	0.36	0.9
Retail trade	-16.1	-1.3	-0.06	9.9
Transportation and warehousing	-2.4	-0.7	0.46	16.4
Information	0.6	-0.75	1.4	3.5
Finance and insurance	-3.5	1	-1.1	6.2
Real estate, and rental and leasing	-0.05	0.2	1.4	3.4
Professional, scientific and technical services	-0.7	-0.3	1	7.2
Management	-4.8	1	4.5	0.5
Admin. support and waste management	-5	-0.4	0.4	-1.2
Educational services	-0.5	0.2	-0.5	1.3
Health care and social assistance	-6.7	4	2	4.5
Arts, entertainment and recreation	-0.9	-0.4	-1.3	1.1
Food and accommodation services	0.2	-0.9	0.5	8.4

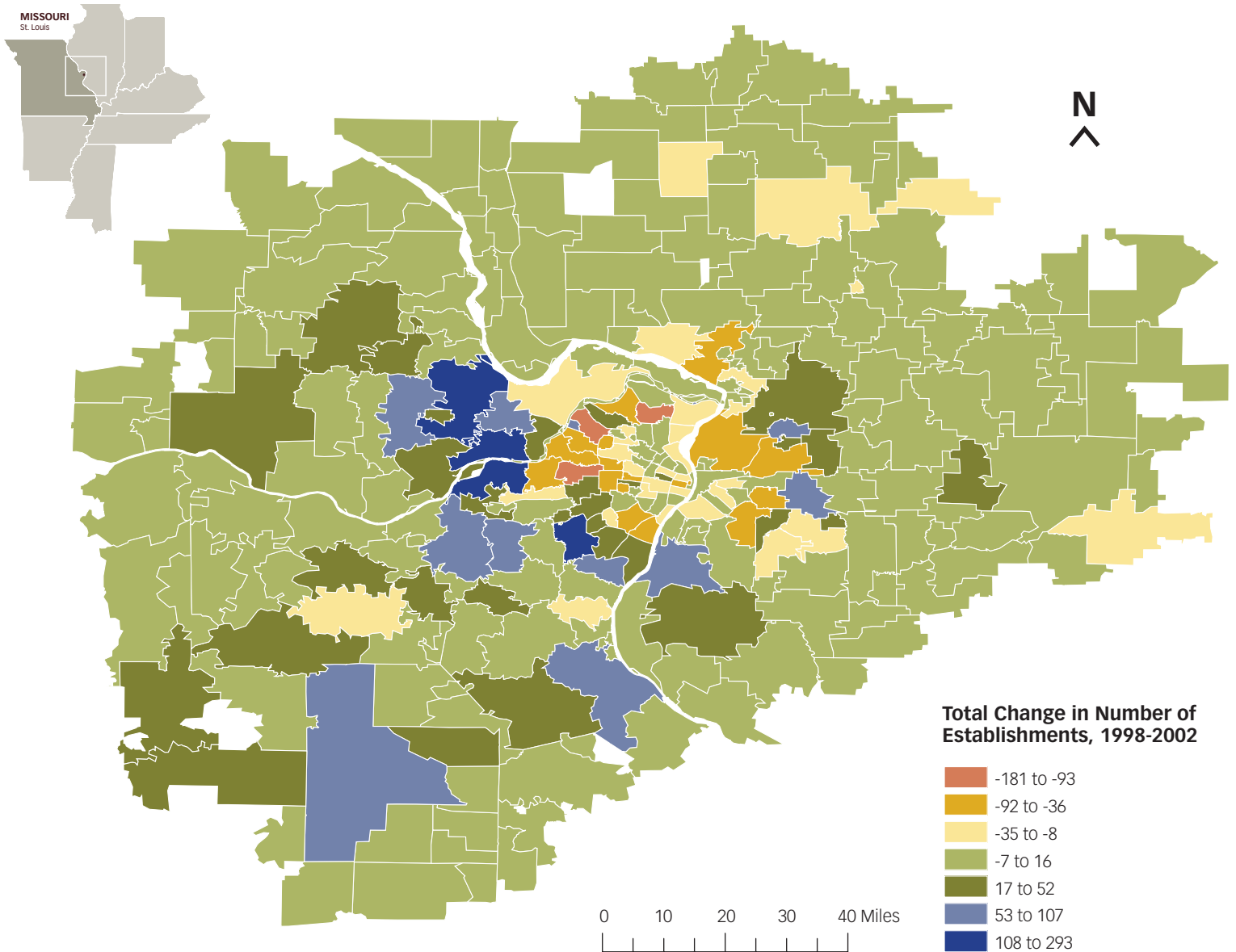
the bottom and those of the middle quartiles, but what really distinguishes the top quartile in Memphis from the other three are education, income and unemployment. Among the fastest-growing neighborhoods, the average college-completion fraction is nearly 32 percent. In no other quartile does it exceed even 19 percent. Per capita income in the top quartile exceeds that of the other three by at least \$10,000 per year; the unemployment rate averages 2.9 percent compared with rates of 11.3 percent, 6.4 percent and 7.3 percent for the first three quartiles, respectively.

Changes in the numbers of business establishments by industry for each of the four quartiles are reported in Table 12B. Starting with the bottom quartile, it is evident that many different industries have shown declines in business activity. Construction, manufacturing, wholesale trade, retail trade, finance and insurance, management, administrative support and waste management, and health care and social assis-

tance have all experienced large decreases in these particular neighborhoods in Memphis. Again, many of these industries tend to prefer the outlying parts of metro areas, where crime, unemployment and the sheer density of activity are all lower.

Among the major growers within top-quartile ZIP codes are retail trade and transportation and warehousing, which tend to situate themselves in outlying areas where crime and unemployment are low. The particularly high per capita income in these fast-growing neighborhoods is also likely a strong draw for retailers. This quartile of ZIP codes also saw strong gains in finance and insurance; professional, scientific and technical services; information; and health care and social assistance. Recall, these industries tend to locate in neighborhoods where levels of education are particularly high and where unemployment is low. Many of these are also not strongly deterred by crime, which is relatively high in these particular ZIP codes. Much as with the growth of

Figure 4
 St. Louis Total Change in Number of Establishments, 1998–2002



Source: U.S. Census Bureau, ZIP Code Business Patterns

retail trade, the strong growth of accommodation and food service providers in the top quartile is likely driven by the high levels of income and education in these neighborhoods.

St. Louis

The largest of the four metropolitan areas of the Federal Reserve’s Eighth District saw its

ZIP codes add, on average, 3.6 business establishments between 1998 and 2002. During this same time frame, one ZIP code lost 131 establishments, whereas another gained 293. The geographic pattern of growth in St. Louis can be seen from the map in Figure 4. In some ways, it shows a similar result to what we have already seen: large decreases and increases both toward the middle of the metro area and

Table 13A
Summary Characteristics of ZIP Codes in St. Louis
by Establishment Growth Quartile

Variable	Mean of Bottom Quartile	Mean of Second Quartile	Mean of Third Quartile	Mean of Top Quartile
Change in number of establishments, 1998-2002	-33.5	-2.1	4.3	44.2
Population	20,247.5	4,796.1	5,833.4	17,698.1
Employment	12,088.2	1,614.7	1,140.1	6,536.3
Business establishments	585.8	87.4	105	455.7
Land area (square miles)	23.9	29.7	46.4	53.8
Per capita income	22,111.2	17,496.5	17,723.6	24,409.8
Fraction w/ bachelor's degree	0.24	0.118	0.107	0.263
Fraction 25-44 years of age	0.289	0.281	0.288	0.308
Unemployment rate	0.074	0.078	0.06	0.041
Crime index per 1,000 residents	68.9	60	38.5	36.1
Assaults per 1,000 residents	5.1	4.5	3.4	2.4
Burglaries per 1,000 residents	10.4	9.2	6.7	5.5
Larcenies per 1,000 residents	41.2	36.2	23.3	24.1
Auto thefts per 1,000 residents	8.5	7.3	3.7	3.1
Robberies per 1,000 residents	3.3	2.6	1.2	0.8
Primary and secondary education expenditures per capita	1,545.7	1,435.7	1,251.7	1,388.2
Fire protection expenditures per capita	138.1	107.6	59.7	99.8
Hospital expenditures per capita	--	--	477.8	469.6
Highway expenditures per capita	141.8	144.1	131	154.8
Police protection expenditures per capita	240.3	210.1	136.1	156.2
Housing and community development expenditures per capita	109.2	92.5	46.1	30.1
Public parking expenditures per capita	12.7	16.1	18.9	5.6
Water utilities expenditures per capita	45.8	59.7	53.4	45.1
Electric power utilities expenditures per capita	16	30.4	44.3	24.2
Gas utilities expenditures per capita	2	7.4	12.5	5.1
Public transit utilities expenditures per capita	828.7	837.7	837.7	837.7
Sewerage and solid waste management expenditures per capita	166.9	164.3	93.8	71.3
Property taxes per capita	952.3	820.3	589.8	807.1
Sales taxes per capita	281.9	266.2	204.8	239.6
Individual income taxes per capita	446.1	450.9	450.9	450.9

Table 13B**Average Change in Number of Business Establishments in St. Louis by Industry and Establishment Growth Quartile**

Industry	Mean of Bottom Quartile	Mean of Second Quartile	Mean of Third Quartile	Mean of Top Quartile
Utilities	0.4	0	0.07	0.08
Construction	-4.5	0.3	1	4.7
Manufacturing	-3.6	-0.75	-0.3	0
Wholesale trade	-7.4	-0.9	-0.3	-0.2
Retail trade	-7.4	-0.6	0	4
Transportation and warehousing	-1.1	-0.44	0.09	0.8
Information	1.2	0.8	0	2.3
Finance and insurance	-0.5	-0.31	0.8	5.9
Real estate, and rental and leasing	-1	-0.2	0.73	3.6
Professional, scientific and technical services	-1.1	-0.4	2	8.1
Management	-0.6	0	0.6	1.2
Admin. support and waste management	-2.6	0.06	0.23	1.9
Educational services	0.6	0.4	-0.1	0.44
Health care and social assistance	-1.3	1.6	0.5	4.9
Arts, entertainment and recreation	-0.5	0.05	0	0.6
Food and accommodation services	-1.6	-1	0.4	3

moderate changes toward the perimeter. In this case, however, the largest decreases between 1998 and 2002 occurred not in the ZIP codes at the absolute center of the city, but on the western and eastern outskirts of downtown. The most rapid growth, then, took place to the east and west of these areas.

Characteristics of ZIP codes categorized by growth quartiles appear in Table 13A. In a broad sense, the pattern in St. Louis mirrors that of Little Rock, Louisville and Memphis: The bottom and top quartiles (i.e., the slowest- and fastest-growing ZIP codes) tend to have large numbers of residents, workers and businesses, whereas the middle quartiles tend to be smaller along these lines. Perhaps consistent with these size patterns, the bottom and top quartiles have higher levels of educational attainment and per capita income than the middle quartiles, and both of these quantities are higher among fast-growing ZIP codes than slow-growing ZIP codes.

As with the other three metro areas profiled, the slowest-growing 25 percent of neighborhoods in St. Louis have relatively high rates of unemployment and crime. The pattern of crime with respect to business establishment growth in St. Louis, however, matches up much more closely with the statistical results reported in Table 5. These results suggest that higher crime rates correspond to slower growth. Table 13A shows that crime rates are lower in ZIP codes that experience greater business growth.

The difference between the top-growing ZIP codes in Little Rock, Louisville and Memphis—where crime rates were relatively high—and the remainder of the ZIP codes, therefore, is likely due to the differences in unemployment, income, education and possibly population or employment density, rather than crime. In St. Louis, many of these same characteristics likely help to rationalize the difference between the fastest-growing neighborhoods and the slower-growing neighborhoods. However, crime

is also a likely factor within the St. Louis metropolitan area. Across all types of crime (assaults, burglaries, larcenies, auto thefts and robberies), the number of reported incidents per 1,000 residents in the top quartile of ZIP codes is roughly one-half the number of the bottom quartile.

The average changes in the numbers of establishments of different industries across each of the four quartiles in St. Louis are shown in Table 13B. Just as we have seen with Little Rock, Louisville and Memphis, the slowest-growing neighborhoods tend to involve downtown areas. Therefore, industries that tend to shy away from densely populated, high-crime, high-unemployment areas showed the greatest decreases in the bottom quartile in St. Louis: construction, manufacturing, wholesale trade and retail trade.

One industry that did show some modest growth among these neighborhoods, however, was information. This makes sense in light of the results established earlier. This industry tends to seek areas with large amounts of residential and economic activity and, perhaps as a result, is not strongly deterred by crime and unemployment.

Among the fastest-growing 25 percent of ZIP codes, there were also gains in information-related employers, but particularly large increases were seen among finance and insurance; professional, technical and scientific services; real estate; and health care and social assistance. All of these gravitate toward neighborhoods with large amounts of existing economic activity, low rates of unemployment and high levels of education and income. There were also strong gains within construction and retail trade, which seek neighborhoods with low rates of unemployment and crime.

Conclusions

Metropolitan areas within the United States have shown varying degrees of success in attracting business activity over the past decade. Some, particularly those in the southern and western parts of the country, have done quite

well. Others, many of which are located in the Northeast, have not. What this observation misses, however, is the fact that within just about any metropolitan area, there are neighborhoods that tend to have greater success in attracting businesses than others. Rapidly growing metro areas have stagnant neighborhoods. Declining metro areas have growing neighborhoods. This study has investigated some of the potential determinants of this within-metro-area heterogeneity by looking at the growth of business establishments between 1998 and 2002 in more than 15,000 ZIP codes.

The findings suggest that overall business activity (i.e., the total number of business establishments belonging to all industries) has expanded to a larger extent in stereotypically suburban locales. Business growth is greater in ZIP codes with less population, employment and business density; lower rates of crime and unemployment; higher per capita income; greater proportions of relatively young residents and individuals who have at least a bachelor's degree; higher levels of per capita local government expenditures for primary and secondary education, police and fire protection, water and sewerage utilities; and greater per capita tax revenue from sales and property taxes. This pattern, of course, is perfectly consistent with the long-established tendency for businesses and residents within metropolitan areas to spread out over time.

What is particularly interesting, however, is that not all types of businesses follow these average patterns. Some industries—such as construction, manufacturing, wholesale trade, retail trade, transportation and warehousing, administrative support and waste management—seem to look for neighborhoods with low levels of residential and business density as well as low rates of unemployment and crime but (with the exception of retail trade) relatively few college graduates. Finance and insurance and real estate-related employers, for example, do not show a strong aversion for densely populated neighborhoods, but they do show an affinity for areas with high incomes and education and low rates of joblessness and crime. Professional, technical and scientific services; information;

educational services; health care and social assistance; arts, entertainment and recreation; and accommodation and food services do not show a strong aversion to large, densely populated areas (in terms of population, employment or businesses) with high rates of crime.

The implication of these results for policies aimed at attracting economic activity is relatively straightforward. Certain types of businesses do better in certain types of neighborhoods. The prospects of attracting certain types of economic activity to dense, urban cores of a metro area are, therefore, quite different than the prospects of attracting the same types of activity to densely populated suburban areas or to the metro area's sparsely populated outer fringes. Based on the results documented here, for example, downtowns or dense business districts would likely be a much more desirable location for professional services (e.g., law offices or architectural firms), news media providers, performing arts centers and restaurants than for construction companies, manufacturing plants (e.g., auto plants, drug and chemical producers, food processors) and shopping centers.

Of course, identifying any potential set of policies that attracts economic activity to a neighborhood is beyond the scope of this study. As such, this study offers very little guidance with respect to what a policymaker should do (if anything). However, the findings regarding local government expenditures do suggest that the provision of local public goods and services (e.g., roads, police and fire protection) may have a nontrivial impact on the desirability of a neighborhood. Without many of these public goods and services, neighborhoods would likely see their economic prospects deteriorate.

Nonetheless, the primary conclusion for policymakers is that a broad array of neighborhood characteristics matter when considering future business development, and how these characteristics relate to the growth of business activity depends on the type of activity. Neighborhood development, therefore, is an extremely complex issue that should be approached with careful study.

APPENDIX

Table A1

Summary Statistics: ZIP Codes in U.S. Metropolitan Areas

Variable	Mean	Standard Deviation	Minimum	Maximum
Change in number of establishments, 1998-2002	17	59.4	-957	986
Population	15,013.1	15,576.6	0	114,124
Employment	6,000	9,421.6	1	167,393
Business establishments	377.3	467	1	7141
Land area (square miles)	55	151.7	0.01	5004
Per capita income	22,091.1	10,221.7	0	283,189
Fraction w/ bachelor's degree	0.23	0.16	0	1
Fraction 25-44 years of age	0.3	0.06	0	1
Unemployment rate	0.055	0.047	0	1
Crime index per 1,000 residents	40.1	19.1	0	163.5
Assaults per 1,000 residents	3.1	2.3	0	30
Burglaries per 1,000 residents	7.1	3.8	0	34.8
Larcenies per 1,000 residents	24.6	11.5	0	87.7
Auto thefts per 1,000 residents	3.7	3	0	22.9
Robberies per 1,000 residents	1.3	1.4	0	15.4
Primary and secondary education expenditures per capita	2,187.7	4,947	273.5	142,456.5
Fire protection expenditures per capita	119.3	231.4	0.06	5,231.4
Hospital expenditures per capita	478.1	2,750.3	0.003	86,857.8
Highway expenditures per capita	213.9	531.8	0.06	23,169.9
Police protection expenditures per capita	254	517.9	4.5	9,231.4
Housing and community development expenditures per capita	107.3	173.2	0.04	4,797
Public parking expenditures per capita	6.4	9.4	0.003	64.6
Water utilities expenditures per capita	158	354	0.07	8,972.1
Electric power utilities expenditures per capita	298.1	1,517	0.01	47,738.9
Gas utilities expenditures per capita	114.3	769	0.002	15,974.6
Public transit utilities expenditures per capita	130.2	336.8	0.02	3,979.6
Sewerage and solid waste management expenditures per capita	215.5	420.7	1.1	12,356.7
Property taxes per capita	1,461.8	3,661.5	51.4	102,203.8
Sales taxes per capita	342.2	966.1	0.003	9,452.1
Individual income taxes per capita	308.5	890.9	0.01	20,953.3

Summary statistics are calculated from varying years. Local government expenditure and taxation are from 1997; numbers of business establishments and employment are from 2002; all other quantities are from 2000.

ENDNOTES

- 1 ZIP codes are defined at the convenience of the U.S. Postal Service and may change over time. Because we are looking at relatively short periods of time (1994 to 2002 and 1998 to 2002), we assume that the effects of changing geographic boundaries are, on average, relatively small. In addition, the analysis is based upon ZIP codes that are identifiable in all years under consideration (1994, 1998 and 2002). ZIP codes that do not exist in all three years are dropped.
- 2 These calculations are based upon ZIP Code Business Patterns data files published by the U.S. Bureau of the Census. Details about these data appear in the report.
- 3 These figures are derived from the U.S. Census of Population and Housing and are reported by Edward Glaeser. (2005) "Urban Colossus: Why did New York become and stay America's Largest City?" Harvard University working paper.
- 4 See, for example, Richard Voith. (1998) "Do Suburbs Need Cities?" *Journal of Regional Science*. Vol. 38 (3), pp. 445-464.
- 5 There are a few studies that look at patterns of business activity among ZIP codes in the urban economics literature. See Vernon Henderson. (2003) "Marshall's Scale Economies." *Journal of Urban Economics*. Vol. 53, pp. 1-28; and Stuart Rosenthal and William Strange. (2003) "Geography, Industrial Organization, and Agglomeration." *Review of Economics and Statistics*. Vol. 85, pp. 377-393. Neither of these studies, however, considers how many of the neighborhood-level characteristics studied here influence business growth. There are also many studies looking at the differences between the growth experiences of central cities and the surrounding suburbs, but this is a considerably more simplistic way to define neighborhoods than the approach taken here.
- 6 Data on county population and land area are taken from the USA Counties 1998 on CD-ROM produced by the U.S. Bureau of the Census. Land area among ZIP codes is based upon ZIP Code Tabulation Area (ZCTA) land areas reported at www.census.gov/geo/www/gazetteer/places2k.html.
- 7 The Census Bureau defines an establishment as a single physical location where business is done. Hence, although the majority of establishments can also be interpreted as companies (or firms), not all can. Some establishments may only represent parts of firms.
- 8 A ZIP code is a geographic unit used by the U.S. Postal Service and is not commonly used by the U.S. Census Bureau. In an effort to report demographic data among ZIPs, the Census has created ZIP Code Tabulation Areas (ZCTAs), which are approximate ZIPs built upon smaller census geographies. In this study, we assume that ZIP code characteristics are well-represented by the corresponding ZCTA characteristics.
- 9 The Unified Crime Reports data can be accessed at <http://fisher.lib.virginia.edu/collections/stats/crime/>.
- 10 The Unified Crime Reports index includes murder and forcible rape in addition to the five listed in the text.
- 11 The 1997 Census of Governments is available at www.census.gov/govs/www/cog.html.
- 12 Expenditures include those for current operations and capital outlays (e.g., construction and equipment). Detailed definitions of these tax and expenditure categories are given at www.census.gov/govs/www/class.html.
- 13 These figures are based upon County Business Patterns data available at <http://censtats.census.gov/cbpnaic/cbpnaic.shtml>.
- 14 These figures are also based upon County Business Patterns data.
- 15 For a broad discussion of some of the evidence on growth, see Robert Barro and

- Xavier Sala-i-Martin. (2003) *Economic Growth*. Second edition. Cambridge, Mass: MIT Press.
- 16 The first year of data in the ZBP files is 1994.
 - 17 This analysis is based on regressions of the following general form: $\Delta y_{zm} = \mu_m + \beta \Delta x_{zm} + \epsilon_{zm}$, where Δy_{zm} is the change in the outcome of interest (e.g., per capita income) for ZIP code z of metro area m , μ_m is a term that captures the effects of metropolitan area m 's characteristics (e.g., its overall rate of growth), Δx_{zm} is the change in the number of business establishments in ZIP z of metro area m , and ϵ_{zm} is permitted to be heteroskedastic in the estimation. The associations reported in Table 2 are the estimated values of β .
 - 18 Statistical significance simply implies that there is only a very small probability that the actual association is zero.
 - 19 John Kain. "Housing Segregation, Negro Employment, and Metropolitan Decentralization." *Quarterly Journal of Economics*. (1968) Vol. 82, pp. 175-197.
 - 20 See, for example, Harry Holzer. (1991) "The Spatial Mismatch Hypothesis: What Has the Evidence Shown?" *Urban Studies*. Vol. 28, pp. 105-122.
 - 21 For a brief discussion of the links between economic activity and criminal behavior, see Steven Levitt. (2004) "Understanding Why Crime Fell in the 1990s: Four Factors that Explain the Decline and Six that Do Not." *Journal of Economic Perspectives*. Vol. 18, pp. 163-190.
 - 22 Formally, I estimate regressions of the following form: $\Delta y_{zm} = \mu_m + \beta x_{zm} + \epsilon_{zm}$, where Δy_{zm} is the change in the total number of business establishments in ZIP code z of metro area m , μ_m is a metropolitan area term used to capture elements specific to metro area m (e.g., a metro area's location on a coast or its rapid rate of population and employment growth), x_{zm} is the initial value of a characteristic describing ZIP code z of metro area m , and ϵ_{zm} is a residual, which is treated as potentially heteroskedastic in the estimation.
 - 23 As this report was being prepared, the most recent ZIP Business Patterns data release covered the year 2002.
 - 24 See, for example, David Autor, Lawrence Katz and Alan Krueger. (1998) "Computing Inequality: Have Computers Changed the Labor Market?" *Quarterly Journal of Economics*. Vol. 113, pp. 1169-1213.
 - 25 For evidence connecting education and growth, see Curtis Simon and Clark Nardinelli. (2002) "Human Capital and the Rise of American Cities, 1900-1990." *Regional Science and Urban Economics*. Vol. 32, pp. 59-96.
 - 26 This strong negative association between a ZIP code's unemployment rate and its subsequent growth of business activity changes only very little after controlling for the ZIP code's education and per capita income. Such a finding suggests that unemployment affects business growth for reasons other than those related to income and education.
 - 27 All of the correlations reported in Table 5 remain significantly negative after controlling for a ZIP code's average income and fraction of the population with a bachelor's degree.
 - 28 Again, these figures represent local government expenditures aggregated to the county level. Hence, all spending from municipalities within a county (including the county government itself) are summed to the county level. ZIP codes are then matched to the county in which the majority of their population is located.
 - 29 Timothy Bates. (2005) "Alleviating the Lagging Performance of Economically Depressed Communities and Regions." Manuscript prepared for the "Entrepreneurship in Low- and Moderate-Income Communities" conference sponsored by the Federal Reserve Bank of Kansas City and the Ewing Marion Kauffman Foundation, November 2005.

- 30 The lack of statistical importance on the part of the individual income tax variable undoubtedly relates to the infrequency with which local governments (e.g., municipalities and counties) in the United States tax income. This infrequency generates only a small amount of variation in data, which is crucial for the identification of a statistical association.
- 31 Paul Bairoch. *Cities and Economic Development: From the Dawn of History to the Present*. Chicago: University of Chicago Press. 1988. p. 336.
- 32 See Edward Glaeser and Matthew Kahn. “Sprawl and Urban Growth.” (2004) In *Handbook of Regional and Urban Economics*, Vol. 4. J.Vernon Henderson and Jacques-Francois Thisse eds. New York: Elsevier. pp. 2481-2527.
- 33 These associations are based on regressions of the form $y_{izm} = \mu_m + \beta x_{zm} + \varepsilon_{zm}$, where y_{izm} is the share of establishments belonging to industry i in ZIP code z in metro area m ; x_{zm} is the characteristic of interest in this ZIP code; μ_m is a metro-area-specific effect designed to capture the fact that some industries may be more heavily represented in some metro areas than in others; and ε_{zm} is a statistical residual, which is treated as potentially heteroskedastic in the estimation.

