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GROWTH AND VOLATILITY OF MICROPOLITAN STATISTICAL AREAS IN THE U.S.

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ABSTRACT

A micropolitan statistical area is defined by the U.S. Department of Commerce as "A core based statistical area associated with at least one urban cluster that has a population of at least 10,000, but less than 50,000." Recently, the U.S. Census Bureau also identified the micropolitan area as an "emerging metropolitan area." Despite its growing importance, the literature on the economic characteristics of micropolitan areas so far has been limited. The objectives of this study are: (1) to describe the geographic distribution, growth, and volatility of the U.S. micropolitan areas during the 1969-2012 period; and (2) to identify and measure the determinants of growth and volatility of micropolitan areas. Findings show that micropolitan area growth is dependent on sectoral composition, initial market size, and spatial/locational effects.

JEL: R11, R12

KEYWORDS: Micropolitan, Volatility, Central Place

INTRODUCTION

Local politicians, city managers, economic development directors, chambers of commerce, and academics have always been concerned about the economic well-being and prosperity of their local economies. Stiff competition for new firms, investment, and jobs has pitted communities against one another, with activities ranging from the provision of tax incentives to workforce skills development to natural and man-made amenities. The promotion of local economic growth and development remains controversial and problematic especially for local policy-makers. The literature on economic growth is extensive, and although the findings regarding certain determinants of growth may be consistent, these may still provide misleading and risky prescriptions to policy-makers looking for quick fixes. For example, Polzin argues that much attention has been focused on policies which have more public appeal such as education and infrastructure (rather than on sustaining basic industries) but "no proven relationship with state economic growth." (2001: 423)

The analysis of the determinants of U.S. economic growth has been applied to various geographic areas (nation, regions, states, metropolitan areas, and cities) and time periods. This paper focuses on another geographical delineation based on census population called the micropolitan statistical area. This delineation was defined in 2001 by the Office of Management and Budget as a geographical area with one or more counties and an urbanized core with a population of 10,000 to 49,999. This "micro area" is thus somewhere between a metro area and a non-metropolitan/rural area. Its significance is reflected in its desirable mix of urban-rural characteristics and amenities (Vias *et al.*, 2002). As Glavac *et al.* state: "Indeed, the availability of small-town lifestyles, combined with the availability of many modern conveniences once found only in large metropolitan centers, have recently made these micropolitan centers an increasingly important portion of the American landscape." (1998: 633) Thus, the objectives of this paper are:

1. To identify the fastest-growing (and slowest-growing) micropolitan areas based on growth rates of population and per capita personal income (1969-2012);
2. To determine and measure the causes of economic growth and volatility of micropolitan areas.

The following section describes the economic growth (in terms of population and per capita personal income) and geographical distribution of micropolitan areas in the U.S. for the period 1969-2012. This section is followed by a review of past studies examining the determinants of growth of micropolitan areas. Although information on growth is important, what is more useful for policy-makers is to know whether changes in economic activity are stable or volatile over time. Thus, a major objective of this study is to examine the differential effects of different economic variables, particularly industrial composition, location, and suburb vs. central city, on the growth and volatility of population and income in micropolitan areas. A theoretical model is presented and then empirically tested on a sample of U.S. micropolitan areas for the period 2000-2012; tests and adjustments for problems of heteroscedasticity and muticollinearity are also applied. Finally, a discussion of the findings and policy implications are provided.

MICROPOLITAN STATISTICAL AREAS

The number of micropolitan statistical areas as defined by the Office of Management and Budget changes over time in response to Census Bureau population figures of the counties that compose these areas. Based on the 2000 Census, there are 560 micro areas with a combined population accounting for 10.3 percent of total U.S. population. The growth of population inside the micropolitan areas during the period 1990-2000 was 9.9% (see data tables in: http://www.census.gov/population/www/cen2000/briefs/phc-t29/index.html) In 2010, OMB defined 536 micropolitan areas with a combined population of 27,154,213, or approximately 8.8% of U.S. (see http://www.census.gov/population/www/cen2010/cph-t/cph-t-5.html). For a map of these areas, check: http://www.census.gov/population/metro/files/metro_micro_Feb2013.pdf.

As can be seen in Table 1, the populations and per capita incomes of these 536 micropolitan areas varied considerably over the period.

Table 1: Population and Per Capita Income Characteristics of 536 Micropolitan Areas, Various Years

	Population			Income		
Year	**Low**	**High**	**Mean**	**Low**	**High**	**Mean**
1970	2,793	159,666	38,335	1,330	7,041	3,269
1980	6,726	175,970	43,195	3,196	19,383	8,261
1990	9,339	194,215	44,437	5,458	29,862	14,986
2000	12,088	208,230	48,383	9,922	53,720	23,077
2012	13,200	217,390	50,777	19,866	116,978	36,152

Note: Authors' calculations.

Using a longer time period 1969-2012 and population and per capita personal income data for 536 micropolitan areas from the Bureau of Economic Analysis, average annual growth rates (calculated as logarithms of the first differences) for different time periods are presented in Table 1.

Table 2: Population and Per Capita Income Growth (in %) in the 536 Micropolitan Areas

	1970-1980	**1980-1990**	**1990-2000**	**2000-2012**	**1969-2012**
Population	1.40	0.50	0.90	0.40	0.80
Per capita income	9.08	6.18	4.36	3.82	5.70

Note: Authors' calculations.

As Table 2 shows, the growth rate of population in the micropolitan statistical areas averaged less than one percent annually from 1969 to 2012; the growth rates for the different decades ranged from 0.4% in the 2000s to a high of 1.4% in the 1970s. In 2012, the total population of the 536 micropolitan statistical areas

was 27,216,731. Grouping the micropolitan areas into their respective Census Bureau regions, Division 3 (East North Central consisting of the states of Indiana, Illinois, Michigan, Ohio, and Wisconsin) had a combined population of 5,684,567, or 20.9% of the total micropolitan population; it also had the largest number of micropolitan areas at 104. This division was followed by Division 5 (South Atlantic) with over four million. Division 1 (New England) had the smallest population at 1,094,646, spread over 12 micropolitan areas. At the individual state level, seven percent of the total micropolitan population resided in Ohio, which has 32 micropolitan areas. Although Texas had the largest number of micropolitan areas (43), it came in second in terms of population, accounting for approximately six percent. Connecticut and Maine had only one micropolitan area each, while Alaska, Hawaii, Maryland, and Massachusetts had two each. Based on the OMB definition, a micropolitan area consists of more than one county and has an urban core with 10,000-49,999 individuals. In 2012, the micropolitan statistical area population ranged from 13,200 in Craig, CO, to 217,390 in Claremont-Lebanon, NH-VT.

In terms of per capita income growth, Table 2 shows the variability in income growth following national business cycles. Examining per capita income (in nominal dollars) for 2012, micropolitan area income varies widely from a high of $116,978 per capita in Williston, ND, to a low of $19,866 in Rio Grande City, TX. This is to be expected given the regional differences in population density, cost of living, job opportunities, educated workforce, etc. At the Census Bureau division level, the average income per capita narrows somewhat from a high of $37,346 in Division 3, which also has the highest proportion of the micropolitan population, to a low of $34,673 in Division 7 (West South Central consisting of Arkansas, Louisiana, Oklahoma, and Texas).

The economic growth of a micropolitan area is important, but more so is the stability or volatility (i.e., the long-term track record) of that growth. As Fruth aptly states: "Simply identifying the areas that have the fastest or slowest growth rates is insufficient when trying to determine the character of a local economy. The rate, consistency, or stability of the growth is equally important." (Fruth, 2013) Table 3 provides volatility data, measured as the standard deviation of the population growth rate and income growth rate for the entire 1969-2012 period and for separate decades. As can be seen, the volatility of micropolitan area income growth is three times larger than that of population growth. Unlike population changes which seem to be stabilizing over time, income growth is more variable, reflecting national income trends.

Table 3: Volatility of Population and Per Capita Income Growth in Micropolitan Areas

	1970-1980	1980-1990	1990-2000	2000-2012	1970-2012
Population	1.56	1.22	0.80	0.70	1.26
Per capita income	4.44	4.00	2.46	3.30	4.14

Note: Authors' calculations.

The average population growth volatility for the entire period was 1.26, with Fort Polk South, LA experiencing the highest rate at 0.065 and Manitowoc, WI with the lowest at 0.004. Similarly, the average volatility of per capita income growth was 0.034, with Hereford, TX having the highest rate at 0.15 and Lewistown, PA with the lowest variability at 0.026. Of the top 50 most volatile (in terms of population and income growth) micropolitan areas, the most volatile are found consistently in two divisions, Division 7 (West South Central) and Division 8 (Mountain). Similarly, inspection of the top 50 least volatile (most stable) micropolitan areas based on income and population shows that the majority of these stable micro areas are located also in two divisions, namely Division 2 (Middle Atlantic states of New Jersey, New York, and Pennsylvania) and Division 3 (East North Central states of Indiana, Illinois, Michigan, Ohio, and Wisconsin). Thus, there is a strong correlation between population volatility and income volatility of micropolitan areas during the period (correlation = 0.40; prob < 0.0001).

Grouping the micropolitan areas with high volatility rates ("high" being values greater than the mean plus one standard deviation) and low rates (values less than the mean minus one standard deviation) resulted in

only 61 (out of 536 areas, or 11%) micro areas with high income volatility rates during the period and only eleven having low rates. Similarly, only 63 out of 536 micros had "high" population volatility rates and only two had "low" rates. Thus, it is apparent that income volatility and population volatility in U.S. micropolitan areas exhibit a good deal of homogeneity. This generally homogeneous sample provides an opportunity for understanding the determinants of local economic growth and volatility as well as the implications for regional analysis and policy.

PAST LITERATURE

The current study focuses on the growth and stability of local geographic economies called micropolitan statistical areas. Specifically, it examines the impact of industrial composition or economic base on the vitality (in terms of income and population growth) of these micropolitan areas. The extant literature on the impact of diversification on economic growth is extensive (see for example, Felix, 2012; Carlino *et al.,* 2009, 2003; Kuhlmann *et al.,* 2008; Izraeli and Murphy, 2003; Smith and Gibson, 1988; Jackson, 1984) mainly due to the policy implications of pursuing a "diversified portfolio" of industries to promote regional growth. The empirical findings, however, are mixed. Although there is no guarantee that a varied industry mix will lead to more jobs and higher incomes, local officials, politicians, and policymakers tend to favor diversification as a catch-all solution. Rather than focusing on the growth (volatility)-diversity relationship, this study attempts to identify the particular industries which have a generally significant impact on the growth and volatility of micropolitan areas. This objective provides more relevant and useful information to policy-makers rather than simply concluding that industrial diversification leads (or does not lead) to increased growth (or reduced volatility).

Another policy objective involves analyzing the relationship between job growth in the micropolitan central city vs. job growth in the surrounding suburbs. Do micropolitan city growth and suburban growth complement each other or are they conflicting? Moreover, this study covers a more recent time period, 2000-2012. This period of observation is particularly relevant as the delineation of micropolitan statistical areas was made by OMB in 2001; more important, this period also reflects national business cycles with peaks in March 2001 and December 2007. Finally, the study makes adjustments for heteroscedasticity, regional fixed effects, and spatial or distance effects.

The study of micropolitan areas has attracted both economic researchers and geographers before the U.S. government decided to officially delineate these areas as somewhere between rural/non-metropolitan areas and metropolitan areas. Glavac *et al.* asserted that these micropolitan areas were important to analyze since these are "…areas that now provide many of the amenities of larger cities while still maintaining some of the rural lifestyle and small-town character that some people cherish." (1998: 637) They maintained that these micro areas are different not only in terms of geographic scale but also relative to the "determinants and processes" affecting their economic growth. Glavac *et al.* estimated a simultaneous population-employment model and found that employment lead changes in population in micropolitan areas. Their results also showed that transfer payments and retail sales have positive effects on micropolitan growth while distance from a metropolitan area, property taxes, and percentage of population that are black have negative effects. Finally, amenities have no influence on micropolitan growth.

Vias *et al.* (2002) examined the same data set of 219 micropolitan areas studied earlier by Glavac and colleagues (1998). They applied the human ecology theory to explain the relationship between industrial specialization and population change in micropolitan areas. Vias and others (2002) grouped the micropolitan areas into nine functional areas based on the employment distribution across various sectors. They found that more diversified micropolitan areas grew faster while those dependent on agriculture, mining, and government sectors lagged; micropolitan areas that are classified as manufacturing, service, and trade places were stable during the period under study.

In their 2006 study, Mulligan and Vias analyzed 581 micropolitan counties (not areas) identified by the US Census Bureau and Office of Management and Budget using 1990 census and found micropolitan growth from 1980 to 2000 reflected the national geographic trend where both population and employment "shifted out of the Midwest and Northeast into the Southern and Western regions of the nation" (p. 206) They also showed that these micropolitan counties were becoming more diversified during the period due to: (1) county size (in terms of employment) with larger counties less diversified, or more specialized, than smaller counties; (2) counties with larger employment shares (or functional specializations) in agriculture, mining, and government were less diversified, while those with larger shares in trade were more diversified; (3) manufacturing was not important; (4) location was not important. Similar to Glavac *et al.* (1998), Mulligan and Vias (2006) also applied two-stage least squares method to analyze the interactions between population and employment growth. They found that changes in the populations of micropolitan counties were greater in the West and South regions; larger counties grew faster; initial population level is an important determinant; micropolitan counties with higher employment shares in agriculture and mining had slower growth than those with higher shares in trade, services or government; transfer payments limited growth. Mulligan (2009, 2010) found that the multiplier effects of construction and services were greater than that of manufacturing.

Recent studies by Davidsson and Rickman (2011) and Cortes *et al.* (2013) reexamined the economic performance of micropolitan statistical areas using larger sample sizes, more recent time periods, and more explanatory variables including industrial composition, amenities, demographic variables, distance, regional dummy variables as well as fiscal policy variables. The most important determinants of micropolitan population growth were industry composition, regional/census division location of the micropolitan areas, and fiscal policy.

Aside from employing the human ecology theory and economic base theory following Vias *et al.* (2002) and Mulligan (2009, 2010) as bases for this study, another useful perspective is that of the central place theory (CPT) which identifies a rank order or hierarchy of central places (see Blair, 1991). That is, there are lower-order places such as villages or towns which produce food and other lower-order/routine household products, and there are higher-order places such as cities or regional capitals which produce specialized goods such as automobiles. The CPT's two important concepts are threshold (or minimum market size) and range (the maximum distance consumers are willing to travel in order to buy products). As discussed earlier, micropolitan areas are becoming more diversified; thus, such "lower-order places" have the ability to be diverse given their various functional specializations and abilities. In addition, given the geographic dispersion and distribution of micropolitan areas around the country, the role of distance to a higher-order place or metropolitan area needs to be considered. Finally, since Vias *et al.* stated micropolitan areas may be "large and significant enough to stand on their own" (2002: 400), this study will also analyze the interactions and contributions of the central city vs. suburbs in the micropolitan area context. In an early study, Voith (1998) estimated a structural model to determine the causality between city growth and suburban growth. He found that city income growth in large cities of metropolitan areas leads to higher income growth in the suburbs, higher housing prices, and minimally, population growth. On the other hand, Leichenko (2001) found that the city-suburb relationship differs over time. In the 1970s, 1980s, and 1990s, the direction of causality was from suburban growth (population and jobs) to city growth; city growth was important in positively affecting suburban growth only in the 1990s. Hollar (2011) compares and contrasts the two views on the metropolitan central city-suburb relationship: (1) the rival view which asserts that the central city and suburbs are independent competitors in the labor market; (2) the ally view which states that there is a positive, complementary relationship between the central city and the suburban area. Hollar (2011) found support for the interdependent or allies view.

DATA AND METHODOLOGY

The theoretical bases for this study are a combination of regional economics, economic geography, and human ecology approaches (specifically, the traditional economic base model and Central Place Theory). It derives much from earlier models of metropolitan-micropolitan economic growth developed and tested by Vias *et al*. (2002). The model estimated here uses the micropolitan statistical area (as defined by Office of Management and Budget) as the main unit of observation. There are four dependent variables: population growth, income growth, population volatility, and income volatility. The explanatory variables of interest are industry structure (shown here by the nine different sector employment shares), central city employment change, and suburban employment change. Except for the control variables (regional dummy variables and distance), all the exogenous factors are expressed as percentage changes. The values of these exogenous variables pertain to beginning or near the beginning of the time period under study so as to account for any simultaneity issue and to address any concerns regarding the direction of causation between the variables. To adjust for spurious results, location-specific factors such distance and census division variables are included in the specification. Thus, the general specification is:

$$\begin{aligned}\text{Growth (or Volatility)} = \alpha + \beta_1(\text{Initial population}) + \beta_2(\text{Initial income}) + \beta_3(\text{Food}) + \beta_4(\text{Health}) + \\ \beta_5(\text{Professional}) + \beta_6(\text{Finance}) + \beta_7(\text{Other}) + \beta_8(\text{Manufacturing}) + \beta_9(\text{Retail}) \\ + \beta_{10}(\text{Wholesale}) + \beta_{11}(\text{Construction}) + \beta_{12}(\text{Central city employment}) + \\ \beta_{13}(\text{Suburban employment}) + \beta_{14}(\text{Distance}) + \sum\text{Census division dummies}\end{aligned}$$

As mentioned earlier, volatility is measured by the standard deviation of the annual growth rates of population and per capita income of micropolitan areas. Based on the traditional economic base theory, changes in employment for nine separate industries (namely, construction; manufacturing; wholesale trade; retail trade; finance and insurance; professional, scientific, and technical services; health care and social assistance; accommodation and food services; other services except public administration) are included in the model to help identify the key sectors which contribute to micropolitan growth and stability. This study focuses on the mix of industries and does not include a diversity index given the latter's high correlation with specific sectors as also found by other researchers (see for example, Felix, 2012; Cortes *et al.* 2013). Following Leichenko (2001), central city employment and suburban employment are also added as variables of interest. Initial examination of raw correlation between job growth in the micropolitan area's central city and its surrounding suburban area indicates a negative and statistically significant relationship (corr = -2.33, prob < 0.02), contrary to the generally positive and complementary central city-suburb relationship for metropolitan areas (Rappaport, 2005; Hollar, 2011). Following central place theory, initial population and initial income are included to reflect the "threshold" requirements for lower-order places such as micropolitan areas. Initial per capita income for 2000 is also included to check for conditional convergence of micropolitan area income growth rates and is expected to be negative following the literature. The Central Place Theory's concept of "range" is represented here by the distance variable. Following Partridge *et al.* (2008) and Partridge and Rickman (2008), distance to the nearest metropolitan area is used in this study. The relationship between distance and area economic growth, however, is ambiguous. As stated by Cortes *et al.* (2013), a negative relationship may result from loss of agglomeration economies as distance to a metro area increases ("tyranny of distance"). On the other hand, nearness to a metro area may have a conflicting or restrictive effect on a micropolitan area resulting from increased competition for revenues, labor input, and services from a larger and denser metropolitan area ("tyranny of proximity"). Finally, census division dummy variables are added to account for regional fixed effects; the base division is Census Division 1.

The general model above is estimated using the EViews software and annual data for the period 2000-2012 for a cross-section of 417 micropolitan statistical areas. The dependent variables are measured over the 2000-2012 period, while the main explanatory variables (except for initial income, initial population, distance, and regional dummy variables) are percentage changes over the period 2002-2007 to account for

national business cycle effects as well as to adjust for any potential endogeneity bias. The data are taken primarily from the U.S. Bureau of Economic Analysis (for data on micropolitan area income and population), U.S. Census Bureau American FactFinder (for data on number of employees by industry), and State of the Cities Data Systems: County Business Patterns Special Data Extract (for data on central city and suburban job growth). Data on the distance to the nearest metropolitan area are taken from Davidsson and Rickman (2011). Descriptive statistics of the variables of the model are available from the authors upon request.

RESULTS

Table 4 shows the results of applying ordinary least squares regression on the model with population and income growth as dependent variables. Each regression was initially tested for heteroscedasticity; the presence of heteroscedasticity was then corrected using White's (1980) heteroscedaticity-consistent standard errors and covariance. In addition, tests employing Variance Inflation Factors indicated no problem of multicollinearity. The results indicate that employment growth in many industries (except for construction and other services sectors) has a positive and significant influence on the population growth of micropolitan areas. More interesting, job growth in the suburbs (and not in the central city) has a positive impact on micropolitan population. The initial levels of population and income have a direct effect on population growth indicating that beginning market size attracts people. The census divisions 5 (South Atlantic) and 8 (Mountain) grew faster than the base or omitted region, Division 1 (New England), reflecting the continued population shift from the northeast to the southern and mountain states. Finally, distance has a negative but insignificant effect on population growth of micropolitan areas.

Table 4: OLS Regressions of Population Growth and Income Growth, 2000-12

Variable	Population Growth		Per Capita Income Growth	
	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-1.10	-4.14***	4.68	12.16***
Population 2000	0.000004	3.58***	-0.000002	-1.37
Income 2000	0.00003	3.93***	-0.00003	-2.61***
Accommodations & Food	0.0045	2.63***	-0.0017	-0.73
Health Care	0.0079	4.23***	-0.0081	-3.60***
Professional & Scientific	0.0011	1.65*	-0.0015	-2.24**
Finance & Insurance	0.0063	4.56***	-0.0028	-1.33
Other Services	0.0009	1.61	-0.0016	-2.06**
Manufacturing	0.0018	1.92*	0.0023	1.19
Retail Trade	0.0136	5.31***	-0.0009	-0.27
Wholesale	0.0011	2.77***	0.0004	0.67
Construction	0.0016	1.41	0.0065	2.66***
City Job Growth	0.0025	1.25	0.0085	3.45***
Suburban Job Growth	0.0016	3.11***	-0.0002	-0.16
Distance to Metropolitan Area	-0.0003	-0.32	0.0061	2.93***
Census Division 2	-0.1008	-0.78	-0.0487	-0.21
Census Division 3	0.0991	0.81	-0.7046	-3.24***
Census Division 4	0.1749	1.26	0.0065	0.03
Census Division 5	0.4661	3.30***	-0.7928	-3.40***
Census Division 6	0.0921	0.61	-0.5482	-2.31**
Census Division 7	0.1166	0.75	0.0443	0.16
Census Division 8	0.5364	3.20***	-0.4329	-1.31
Census Division 9	0.2829	1.60	-0.8162	-3.20***
Adjusted R-squared	0.42		0.37	
F-statistic	14.60 (prob<0.0001)		12.10 (prob<0.0001)	
Number of observations	417		417	

*Note: This table shows the OLS regression estimates for the model, with population growth and income growth as dependent variables. ***significant at 1% level; **significant at 5%; *at 10%.*

In terms of income growth, only employment change in the construction industry has a direct and significant effect; on the other hand, the more people are employed in the health care, professional and scientific, and other services sectors, the slower the income growth. Interestingly, unlike population growth, micropolitan

income tends to be more affected by job changes in the center city. This result tends to support the Central Place Theory's hierarchy of places. Moreover, the positive and statistically significant distance variable indicates that lower-order places such as micropolitan areas may be more self-supporting and dynamic given their own functional abilities and diversity. The census division dummy variables show that, relative or compared to the micropolitan areas located in the northeast region (Division 1), incomes grew much slower in Division 3 (East North Central), 5 (South Atlantic), 6 (East South Central), and 9 (Pacific) micropolitan areas during the 2000-12 period.

As mentioned earlier, this study is also concerned with the stability or volatility of a micropolitan area's economic growth over time. Table 5 shows the results of regressing micropolitan population (and income) volatility on the same set of explanatory variables. An examination of the coefficient estimates for the various employment sectors shows that job changes in the professional sector, retail trade, and construction cause volatility in population growth. Similarly, employment changes in the suburban areas lead to increased instability. On the other hand, micropolitan areas with larger initial populations and income levels tended to have lower volatility, consistent with other studies (see Felix, 2012). Locational factors indicate that the farther the micropolitan area is to a larger urban area, the greater the population volatility; moreover, relative to Division 1 (New England) micropolitan areas, those micro areas located in Division 8 (Mountain) had more variable population growth rates while those in Division 2 (Middle Atlantic) had lower volatility.

Table 5: OLS Regressions of Population Volatility and Income Volatility, 2000-12

Variable	Population Volatility		Per Capita Income Volatility	
	Coefficient	t-statistic	Coefficient	t-statistic
Constant	1.02	-4.51***	-0.63	-0.70
Population 2000	-0.000003	-4.74***	-0.00002	-6.99***
Income 2000	-0.00001	-2.09**	0.0001	4.84***
Accommodations & Food	0.0003	0.29	0.0009	0.22
Health Care	-0.0012	-1.13	-0.0071	-1.77*
Professional & Scientific	0.0009	2.73***	-0.0009	-0.73
Finance & Insurance	-0.0002	-0.18	-0.0103	-2.99***
Other Services	0.00003	0.11	-0.0002	-0.16
Manufacturing	0.0004	0.52	0.0040	1.19
Retail Trade	0.0038	2.19**	-0.0027	-0.47
Wholesale	0.0003	0.67	-0.0010	-0.92
Construction	0.0015	1.87*	0.0079	2.52**
City Job Growth	0.0009	0.86	0.0067	1.41
Suburban Job Growth	0.0008	1.81*	0.0015	0.87
Distance to Metropolitan Area	0.0012	1.98**	0.0069	2.98***
Census Division 2	-0.2353	-2.09**	0.5601	1.96**
Census Division 3	-0.1580	-1.49	0.4450	1.86*
Census Division 4	-0.1147	-1.04	0.9000	3.00***
Census Division 5	0.0256	0.23	0.5335	1.96**
Census Division 6	-0.1484	-1.29	0.7495	2.41**
Census Division 7	-0.1288	-1.07	1.7981	4.80***
Census Division 8	0.2602	1.73*	1.83	4.06***
Census Division 9	-0.0054	-0.04	0.2789	0.83
Adjusted R-squared	0.37		0.41	
F-statistic	12.09 (prob<0.0001)		14.14 (prob<0.0001)	
Number of observations	417		417	

*Note: This table shows the OLS regression estimates for the model, with population volatility and income volatility as dependent variables. ***significant at 1% level; **significant at 5%; *at 10%.*

As with population volatility, variations in construction employment contributed to higher income volatility during the period under study. However, two sectors – health care and finance & insurance – had a restraining effect on income volatility in the micropolitan areas. This finding indicates that specific sectors in the micropolitan economy, and not its overall diversity, may not only be sources of internal growth but also serve as stabilizers during national business cycles. Interestingly, the location of jobs either in the city proper or the suburbs does not have any influence on income volatility. Similar to the population volatility case, distance from a metropolitan area leads to more volatility in micropolitan area incomes. Finally,

except for the west coast or Division 9 (Pacific), all of the census divisions' micropolitan areas have experienced proportionately greater instability in income growth than the base group located in the northeast region (Division 1) during the 2000-12 period.

CONCLUSION

The geographic scale, geographic distribution, and character of micropolitan statistical areas continue to attract the attention of social scientists and policymakers. This is to be expected as migration and population shifts occur and income and wealth are redistributed across the United States. The objectives of this study are to describe the current state of U.S. micropolitan statistical areas in terms of income and population trends and to identify the various factors that contribute to the growth and volatility of these areas. It developed and tested a regional economic growth (volatility) model for a cross-section of 417 micropolitan areas for the period 2000-2012. Ordinary least squares regression technique is applied to the sample; adjustments are also made to correct for empirical issues of multicollinearity, heteroscedasticity, and endogeneity. This study adds to the literature of micropolitan areas by identifying specific industries or functional specializations which not only can contribute to positive economic growth but also help to stabilize business fluctuations. Consistent with Glavac *et al.* (1998), our findings show that employment changes in specific sectors lead population growth. Moreover, initial market size (in terms of population and income) and job growth in the suburbs have a positive impact on population growth in micropolitan areas. In terms of income growth, sectors have differential effects: health, professional, and other services have a restraining effect on growth as compared to construction. An important limitation of this study is that the primary sector is not included (due to data limitations) even though agriculture has lead GDP growth in recent years. Increases in job opportunities in the center city have a direct contribution to income growth in the entire micropolitan area. Distance and regional location are also important determinants. In terms of volatility, changes in construction employment are a major source of instability for micropolitan areas. However, sectors such as health care and finance and insurance tend to have a moderating or stabilizing effect. The point is that micropolitan areas need to identify those home-grown industries that promote vitality, and encourage internal expansion via appropriate local credit or tax incentives instead of attempting to attract new firms or industries into the micropolitan area. Suggestions for further research include the application of geospatial tests and the determination of factors which may affect the decision of outside firms to locate in micropolitan areas. There is much to be learned from investigating the "psychology of place."

APPENDIX

Appendix A: Top 50 Fastest and Slowest Growing Micropolitan Areas

TOP 50 FASTEST GROWING MICRO AREAS (IN TERMS OF POPULATION, 1969-2012)		**TOP 50 SLOWEST GROWING MICRO AREAS (IN TERMS OF POPULATION, 1969-2012)**	
Area	**Average Growth**	**Area**	**Average Growth**
Breckenridge, CO (Micropolitan Statistical Area (MSA))	0.0568	Helena-West Helena, AR (MSA)	-0.0155
Pahrump, NV (MSA)	0.0476	Clarksdale, MS (MSA)	-0.0110
Edwards, CO (MSA)	0.0465	Cleveland, MS (MSA)	-0.0091
Gardnerville Ranchos, NV (MSA)	0.0454	Greenville, MS (MSA)	-0.0085
Summit Park, UT (MSA)	0.0433	Blytheville, AR (MSA)	-0.0075
Fernley, NV (MSA)	0.0428	Indianola, MS (MSA)	-0.0067
St. Marys, GA (MSA)	0.0352	Selma, AL (MSA)	-0.0064
Jackson, WY-ID (MSA)	0.0348	Fort Dodge, IA (MSA)	-0.0060
Heber, UT (MSA)	0.0342	Logan, WV (MSA)	-0.0057
Cedar City, UT (MSA)	0.0318	Greenwood, MS (MSA)	-0.0055
Truckee-Grass Valley, CA (MSA)	0.0316	Lamesa, TX (MSA)	-0.0051
Branson, MO (MSA)	0.0304	Butte-Silver Bow, MT (MSA)	-0.0049
Glenwood Springs, CO (MSA)	0.0304	Fort Madison-Keokuk, IA-IL-MO (MSA)	-0.0046
Okeechobee, FL (MSA)	0.0300	Parsons, KS (MSA)	-0.0046

Gillette, WY (MSA)	0.0299	Wahpeton, ND-MN (MSA)	-0.0045
Kill Devil Hills, NC (MSA)	0.0298	Bradford, PA (MSA)	-0.0044
Steamboat Springs, CO (MSA)	0.0297	Albert Lea, MN (MSA)	-0.0043
Elko, NV (MSA)	0.0296	Marion, IN (MSA)	-0.0043
Rio Grande City, TX (MSA)	0.0290	New Castle, PA (MSA)	-0.0042
Zapata, TX (MSA)	0.0289	Camden, AR (MSA)	-0.0041
Nogales, AZ (MSA)	0.0288	Bastrop, LA (MSA)	-0.0038
Clearlake, CA (MSA)	0.0285	Huron, SD (MSA)	-0.0038
Sevierville, TN (MSA)	0.0279	Galesburg, IL (MSA)	-0.0038
Clewiston, FL (MSA)	0.0273	Burlington, IA-IL (MSA)	-0.0038
Oak Harbor, WA (MSA)	0.0265	Beatrice, NE (MSA)	-0.0037
Shelton, WA (MSA)	0.0260	Bucyrus, OH (MSA)	-0.0037
Athens, TX (MSA)	0.0258	Altus, OK (MSA)	-0.0037
Hilo, HI (MSA)	0.0255	Pampa, TX (MSA)	-0.0036
Evanston, WY (MSA)	0.0252	Coffeyville, KS (MSA)	-0.0035
Eagle Pass, TX (MSA)	0.0248	Vernon, TX (MSA)	-0.0035
Hailey, ID (MSA)	0.0248	Clinton, IA (MSA)	-0.0035
Bozeman, MT (MSA)	0.0247	Warren, PA (MSA)	-0.0033
Jefferson, GA (MSA)	0.0247	Oil City, PA (MSA)	-0.0033
Vineyard Haven, MA (MSA)	0.0239	Ottumwa, IA (MSA)	-0.0033
Vernal, UT (MSA)	0.0238	Richmond, IN (MSA)	-0.0033
Mountain Home, AR (MSA)	0.0237	Atchison, KS (MSA)	-0.0032
Crossville, TN (MSA)	0.0237	Canton, IL (MSA)	-0.0032
Lake City, FL (MSA)	0.0234	Pecos, TX (MSA)	-0.0032
Durango, CO (MSA)	0.0230	Austin, MN (MSA)	-0.0031
Arcadia, FL (MSA)	0.0227	Natchez, MS-LA (MSA)	-0.0031
Winnemucca, NV (MSA)	0.0226	Jamestown, ND (MSA)	-0.0030
Sandpoint, ID (MSA)	0.0224	Mason City, IA (MSA)	-0.0029
Kerrville, TX (MSA)	0.0219	El Dorado, AR (MSA)	-0.0027
Sonora, CA (MSA)	0.0217	Lincoln, IL (MSA)	-0.0027
Dunn, NC (MSA)	0.0212	Amsterdam, NY (MSA)	-0.0027
Rock Springs, WY (MSA)	0.0210	Borger, TX (MSA)	-0.0026
Juneau, AK (MSA)	0.0209	Morgan City, LA (MSA)	-0.0026
Fredericksburg, TX (MSA)	0.0206	Big Spring, TX (MSA)	-0.0026
Huntsville, TX (MSA)	0.0202	Forrest City, AR (MSA)	-0.0026
Calhoun, GA (MSA)	0.0201	Middlesborough, KY (MSA)	-0.0026

TOP 50 FASTEST GROWING MICROPOLITAN AREAS (IN TERMS OF PER CAPITA INCOME)		**TOP 50 SLOWEST GROWING MICROPOLITAN AREAS (IN TERMS OF PER CAPITA INCOME)**	
Area	**Average Growth**	**Area**	**Average Growth**
Williston, ND (MSA)	0.0826	Clewiston, FL (MSA)	0.0417
Dickinson, ND (MSA)	0.0761	Pahrump, NV (MSA)	0.0442
Summit Park, UT (MSA)	0.0726	Hereford, TX (MSA)	0.0461
Cleveland, MS (MSA)	0.0696	Fernley, NV (MSA)	0.0466
Opelousas, LA (MSA)	0.0696	Grants, NM (MSA)	0.0475
Wahpeton, ND-MN (MSA)	0.0691	Crescent City, CA (MSA)	0.0486
Alice, TX (MSA)	0.0690	Peru, IN (MSA)	0.0490
Clarksdale, MS (MSA)	0.0678	Dumas, TX (MSA)	0.0491
Las Vegas, NM (MSA)	0.0675	Owosso, MI (MSA)	0.0491
Zapata, TX (MSA)	0.0668	Sturgis, MI (MSA)	0.0493
Hays, KS (MSA)	0.0668	Red Bluff, CA (MSA)	0.0493
Indianola, MS (MSA)	0.0667	Wauchula, FL (MSA)	0.0497
Aberdeen, SD (MSA)	0.0664	Pecos, TX (MSA)	0.0496
Mitchell, SD (MSA)	0.0664	Othello, WA (MSA)	0.0498
Gainesville, TX (MSA)	0.0663	Norwalk, OH (MSA)	0.0498
Kearney, NE (MSA)	0.0662	Gardnerville Ranchos, NV (MSA)	0.0501
Minot, ND (MSA)	0.0662	Susanville, CA (MSA)	0.0504
Brookings, SD (MSA)	0.0660	New Castle, IN (MSA)	0.0505
Durango, CO (MSA)	0.0659	Ionia, MI (MSA)	0.0505
Georgetown, SC (MSA)	0.0659	Hillsdale, MI (MSA)	0.0505
Brenham, TX (MSA)	0.0659	Connersville, IN (MSA)	0.0508
Key West, FL (MSA)	0.0659	Richmond, IN (MSA)	0.0508
Rock Springs, WY (MSA)	0.0655	Adrian, MI (MSA)	0.0510
Natchitoches, LA (MSA)	0.0653	Klamath Falls, OR (MSA)	0.0510
Eagle Pass, TX (MSA)	0.0653	Aberdeen, WA (MSA)	0.0511
Breckenridge, CO (MSA)	0.0652	Bucyrus, OH (MSA)	0.0511
Oxford, MS (MSA)	0.0651	Juneau, AK (MSA)	0.0512
Gillette, WY (MSA)	0.0648	Cedar City, UT (MSA)	0.0512

Fredericksburg, TX (MSA)	0.0647	Dodge City, KS (MSA)	0.0513
Jamestown, ND (MSA)	0.0647	Wooster, OH (MSA)	0.0513
Raymondville, TX (MSA)	0.0646	Shelton, WA (MSA)	0.0514
Morehead City, NC (MSA)	0.0644	Ashland, OH (MSA)	0.0514
Levelland, TX (MSA)	0.0644	Ontario, OR-ID (MSA)	0.0515
Greenwood, MS (MSA)	0.0642	Tiffin, OH (MSA)	0.0515
Taos, NM (MSA)	0.0642	Urbana, OH (MSA)	0.0515
Bainbridge, GA (MSA)	0.0641	Marshalltown, IA (MSA)	0.0516
Vermillion, SD (MSA)	0.0641	Okeechobee, FL (MSA)	0.0516
Helena-West Helena, AR (MSA)	0.0640	Summerville, GA (MSA)	0.0516
Snyder, TX (MSA)	0.0640	Moses Lake, WA (MSA)	0.0516
Poplar Bluff, MO (MSA)	0.0639	Eureka-Arcata-Fortuna, CA (MSA)	0.0517
Jackson, WY-ID (MSA)	0.0637	Logansport, IN (MSA)	0.0517
Kill Devil Hills, NC (MSA)	0.0637	Nogales, AZ (MSA)	0.0517
Steamboat Springs, CO (MSA)	0.0637	Coldwater, MI (MSA)	0.0518
Elk City, OK (MSA)	0.0637	Pullman, WA (MSA)	0.0519
Marshall, TX (MSA)	0.0637	Wilmington, OH (MSA)	0.0519
Troy, AL (MSA)	0.0636	Kendallville, IN (MSA)	0.0519
Fallon, NV (MSA)	0.0636	Decatur, IN (MSA)	0.0519
Española, NM (MSA)	0.0635	Plymouth, IN (MSA)	0.0520
Hailey, ID (MSA)	0.0634	Hilo, HI (MSA)	0.0520
Roanoke Rapids, NC (MSA)	0.0634	Alma, MI (MSA)	0.0521

Appendix B: Top 50 Most Volatile and Least Volatile Micropolitan Areas

TOP 50 MOST VOLATILE AREAS		**TOP 50 MOST VOLATILE AREAS**	
Area	**Stdev of PCPI Growth**	**Area**	**Stdev of Population Growth**
Hereford, TX (MSA)	0.1505	Fort Polk South, LA (MSA)	0.0652
Wahpeton, ND-MN (MSA)	0.1471	Evanston, WY (MSA)	0.0604
Lamesa, TX (MSA)	0.1451	Pahrump, NV (MSA)	0.0571
Guymon, OK (MSA)	0.1259	Gillette, WY (MSA)	0.0540
Williston, ND (MSA)	0.1083	Breckenridge, CO (MSA)	0.0501
Othello, WA (MSA)	0.1074	Craig, CO (MSA)	0.0499
Levelland, TX (MSA)	0.1023	Junction City, KS (MSA)	0.0476
Raymondville, TX (MSA)	0.0990	Elk City, OK (MSA)	0.0474
Plainview, TX (MSA)	0.0894	Rock Springs, WY (MSA)	0.0452
Gillette, WY (MSA)	0.0880	Fort Leonard Wood, MO (MSA)	0.0451
Jamestown, ND (MSA)	0.0872	St. Marys, GA (MSA)	0.0429
Zapata, TX (MSA)	0.0867	Gardnerville Ranchos, NV (MSA)	0.0384
Bay City, TX (MSA)	0.0860	Williston, ND (MSA)	0.0373
Pecos, TX (MSA)	0.0853	Mineral Wells, TX (MSA)	0.0363
Maryville, MO (MSA)	0.0837	Winnemucca, NV (MSA)	0.0357
Snyder, TX (MSA)	0.0834	Andrews, TX (MSA)	0.0351
Worthington, MN (MSA)	0.0826	Elko, NV (MSA)	0.0336
Dumas, TX (MSA)	0.0795	Wauchula, FL (MSA)	0.0333
Andrews, TX (MSA)	0.0779	Edwards, CO (MSA)	0.0325
Jackson, WY-ID (MSA)	0.0768	Vernal, UT (MSA)	0.0324
Clewiston, FL (MSA)	0.0764	Sault Ste. Marie, MI (MSA)	0.0318
Woodward, OK (MSA)	0.0763	Woodward, OK (MSA)	0.0313
Indianola, MS (MSA)	0.0737	Steamboat Springs, CO (MSA)	0.0304
Portales, NM (MSA)	0.0734	Ozark, AL (MSA)	0.0295
Vermillion, SD (MSA)	0.0733	Mountain Home, ID (MSA)	0.0284
Rock Springs, WY (MSA)	0.0717	Juneau, AK (MSA)	0.0282
Elk City, OK (MSA)	0.0713	Crescent City, CA (MSA)	0.0280
Garden City, KS (MSA)	0.0712	Plainview, TX (MSA)	0.0279
Breckenridge, CO (MSA)	0.0707	Dickinson, ND (MSA)	0.0277
Vernal, UT (MSA)	0.0703	Truckee-Grass Valley, CA (MSA)	0.0274
Pullman, WA (MSA)	0.0702	Weatherford, OK (MSA)	0.0271
Storm Lake, IA (MSA)	0.0700	Vineyard Haven, MA (MSA)	0.0269
Pierre, SD (MSA)	0.0677	Bay City, TX (MSA)	0.0264
Big Spring, TX (MSA)	0.0671	Oak Harbor, WA (MSA)	0.0263
Beatrice, NE (MSA)	0.0661	Fernley, NV (MSA)	0.0262
Minot, ND (MSA)	0.0657	Okeechobee, FL (MSA)	0.0259
Evanston, WY (MSA)	0.0657	Mountain Home, AR (MSA)	0.0255
Huron, SD (MSA)	0.0657	Summit Park, UT (MSA)	0.0254
Edwards, CO (MSA)	0.0643	Clearlake, CA (MSA)	0.0251

Hobbs, NM (MSA)	0.0643	Hilo, HI (MSA)	0.0245
Great Bend, KS (MSA)	0.0642	Price, UT (MSA)	0.0244
Hailey, ID (MSA)	0.0641	Snyder, TX (MSA)	0.0244
Burley, ID (MSA)	0.0626	Eagle Pass, TX (MSA)	0.0244
Hilo, HI (MSA)	0.0623	Borger, TX (MSA)	0.0244
Fort Morgan, CO (MSA)	0.0618	Jackson, WY-ID (MSA)	0.0244
Dickinson, ND (MSA)	0.0616	Hailey, ID (MSA)	0.0244
Alice, TX (MSA)	0.0615	Pullman, WA (MSA)	0.0241
Helena-West Helena, AR (MSA)	0.0614	Glenwood Springs, CO (MSA)	0.0241
Norfolk, NE (MSA)	0.0609	Key West, FL (MSA)	0.0239
Borger, TX (MSA)	0.0609	Hobbs, NM (MSA)	0.0238

TOP 50 LEAST VOLATILE AREAS		**TOP 50 LEAST VOLATILE AREAS**	
Area	**Standard Deviation of Income Growth**	**Area**	**Std Dev of Population Growth**
Lewistown, PA (MSA)	0.0255	Manitowoc, WI (MSA)	0.0040
Cortland, NY (MSA)	0.0258	Richmond, IN (MSA)	0.0041
Amsterdam, NY (MSA)	0.0261	Mason City, IA (MSA)	0.0048
Barre, VT (MSA)	0.0270	Jasper, IN (MSA)	0.0050
Frankfort, KY (MSA)	0.0270	Sunbury, PA (MSA)	0.0050
Pottsville, PA (MSA)	0.0273	Jamestown-Dunkirk-Fredonia, NY (MSA)	0.0050
Thomaston, GA (MSA)	0.0276	Newberry, SC (MSA)	0.0050
Grants, NM (MSA)	0.0276	Findlay, OH (MSA)	0.0051
Gloversville, NY (MSA)	0.0276	Marion, IN (MSA)	0.0051
Olean, NY (MSA)	0.0277	New Philadelphia-Dover, OH (MSA)	0.0053
Huntingdon, PA (MSA)	0.0278	Tiffin, OH (MSA)	0.0054
Oneonta, NY (MSA)	0.0279	Wilson, NC (MSA)	0.0054
Helena, MT (MSA)	0.0280	Red Wing, MN (MSA)	0.0054
Sunbury, PA (MSA)	0.0281	Lewistown, PA (MSA)	0.0055
Ogdensburg-Massena, NY (MSA)	0.0282	Freeport, IL (MSA)	0.0056
Rutland, VT (MSA)	0.0282	New Castle, PA (MSA)	0.0057
Alpena, MI (MSA)	0.0283	Paducah, KY-IL (MSA)	0.0057
Meadville, PA (MSA)	0.0284	Auburn, NY (MSA)	0.0057
Auburn, NY (MSA)	0.0285	Batavia, NY (MSA)	0.0058
New Castle, PA (MSA)	0.0286	Wabash, IN (MSA)	0.0058
Greenfield Town, MA (MSA)	0.0286	Corning, NY (MSA)	0.0058
Eureka-Arcata-Fortuna, CA (MSA)	0.0286	Greensburg, IN (MSA)	0.0059
Cambridge, OH (MSA)	0.0287	Barre, VT (MSA)	0.0059
Jamestown-Dunkirk-Fredonia, NY (MSA)	0.0287	Crawfordsville, IN (MSA)	0.0060
Red Bluff, CA (MSA)	0.0288	Zanesville, OH (MSA)	0.0060
Klamath Falls, OR (MSA)	0.0289	Ashtabula, OH (MSA)	0.0060
Portsmouth, OH (MSA)	0.0292	Salem, OH (MSA)	0.0060
Brainerd, MN (MSA)	0.0293	Danville, VA (MSA)	0.0060
Escanaba, MI (MSA)	0.0293	Ottawa-Peru, IL (MSA)	0.0060
Marion, OH (MSA)	0.0294	Albemarle, NC (MSA)	0.0061
Talladega-Sylacauga, AL (MSA)	0.0294	Somerset, PA (MSA)	0.0061
Augusta-Waterville, ME (MSA)	0.0295	Roanoke Rapids, NC (MSA)	0.0062
Malone, NY (MSA)	0.0296	Jacksonville, IL (MSA)	0.0062
Wisconsin Rapids-Marshfield, WI (MSA)	0.0298	Tullahoma-Manchester, TN (MSA)	0.0062
Merrill, WI (MSA)	0.0298	Decatur, IN (MSA)	0.0062
Orangeburg, SC (MSA)	0.0298	Galesburg, IL (MSA)	0.0063
Centralia, IL (MSA)	0.0298	Celina, OH (MSA)	0.0063
Lebanon, MO (MSA)	0.0300	Burlington, IA-IL (MSA)	0.0063
Richmond-Berea, KY (MSA)	0.0300	Seymour, IN (MSA)	0.0063
Batavia, NY (MSA)	0.0300	Forest City, NC (MSA)	0.0064
Claremont-Lebanon, NH-VT (MSA)	0.0301	Defiance, OH (MSA)	0.0064
Jackson, OH (MSA)	0.0302	Sandusky, OH (MSA)	0.0064
Clarksburg, WV (MSA)	0.0302	Chillicothe, OH (MSA)	0.0064
Bradford, PA (MSA)	0.0302	Hannibal, MO (MSA)	0.0064
Shelton, WA (MSA)	0.0302	Plymouth, IN (MSA)	0.0065
Menomonie, WI (MSA)	0.0303	Norwalk, OH (MSA)	0.0065
Ashtabula, OH (MSA)	0.0303	Seneca, SC (MSA)	0.0065
Baraboo, WI (MSA)	0.0303	LaGrange, GA (MSA)	0.0065
Tullahoma-Manchester, TN (MSA)	0.0305	Pottsville, PA (MSA)	0.0065
Clearlake, CA (MSA)	0.0305	Oneonta, NY (MSA)	0.0065

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