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An Update of the Regional Growth Model for Large and Mid-Size U.S. Metropolitan Areas: Northeast Ohio Dashboard Indicators

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**AN UPDATE OF THE REGIONAL GROWTH MODEL FOR LARGE
AND MID-SIZE U.S. METROPOLITAN AREAS:
NORTHEAST OHIO DASHBOARD INDICATORS**

Prepared by

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Prepared for

The Fund for Our Economic Future

August 2007

**This report follows *Dashboard Indicators for the Northeast Ohio Economy* by
Randall Eberts, George Erickcek, and Jack Kleinhenz, April 2006.**

**The report was reviewed by the Northeast Ohio Council of
Regional Economic Policy Advisors**

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Jack Kleinhenz from Kleinhenz and Associates accompanied this study from the beginning and contributed to the discussion of data, methodology, and results. Mark Schweitzer and Mark Sniderman from the Federal Reserve Bank of Cleveland consulted on several methodological issues and reviewed preliminary results and earlier drafts.

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EXECUTIVE SUMMARY

Introduction

This study develops a set of dashboard indicators that best explains the dynamics of regional economic growth for large and mid-size metropolitan areas in the U.S. Dashboard indicators help monitor the economic performance of Northeast Ohio and provide policy makers with a sound information base that can be used to design effective strategies and policy interventions.

This paper presents factors of economic growth and establishes a set of dashboard indicators and the variables that underlie each indicator. The study shows the degree to which the dashboard indicators are associated with economic growth and ranks the performance of Northeast Ohio metropolitan areas in comparison to other regions. It builds upon an earlier study of dashboard indicators (Eberts, Erickcek, and Kleinhenz, 2006) that laid the foundation for the methodology used in this paper.¹ It is expected that these indicators, as well as the measures of economic growth, will be updated annually so that policy makers, economic development planners, and political and civic leaders can track the progress that Northeast Ohio is making over time and adjust their strategies as needed.

This executive summary emphasizes the performance of the four Northeast Ohio metropolitan areas including Akron, Canton-Massillon, Cleveland-Elyria-Mentor, and Youngstown-Warren-Boardman. These four metropolitan areas combined represent Northeast Ohio as a region and are linked through a common history and industrial structure. However, the economic analysis is conducted at the metropolitan area level to allow for comparison with other metropolitan areas across the country. Northeast Ohio metropolitan areas are being analyzed as part of a group of 136 metropolitan areas across the U.S. with a population between 300,000 and 3.5 million. The analysis ranks all metropolitan areas in the study and assigns them to quartiles based on the ranking.²

¹ *Dashboard Indicators for the Northeast Ohio Economy: Prepared for the Fund for Our Economic Future* by Randall Eberts, George Erickcek, and Jack Kleinhenz, April 2006. The report was published as working paper 06-05 by the Federal Reserve Bank of Cleveland.

² Metropolitan areas that are ranked between #1 and #34 are part of the first quartile, those ranked between #35 and #68 are in the second quartile, those ranked between #69 and #102 are in the third quartile, and those ranked between #103 and #136 are in the fourth quartile.

Northeast Ohio (NEO) and Measures of Economic Growth

To estimate regional economic performance, this study uses four measures of economic growth: percentage change in per capita personal income, employment, gross metropolitan product, and productivity. Per capita income approximates the regional standard of living and is often used as a critical gauge in assessing a region's economic performance.³ Employment measures job opportunities available to people in the regional labor force, but it does not differentiate between low-skill, low-paying jobs and high-skill, high-paying jobs. Gross metropolitan product (GMP) measures value-added output produced in the region approximating the scale of the regional economy and is the regional counterpart to the national gross domestic product. Productivity measures GMP per employee and provides a proxy for a critical measure of regional competitiveness. The four NEO metropolitan areas are compared to the other metropolitan areas as well as the average of all 136 areas.⁴

The study shows that Northeast Ohio metropolitan areas grew at modest rates in all four measures and always below the sample average. For example, between 1995 and 2004, per capita personal income grew by 8.9 percent in the Cleveland metro area and 12.7 percent in the Akron area in comparison to the sample average growth rate of nearly 14 percent. NEO's performance was even worse when measuring growth by employment. Employment growth rates between 1995 and 2005 ranged from an 8.4 percent gain in Akron to less than one percent growth in the Cleveland metro area and a two percent decline in the Youngstown area; this is in comparison to a sample average growth rate of 15.9 percent. The relatively poor economic performance of NEO's metropolitan areas is attributed to slow growth during the expansionary years of the late 1990s and a more severe and lengthier decline during the recession of the early 2000s.

There were different growth patterns among NEO's four metropolitan areas. Akron had the highest rank among NEO's metro areas in all four measures. Anecdotal evidence suggests that strong and consistent political leadership, strong institutions (two large universities, two hospital systems, and several large corporations), and the relatively small size of the metropolitan area contributed to stronger economic performance in the Akron area.

Analysis of a more recent time period (2002-2005) suggests that NEO's metro areas grew faster in the past three years than they did over the longer time period (1995-2005) and improved their relative ranking. Moreover, some of NEO's metropolitan areas jumped quartiles in their ranking among all metro areas when comparing longer-term and shorter-term growth patterns. The Akron metropolitan area jumped to the second quartile in growth rates of per capita income and employment; however, it dropped from the third to the fourth quartile in productivity growth. The Cleveland and Youngstown metropolitan

³ Per capita personal income is calculated as the personal income of the residents of an area divided by the population of that area. Per capita income gives no indication of the distribution of that income within the region.

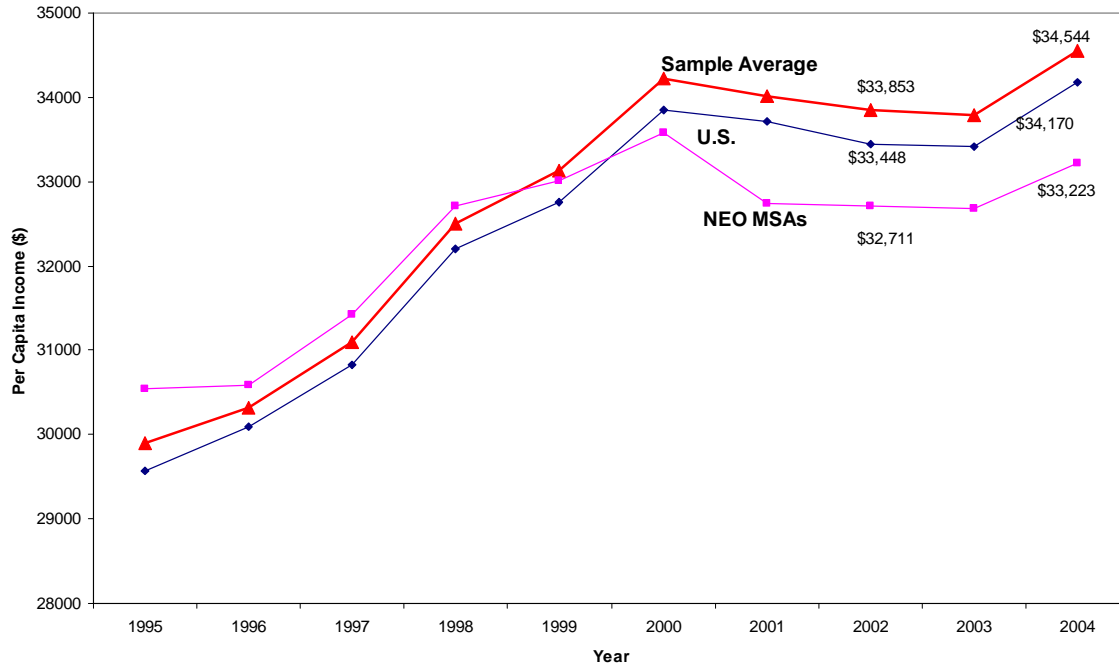
⁴ The average of the 136 metropolitan areas included in the study is referred to as the sample average.

areas improved their quartile rankings in growth of per capita income, while the Canton metropolitan area improved in productivity growth.

How does the Cleveland metro area compare to other large Midwest areas? Analysis of regional economic growth between 1995 and 2005 in the Cleveland metropolitan area and seven other large Midwest metro areas reveals that Cleveland experienced the lowest growth rates in three measures of economic growth: per capita income, employment, and GMP. The only measure of economic growth in which the Cleveland metropolitan area performed better is productivity growth, where it ranked in the middle among the group of Midwest metro areas. During the expansionary portion of the most recent business cycle, 2002-2005, Cleveland still had the lowest rate of growth in per capita income and employment among the Midwest metropolitan areas and again ranked in the middle in productivity growth. The Cleveland metropolitan area's growth rates in all four measures of regional economic growth were lower than the sample average of the 136 MSAs.

How does Northeast Ohio, defined by the four metro areas combined, compare to the national average and the average of the 136 MSAs included in this study? Trends in per capita income between 1995 and 2004 reveal that per capita income in Northeast Ohio was higher than the national average through the year 1999, after which it fell and remained below the national average. *The year 1999 was the first time in the region's history that its per capita income dropped below the national average.* In 1995, NEO's per capita income was 3.3 percent higher than the national average; by 2004, it was 2.8 percent below the national average. In this 10-year period, the gap between the national and NEO average per capita income deteriorated by six percentage points. The latest recession had a more severe impact in Northeast Ohio and lasted much longer than in other regions of the country. The decline in Northeast Ohio's per capita income between 2000 and 2001 was substantial; Northeast Ohio saw a 2.5 percent decline in per capita income in one year, a loss about five times larger than the average loss in the sample MSAs and the nation. Future updates will show whether the gap between the national and NEO per capita income continues to increase or whether efforts to transform the economy are effective.

Per Capita Income in Northeast Ohio, the U.S., and the Sample Average, 1995 – 2004*



*Per capita income is adjusted for inflation.

What would it mean if NEO's metropolitan areas grew at faster rates, such as the average growth rates of the third or second quartile? The Cleveland metro area ranked in the fourth quartile in per capita income growth between 1995 and 2004. Its per capita income of \$35,425 in 2004 grew by 8.9 percent, while the average growth rate of per capita income for third quartile metro areas was 13 percent. Every person in the Cleveland metropolitan area would have an additional \$1,238 in 2004 if per capita income grew at the average growth rate of third quartile metropolitan areas. Moreover, every person in the Cleveland metropolitan area, on average, would have an additional \$2,184 if the metropolitan area had grown at the average growth rate of second quartile metro areas (16%).

By 2005, there were 1.1 million people working in the Cleveland metropolitan area. However, fewer than 8,900 jobs were added (net growth) since 1995, for a very slow job growth rate of less than one percent (0.8%). If employment in the Cleveland metro area would have grown at the average rate of third quartile metro areas (11%), there would have been an additional 108,140 jobs in the Cleveland metropolitan area in 2005.

Dashboard Indicators

What determines regional economic growth? Why do some regions accelerate while others grow at a slow pace or remain stagnant? This study offers a framework for understanding the factors associated with regional economic growth. It identifies statistical correlations between nine indicators and economic growth in income, employment, output, and worker productivity. These dashboard indicators are derived from a statistical analysis of 38 variables for 136 metropolitan areas in the U.S.⁵

The dashboard indicators include:

- Skilled Workforce and R&D
- Technology Commercialization
- Racial Inclusion & Income Equality
- Urban Assimilation
- Legacy of Place
- Business Dynamics
- Individual Entrepreneurship
- Locational Amenities
- Urban/Metro Structure

Skilled Workforce and R&D

This indicator primarily describes the quality of the regional labor force and the region's advanced research activities. As the primary indicator for human capital, it is one of the critical components of economic growth. It includes variables that describe high educational attainment and high-level occupations (percentage of population with bachelor's and graduate degrees and professional occupations). This indicator also describes the ability of a region to be engaged in technology-driven economic development based on industrial and university R&D and technology-related small business entrepreneurship (Industry R&D, University R&D, and Small Business Innovation Research awards). This factor confirms that there is more scientific and technological research in metropolitan areas with large concentrations of highly educated residents—a characteristic that does not change quickly over time and requires years of development and persistent investment.

Technology Commercialization

Many regions and communities are adopting strategies to foster innovation. Successful production of innovation requires investments in research and development that can lead to the introduction of new products and more efficient production processes. Traditionally, innovation was dominated by large companies with substantial R&D budgets. However, in more recent years smaller firms, some which started as spin offs from university-based research, are commercializing new technologies.

⁵ Factor analysis is a statistical tool that reduces an initial number of variables to a smaller set of factors. The statistical method, not the researcher, determines the set of variables that are included in each factor. In this study, the factors became the dashboard indicators.

The Technology Commercialization indicator includes three variables—venture capital per employee, number of patents per employee, and cost of living. The patents and venture capital variables represent the process of innovation commercialization. Number of patents indicates successful research and the potential for commercialization, while venture capital shows that investors believe in the possible transformation of these innovations into marketable products. The cost of living variable is also included with this factor, suggesting that many research facilities producing patents and many startup companies that are funded by venture capital are located in metropolitan areas with a high cost of living, primarily along the eastern and western coasts of the U.S.

Racial Inclusion & Income Equality

Poverty and segregation are often found in conjunction with high rates of crime and social welfare. Two variables included in this factor directly relate to racial patterns (percentage blacks and Black Isolation Index).⁶ Two other variables relate to poverty and distribution of income. These variables are percentage of children living in high-poverty neighborhoods (approximated by the share of students in schools where more than 70 percent of students receive free lunch) and income inequality. A fifth variable is violent crime rate, suggesting that areas that have high racial isolation and high poverty and income inequality are likely also to have high rates of violent crime. Although this indicator includes some social and demographic variables, racial inclusion and income equality are thought to be related to economic growth.

Urban Assimilation

Assimilating minority and immigrant populations into the economy and social fabric of regions enhances regional growth. Separate from the previous indicator, this indicator describes ethnic diversity (percentage Hispanic, percentage foreign born, and percentage Asian), as well as percentage employed in minority-owned businesses and productivity in the information sector. The distribution of productivity in the information sector varies across metropolitan areas in a similar pattern as the four urban assimilation variables.

Legacy of Place

This indicator reflects business churning (approximated by the rate of business openings and closings), and the demographic, social, and economic history of metropolitan areas. It includes variables that may suggest old physical infrastructure (approximated by the percentage of houses built before 1940), industrial heritage (share of manufacturing employment), and racial and poverty concentrations in central cities (Black Dissimilarity Index and the core city's share of poverty relative to its share of the metropolitan population). Other variables included in this indicator are climate and the number of governmental units per capita. Regions with high legacy costs and high poverty also have low business churning and slower economic growth.

Business Dynamics

This indicator includes one variable that measures business dynamics in a metro area. It is calculated as the ratio between business openings and business closings of single-site

⁶ The Isolation Index estimates the degree to which a minority group is exposed to a majority group in its neighborhood. Higher values of isolation indicate higher segregation.

companies. Metro areas with more business openings than closings have a healthier and more dynamic economy.

Individual Entrepreneurship

This indicator describes the small business sector of regional economies. The Individual Entrepreneurship indicator includes two variables: percentage of self employed and the share of business establishments with fewer than 20 employees. It confirms researchers' projections for the increased role of small and personal businesses in the economy.

Locational Amenities

Locational amenities reflect the quality of life in a region and influence people's decisions about the places they want to live, work, and play. Four measures define the Locational Amenities indicator, including transportation, arts, recreation, and healthcare indices; each index is calculated based on several variables. This factor is important because regional quality of life characteristics may affect people's decisions on where to live, work, or start their businesses.

Urban/Metro Structure

Economic development literature suggests that metropolitan areas with healthy central cities have stronger economic growth over time. This indicator includes two variables: central city population as a percentage of metro population and the rate of property crime. This factor is more difficult to interpret since the larger share of population in a central city is considered a positive characteristic of metropolitan areas. At the same time, this variable is highly correlated with a high property crime rate. Having these two variables in the same factor suggests that they vary in similar patterns across metropolitan areas so that larger cities (relative to their metro area) are likely to have higher property crime rates compared to smaller cities.

Relationships of Dashboard Indicators to Economic Growth

The nine dashboard indicators vary in their relationship to the four measures of economic growth, and not all indicators are associated with every measure of economic growth. Based on a regression analysis, the table below shows the indicators that explain each measure. It should be noted that the relationships depicted in the table describe the association between each of the indicators and a measure of economic growth but do not indicate causality. For example, the table suggests a statistical association between Technology Commercialization and growth in per capita income; it does not mean that an increase in technology commercialization will cause an increase in regional per capita income.⁷

⁷ In addition, the indicators account for only a proportion of the variation in the measures of economic growth. Based on adjusted R^2 of the regression models, the indicators explain 47.1% of the variation in per capita income growth; 61.8% of the variation in employment growth, 67.6 % of the variation in GMP growth, and 22.2% of the variation in productivity growth.

Indicators' Impact on Regional Economic Growth

Per Capita Income	Employment	GMP	Productivity
Skilled Workforce and R&D			Skilled Workforce and R&D
Technology Commercialization		Technology Commercialization	Technology Commercialization
Racial Inclusion & Income Equality	Racial Inclusion & Income Equality	Racial Inclusion & Income Equality	Racial Inclusion & Income Equality
	Urban Assimilation	Urban Assimilation	Urban Assimilation
	Legacy of Place*	Legacy of Place*	Legacy of Place*
	Business Dynamics	Business Dynamics	
	Individual Entrepreneurship	Individual Entrepreneurship	
Locational Amenities			
	Urban/Metro Structure	Urban/Metro Structure	

* Denotes that the indicator is negatively related to the measure of economic growth.

The association between the indicators and economic growth reveals two patterns. The first pattern shows that some of the indicators that affect the growth of per capita income are also significant in productivity growth. More specifically, three indicators are significant for the growth of both per capita income and productivity: Technology Commercialization, Skilled Workforce and R&D, and Racial Inclusion & Income Equality. The second pattern shows that six indicators are significant for growth of employment and gross metropolitan product (GMP): Legacy of Place (negatively related to economic growth), Business Dynamics, Racial Inclusion & Income Equality, Individual Entrepreneurship, Urban Assimilation, and Urban/Metro Structure.

Only one indicator, Racial Inclusion and Income Equality, is related to all measures of economic performance. It suggests that improvements in any of the variables that underlie this indicator will be associated with gains in per capita income, employment, GMP, and productivity. For example, a decline in poverty and falling rates of violent crime as well as an increase in racial inclusion and income equality should positively affect all measures of regional economic growth.

On the other hand, Locational Amenities, a proxy for quality of life, is shown to be significant only in relation to growth in per capita income. Since wages are a critical part of per capita personal income, it may suggest that people with higher-paying jobs are attracted to places with higher quality of life.

Ranking of NEO's Metropolitan Areas Based on Dashboard Indicators in 2000 and 2005

The economic performance of Northeast Ohio metropolitan areas and other regional economies depends on changes in the indicators and their underlying variables. The table below shows the rankings for each dashboard indicator for both 2000 and 2005 in the four Northeast Ohio metropolitan areas. It should be noted that comparison of Locational

Amenities ranking between the two years is not meaningful because the methodology used to calculate the variables underlying this indicator changed in the later ranking.

Comparison of Indicator Rankings of Northeast Ohio MSAs among 136 Metropolitan Areas

Indicator	Akron		Canton		Cleveland		Youngstown	
	2000	2005	2000	2005	2000	2005	2000	2005
Skilled Workforce and R&D	74	58	119	117	66	64	128	129
Technology Commercialization	36	60	91	97	35	57	125	134
Racial Inclusion & Income Equality	69	69	40	74	119	124	81	105
Urban Assimilation	127	129	136	134	86	93	130	127
Legacy of Place	30	29	17	17	16	16	6	7
Business Dynamics	89	93	81	112	100	127	104	123
Individual Entrepreneurship	104	101	100	81	102	94	87	74
Locational Amenities	71	49	110	62	3	16	114	74
Urban/Metro Structure Score	38	66	32	42	35	23	18	16

Note: 2005 refers to data from 2005 or earlier years if 2005 data were not available.

All four metro areas in Northeast Ohio showed improvement in ranking of Individual Entrepreneurship. Three of the four areas showed improvement in Skilled Workforce and R&D (Akron, Canton, and Cleveland).

The *Akron* area improved its ranking in two indicators. It experienced a significant improvement in Skilled Workforce and R&D and a small one in Individual Entrepreneurship. Akron remained stable in Racial Inclusion & Income Equality.

The *Canton* area improved its ranking in three indicators. It showed small improvements in Skilled Workforce and R&D and in Urban Assimilation and a more substantial increase in Individual Entrepreneurship.

The *Cleveland* area improved its ranking in three indicators. It experienced a small improvement in Skilled Workforce and R&D and more significant improvements in Individual Entrepreneurship and Urban/Metro Structure.

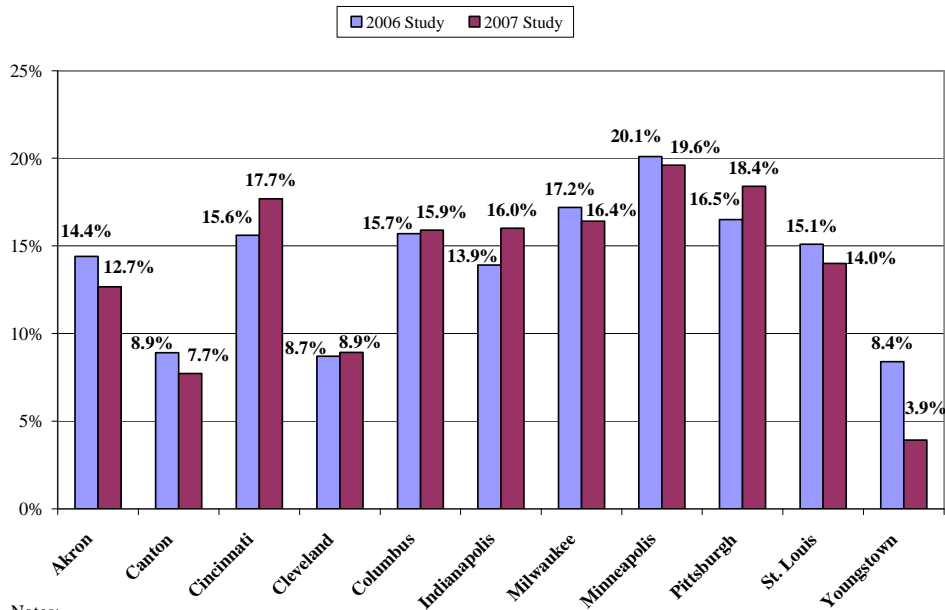
The *Youngstown* area improved its ranking in four indicators. Rankings increased slightly in Urban Assimilation, Legacy of Place, and Urban/Metro Structure. The Youngstown area had a more significant increase in the ranking of Individual Entrepreneurship.

Comparison of Per Capita Income and Employment Growth Rates Based on the 2006 and the 2007 Dashboard Indicators Studies

Comparing growth rates of per capita income between the original study and this update reveals that the growth rate increased slightly in the Cleveland metropolitan area (from 8.7 percent over the earlier period to 8.9 percent between 1995 and 2004) but slowed in

each of NEO’s smaller three metropolitan areas. Among the larger Midwest metropolitan areas, Columbus had a slight increase in its growth rate and grew significantly faster than the Cleveland area. Three other metropolitan areas grew faster than Cleveland and also increased their rates of growth by two percentage points—Cincinnati, Indianapolis, and Pittsburgh. However, Milwaukee, Minneapolis, and St. Louis experienced slower growth rates in the latter time period.

Comparison of Per Capita Income Trends among Midwest MSAs

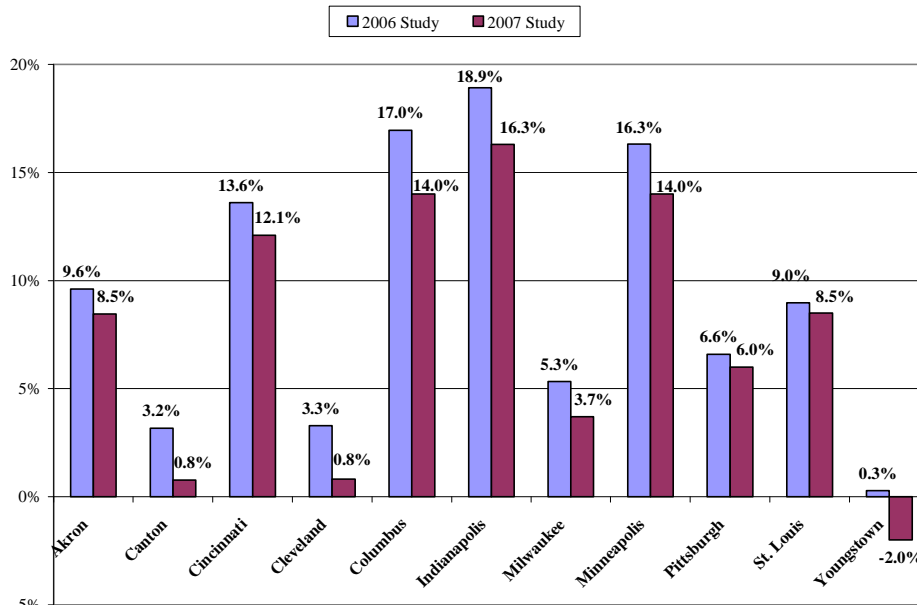


Notes:

- Per capita income is adjusted for inflation.
- The 2006 Dashboard study measured per capita income growth from 1993 to 2003, and the 2007 Dashboard study measured it from 1995 to 2004. Data from the 2006 study is recalculated for a nine-year period to match the number of years of the 2007 study.

Comparing employment trends between the two studies demonstrates that employment growth rates declined in the four NEO metropolitan areas as well as in the larger Midwest metropolitan areas. The average employment growth rate for all four NEO metropolitan areas dropped from 3.9 percent between 1994 and 2004 to 1.7 percent between 1995 and 2005. Even Indianapolis, which was the fastest-growing metropolitan area among the larger Midwest areas in both time periods, experienced a decline in its employment growth rate from 18.9 percent in 1994-2004 to 16.3 percent in 1995-2005.

Comparison of Employment Trends among Midwest MSAs



Note:

The 2006 Dashboard study measured employment growth from 1994 to 2004; the 2007 Dashboard study measured growth from 1995 to 2005.

Conclusions

This report provides a broad framework and a set of dashboard indicators that explain the regional economic performance of metropolitan areas in the U.S. This framework suggests several points of intervention, allowing decision makers to make educated decisions on how to prioritize their investments. Many of the dashboard indicators can lead to initiatives that may be undertaken by different entities. Although the framework is diagnostic in nature, it does not provide one simple prescription on how to transform a slow-moving, traditional manufacturing-based economy into a fast-growing one. The study also offers a strong starting point for additional research and an examination of policies undertaken by other regions that are similar to Northeast Ohio but experienced stronger economic growth.

The dashboard indicators also provide a mechanism to monitor the performance of the Northeast Ohio economy. The four measures of economic growth as well as the nine indicators will be updated annually to monitor the progress of Northeast Ohio metropolitan areas over time and in comparison to other metro areas across the U.S.

There are two types of regional growth in large and mid-sized metropolitan areas in the U.S. The first reflects the restructuring of regional economies through technological product and process innovations and results in growth in productivity and per capita income. This productivity-driven type of growth is less sensitive to regional legacy characteristics and socio-economic factors. It can best be described by such vibrant

economies driven by a skilled workforce paired with research and development resources that result in the deployment of new technologies within a region.

The second pattern creates larger-scale economies through business dynamics and results in an increase in total gross regional product and employment. It is place related and requires the right combination of socio-economic characteristics and business dynamic factors for an economy to grow in size. These regions may not be the fastest growing, but their size provides them with an opportunity for economic diversification, generating steady growth and compensating for declines during recessionary periods. These regions could succeed in mitigating legacy costs through urban assimilation, racial inclusion, and income and social equality. However, size alone does not guarantee economic diversity or growth in employment and GMP, and not every metropolitan area fits into one of the two patterns.

The economic performance of Northeast Ohio is modest at best when compared to other regions of the country, although its relative performance improved in recent years in comparison to a longer period. The decline has occurred over many decades, and new initiatives will take time to make a measurable impact. This history should not discourage the development of new initiatives or tracking the progress of the local economy, but it sets expectations regarding our ability to see quick progress over the short run. Policy makers should expect some variables and indicators to register improvement, while others will continue to decline. Nevertheless, Northeast Ohio must continue to pay attention to its progress over time in comparison to its past performance and in comparison to the performance of other metropolitan areas across the U.S. Continued monitoring of the regional economy is necessary in helping decision makers adjust their strategies for the transformation of Northeast Ohio.

INTRODUCTION

Many economic development researchers and practitioners are engaged in monitoring the performance of their regional or state economies. Every year, literally hundreds of city and state rankings are published using different areas of focus and a variety of measures.

In Northeast Ohio, The Fund for Our Economic Future is interested in monitoring and tracking the Northeast Ohio region in comparison to other regions across the country.⁸ For that purpose, a set of “dashboard indicators” that best explain the dynamics of regional economic growth was developed. Dashboard indicators provide policy makers with a sound information base that can be used in the design of effective strategies and policy interventions.

This paper presents a framework of factors for economic growth, establishes a set of dashboard indicators that describe these factors, and offers a set of variables that underlie each indicator. The study shows the degree to which the dashboard indicators are associated with economic growth and ranks the performance of Northeast Ohio metropolitan areas in comparison to other regions. The Northeast Ohio region is represented in this study by its four metropolitan areas, including Akron, Canton-Massillon, Cleveland-Elyria-Mentor, and Youngstown-Warren Boardman. It is expected that the dashboard indicators as well as the measures of economic growth will be updated annually so that policy makers, economic development planners, and political and civic leaders can track the progress Northeast Ohio is making over time and adjust their strategies as needed. This study builds upon an earlier study of dashboard indicators (Eberts, Erickcek, and Kleinhenz, 2006) that laid the foundation for the methodology used in this paper.⁹

⁸ “The Fund for Our Economic Future is a multi-year ad-hoc coalition of organized philanthropy in Northeast Ohio formed to encourage and advance a common and focused regional economic development agenda that can lead to long-term economic transformation in ways that recognize the importance of core cities, inclusion/diversity, and quality of life. This will be accomplished by convening key stakeholders, educating and engaging the public, tracking overall progress, and backing key initiatives with grants.” <http://www.futurefundneo.org/page9066.cfm>.

This study has five objectives:

1. Update the original framework of the 2006 study with additional variables and indicators describing innovation and entrepreneurship.
2. Develop a revised set of indicators that describe the socio-economic characteristics of a region.
3. Explain the dashboard indicators and their association with regional economic growth.
4. Update the dashboard with 2005 data or the most recent data available to establish a benchmark for ongoing monitoring of changes in Northeast Ohio.
5. Provide a dashboard that will become a common informational base for Northeast Ohio leaders to develop initiatives that will lead to transformative changes in Northeast Ohio. A website on dashboard indicators will be instrumental in achieving this objective.

This report includes six sections, the first of which is this section. The second section briefly discusses the study methodology. The third section discusses the development of dashboard indicators. It begins with a brief description of data and the factor analysis technique used to identify dashboard indicators and then continues with a description of each of the indicators and their variables. The fourth section presents the indicators and their association with economic growth. It discusses four measures of economic growth: per capita income, employment, gross metropolitan product, and productivity, and it explains the association between each of the dashboard indicators and the measures of economic growth. It also ranks the metropolitan areas by each of the economic growth measures and compares Northeast Ohio's metropolitan areas to the U.S. and the average of all metro areas included in the study. This section ends with estimated gains in Northeast Ohio if its metro areas were to grow at higher rates. The fifth section ranks the metropolitan areas included in the study by each of the indicators in two years, 2000 and 2005. The standings of the four Northeast Ohio metropolitan areas in comparison to

⁹ *Dashboard Indicators for the Northeast Ohio Economy: Prepared for the Fund for Our Economic Future* by Randall Eberts, George Erickcek, and Jack Kleinhenz, April 2006. The report was published as working paper 06-05 by the Federal Reserve Bank of Cleveland.

other regions, including those in the Midwest, are highlighted. This section also compares the economic performance and ranking of Northeast Ohio metro areas in this study with those from the original study. The report ends with concluding comments.

METHODOLOGY

This study uses several statistical techniques to develop dashboard indicators and estimate their association with economic growth (much like the original 2006 study).

The following steps were taken:

- Assemble data on variables that measure regional economic and social characteristics for all metropolitan areas in the U.S. with population between 300,000 and 3.5 million. Data were collected for the year 2000 because it was the peak of the business cycle and data were available for all variables. The year 2000 also represents the middle point for the data on the dependent variables in regressions that explain economic growth. This helps to avoid introducing a reverse causation in a growth model and, at the same time, provides enough time for the dependent variables to measure long-term growth.
- Conduct a factor analysis — a mathematical tool used to reduce the initial number of variables to a smaller set of factors and detect structure in the relationships among variables. More specifically, factor analysis seeks to discover if the process underlying variation in all of the analyzed variables can be explained largely or entirely by a much smaller number of variables called factors.
- Identify factors based on the factor analysis and name them. These factors will then become the set of dashboard indicators. Each factor is defined by a reduced set of key variables that are used to calculate factor scores. The factor analysis also defines correlation coefficients of each of the key variables to a corresponding factor. The coefficient of correlation represents a share of each variable devoted to an explanation of a variation in the factor as a whole. These coefficients identify the structural relationships between the variables and the factors and therefore define the structure of the economy at the moment the variables were assessed. This technique allows us to compare annual changes in the dashboard indicators using the 2000 structure of the economy, expressed as factor scores. The 2000 structural framework will be used until a significant shift in the economy's structure requires re-running a factor analysis.
- Use regression analysis to associate each of the dashboard indicators with four measures of economic growth: per capita income, employment, gross metropolitan product, and productivity. The measures of economic growth are calculated as an average of annual percentage changes between 1995 and 2005, excluding the recessionary 2001-2002 years. Such measures of the dependent variables exclude the influence of cyclical fluctuations and help to better assess long-term growth.

- Rank metropolitan areas based on the four measures of economic performance.
- Update the variables included in each of the dashboard indicators with data for 2005 or the most recent data if only an earlier year is available.¹⁰
- Rank metropolitan areas based on dashboard indicators, using 2000 and 2005 data. Rankings based on the 2005 data (or latest data available) use factor scores derived from the 2000 factor analysis.
- Compare shifts in rankings for Northeast Ohio MSAs, Midwest MSAs, and other regions identified as fast growing or similar to Northeast Ohio in economic structure or history.

¹⁰ In this report, we refer to the latest data available as 2005 data.

DEVELOPING DASHBOARD INDICATORS

This study is based on the methodology offered by the 2006 dashboard indicators report and enhances its framework. Taking into account all areas of economic and social concerns relevant for Northeast Ohio, the study enriches the previously identified eight indicators with variables that describe two additional factors of regional growth — innovation and entrepreneurship. These two factors cannot be ignored in the economy of the 21st century, which is based on knowledge, technological advances, and individual entrepreneurship. The New Growth Theory and multiple studies conducted on entrepreneurship and innovation not only confirm the importance of these two factors but emphasize them as the main drivers of rapidly growing regional economies.

Due to data availability and aiming for a larger explanatory power of the statistical models, this study is based on a larger sample of metropolitan statistical areas (136 compared to 118). In addition, this study uses the new definition of metropolitan area boundaries that was adopted by the U.S. Office of Management and Budget in 2003. The new geographic boundaries identify more accurately the current regional labor markets and commuting patterns among counties included in each metropolitan area.

The variables included in this study fall into three categories: same variables and data sources as in the original study, same or similar variables but from a different data source, and new variables to enhance the measurement of innovation and entrepreneurship. Appendix A lists the variables that were added and those that required a new data source.

For this study, we assembled data for the year 2000 on 38 variables for 136 U.S. metropolitan areas with population between 300,000 and 3.5 million.¹¹ A list of variables and data sources is included in Appendix B. Four Northeast Ohio metropolitan areas are included in the sample: Akron, Canton-Massillon, Cleveland-Elyria-Mentor, and

¹¹ This study uses the 2003 definition of metropolitan areas provided by the U.S. Office of Management and Budget.

Youngstown-Warren-Boardman. Their population ranges from 401,000 in the Canton metropolitan area to 2.1 million in the Cleveland metropolitan area.

We used a factor analysis to reduce the initial number of 38 variables to a smaller set of nine indicators. The new factor analysis identifies eight statistically significant factors. These eight factors explain 88 percent of the variation in the 38 included variables. The factor analysis also highlights one individual variable important to economic growth—Business Openings over Business Closings—that did not group with the other factors. Of the 38 variables, 35 were loaded in the eight factors. The factors and the variables that define each factor are included in Table 1.¹²

¹² The factor loadings shown in Table 1 describe the correlations between the variables (rows) and the factors (columns). The percentage of the variable's variance explained by the factor is calculated by the squared factor loading. For example, the Technology Commercialization factor explains 53 percent of the variance of venture capital ($0.7306 * 0.7306 = 0.5338$).

Table 1. Elements of the Regional Framework (2007 Factor Analysis Results Based on 2000 Data)

Variable	Factor										
	Skilled Workforce & R&D	Legacy of Place	Urban Assimilation	Racial Inclusion & Income Equality	Locational Amenities	Technology Commercialization	Urban/Metro Structure	Individual Entrepreneurship			Business Dynamics
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10	Column 11	Column 12
pct. of population in professional occupations	0.9434	0.0448	-0.0111	-0.0197	0.1877	0.1021	0.0084	0.0010	0.0531	-0.0283	0.0715
pct. of population with graduate or professional degree	0.9344	0.0604	-0.0556	-0.0048	0.1000	0.0613	0.0591	0.0981	0.0304	-0.0502	0.0253
pct. of population with bachelor's degree	0.8194	-0.1672	-0.2006	0.1266	0.2983	0.0816	0.0023	0.0297	0.0928	-0.0177	0.0715
industry R&D per employee	0.7223	0.0095	0.1621	0.0612	-0.0405	0.3785	0.0315	-0.0401	0.0852	-0.0274	-0.1250
SBIR & STTR awards per employee	0.5242	-0.0692	0.1143	0.0738	-0.0619	-0.0156	0.0415	0.0243	-0.0095	-0.0890	-0.1793
population dependency	-0.5942	0.0878	0.3368	0.0745	-0.1053	-0.0406	0.1132	0.3179	-0.0846	0.3817	0.0275
university R&D per employee	0.4867	-0.0284	0.0043	-0.0525	0.1281	-0.0444	-0.0722	-0.0990	-0.0795	-0.1924	0.0000
business churning	0.1342	-0.8479	0.1313	0.0464	0.0526	-0.0041	0.0009	0.1355	-0.0707	0.0865	0.2656
climate	-0.0781	-0.5485	0.4416	-0.0588	-0.1411	0.1226	-0.0767	0.2889	0.2223	-0.1203	-0.0752
pct. of houses built before 1940	0.0435	0.8579	-0.1738	0.2114	0.1457	0.0311	0.1474	-0.0581	-0.1004	0.0108	0.0583
dissimilarity index for black population	0.0874	0.6879	-0.1595	-0.3824	0.2106	-0.1075	0.1585	-0.0513	-0.0566	0.1626	0.0785
city poverty ratio	0.1674	0.5727	-0.1571	0.0093	0.1505	0.0115	0.4095	-0.1117	-0.0755	0.1977	0.0333
No. of government units per capita	-0.1360	0.5401	-0.1885	0.2867	-0.1070	-0.0217	-0.2580	0.0145	-0.1142	0.1277	0.1978
share of manufacturing employment	-0.1053	0.3918	-0.2592	0.2329	-0.0631	0.3852	0.0090	-0.3076	-0.1237	0.1219	-0.3124
pct. of Hispanic population	-0.1329	-0.1702	0.9184	0.1435	-0.1354	0.0198	-0.0966	0.0581	-0.0891	-0.0629	0.0139
share of minority business employment (in total emp)	-0.0459	-0.2056	0.7908	-0.0489	-0.0406	-0.0615	-0.1095	-0.1330	0.4109	0.0648	-0.0866
pct. of foreign-born population	0.0791	-0.2380	0.7640	0.1891	-0.0843	0.2732	0.1075	0.1711	0.2606	-0.1512	0.1168
productivity in information sector	0.0530	0.1061	0.4006	0.0394	-0.0481	0.0755	0.1406	0.1931	0.0878	-0.2675	0.0324
pct. of Asian population	0.1775	-0.0619	0.2161	0.0907	0.0309	0.1625	-0.0040	-0.0276	0.8779	-0.1224	0.0259
pct. of black population	0.0365	-0.1537	-0.2567	-0.8754	0.0201	-0.0499	-0.0301	-0.1882	-0.0243	-0.0287	-0.0801
isolation index for black population	0.0605	0.1996	-0.3380	-0.8216	0.1686	-0.0902	0.0414	-0.1557	-0.0351	0.1581	-0.0241
income inequality	-0.1273	-0.1582	0.4501	-0.6672	-0.0311	0.0192	-0.1280	0.1729	-0.0528	-0.1776	-0.0056
share of students at schools with more than 70% free lunches	-0.2470	0.0744	0.3827	-0.6596	-0.1375	-0.0686	-0.1830	0.1139	-0.0677	-0.1388	-0.0200
violent crime rate	-0.1685	-0.2594	0.0722	-0.5020	0.1805	-0.0416	-0.3598	0.0524	-0.0233	0.0552	0.1988
transportation index	0.2537	0.1571	-0.0937	-0.0599	0.7792	-0.0226	-0.0851	-0.0922	-0.0495	-0.0992	0.1073
arts index	0.4485	0.1683	-0.1245	-0.0009	0.6887	0.1056	0.0027	-0.0669	0.0950	-0.0054	-0.0545
recreation index	0.1962	-0.0651	-0.1686	-0.1084	0.6323	-0.0323	0.2323	0.0738	0.0826	0.2259	0.0053
health index	0.3866	0.1429	-0.2261	-0.1703	0.5429	0.0542	-0.0940	0.0855	-0.0426	-0.0871	-0.1832
venture capital per employee	0.4382	-0.0427	0.1530	0.0499	0.0756	0.7306	0.0262	-0.0064	0.1882	0.0147	0.0157
number of patents per employee	0.5072	0.0891	0.0382	0.2027	-0.0592	0.5913	0.0530	-0.0421	0.0465	0.0960	0.1016
cost of living index	0.3916	-0.2393	0.1380	0.1008	0.1072	0.5281	0.1956	0.3200	0.3314	-0.1188	0.0187
share of city population in MSA population	0.0986	-0.2455	0.2145	-0.0812	-0.0276	-0.0285	-0.6519	-0.1581	0.0347	-0.2763	-0.1115
property crime rate	-0.1294	-0.2794	0.0467	-0.3794	0.0920	-0.2156	-0.5789	-0.0610	-0.0235	0.1338	-0.0022
pct. of self employed (all industries except ag & mining)	0.0775	-0.4358	0.1020	0.2370	-0.0278	0.0392	0.0841	0.7343	-0.0777	0.0971	-0.0420
share of business establishments with under 20 workers	-0.0177	-0.2343	0.0751	0.2045	-0.1931	-0.0684	0.0444	0.4556	0.0149	0.0518	0.2246
pct. of homeownership	-0.3118	0.1029	-0.3117	-0.0053	-0.0276	0.0484	0.1216	0.0848	-0.2722	0.6871	-0.1023
business openings over business closings	0.2402	-0.1557	0.0186	0.3103	0.0372	0.1336	0.1531	-0.0322	0.0770	-0.2027	0.5486
university enrollment per capita	0.2114	0.0142	-0.0677	-0.2042	-0.2144	-0.0679	-0.1826	-0.0201	-0.0183	-0.0734	-0.0459

FACTOR DESCRIPTION

The descriptive characteristics of the metropolitan statistical areas selected to be in the sample of this study are mathematically grouped by a factor analysis in eight statistically meaningful factors identified in Table 1.¹³ Highlighted variables associated with each factor have the highest loading scores that measure the correlation between the specific variable and the factor. The regional characteristics that these variables approximate collectively describe the unique dimension of each factor as an indicator that might play a role in regional growth (the association of each indicator with regional growth is explained in the next section).

This factor analysis preserves and enhances the themes of the original study. In addition to the factors that were associated with economic growth in the original study, two new factors are presented. The new factors—Technology Commercialization and Individual Entrepreneurship—describe innovation and entrepreneurship. Other changes include the merger of two factors from the original study into one factor: Racial Inclusion and Income Equality and a few changes in the variables that define some of the factors. These changes are detailed in Appendix C.

The factor analysis identified eight factors that will become the eight dashboard indicators. In addition, a ninth indicator is added although it includes only one variable. It is included in order to continue the theoretical framework of the original study. In the order of factor analysis, these indicators are:

- Skilled Workforce and R&D
- Legacy of Place
- Urban Assimilation
- Racial Inclusion and Income Equality
- Locational Amenities

¹³ Even though a factor analysis is a very powerful statistical tool, it is based purely on mathematical reasoning and does not take into consideration theoretical linkages between variables. A researcher's expertise is responsible for selecting the right variables and correctly operationalizing regional characteristics that the variables approximate. Sometimes variables are loaded with unexpected signs for the relationship with a factor or are loaded together with theoretically unrelated variables. The communality of variables' variation is the only decisive factor that places variables together within the same mathematical dimension or statistical factor.

- Technology Commercialization
- Urban/Metro Structure
- Individual Entrepreneurship
- Business Dynamics

Skilled Workforce and Research & Development (R&D)

As an indicator of the regional economy, this factor primarily describes the labor force quality affiliated with advanced research (column 2 in Table 1). Defined by the variables approximating high educational attainments and occupational levels (graduate and bachelor's degrees and professional occupations), this factor describes the ability of a region to be engaged in technology-driven economic development based on industrial and university R&D and technology-related small business entrepreneurship. The definition of this factor confirms that scientific and technological research are intense in metropolitan areas with large concentrations of highly educated residents—a characteristic that does not change quickly over time and requires years of development and persistent investment.

The three variables with the highest loading scores in this factor include percentage of the adult population with professional and managerial occupations, graduate degrees, and bachelor's degrees. Three other variables describe the R&D component of this factor including industry R&D expenditures per employee, university R&D funding per employee, and Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) awards per employee. SBIR and STTR awards are given by 11 federal government agencies. Their purpose is to support private sector R&D through set-aside funding earmarked for promising technologies that are not yet commercially viable. These initiatives are designed to stimulate technological innovation and provide opportunities for small businesses.¹⁴

¹⁴ The SBIR program provides competitive grants in two phases. Phase I awards are given to innovators and researchers seeking to conduct proof-of-concept research for technical merit. Phase II awards are provided for feasibility and prototype development. The STTR Program aims at partnerships between small businesses and nonprofit research institutions, including universities, to advance technology transfer.

A seventh variable (Population Dependency), negatively related to the factor, describes the share of population that is typically not in the labor force, i.e., those younger than 18 and older than 65 years.

Other variables that are associated with higher shares of skilled workforce and larger R&D investments but had their highest loading coefficients with the Technology Commercialization factor include venture capital, number of patents, and cost of living. Such a close affiliation of this factor with the variables describing technology commercialization confirms the critical importance of an educated workforce and the presence of R&D activities for technology-based economic development in that region. However, the fact that these two factors were grouped separately by a factor analysis indicates that educated labor and research and development activities are necessary but not sufficient conditions for successful regional economic growth.

All four measures of quality of life are also highly correlated with the Skilled Workforce and R&D factor, but their highest coefficients are in the Locational Amenities factor. This affiliation with quality of life suggests that a region that wants to attract and retain its skilled workforce may need to create and develop its cultural and recreational amenities.

Metropolitan areas that have a highly skilled and educated workforce and high levels of R&D are also likely to have a higher number of patents (from research conducted at their universities and companies), more investments from venture capital firms (which fund commercialization of some of the products developed through local R&D and patents), and better quality of life.

The Skilled Workforce and R&D factor captures the human capital input in the production function for goods and services. The academic and popular literature generally views human capital as one of the critical components of economic growth and postulates that regions with more educated workers experience faster-growing

economies. It is expected that this factor will play a role in explaining regional economic growth.

Legacy of Place

This factor (column 3 in Table 1) reflects the demographic, social, and economic history of metropolitan areas. It includes variables that may suggest old physical infrastructure including industrial and residential buildings (approximated by the percentage of houses built before 1940), industrial heritage (share of manufacturing employment), and racial and poverty concentrations in central cities (dissimilarity index¹⁵ and the core city's share of poverty relative to the core city's share of the metropolitan population). All of these variables have positive signs in contrast to another important variable in this factor, business churning, which has a negative sign. Business churning is calculated by the summation of the number of businesses that opened and closed divided by total number of establishments. The combination of variables in the Legacy of Place factor suggests that metropolitan areas with high historical economic and social legacy costs have low business churning and places with low legacy costs have a high business churning.

Another variable in this factor—climate—cannot be subject to any policy. Sun belt metropolitan areas have the advantage of a sunny and warm environment, which contrasts with the cloudy and often gloomy weather of the rust belt regions.¹⁶

The Legacy of Place factor is interpreted as an indicator that imposes social and economic burdens on regional economies. It may differentiate between the newer metropolitan areas located in the Southern and Western regions of the U.S., which have lower legacy and a higher business dynamic, and the Midwestern and Northeastern economies, which are held back by high costs of doing business due to a maturing and declining industrial structure, old cities, and fragmented government units.

¹⁵ Dissimilarity Index measures the percentage of a black population that would have to change residence for each neighborhood to have the same share of black population in the neighborhood as in the metropolitan area. An index ranges from 0 to 100, where 0 indicates complete integration and 100 shows complete segregation.

¹⁶ Glaeser, E. and K. Tobio. *The Rise of the Sunbelt*. NBER Working Paper No. 13071, April 2007. <http://www.nber.org/papers/w13071>

Consisting primarily of legacy costs, we expect this indicator to be reversely affiliated with changes in regional economic outcomes—per capita income, employment, productivity, and gross metropolitan product.

Urban Assimilation

Assimilating minority populations into the economic and social life of regions through advanced community development and equity greatly enhances regional growth, according to the latest study by Pastor et al.¹⁷ A third strong group of variables distinguished by the factor analysis describes the assimilation of different ethnic groups and acknowledges a common variation of the high presence of this population in places with a strong share of minority-owned businesses and advanced information sector. Four of the five variables included in this factor describe ethnic diversity (column 4 in Table 1) by the share of Hispanic population, percentage employed in minority-owned businesses, percentage foreign born population, and the percentage of Asian population. The variation of the Urban Assimilation indicator is clearly driven by the presence of the Hispanic population variable.

The distribution of productivity in the information sector varies across metropolitan areas in a similar pattern as the four urban assimilation variables. For example, metropolitan areas in California have both a high percentage of Asian residents and high productivity in the information sector. However, policy makers working on immigration strategies should not conclude that having more immigrants will increase regional productivity; this obviously depends on the education and skill level of immigrants and their attitude towards employment and entrepreneurship.

It should be noted that, similar to the original study, this factor is not affiliated with high poverty and racial isolation, which are approximated by the variables included in the next factor, Racial Inclusion & Income Equality.

¹⁷ Manuel Pastor, Peter Dreier, Eugene Grigsby, and Marta Lopes-Garza (2000) *Regions That Work: How Cities and Suburbs Can Grow Together*. University of Minnesota Press.

Racial Inclusion and Income Equality

Poverty and segregation are often found in conjunction with high rates of crime and social welfare. Variables included in the Racial Inclusion and Income Equality factor have a distinctly different pattern of variation across the metropolitan areas from the variables that measure assimilation of different ethnicities and immigrants in society's social and economic life. Areas with a large black population have a different set of economic and social problems and, therefore, a different path of development.

This factor (column 5 in Table 1) is a combination of two factors from the original study. Two variables included in this factor directly relate to racial patterns (percentage of blacks and black isolation index)¹⁸ and two other variables relate to poverty and distribution of income. These variables are percentage of children living in high-poverty neighborhoods (approximated by the share of students in schools where more than 70 percent of students receive free lunch) and income inequality. A fifth variable that loaded highly in this factor is the violent crime rate, suggesting that areas that have high racial isolation and high poverty and income inequality are likely to also have high rates of violent crime.

In addition, this factor is defined by uneven distribution of the black population across metropolitan areas (dissimilarity index for black population) and high property crime (the rate of property crime), both correlating negatively with the factor and having their highest correlations with other factors. Other variables that play a role in the Racial Inclusion and Income Equality factor, although their highest correlations are with other factors, include measures of business dynamics, industry structure, and government fragmentation, all loaded positively with this factor. The correlations of these variables mean that metropolitan areas with higher racial inclusion and income equality are likely to have a larger number of government units, greater number of self-employed people, higher share of business establishments with less than 20 employees, higher ratio of openings of business establishments over closings, and a higher share of manufacturing

¹⁸ The Isolation Index estimates the degree to which a minority group is exposed to a majority group in its neighborhood. Higher values of isolation indicate higher segregation.

employment. Therefore, we expect this factor to be positively associated with the measures of regional growth.

Locational Amenities

Locational amenities reflect the quality of life in a region and influence people's decisions about the places they want to live, work, and play. Even though the quality of life measures are highly subjective and people prioritize them differently, in our analysis we included variables that reflect some universal priorities. These variables describe transportation infrastructure, arts and recreational amenities, and healthcare services.

Four measures define the Locational Amenities factor, including transportation, arts, recreation, and healthcare indices (column 6 in Table 1). These measures were developed by *Places Rated Almanac*, which provides publicly available ranking of metropolitan areas based on multiple measures of quality of life. Each index is calculated based on several variables.¹⁹ For example, the Arts Index is calculated using two categories: art museums and galleries and lively arts calendar.²⁰ For the Transportation System Index, the Almanac combines information on commute, connectivity, and centrality.²¹ The Healthcare Index assesses the availability of doctors and hospitals.²² The Recreation Index measures categories of dining, entertainment, and outdoor activities.²³

¹⁹ *Places Rated Almanac* by David Savageau and Ralph D'Agostino, 2000.

²⁰ The art museums and galleries category includes information on number of art museums, annual museum attendance, and per capita museum attendance. The lively arts calendar category includes information on annual ballet performances, touring artist bookings, opera performances, professional theater performances, and symphony performances.

²¹ Information on commute includes local transit revenue miles and average commute time. Information on connectivity includes number of nonstop jet flights, commuter airline destination, number of passenger rail departures, and national highways. Information on centrality uses data on distances to other metro areas.

²² The healthcare category includes data on general and family doctors per 100,000 population, medical specialists per 100,000 population, number of surgical specialists per 100,000 population, number of accredited general hospital beds, and number of hospitals with physician residency programs.

²³ The recreation index includes information on good restaurants, professional and college sports, zoos and aquariums, amusement and theme parks, movie theaters, gambling, golf courses, skiing, protected recreation areas, water areas, and auto racing.

This factor is important because of the discussion in both the academic and popular literature on whether regional quality of life characteristics affect people's decisions on where to live, work, or start their businesses. This study will test whether and how this factor is associated with regional economic growth.

Technology Commercialization

Many regions and communities are adopting strategies to foster innovation. Successful production of innovation requires investments in research and development that can lead to the introduction of new products and more efficient processes of production.

Traditionally, innovation was dominated by large companies and their substantial R&D budgets. However, in more recent years smaller firms, some which started as spin-offs from university-based research, are commercializing new technologies. Examples include Hewlett-Packard, Google, and Genentech.²⁴ Furthermore, the Council on Competitiveness asserts that large firms often depend on small firms for new ideas and technologies. There are three types of relationships between large and small companies pertaining to innovation and commercialization: large companies investing in startups, large companies acquiring small companies with promising new technologies, and large firms partnering with small firms to develop new products.

Three variables loaded highly with the Technology Commercialization factor (column 7 in Table 1)—venture capital per employee, number of patents per employee, and cost of living. This is one of two new factors introduced in this study.²⁵ Research and development funding, patent awards, pre-seed funding, venture capital, and initial public offerings are all on a continuum from exploratory research to the introduction of new products and processes to the market. The patents and venture capital variables in this factor represent the process of innovation commercialization, reflecting the higher end of the continuum. Number of patents indicates successful research and the potential for

²⁴ *Where America Stands: Entrepreneurship Competitiveness Index*, Council on Competitiveness, 2006.

²⁵ The Technology Commercialization factor consists of one new variable (venture capital per employee) and two other variables that loaded in other factors in the original study.

commercialization, while venture capital shows that investors believe in the possible transformation of these potential innovations into marketable products.

The cost of living variable also loads highly with this factor, suggesting that many research facilities producing patents and many startup companies that are funded by venture capital are located in metropolitan areas with a high cost of living, primarily along the Eastern and Western coasts of the U.S.

Two other variables have positive coefficients in this factor, although not the highest, including share of manufacturing employment and industry R&D. Industry R&D accounts for a large portion of all R&D expenditures, and many of the corporations with R&D budgets are manufacturing companies. Although in general the old and mature manufacturing sector is viewed as a barrier to economic growth through the Legacy of Place factor, many advanced manufacturing companies are innovative and competitive. Overall, the Technology Commercialization factor shows that metropolitan areas with a higher number of patents are also likely to have higher amounts of venture capital funding, more industry R&D expenditures, and larger shares of manufacturing employment. It is expected that this factor is positively associated with regional growth.

Urban/Metro Structure

Economic development literature suggests that metropolitan areas with healthy central cities have stronger economic growth over time.²⁶ Two variables in our analysis have their highest loadings in this factor (column 8 in Table 1), central city population as a percentage of metro population and the rate of property crime. This factor is more difficult to interpret since the larger share of population in a central city is considered as a positive characteristic of a metropolitan area, but at the same time, this variable is highly correlated with high property crime rate, which is a negative attribute of regional life.

²⁶ Hill, E., J. Brennan, *Where Are the Jobs? Cities, Suburbs, and the Competition for Employment*. Brookings Center on Urban and Metropolitan Policy (November 1999), <http://www.brookings.edu/es/urban/hillexsum.htm>; Glaeser, E., M. Kahn, and C. Chu, *Job Sprawl: Employment Location in U.S. Metropolitan Areas*. Brookings Center on Urban and Metropolitan Policy (July 2001), <http://www.brookings.edu/es/urban/publications/glaeserjobsprawlsum.htm>; Hill, Edward W. and John Brennan. 2005. "America's central cities and the location of work - Can cities compete with their suburbs?" *Journal of the American Planning Association* 71 (4): 411-432.

Having these two variables in the same factor suggests that they vary in similar patterns across metropolitan areas so that larger cities (relative to their metro area) are likely to have higher property crime rates compared to smaller cities. Both variables have negative loadings with the factor.

Moreover, other variables such as the rate of violent crime and the share of students in schools with more than 70 percent free lunches (approximating the percentage of children living in high-poverty neighborhoods) also have negative loadings with this factor, although their highest loading coefficients are in the Racial Inclusion and Income Equality factor. Again, this factor suggests that relatively large central cities are likely to have higher property and violent crime rates and high poverty. Another variable with relatively high loadings in this factor (although its highest loading is with Legacy of Place factor) is the poverty ratio. It measures the core city's share of metropolitan poverty relative to its share of the metropolitan population, and it confirms the higher concentration of poverty in central cities. The number of governmental units (per population) has the highest coefficient in the Legacy of Place factor, but it is positively correlated with the Urban/Metro Structure factor, suggesting that metro areas with a large city have larger poverty and higher crime rates as well as a more fragmented government structure with more government units. Thus more collaboration among individual government units in both expenditures and tax revenue sharing may allow governments to operate more efficiently and reduce crime and poverty.

Individual Entrepreneurship

This is the second new factor developed in this study (column 9 in Table 1), and it describes the small business sector of regional economies. The Individual Entrepreneurship indicator includes two variables: percentage of self employed and the share of business establishments with less than 20 employees. This factor confirms researchers' projections for the increased role of small and personal businesses in the economy. The small business sector is expected to expand because the growing digital infrastructure reduces the barriers to entry by lowering the costs of starting a new

business as well as opening new markets and new industries.²⁷ It is expected that small businesses will be mainly established by people entering the job market and those nearing retirement. Immigrants and women are also projected to start new businesses in growing numbers. In addition, the role of personal businesses as home-based ‘one-person enterprises’ in the small business sector is expected to grow. Thus with the downscaling of the average size of a business establishment, declining job growth in large companies, and reduced costs to start a small or personal business, it is expected that job growth will increasingly occur in small businesses.

Business Dynamics (Variable)

This variable did not load within any of the eight factors identified as statistically meaningful by the factor analysis. However, business dynamics is part of the theoretical framework of regional growth, and a similar variable was a critical variable in the description of business dynamics in the original study.

This variable measures business dynamics in a metro area and is calculated as the ratio between business openings and business closings of single-site companies. Metro areas with more business openings than closings have a healthier and more dynamic economy. Although this measure analyzes the dynamics of business establishments and not the employment associated with these openings and closings, it provides a good proxy for employment changes due to business dynamics that occur within regional economies.

Other Variables

Two variables in the factor analysis did not load highly in any indicator and therefore did not explain any processes captured within eight-dimensional space described by eight statistically meaningful factors and the business openings over business closings variable. These variables are the percentage of home ownership and university enrollment per capita.

²⁷ *Intuit Future of Small Business Report: Demographic Trends and Small Business*, January 2007.

INDICATORS AND ECONOMIC GROWTH

METHODOLOGY AND MEASURES OF ECONOMIC GROWTH

Following the identification of the nine factors and the variables that define them, we investigated how these factors relate to economic growth. Similar to the original study, we use four measures of economic growth to describe regional economic performance: percentage changes in per capita personal income, employment, gross metropolitan product, and productivity. Per capita income approximates the regional standard of living and is used by many economists as a critical gauge in assessing a region's economic performance.²⁸ Employment measures job opportunities available to people in the regional labor force, but it does not differentiate between low-skill, low-paying jobs and high-skill, high-paying jobs. Gross metropolitan product (GMP) measures value-added output produced in the region and is the regional counterpart to the national gross domestic product. Productivity measures GMP per employee and provides a proxy for a critical measure of regional competitiveness. We created a dataset for per capita personal income using annual data for 1995-2004; annual data for 1995-2005 was used for the other three variables. Per capita income, GMP, and productivity are measured in real dollars, where the earlier year data were inflated to the later year data using the Consumer Price Index (CPI-U) for the U.S.

To estimate the relationships between the nine factors and the four measures of economic growth, we ran four regressions with factor scores and the business dynamics variable as independent variables and the percentage change in economic growth measures as dependent variables. Factors that were statistically significant became the dashboard indicators. These factors are referred to as “dashboard indicators” or simply “indicators.”

²⁸ Per capita personal income is calculated as the personal income of the residents of an area divided by the population of that area. Per capita income gives no indication of the distribution of that income within the region.

ASSOCIATION BETWEEN DASHBOARD INDICATORS AND ECONOMIC GROWTH

The U.S. economy continued to grow over the most recent business cycle, driven by business dynamics, research, innovation, and entrepreneurial activities. The driving force behind U.S. competitiveness is its human capital, especially highly educated, highly skilled workers. U.S. economic dynamism is also characterized by a high rate of business churning. It is estimated that during any given quarter, five percent of all business establishments open or go out of business.²⁹

Similar to the national economy, regional economies are also affected by a skilled workforce, business dynamics, and innovations. Equity, inclusion, and other social considerations may also enhance economic growth and entrepreneurial activities.

Unfortunately, since the mid to late 1990s, the Northeast Ohio economy has not fared as well as the U.S. economy. Because of the historical dominance of large manufacturing companies that offered secure jobs with high wages and benefits to workers without a college degree, the region did not develop a highly educated workforce large enough to accelerate economic growth in the knowledge-based economy. In addition, the historical easy access to both low-skill and high-skill jobs in large companies created a disincentive for people to start their own business. In contrast to the local traditions of the early 20th century, the Northeast Ohio region lost its culture of experimentation and risk taking.

Responding to the economic transformation in the national and global economies, Northeast Ohio is currently moving towards a knowledge- and technology-based economy.³⁰ However, many other regions in the U.S. began to transform years ago and, as a result, have experienced economic growth that surpasses Northeast Ohio.

²⁹ Where America Stands: Entrepreneurship Competitiveness Index, Council on Competitiveness, February 2007.

³⁰ Several measures suggest that Northeast Ohio is moving towards a knowledge- and technology-based economy. These include a larger number of people in Northeast Ohio with bachelor's degrees and with graduate or professional degrees, greater overall university enrollment, increased levels of SBIR and STTR awards, and higher levels of university R&D funds.

Table 2 shows the association between each of the dashboard indicators and the four measures of regional economic growth. It is based on four regressions in which changes in per capita income, employment, GMP, and productivity are the respective dependent variables. The table shows the statistically significant factors in each of the four models of regional growth.³¹ Each of the factors affects at least one measure of economic growth and thus becomes part of the dashboard indicators. It should be noted that the table does not suggest causality and that the indicators account for only a proportion of the variation in the measures of economic growth. Based on adjusted R^2 of the regression models, the indicators explain 47.1% of the variation in per capita income growth; 61.8% of the variation in employment growth, 67.6 % of the variation in GMP growth, and 22.2% of the variation in productivity growth.

Table 2. Factors' Impact on Regional Economic Growth

Factor	Per Capita Income	Employment	GMP	Productivity
Skilled Workforce and R&D	0.00333			0.00134
Technology Commercialization	0.00374		0.00211	0.00232
Racial Inclusion & Income Equality	0.00104	0.00208	0.00357	0.00138
Urban Assimilation		0.00143	0.00276	0.00126
Legacy of Place		-0.00748	-0.00917	-0.00136
Business Dynamics		0.00237	0.00281	
Individual Entrepreneurship		0.00200	0.00180	
Locational Amenities	0.00222			
Urban/Metro Structure		0.00129	0.00218	

Based on the regression structures, the contributions of the indicators to economic growth reveal two patterns. The first pattern shows that some of the indicators that are statistically significant in the growth of per capita income are also significant in productivity growth. More specifically, three indicators are significant for the growth of

³¹ It should be noted that the relationships depicted in the table describe the association between each of the indicators and a measure of economic growth but do not indicate causality. For example, the table suggests a statistical association between Technology Commercialization and growth in per capita income; it does not mean that an increase in technology commercialization will cause an increase in regional per capita income.

both per capita income and productivity: Technology Commercialization, Skilled Workforce and R&D, and Racial Inclusion & Income Equality. This pattern reflects the restructuring of regional economies through technological product and process innovations and results in growth in both productivity and per capita income (e.g., Seattle, Minneapolis, San Jose, and Virginia Beach-Norfolk). The productivity-driven type of growth is less sensitive to regional legacy characteristics and socio-economic factors of place. It can best be described by dynamic economies driven by the creativity of a skilled workforce paired with an abundance of research and development resources that results in the deployment of new technologies within a region.

The second pattern shows that six indicators are significant for growth of employment and gross metropolitan product (GMP): Legacy of Place (negatively related to economic growth), Business Dynamics, Racial Inclusion & Income Equality, Individual Entrepreneurship, Urban Assimilation, and Urban/Metro Structure. This type of regional growth is place-related and requires the right combination of socio-economic characteristics and business dynamic factors for an economy to grow in size. These regions may not be the fastest-growing, but their size provides them with an opportunity for economic diversification, generating steady growth and compensating for declines during recessionary periods (e.g., San Diego, Tampa, Sacramento, Orlando, and Las Vegas). These regions could succeed in mitigating negative legacy costs through urban assimilation, racial inclusion, and income and social equality. However, it should be noted that size alone does not guarantee economic diversity or growth in employment in GDP and not every metropolitan area fits into one of the two patterns.

As expected, *not all indicators are associated with all measures of economic growth.* This is important when developing new policies and initiatives. It also suggests the importance of regional goals.

There is only one indicator, Racial Inclusion and Income Equality, which is significant in all measures of economic performance. It suggests that improvements in any of the variables that underlie this indicator will be associated with gains in per capita income,

employment, GMP, and productivity. For example, a decline in poverty as well as a decline in racial isolation (or increase in racial inclusion) will increase regional economic growth. A decline in income inequality (or increase in income equality) and falling rates of violent crime will also increase all four measures of regional economic growth.

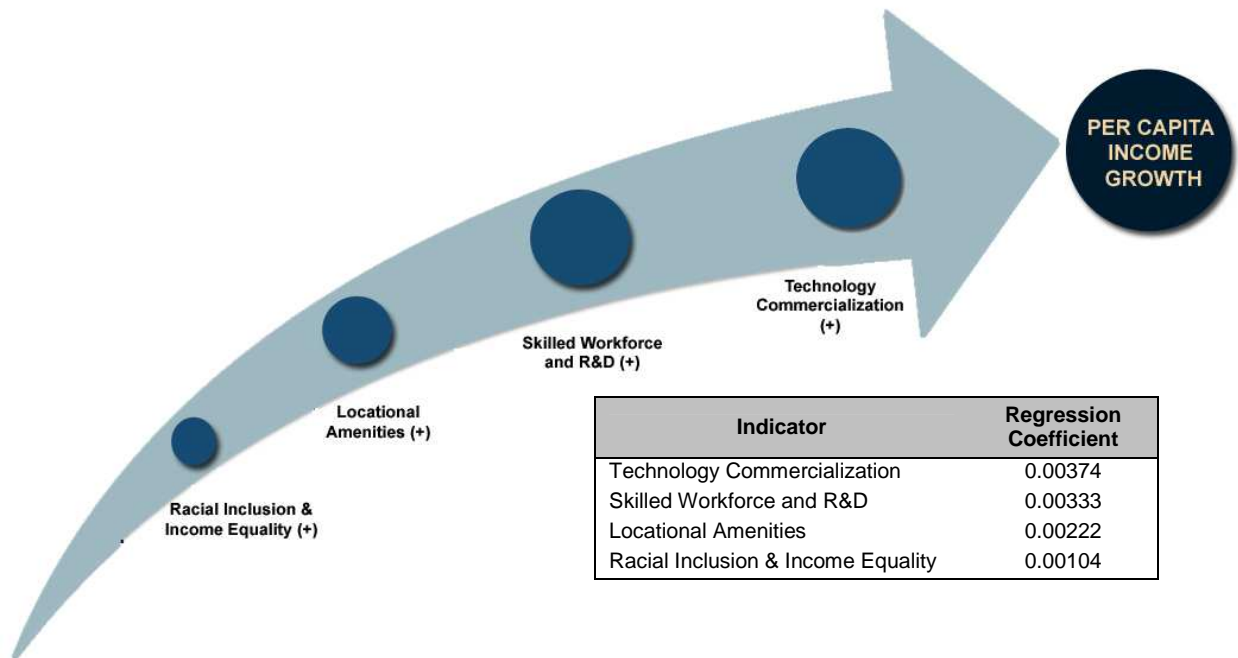
On the other hand, Locational Amenities, a proxy for quality of life, is shown to be only significant in relation to growth in per capita income. Since wages are a critical part of per capita personal income, it may suggest that people with higher-paying jobs are attracted to places with higher quality of life.

Per Capita Income

If we want to affect regional per capita income and increase its rate of growth, we need to consider policy interventions that influence four indicators. The Technology Commercialization indicator has the largest significant and positive coefficient, followed closely by Skilled Workforce and R&D (Figure 1). This means that initiatives that will result in increased educational attainment among Northeast Ohio's residents—through increased number of graduates, higher retention rates of graduates, or attracting highly educated people to Northeast Ohio—will increase the region's per capita income. Increasing the level of R&D funding, the number of patents awarded to local inventors, and venture capital investments for local startup companies will also increase the growth rate of regional per capita income.

Two other factors important to growth in per capita income are Locational Amenities and Racial Inclusion & Income Equality. This suggests that policies that lead to more racial inclusion (less segregation) and higher income equality in Northeast Ohio as well as improvements in quality of life will also positively affect growth in per capita income. Thus, if the regional goal is to increase per capita income, this research points to the policy areas that need to be addressed. Additional research will more specifically identify the required changes in each of the indicators and corresponding variables needed to stimulate additional economic growth.

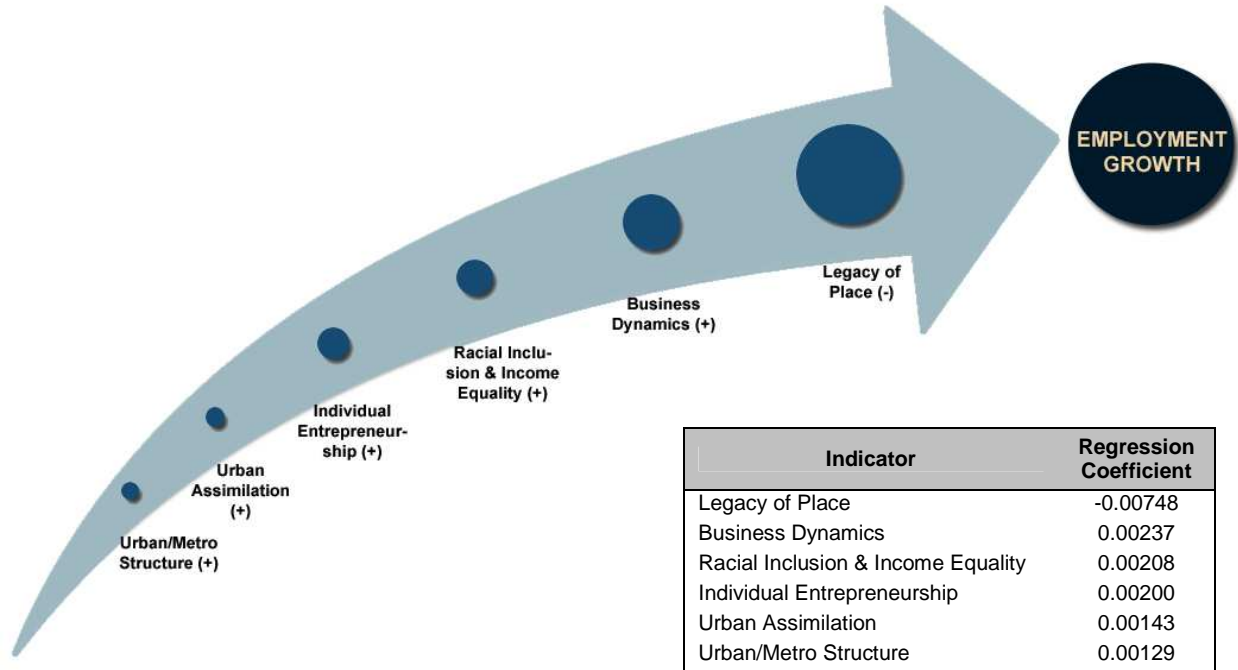
**Figure 1. Dashboard Indicators Associated with Per Capita Income Growth
(Based on Regression Coefficients)**



Employment

Different factors are critical to increased employment. The Legacy of Place has the largest impact and negative association with increased number of jobs (Figure 2). Legacy of Place is an impediment to growth that reflects older infrastructure, concentration of poverty in the central city, mature industrial structure, and a large number of government units, all creating serious challenges to employment growth. Policy intervention that can address this indicator will in the long run contribute to regional employment growth. However, it is obvious that negative regional conditions were created over many decades and initiating strategic interventions, although essential, cannot affect our region immediately. For example, having a mature industry structure is an impediment to growth. Policies that stimulate the creation of new products, new industries, and new technologies within existing industries are very critical but will take time to affect regional outcomes. Changes in this indicator require long-term strategies and patience in achieving measurable results. Intermediary measures can be useful in monitoring incremental changes, but this indicator may not show much improvement in the short term.

**Figure 2. Dashboard Indicators Associated with Employment Growth
(Based on Regression Coefficients)**

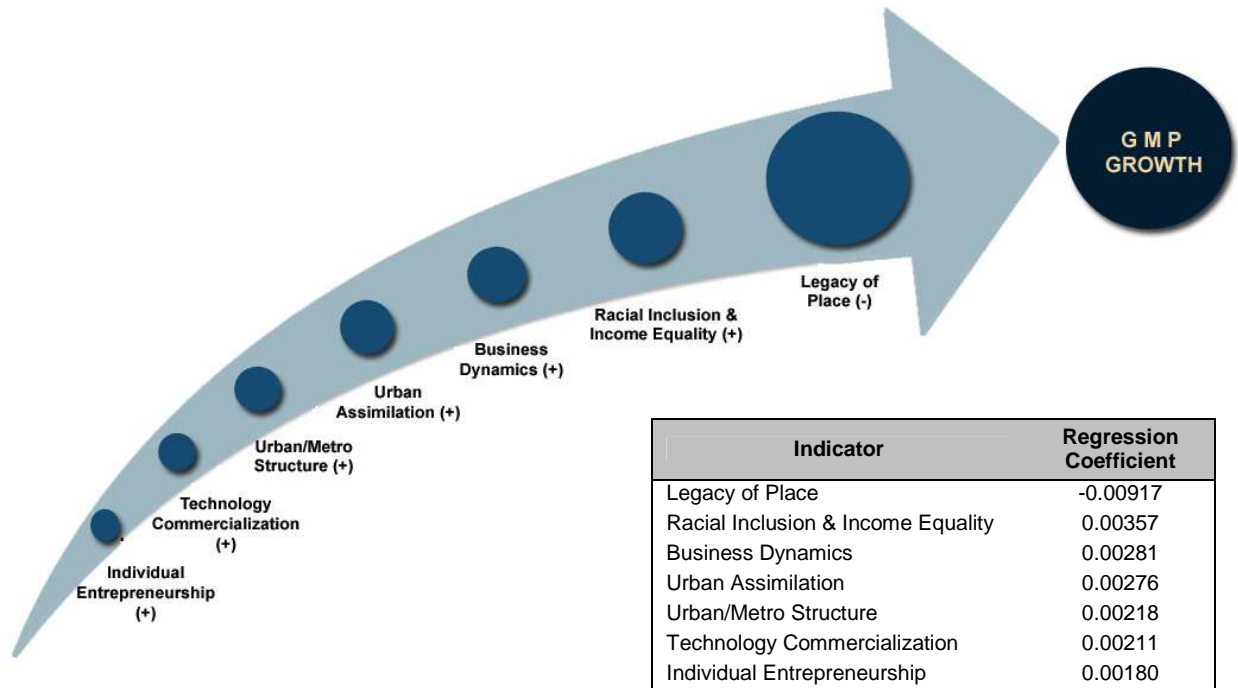


Other important factors associated positively with employment growth are Business Dynamics, Racial Inclusion & Income Equality, Individual Entrepreneurship, Urban Assimilation, and Urban/Metro Structure. Regional policies that can stimulate an increase in the number of new business openings (relative to business closings), improve racial inclusion, lower poverty and crime, increase the size of the small and personal businesses sector, and create conditions for the growth of the immigrant population and minority-owned businesses will be successful in accelerating regional employment growth. Again, this provides decision makers with a list of possible areas in which policy can be effective in altering these measures and thus improve employment growth in the region. For example, important interventions could be those that stimulate more business openings and advance the attractiveness of Northeast Ohio to immigrants, especially to highly educated, highly skilled, entrepreneurial individuals.

Gross Metropolitan Product (GMP)

How can we increase GMP growth rate? Seven indicators are associated with growth in regional output, or GMP. As with employment, Legacy of Place has the largest influence and is negatively related to GMP growth. Northeast Ohio, like many other metropolitan areas in the Midwest, has to recognize the burden imposed on its economy through characteristics reflected in this indicator. In addition to the discussion regarding employment growth, we need to be reminded that not all variables underlying the Legacy of Place indicators can be changed by policy, but they should be recognized as local context in developing strategies to improve economic performance. One example is the old infrastructure approximated by the percentage of houses built before 1940.

**Figure 3. Dashboard Indicators Associated with GMP Growth
(Based on Regression Coefficients)**

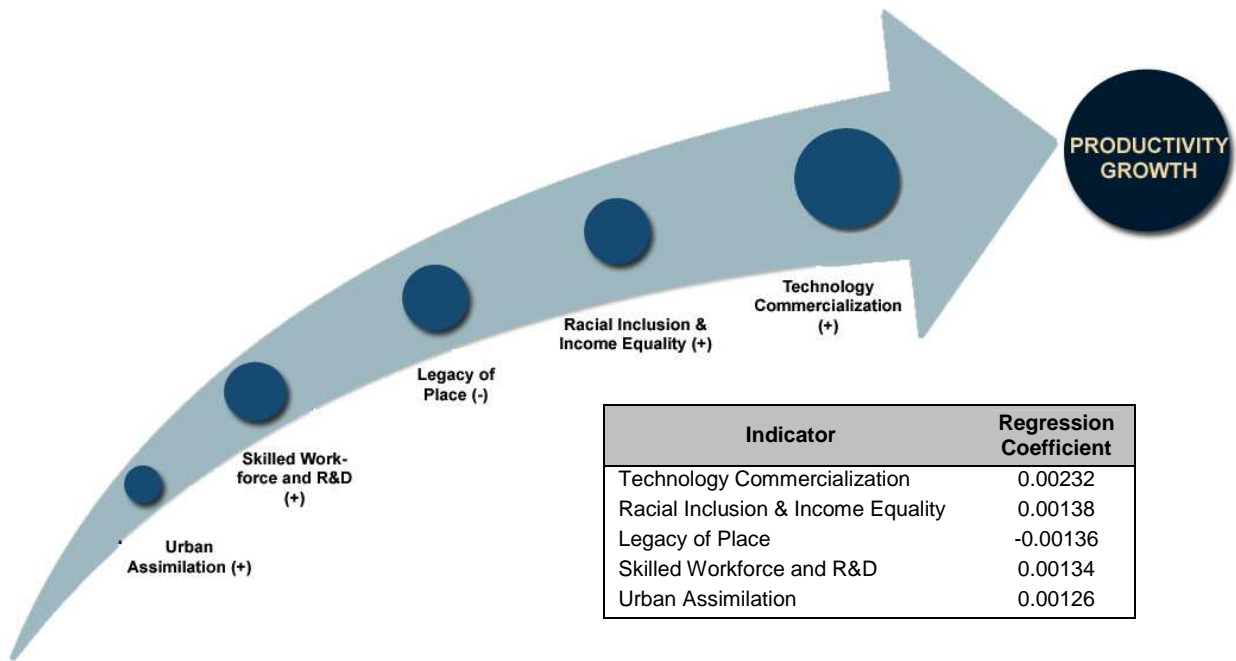


Six indicators affect growth in both employment and GMP. In addition, Technology Commercialization affects only GMP and not employment. Figure 3 shows all seven indicators that affect GMP growth; it suggests that policy makers have many options for stimulating regional production of goods and services.

Productivity

Productivity, measured by GMP per employee, is most affected by the Technology Commercialization indicator (Figure 4). Policies and interventions that will increase the amounts of venture capital invested in local companies and the number of patents awarded to researchers in Northeast Ohio’s universities, corporations, and research labs will result in increased productivity as well as increases in per capita income.

Figure 4. Dashboard Indicators Associated with Productivity Growth (Based on Regression Coefficients)



Other indicators that positively affect productivity include Racial Inclusion & Income Equality, Skilled Workforce and R&D, and Urban Assimilation. Thus any improvements to the variables that make up these indicators will increase productivity. As with

employment and GMP growth, the Legacy of Place indicator is negatively associated with productivity growth.

RANKING OF METRO AREAS BY MEASURES OF ECONOMIC GROWTH

Following the description of the relationships between the nine indicators and the four measures of economic growth, this section ranks the metropolitan areas in terms of economic performance (another section will rank metro areas by factor scores). How do Northeast Ohio's metropolitan areas compare to other regions in terms of economic growth? The comparative analysis is conducted using a longer time period, 1995-2005, and a shorter three-year period, 2002-2005.³² The longer-term period covers a full business cycle, while the shorter time period includes the national expansionary period of the latest business cycle, although many areas in the Midwest did not come out of the recession until a year or two later.

Tables D1-D4 in Appendix D show the percentage change and ranking of the metropolitan areas included in our study in each of the four measures of economic growth between 1995 and 2005. It is easy to spot the highest- and lowest-performing metro areas as well as those above or below the average growth rates of the 136 metropolitan areas included in the study (referred to as "sample average"). In addition, the metropolitan areas are divided into four quartiles based on their rank. Metropolitan areas that are ranked between #1 and #34 are part of the first quartile, those ranked between #35 and #68 are in the second quartile, those ranked between #69 and #102 are in the third quartile, and those ranked between #103 and #136 are in the fourth quartile.

Ranking of Northeast Ohio's Metro Areas

Table 3 highlights the growth rate, ranking, and quartiles of NEO's metropolitan areas and the sample average between 1995 and 2005. They show that the four Northeast Ohio metropolitan areas grew at modest rates in all four measures and always below the

³² The latest year available for per capita personal income is 2004. Thus, the long-term period for per capita income is 1995-2004 and the three-year period is 2001-2004.

sample average. For example, per capita personal income grew by 8.9 percent in the Cleveland metro area and 12.7 percent in the Akron area in comparison to the sample average growth rate of nearly 14 percent. The situation was even worse when measuring economic performance by employment; employment growth rates ranged between an 8.4 percent gain in Akron to a two percent decline in the Youngstown area in comparison to a sample average growth rate of 15.9 percent.

Table 3. NEO's MSA Rankings by Measures of Economic Growth, 1995-2005

NEO's MSAs	Per Capita Income			Employment			Gross Metro Product			Productivity		
	% change	Rank	Quartile	% change	Rank	Quartile	% change	Rank	Quartile	% change	Rank	Quartile
Akron	12.67	87	3	8.43	105	4	25.67	98	3	15.90	72	3
Canton	7.72	116	4	0.76	130	4	11.51	131	4	10.66	125	4
Cleveland	8.91	110	4	0.82	129	4	14.36	127	4	13.43	98	3
Youngstown	3.91	133	4	-2.00	132	4	1.41	134	4	3.48	132	4
Sample Average	13.95			15.94			35.69			16.97		

Note: Per capita personal income is measured for the 1995-2004 period.

The relatively poor economic performance of NEO's metropolitan areas is attributed to slow growth during the expansionary years of the late 1990s and a more severe and lengthier decline during the recession in the first years of 2000s. However, there was a difference in growth patterns among NEO's sub regions, as described by the four separate metropolitan areas. Among NEO's metro areas, Akron had the highest rank in all measures. Moreover, among the 136 metro areas, Akron was ranked in the third quartile in growth rates in per capita income, gross metropolitan product, and productivity. Anecdotal evidence suggests that continuing strong political leadership in combination with the relatively small size of the metropolitan area contributed to the stronger economic growth in the Akron area. The Cleveland metropolitan area ranked in the third quartile in productivity growth and had fourth quartile rankings in the other three growth measures. The Youngstown and Canton metro areas ranked the lowest among NEO's areas, putting them in the fourth quartile in all measures.

The relative ranking of NEO's metro areas generally improved when analyzing economic activity over the latest three-year period. That means that, relative to other metro areas,

NEO's areas grew faster in the past three years than they did over the longer time period. Tables D5-D8 in Appendix D provide growth rates and rankings for all metropolitan areas between 2002 and 2005, while Table 4 again highlights NEO's metro areas. It confirms Akron's superior performance among NEO's metropolitan areas. Moreover, during the 2002-2005 period, the Akron area moved to the second quartiles in both per capita personal income and employment growth, growing at a faster rate than the growth rate of the sample average of all 136 areas. Akron also ranked highest among NEO's areas in GMP and was the only one to rank in the third quartile, but it grew at a slower pace than the sample average.

Table 4. NEO's MSA Rankings by Measures of Economic Growth, 2002-2005

NEO's MSAs	Per Capita Income			Employment			Gross Metro Product			Productivity		
	% change	Rank	Quartile	% change	Rank	Quartile	% change	Rank	Quartile	% change	Rank	Quartile
Akron	3.32	43	2	4.69	39	2	9.39	81	3	4.49	114	4
Canton	-0.02	108	4	-2.77	132	4	2.42	132	4	5.34	94	3
Cleveland	1.00	88	3	-1.06	121	4	5.35	117	4	6.48	72	3
Youngstown	2.25	69	3	-0.61	116	4	3.72	126	4	4.36	117	4
Sample Average	1.90			3.42			10.63			6.99		

Note: Per capita personal income is measured for the 2001-2004 period.

The Cleveland area ranked the highest among Northeast Ohio's metro areas in productivity growth, but it remained in the third quartile and slightly below the sample average. Cleveland also ranked in the third quartile in growth of per capita personal income.

It should be noted that some of NEO's metropolitan areas jumped quartiles in their ranking among all metro areas when comparing long-term and short-term growth patterns. The Akron metropolitan area jumped to the second quartile in growth rates of per capita income and employment; however, it dropped to the fourth quartile in productivity growth. The Cleveland and Youngstown metropolitan areas improved their quartile rankings in growth of per capita income, while the Canton metropolitan area improved in productivity growth.

Even though the three-year growth rates smooth annual changes, they still reflect only short-term trends and should be considered jointly with longer-term trends.

Ranking of Midwest Metro Areas

The tables in Appendix D allow us to compare the Cleveland metro area to comparable metropolitan areas in the Midwest and other parts of the country. It also allows us to compare the smaller Northeast Ohio metropolitan areas to other small areas. Tables 5 and 6 highlight the performance of Cleveland in comparison to other Midwest metropolitan areas, which have similar size, economic history, and industry structure. The longer and shorter time periods are again utilized in this analysis.

Table 5. Cleveland and Similar Midwest MSAs by Measures of Economic Growth, 1995-2005

Midwest MSAs	Per Capita Income			Employment			Gross Metro Product			Productivity		
	% change	Rank	Quartile	% change	Rank	Quartile	% change	Rank	Quartile	% change	Rank	Quartile
Cincinnati	17.7	32	1	12.1	77	3	25.9	96	3	12.3	108	4
Cleveland	8.9	110	4	0.8	129	4	14.4	127	4	13.4	98	3
Columbus	15.9	48	2	14.0	66	2	28.2	84	3	12.5	106	4
Indianapolis	16.0	45	2	16.3	56	2	40.2	47	2	20.5	34	1
Milwaukee	16.4	43	2	3.7	120	4	21.2	113	4	16.8	64	2
Minneapolis	19.6	24	1	14.0	65	2	43.2	38	2	25.6	14	1
Pittsburgh	18.4	27	1	6.0	115	4	18.5	120	4	11.8	113	4
St. Louis	14.0	74	3	8.5	104	4	22.1	110	4	12.6	105	4
Sample Average	14.0			15.9			35.7			17.0		

Note: Per capita personal income is measured for the 1995-2004 period.

Growth Trends during 1995-2005

Analysis of regional economic growth between 1995 and 2005 in the Cleveland metropolitan area and other large Midwest areas reveals that Cleveland experienced the lowest growth rates in three measures of economic growth: per capita income, employment, and GMP (Table 5). Moreover, in per capita income, these Midwest metropolitan areas grew at or above the sample average growth rate (14%), except for Cleveland, which grew at a substantially lower rate (8.9%). The only measure of

economic growth in which the Cleveland metropolitan performed better is productivity growth, where Cleveland ranks in the middle among the group of Midwest metro areas.

The Minneapolis metropolitan area ranked above the sample average of all 136 metropolitan areas and experienced the highest rates of growth among the Midwest areas in three of the four economic growth measures—per capita income, GMP, and productivity. Minneapolis ranked in the first quartile in per capita income and productivity growth and in the second quartile in employment and GMP growth.

The Indianapolis metropolitan area had the highest growth rate in employment and was the only Midwest metro area that grew at a higher rate (16.3%) than the sample average (15.9%). Indianapolis also performed well in productivity growth, in which it ranked in the first quartile. Indianapolis ranked in the second quartile in the other three measures of economic growth.

Some Midwest metropolitan areas were quite competitive in comparison to other metro areas during the 1995-2005 years. Three Midwest metropolitan areas ranked in the first quartile in per capita income growth (Minneapolis, Pittsburgh, and Cincinnati) and two Midwest metro areas ranked in the first quartile in productivity growth (Minneapolis and Indianapolis).

Growth Trends during 2002-2005

During the expansionary portion of the most recent business cycle, 2002-2005, Cleveland still had the lowest rate of growth in per capita income and employment among the Midwest metropolitan areas and again ranked in the middle in productivity growth (Table 6).

Table 6. Cleveland and Similar Midwest MSAs by Measures of Economic Growth, 2002-2005

Midwest MSAs	Per Capita Income			Employment			Gross Metro Product			Productivity		
	% change	Rank	Quartile	% change	Rank	Quartile	% change	Rank	Quartile	% change	Rank	Quartile
Cincinnati	3.5	39	2	2.6	73	3	5.8	112	4	3.1	129	4
Cleveland	1.0	88	3	-1.1	121	4	5.4	117	4	6.5	72	3
Columbus	1.8	73	3	1.0	97	3	5.7	114	4	4.7	110	4
Indianapolis	1.7	75	3	3.4	63	2	10.5	63	2	6.9	65	2
Milwaukee	1.1	86	3	-0.5	114	4	6.8	106	4	7.3	54	2
Minneapolis	2.2	60	2	2.8	70	3	10.5	60	2	7.5	51	2
Pittsburgh	3.1	52	2	-0.6	117	4	5.4	116	4	6.1	84	3
St. Louis	3.3	45	2	1.4	91	3	5.3	118	4	3.9	123	4
Sample Average	1.9			3.4			10.6			7.0		

Note: Per capita personal income is measured for the 2001-2004 period.

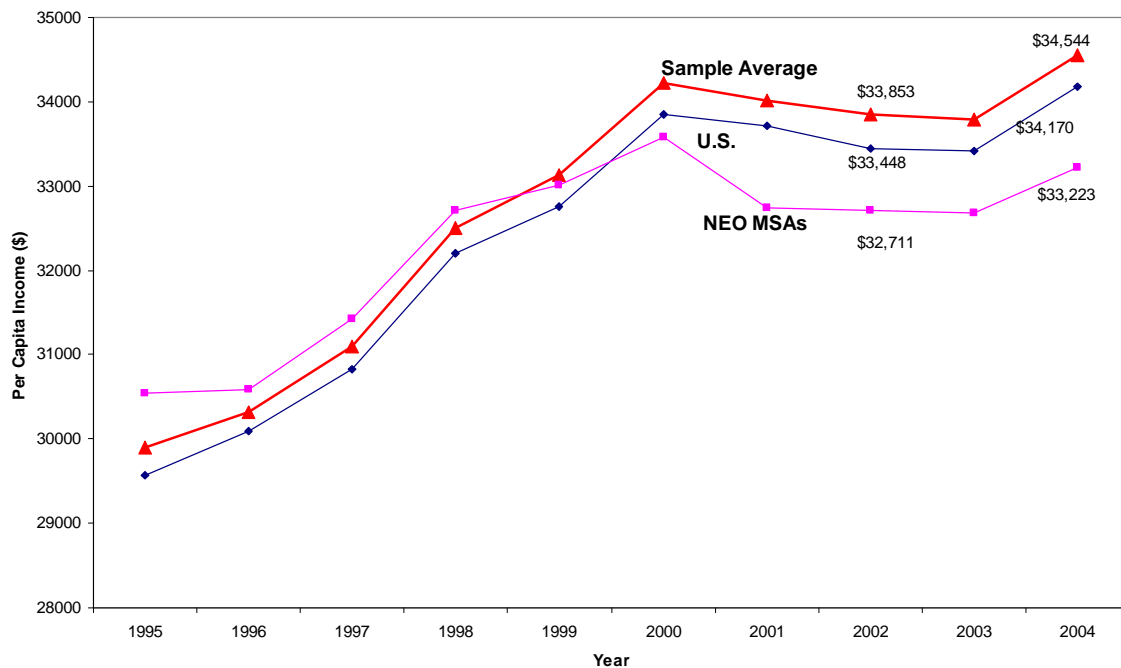
The Cleveland metropolitan area's growth rates in all four measures of regional economic growth were lower than the sample average of the 136 MSAs. In contrast, some other Midwest metropolitan areas grew faster than the sample average. For example, four metropolitan areas (Cincinnati, St. Louis, Pittsburgh, and Minneapolis) experienced faster growth rates in per capita income than the sample average, and two metropolitan areas (Minneapolis and Milwaukee) had productivity growth rates higher than the sample average. However, all of the Midwest metropolitan areas grew more slowly than the sample average in employment and gross metropolitan product.

Northeast Ohio in Comparison to the U.S. and the Average of Metropolitan Areas Included in the Study

How does Northeast Ohio, defined by the four metro areas combined, compare to the national average and the average of the 136 MSAs included in this study? Figure 5 illustrates trends in per capita income between 1995 and 2004. It reveals that per capita income in Northeast Ohio was higher than the national average through the year 1999, after which it fell and remained below the national average. *The year 1999 was the first time in the region's history that its per capita income dropped below the national average.*

In 1995, NEO's per capita income was 3.3 percent higher than the national average; by 2004, it was 2.8 percent below the national average, suggesting that in this 10-year period the gap between the national and NEO average per capita income deteriorated by six percentage points. The figure also shows that the levels of per capita income in the U.S. and the average level for all 136 metro areas moved in similar patterns. Northeast Ohio's per capita income fell below the sample average in 1999 and below the national average in 2000. The latest recession had a more severe impact in Northeast Ohio and lasted much longer than in other regions of the country. The decline in Northeast Ohio's per capita income between 2000 and 2001 was extremely large; Northeast Ohio lost 2.5 percent of its per capita income in one year, a loss about five times larger than the average loss in the sample MSAs (-0.6%) and the average national decline (-0.4%).

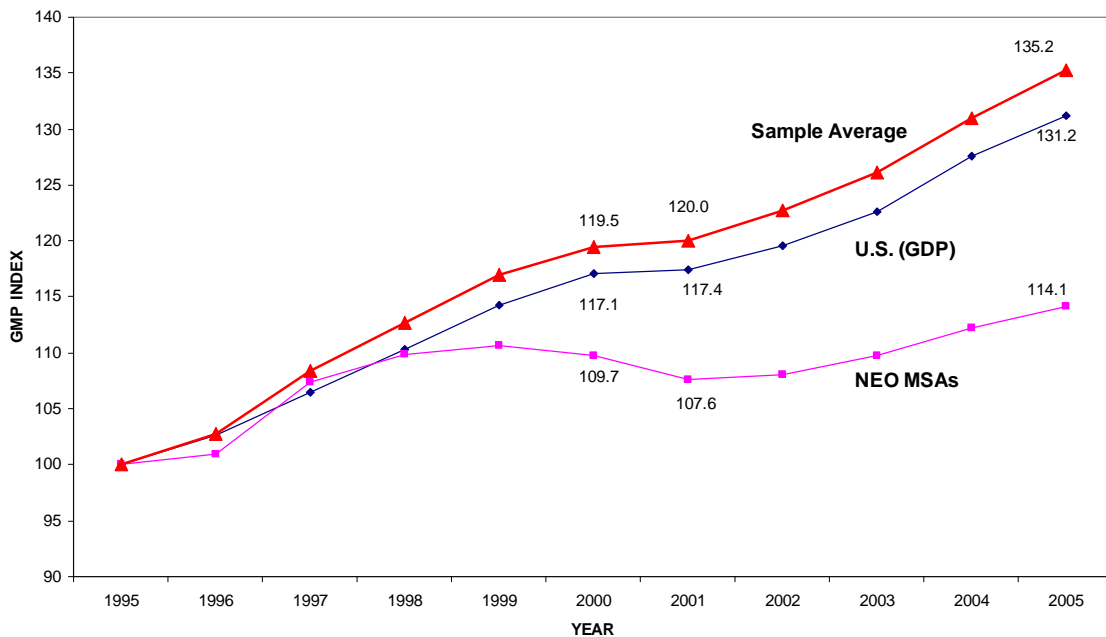
Figure 5. Per Capita Income in Northeast Ohio, the U.S., and the Sample Average, 1995 – 2004



The fact that the latest recession lasted longer and was more severe in Northeast Ohio than in the U.S. is also evident in the analysis of trends in gross metropolitan product.

Figure 6 shows trends in gross metropolitan product over the 1995-2005 period.³³ The figure illustrates that the growth patterns in Northeast Ohio, the U.S., and the average of the 136 metropolitan areas in our study (sample average) were similar in the expansionary years of 1995 through 1998. However, in 1999, the Northeast Ohio region reached a plateau and then declined for the following three years while the U.S. and the sample average continued to increase. Even though NEO's gross metropolitan product began to rise in 2002, the gap between NEO and the national economy has increased.

Figure 6. Gross Metropolitan Product, 1995-2005
1995=100



WHAT IF NORTHEAST OHIO’S METRO AREAS GREW AT FASTER RATES?

The analysis verifies that the Northeast Ohio region is growing at a slower pace than many other metropolitan areas in the U.S. and even in comparison to other metropolitan areas in the Midwest. In order to improve our region’s economic performance, regional

³³ The comparison of gross metropolitan product across regions of significantly different sizes necessitates standardizing the levels to an index of 100 in the initial year of 1995.

leaders, local communities, and other stakeholders need to set strategies and goals for economic growth.

Based on priorities developed by Voices & Choices (an 18-month process involving 21,000 people throughout Northeast Ohio and funded by the Fund for Our Economic Future) along with additional interviews with organizations and leaders through Northeast Ohio, a set of actions under a plan called Advance Northeast Ohio has been recently revealed.³⁴ The study’s framework and set of dashboard indicators provide analytical tools that assist the strategy development, and it is expected that they will help to monitor future regional performance.

Without recommending specific goals, we respond to the question of what would it mean if NEO’s metropolitan areas grew at faster rates, such as the average growth rates of the third or second quartile metro areas. Tables 7 and 8 answer these questions in terms of per capita income and employment, respectively.³⁵

Table 7. Implications for Improvements in Per Capita Income

NEO MSAs	Per Capita Income 2004 (in \$2005)	Actual Change 1995-2004 (in \$2005)	Percentage Change 1995-2004 (%)	Additional Per Capita Income Needed to Reach	
				3rd Quartile Average (\$)	2nd Quartile Average (\$)
Akron	33,562	3,775	12.7%	11	878
Canton	29,118	2,088	7.7%	1,348	2,135
Cleveland	35,425	2,897	8.9%	1,238	2,184
Youngstown	27,769	1,046	3.9%	2,351	3,128

Note: These calculations are based on the average growth rates of 13% and 16%, respectively, of the 3rd and 2nd quartiles of sample MSAs.

³⁴ <http://www.advancenortheastohio.org/>

³⁵ Among the comparable Midwest metro areas, three were ranked in the first quartile, three in the second quartile, and one in the third quartile in income growth. Thus analyzing what would happen if per capita income in Northeast Ohio grew at the average growth rate of the second quartile is consistent with Midwest areas. For employment grow, the average growth rate of the third quartile is a better representation of the Midwest areas.

The Cleveland metro area ranked in the fourth quartile in per capita income growth during the 1995-2004 years. Its per capita income of \$35,425 grew by 8.9 percent, while the average growth rate of income for third-quartile metro areas was 13 percent. How much additional income would every person living in the Cleveland metro area have if the Cleveland metropolitan area grew by 13 percent? Table 7 suggests that every person in the Cleveland metropolitan area would have an additional \$1,238 in 2004 if per capita income grew at the average growth rate of third quartile metropolitan areas. Moreover, every person in the Cleveland metropolitan area would have an additional \$2,184 if the metropolitan area had grown at the average growth rate of second quartile metro areas (16%). Thus improvements in regional economic growth, on average, could benefit every person living in Northeast Ohio.

A similar “what if” scenario can be developed for changes in the other measures of economic growth. Table 8 demonstrates the additional number of jobs that NEO’s metro areas could have if they would have grown at higher rates of growth. By 2005, there were 1.1 million people working in the Cleveland metropolitan area. However, just fewer than 8,900 jobs were added (net growth) since 1995, for a very slow job growth rate of less than one percent (0.8%). If employment in the Cleveland metro area would have grown at the average growth rate of third quartile metro areas (11%), there would have been an additional 108,140 jobs in the Cleveland metropolitan area in 2005.

Table 8: Implications for Improvements in Employment

NEO MSAs	Employment 2005	Actual Change 1995-2005	Percentage Change 1995-2005 (%)	Additional Employment Needed to Reach	
				3rd Quartile Average	2nd Quartile Average
Akron	341,733	26,554	8.4%	7,737	26,963
Canton	180,882	1,367	0.8%	18,164	29,115
Cleveland	1,084,309	8,868	0.8%	108,140	173,742
Youngstown	250,648	-5,109	-2.0%	32,935	48,537

Note: These calculations are based on the average growth rates of 11% and 17%, respectively, of the 3rd and 2nd quartiles of sample MSAs.

Jobs in the Akron metro area grew at a faster rate than in Cleveland, but were still below the third quartile average (8.4% in Akron compared to 11% for third-quartile metro areas). The table shows that if employment in the Akron metropolitan area would have grown by 11 percent, there would have been an additional 7,737 jobs in Akron in 2005. Moreover, if jobs in Akron had grown at the second quartile growth rate (17%), there would have been 27,000 additional jobs in the metropolitan area.

In order to increase regional economic performance, metropolitan areas need to improve their measures of the variables that underlie each of the indicators. The next section will discuss the ranking of metro areas by each of the dashboard indicators.

RANKING OF METROPOLITAN AREAS BY DASHBOARD INDICATORS, 2000 AND 2005³⁶

This section ranks the 136 sample metropolitan areas in each of the nine indicators for two time periods: 2000 (the year for which the factor analysis was run) and 2005 (or earlier, if 2005 data were not available). Tables 9-17 provide the scores and rankings for each indicator and the metropolitan areas are listed based on their 2005 rank. Although the indicator scores do not have any intrinsic value, they provide us with a way of interpreting the rankings using the distance between the scores of individual metro areas. As with metropolitan area rankings by economic growth measures, the metropolitan areas are divided into four quartiles based on the rank.³⁷ A couple of caveats should be noted: in some cases the difference between scores of two closely ranked metropolitan areas is large, while in other cases the scores are very close. Similarly, scores of metropolitan areas close to the bottom of one quartile and the top of the following quartile can be similar or could be far apart. The four Northeast Ohio metropolitan areas are highlighted in these tables for easy identification.

Skilled Workforce and R&D

Among the top-ranked metropolitan areas in terms of skilled workforce and R&D are some metropolitan areas that immediately come to mind as strongholds of a highly educated workforce and locations of prominent research universities. These include Ann Arbor, MI; Durham and Raleigh, NC; San Jose and San Diego, CA; Madison, WI; Huntsville, AL; Austin, TX; Trenton, NJ; and Bridgeport, CT (Table 9). The first eight metro areas were ranked among the top 10 in both years; however, San Diego and Bridgeport were ranked below the top 10 in 2000. In contrast, Seattle, WA and Santa Barbara, CA lost their place among the leading 10 that they held in 2000.

³⁶ Where possible, variables were updated with 2005 data. However, when 2005 data were not available, the most recent available year was used.

³⁷ The first quartile includes metropolitan areas that are ranked between #1 and #34. Those areas that are ranked between #35 and #68 are in the second quartile; those ranked between #69 and #102 are in the third quartile, and those ranked between #103 and #136 are in the fourth quartile.

In addition to the Midwest's two college towns that ranked in the top 10 (Ann Arbor, MI and Madison, WI), other Midwest metropolitan areas that ranked in the first quartile in 2005 were Minneapolis, MN (#14); Columbus, OH (#24); and Lansing and Kalamazoo, MI (#29 and #32, respectively). Kalamazoo, MI improved its position from the second quartile in 2000 to the first quartile in 2005. On the other hand, Dayton, OH moved from the bottom of the first quartile in 2000 (#31) to the top of the second quartile in 2005 (#37).

Of the eight large Midwest metropolitan areas, five increased their rankings between 2000 and 2005 (Minneapolis, Milwaukee, St. Louis, Pittsburgh, and Cleveland), two fell slightly in their rankings (Indianapolis and Cincinnati), and Columbus retained the same ranking. Both Minneapolis and Columbus were in the first quartile in both years.

The Akron, Canton, and Cleveland metropolitan areas improved their relative rankings between 2000 and 2005. While the Cleveland area remained in the second quartile in both years, improving its ranking only slightly from #66 in 2000 to #64 in 2005, the Akron area increased its ranking more significantly, not only moving from the third quartile in 2000 (#74) to the second quartile in 2005 (#58), but passing the Cleveland metro area to become the highest-ranking metropolitan area in Northeast Ohio in terms of the Skilled Workforce and R&D indicator. Canton and Youngstown were in the fourth quartile in both years.

The Skilled Workforce and R&D factor is critical because the study's framework showed that regions that have a highly skilled workforce and are engaged in R&D through their universities, federal labs, and corporations tend to have higher growth rates of both per capita personal income and productivity. The higher the score and rank Northeast Ohio metropolitan areas can achieve, the higher the probability they have for increased productivity and per capita income.

Ranking of Metropolitan Areas by Dashboard Indicators

Table 9. Rank of Sample Metropolitan Areas According to Workforce and R&D Factor Score, 2000 and 2005

Metro Areas*	2000		2005		Metro Areas	2000		2005	
	Rank	Score	Rank	Score		Rank	Score	Rank	Score
Ann Arbor, MI	1	16.02	1	17.21	Reno-Sparks, NV	75	-0.81	69	-0.22
Durham, NC	2	14.41	2	15.06	New Orleans-Metairie-Kenner, LA	78	-0.98	70	-0.28
San Jose-Sunnyvale-Santa Clara, CA	3	13.75	3	13.84	Birmingham-Hoover, AL	64	-0.39	71	-0.31
Madison, WI	4	9.52	4	10.28	Spokane, WA	72	-0.67	72	-0.38
Huntsville, AL	5	8.38	5	8.10	Oklahoma City, OK	76	-0.81	73	-0.45
Austin-Round Rock, TX	7	7.59	6	7.37	Orlando, FL	57	0.07	74	-0.52
Raleigh-Cary, NC	8	7.51	7	7.08	Winston-Salem, NC	58	-0.08	75	-0.63
Trenton-Ewing, NJ Metro Area	6	7.81	8	6.87	San Antonio, TX	67	-0.51	76	-0.65
San Diego-Carlsbad-San Marcos, CA	13	6.26	9	6.43	Buffalo-Niagara Falls, NY	70	-0.60	77	-0.75
Bridgeport-Stamford-Norwalk, CT	11	6.54	10	5.89	Boise City-Nampa, ID	62	-0.34	78	-0.91
Seattle-Tacoma-Bellevue, WA	9	6.96	11	5.58	Montgomery, AL	73	-0.69	79	-1.01
Tallahassee, FL	12	6.54	12	5.34	Allentown-Bethlehem-Easton, PA-NJ	90	-1.82	80	-1.01
New Haven-Milford, CT	17	4.38	13	5.32	Jacksonville, FL	82	-1.45	81	-1.02
Santa Barbara-Santa Maria-Goleta, CA	10	6.77	14	4.94	Savannah, GA	83	-1.45	82	-1.26
Baltimore-Towson, MD	18	4.28	15	4.50	Tulsa, OK	93	-1.84	83	-1.27
Minneapolis-St. Paul-Bloomington, MN-WI	22	3.90	16	4.42	Louisville, KY-IN	88	-1.77	84	-1.46
Worcester, MA	27	2.15	17	4.09	Asheville, NC	95	-1.92	85	-1.50
Albany-Schenectady-Troy, NY	15	4.60	18	4.05	Ogden-Clearfield, UT	89	-1.81	86	-1.65
Tucson, AZ	21	3.97	19	3.97	Greensboro-High Point, NC	80	-1.20	87	-1.67
Lexington-Fayette, KY	20	4.16	20	3.91	Baton Rouge, LA	79	-1.13	88	-1.68
Denver-Aurora, CO	19	4.20	21	3.86	Fort Wayne, IN	86	-1.65	89	-1.68
Manchester-Nashua, NH	25	2.94	22	3.46	Tampa-St. Petersburg-Clearwater, FL	96	-1.98	90	-1.71
Colorado Springs, CO	14	5.13	23	3.19	Wichita, KS	84	-1.52	91	-1.79
Portland-Vancouver-Beaverton, OR-WA	29	2.00	24	3.04	Chattanooga, TN-GA	100	-2.29	92	-1.88
Hartford-West Hartford-East Hartford, CT	24	3.06	25	2.96	Toledo, OH	98	-2.10	93	-2.00
Columbus, OH	26	2.28	26	2.86	Memphis, TN-MS-AR	94	-1.90	94	-2.01
Albuquerque, NM	16	4.41	27	2.78	Grand Rapids-Wyoming, MI	99	-2.14	95	-2.05
Rochester, NY	28	2.03	28	2.71	Davenport-Moline-Rock Island, IA-IL	110	-3.12	96	-2.07
Lansing-East Lansing, MI	23	3.57	29	2.68	Augusta-Richmond County, GA-SC	87	-1.76	97	-2.09
Eugene-Springfield, OR	30	1.77	30	1.97	South Bend-Mishawaka, IN-MI	92	-1.84	98	-2.12
Portland-South Portland-Biddeford, ME	35	1.23	31	1.80	Springfield, MO	103	-2.37	99	-2.17
Kalamazoo-Portage, MI	44	0.77	32	1.66	Charleston, WV	104	-2.61	100	-2.26
Santa Rosa-Petaluma, CA	39	1.10	33	1.66	Vallejo-Fairfield, CA	97	-2.06	101	-2.27
Kansas City, MO-KS	40	1.00	34	1.59	Peoria, IL	102	-2.31	102	-2.28
Sacramento-Arden-Arcade-Roseville, CA	32	1.52	35	1.50	Pensacola-Ferry Pass-Brent, FL	91	-1.83	103	-2.45
Dayton, OH	31	1.56	36	1.39	Lancaster, PA	109	-3.11	104	-2.58
Des Moines, IA	45	0.64	37	1.37	Evansville, IN-KY	111	-3.29	105	-2.95
Omaha-Council Bluffs, NE-IA	50	0.36	38	1.34	Reading, PA	114	-3.47	106	-3.01
Anchorage, AK	33	1.43	39	1.07	Salem, OR	105	-2.66	107	-3.09
Richmond, VA	37	1.16	40	1.02	Sarasota-Bradenton-Venice, FL	108	-3.06	108	-3.17
Oxnard-Thousand Oaks-Ventura, CA	36	1.19	41	0.94	Naples-Marco Island, FL	101	-2.29	109	-3.24
Nashville-Davidson--Murfreesboro, TN	43	0.78	42	0.82	Salinas, CA	85	-1.54	110	-3.37
Charleston-North Charleston, SC	51	0.34	43	0.81	Killeen-Temple-Fort Hood, TX	106	-2.66	111	-3.42
Milwaukee-Waukesha-West Allis, WI	53	0.26	44	0.81	Mobile, AL	115	-3.47	112	-3.45
Salt Lake City, UT	38	1.12	45	0.72	Scranton--Wilkes-Barre, PA	121	-4.16	113	-3.55
Columbia, SC	41	0.88	46	0.65	York-Hanover, PA	112	-3.39	114	-3.63
Providence-New Bedford-Fall River, RI-MA	55	0.12	47	0.64	Shreveport-Bossier City, LA	116	-3.59	115	-3.73
Springfield, MA	49	0.43	48	0.61	Corpus Christi, TX	117	-3.77	116	-3.98
Indianapolis, IN	48	0.53	49	0.59	Canton-Massillon, OH	119	-4.06	117	-4.01
Provo-Orem, UT	34	1.41	50	0.52	Deltona-Daytona Beach-Ormond Beach, FL	120	-4.15	118	-4.07
Charlotte-Gastonia-Concord, NC-SC	42	0.86	51	0.50	Rockford, IL	113	-3.46	119	-4.18
Jackson, MS	61	-0.15	52	0.47	Fayetteville, NC	107	-3.06	120	-4.23
St. Louis, MO-IL	60	-0.13	53	0.43	Port St. Lucie-Fort Pierce, FL	126	-4.54	121	-4.28
Poughkeepsie-Newburgh-Middletown, NY	56	0.07	54	0.33	Cape Coral-Fort Myers, FL	122	-4.23	122	-4.37
Pittsburgh, PA	68	-0.52	55	0.08	Las Vegas-Paradise, NV	118	-3.98	123	-4.45
Honolulu, HI Metro Area	46	0.62	56	0.01	Flint, MI	125	-4.46	124	-4.46
Harrisburg-Carlisle, PA	69	-0.59	57	0.01	Hickory-Lenoir-Morganton, NC	131	-5.74	125	-4.54
Akron, OH	74	-0.71	58	-0.02	Fresno, CA	123	-4.23	126	-4.66
Cincinnati-Middletown, OH-KY-IN	54	0.15	59	-0.04	Stockton, CA	129	-5.22	127	-4.88
Syracuse, NY	52	0.30	60	-0.06	Beaumont-Port Arthur, TX	127	-4.93	128	-5.15
Fayetteville-Springdale-Rogers, AR-MO	81	-1.33	61	-0.06	Youngstown-Warren-Boardman, OH-PA	128	-5.12	129	-5.20
Little Rock-North Little Rock, AR	63	-0.38	62	-0.10	El Paso, TX	124	-4.34	130	-5.34
Knoxville, TN	47	0.53	63	-0.12	Lakeland, FL	133	-5.85	131	-5.79
Cleveland-Elyria-Mentor, OH	66	-0.43	64	-0.13	Modesto, CA	132	-5.77	132	-5.88
Greenville, SC	71	-0.63	65	-0.13	Bakersfield, CA	130	-5.48	133	-6.04
Palm Bay-Melbourne-Titusville, FL	77	-0.91	66	-0.17	McAllen-Edinburg-Pharr, TX	135	-6.80	134	-6.64
Wilmington, NC	65	-0.40	67	-0.20	Brownsville-Harlingen, TX	134	-6.30	135	-7.53
Virginia Beach-Norfolk-Newport News, VA-NC	59	-0.09	68	-0.21	Visalia-Porterville, CA	136	-7.11	136	-7.55

*Ranked by 2005 Score

The variables that contributed to the increased ranking of the Akron metropolitan area primarily include educational attainment and professional occupations (Table 1 in Appendix E). More specifically, those variables include the percentage of the population in professional occupations, percentage of the population with graduate and professional degrees, percentage of the population with bachelor's degrees, and a smaller proportion of the dependent population (those younger than 18 and older than 65). By 2005, the Akron metropolitan area was above or at the sample average in each of these variables.

In the Cleveland metropolitan area, some educational attainment and increased research awards resulted in increased rankings for the indicator. These variables include percentage of the population with professional and graduate degrees and SBIR and STTR awards. In both measures, the Cleveland metropolitan area was above the sample average in 2005. In addition, Cleveland improved its ranking in the share of dependent population, although the dependency share was still above the sample average.

Technology Commercialization

The Technology Commercialization indicator is focused primarily on venture capital and number of patents. Also, metropolitan areas that have higher investments by venture capital firms and greater number of patents are likely to have higher costs of living, as exemplified by locations on both the east and west coasts. In terms of economic growth, Technology Commercialization is statistically positively associated with three measures of economic growth: per capita personal income, gross metropolitan product, and productivity. It has no statistically significant relationship with changes in employment.

The leading regions in this indicator in 2005 include five metropolitan areas in California—San Jose, San Diego, Santa Rosa, Santa Barbara, and Oxnard (Table 10). It should be noted that there is a very large difference in factor scores between top-ranked San Jose and second place, Boise City, ID, primarily due to San Jose being an outlier with a very large number of patents per employee.

Table 10. Rank of Sample Metropolitan Areas According to Technology Commercialization Factor Score, 2000 and 2005

Metro Areas*	2000		2005		Metro Areas	2000		2005	
	Rank	Score	Rank	Score		Rank	Score	Rank	Score
San Jose-Sunnyvale-Santa Clara, CA	1	14.50	1	13.09	Deltona-Daytona Beach-Ormond Beach, FL	110	-0.83	69	-0.46
Bridgeport-Stamford-Norwalk, CT	2	4.42	2	4.38	Charleston-North Charleston, SC	63	-0.38	70	-0.46
Durham, NC	17	1.28	3	2.94	Birmingham-Hoover, AL	73	-0.44	71	-0.49
San Diego-Carlsbad-San Marcos, CA	7	2.12	4	2.80	Winston-Salem, NC	56	-0.31	72	-0.49
Santa Rosa-Petaluma, CA	6	2.62	5	2.70	Visalia-Porterville, CA	88	-0.56	73	-0.50
Boise City-Nampa, ID	3	3.12	6	2.48	Spokane, WA	105	-0.76	74	-0.51
Oxnard-Thousand Oaks-Ventura, CA	11	1.79	7	1.89	Jacksonville, FL	81	-0.50	75	-0.52
Santa Barbara-Santa Maria-Goleta, CA	16	1.32	8	1.85	Richmond, VA	65	-0.40	76	-0.53
Trenton-Ewing, NJ Metro Area	5	2.68	9	1.74	Asheville, NC	69	-0.42	77	-0.53
South Bend-Mishawaka, IN-MI	115	-0.90	10	1.67	Reading, PA	67	-0.41	78	-0.54
Honolulu, HI Metro Area	33	0.31	11	1.63	Kalamazoo-Portage, MI	60	-0.35	79	-0.56
Nashville-Davidson--Murfreesboro, TN	50	-0.23	12	1.58	Springfield, MA	85	-0.52	80	-0.57
Austin-Round Rock, TX	4	2.86	13	1.57	Flint, MI	95	-0.64	81	-0.58
Ann Arbor, MI	8	1.96	14	1.39	Greensboro-High Point, NC	58	-0.32	82	-0.60
Worcester, MA	14	1.38	15	1.30	Greenville, SC	27	0.44	83	-0.60
Vallejo-Fairfield, CA	24	0.56	16	1.23	Knoxville, TN	62	-0.37	84	-0.60
Poughkeepsie-Newburgh-Middletown, NY	13	1.46	17	1.17	Salem, OR	94	-0.63	85	-0.61
Seattle-Tacoma-Bellevue, WA	15	1.34	18	1.09	Chattanooga, TN-GA	71	-0.43	86	-0.62
Rochester, NY	20	0.97	19	1.03	San Antonio, TX	101	-0.69	87	-0.62
Reno-Sparks, NV	34	0.15	20	1.00	St. Louis, MO-IL	90	-0.58	88	-0.63
Hartford-West Hartford-East Hartford, CT	25	0.54	21	0.97	York-Hanover, PA	80	-0.49	89	-0.64
Peoria, IL	53	-0.26	22	0.93	Lakeland, FL	113	-0.87	90	-0.64
Salinas, CA	19	1.04	23	0.93	Pittsburgh, PA	43	-0.10	91	-0.66
Manchester-Nashua, NH	9	1.95	24	0.92	Huntsville, AL	55	-0.30	92	-0.67
Naples-Marco Island, FL	21	0.79	25	0.87	Eugene-Springfield, OR	93	-0.61	93	-0.68
New Haven-Milford, CT	18	1.13	26	0.85	Grand Rapids-Wyoming, MI	72	-0.44	94	-0.69
Raleigh-Cary, NC	12	1.56	27	0.73	Jackson, MS	106	-0.77	95	-0.69
Providence-New Bedford-Fall River, RI-MA	44	-0.14	28	0.57	Baton Rouge, LA	79	-0.49	96	-0.69
Sacramento--Arden-Arcade--Roseville, CA	41	-0.07	29	0.55	Canton-Massillon, OH	91	-0.60	97	-0.70
Cape Coral-Fort Myers, FL	97	-0.65	30	0.52	New Orleans-Metairie-Kenner, LA	100	-0.69	98	-0.70
Portland-Vancouver-Beaverton, OR-WA	22	0.72	31	0.52	Columbus, OH	84	-0.51	99	-0.70
Minneapolis-St. Paul-Bloomington, MN-WI	23	0.70	32	0.49	Columbia, SC	86	-0.53	100	-0.71
Denver-Aurora, CO	10	1.92	33	0.48	Lexington-Fayette, KY	83	-0.50	101	-0.72
Allentown-Bethlehem-Easton, PA-NJ	30	0.39	34	0.38	Des Moines, IA	87	-0.55	102	-0.73
Stockton, CA	51	-0.23	35	0.26	Dayton, OH	70	-0.42	103	-0.74
Sarasota-Bradenton-Venice, FL	52	-0.24	36	0.23	Memphis, TN-MS-AR	76	-0.47	104	-0.76
Baltimore-Towson, MD	37	0.06	37	0.20	Tallahassee, FL	108	-0.81	105	-0.77
Tucson, AZ	45	-0.14	38	0.17	Pensacola-Ferry Pass-Brent, FL	66	-0.40	106	-0.78
Tampa-St. Petersburg-Clearwater, FL	59	-0.32	39	0.11	Hickory-Lenoir-Morganton, NC	98	-0.66	107	-0.79
Albany-Schenectady-Troy, NY	40	-0.04	40	0.09	Virginia Beach-Norfolk-Newport News, VA-NC	126	-0.99	108	-0.80
Palm Bay-Melbourne-Titusville, FL	47	-0.16	41	0.08	Toledo, OH	78	-0.48	109	-0.81
Port St. Lucie-Fort Pierce, FL	82	-0.50	42	0.04	Louisville, KY-IN	77	-0.47	110	-0.83
Salt Lake City, UT	32	0.32	43	0.03	Savannah, GA	119	-0.92	111	-0.84
Provo-Orem, UT	31	0.33	44	0.00	El Paso, TX	128	-1.01	112	-0.86
Corpus Christi, TX	122	-0.95	45	-0.01	Fort Wayne, IN	102	-0.70	113	-0.89
Las Vegas-Paradise, NV	68	-0.41	46	-0.01	Mobile, AL	96	-0.64	114	-0.91
Indianapolis, IN	57	-0.32	47	-0.07	Lansing-East Lansing, MI	104	-0.75	115	-0.92
Lancaster, PA	89	-0.57	48	-0.12	Montgomery, AL	124	-0.97	116	-0.93
Colorado Springs, CO	28	0.42	49	-0.14	Buffalo-Niagara Falls, NY	29	0.40	117	-0.93
Madison, WI	38	0.05	50	-0.16	Omaha-Council Bluffs, NE-IA	64	-0.40	118	-0.95
Orlando, FL	75	-0.47	51	-0.20	Syracuse, NY	111	-0.87	119	-0.95
Wilmington, NC	39	0.03	52	-0.23	Shreveport-Bossier City, LA	133	-1.12	120	-0.95
Scranton--Wilkes-Barre, PA	130	-1.05	53	-0.25	Oklahoma City, OK	114	-0.90	121	-0.97
Bakersfield, CA	103	-0.72	54	-0.26	Springfield, MO	120	-0.92	122	-0.97
Fresno, CA	117	-0.91	55	-0.27	Beaumont-Port Arthur, TX	121	-0.93	123	-0.97
Albuquerque, NM	61	-0.35	56	-0.27	Rockford, IL	127	-1.00	124	-0.98
Cleveland-Elyria-Mentor, OH	35	0.12	57	-0.33	Augusta-Richmond County, GA-SC	123	-0.96	125	-1.01
Milwaukee-Waukesha-West Allis, WI	74	-0.44	58	-0.34	Little Rock-North Little Rock, AR	116	-0.91	126	-1.03
Modesto, CA	99	-0.66	59	-0.35	Killeen-Temple-Fort Hood, TX	134	-1.14	127	-1.03
Akron, OH	36	0.10	60	-0.35	Evansville, IN-KY	112	-0.87	128	-1.04
Portland-South Portland-Biddeford, ME	49	-0.22	61	-0.35	Charleston, WV	109	-0.82	129	-1.05
Cincinnati-Middletown, OH-KY-IN	48	-0.16	62	-0.36	Wichita, KS	118	-0.91	130	-1.05
Charlotte-Gastonia-Concord, NC-SC	26	0.48	63	-0.36	Fayetteville-Springdale-Rogers, AR-MO	132	-1.10	131	-1.07
Kansas City, MO-KS	54	-0.29	64	-0.36	Davenport-Moline-Rock Island, IA-IL	135	-1.25	132	-1.10
Tulsa, OK	107	-0.78	65	-0.36	McAllen-Edinburg-Pharr, TX	129	-1.02	133	-1.11
Ogden-Clearfield, UT	42	-0.08	66	-0.37	Youngstown-Warren-Boardman, OH-PA	125	-0.98	134	-1.13
Anchorage, AK	46	-0.14	67	-0.42	Fayetteville, NC	131	-1.05	135	-1.14
Harrisburg-Carlisle, PA	92	-0.61	68	-0.43	Brownsville-Harlingen, TX	136	-1.49	136	-1.34

*Ranked by 2005 Score

Additional metro areas in the top 10 in Technology Commercialization are Austin, TX; Trenton, NJ; Bridgeport, CT; and Ann Arbor, MI. Of these 10, two California metropolitan areas were ranked below the top 10 in 2000, Santa Barbara and Oxnard. On the other hand, two other metropolitan areas were in the top 10 in 2000 but dropped lower into the first quartile: Manchester, NH and Denver, CO.

In addition to Ann Arbor, the only other Midwest metropolitan area ranked in the first quartile in 2005 was Minneapolis, ranking #23 in both 2000 and 2005. Three large Midwest metropolitan areas and two smaller ones were ranked in the second quartile. These include, in decreasing rank, Madison, WI; Pittsburgh, PA; Akron, OH; Milwaukee, WI; and Cincinnati, OH. Only Milwaukee improved its ranking and moved from the third quartile in 2000 to the second quartile in 2005. The other four metro areas lowered their ranks but remained in the second quartile in both years.

All four Northeast Ohio metro areas lost ground in the Technology Commercialization indicator between 2000 and 2005 (Table E-1). Although the Akron and Cleveland areas remained in the second quartile, Akron dropped from #36 in 2000 to #60 in 2005 and Cleveland fell from #35 to #57. The Canton metropolitan area remained in the lower part of third quartile, while Youngstown was at the bottom, falling from #125 in 2000 to #134 in 2005. The falling scores and rankings for NEO's metro areas are the result of declines in the variables that are included in this indicator: venture capital and number of patents.

It should be noted that the year 2000 was the peak of the computer technology sector before it crashed throughout the country. However, other regions regained some strength in the technology sector well before Northeast Ohio. In venture capital, both Akron and Cleveland suffered losses in the size of investments and in rankings between 2000 and 2005.³⁸ The ranking of the Cleveland metropolitan area in venture capital per employee declined slightly from #29 in the bottom of the first quartile to #36 in the top of the second quartile. In terms of patents per employee, Akron and Canton experienced some

³⁸ Recent studies have shown increased levels of venture capital investments in Northeast Ohio. For example, *The 2006 Greater Cleveland Venture Capital Report* shows that between 2004 and 2006, 97 Northeast Ohio companies received over \$500 million from venture capital firms and private equity groups.

gains, but only Canton improved its rank. The number of patents per employee in Akron and Canton was above the sample average in 2005; in Cleveland it was slightly below.

Racial Inclusion & Income Equality

This is the only factor that has a statistically significant association with all four measures of economic growth (discussed earlier in Table 2). This implies that lowering racial exclusion, income inequality, poverty, and violent crime will improve a region's growth in per capita income, employment, GMP, and productivity.³⁹

According to ranking by the factor scores, the metropolitan areas that lead in terms of racial inclusion and income equality are mainly smaller areas that are more racially homogenous. Table 11 shows the two leading metropolitan areas in Utah (Ogden and Provo) and other small metropolitan areas that include Honolulu, HI; Manchester, NH; Worcester, MA; Lancaster, PA; and Eugene, OR. Two California metropolitan areas, San Jose and Oxnard, are also ranked among the top 10 metropolitan areas.

From the Midwest, only two smaller metro areas are ranked in the first quartile—Madison, WI and Fort Wayne, IN. Of the eight larger Midwest metropolitan areas, seven lost rankings between 2000 and 2005. Minneapolis fell from the bottom of the first quartile in 2000 (#33) to the middle of the second quartile (#48). St. Louis, the only other large Midwest metropolitan area in the second quartile, was also the only metro area that improved, going from the fourth quartile to the second over the five-year period. Pittsburgh, Columbus, Cincinnati, and Indianapolis were all in the third quartile in 2005, while Milwaukee and Cleveland ranked in the fourth quartile.

Three Northeast Ohio metropolitan areas lost ground in this indicator: Canton, Cleveland, and Youngstown. Akron retained its ranking (#69) in both years. Akron and Canton are ranked in the top of the third quartile but Canton dropped from the second quartile (#40) in 2000 to the third quartile (#74) in 2005. Youngstown fell from the third quartile in

³⁹ Coefficients of the high-loading variables with this factor are negative, and the regression coefficients are positive.

2000 (#81) to the fourth quartile in 2005 (#105). The Cleveland metropolitan area performed the worst among Northeast Ohio metropolitan areas, placing toward the bottom of the fourth quartile in both years (#119 in 2000 and #124 in 2005).

The falling scores and ranks of Northeast Ohio metropolitan areas show the poor economic performance experienced by our region in recent years. The framework developed in this study suggests that the Racial Inclusion and Income Equality indicator has influence on all four measures of regional growth: per capita personal income, employment, GMP, and productivity. The variables included in this indicator that worsened between 2000 and 2005 are the Black Isolation Index and Income Inequality. The ranking of the rate of violent crime also deteriorated in Akron and Canton but remained the same in the Cleveland metropolitan area and improved slightly in Youngstown.

Table 11. Rank of Sample Metropolitan Areas According to Racial Inclusion & Income Equality Factor Score, 2000 and 2005

Metro Areas*	2000		2005		Metro Areas	2000		2005	
	Rank	Score	Rank	Score		Rank	Score	Rank	Score
Ogden-Clearfield, UT	5	3.92	1	3.88	Akron, OH	69	0.26	69	0.20
Provo-Orem, UT	1	4.54	2	3.48	Pittsburgh, PA	63	0.53	70	0.20
San Jose-Sunnyvale-Santa Clara, CA	29	2.36	3	3.45	Albuquerque, NM	84	-0.45	71	0.12
Honolulu, HI Metro Area	25	2.57	4	3.32	Chattanooga, TN-GA	93	-0.85	72	0.12
Manchester-Nashua, NH	2	4.32	5	3.22	Springfield, MO	18	3.08	73	0.04
Worcester, MA	24	2.60	6	3.15	Canton-Massillon, OH	40	1.42	74	0.04
Oxnard-Thousand Oaks-Ventura, CA	20	2.94	7	3.13	Visalia-Porterville, CA	105	-1.47	75	-0.01
Lancaster, PA	10	3.57	8	3.12	Lansing-East Lansing, MI	38	1.50	76	-0.06
Eugene-Springfield, OR	13	3.36	9	3.09	Tulsa, OK	86	-0.51	77	-0.09
Portland-South Portland-Biddeford, ME	3	4.08	10	3.09	Oklahoma City, OK	94	-0.88	78	-0.25
Santa Rosa-Petaluma, CA	9	3.64	11	2.83	Greensboro-High Point, NC	100	-1.18	79	-0.26
Fayetteville-Springdale-Rogers, AR-MO	8	3.67	12	2.79	Fresno, CA	120	-2.77	80	-0.33
Salem, OR	23	2.71	13	2.75	Virginia Beach-Norfolk-Newport News, VA-NC	109	-1.65	81	-0.35
Portland-Vancouver-Beaverton, OR-WA	28	2.42	14	2.66	Charleston, WV	53	0.93	82	-0.43
Madison, WI	7	3.73	15	2.63	Columbus, OH	80	-0.23	83	-0.53
Salt Lake City, UT	6	3.83	16	2.63	Rochester, NY	71	0.23	84	-0.53
Boise City-Nampa, ID	4	3.94	17	2.37	Omaha-Council Bluffs, NE-IA	52	0.94	85	-0.55
Hickory-Lenoir-Morganton, NC	17	3.13	18	2.37	Albany-Schenectady-Troy, NY	41	1.41	86	-0.55
San Antonio, TX	72	0.18	19	2.29	New Haven-Milford, CT	70	0.24	87	-0.62
Reading, PA	22	2.83	20	2.27	Tucson, AZ	60	0.65	88	-0.65
McAllen-Edinburg-Pharr, TX	78	-0.04	21	2.27	Sarasota-Bradenton-Venice, FL	57	0.78	89	-0.66
Scranton--Wilkes-Barre, PA	11	3.50	22	2.21	Winston-Salem, NC	107	-1.55	90	-0.78
Poughkeepsie-Newburgh-Middletown, NY	31	2.32	23	2.21	El Paso, TX	101	-1.33	91	-0.85
Santa Barbara-Santa Maria-Goleta, CA	39	1.48	24	2.18	Durham, NC	118	-2.47	92	-0.91
Colorado Springs, CO	21	2.90	25	2.10	Rockford, IL	65	0.44	93	-0.91
Salinas, CA	54	0.91	26	2.04	Buffalo-Niagara Falls, NY	99	-1.16	94	-0.92
Des Moines, IA	12	3.41	27	2.03	Cincinnati-Middletown, OH-KY-IN	85	-0.51	95	-1.00
San Diego-Carlsbad-San Marcos, CA	59	0.74	28	2.00	Syracuse, NY	62	0.61	96	-1.03
Fort Wayne, IN	30	2.34	29	1.99	Toledo, OH	108	-1.64	97	-1.03
Louisville, KY-IN	88	-0.54	30	1.93	Pensacola-Ferry Pass-Brent, FL	113	-2.11	98	-1.05
Reno-Sparks, NV	16	3.13	31	1.90	Indianapolis, IN	79	-0.14	99	-1.09
Lakeland, FL	68	0.27	32	1.85	Stockton, CA	96	-1.02	100	-1.09
York-Hanover, PA	19	2.99	33	1.75	Kalamazoo-Portage, MI	66	0.35	101	-1.21
Asheville, NC	27	2.46	34	1.73	Huntsville, AL	102	-1.39	102	-1.23
Brownsville-Harlingen, TX	58	0.75	35	1.68	Charlotte-Gastonia-Concord, NC-SC	104	-1.45	103	-1.24
Naples-Marco Island, FL	67	0.28	36	1.62	Nashville-Davidson--Murfreesboro, TN	103	-1.41	104	-1.25
Harrisburg-Carlisle, PA	49	1.05	37	1.60	Youngstown-Warren-Boardman, OH-PA	81	-0.24	105	-1.26
Allentown-Bethlehem-Easton, PA-NJ	14	3.20	38	1.49	Dayton, OH	97	-1.02	106	-1.29
Las Vegas-Paradise, NV	42	1.36	39	1.41	Davenport-Moline-Rock Island, IA-IL	75	0.07	107	-1.38
Cape Coral-Fort Myers, FL	35	1.87	40	1.40	Milwaukee-Waukesha-West Allis, WI	87	-0.54	108	-1.44
Vallejo-Fairfield, CA	50	1.05	41	1.40	Richmond, VA	114	-2.13	109	-1.45
Modesto, CA	64	0.52	42	1.30	Orlando, FL	95	-0.93	110	-1.47
Lexington-Fayette, KY	82	-0.29	43	1.24	Kansas City, MO-KS	83	-0.45	111	-1.75
Wilmington, NC	98	-1.07	44	1.20	Little Rock-North Little Rock, AR	106	-1.49	112	-1.85
Ann Arbor, MI	47	1.07	45	1.16	Peoria, IL	92	-0.81	113	-1.86
South Bend-Mishawaka, IN-MI	48	1.06	46	1.13	Bakersfield, CA	111	-1.84	114	-2.05
Palm Bay-Melbourne-Titusville, FL	46	1.17	47	1.10	Charleston-North Charleston, SC	125	-4.29	115	-2.08
Minneapolis-St. Paul-Bloomington, MN-WI	33	2.03	48	1.05	Tampa-St. Petersburg-Clearwater, FL	90	-0.68	116	-2.13
Corpus Christi, TX	89	-0.66	49	0.99	Savannah, GA	127	-4.45	117	-2.32
Raleigh-Cary, NC	77	-0.03	50	0.94	Columbia, SC	123	-3.64	118	-2.52
Sacramento--Arden-Arcade--Roseville, CA	74	0.14	51	0.86	Augusta-Richmond County, GA-SC	124	-3.67	119	-2.69
Knoxville, TN	51	0.96	52	0.83	Fayetteville, NC	117	-2.45	120	-2.72
St. Louis, MO-IL	112	-1.90	53	0.82	Flint, MI	122	-3.62	121	-2.94
Hartford-West Hartford-East Hartford, CT	61	0.62	54	0.78	Trenton-Ewing, NJ Metro Area	115	-2.26	122	-2.95
Port St. Lucie-Fort Pierce, FL	76	0.00	55	0.74	Providence-New Bedford-Fall River, RI-MA	45	1.22	123	-3.00
Deltona-Daytona Beach-Ormond Beach, FL	73	0.16	56	0.69	Cleveland-Elyria-Mentor, OH	119	-2.70	124	-3.01
Denver-Aurora, CO	34	1.99	57	0.69	Beaumont-Port Arthur, TX	128	-4.67	125	-3.36
Evansville, IN-KY	36	1.78	58	0.67	Birmingham-Hoover, AL	121	-3.41	126	-3.69
Killeen-Temple-Fort Hood, TX	55	0.82	59	0.67	Jacksonville, FL	116	-2.32	127	-3.77
Wichita, KS	37	1.69	60	0.62	Baltimore-Towson, MD	126	-4.41	128	-4.09
Bridgeport-Stamford-Norwalk, CT	43	1.31	61	0.59	Montgomery, AL	130	-5.97	129	-4.34
Springfield, MA	91	-0.71	62	0.48	Tallahassee, FL	129	-5.79	130	-4.41
Seattle-Tacoma-Bellevue, WA	26	2.56	63	0.46	Baton Rouge, LA	131	-6.06	131	-4.42
Spokane, WA	15	3.19	64	0.45	Mobile, AL	132	-6.12	132	-4.79
Austin-Round Rock, TX	44	1.24	65	0.44	Shreveport-Bossier City, LA	133	-6.68	133	-4.91
Anchorage, AK	32	2.25	66	0.35	New Orleans-Metairie-Kenner, LA	136	-8.55	134	-5.14
Grand Rapids-Wyoming, MI	56	0.79	67	0.33	Jackson, MS	134	-7.92	135	-5.33
Greenville, SC	110	-1.79	68	0.24	Memphis, TN-MS-AR	135	-8.08	136	-6.97

*Ranked by 2005 Score

Urban Assimilation

This indicator is led by shares of Hispanic, Asian, and foreign-born population, share of employment in minority-owned businesses, and productivity in the information sector. Urban Assimilation is positively associated with growth in three of the economic measures: employment, gross metropolitan product, and productivity. As expected from the variables that underlie this indicator, the top 10 ranked metropolitan areas include four areas in Texas, five in California, and one in Hawaii (Table 12). These are all areas that lead in population growth due to immigrants from Central and South America and from Asia.

All of the large Midwest metropolitan areas were ranked in the third and fourth quartiles. Five metropolitan areas are ranked in the third quartile (Milwaukee, Minneapolis, Cleveland, St. Louis, and Columbus) and three are ranked in the fourth quartile (Indianapolis, Pittsburgh, and Cincinnati). Columbus is the only metropolitan area that jumped quartiles by improving its score between 2000 and 2005; in 2000 the Columbus area was ranked #107 in the top of the fourth quartile and moved to #99, in the bottom of the third quartile. Milwaukee and Minneapolis improved their rankings slightly within the third quartile.

The Cleveland metropolitan area is the highest ranked in Northeast Ohio (in the third quartile), however, it slipped from #86 in 2000 to #93 in 2005. The Cleveland metropolitan area's shares of Hispanic and foreign-born population increased slightly but at a slower pace than in other parts of the U.S. Hispanics made up only 3.8 percent of Cleveland's population in 2005, significantly lower than the sample average of 12.4 percent. The share of the Cleveland metropolitan area's foreign-born population was also much lower than the sample average in 2005 (5.6% in Cleveland versus 9.0% for the sample average). In contrast, the share of Asian population in the Cleveland metropolitan area increased and its ranking improved (1.8% in 2005), but this share was still lower than the sample average (3.2%). The other smaller Northeast Ohio metropolitan areas are all in the bottom of the fourth quartile.

Ranking of Metropolitan Areas by Dashboard Indicators

Table 12. Rank of Sample Metropolitan Areas According to Urban Assimilation Factor Score, 2000 and 2005

Metro Areas*	2000		2005		Metro Areas	2000		2005	
	Rank	Score	Rank	Score		Rank	Score	Rank	Score
McAllen-Edinburg-Pharr, TX	1	10.48	1	10.06	Allentown-Bethlehem-Easton, PA-NJ	72	-0.98	69	-0.85
El Paso, TX	2	10.20	2	9.89	Augusta-Richmond County, GA-SC	64	-0.76	70	-0.87
Brownsville-Harlingen, TX	3	9.88	3	9.44	Kansas City, MO-KS	69	-0.91	71	-0.92
San Jose-Sunnyvale-Santa Clara, CA	5	6.54	4	6.69	Tulsa, OK	78	-1.19	72	-0.96
Honolulu, HI Metro Area	4	7.16	5	6.62	Pensacola-Ferry Pass-Brent, FL	76	-1.13	73	-0.97
Salinas, CA	6	5.92	6	5.66	Spokane, WA	40	0.03	74	-1.00
Visalia-Porterville, CA	7	5.44	7	5.31	Greensboro-High Point, NC	83	-1.25	75	-1.01
Fresno, CA	8	5.08	8	5.01	Ogden-Clearfield, UT	73	-1.07	76	-1.04
Stockton, CA	11	4.35	9	4.83	Reading, PA	95	-1.44	77	-1.07
San Antonio, TX	9	4.77	10	4.60	Oklahoma City, OK	75	-1.12	78	-1.10
Oxnard-Thousand Oaks-Ventura, CA	10	4.40	11	4.34	Grand Rapids-Wyoming, MI	74	-1.12	79	-1.14
Modesto, CA	12	3.89	12	4.30	Winston-Salem, NC	81	-1.24	80	-1.15
Vallejo-Fairfield, CA	14	3.63	13	3.96	Milwaukee-Waukesha-West Allis, WI	87	-1.33	81	-1.17
San Diego-Carlsbad-San Marcos, CA	13	3.83	14	3.93	Minneapolis-St. Paul-Bloomington, MN-WI	85	-1.26	82	-1.18
Bakersfield, CA	17	3.28	15	3.70	New Orleans-Metairie-Kenner, LA	68	-0.86	83	-1.27
Santa Barbara-Santa Maria-Goleta, CA	15	3.32	16	3.15	Memphis, TN-MS-AR	89	-1.35	84	-1.28
Corpus Christi, TX	16	3.30	17	3.13	Tallahassee, FL	80	-1.20	85	-1.31
Sacramento-Arden-Arcade-Roseville, CA	20	2.08	18	2.44	Greenville, SC	88	-1.34	86	-1.32
Albuquerque, NM	18	2.61	19	2.42	Lansing-East Lansing, MI	79	-1.20	87	-1.35
Las Vegas-Paradise, NV	21	1.95	20	2.03	Davenport-Moline-Rock Island, IA-IL	82	-1.24	88	-1.35
Trenton-Ewing, NJ Metro Area	24	1.61	21	2.00	Eugene-Springfield, OR	98	-1.49	89	-1.36
Austin-Round Rock, TX	22	1.84	22	1.82	Little Rock-North Little Rock, AR	94	-1.42	90	-1.40
Santa Rosa-Petaluma, CA	23	1.63	23	1.73	Provo-Orem, UT	84	-1.25	91	-1.42
Denver-Aurora, CO	26	1.50	24	1.62	Nashville-Davidson--Murfreesboro, TN	97	-1.49	92	-1.45
Seattle-Tacoma-Bellevue, WA	19	2.38	25	1.55	Cleveland-Elyria-Mentor, OH	86	-1.32	93	-1.45
Tucson, AZ	25	1.58	26	1.52	Huntsville, AL	93	-1.41	94	-1.47
Orlando, FL	29	0.98	27	1.48	St. Louis, MO-IL	90	-1.35	95	-1.47
Naples-Marco Island, FL	30	0.92	28	1.42	Madison, WI	92	-1.37	96	-1.49
Bridgeport-Stamford-Norwalk, CT	28	1.14	29	1.37	Columbia, SC	102	-1.54	97	-1.52
Reno-Sparks, NV	27	1.14	30	1.15	South Bend-Mishawaka, IN-MI	116	-1.76	98	-1.54
Poughkeepsie-Newburgh-Middletown, NY	31	0.57	31	0.91	Columbus, OH	107	-1.61	99	-1.54
New Haven-Milford, CT	32	0.54	32	0.77	Harrisburg-Carlisle, PA	105	-1.57	100	-1.57
Tampa-St. Petersburg-Clearwater, FL	33	0.46	33	0.70	Fort Wayne, IN	106	-1.59	101	-1.57
Salem, OR	34	0.35	34	0.32	Baton Rouge, LA	99	-1.50	102	-1.59
Rochester, NY	41	0.02	35	0.30	Indianapolis, IN	114	-1.72	103	-1.59
Colorado Springs, CO	38	0.10	36	0.20	Hickory-Lenoir-Morganton, NC	101	-1.53	104	-1.60
Hartford-West Hartford-East Hartford, CT	36	0.18	37	0.19	Boise City-Nampa, ID	100	-1.50	105	-1.64
Lakeland, FL	46	-0.17	38	0.14	Lancaster, PA	103	-1.56	106	-1.65
Worcester, MA	35	0.26	39	0.06	Jackson, MS	91	-1.36	107	-1.67
Cape Coral-Fort Myers, FL	54	-0.45	40	0.05	Peoria, IL	113	-1.72	108	-1.68
Killeen-Temple-Fort Hood, TX	37	0.16	41	0.02	Charleston-North Charleston, SC	96	-1.44	109	-1.69
Durham, NC	49	-0.37	42	-0.04	Omaha-Council Bluffs, NE-IA	119	-1.84	110	-1.70
Portland-Vancouver-Beaverton, OR-WA	42	0.00	43	-0.12	Des Moines, IA	117	-1.82	111	-1.70
Port St. Lucie-Fort Pierce, FL	56	-0.47	44	-0.13	Toledo, OH	115	-1.72	112	-1.70
Providence-New Bedford-Fall River, RI-MA	48	-0.33	45	-0.16	Birmingham-Hoover, AL	108	-1.63	113	-1.73
Richmond, VA	45	-0.16	46	-0.16	Shreveport-Bossier City, LA	111	-1.70	114	-1.76
Beaumont-Port Arthur, TX	43	-0.12	47	-0.25	Kalamazoo-Portage, MI	109	-1.63	115	-1.80
Raleigh-Cary, NC	47	-0.30	48	-0.28	Montgomery, AL	110	-1.69	116	-1.80
Buffalo-Niagara Falls, NY	51	-0.42	49	-0.28	Scranton--Wilkes-Barre, PA	128	-1.97	117	-1.82
Fayetteville, NC	39	0.07	50	-0.35	Pittsburgh, PA	121	-1.87	118	-1.84
Baltimore-Towson, MD	55	-0.46	51	-0.39	Asheville, NC	118	-1.83	119	-1.85
Albany-Schenectady-Troy, NY	58	-0.51	52	-0.43	Flint, MI	104	-1.57	120	-1.87
Rockford, IL	70	-0.92	53	-0.45	Knoxville, TN	123	-1.90	121	-1.94
Springfield, MA	57	-0.49	54	-0.48	Dayton, OH	125	-1.91	122	-1.95
Ann Arbor, MI	59	-0.60	55	-0.53	Lexington-Fayette, KY	124	-1.91	123	-1.99
Wichita, KS	53	-0.43	56	-0.55	Chattanooga, TN-GA	129	-1.98	124	-1.99
Sarasota-Bradenton-Venice, FL	66	-0.85	57	-0.55	Cincinnati-Middletown, OH-KY-IN	126	-1.92	125	-2.01
Palm Bay-Melbourne-Titusville, FL	62	-0.72	58	-0.56	Mobile, AL	122	-1.89	126	-2.06
Anchorage, AK	44	-0.13	59	-0.58	Youngstown-Warren-Boardman, OH-PA	130	-2.01	127	-2.06
Syracuse, NY	52	-0.42	60	-0.59	Louisville, KY-IN	132	-2.10	128	-2.07
Manchester-Nashua, NH	67	-0.85	61	-0.63	Akron, OH	127	-1.96	129	-2.10
Salt Lake City, UT	60	-0.61	62	-0.66	Springfield, MO	120	-1.86	130	-2.11
Charlotte-Gastonia-Concord, NC-SC	71	-0.98	63	-0.66	Evansville, IN-KY	134	-2.22	131	-2.18
Jacksonville, FL	61	-0.65	64	-0.70	Charleston, WV	133	-2.19	132	-2.27
Virginia Beach-Norfolk-Newport News, VA-NC	50	-0.39	65	-0.70	York-Hanover, PA	131	-2.09	133	-2.28
Savannah, GA	63	-0.75	66	-0.72	Canton-Massillon, OH	136	-2.30	134	-2.34
Fayetteville-Springdale-Rogers, AR-MO	77	-1.15	67	-0.74	Portland-South Portland-Biddeford, ME	135	-2.28	135	-2.37
Deltona-Daytona Beach-Ormond Beach, FL	65	-0.84	68	-0.78	Wilmington, NC	112	-1.71	136	-2.37

*Ranked by 2005 Score

This indicator and its impact on economic growth provide good information for a discussion pertaining to regional strategies on how to increase inflows of foreign immigrants to Northeast Ohio. Urban Assimilation can be affected by immigration policies and policies that stimulate the growth of minority-owned businesses. The Census Bureau has documented that many large and small metropolitan areas would lose population without the immigrants who have been moving in.⁴⁰ Parts of the Midwest, including the Pittsburgh and Cleveland metropolitan areas, continue to lose population. Policies intended to bring highly educated and highly skilled immigrants into Northeast Ohio would help increase population, prop up the housing market, and grow the regional economy. This dynamic is observed in large metropolitan areas such as New York, Los Angeles, and Boston and in small metropolitan areas such as Battle Creek, Michigan and Ames, Iowa.

In addition, workforce diversity is being recognized as a competitive asset for entrepreneurial activity. It has been shown that immigrants are more prone to start a business than American born residents. In 2005, 4.2 percent of all immigrants started a business in comparison to 3.4 percent of native-born Americans.⁴¹

Legacy of Place

This indicator describes regions with high legacy costs caused by older infrastructure, mature industries, and fragmented government. The Legacy of Place indicator negatively affects growth in employment, GMP, and productivity. Thus costs associated with Legacy of Place act as an impediment to economic growth. Metro areas ranked according to the Legacy of Place indicator are ranked from high legacy costs to low.

It is not surprising that almost all of the metropolitan areas ranked in the first quartile are located in the Northeast and Midwest, including the four Northeast Ohio metropolitan areas (Table 13). In contrast, fourth quartile metropolitan areas with low legacy costs are located in the Western and Southern regions of the country. Leading the list of areas with

⁴⁰ *Census: Immigrants Stabilize Big-City Population*, CNN.com, April 5, 2007.

⁴¹ Kaufman Foundation, "Kaufman Index of Entrepreneurial Activity 1996-2005" (2006).

high legacy costs are Peoria, IL; four areas in Pennsylvania (York, Scranton, Reading, and Lancaster); two areas in New York (Rochester and Albany); Youngstown, OH; Hartford, CT; and Davenport, IA. The lowest legacy costs are in Las Vegas and Reno, NV; seven metropolitan areas in Florida, and Albuquerque, NM.

Five large Midwest areas are in the first quartile (Pittsburgh, Cleveland, Milwaukee, Cincinnati, and St. Louis) and three others are in the second quartile (Minneapolis, Indianapolis, and Columbus). All four Northeast Ohio metropolitan areas are ranked in the first quartile. There was little movement in rankings between 2000 and 2005 among both the large Midwest areas and Northeast Ohio areas. Cleveland retained its #16 rank, while Akron moved slightly from #30 to #29.

Although some of this indicator's variables are not strong candidates for public policy or could only be changed very slowly over time, it is important to acknowledge the historic, social, and economic effects it has primarily on the Rust Belt economies.

Table 13. Rank of Sample Metropolitan Areas According to Legacy of Place Factor Score, 2000 and 2005

Metro Areas*	2000		2005		Metro Areas	2000		2005	
	Rank	Score	Rank	Score		Rank	Score	Rank	Score
Peoria, IL	2	6.92	1	6.83	Huntsville, AL	65	-0.56	69	-0.58
York-Hanover, PA	3	6.92	2	6.42	Columbia, SC	66	-0.62	70	-0.63
Scranton--Wilkes-Barre, PA	4	6.38	3	6.21	Winston-Salem, NC	59	-0.25	71	-0.64
Rochester, NY	7	5.48	4	5.79	Savannah, GA	87	-1.92	72	-0.76
Albany-Schenectady-Troy, NY	13	5.06	5	5.79	Spokane, WA	71	-0.82	73	-0.76
Reading, PA	1	7.11	6	5.74	Baton Rouge, LA	85	-1.76	74	-0.78
Youngstown-Warren-Boardman, OH-PA	6	5.65	7	5.49	Visalia-Porterville, CA	89	-2.00	75	-0.78
Lancaster, PA	5	5.98	8	5.25	Tulsa, OK	68	-0.70	76	-0.79
Hartford-West Hartford-East Hartford, CT	8	5.47	9	5.24	Asheville, NC	63	-0.48	77	-0.91
Davenport-Moline-Rock Island, IA-IL	11	5.23	10	5.09	Nashville-Davidson--Murfreesboro, TN	77	-1.14	78	-0.94
Pittsburgh, PA	12	5.17	11	5.00	Shreveport-Bossier City, LA	82	-1.41	79	-1.06
Syracuse, NY	9	5.47	12	4.95	Fayetteville-Springdale-Rogers, AR-MO	62	-0.35	80	-1.07
Kalamazoo-Portage, MI	21	4.01	13	4.89	Greenville, SC	76	-1.06	81	-1.12
Buffalo-Niagara Falls, NY	14	5.00	14	4.89	Portland-Vancouver-Beaverton, OR-WA	80	-1.39	82	-1.33
Harrisburg-Carlisle, PA	10	5.30	15	4.76	Eugene-Springfield, OR	90	-2.00	83	-1.34
Cleveland-Ellyria-Mentor, OH	16	4.81	16	4.68	Oklahoma City, OK	88	-1.99	84	-1.40
Canton-Massillon, OH	17	4.78	17	4.68	Denver-Aurora, CO	72	-0.84	85	-1.60
Allentown-Bethlehem-Easton, PA-NJ	15	4.94	18	4.61	Ogden-Clearfield, UT	70	-0.82	86	-1.78
Milwaukee-Waukesha-West Allis, WI	20	4.18	19	4.50	Charleston-North Charleston, SC	95	-2.40	87	-1.98
Toledo, OH	19	4.43	20	4.10	Seattle-Tacoma-Bellevue, WA	91	-2.02	88	-2.00
Springfield, MA	18	4.56	21	3.99	Stockton, CA	86	-1.90	89	-2.04
Omaha-Council Bluffs, NE-IA	27	3.70	22	3.92	Salt Lake City, UT	83	-1.43	90	-2.13
Worcester, MA	23	4.00	23	3.86	Salem, OR	93	-2.24	91	-2.20
Evansville, IN-KY	36	2.94	24	3.75	Salinas, CA	97	-2.56	92	-2.22
Dayton, OH	28	3.63	25	3.68	Charlotte-Gastonia-Concord, NC-SC	94	-2.34	93	-2.26
Cincinnati-Middletown, OH-KY-IN	24	3.95	26	3.66	Fresno, CA	92	-2.17	94	-2.30
Grand Rapids-Wyoming, MI	26	3.86	27	3.59	Boise City-Nampa, ID	101	-2.69	95	-2.34
Poughkeepsie-Newburgh-Middletown, NY	25	3.95	28	3.45	Tallahassee, FL	96	-2.51	96	-2.36
Akron, OH	30	3.43	29	3.39	Virginia Beach-Norfolk-Newport News, VA-NC	105	-2.81	97	-2.41
St. Louis, MO-IL	29	3.56	30	3.39	Honolulu, HI Metro Area	98	-2.57	98	-2.56
Providence-New Bedford-Fall River, RI-MA	22	4.01	31	3.14	Durham, NC	84	-1.73	99	-2.58
South Bend-Mishawaka, IN-MI	34	2.99	32	3.13	Killeen-Temple-Fort Hood, TX	109	-2.98	100	-2.67
New Haven-Milford, CT	32	3.13	33	3.12	Pensacola-Ferry Pass-Brent, FL	114	-3.36	101	-2.72
Portland-South Portland-Biddeford, ME	38	2.82	34	3.10	Brownsville-Harlingen, TX	100	-2.68	102	-2.82
Rockford, IL	31	3.29	35	3.04	Fayetteville, NC	112	-3.27	103	-2.84
Lansing-East Lansing, MI	35	2.95	36	2.82	Santa Rosa-Petaluma, CA	99	-2.65	104	-2.93
Flint, MI	37	2.86	37	2.81	Santa Barbara-Santa Maria-Goleta, CA	104	-2.77	105	-2.95
Fort Wayne, IN	41	1.93	38	2.33	Wilmington, NC	79	-1.27	106	-2.97
Madison, WI	33	3.00	39	2.24	San Antonio, TX	110	-3.11	107	-3.02
Minneapolis-St. Paul-Bloomington, MN-WI	39	2.75	40	2.12	Corpus Christi, TX	102	-2.72	108	-3.06
Birmingham-Hoover, AL	48	1.22	41	1.90	Vallejo-Fairfield, CA	117	-3.44	109	-3.14
Kansas City, MO-KS	43	1.82	42	1.86	El Paso, TX	118	-3.58	110	-3.15
Manchester-Nashua, NH	45	1.72	43	1.83	Anchorage, AK	124	-4.10	111	-3.20
Wichita, KS	42	1.87	44	1.70	Sacramento--Arden-Arcade--Roseville, CA	106	-2.83	112	-3.25
Chattanooga, TN-GA	55	0.53	45	1.67	Modesto, CA	103	-2.76	113	-3.27
Bridgeport-Stamford-Norwalk, CT	40	2.28	46	1.60	Oxnard-Thousand Oaks-Ventura, CA	108	-2.96	114	-3.31
Des Moines, IA	44	1.76	47	1.37	Jacksonville, FL	116	-3.40	115	-3.40
Indianapolis, IN	52	0.94	48	1.29	Sarasota-Bradenton-Venice, FL	111	-3.26	116	-3.44
Baltimore-Towson, MD	49	1.19	49	1.25	Raleigh-Cary, NC	123	-4.00	117	-3.55
Trenton-Ewing, NJ Metro Area	46	1.44	50	1.15	Bakersfield, CA	107	-2.85	118	-3.56
Columbus, OH	51	1.09	51	1.09	San Jose-Sunnyvale-Santa Clara, CA	119	-3.69	119	-3.59
Louisville, KY-IN	50	1.15	52	1.08	McAllen-Edinburg-Pharr, TX	130	-4.48	120	-3.74
Beaumont-Port Arthur, TX	56	0.40	53	0.82	Palm Bay-Melbourne-Titusville, FL	126	-4.24	121	-3.78
Hickory-Lenoir-Morganton, NC	47	1.39	54	0.63	Austin-Round Rock, TX	113	-3.29	122	-3.80
Ann Arbor, MI	53	0.85	55	0.56	Colorado Springs, CO	121	-3.94	123	-3.83
Memphis, TN-MS-AR	81	-1.39	56	0.42	Tucson, AZ	128	-4.38	124	-3.88
Springfield, MO	61	-0.33	57	0.30	San Diego-Carlsbad-San Marcos, CA	120	-3.70	125	-3.92
Little Rock-North Little Rock, AR	69	-0.72	58	0.28	Provo-Orem, UT	115	-3.36	126	-4.01
Charleston, WV	58	-0.13	59	0.27	Tampa-St. Petersburg-Clearwater, FL	122	-3.97	127	-4.06
Knoxville, TN	57	0.04	60	0.01	Albuquerque, NM	129	-4.47	128	-4.10
Richmond, VA	54	0.53	61	-0.05	Deltona-Daytona Beach-Ormond Beach, FL	125	-4.10	129	-4.39
Montgomery, AL	73	-0.86	62	-0.12	Reno-Sparks, NV	131	-4.57	130	-4.69
Jackson, MS	74	-0.96	63	-0.18	Orlando, FL	127	-4.32	131	-4.74
New Orleans-Metairie-Kenner, LA	60	-0.26	64	-0.26	Lakeland, FL	132	-4.67	132	-4.75
Greensboro-High Point, NC	64	-0.49	65	-0.36	Cape Coral-Fort Myers, FL	135	-5.66	133	-5.25
Mobile, AL	67	-0.69	66	-0.42	Port St. Lucie-Fort Pierce, FL	133	-5.17	134	-5.36
Augusta-Richmond County, GA-SC	78	-1.19	67	-0.43	Naples-Marco Island, FL	134	-5.22	135	-6.09
Lexington-Fayette, KY	75	-1.03	68	-0.52	Las Vegas-Paradise, NV	136	-6.98	136	-7.25

*Ranked by 2005 Score

Business Dynamics

This is a one-variable indicator that measures the ratio of business openings to business closings. To prevent confusion with branch activities of many banks, retail chain stores, restaurants, and drug stores, it only measures business openings and closings of single-establishment companies. It measures the opening and closing of companies over a one-year period; 2000 data measures number of business openings and closings between 1999 and 2000, and 2003 data (the latest data available) measures business openings and closings between 2002 and 2003. In contrast to other indicators and variables, this one experienced large swings in ranking between 2000 and 2003. This is consistent with the business cycle; the year 2000 captured the peak of the business cycle, while 2003 is the bottom of the cycle in some regions or the beginning of the expansion in other regions.

Most of the metropolitan areas among the top 10 are smaller areas. Two, however, are larger areas—Las Vegas, NV and Orlando, FL. It is interesting to note that three of the top 10 are located in Florida (Table 14). Because of the large changes in rankings, of the top 10 areas in 2003, only half were among the leading group in 2000.

Analysis of the large Midwest areas shows that only Minneapolis is ranked in the first quartile (#34), while the rest of the Midwest areas are ranked among the lower half of the metropolitan areas. Columbus, Indianapolis, and St. Louis are ranked in the third quartile, while Cincinnati, Milwaukee, Cleveland, and Pittsburgh are ranked in the fourth quartile. In contrast to large swings in the rankings of many metropolitan areas, only two Midwest areas experienced a slight improvement in rankings: Indianapolis was ranked #80 in 2000 and improved to #76 in 2003 and St. Louis ranked #85 in 2000 and moved up to #80 in 2005. Both areas remained in the third quartile.

Table 14. Rank of Sample Metropolitan Areas According to Business Dynamics Variable, 2000 and 2003

Metro Areas	2000		2003		Metro Areas	2000		2003	
	Rank	Score	Rank	Score		Rank	Score	Rank	Score
Springfield, MA	1	1.56	1	2.37	Reno-Sparks, NV	45	1.10	69	-0.06
Fayetteville-Springdale-Rogers, AR-MO	24	1.14	2	1.62	Madison, WI	23	1.14	70	-0.07
Las Vegas-Paradise, NV	2	1.32	3	1.29	Denver-Aurora, CO	17	1.16	71	-0.09
Ogden-Clearfield, UT	3	1.26	4	1.14	Knoxville, TN	131	0.93	72	-0.09
Tallahassee, FL	35	1.11	5	1.03	Ann Arbor, MI	46	1.09	73	-0.10
Orlando, FL	31	1.11	6	0.96	Columbus, OH	74	1.05	74	-0.10
Lakeland, FL	111	0.97	7	0.88	Omaha-Council Bluffs, NE-IA	15	1.17	75	-0.11
McAllen-Edinburg-Pharr, TX	34	1.11	8	0.88	Indianapolis, IN	80	1.03	76	-0.11
Boise City-Nampa, ID	4	1.24	9	0.85	Nashville-Davidson--Murfreesboro, TN	97	0.99	77	-0.11
Provo-Orem, UT	7	1.22	10	0.77	Rochester, NY	67	1.05	78	-0.12
Honolulu, HI Metro Area	29	1.12	11	0.76	Birmingham-Hoover, AL	117	0.97	79	-0.12
Pensacola-Ferry Pass-Brent, FL	135	0.90	12	0.66	St. Louis, MO-IL	85	1.02	80	-0.14
Tampa-St. Petersburg-Clearwater, FL	95	1.00	13	0.62	Lancaster, PA	56	1.08	81	-0.15
Virginia Beach-Norfolk-Newport News, VA-NC	72	1.05	14	0.59	Grand Rapids-Wyoming, MI	86	1.02	82	-0.15
Port St. Lucie-Fort Pierce, FL	107	0.98	15	0.59	Fresno, CA	52	1.09	83	-0.17
Naples-Marco Island, FL	32	1.11	16	0.57	Charlotte-Gastonia-Concord, NC-SC	42	1.10	84	-0.17
Sarasota-Bradenton-Venice, FL	82	1.03	17	0.56	Fort Wayne, IN	94	1.00	85	-0.19
Worcester, MA	26	1.13	18	0.53	Buffalo-Niagara Falls, NY	130	0.94	86	-0.19
Des Moines, IA	65	1.06	19	0.52	New Orleans-Metairie-Kenner, LA	99	0.99	87	-0.19
Stockton, CA	18	1.15	20	0.52	Durham, NC	66	1.06	88	-0.19
Anchorage, AK	37	1.11	21	0.51	Wichita, KS	59	1.08	89	-0.20
Killeen-Temple-Fort Hood, TX	70	1.05	22	0.50	Bakersfield, CA	36	1.11	90	-0.21
Oxnard-Thousand Oaks-Ventura, CA	39	1.10	23	0.48	Memphis, TN-MS-AR	113	0.97	91	-0.24
Wilmington, NC	128	0.94	24	0.46	Montgomery, AL	115	0.97	92	-0.26
Cape Coral-Fort Myers, FL	61	1.07	25	0.46	Akron, OH	89	1.01	93	-0.26
Salt Lake City, UT	33	1.11	26	0.45	Visalia-Porterville, CA	25	1.14	94	-0.28
Palm Bay-Melbourne-Titusville, FL	118	0.96	27	0.42	Harrisburg-Carlisle, PA	38	1.11	95	-0.32
Charleston-North Charleston, SC	9	1.20	28	0.42	Allentown-Bethlehem-Easton, PA-NJ	62	1.07	96	-0.33
Deltona-Daytona Beach-Ormond Beach, FL	84	1.02	29	0.42	Reading, PA	30	1.12	97	-0.33
Salem, OR	96	0.99	30	0.41	Tulsa, OK	91	1.01	98	-0.34
Huntsville, AL	28	1.12	31	0.40	Louisville, KY-IN	109	0.97	99	-0.35
Jackson, MS	108	0.97	32	0.36	Greensboro-High Point, NC	68	1.05	100	-0.35
Spokane, WA	106	0.98	33	0.36	Savannah, GA	43	1.10	101	-0.36
Minneapolis-St. Paul-Bloomington, MN-WI	13	1.18	34	0.36	Trenton-Ewing, NJ Metro Area	41	1.10	102	-0.36
Austin-Round Rock, TX	5	1.23	35	0.35	Santa Barbara-Santa Maria-Goleta, CA	53	1.09	103	-0.40
Jacksonville, FL	77	1.04	36	0.35	Manchester-Nashua, NH	49	1.09	104	-0.42
Portland-South Portland-Biddeford, ME	6	1.22	37	0.34	Peoria, IL	102	0.99	105	-0.45
Poughkeepsie-Newburgh-Middletown, NY	14	1.17	38	0.34	Cincinnati-Middletown, OH-KY-IN	75	1.04	106	-0.47
Providence-New Bedford-Fall River, RI-MA	47	1.09	39	0.34	Chattanooga, TN-GA	127	0.94	107	-0.50
Baltimore-Towson, MD	79	1.03	40	0.33	Fayetteville, NC	119	0.96	108	-0.50
Modesto, CA	63	1.07	41	0.31	Beaumont-Port Arthur, TX	105	0.98	109	-0.50
Vallejo-Fairfield, CA	20	1.15	42	0.29	Santa Rosa-Petaluma, CA	27	1.13	110	-0.50
Asheville, NC	21	1.15	43	0.24	Winston-Salem, NC	55	1.09	111	-0.50
Springfield, MO	57	1.08	44	0.23	Canton-Massillon, OH	81	1.03	112	-0.51
San Diego-Carlsbad-San Marcos, CA	16	1.17	45	0.23	El Paso, TX	133	0.92	113	-0.57
Brownsville-Harlingen, TX	122	0.96	46	0.22	Toledo, OH	88	1.02	114	-0.58
Richmond, VA	87	1.02	47	0.21	Scranton--Wilkes-Barre, PA	116	0.97	115	-0.58
Sacramento--Arden-Arcade--Roseville, CA	8	1.21	48	0.21	Dayton, OH	132	0.92	116	-0.60
Oklahoma City, OK	48	1.09	49	0.18	Lansing-East Lansing, MI	92	1.01	117	-0.60
Raleigh-Cary, NC	10	1.19	50	0.17	Charleston, WV	112	0.97	118	-0.60
Albany-Schenectady-Troy, NY	58	1.08	51	0.17	Salinas, CA	54	1.09	119	-0.64
Augusta-Richmond County, GA-SC	136	0.88	52	0.17	Rockford, IL	129	0.94	120	-0.65
Portland-Vancouver-Beaverton, OR-WA	51	1.09	53	0.16	South Bend-Mishawaka, IN-MI	126	0.95	121	-0.68
Columbia, SC	78	1.04	54	0.14	York-Hanover, PA	93	1.01	122	-0.68
Eugene-Springfield, OR	110	0.97	55	0.11	Youngstown-Warren-Boardman, OH-PA	104	0.98	123	-0.71
Kansas City, MO-KS	50	1.09	56	0.07	Milwaukee-Waukesha-West Allis, WI	101	0.99	124	-0.72
Colorado Springs, CO	22	1.14	57	0.06	Bridgeport-Stamford-Norwalk, CT	40	1.10	125	-0.77
Tucson, AZ	69	1.05	58	0.06	San Jose-Sunnyvale-Santa Clara, CA	12	1.18	126	-0.77
Little Rock-North Little Rock, AR	19	1.15	59	0.05	Cleveland-Elyria-Mentor, OH	100	0.99	127	-0.78
Shreveport-Bossier City, LA	103	0.99	60	0.05	Pittsburgh, PA	83	1.03	128	-0.78
Albuquerque, NM	123	0.96	61	0.03	Davenport-Moline-Rock Island, IA-IL	125	0.95	129	-0.78
Lexington-Fayette, KY	11	1.19	62	0.03	Mobile, AL	120	0.96	130	-0.79
Greenville, SC	60	1.08	63	0.03	Evansville, IN-KY	98	0.99	131	-0.80
San Antonio, TX	90	1.01	64	0.01	Flint, MI	73	1.05	132	-0.82
Syracuse, NY	124	0.96	65	0.01	Hickory-Lenoir-Morganton, NC	64	1.06	133	-0.82
Corpus Christi, TX	134	0.90	66	-0.01	Kalamazoo-Portage, MI	76	1.04	134	-0.86
Seattle-Tacoma-Bellevue, WA	44	1.10	67	-0.03	Hartford-West Hartford-East Hartford, CT	121	0.96	135	-0.96
Baton Rouge, LA	114	0.97	68	-0.05	New Haven-Milford, CT	71	1.05	136	-0.99

*Ranked by 2003 Score

All four metro areas in Northeast Ohio lost ground in the Business Dynamics indicator between 2000 and 2003. This is not surprising, since the Northeast Ohio region suffered severe losses during the recession and did not begin its modest recovery until later. Only the Akron area ranked in the third quartile (#89 in 2000 dropping slightly to #93 in 2003). Canton was ranked in the third quartile in 2000 (#81) but dropped to the fourth quartile in 2003 (#112). The other two Northeast Ohio areas—Youngstown and Cleveland—were ranked in the fourth quartile and both lost ground between 2000 and 2003.

This indicator is important because it is strong and positively associated with growth in employment and gross metropolitan product. Policies that can stimulate additional start-up companies and reduce the number of businesses that close would increase employment and the value of goods and services produced in the economy.

Individual Entrepreneurship

This indicator includes variables that describe small and personal businesses: percentage of the self-employed and the percentage of small businesses with less than 20 employees. The Individual Entrepreneurship indicator is positively associated with growth in both employment and gross metropolitan product.

Among the top 10 metropolitan areas, five are in Florida: Sarasota, Naples, Port St. Lucie, Deltona, and Cape Coral (Table 15). Other leading areas are relatively small, including Brownsville, TX; Santa Rosa, CA; Portland, ME; Bridgeport, CT; and Wilmington, NC.

Three of the large Midwest metropolitan areas, including Cleveland, are ranked in the third quartile, while the other five are in the fourth quartile. Pittsburgh, Minneapolis, and Cleveland were ranked in the third quartile in both 2000 and 2005; however, Pittsburgh and Cleveland improved their standing, and Minneapolis remained at the same rank.

Table 15. Rank of Sample Metropolitan Areas According to Individual Entrepreneurship Factor Score, 2000 and 2005

Metro Areas*	2000		2005		Metro Areas	2000		2005	
	Rank	Score	Rank	Score		Rank	Score	Rank	Score
Brownsville-Harlingen, TX	31	0.56	1	7.69	Savannah, GA	43	0.17	69	-0.26
Sarasota-Bradenton-Venice, FL	2	3.08	2	2.57	Augusta-Richmond County, GA-SC	107	-0.65	70	-0.26
Naples-Marco Island, FL	1	3.87	3	2.16	New Haven-Milford, CT	57	-0.04	71	-0.27
Port St. Lucie-Fort Pierce, FL	4	2.41	4	1.96	Beaumont-Port Arthur, TX	79	-0.42	72	-0.28
Deltona-Daytona Beach-Ormond Beach, FL	10	1.90	5	1.76	Nashville-Davidson--Murfreesboro, TN	42	0.18	73	-0.29
Santa Rosa-Petaluma, CA	3	2.87	6	1.75	Youngstown-Warren-Boardman, OH-PA	87	-0.48	74	-0.29
Portland-South Portland-Biddeford, ME	11	1.77	7	1.47	Baltimore-Towson, MD	74	-0.36	75	-0.30
Bridgeport-Stamford-Norwalk, CT	8	2.05	8	1.46	Chattanooga, TN-GA	71	-0.32	76	-0.30
Cape Coral-Fort Myers, FL	6	2.24	9	1.29	Kansas City, MO-KS	75	-0.37	77	-0.30
Wilmington, NC	5	2.33	10	1.25	Wichita, KS	90	-0.50	78	-0.32
Boise City-Nampa, ID	16	1.18	11	1.20	Lexington-Fayette, KY	94	-0.53	79	-0.33
Asheville, NC	13	1.49	12	1.13	Pittsburgh, PA	89	-0.50	80	-0.33
Eugene-Springfield, OR	7	2.21	13	1.08	Canton-Massillon, OH	100	-0.56	81	-0.34
Anchorage, AK	24	0.84	14	0.97	Fayetteville, NC	129	-1.07	82	-0.34
Salinas, CA	15	1.40	15	0.93	Flint, MI	84	-0.44	83	-0.36
Poughkeepsie-Newburgh-Middletown, NY	28	0.61	16	0.85	Montgomery, AL	95	-0.55	84	-0.37
Palm Bay-Melbourne-Titusville, FL	17	1.15	17	0.84	Bakersfield, CA	44	0.16	85	-0.37
Santa Barbara-Santa Maria-Goleta, CA	9	2.00	18	0.84	Lancaster, PA	68	-0.29	86	-0.38
Pensacola-Ferry Pass-Brent, FL	34	0.49	19	0.83	Manchester-Nashua, NH	56	-0.03	87	-0.40
Salem, OR	21	0.99	20	0.82	Mobile, AL	80	-0.42	88	-0.41
Tampa-St. Petersburg-Clearwater, FL	20	1.02	21	0.79	Richmond, VA	136	-4.28	89	-0.42
Provo-Orem, UT	29	0.59	22	0.78	Shreveport-Bossier City, LA	88	-0.48	90	-0.42
Colorado Springs, CO	25	0.74	23	0.74	Minneapolis-St. Paul-Bloomington, MN-WI	91	-0.50	91	-0.42
Denver-Aurora, CO	23	0.88	24	0.67	Trenton-Ewing, NJ Metro Area	92	-0.51	92	-0.44
Portland-Vancouver-Beaverton, OR-WA	19	1.03	25	0.64	Ann Arbor, MI	93	-0.51	93	-0.44
Ogden-Clearfield, UT	45	0.15	26	0.60	Cleveland-Elyria-Mentor, OH	102	-0.58	94	-0.44
Oxnard-Thousand Oaks-Ventura, CA	14	1.42	27	0.57	Rochester, NY	98	-0.56	95	-0.45
San Diego-Carlsbad-San Marcos, CA	22	0.94	28	0.54	Omaha-Council Bluffs, NE-IA	106	-0.64	96	-0.47
McAllen-Edinburg-Pharr, TX	18	1.08	29	0.52	Columbia, SC	81	-0.43	97	-0.49
Lakeland, FL	60	-0.06	30	0.47	Scranton--Wilkes-Barre, PA	69	-0.29	98	-0.51
Oklahoma City, OK	30	0.58	31	0.44	Syracuse, NY	101	-0.56	99	-0.51
Orlando, FL	40	0.34	32	0.44	Louisville, KY-IN	105	-0.62	100	-0.53
Seattle-Tacoma-Bellevue, WA	12	1.53	33	0.38	Akron, OH	104	-0.60	101	-0.53
Tulsa, OK	36	0.46	34	0.38	Modesto, CA	46	0.15	102	-0.53
Jacksonville, FL	58	-0.05	35	0.35	Peoria, IL	109	-0.68	103	-0.54
Spokane, WA	38	0.36	36	0.31	Albany-Schenectady-Troy, NY	83	-0.43	104	-0.55
Fayetteville-Springdale-Rogers, AR-MO	37	0.40	37	0.30	Birmingham-Hoover, AL	72	-0.34	105	-0.55
Springfield, MO	27	0.63	38	0.28	Charlotte-Gastonia-Concord, NC-SC	86	-0.47	106	-0.55
Reno-Sparks, NV	41	0.21	39	0.27	St. Louis, MO-IL	110	-0.75	107	-0.57
Killeen-Temple-Fort Hood, TX	117	-0.87	40	0.22	Davenport-Moline-Rock Island, IA-IL	114	-0.83	108	-0.59
Corpus Christi, TX	32	0.55	41	0.22	Hickory-Lenoir-Morganton, NC	115	-0.86	109	-0.61
Austin-Round Rock, TX	48	0.12	42	0.17	Knoxville, TN	62	-0.10	110	-0.61
Charleston-North Charleston, SC	50	0.02	43	0.13	Rockford, IL	119	-0.91	111	-0.62
Tallahassee, FL	55	-0.02	44	0.11	Evansville, IN-KY	120	-0.93	112	-0.65
Visalia-Porterville, CA	39	0.35	45	0.05	Lansing-East Lansing, MI	113	-0.81	113	-0.65
Providence-New Bedford-Fall River, RI-MA	59	-0.05	46	0.04	Stockton, CA	108	-0.65	114	-0.65
Springfield, MA	52	0.00	47	-0.02	Las Vegas-Paradise, NV	127	-1.06	115	-0.68
Honolulu, HI Metro Area	63	-0.11	48	-0.03	Huntsville, AL	85	-0.45	116	-0.69
San Antonio, TX	64	-0.12	49	-0.06	Virginia Beach-Norfolk-Newport News, VA-NC	121	-0.94	117	-0.70
Tucson, AZ	35	0.48	50	-0.06	Indianapolis, IN	111	-0.77	118	-0.71
Sacramento--Arden-Arcade--Roseville, CA	33	0.53	51	-0.06	Greensboro-High Point, NC	73	-0.35	119	-0.76
El Paso, TX	78	-0.40	52	-0.10	Madison, WI	118	-0.88	120	-0.77
Allentown-Bethlehem-Easton, PA-NJ	76	-0.37	53	-0.11	Des Moines, IA	116	-0.86	121	-0.78
Worcester, MA	70	-0.31	54	-0.11	Buffalo-Niagara Falls, NY	128	-1.06	122	-0.80
Vallejo-Fairfield, CA	96	-0.55	55	-0.11	Kalamazoo-Portage, MI	97	-0.55	123	-0.84
Charleston, WV	82	-0.43	56	-0.12	Baton Rouge, LA	103	-0.59	124	-0.87
Greenville, SC	77	-0.38	57	-0.12	Harrisburg-Carlisle, PA	124	-0.96	125	-0.88
Albuquerque, NM	26	0.72	58	-0.13	Cincinnati-Middletown, OH-KY-IN	126	-1.05	126	-0.89
San Jose-Sunnyvale-Santa Clara, CA	99	-0.56	59	-0.15	Columbus, OH	130	-1.11	127	-0.92
Raleigh-Cary, NC	49	0.04	60	-0.15	Fort Wayne, IN	132	-1.11	128	-0.93
Fresno, CA	54	-0.01	61	-0.16	Grand Rapids-Wyoming, MI	123	-0.95	129	-0.93
Salt Lake City, UT	53	0.00	62	-0.17	Reading, PA	112	-0.81	130	-0.95
Durham, NC	61	-0.09	63	-0.22	Toledo, OH	131	-1.11	131	-0.95
Little Rock-North Little Rock, AR	51	0.01	64	-0.22	South Bend-Mishawaka, IN-MI	125	-1.00	132	-1.00
Hartford-West Hartford-East Hartford, CT	66	-0.23	65	-0.22	York-Hanover, PA	122	-0.94	133	-1.09
New Orleans-Metairie-Kenner, LA	47	0.14	66	-0.22	Milwaukee-Waukesha-West Allis, WI	135	-1.42	134	-1.18
Winston-Salem, NC	67	-0.26	67	-0.24	Dayton, OH	134	-1.31	135	-1.29
Jackson, MS	65	-0.17	68	-0.25	Memphis, TN-MS-AR	133	-1.28	136	-1.39

*Ranked by 2005 Score

All four Northeast Ohio metro areas are in the third quartile and all improved their ranking within that quartile. This improvement is the result of a higher share of business establishments with less than 20 employees and increased ranking in this variable.⁴² This is consistent with business transformations in Northeast Ohio. Several large headquarter companies left Northeast Ohio, such as BP, TRW, and OfficeMax. On the other hand, several small companies based in Northeast Ohio grew significantly from small companies, such as Hyland Software and several accounting and law firms. In Northeast Ohio as well as in other regions of the U.S., most of the employment growth occurs in small companies.

Locational Amenities

The Locational Amenities indicator includes four indices that approximate quality of life. These include transportation index, arts index, recreation index, and health index. These indices were estimated by *Places Rated Almanac* in 2000 and *Cities Ranked & Rated* in 2004. The challenge is that these publications use different methodologies to calculate these indices in both years. The biggest difference is in the Health Index, where in the year 2000 the index included only healthcare measured by the number of physicians in several specialties (and adjusted for population size) as well as number of hospital beds and residency programs. In 2004, in addition to healthcare, the index included a whole new category, Hazard and Illness, which measured air and water quality, cancer mortality, and other variables. The methodology to calculate other indices also changed, but less significantly. The different methodologies explain the big change in rankings experienced by many metro areas between 2000 and 2004. The difference in methodologies does not allow the comparison of ranks between years; metropolitan areas should be only compared among themselves within each year.

⁴² It should be noted that the share of businesses with less than 20 employees has a narrow range among the study's sample metropolitan areas; the range is from a low of 81 percent to a high of 90 percent.

Table 16. Rank of Sample Metropolitan Areas According to Locational Amenities Factor Score, 2000 and 2004

Metro Areas*	2000		2004		cbsa	Metro Areas	2000		2004	
	Rank	Score	Rank	Score			Rank	Score	Rank	Score
Seattle-Tacoma-Bellevue, WA	14	2.65	1	3.65	22420	Flint, MI	112	-2.16	69	0.05
Denver-Aurora, CO	5	2.91	2	3.44	32820	Memphis, TN-MS-AR	37	1.72	70	0.05
Pittsburgh, PA	9	2.82	3	3.36	12420	Austin-Round Rock, TX	57	0.79	71	0.05
Portland-Vancouver-Beaverton, OR-WA	26	2.11	4	3.25	47260	Virginia Beach-Norfolk-Newport News, VA-NC	49	1.19	72	-0.02
Minneapolis-St. Paul-Bloomington, MN-WI	1	3.41	5	3.16	16620	Charleston, WV	92	-0.90	73	-0.05
San Antonio, TX	62	0.53	6	2.86	49660	Youngstown-Warren-Boardman, OH-PA	114	-2.28	74	-0.14
Ann Arbor, MI	83	-0.28	7	2.85	46140	Tulsa, OK	65	0.43	75	-0.15
Madison, WI	48	1.19	8	2.75	23060	Fort Wayne, IN	67	0.35	76	-0.16
Buffalo-Niagara Falls, NY	17	2.52	9	2.73	42540	Scranton--Wilkes-Barre, PA	60	0.56	77	-0.16
Milwaukee-Waukesha-West Allis, WI	4	3.16	10	2.68	49340	Worcester, MA	7	2.85	78	-0.24
Hartford-West Hartford-East Hartford, CT	33	1.86	11	2.60	24660	Greensboro-High Point, NC	38	1.67	79	-0.25
Trenton-Ewing, NJ Metro Area	87	-0.52	12	2.52	11700	Asheville, NC	96	-1.10	80	-0.27
Honolulu, HI Metro Area	35	1.85	13	2.50	23420	Fresno, CA	115	-2.42	81	-0.32
Dayton, OH	43	1.48	14	2.47	19340	Davenport-Moline-Rock Island, IA-IL	81	-0.19	82	-0.40
St. Louis, MO-IL	15	2.63	15	2.42	22220	Fayetteville-Springdale-Rogers, AR-MO	98	-1.13	83	-0.42
Cleveland-Elyria-Mentor, OH	3	3.28	16	2.28	40900	Sacramento--Arden-Arcade--Roseville, CA	54	0.90	84	-0.44
Baltimore-Towson, MD	8	2.82	17	2.23	45220	Tallahassee, FL	89	-0.59	85	-0.52
Kansas City, MO-KS	20	2.29	18	2.03	46700	Vallejo-Fairfield, CA	116	-2.56	86	-0.52
Albany-Schenectady-Troy, NY	40	1.62	19	1.95	39740	Reading, PA	118	-2.62	87	-0.56
Springfield, MA	58	0.74	20	1.91	17900	Columbia, SC	68	0.31	88	-0.59
Syracuse, NY	18	2.36	21	1.87	21340	El Paso, TX	106	-1.62	89	-0.61
Eugene-Springfield, OR	103	-1.37	22	1.84	41420	Salem, OR	133	-4.70	90	-0.63
Omaha-Council Bluffs, NE-IA	23	2.20	23	1.79	16700	Charleston-North Charleston, SC	50	1.05	91	-0.72
San Diego-Carlsbad-San Marcos, CA	19	2.30	24	1.79	30780	Little Rock-North Little Rock, AR	64	0.48	92	-0.72
Rochester, NY	24	2.19	25	1.73	21780	Evansville, IN-KY	84	-0.36	93	-0.76
Anchorage, AK	122	-3.15	26	1.65	42260	Sarasota-Bradenton-Venice, FL	44	1.42	94	-0.79
Lansing-East Lansing, MI	94	-0.98	27	1.64	42340	Savannah, GA	90	-0.72	95	-0.88
Cincinnati-Middletown, OH-KY-IN	16	2.58	28	1.52	48900	Wilmington, NC	101	-1.23	96	-0.91
New Haven-Milford, CT	34	1.86	29	1.50	37860	Pensacola-Ferry Pass-Brent, FL	97	-1.12	97	-1.16
Las Vegas-Paradise, NV	66	0.37	30	1.43	38940	Port St. Lucie-Fort Pierce, FL	123	-3.30	98	-1.20
Providence-New Bedford-Fall River, RI-MA	52	1.00	31	1.42	40420	Rockford, IL	107	-1.67	99	-1.21
Tampa-St. Petersburg-Clearwater, FL	27	2.10	32	1.32	13140	Beaumont-Port Arthur, TX	119	-2.73	100	-1.26
Reno-Sparks, NV	61	0.54	33	1.22	24860	Greenville, SC	63	0.49	101	-1.26
Des Moines, IA	77	-0.11	34	1.20	41500	Salinas, CA	91	-0.86	102	-1.31
Richmond, VA	41	1.53	35	1.15	16860	Chattanooga, TN-GA	72	0.05	103	-1.33
Santa Barbara-Santa Maria-Goleta, CA	78	-0.12	36	1.05	36420	Oklahoma City, OK	51	1.01	104	-1.35
Albuquerque, NM	46	1.36	37	0.99	31700	Manchester-Nashua, NH	6	2.85	105	-1.36
Toledo, OH	42	1.52	38	0.99	13820	Birmingham-Hoover, AL	29	1.98	106	-1.36
Kalamazoo-Portage, MI	70	0.23	39	0.95	15980	Cape Coral-Fort Myers, FL	74	0.00	107	-1.41
Portland-South Portland-Biddeford, ME	55	0.90	40	0.87	33860	Montgomery, AL	104	-1.48	108	-1.43
Orlando, FL	31	1.89	41	0.85	19660	Deltona-Daytona Beach-Ormond Beach, FL	109	-1.90	109	-1.45
Boise City-Nampa, ID	80	-0.19	42	0.80	43340	Shreveport-Bossier City, LA	82	-0.28	110	-1.46
Tucson, AZ	56	0.87	43	0.77	29540	Lancaster, PA	111	-2.08	111	-1.49
Provo-Orem, UT	125	-3.41	44	0.76	27140	Jackson, MS	73	0.05	112	-1.50
Peoria, IL	85	-0.46	45	0.68	34940	Naples-Marco Island, FL	121	-3.06	113	-1.53
Harrisburg-Carlisle, PA	76	-0.06	46	0.62	37100	Oxnard-Thousand Oaks-Ventura, CA	117	-2.57	114	-1.69
Wichita, KS	75	-0.05	47	0.58	20500	Durham, NC	21	2.29	115	-1.70
Columbus, OH	30	1.96	48	0.58	12940	Baton Rouge, LA	95	-1.05	116	-1.72
Akron, OH	71	0.16	49	0.58	29460	Lakeland, FL	128	-3.69	117	-1.87
Springfield, MO	108	-1.84	50	0.55	25860	Hickory-Lenoir-Morganton, NC	120	-2.96	118	-1.89
Grand Rapids-Wyoming, MI	53	0.95	51	0.54	26620	Huntsville, AL	93	-0.91	119	-1.92
Indianapolis, IN	10	2.76	52	0.51	28660	Killeen-Temple-Fort Hood, TX	130	-4.34	120	-1.95
Nashville-Davidson--Murfreesboro, TN	28	2.09	53	0.49	44700	Stockton, CA	131	-4.60	121	-1.98
New Orleans-Metairie-Kenner, LA	13	2.72	54	0.43	33660	Mobile, AL	79	-0.17	122	-2.13
San Jose-Sunnyvale-Santa Clara, CA	45	1.42	55	0.42	47300	Visalia-Porterville, CA	135	-5.39	123	-2.37
Bridgeport-Stamford-Norwalk, CT	2	3.40	56	0.42	49620	York-Hanover, PA	136	-5.48	124	-2.59
Knoxville, TN	47	1.28	57	0.40	15180	Brownsville-Harlingen, TX	129	-3.91	125	-2.62
Louisville, KY-IN	25	2.17	58	0.37	12260	Augusta-Richmond County, GA-SC	100	-1.14	126	-2.81
Allentown-Bethlehem-Easton, PA-NJ	88	-0.58	59	0.36	27260	Jacksonville, FL	32	1.89	127	-2.81
Raleigh-Cary, NC	22	2.29	60	0.33	12540	Bakersfield, CA	126	-3.51	128	-3.02
Santa Rosa-Petaluma, CA	102	-1.34	61	0.32	39100	Poughkeepsie-Newburgh-Middletown, NY	127	-3.55	129	-3.12
Canton-Massillon, OH	110	-1.99	62	0.28	37340	Palm Bay-Melbourne-Titusville, FL	105	-1.53	130	-3.27
Lexington-Fayette, KY	59	0.61	63	0.28	22180	Fayetteville, NC	124	-3.37	131	-3.35
Colorado Springs, CO	99	-1.14	64	0.27	41620	Salt Lake City, UT	12	2.75	132	-3.40
Charlotte-Gastonia-Concord, NC-SC	36	1.75	65	0.26	33700	Modesto, CA	134	-4.72	133	-3.41
South Bend-Mishawaka, IN-MI	86	-0.48	66	0.13	32580	McAllen-Edinburg-Pharr, TX	132	-4.63	134	-3.54
Corpus Christi, TX	113	-2.28	67	0.12	49180	Winston-Salem, NC	39	1.67	135	-3.55
Spokane, WA	69	0.23	68	0.10	36260	Ogden-Clearfield, UT	11	2.75	136	-3.55

*Ranked by 2004 Score

Locational Amenities is the only indicator where one of the Northeast Ohio areas, Cleveland, is ranked in the first quartile, except for Legacy of Place where first quartile ranking suggests a negative impact on economic growth. Cleveland ranked #16 in 2004 (Table 16). When quality of air and water were added into the mix, the Cleveland area did not rank as well as when only healthcare was measured.

Northeast Ohio's high rankings are consistent with the high rankings of other Midwest areas. Among the leading 10 areas are three large Midwest areas—Pittsburgh, Minneapolis, and Milwaukee—and two small Midwest areas, Ann Arbor, MI and Madison, WI. The top two areas in Locational Amenities are Seattle and Denver.

As it relates to regional economic growth, this indicator is not as influential as other indicators and is significantly associated only with growth in per capita income. Nevertheless, per capita income is a critical measure of economic performance, and some anecdotal evidence suggests that quality of life is an important determinant in location selection for highly skilled, highly educated people.

Urban/Metro Structure

The two main variables that are included in this indicator measure the share of the metro area population located in the central city and the rate of property crime. Since the variables are loaded negatively with the indicator and the indicator is positively related to growth of employment and GMP, the results of the factor analysis suggest the following: the smaller the central city is relative to its metro area and the lower the metro area property crime rate, the higher employment and GMP growth rates are in the metropolitan area.

Most of the top-ranked areas are smaller metropolitan areas, except for Pittsburgh, PA and Albany, NY (Table 17). Five large Midwest areas are in the first quartile—Pittsburgh, PA; Minneapolis, MN; Cleveland, OH; St. Louis, MO; and Cincinnati, OH. The Youngstown area is also ranked in the first quartile, while Canton and Akron are ranked in the second quartile. The rankings of the Youngstown and Cleveland areas

improved between 2000 and 2005. In the Cleveland area, the rate of property crime declined and its ranking improved. As is expected, the share of the city of Cleveland's population of the Cleveland metro area declined as well, because of the continuing population losses in the city.

Table 17. Rank of Sample Metropolitan Areas According to Urban Structure Score, 2000 and 2005

Metro Areas*	2000		2005		Metro Areas	2000		2005	
	Rank	Score	Rank	Score		Rank	Score	Rank	Score
Poughkeepsie-Newburgh-Middletown, NY	1	2.04	1	2.20	Denver-Aurora, CO	59	0.39	69	0.15
Naples-Marco Island, FL	20	1.08	2	1.82	Sacramento--Arden-Arcade--Roseville, CA	46	0.58	70	0.15
Harrisburg-Carlisle, PA	3	1.75	3	1.75	Milwaukee-Waukesha-West Allis, WI	84	-0.26	71	0.03
Lancaster, PA	5	1.72	4	1.66	Seattle-Tacoma-Bellevue, WA	76	-0.01	72	-0.02
Scranton--Wilkes-Barre, PA	2	1.88	5	1.65	Salinas, CA	55	0.47	73	-0.05
York-Hanover, PA	4	1.74	6	1.62	San Jose-Sunnyvale-Santa Clara, CA	66	0.22	74	-0.08
Portland-South Portland-Biddeford, ME	10	1.43	7	1.60	Jackson, MS	105	-0.87	75	-0.09
Pittsburgh, PA	6	1.69	8	1.59	San Diego-Carlsbad-San Marcos, CA	63	0.24	76	-0.10
Bridgeport-Stamford-Norwalk, CT	19	1.15	9	1.53	South Bend-Mishawaka, IN-MI	100	-0.71	77	-0.15
Albany-Schenectady-Troy, NY	7	1.47	10	1.53	Portland-Vancouver-Beaverton, OR-WA	77	-0.02	78	-0.21
Providence-New Bedford-Fall River, RI-MA	12	1.34	11	1.45	Des Moines, IA	82	-0.21	79	-0.23
Worcester, MA	15	1.21	12	1.41	Beaumont-Port Arthur, TX	72	0.10	80	-0.25
Allentown-Bethlehem-Easton, PA-NJ	9	1.43	13	1.41	Salt Lake City, UT	74	0.09	81	-0.25
Oxnard-Thousand Oaks-Ventura, CA	8	1.45	14	1.26	Louisville, KY-IN	50	0.56	82	-0.29
Pensacola-Ferry Pass-Brent, FL	22	1.04	15	1.24	McAllen-Edinburg-Pharr, TX	81	-0.14	83	-0.31
Youngstown-Warren-Boardman, OH-PA	18	1.17	16	1.19	Las Vegas-Paradise, NV	78	-0.03	84	-0.32
Hartford-West Hartford-East Hartford, CT	14	1.24	17	1.17	Nashville-Davidson--Murfreesboro, TN	102	-0.83	85	-0.36
Hickory-Lenoir-Morganton, NC	17	1.20	18	1.15	New Orleans-Metairie-Kenner, LA	96	-0.62	86	-0.36
Fayetteville-Springdale-Rogers, AR-MO	13	1.30	19	1.15	Visalia-Porterville, CA	51	0.51	87	-0.36
Manchester-Nashua, NH	28	0.98	20	1.12	Greensboro-High Point, NC	87	-0.34	88	-0.37
Minneapolis-St. Paul-Bloomington, MN-WI	27	0.98	21	1.10	Augusta-Richmond County, GA-SC	86	-0.32	89	-0.40
Santa Barbara-Santa Maria-Goleta, CA	11	1.35	22	1.10	Springfield, MO	93	-0.55	90	-0.43
Cleveland-Elyria-Mentor, OH	35	0.77	23	1.08	Tallahassee, FL	124	-1.42	91	-0.46
Syracuse, NY	16	1.20	24	1.08	Wilmington, NC	95	-0.58	92	-0.47
Palm Bay-Melbourne-Titusville, FL	34	0.78	25	1.08	Chattanooga, TN-GA	92	-0.53	93	-0.47
Reading, PA	23	1.01	26	1.04	Baton Rouge, LA	111	-1.03	94	-0.48
Trenton-Ewing, NJ Metro Area	43	0.62	27	1.04	Huntsville, AL	94	-0.56	95	-0.55
Ogden-Clearfield, UT	29	0.93	28	0.99	Bakersfield, CA	67	0.18	96	-0.55
New Haven-Milford, CT	25	0.99	29	0.94	Davenport-Moline-Rock Island, IA-IL	79	-0.07	97	-0.59
St. Louis, MO-IL	52	0.50	30	0.93	Fort Wayne, IN	89	-0.46	98	-0.66
Greenville, SC	21	1.05	31	0.87	Tulsa, OK	88	-0.45	99	-0.70
Cincinnati-Middletown, OH-KY-IN	30	0.87	32	0.84	Indianapolis, IN	85	-0.31	100	-0.71
Buffalo-Niagara Falls, NY	36	0.75	33	0.84	Winston-Salem, NC	108	-0.96	101	-0.73
Asheville, NC	31	0.87	34	0.83	Little Rock-North Little Rock, AR	98	-0.65	102	-0.77
Rochester, NY	33	0.85	35	0.82	Austin-Round Rock, TX	106	-0.88	103	-0.80
Richmond, VA	45	0.60	36	0.80	Omaha-Council Bluffs, NE-IA	113	-1.05	104	-0.82
Sarasota-Bradenton-Venice, FL	26	0.99	37	0.75	Salem, OR	101	-0.73	105	-0.84
Lansing-East Lansing, MI	40	0.68	38	0.73	Savannah, GA	110	-0.99	106	-0.86
Grand Rapids-Wyoming, MI	47	0.57	39	0.65	Honolulu, HI Metro Area	103	-0.83	107	-0.87
Orlando, FL	60	0.35	40	0.65	Reno-Sparks, NV	99	-0.70	108	-0.90
Springfield, MA	42	0.66	41	0.64	Durham, NC	116	-1.20	109	-0.93
Canton-Massillon, OH	32	0.87	42	0.63	Toledo, OH	114	-1.10	110	-0.97
Deltona-Daytona Beach-Ormond Beach, FL	39	0.69	43	0.62	Eugene-Springfield, OR	109	-0.98	111	-0.97
Charleston, WV	24	1.01	44	0.58	Lexington-Fayette, KY	123	-1.42	112	-0.98
Ann Arbor, MI	49	0.57	45	0.57	Peoria, IL	129	-2.00	113	-1.00
Santa Rosa-Petaluma, CA	37	0.74	46	0.56	Columbus, OH	112	-1.03	114	-1.05
Dayton, OH	57	0.40	47	0.55	Charlotte-Gastonia-Concord, NC-SC	107	-0.89	115	-1.10
Evansville, IN-KY	56	0.47	48	0.54	Fayetteville, NC	104	-0.87	116	-1.14
Lakeland, FL	73	0.10	49	0.52	Brownsville-Harlingen, TX	115	-1.13	117	-1.33
Kansas City, MO-KS	69	0.13	50	0.52	Stockton, CA	91	-0.53	118	-1.35
Provo-Orem, UT	44	0.60	51	0.50	Fresno, CA	119	-1.32	119	-1.45
Baltimore-Towson, MD	71	0.10	52	0.47	Modesto, CA	97	-0.64	120	-1.46
Tampa-St. Petersburg-Clearwater, FL	58	0.40	53	0.46	Oklahoma City, OK	122	-1.39	121	-1.48
Kalamazoo-Portage, MI	70	0.12	54	0.46	Colorado Springs, CO	117	-1.21	122	-1.52
Cape Coral-Fort Myers, FL	61	0.32	55	0.43	Jacksonville, FL	127	-1.75	123	-1.52
Raleigh-Cary, NC	90	-0.46	56	0.40	Shreveport-Bossier City, LA	125	-1.57	124	-1.59
Columbia, SC	65	0.23	57	0.36	Wichita, KS	118	-1.29	125	-1.61
Killeen-Temple-Fort Hood, TX	48	0.57	58	0.34	Mobile, AL	120	-1.32	126	-1.63
Virginia Beach-Norfolk-Newport News, VA-NC	64	0.23	59	0.34	Albuquerque, NM	132	-2.13	127	-1.67
Charleston-North Charleston, SC	75	0.07	60	0.34	El Paso, TX	134	-2.21	128	-1.68
Madison, WI	62	0.25	61	0.32	Montgomery, AL	128	-1.86	129	-1.70
Boise City-Nampa, ID	80	-0.11	62	0.30	Spokane, WA	121	-1.33	130	-1.71
Port St. Lucie-Fort Pierce, FL	54	0.49	63	0.30	Anchorage, AK	131	-2.05	131	-1.78
Flint, MI	83	-0.22	64	0.20	Memphis, TN-MS-AR	126	-1.67	132	-1.85
Knoxville, TN	53	0.50	65	0.19	Rockford, IL	136	-2.24	133	-2.03
Akron, OH	38	0.73	66	0.19	San Antonio, TX	135	-2.21	134	-2.13
Birmingham-Hoover, AL	68	0.17	67	0.18	Tucson, AZ	130	-2.04	135	-2.53
Vallejo-Fairfield, CA	41	0.67	68	0.16	Corpus Christi, TX	133	-2.14	136	-2.67

*Ranked by 2005 Score

SUMMARY OF INDICATOR RANKINGS FOR NORTHEAST OHIO METROPOLITAN AREAS

The economic performance of Northeast Ohio metropolitan areas (as well as other areas) depends on changes in the indicators and their underlying variables. Focusing on the performance of Northeast Ohio, Table 18 shows the ranks for each dashboard indicator for both 2000 and 2005 in the four Northeast Ohio metropolitan areas. It should be noted again that comparison of Locational Amenities ranking between the two years is not meaningful because the methodology used to calculate the variables underlying this indicator has changed. Table E-2 in Appendix E provides the factor scores that determined these rankings. Table E-1 (as shown earlier) not only presents the factor scores but also shows the values of each of the variables and the ranks of Northeast Ohio areas in each of these variables.

Table 18. Comparison of Indicator Rankings of Northeast Ohio MSAs, 2000 and 2005

Indicator	Akron		Canton		Cleveland		Youngstown	
	2000	2005	2000	2005	2000	2005	2000	2005
Skilled Workforce and R&D	74	58	119	117	66	64	128	129
Technology Commercialization	36	60	91	97	35	57	125	134
Racial Inclusion & Income Equality	69	69	40	74	119	124	81	105
Urban Assimilation	127	129	136	134	86	93	130	127
Legacy of Place	30	29	17	17	16	16	6	7
Business Dynamics	89	93	81	112	100	127	104	123
Individual Entrepreneurship	104	101	100	81	102	94	87	74
Locational Amenities	71	49	110	62	3	16	114	74
Urban/Metro Structure Score	38	66	32	42	35	23	18	16

Note: 2005 refers to data from 2005 or earlier years if 2005 data were not available.

Summary by Northeast Ohio Metro Areas

All four metro areas in Northeast Ohio showed improvements in relative performance to other metro areas, as shown by higher ranks in Individual Entrepreneurship. Three of the four areas showed improvements in Skilled Workforce and R&D (Akron, Canton, and Cleveland).

The *Akron* area improved its ranking in two indicators: Skilled Workforce and R&D and Individual Entrepreneurship (small improvement)⁴³. Akron remained stable in Racial Inclusion & Income Equality.

The *Canton* area improved its ranking in three indicators: Skilled Workforce and R&D (small improvement), Urban Assimilation (small improvement), and Individual Entrepreneurship.

The *Cleveland* area improved its ranking in three indicators: Skilled Workforce and R&D (small improvement), Individual Entrepreneurship, and Urban/Metro Structure.

The *Youngstown* area improved its ranking in four indicators: Urban Assimilation (small improvement), Legacy of Place (small improvement), Individual Entrepreneurship, and Urban/Metro Structure (small improvement).

Summary by Indicator

Northeast Ohio showed improvements in the *Skilled Workforce and R&D indicator*. It improved significantly in the Akron area, while improving more moderately in Canton and Cleveland. Both Akron and Cleveland ranked in the second quartile by 2005. As suggested earlier, this indicator is linked to growth in per capita income and productivity.

All four metro areas lost ground in terms of factor scores and ranking in *Technology Commercialization*. However, Akron is still highly ranked in the second quartile. As with the Skilled Workforce and R&D indicator, this indicator is also linked to growth in per capita income and productivity; in addition, it is also associated with growth in GMP.

The *Racial Inclusion & Income Equality* indicator is associated with growth in all four measures of economic growth: per capita income, employment, GMP, and productivity. Unfortunately for Northeast Ohio, three metro areas were ranked lower in 2005 than in

⁴³ Small improvement is increased ranking by one to three ranks.

2000—Canton, Cleveland, and Youngstown. The Akron area had a lower score, but its ranking remained the same.

All four areas had small deteriorations in the scores of the *Urban Assimilation* indicator. However, the Canton and Youngstown areas showed some improvements in their respective rankings, although both were ranked in the bottom of the fourth quartile. The Cleveland area, although it placed in the third quartile, experienced a lower rank in 2005. Again, this does not bode well for regional growth in employment, GMP, and productivity, all of which are affected by this indicator.

The *Legacy of Place* indicator negatively affects growth in employment, GMP, and productivity. All four Northeast Ohio areas were ranked in the first quartile in both 2000 and 2005 with very minor improvements in the scores between these years and almost no change in rankings. High ranking in this indicator means high legacy cost. Rankings in this indicator are expected to change very slowly, and Northeast Ohio's areas are expected to retain their high ranks (negative effects on growth) for years to come. High (negative) ranking are common among most Midwest areas.

All four areas had declining scores and lower rankings in the *Business Dynamics* indicator. Again, this is unfortunate for Northeast Ohio because this indicator is associated with regional growth in employment and GMP.

In contrast, all four areas experienced improvements in the scores and ranks of the *Individual Entrepreneurship* indicator. This is linked to growth in employment and GMP, counteracting the negative impact from lower scores in the Business Dynamics indicator.

Comparison across years is not meaningful in the *Locational Amenities* indicator. The Cleveland metropolitan area led the four Northeast Ohio areas in both 2000 and 2005. This is consistent with Cleveland being the largest metro area in Northeast Ohio with many amenities that serve the whole region. The Cleveland metropolitan area ranked in

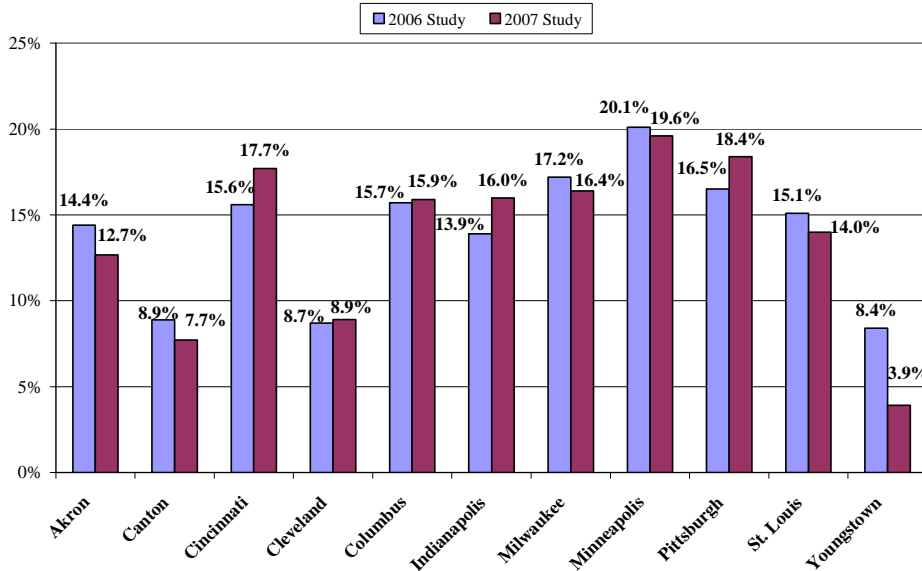
the first quartile in both years. The Akron and Canton metro areas ranked in the second quartile in 2005.

The performance of Northeast Ohio metro areas in the *Urban/Metro Structure* indicator was mixed. The scores and ranks of the Cleveland and Youngstown areas have increased, placing both in the first quartile. They declined in the Akron and Canton areas, although they are still ranked in the second quartile. This indicator contributes to growth in employment and GMP.

COMPARISON OF ECONOMIC GROWTH MEASURES, 2006 VERSUS 2007 STUDY

Comparing growth rates of per capita income between the original study and this update reveals that the growth rate increased slightly in the Cleveland metropolitan area (from 8.7 percent over the earlier period to 8.9 percent between 1995 and 2004) but slowed in each of NEO's smaller three metropolitan areas (Figure 7). Among the larger Midwest metropolitan areas, Columbus had a slight increase in its growth rate, and it grew significantly faster than the Cleveland area. Three other metropolitan area grew faster than Cleveland and also increased their rates of growth by two percentage points—Cincinnati, Indianapolis, and Pittsburgh. However, Milwaukee, Minneapolis, and St. Louis experienced slower growth rates in the latter time period.

Figure 7. Comparison of Per Capita Income Trends among Midwest MSAs

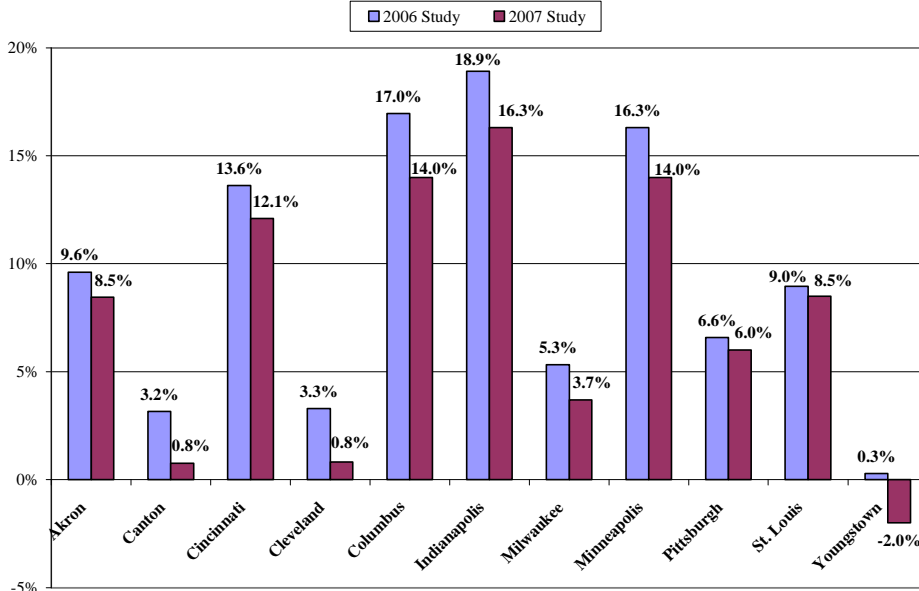


Notes:

The 2006 Dashboard study measured per capita income growth from 1993 to 2003, and the 2007 Dashboard study measured it from 1995 to 2004. Data from the 2006 study is recalculated for a nine-year period to match the number of years of the 2007 study.

Comparing employment trends between the two studies demonstrates that employment growth rates declined in the four NEO metropolitan areas as well as in the larger Midwest metropolitan areas (Figure 8). The average employment growth rate for all four NEO metropolitan areas dropped from 3.9 percent between 1994 and 2004 to 1.7 percent between 1995 and 2005. Even Indianapolis, which was the fastest growing metropolitan area among the larger Midwest areas in both time periods, experienced a decline in its employment growth rate from 18.9 percent in 1994-2004 to 16.3 percent in 1995-2005.

Figure 8. Comparison of Employment Trends among Midwest MSAs

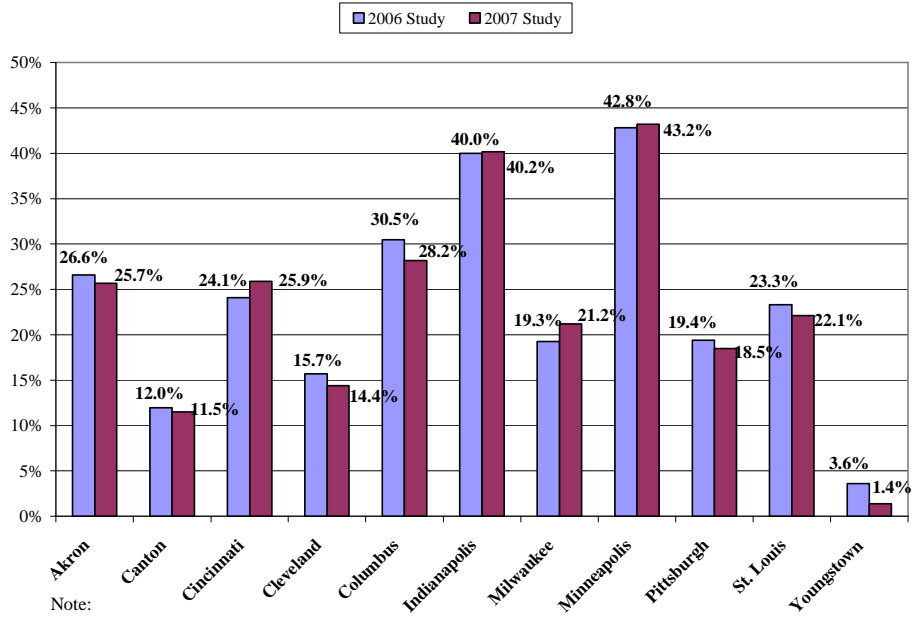


Note:

The 2006 Dashboard study measured employment growth from 1994 to 2004; the 2007 Dashboard study measured growth from 1995 to 2005.

Comparing trends in Gross Metropolitan Product (GMP) between the two studies shows that among the 11 metropolitan areas displayed in Figure 9, seven areas experienced a slowing down in the rate of growth in GMP. All four Northeast Ohio metropolitan areas as well as the Columbus, Pittsburgh, and St. Louis areas experienced lower growth rates in the period 1995-2005 in comparison to 1994-2004. The largest increase in the percentage of GMP growth rates occurred in Milwaukee and Cincinnati.

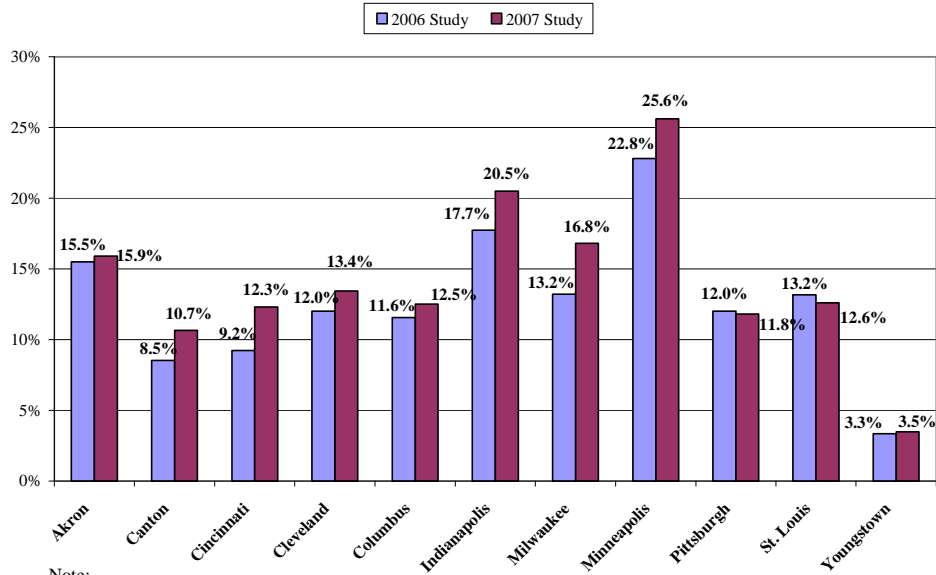
Figure 9. Comparison of GMP Growth among Midwest MSAs



Note:
 The 2006 Dashboard study measured employment growth from 1994 to 2004; the 2007 Dashboard study measured growth from 1995-2005.

In contrast to employment and GMP, productivity growth rates increased in most of the metro areas including the four Northeast Ohio metro areas (Table 10). Productivity in the Cleveland metropolitan area increased by 12 percent between 1994 and 2004; it grew faster, at 13.4 percent, between 1995 and 2005. Minneapolis and Indianapolis had the highest productivity growth rates in both time periods, and their rates of growth have accelerated.

Figure 10. Comparison of Productivity Trends among Midwest MSAs



Note:

The 2006 Dashboard study measured productivity growth from 1994 to 2004; the 2007 Dashboard study measured growth from 1995-2005.

CONCLUDING COMMENTS

This report provides a broad framework that explains regional economic performance. Through a set of dashboard indicators, the framework may assist regional leaders in developing policy, strategy, and initiatives to transform the Northeast Ohio economy. The framework is complex but flexible. It provides the region with many tools and possible actions to improve the regional economy. It is diagnostic in nature, but it does not provide one simple prescription on how to transform a slow-moving, traditional manufacturing-based economy into a fast-growing one.

The dashboard indicators offer a variety of players in the regional economy the opportunity to be involved with a diverse set of initiatives. For example, while some policy makers can be involved in improving the education and skills levels of the local workforce, others may be involved in creating more business startups or increasing the research base of the region. Other groups and leaders may work on ways to attract new immigrants to the region, while others can get involved in initiatives to reduce poverty, income inequality, and racial isolation.

The dashboard indicators also provide a mechanism to monitor the performance of the Northeast Ohio economy. The measures of economic growth as well as the indicators and their variables will be updated annually to measure the progress of Northeast Ohio metropolitan areas in comparison to other metro areas across the U.S.

This report identified nine dashboard indicators, many of which consist of several variables. The list of indicators includes:

- Skilled Workforce and R&D
- Technology Commercialization
- Racial Inclusion & Income Equality
- Urban Assimilation
- Legacy of Place
- Business Dynamics

- Individual Entrepreneurship
- Locational Amenities
- Urban/Metro Structure

Several of these indicators are consistent with the regional priorities established by Voices & Choices, an 18-month process involving 21,000 people throughout Northeast Ohio. The priorities include:

- Training workers for current and future jobs
- Improving racial inclusion and income equality
- Attracting and growing businesses
- Reducing government fragmentation and inefficiency
- Ensuring equitable school funding and accountability
- Reducing sprawl and improving regional connectivity

These priorities, along with additional interviews with organizations and leaders throughout Northeast Ohio, have been recently turned into a set of actions under a plan called *Advance Northeast Ohio*.⁴⁴

There are two types of regional growth in mid-sized metropolitan areas in the U.S. The first reflects the restructuring of regional economies through technological product and process innovations and results in growth in both productivity and per capita income. The second creates larger-scale economies through business dynamics and results in an increase of total gross regional product and employment.

The first, productivity-driven type of growth is less sensitive to regional legacy characteristics and socio-economic factors. It can best be described as dynamic economies driven by a skilled workforce paired with research and development resources that result in the deployment of new technologies within a region.

The second type of economic growth is place-related and requires the right combination of socio-economic characteristics and business dynamic factors for an economy to grow

⁴⁴ <http://www.advancenortheastohio.org/>

in size. These regions may not be the fastest-growing, but their size provides them with an opportunity for economic diversification, generating steady growth and compensating for declines during recessionary periods. These regions could succeed in mitigating legacy costs through urban assimilation, racial inclusion, and income and social equality. However, size alone does not guarantee economic diversity or growth in employment and GMP, and not every metropolitan area fits into one of the two patterns.

The economic performance of Northeast Ohio is modest at best when compared to other regions of the country. The decline has occurred over many decades, and new initiatives will take time to make measurable impacts. This history does not discourage the development of new initiatives or tracking progress of the local economy, but it sets expectations regarding our ability to see progress over the short run. Policy makers should expect some variables and indicators to register improvement, while others will continue to decline. However, Northeast Ohio should continue to pay attention to its progress over time in comparison to its own past performance and in comparison to other metropolitan areas across the U.S. Continuing monitoring of the regional economy is important because it will help decision makers adjust their strategies for the transformation of Northeast Ohio.

APPENDICES

APPENDIX A: CHANGES IN VARIABLES, 2006 VERSUS 2007 STUDY

We began this study with a review of the 34 variables loaded into factors in the original study.

- Three (3) variables were eliminated
 - Skill Differences
 - Major University
 - Commuter Time

- Five (5) variables required a different source or specification
 - Isolation Index
 - Dissimilarity Index
 - Business Churning (variable was replaced by two separate variables: summation of business openings and closings of all establishments divided by total number of establishments and the ratio of business openings to business closings of single establishments)
 - Crime Index (variable was replaced by two separate variables; violent crime rate and property crime rate)
 - % Children Living in High-Poverty Neighborhoods (approximated by the share of students in schools with more than 70% free lunches)

- Seven (7) new variables loaded across the factors
 - Venture Capital per Employee
 - SBIR & STTR Awards per Employee
 - Industry R&D per Employee
 - University R&D per Employee
 - Pct. of Self Employed
 - Property Crime Rate
 - Single Establishments Openings/Closings

This study uses 38 variables in its analysis. Of those, 35 were loaded in factors.

APPENDIX B: VARIABLES AND DATA SOURCES

VARIABLES	DATA SOURCE
	Economic Growth Variables
Per capita income	U.S. Bureau of Economic Analysis (BEA)
Employment	Moody's Economy.com
Gross metropolitan product	Moody's Economy.com
Productivity	Moody's Economy.com
	Factor 1: Skilled Workforce and R&D
Pct. of population in professional and managerial occupations	U.S. Census, American Community Survey (ACS)
Pct. of population with graduate or professional degree	U.S. Census, American Community Survey (ACS)
Pct. of population with bachelor's degree	U.S. Census, American Community Survey (ACS)
Industry R&D 3 year average per employee	National Science Foundation, Moody's Economy.com
Total SBIR & STTR awards per employee	U.S. Small Business Administration, ACS 2005
Population dependency	American Community Survey (ACS) 2005
University R&D 3 year average per employee	National Science Foundation, Moody's Economy.com
	Factor 2: Legacy of Place
Business churning in all establishments	U.S. Census Longitudinal Establishment and Enterprise Microdata (LEEM)
Climate	Places Rated Almanac (Savageau, D. 2000)
Pct. of houses built before 1940	U.S. Census, American Community Survey (ACS)
Dissimilarity index for black population	National Center for Education Statistics
City poverty ratio	U.S. Census, American Community Survey (ACS)
No. of government units per capita (10,000 population)	U.S. Census of Governments
Share of manufacturing employment	Moody's Economy.com
	Factor 3: Urban Assimilation
Pct. of Hispanic population	U.S. Census, American Community Survey (ACS)
Share of minority business employment (in total emp)	U.S. Census, County Business Patterns
Pct. of foreign-born population	U.S. Census, American Community Survey (ACS)
Productivity in information sector	Moody's Economy.com
Pct. of Asian population	U.S. Census, American Community Survey (ACS)
	Factor 4: Racial Inclusion and Income Equality
Pct. of black or African American population alone	U.S. Census, American Community Survey (ACS)
Isolation index for black population	National Center for Education Statistics
Income inequality	Housing and Urban Development
Share of students at schools with more than 70% free lunches	National Center for Education Statistics
Violent crime rate (per 100,000 population)	Federal Bureau of Investigation, States of the Cities Data System
	Factor 5: Locational Amenities
Transportation index	Places Rated Almanac (Savageau, 2000), Cities Ranked & Rated (Sperling and Sander, 2004)
Arts index	Places Rated Almanac (Savageau, 2000), Cities Ranked & Rated (Sperling and Sander, 2004)
Recreation index	Places Rated Almanac (Savageau, 2000), Cities Ranked & Rated (Sperling and Sander, 2004)
Health index	Places Rated Almanac (Savageau, 2000), Cities Ranked & Rated (Sperling and Sander, 2004)
	Factor 6: Technology Commercialization
Venture capital per employee, total investment	Thomson Financial Venture Economics, Moody's Economy.com
Number of patents per thousand employees	U.S. Patent and Trademark Office
Cost of living index	Moody's Economy.com
	Factor 7: Urban/Metro Structure
Share of city population in MSA population	U.S. Census, American Community Survey (ACS)
Property crime rate (per 100,000 population)	Federal Bureau of Investigation, States of the Cities Data System
	Factor 8: Individual Entrepreneurship
Pct. of self employed (all industries except ag & mining)	U.S. Census, American Community Survey (ACS)
Share of business establishments with under 20 workers	U.S. Census, County Business Patterns
	Variable: Business Dynamics
Business openings over business closings in single establishments	U.S. Census Longitudinal Establishment and Enterprise Microdata (LEEM)
OTHER VARIABLES	
Pct. of homeownership	American Community Survey (ACS)
University enrollment per capita	National Science Foundation, U.S. Census

**APPENDIX C:
COMPARISON OF FACTORS, 2006 VERSUS 2007 STUDY**

NEW FACTOR	ORIGINAL FACTOR
Factor 1: Skilled Workforce and R&D	
Skilled Workforce and R&D	Skilled Workforce
Pct. of population in professional and managerial occupations (0.94)	Pct. of population in professional and managerial occupations (0.96)
Pct. of population with graduate or professional degree (0.93)	Pct. of population with graduate or professional degree (0.91)
Pct. of population with bachelor's degree (0.82)	Pct. of population with bachelor's degree (0.88)
Population dependency (<18 and >65) (-0.59)	Population dependency (<18 and >65) (-0.66)
Industry R&D per employee (0.72)	SKILL DIFFERENCES (0.61)
SBIR & STTR awards per employee (0.52)	<i>Number of patents (0.48)</i>
University R&D per employee (0.49)	<i>Productivity in information sector (0.46)</i>
Factor 2: Legacy of Place	
Business churning (-0.85)	Business churning (0.62)
Climate (-0.55)	Climate (0.62)
Pct. of houses built before 1940 (0.86)	Pct. of houses built before 1940 (-0.88)
Number of government units per capita (0.54)	Number of governmental units per capita (-0.45)
<i>Dissimilarity Index for Black population (0.69)</i>	<i>Crime Index (-0.53)</i>
<i>City poverty ratio (0.57)</i>	
<i>Share of manufacturing employment (0.39)</i>	
Factor 3: Urban Assimilation	
Pct. of Hispanic population (0.92)	Pct. of Hispanic population (0.77)
Share of minority businesses employment (0.79)	Share of minority businesses employment (0.88)
Pct. of foreign-born population (0.76)	Pct. of foreign-born population (0.93)
Pct. of Asian population (0.22)	Pct. of Asian population (0.66)
<i>Productivity in information sector (0.40)</i>	<i>Cost of living index (0.68)</i>
	COMMUTER TIME (0.55)
	% HOME OWNERSHIP (-0.54)
Factor 4: Racial Inclusion & Income Equality	
Racial Inclusion & Income Equality	Racial Inclusion
Pct. of Black population (-.88)	Pct. of Black population (0.59)
Isolation Index for Black population (-0.82)	Isolation Index for Black population (0.93)
Income inequality (-0.67)	<i>Dissimilarity Index (0.83)</i>
Share of students at schools with more than 70% free lunches (-0.66)	
Violent crime rate (-0.50)	Income Equality
	Income inequality (0.77)
	Pct. of children living in high-poverty neighborhoods (0.81)
Factor 5: Locational Amenities	
Transportation Index (0.78)	Transportation Index (0.82)
Arts Index (0.69)	Arts Index (0.54)
Recreation Index (0.63)	Recreation Index (0.58)
Healthcare Index (0.54)	Healthcare Index (0.45)
	MAJOR UNIVERSITY (0.52)

NEW FACTOR	ORIGINAL FACTOR
Factor 6: Technology Commercialization	
Venture capital per employee (0.73)	
<i>Number of patents per employee (0.59)</i>	
<i>Cost of living index (0.53)</i>	
Factor 7: Urban/Metro Structure	
Share of city population in MSA population (-0.65)	Share of city population in MSA population (-0.76)
Property crime rate (-0.58)	<i>Concentration of poverty in core city (0.71)</i>
Factor 8: Individual Entrepreneurship	
Pct. of self employed (0.73)	
<i>Share of establishments with under 20 workers (0.46)</i>	
Variable: Business Dynamics	
Business openings over business closings	<i>Share of establishments with under 20 workers (0.83)</i>
	<i>Business churning (0.47)</i>
	<i>Share of manufacturing employment (-0.69)</i>

Notes

Bold-new variables

SMALL CAPS-VARIABLES ELIMINATED OR DID NOT LOAD

Italics-variables loaded with different factors

The numbers in parenthesis are the coefficients from the factor analysis

**APPENDIX D: RANKING OF METROPOLITAN AREAS BY MEASURES OF
ECONOMIC GROWTH**

**REGIONAL ECONOMIC GROWTH MEASURED BY PERCENTAGE CHANGES IN
PER CAPITA INCOME, 1995-2004 AND 2001-2004
EMPLOYMENT, 1995-2005 AND 2002-2005
GROSS METROPOLITAN PRODUCT, 1995-2005 AND 2002-2005
PRODUCTIVITY, 1995-2005 AND 2002-2005**

(TABLES D1-D4, LONGER-TERM TRENDS)

(TABLES D5-D8, SHORTER-TERM TRENDS)

Table D-1. Rank of Metropolitan Areas by Percent Change in Per Capita Income, 1995 - 2004

Rank	Metropolitan Name	Percent Change	Rank	Metropolitan Name	Percent Change
1	San Diego-Carlsbad-San Marcos, CA	30.15	70	Buffalo-Niagara Falls, NY	14.09
2	Charleston-North Charleston, SC	25.19	71	Tucson, AZ	14.03
3	San Jose-Sunnyvale-Santa Clara, CA	24.38	72	Visalia-Porterville, CA	14.02
4	Seattle-Tacoma-Bellevue, WA	24.37	73	New Haven-Milford, CT	14.02
5	Baltimore-Towson, MD	23.70	74	St. Louis, MO-IL	13.95
6	Virginia Beach-Norfolk-Newport News, VA-NC	23.06		Sample Average	13.95
7	Vallejo-Fairfield, CA	22.21	75	Beaumont-Port Arthur, TX	13.86
8	Santa Rosa-Petaluma, CA	22.04	76	Lexington-Fayette, KY	13.61
9	Denver-Aurora, CO	21.66	77	Springfield, MO	13.47
10	Oklahoma City, OK	21.53	78	Orlando, FL	13.34
11	Salt Lake City, UT	21.50	79	Chattanooga, TN-GA	13.32
12	Bridgeport-Stamford-Norwalk, CT	21.12	80	Modesto, CA	13.32
13	Madison, WI	21.05	81	Augusta-Richmond County, GA-SC	13.28
14	Worcester, MA	20.57	82	Charlotte-Gastonia-Concord, NC-SC	13.12
15	Killeen-Temple-Fort Hood, TX	20.56	83	Harrisburg-Carlisle, PA	13.06
16	Omaha-Council Bluffs, NE-IA	20.53	84	Deltona-Daytona Beach-Ormond Beach, FL	12.92
17	Manchester-Nashua, NH	20.50	85	Brownsville-Harlingen, TX	12.91
18	Trenton-Ewing, NJ	20.43	86	Knoxville, TN	12.76
19	Colorado Springs, CO	20.27		87 Akron, OH	12.67
20	Providence-New Bedford-Fall River, RI-MA	20.25	88	Allentown-Bethlehem-Easton, PA-NJ	12.66
21	Portland-South Portland-Biddeford, ME	20.20	89	McAllen-Edinburg-Pharr, TX	12.64
22	Corpus Christi, TX	19.73	90	Reno-Sparks, NV	12.49
23	Fayetteville, NC	19.57	91	Durham, NC	12.35
24	Minneapolis-St. Paul-Bloomington, MN-WI	19.57	92	Spokane, WA	12.15
25	Evansville, IN-KY	19.57	93	Ann Arbor, MI	12.12
26	El Paso, TX	19.05	94	Poughkeepsie-Newburgh-Middletown, NY	11.99
27	Pittsburgh, PA	18.43	95	Syracuse, NY	11.82
28	Birmingham-Hoover, AL	18.43	96	Salinas, CA	11.64
29	Richmond, VA	18.21	97	Sarasota-Bradenton-Venice, FL	11.54
30	Charleston, WV	18.03	98	Fresno, CA	11.53
31	Des Moines, IA	17.96	99	Lakeland, FL	11.10
32	Cincinnati-Middletown, OH-KY-IN	17.65	100	Albuquerque, NM	11.03
33	Jackson, MS	17.60	101	Grand Rapids-Wyoming, MI	10.62
34	South Bend-Mishawaka, IN-MI	17.52	102	Baton Rouge, LA	10.62
35	Tulsa, OK	17.20	103	Wilmington, NC	10.48
36	Louisville, KY-IN	17.18	104	Bakersfield, CA	10.48
37	Palm Bay-Melbourne-Titusville, FL	17.03	105	Lancaster, PA	10.05
38	Hartford-West Hartford-East Hartford, CT	17.01	106	Las Vegas-Paradise, NV	9.95
39	Santa Barbara-Santa Maria-Goleta, CA	16.64	107	Portland-Vancouver-Beaverton, OR-WA	9.65
40	Austin-Round Rock, TX	16.55	108	Raleigh-Cary, NC	9.60
41	Little Rock-North Little Rock, AR	16.49	109	Anchorage, AK	9.18
42	Davenport-Moline-Rock Island, IA-IL	16.41		110 Cleveland-Elyria-Mentor, OH	8.91
43	Milwaukee-Waukesha-West Allis, WI	16.36	111	Kalamazoo-Portage, MI	8.65
44	Ogden-Clearfield, UT	16.11	112	Toledo, OH	8.59
45	Indianapolis, IN	15.98	113	Dayton, OH	8.47
46	Peoria, IL	15.96	114	Rochester, NY	8.17
47	Oxnard-Thousand Oaks-Ventura, CA	15.94	115	Eugene-Springfield, OR	8.02
48	Columbus, OH	15.92		116 Canton-Massillon, OH	7.72
49	New Orleans-Metairie-Kenner, LA	15.88	117	Salem, OR	7.52
50	Albany-Schenectady-Troy, NY	15.84	118	Mobile, AL	7.42
51	Shreveport-Bossier City, LA	15.82	119	Greenville, SC	7.25
52	Fayetteville-Springdale-Rogers, AR-MO	15.75	120	Lansing-East Lansing, MI	7.17
53	Columbia, SC	15.40	121	Naples-Marco Island, FL	7.10
54	Cape Coral-Fort Myers, FL	15.38	122	Stockton, CA	6.99
55	Pensacola-Ferry Pass-Brent, FL	15.28	123	Boise City-Nampa, ID	6.90
56	Nashville-Davidson--Murfreesboro, TN	15.26	124	Provo-Orem, UT	6.58
57	Sacramento--Arden-Arcade--Roseville, CA	14.96	125	Greensboro-High Point, NC	6.36
58	San Antonio, TX	14.90	126	Port St. Lucie-Fort Pierce, FL	5.82
59	Memphis, TN-MS-AR	14.88	127	Asheville, NC	5.46
60	Huntsville, AL	14.78	128	Honolulu, HI	5.35
61	Kansas City, MO-KS	14.78	129	York-Hanover, PA	5.09
62	Wichita, KS	14.70	130	Winston-Salem, NC	4.99
63	Jacksonville, FL	14.67	131	Reading, PA	4.88
64	Montgomery, AL	14.65	132	Hickory-Lenoir-Morganton, NC	4.48
65	Springfield, MA	14.53		133 Youngstown-Warren-Boardman, OH-PA	3.91
66	Tallahassee, FL	14.42	134	Fort Wayne, IN	3.08
67	Scranton--Wilkes-Barre, PA	14.34	135	Rockford, IL	-1.40
68	Savannah, GA	14.18	136	Flint, MI	-5.66
69	Tampa-St. Petersburg-Clearwater, FL	14.18			

Source: U.S. Bureau of Economic Analysis

Table D-2. Rank of Metropolitan Areas by Percent Change in Employment, 1995 - 2005

Rank	Metropolitan Area	Percent Change	Rank	Metropolitan Area	Percent Change
1	Las Vegas-Paradise, NV	73.08	69	Corpus Christi, TX	13.28
2	Naples-Marco Island, FL	64.10	70	Omaha-Council Bluffs, NE-IA	13.06
3	McAllen-Edinburg-Pharr, TX	51.85	71	Baltimore-Towson, MD	12.87
4	Cape Coral-Fort Myers, FL	50.47	72	Virginia Beach-Norfolk-Newport News, VA-NC	12.66
5	Sarasota-Bradenton-Venice, FL	45.55	73	Baton Rouge, LA	12.65
6	Orlando, FL	42.96	74	Asheville, NC	12.60
7	Port St. Lucie-Fort Pierce, FL	42.08	75	Lexington-Fayette, KY	12.39
8	Fayetteville-Springdale-Rogers, AR-MO	39.47	76	Providence-New Bedford-Fall River, RI-MA	12.26
9	Boise City-Nampa, ID	38.86	77	Cincinnati-Middletown, OH-KY-IN	12.14
10	Wilmington, NC	37.25	78	Grand Rapids-Wyoming, MI	12.05
11	Provo-Orem, UT	33.69	79	Little Rock-North Little Rock, AR	12.01
12	Austin-Round Rock, TX	33.62	80	Columbia, SC	11.88
13	Sacramento-Arden-Arcade-Roseville, CA	32.23	81	Ann Arbor, MI	11.86
14	Raleigh-Cary, NC	31.17	82	Montgomery, AL	11.75
15	Reno-Sparks, NV	29.72	83	Fayetteville, NC	11.49
16	San Diego-Carlsbad-San Marcos, CA	28.42	84	Visalia-Porterville, CA	11.40
17	Tampa-St. Petersburg-Clearwater, FL	28.36	85	Fresno, CA	11.28
18	Stockton, CA	27.06	86	Memphis, TN-MS-AR	10.91
19	Vallejo-Fairfield, CA	26.29	87	Winston-Salem, NC	10.76
20	Charleston-North Charleston, SC	25.93	88	Durham, NC	10.53
21	Lakeland, FL	25.83	89	York-Hanover, PA	10.39
22	Brownsville-Harlingen, TX	25.76	90	Shreveport-Bossier City, LA	10.09
23	Ogden-Clearfield, UT	24.77	91	El Paso, TX	9.92
24	Charlotte-Gastonia-Concord, NC-SC	24.68	92	Greenville, SC	9.85
25	Modesto, CA	24.59	93	Charleston, WV	9.77
26	Deltona-Daytona Beach-Ormond Beach, FL	24.48	94	Wichita, KS	9.48
27	Salt Lake City, UT	24.21	95	Peoria, IL	9.05
28	Anchorage, AK	24.06	96	Harrisburg-Carlisle, PA	9.00
29	Santa Rosa-Petaluma, CA	22.71	97	Greensboro-High Point, NC	8.92
30	Oxnard-Thousand Oaks-Ventura, CA	22.27	98	Chattanooga, TN-GA	8.88
31	Bakersfield, CA	22.18	99	Augusta-Richmond County, GA-SC	8.72
32	Jacksonville, FL	21.94	100	Albany-Schenectady-Troy, NY	8.71
33	Palm Bay-Melbourne-Titusville, FL	21.80	101	Birmingham-Hoover, AL	8.66
34	Colorado Springs, CO	20.83	102	Worcester, MA	8.63
35	Salinas, CA	20.76	103	Kansas City, MO-KS	8.62
36	Trenton-Ewing, NJ	20.67	104	St. Louis, MO-IL	8.47
37	Tucson, AZ	20.34	105 Akron, OH	8.43	
38	Savannah, GA	19.94	106	New Haven-Milford, CT	8.23
39	Springfield, MO	19.68	107	Mobile, AL	7.63
40	Seattle-Tacoma-Bellevue, WA	19.53	108	Evansville, IN-KY	7.53
41	San Antonio, TX	19.48	109	Davenport-Moline-Rock Island, IA-IL	7.49
42	Nashville-Davidson--Murfreesboro, TN	19.31	110	Springfield, MA	7.44
43	Madison, WI	19.12	111	Scranton--Wilkes-Barre, PA	7.22
44	Denver-Aurora, CO	18.78	112	Louisville, KY-IN	6.96
45	Huntsville, AL	18.29	113	Honolulu, HI	6.87
46	Poughkeepsie-Newburgh-Middletown, NY	17.62	114	Bridgeport-Stamford-Norwalk, CT	6.49
47	Santa Barbara-Santa Maria-Goleta, CA	17.59	115	Pittsburgh, PA	5.95
48	Killeen-Temple-Fort Hood, TX	17.29	116	Reading, PA	5.74
49	Richmond, VA	17.22	117	Hartford-West Hartford-East Hartford, CT	5.16
50	Portland-South Portland-Biddeford, ME	17.17	118	Kalamazoo-Portage, MI	4.31
51	Pensacola-Ferry Pass-Brent, FL	17.00	119	Syracuse, NY	3.84
52	Salem, OR	16.84	120	Milwaukee-Waukesha-West Allis, WI	3.74
53	Portland-Vancouver-Beaverton, OR-WA	16.40	121	San Jose-Sunnyvale-Santa Clara, CA	3.56
54	Allentown-Bethlehem-Easton, PA-NJ	16.39	122	Fort Wayne, IN	3.21
55	Albuquerque, NM	16.33	123	South Bend-Mishawaka, IN-MI	2.99
56	Indianapolis, IN	16.32	124	Beaumont-Port Arthur, TX	2.45
	Sample Average	15.94	125	Toledo, OH	2.39
57	Oklahoma City, OK	15.62	126	Lansing-East Lansing, MI	1.93
58	Jackson, MS	15.14	127	Rochester, NY	1.78
59	Lancaster, PA	15.07	128	Buffalo-Niagara Falls, NY	1.08
60	Knoxville, TN	15.07	129 Cleveland-Elyria-Mentor, OH	0.82	
61	Manchester-Nashua, NH	15.06	130 Canton-Massillon, OH	0.76	
62	Tallahassee, FL	14.72	131	Rockford, IL	-0.20
63	Spokane, WA	14.64	132 Youngstown-Warren-Boardman, OH-PA	-2.00	
64	Eugene-Springfield, OR	14.62	133	Dayton, OH	-3.01
65	Minneapolis-St. Paul-Bloomington, MN-WI	14.02	134	New Orleans-Metairie-Kenner, LA	-7.48
66	Columbus, OH	13.95	135	Hickory-Lenoir-Morganton, NC	-7.77
67	Des Moines, IA	13.76	136	Flint, MI	-11.54
68	Tulsa, OK	13.46			

Source: Moody's Economy.com

Table D-3. Rank of Metropolitan Areas by Percent Change in Gross Metropolitan Product, 1995 - 2005

Rank	Metropolitan Area	Percent Change	Rank	Metropolitan Area	Percent Change
1	Las Vegas-Paradise, NV	96.54	69	Huntsville, AL	32.98
2	Naples-Marco Island, FL	92.82	70	Tallahassee, FL	32.98
3	Raleigh-Cary, NC	75.29	71	Fresno, CA	32.80
4	Cape Coral-Fort Myers, FL	74.63	72	Springfield, MO	32.67
5	McAllen-Edinburg-Pharr, TX	72.92	73	Providence-New Bedford-Fall River, RI-MA	32.64
6	Fayetteville-Springdale-Rogers, AR-MO	68.78	74	Baltimore-Towson, MD	32.06
7	Charlotte-Gastonia-Concord, NC-SC	68.14	75	Montgomery, AL	31.70
8	Vallejo-Fairfield, CA	66.53	76	Eugene-Springfield, OR	30.79
9	Port St. Lucie-Fort Pierce, FL	63.80	77	Kalamazoo-Portage, MI	30.33
10	Sarasota-Bradenton-Venice, FL	61.96	78	El Paso, TX	29.92
11	Orlando, FL	61.00	79	Ann Arbor, MI	29.88
12	Austin-Round Rock, TX	59.09	80	Oklahoma City, OK	29.75
13	Des Moines, IA	58.68	81	Augusta-Richmond County, GA-SC	28.93
14	Provo-Orem, UT	58.57	82	Columbia, SC	28.83
15	Wilmington, NC	57.53	83	Little Rock-North Little Rock, AR	28.31
16	Sacramento--Arden-Arcade--Roseville, CA	55.59	84	Columbus, OH	28.18
17	Bakersfield, CA	55.49	85	Jackson, MS	27.97
18	San Diego-Carlsbad-San Marcos, CA	55.33	86	Albany-Schenectady-Troy, NY	27.81
19	Colorado Springs, CO	54.90	87	San Jose-Sunnyvale-Santa Clara, CA	27.79
20	Denver-Aurora, CO	53.17	88	New Haven-Milford, CT	27.75
21	Reno-Sparks, NV	53.16	89	Manchester-Nashua, NH	27.71
22	Ogden-Clearfield, UT	52.91	90	Lancaster, PA	27.64
23	Modesto, CA	52.49	91	Greenville, SC	27.27
24	Salt Lake City, UT	51.60	92	Lexington-Fayette, KY	27.17
25	Boise City-Nampa, ID	51.57	93	Springfield, MA	27.08
26	Stockton, CA	51.17	94	Omaha-Council Bluffs, NE-IA	26.87
27	Oxnard-Thousand Oaks-Ventura, CA	50.95	95	Peoria, IL	26.76
28	Seattle-Tacoma-Bellevue, WA	50.56	96	Cincinnati-Middletown, OH-KY-IN	25.92
29	Brownsville-Harlingen, TX	49.78	97	Tulsa, OK	25.90
30	Tucson, AZ	47.63	98 Akron, OH	25.67	
31	Tampa-St. Petersburg-Clearwater, FL	47.61	99	Beaumont-Port Arthur, TX	25.45
32	Killeen-Temple-Fort Hood, TX	47.14	100	Wichita, KS	25.26
33	San Antonio, TX	45.68	101	York-Hanover, PA	24.82
34	Winston-Salem, NC	45.53	102	Birmingham-Hoover, AL	24.27
35	Palm Bay-Melbourne-Titusville, FL	45.35	103	Hartford-West Hartford-East Hartford, CT	23.68
36	Richmond, VA	44.69	104	Kansas City, MO-KS	23.56
37	Lakeland, FL	43.90	105	Shreveport-Bossier City, LA	23.35
38	Minneapolis-St. Paul-Bloomington, MN-WI	43.21	106	Grand Rapids-Wyoming, MI	23.10
39	Charleston-North Charleston, SC	43.21	107	Evansville, IN-KY	22.76
40	Deltona-Daytona Beach-Ormond Beach, FL	42.82	108	Harrisburg-Carlisle, PA	22.37
41	Santa Rosa-Petaluma, CA	42.53	109	Louisville, KY-IN	22.25
42	Madison, WI	42.39	110	St. Louis, MO-IL	22.11
43	Greensboro-High Point, NC	41.90	111	Hickory-Lenoir-Morganton, NC	21.94
44	Nashville-Davidson--Murfreesboro, TN	41.10	112	South Bend-Mishawaka, IN-MI	21.16
45	Salinas, CA	40.90	113	Milwaukee-Waukesha-West Allis, WI	21.15
46	Virginia Beach-Norfolk-Newport News, VA-NC	40.59	114	Scranton--Wilkes-Barre, PA	19.48
47	Indianapolis, IN	40.20	115	Albuquerque, NM	19.45
48	Portland-South Portland-Biddeford, ME	39.45	116	Anchorage, AK	19.45
49	Jacksonville, FL	38.83	117	Buffalo-Niagara Falls, NY	19.40
50	Allentown-Bethlehem-Easton, PA-NJ	37.84	118	Baton Rouge, LA	18.81
51	Knoxville, TN	37.45	119	Fort Wayne, IN	18.49
52	Trenton-Ewing, NJ	37.33	120	Pittsburgh, PA	18.48
53	Fayetteville, NC	37.31	121	Syracuse, NY	17.39
54	Visalia-Porterville, CA	37.21	122	Reading, PA	17.09
55	Portland-Vancouver-Beaverton, OR-WA	36.58	123	Mobile, AL	16.95
56	Memphis, TN-MS-AR	36.54	124	Lansing-East Lansing, MI	16.61
57	Worcester, MA	36.49	125	Toledo, OH	16.51
58	Chattanooga, TN-GA	36.39	126	Rochester, NY	14.81
59	Santa Barbara-Santa Maria-Goleta, CA	36.34	127 Cleveland-Elyria-Mentor, OH	14.36	
60	Bridgeport-Stamford-Norwalk, CT	36.18	128	Honolulu, HI	14.07
61	Spokane, WA	36.02	129	Charleston, WV	13.28
	Sample Average	35.69	130	Davenport-Moline-Rock Island, IA-IL	11.97
62	Corpus Christi, TX	35.53	131 Canton-Massillon, OH	11.51	
63	Asheville, NC	35.38	132	Dayton, OH	11.31
64	Durham, NC	34.33	133	Rockford, IL	11.29
65	Pensacola-Ferry Pass-Brent, FL	33.49	134 Youngstown-Warren-Boardman, OH-PA	1.41	
66	Poughkeepsie-Newburgh-Middletown, NY	33.26	135	Flint, MI	-1.60
67	Savannah, GA	33.16	136	New Orleans-Metairie-Kenner, LA	-5.91
68	Salem, OR	33.15			

Source: Moody's Economy.com

Table D-4. Rank of Metropolitan Areas by Percent Change in Productivity, 1995 - 2005

Rank	Metropolitan Area	Percent Change	Rank	Metropolitan Area	Percent Change
1	Des Moines, IA	39.48	69	Cape Coral-Fort Myers, FL	16.06
2	Charlotte-Gastonia-Concord, NC-SC	34.86	70	Santa Barbara-Santa Maria-Goleta, CA	15.95
3	Raleigh-Cary, NC	33.64	71	Tallahassee, FL	15.92
4	Hickory-Lenoir-Morganton, NC	32.21	72	Akron, OH	15.90
5	Vallejo-Fairfield, CA	31.87	73	Greenville, SC	15.85
6	Winston-Salem, NC	31.40	74	Port St. Lucie-Fort Pierce, FL	15.29
7	Greensboro-High Point, NC	30.28	75	Columbia, SC	15.15
8	Denver-Aurora, CO	28.95	76	Tampa-St. Petersburg-Clearwater, FL	15.00
9	Colorado Springs, CO	28.19	77	Fort Wayne, IN	14.80
10	Bridgeport-Stamford-Norwalk, CT	27.88	78	Wilmington, NC	14.78
11	Bakersfield, CA	27.27	79	Dayton, OH	14.76
12	Seattle-Tacoma-Bellevue, WA	25.97	80	Deltona-Daytona Beach-Ormond Beach, FL	14.73
13	Worcester, MA	25.65	81	Little Rock-North Little Rock, AR	14.55
14	Minneapolis-St. Paul-Bloomington, MN-WI	25.60	82	Wichita, KS	14.42
15	Killeen-Temple-Fort Hood, TX	25.44	83	Lansing-East Lansing, MI	14.41
16	Chattanooga, TN-GA	25.27	84	Birmingham-Hoover, AL	14.36
17	Kalamazoo-Portage, MI	24.95	85	Lakeland, FL	14.36
18	Virginia Beach-Norfolk-Newport News, VA-NC	24.79	86	Louisville, KY-IN	14.29
19	Oxnard-Thousand Oaks-Ventura, CA	23.46	87	Evansville, IN-KY	14.17
20	Richmond, VA	23.43	88	Eugene-Springfield, OR	14.11
21	San Jose-Sunnyvale-Santa Clara, CA	23.40	89	Pensacola-Ferry Pass-Brent, FL	14.09
22	Visalia-Porterville, CA	23.17	90	Salem, OR	13.96
23	Fayetteville, NC	23.16	91	McAllen-Edinburg-Pharr, TX	13.87
24	Memphis, TN-MS-AR	23.11	92	Jacksonville, FL	13.85
25	Tucson, AZ	22.67	93	Trenton-Ewing, NJ	13.80
26	Ogden-Clearfield, UT	22.55	94	Toledo, OH	13.79
27	Beaumont-Port Arthur, TX	22.45	95	Kansas City, MO-KS	13.76
28	Modesto, CA	22.40	96	Charleston-North Charleston, SC	13.72
29	Salt Lake City, UT	22.05	97	Las Vegas-Paradise, NV	13.56
30	San Antonio, TX	21.93	98	Cleveland-Elyria-Mentor, OH	13.43
31	Durham, NC	21.52	99	Poughkeepsie-Newburgh-Middletown, NY	13.30
32	Fayetteville-Springdale-Rogers, AR-MO	21.02	100	Lexington-Fayette, KY	13.15
33	San Diego-Carlsbad-San Marcos, CA	20.96	101	York-Hanover, PA	13.07
34	Indianapolis, IN	20.52	102	Syracuse, NY	13.05
35	Asheville, NC	20.23	103	Rochester, NY	12.80
36	Corpus Christi, TX	19.65	104	Orlando, FL	12.62
37	Madison, WI	19.54	105	St. Louis, MO-IL	12.57
38	Knoxville, TN	19.45	106	Columbus, OH	12.49
39	Fresno, CA	19.34	107	Huntsville, AL	12.42
40	Palm Bay-Melbourne-Titusville, FL	19.34	108	Cincinnati-Middletown, OH-KY-IN	12.28
41	Brownsville-Harlingen, TX	19.10	109	Harrisburg-Carlisle, PA	12.27
42	Austin-Round Rock, TX	19.06	110	Oklahoma City, OK	12.22
43	Portland-South Portland-Biddeford, ME	19.01	111	Omaha-Council Bluffs, NE-IA	12.21
44	Stockton, CA	18.97	112	Shreveport-Bossier City, LA	12.04
45	Spokane, WA	18.65	113	Pittsburgh, PA	11.83
46	Provo-Orem, UT	18.61	114	Rockford, IL	11.51
47	Augusta-Richmond County, GA-SC	18.59	115	Scranton--Wilkes-Barre, PA	11.44
48	Allentown-Bethlehem-Easton, PA-NJ	18.43	116	Sarasota-Bradenton-Venice, FL	11.28
49	Springfield, MA	18.29	117	Flint, MI	11.25
50	Nashville-Davidson--Murfreesboro, TN	18.27	118	Jackson, MS	11.14
51	El Paso, TX	18.19	119	Savannah, GA	11.02
52	Providence-New Bedford-Fall River, RI-MA	18.16	120	Manchester-Nashua, NH	11.00
53	Buffalo-Niagara Falls, NY	18.13	121	Tulsa, OK	10.96
54	Reno-Sparks, NV	18.07	122	Lancaster, PA	10.92
55	New Haven-Milford, CT	18.04	123	Springfield, MO	10.86
56	Montgomery, AL	17.85	124	Reading, PA	10.74
57	Sacramento--Arden-Arcade--Roseville, CA	17.67	125	Canton-Massillon, OH	10.66
58	South Bend-Mishawaka, IN-MI	17.64	126	Grand Rapids-Wyoming, MI	9.86
59	Hartford-West Hartford-East Hartford, CT	17.61	127	Boise City-Nampa, ID	9.15
60	Albany-Schenectady-Troy, NY	17.56	128	Mobile, AL	8.66
61	Naples-Marco Island, FL	17.50	129	Honolulu, HI	6.73
62	Portland-Vancouver-Beaverton, OR-WA	17.34	130	Baton Rouge, LA	5.47
63	Baltimore-Towson, MD	17.00	131	Davenport-Moline-Rock Island, IA-IL	4.17
	Sample Average	16.97	132	Youngstown-Warren-Boardman, OH-PA	3.48
64	Milwaukee-Waukesha-West Allis, WI	16.79	133	Charleston, WV	3.20
65	Salinas, CA	16.67	134	Albuquerque, NM	2.68
66	Peoria, IL	16.24	135	New Orleans-Metairie-Kenner, LA	1.70
67	Santa Rosa-Petaluma, CA	16.16	136	Anchorage, AK	-3.72
68	Ann Arbor, MI	16.11			

Source: Moody's Economy.com

Table D-5. Rank of Metropolitan Areas by Percent Change in Per Capita Income, 2001 - 2004

Rank	Metropolitan Name	Percent Change	Rank	Metropolitan Name	Percent Change
1	Fayetteville, NC	10.50	70	Scranton--Wilkes-Barre, PA	2.12
2	Killeen-Temple-Fort Hood, TX	8.27	71	Louisville, KY-IN	2.12
3	Virginia Beach-Norfolk-New port News, VA-NC	7.36	72	Orlando, FL	2.11
4	Honolulu, HI	6.69		Sample Average	1.90
5	Shreveport-Bossier City, LA	6.58	73	Columbus, OH	1.79
6	Corpus Christi, TX	6.19	74	New Haven-Milford, CT	1.72
7	Des Moines, IA	5.71	75	Indianapolis, IN	1.71
8	Davenport-Moline-Rock Island, IA-IL	5.60	76	Allentown-Bethlehem-Easton, PA-NJ	1.59
9	Fayetteville-Springdale-Rogers, AR-MO	5.54	77	Mobile, AL	1.58
10	Huntsville, AL	5.35	78	Springfield, MO	1.53
11	Evansville, IN-KY	5.30	79	Sacramento--Arden-Arcade--Roseville, CA	1.44
12	South Bend-Mishawaka, IN-MI	5.16	80	Salt Lake City, UT	1.38
13	Visalia-Porterville, CA	5.11	81	Winston-Salem, NC	1.35
14	San Diego-Carlsbad-San Marcos, CA	5.04	82	Flint, MI	1.27
15	Fresno, CA	5.03	83	Lancaster, PA	1.26
16	Montgomery, AL	4.91	84	Oklahoma City, OK	1.26
17	Bakersfield, CA	4.86	85	Tampa-St. Petersburg-Clearwater, FL	1.19
18	Birmingham-Hoover, AL	4.82	86	Milwaukee-Waukesha-West Allis, WI	1.12
19	Jackson, MS	4.76	87	Manchester-Nashua, NH	1.11
20	Buffalo-Niagara Falls, NY	4.75		88 Cleveland-Elyria-Mentor, OH	1.00
21	Oxnard-Thousand Oaks-Ventura, CA	4.72	89	Deltona-Daytona Beach-Ormond Beach, FL	0.96
22	Baltimore-Towson, MD	4.32	90	Dayton, OH	0.91
23	Omaha-Council Bluffs, NE-IA	4.32	91	Hartford-West Hartford-East Hartford, CT	0.90
24	Charleston-North Charleston, SC	4.28	92	Lakeland, FL	0.84
25	Little Rock-North Little Rock, AR	4.28	93	Lexington-Fayette, KY	0.80
26	Vallejo-Fairfield, CA	4.27	94	McAllen-Edinburg-Pharr, TX	0.76
27	Providence-New Bedford-Fall River, RI-MA	4.26	95	Kansas City, MO-KS	0.66
28	Las Vegas-Paradise, NV	4.20	96	York-Hanover, PA	0.60
29	El Paso, TX	4.16	97	Rochester, NY	0.55
30	Richmond, VA	4.15	98	Albany-Schenectady-Troy, NY	0.53
31	Kalamazoo-Portage, MI	4.12	99	Lansing-East Lansing, MI	0.48
32	Nashville-Davidson--Murfreesboro, TN	4.08	100	Spokane, WA	0.38
33	Madison, WI	4.07	101	Eugene-Springfield, OR	0.38
34	Harrisburg-Carlisle, PA	3.92	102	San Antonio, TX	0.34
35	Beaumont-Port Arthur, TX	3.78	103	Anchorage, AK	0.33
36	Peoria, IL	3.74	104	Grand Rapids-Wyoming, MI	0.18
37	Salinas, CA	3.61	105	Charlotte-Gastonia-Concord, NC-SC	0.10
38	Trenton-Ewing, NJ	3.55	106	Santa Rosa-Petaluma, CA	0.08
39	Cincinnati-Middletown, OH-KY-IN	3.45	107	Reading, PA	0.03
40	Modesto, CA	3.41		108 Canton-Massillon, OH	-0.02
41	Santa Barbara-Santa Maria-Goleta, CA	3.41	109	Colorado Springs, CO	-0.36
42	New Orleans-Metairie-Kenner, LA	3.33	110	Wichita, KS	-0.41
43	Akron, OH	3.32	111	Greenville, SC	-0.43
44	Ann Arbor, MI	3.31	112	Durham, NC	-0.45
45	St. Louis, MO-IL	3.28	113	Cape Coral-Fort Myers, FL	-0.50
46	Knoxville, TN	3.26	114	Worcester, MA	-0.56
47	Charleston, WV	3.25	115	Stockton, CA	-0.64
48	Seattle-Tacoma-Bellevue, WA	3.24	116	Greensboro-High Point, NC	-0.71
49	Portland-South Portland-Biddeford, ME	3.20	117	Reno-Sparks, NV	-0.88
50	Savannah, GA	3.16	118	Fort Wayne, IN	-0.95
51	Palm Bay-Melbourne-Titusville, FL	3.12	119	Poughkeepsie-Newburgh-Middletown, NY	-1.04
52	Pittsburgh, PA	3.09	120	Boise City-Nampa, ID	-1.30
53	Baton Rouge, LA	3.07	121	Albuquerque, NM	-1.33
54	Chattanooga, TN-GA	3.04	122	Rockford, IL	-1.46
55	Memphis, TN-MS-AR	3.02	123	Portland-Vancouver-Beaverton, OR-WA	-1.84
56	Syracuse, NY	3.01	124	Wilmington, NC	-2.20
57	Toledo, OH	2.90	125	Asheville, NC	-2.40
58	Tucson, AZ	2.86	126	Hickory-Lenoir-Morganton, NC	-2.62
59	Jacksonville, FL	2.81	127	Provo-Orem, UT	-2.70
60	Minneapolis-St. Paul-Bloomington, MN-WI	2.62	128	Denver-Aurora, CO	-2.71
61	Augusta-Richmond County, GA-SC	2.59	129	Sarasota-Bradenton-Venice, FL	-2.83
62	Brownsville-Harlingen, TX	2.55	130	Tulsa, OK	-3.94
63	Ogden-Clearfield, UT	2.54	131	Naples-Marco Island, FL	-4.00
64	Columbia, SC	2.54	132	Bridgeport-Stamford-Norwalk, CT	-4.45
65	Pensacola-Ferry Pass-Brent, FL	2.51	133	Port St. Lucie-Fort Pierce, FL	-5.12
66	Salem, OR	2.50	134	Raleigh-Cary, NC	-5.18
67	Tallahassee, FL	2.49	135	Austin-Round Rock, TX	-5.43
68	Springfield, MA	2.41	136	San Jose-Sunnyvale-Santa Clara, CA	-7.06
69	Youngstown-Warren-Boardman, OH-PA	2.25			

Source: U.S. Bureau of Economic Analysis

Table D-6. Rank of Metropolitan Areas by Percent Change in Employment, 2002 - 2005

Rank	Metropolitan Name	Percent Change	Rank	Metropolitan Name	Percent Change
1	Cape Coral-Fort Myers, FL	21.38	69	Charlotte-Gastonia-Concord, NC-SC	2.79
2	Las Vegas-Paradise, NV	19.12	70	Minneapolis-St. Paul-Bloomington, MN-WI	2.78
3	Port St. Lucie-Fort Pierce, FL	17.15	71	Chattanooga, TN-GA	2.65
4	McAllen-Edinburg-Pharr, TX	15.05	72	Asheville, NC	2.64
5	Orlando, FL	14.01	73	Cincinnati-Middletown, OH-KY-IN	2.59
6	Naples-Marco Island, FL	13.03	74	Davenport-Moline-Rock Island, IA-IL	2.53
7	Wilmington, NC	12.73	75	Baltimore-Towson, MD	2.50
8	Lakeland, FL	11.42	76	Oxnard-Thousand Oaks-Ventura, CA	2.43
9	Deltona-Daytona Beach-Ormond Beach, FL	11.32	77	San Antonio, TX	2.42
10	Fayetteville-Springdale-Rogers, AR-MO	11.30	78	Corpus Christi, TX	2.39
11	Sarasota-Bradenton-Venice, FL	10.90	79	Peoria, IL	2.28
12	Provo-Orem, UT	10.64	80	Oklahoma City, OK	2.05
13	Reno-Sparks, NV	9.71	81	Memphis, TN-MS-AR	2.03
14	Savannah, GA	9.42	82	El Paso, TX	2.03
15	Palm Bay-Melbourne-Titusville, FL	9.31	83	Colorado Springs, CO	2.00
16	Tampa-St. Petersburg-Clearwater, FL	9.16	84	Birmingham-Hoover, AL	1.99
17	Boise City-Nampa, ID	8.63	85	Kansas City, MO-KS	1.88
18	Killeen-Temple-Fort Hood, TX	7.70	86	Portland-South Portland-Biddeford, ME	1.87
19	Jacksonville, FL	7.32	87	Omaha-Council Bluffs, NE-IA	1.86
20	Huntsville, AL	7.11	88	Brownsville-Harlingen, TX	1.55
21	Raleigh-Cary, NC	7.09	89	Denver-Aurora, CO	1.52
22	Honolulu, HI	6.66	90	Louisville, KY-IN	1.48
23	Nashville-Davidson--Murfreesboro, TN	6.65	91	St. Louis, MO-IL	1.38
24	Ogden-Clearfield, UT	6.34	92	Albany-Schenectady-Troy, NY	1.26
25	Charleston-North Charleston, SC	6.22	93	Manchester-Nashua, NH	1.19
26	Anchorage, AK	5.98	94	Fort Wayne, IN	1.07
27	Trenton-Ewing, NJ	5.84	95	Fresno, CA	1.04
28	Springfield, MO	5.79	96	Winston-Salem, NC	1.03
29	Sacramento--Arden-Arcade--Roseville, CA	5.77	97	Columbus, OH	0.98
30	Richmond, VA	5.76	98	South Bend-Mishawaka, IN-MI	0.66
31	Stockton, CA	5.70	99	Tulsa, OK	0.61
32	Fayetteville, NC	5.67	100	Syracuse, NY	0.47
33	Tucson, AZ	5.63	101	Greensboro-High Point, NC	0.37
34	Pensacola-Ferry Pass-Brent, FL	5.56	102	Harrisburg-Carlisle, PA	0.33
35	Austin-Round Rock, TX	5.23	103	Reading, PA	0.33
36	Salem, OR	4.83	104	Charleston, WV	0.30
37	York-Hanover, PA	4.77	105	New Haven-Milford, CT	0.12
38	Tallahassee, FL	4.69	106	Grand Rapids-Wyoming, MI	0.02
39	Akron, OH	4.69	107	Worcester, MA	0.02
40	Shreveport-Bossier City, LA	4.64	108	Hartford-West Hartford-East Hartford, CT	-0.01
41	Allentown-Bethlehem-Easton, PA-NJ	4.64	109	Mobile, AL	-0.03
42	Baton Rouge, LA	4.63	110	Kalamazoo-Portage, MI	-0.18
43	Spokane, WA	4.60	111	Greenville, SC	-0.19
44	Salt Lake City, UT	4.56	112	Buffalo-Niagara Falls, NY	-0.35
45	Vallejo-Fairfield, CA	4.43	113	Rochester, NY	-0.35
46	Bakersfield, CA	4.42	114	Milwaukee-Waukesha-West Allis, WI	-0.48
47	Des Moines, IA	4.38	115	Bridgeport-Stamford-Norwalk, CT	-0.60
48	Albuquerque, NM	4.38	116	Youngstown-Warren-Boardman, OH-PA	-0.61
49	Madison, WI	4.14	117	Pittsburgh, PA	-0.62
50	Knoxville, TN	4.13	118	Durham, NC	-0.73
51	Eugene-Springfield, OR	4.03	119	Toledo, OH	-0.94
52	Modesto, CA	3.98	120	Springfield, MA	-0.99
53	San Diego-Carlsbad-San Marcos, CA	3.97	121	Cleveland-Elyria-Mentor, OH	-1.06
54	Poughkeepsie-Newburgh-Middletown, NY	3.86	122	Rockford, IL	-1.16
55	Jackson, MS	3.82	123	Ann Arbor, MI	-1.17
56	Providence-New Bedford-Fall River, RI-MA	3.82	124	Salinas, CA	-1.21
57	Portland-Vancouver-Beaverton, OR-WA	3.81	125	Evansville, IN-KY	-1.26
58	Montgomery, AL	3.80	126	Santa Rosa-Petaluma, CA	-1.68
59	Little Rock-North Little Rock, AR	3.75	127	Beaumont-Port Arthur, TX	-1.93
60	Scranton--Wilkes-Barre, PA	3.64	128	Wichita, KS	-2.14
61	Augusta-Richmond County, GA-SC	3.49	129	Dayton, OH	-2.56
	Sample Average	3.42	130	Lansing-East Lansing, MI	-2.64
62	Santa Barbara-Santa Maria-Goleta, CA	3.39	131	Visalia-Porterville, CA	-2.71
63	Indianapolis, IN	3.36	132	Canton-Massillon, OH	-2.77
64	Virginia Beach-Norfolk-Newport News, VA-NC	3.18	133	Flint, MI	-3.29
65	Lancaster, PA	3.05	134	Hickory-Lenoir-Morganton, NC	-4.28
66	Seattle-Tacoma-Bellevue, WA	2.89	135	San Jose-Sunnyvale-Santa Clara, CA	-5.09
67	Lexington-Fayette, KY	2.84	136	New Orleans-Metairie-Kenner, LA	-11.22
68	Columbia, SC	2.83			

Source: Moody's Economy.com

Table D-7. Rank of Metropolitan Areas by Percent Change in Gross Metropolitan Product, 2002 - 2005

Rank	Metropolitan Name	Percent Change	Rank	Metropolitan Name	Percent Change
1	Las Vegas-Paradise, NV	27.60	69	Portland-South Portland-Biddeford, ME	10.13
2	Cape Coral-Fort Myers, FL	24.37	70	Santa Barbara-Santa Maria-Goleta, CA	10.11
3	Port St. Lucie-Fort Pierce, FL	24.36	71	Albuquerque, NM	10.10
4	Fayetteville-Springdale-Rogers, AR-MO	22.52	72	Birmingham-Hoover, AL	10.08
5	Vallejo-Fairfield, CA	22.11	73	Colorado Springs, CO	10.08
6	McAllen-Edinburg-Pharr, TX	20.95	74	Lexington-Fayette, KY	9.97
7	Fayetteville, NC	20.69	75	Springfield, MO	9.94
8	Bakersfield, CA	19.87	76	Salt Lake City, UT	9.80
9	Wilmington, NC	19.64	77	Portland-Vancouver-Beaverton, OR-WA	9.76
10	Palm Bay-Melbourne-Titusville, FL	18.79	78	Augusta-Richmond County, GA-SC	9.61
11	Reno-Sparks, NV	18.73	79	Eugene-Springfield, OR	9.51
12	Pensacola-Ferry Pass-Brent, FL	18.53	80	Allentown-Bethlehem-Easton, PA-NJ	9.49
13	Orlando, FL	18.39	81	Akron, OH	9.39
14	Killeen-Temple-Fort Hood, TX	18.28	82	Baltimore-Towson, MD	9.31
15	Deltona-Daytona Beach-Ormond Beach, FL	18.25	83	Tulsa, OK	9.28
16	Modesto, CA	18.04	84	Reading, PA	9.14
17	Naples-Marco Island, FL	17.85	85	Providence-New Bedford-Fall River, RI-MA	9.07
18	Sarasota-Bradenton-Venice, FL	17.32	86	Spokane, WA	9.02
19	Lakeland, FL	16.39	87	Madison, WI	8.86
20	Boise City-Nampa, ID	16.19	88	Jackson, MS	8.84
21	Des Moines, IA	16.00	89	Harrisburg-Carlisle, PA	8.71
22	Sacramento--Arden-Arcade--Roseville, CA	15.95	90	Springfield, MA	8.50
23	Provo-Orem, UT	15.65	91	Denver-Aurora, CO	8.44
24	Savannah, GA	15.18	92	Salinas, CA	8.37
25	Honolulu, HI	14.84	93	Syracuse, NY	8.35
26	Huntsville, AL	14.69	94	Winston-Salem, NC	8.30
27	Raleigh-Cary, NC	14.65	95	Columbia, SC	8.14
28	Austin-Round Rock, TX	14.58	96	Scranton--Wilkes-Barre, PA	7.87
29	Stockton, CA	14.20	97	Brownsville-Harlingen, TX	7.83
30	Oxnard-Thousand Oaks-Ventura, CA	14.19	98	Buffalo-Niagara Falls, NY	7.74
31	Richmond, VA	14.15	99	Trenton-Ewing, NJ	7.63
32	Tucson, AZ	13.86	100	Greensboro-High Point, NC	7.59
33	Charleston-North Charleston, SC	13.86	101	Mobile, AL	7.43
34	Jacksonville, FL	13.76	102	El Paso, TX	7.14
35	San Diego-Carlsbad-San Marcos, CA	13.73	103	Santa Rosa-Petaluma, CA	7.00
36	Nashville-Davidson--Murfreesboro, TN	13.65	104	Kalamazoo-Portage, MI	6.94
37	Ogden-Clearfield, UT	13.19	105	Louisville, KY-IN	6.83
38	Knoxville, TN	13.11	106	Milwaukee-Waukesha-West Allis, WI	6.81
39	Visalia-Porterville, CA	13.04	107	Kansas City, MO-KS	6.75
40	Shreveport-Bossier City, LA	12.96	108	New Haven-Milford, CT	6.38
41	Corpus Christi, TX	12.79	109	Fort Wayne, IN	6.26
42	Anchorage, AK	12.40	110	Peoria, IL	6.02
43	Tampa-St. Petersburg-Clearwater, FL	12.19	111	San Jose-Sunnyvale-Santa Clara, CA	5.92
44	San Antonio, TX	11.99	112	Cincinnati-Middletown, OH-KY-IN	5.81
45	Virginia Beach-Norfolk-Newport News, VA-NC	11.92	113	Davenport-Moline-Rock Island, IA-IL	5.75
46	Oklahoma City, OK	11.90	114	Columbus, OH	5.72
47	Bridgeport-Stamford-Norwalk, CT	11.57	115	Rochester, NY	5.67
48	Memphis, TN-MS-AR	11.52	116	Pittsburgh, PA	5.40
49	Baton Rouge, LA	11.43	117	Cleveland-Elyria-Mentor, OH	5.35
50	Tallahassee, FL	11.40	118	St. Louis, MO-IL	5.34
51	Chattanooga, TN-GA	11.36	119	Hickory-Lenoir-Morganton, NC	5.33
52	Charlotte-Gastonia-Concord, NC-SC	11.34	120	Toledo, OH	5.17
53	Little Rock-North Little Rock, AR	11.29	121	Charleston, WV	5.05
54	Beaumont-Port Arthur, TX	11.17	122	South Bend-Mishawaka, IN-MI	5.01
55	Asheville, NC	11.16	123	Durham, NC	4.97
56	York-Hanover, PA	11.15	124	Lancaster, PA	4.86
57	Poughkeepsie-Newburgh-Middletown, NY	10.92	125	Evansville, IN-KY	3.96
58	Omaha-Council Bluffs, NE-IA	10.83	126	Youngstown-Warren-Boardman, OH-PA	3.72
	Sample Average	10.63	127	Greenville, SC	3.50
59	Albany-Schenectady-Troy, NY	10.53	128	Rockford, IL	3.18
60	Minneapolis-St. Paul-Bloomington, MN-WI	10.50	129	Dayton, OH	2.94
61	Fresno, CA	10.46	130	Wichita, KS	2.92
62	Worcester, MA	10.45	131	Ann Arbor, MI	2.46
63	Indianapolis, IN	10.45	132	Canton-Massillon, OH	2.42
64	Seattle-Tacoma-Bellevue, WA	10.44	133	Grand Rapids-Wyoming, MI	0.08
65	Montgomery, AL	10.38	134	Lansing-East Lansing, MI	-0.45
66	Hartford-West Hartford-East Hartford, CT	10.26	135	Flint, MI	-1.31
67	Salem, OR	10.25	136	New Orleans-Metairie-Kenner, LA	-6.15
68	Manchester-Nashua, NH	10.19			

Source: Moody's Economy.com

Table D-8. Rank of Metropolitan Areas by Percent Change in Productivity, 2002 - 2005

Rank	Metropolitan Name	Percent Change	Rank	Metropolitan Name	Percent Change
1	Vallejo-Fairfield, CA	16.93	69	Nashville-Davidson--Murfreesboro, TN	6.56
2	Visalia-Porterville, CA	16.19	70	Santa Barbara-Santa Maria-Goleta, CA	6.51
3	Bakersfield, CA	14.79	71	Baton Rouge, LA	6.50
4	Fayetteville, NC	14.22	72	Cleveland-Elyria-Mentor, OH	6.48
5	Modesto, CA	13.53	73	Ogden-Clearfield, UT	6.44
6	Beaumont-Port Arthur, TX	13.36	74	Tallahassee, FL	6.41
7	Pensacola-Ferry Pass-Brent, FL	12.29	75	Montgomery, AL	6.34
8	Bridgeport-Stamford-Norwalk, CT	12.24	76	New Haven-Milford, CT	6.26
9	San Jose-Sunnyvale-Santa Clara, CA	11.60	77	Deltona-Daytona Beach-Ormond Beach, FL	6.23
10	Oxnard-Thousand Oaks-Ventura, CA	11.48	78	Brownsville-Harlingen, TX	6.19
11	Des Moines, IA	11.13	79	Toledo, OH	6.17
12	Worcester, MA	10.42	80	Port St. Lucie-Fort Pierce, FL	6.16
13	Hartford-West Hartford-East Hartford, CT	10.28	81	Wilmington, NC	6.13
14	Corpus Christi, TX	10.16	82	York-Hanover, PA	6.09
15	Fayetteville-Springdale-Rogers, AR-MO	10.08	83	Anchorage, AK	6.06
16	Hickory-Lenoir-Morganton, NC	10.03	84	Pittsburgh, PA	6.06
17	Killeen-Temple-Fort Hood, TX	9.83	85	Rochester, NY	6.05
18	Salinas, CA	9.70	86	Jacksonville, FL	6.00
19	Oklahoma City, OK	9.65	87	Augusta-Richmond County, GA-SC	5.91
20	Sacramento--Arden-Arcade--Roseville, CA	9.62	88	Sarasota-Bradenton-Venice, FL	5.79
21	Springfield, MA	9.59	89	Durham, NC	5.74
22	San Diego-Carlsbad-San Marcos, CA	9.38	90	Portland-Vancouver-Beaverton, OR-WA	5.73
23	San Antonio, TX	9.35	91	New Orleans-Metairie-Kenner, LA	5.70
24	Fresno, CA	9.33	92	Dayton, OH	5.64
25	Memphis, TN-MS-AR	9.30	93	Albuquerque, NM	5.48
26	Albany-Schenectady-Troy, NY	9.15	94	Canton-Massillon, OH	5.34
27	Manchester-Nashua, NH	8.89	95	Evansville, IN-KY	5.28
28	Austin-Round Rock, TX	8.88	96	Louisville, KY-IN	5.27
29	Santa Rosa-Petaluma, CA	8.82	97	Eugene-Springfield, OR	5.27
30	Omaha-Council Bluffs, NE-IA	8.81	98	Savannah, GA	5.26
31	Reading, PA	8.79	99	Salem, OR	5.17
32	Palm Bay-Melbourne-Titusville, FL	8.67	100	Wichita, KS	5.17
33	Knoxville, TN	8.63	101	Columbia, SC	5.16
34	Tulsa, OK	8.61	102	Fort Wayne, IN	5.13
35	Chattanooga, TN-GA	8.49	103	McAllen-Edinburg-Pharr, TX	5.13
36	Virginia Beach-Norfolk-Newport News, VA-NC	8.46	104	Providence-New Bedford-Fall River, RI-MA	5.06
37	Harrisburg-Carlisle, PA	8.35	105	Salt Lake City, UT	5.01
38	Charlotte-Gastonia-Concord, NC-SC	8.32	106	El Paso, TX	5.01
39	Asheville, NC	8.30	107	Jackson, MS	4.83
40	Reno-Sparks, NV	8.22	108	Kansas City, MO-KS	4.79
41	Buffalo-Niagara Falls, NY	8.11	109	Charleston, WV	4.74
42	Portland-South Portland-Biddeford, ME	8.11	110	Columbus, OH	4.69
43	Stockton, CA	8.05	111	Allentown-Bethlehem-Easton, PA-NJ	4.64
44	Shreveport-Bossier City, LA	7.95	112	Madison, WI	4.53
45	Birmingham-Hoover, AL	7.93	113	Provo-Orem, UT	4.52
46	Richmond, VA	7.93	114	Akron, OH	4.49
47	Colorado Springs, CO	7.92	115	Lakeland, FL	4.46
48	Syracuse, NY	7.85	116	Rockford, IL	4.39
49	Tucson, AZ	7.79	117	Youngstown-Warren-Boardman, OH-PA	4.36
50	Honolulu, HI	7.67	118	South Bend-Mishawaka, IN-MI	4.32
51	Minneapolis-St. Paul-Bloomington, MN-WI	7.51	119	Naples-Marco Island, FL	4.26
52	Mobile, AL	7.46	120	Spokane, WA	4.22
53	Seattle-Tacoma-Bellevue, WA	7.34	121	Scranton--Wilkes-Barre, PA	4.08
54	Milwaukee-Waukesha-West Allis, WI	7.33	122	Springfield, MO	3.93
55	Little Rock-North Little Rock, AR	7.28	123	St. Louis, MO-IL	3.90
56	Winston-Salem, NC	7.20	124	Orlando, FL	3.84
57	Greensboro-High Point, NC	7.20	125	Greenville, SC	3.70
58	Charleston-North Charleston, SC	7.19	126	Ann Arbor, MI	3.67
59	Kalamazoo-Portage, MI	7.13	127	Peoria, IL	3.66
60	Las Vegas-Paradise, NV	7.12	128	Davenport-Moline-Rock Island, IA-IL	3.14
61	Huntsville, AL	7.07	129	Cincinnati-Middletown, OH-KY-IN	3.14
62	Raleigh-Cary, NC	7.06	130	Tampa-St. Petersburg-Clearwater, FL	2.78
	Sample Average	6.99	131	Cape Coral-Fort Myers, FL	2.47
63	Boise City-Nampa, ID	6.96	132	Lansing-East Lansing, MI	2.26
64	Lexington-Fayette, KY	6.94	133	Flint, MI	2.04
65	Indianapolis, IN	6.85	134	Lancaster, PA	1.76
66	Denver-Aurora, CO	6.82	135	Trenton-Ewing, NJ	1.69
67	Poughkeepsie-Newburgh-Middletown, NY	6.80	136	Grand Rapids-Wyoming, MI	0.06
68	Baltimore-Towson, MD	6.64			

Source: Moody's Economy.com

**APPENDIX E:
NEO AND ITS METROPOLITAN AREAS: VALUES AND RANKINGS BY
INDICATOR AND VARIABLE**

**TABLE E-1. RANKING OF NEO'S METROPOLITAN AREAS BY FACTOR AND BY THEIR
VARIABLES, 2000 AND 2005**

TABLE E-2. RANKING OF NEO'S METROPOLITAN AREAS BY INDICATOR SCORES

Table E-1. NEO Metropolitan Areas Ranked by Each Variable

Factors and Variables	Akron MSA				Canton-Massillon MSA				Cleveland-Elyria-Mentor MSA				Youngstown-Warren-Boardman				NEO Average	
	2000		2005		2000		2005		2000		2005		2000		2005		2000	2005
	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Value
Skilled Workforce & R&D		74		58		119		117		66		64		128		129		
pct. of population in professional occupations	32.0	81	34.1	59	28.1	122	28.7	114	33.5	58	33.9	64	26.1	133	26.5	130	31.6	32.3
pct. of population with graduate or professional degree	8.1	73	9.7	61	5.9	121	6.1	124	8.7	61	10.0	52	5.3	127	5.6	128	7.7	8.9
pct. of population with bachelor's degree	16.2	56	18.4	48	11.5	119	12.6	122	15.2	75	16.6	80	11.0	125	11.7	129	14.3	15.7
industry R&D per employee	417.3	66	353.5	74	394.6	69	476.5	64	719.7	47	759.7	50	57.4	132	50.6	132	397.2	410.1
SBIR & STTR awards per employee	5.78	44	6.54	62	0.00	103	0.00	114	9.30	33	26.63	23	0.00	136	0.00	136	6.51	16.75
population dependency	0.38	71	0.37	54	0.40	110	0.38	96	0.40	109	0.38	99	0.41	119	0.39	111	0.40	0.38
university R&D per employee	109.0	49	140.8	51	0.0	98	0.0	94	193.1	34	235.8	37	2.6	84	4.5	79	76.2	95.3
Technology Commercialization		36		60		91		97		35		57		125		134		
venture capital per employee	270.2	60	0.0	95	0.0	114	8.3	83	840.4	29	239.9	36	39.5	96	5.0	87	550.4	141.5
number of patents per employee	1.424	18	1.437	20	0.902	33	1.095	27	0.845	38	0.803	42	0.392	88	0.307	96	0.889	0.881
cost of living	96.2	66	89.0	100	91.6	117	84.7	126	97.9	49	89.7	95	90.0	126	83.8	132	93.9	86.8
Racial Inclusion & Income Equality		69		69		40		74		119		124		81		105		
pct. of black population	10.9	86	11.5	88	6.7	58	6.4	56	19.1	107	19.4	111	10.6	84	10.5	81	15.0	15.1
isolation index for black population	0.61	106	0.47	112	0.42	79	0.28	82	0.79	131	0.68	136	0.65	114	0.53	123	0.62	0.49
income inequality	5.8	62	5.5	40	5.1	21	7.5	117	6.3	88	6.8	102	5.5	48	7.1	110	5.7	6.7
share of students at schools with more than 70% free lunches	0.121	81	0.062	78	0.084	64	0.046	60	0.259	121	0.136	119	0.153	98	0.091	99	0.199	0.105
violent crime rate	191.7	4	274.7	18	403.3	45	386.9	49	436.7	54	401.9	54	348.4	33	323.4	30	345.0	346.7
Urban Assimilation		127		129		136		134		86		93		130		127		
pct. of Hispanic population	0.8	134	1.0	133	0.9	131	0.9	134	3.4	85	3.8	94	1.7	117	1.9	122	2.4	2.7
share of minority business employment (in total emp)	0.010	118	0.010	118	0.009	122	0.009	122	0.017	75	0.017	75	0.012	107	0.012	107	0.014	0.014
pct. of foreign-born population	3.0	113	3.2	117	1.7	131	1.9	132	5.3	71	5.6	83	2.0	129	1.7	134	4.0	4.1
productivity in information sector	98.5	94	146.5	96	89.2	121	144.8	100	98.1	97	145.5	97	97.4	99	161.6	70	97.5	147.3
pct. of Asian population	1.3	92	1.6	89	0.5	134	0.6	133	1.4	82	1.8	76	0.4	136	0.5	136	1.1	1.4
Legacy of Place		30		29		17		17		16		16		6		7		
business churning	0.171	112	0.169	114	0.157	133	0.157	130	0.171	114	0.171	110	0.161	128	0.158	128	0.168	0.167
climate	19	114	19	114	14	122	14	122	15	119	15	119	8	128	8	128	14.0	14.0
pct. of houses built before 1940	20.7	108	21.2	110	24.1	120	24.0	117	24.3	121	25.9	120	23.6	117	22.4	111	23.5	24.3
dissimilarity index for black population	0.70	110	0.66	115	0.61	93	0.60	101	0.80	135	0.78	132	0.77	130	0.73	126	0.72	0.69
city poverty ratio	1.79	97	1.78	98	2.05	109	2.27	115	2.44	124	2.34	119	2.16	111	2.03	107	2.21	2.17
No. of government units per capita	1.266	63	1.266	63	1.843	94	1.843	94	0.968	44	0.968	44	2.504	113	2.504	113	1.355	1.355
share of manufacturing employment	0.19	115	0.17	114	0.24	130	0.19	121	0.17	107	0.16	109	0.20	124	0.21	129	0.18	0.18
Business Dynamics		89		93		81		112		100		127		104		123		
business openings over business closings	1.01	89	1.10	93	1.03	81	1.05	112	0.99	100	0.99	127	0.98	104	1.00	123	0.995	1.01
Individual Entrepreneurship		104		101		100		81		102		94		87		74		
pct. of self employed (all industries except ag & mining)	0.083	84	0.094	93	0.082	89	0.095	90	0.082	90	0.089	110	0.080	99	0.088	113	0.082	0.090
share of business establishments with under 20 workers	0.837	106	0.840	99	0.840	94	0.846	76	0.839	98	0.846	75	0.849	70	0.853	51	0.840	0.846
Locational Amenities		71		49		110		62		3		16		114		74		
transportation index (Almanac)	69.7	76	38.0	71	65.4	83	54.0	47	96.3	10	73.0	25	49.0	109	24.0	98	n/a	n/a
arts index (Almanac)	81.6	37	76.0	45	8.8	132	36.0	107	97.2	6	94.0	10	21.8	124	65.0	70	n/a	n/a
recreation index (Almanac)	77.3	54	76.0	34	68.0	77	70.0	46	99.7	2	92.0	8	73.7	64	63.0	61	n/a	n/a
health index (Almanac)	24.1	117	33.0	78	34.3	103	53.0	47	84.7	29	23.0	102	20.4	122	48.0	57	n/a	n/a
Urban/ Metro Structure		38		66		32		42		35		23		18		16		
share of city population in MSA population	0.31	75	0.29	71	0.20	38	0.18	38	0.22	42	0.20	42	0.14	17	0.12	14	0.22	0.20
property crime rate	2795.4	16	3772.9	61	3423.7	37	3764.9	60	3423.2	36	2759.1	21	3319.2	32	3185.0	34	3240.4	3370.5

Table E-2. Comparison of Factor Scores of Northeast Ohio MSAs

Indicator	Akron		Canton		Cleveland		Youngstown	
	2000	2005	2000	2005	2000	2005	2000	2005
Skilled Workforce and R&D Factor	-0.71	-0.02	-4.06	-4.01	-0.43	-0.13	-5.12	-5.20
Technology Commercialization Factor	0.10	-0.35	-0.60	-0.70	0.12	-0.33	-0.98	-1.13
Racial Inclusion & Income Equality Factor	0.26	0.20	1.42	0.04	-2.70	-3.01	-0.24	-1.26
Urban Assimilation Factor	-1.96	-2.10	-2.30	-2.34	-1.32	-1.45	-2.01	-2.06
Legacy of Place Factor	3.43	3.39	4.78	4.68	4.81	4.68	5.65	5.49
Business Dynamics Variable	1.01	-0.26	1.03	-0.51	0.99	-0.78	0.98	-0.71
Entrepreneurship Factor	-0.60	-0.53	-0.56	-0.34	-0.58	-0.44	-0.48	-0.29
Locational Amenities Factor	0.16	0.58	-1.99	0.28	3.28	2.28	-2.28	-0.14
Urban Structure Score	0.73	0.19	0.87	0.63	0.77	1.08	1.17	1.19

Note: 2005 refers to data from 2005 or earlier years if 2005 data were not available.