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# Traditional Regional Economic Indicators 2006

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# TRADITIONAL REGIONAL ECONOMIC INDICATORS

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## EXECUTIVE SUMMARY

Eleven Metropolitan Statistical Areas from across the Midwest and the nation were selected for a comparative and competitive analysis with the Youngstown-Warren-Boardman Metropolitan Statistical Area, based on the following criteria: ***size*** (total population and labor force); ***structure*** (traditional manufacturing industrial structure); ***unemployment*** (percent annual unemployment rate); and ***location*** (comparable Midwest Metropolitan Areas), including similar metropolitan areas outside the Midwest Rust belt.

Inclusive of the Youngstown-Warren-Boardman MSA, twelve comparable metropolitan areas were analyzed using the following traditional regional economic indicator and sub-indicator variables: total employment and percentage change in employment; unemployment rate; annual average wages and percentage change in wages; per capita personal income (PCPI) and percentage change in income; gross metropolitan product (GMP), projected GMP and percentage change in projected GMP; productivity per employee (PPE) and percentage change in PPE.

The ***performance raw scores*** of each of the twelve Metropolitan Statistical Areas in each of these indicator variables were ***nominally*** ranked on selected base years, and thereafter, on their percentage growth rates as follows:

***Total Employment***:

Between 2000 and 2004, the following MSAs: Knoxville, TN; Allentown-Bethlehem-Easton, PA; Harrisburg-Carlisle, PA; Akron, OH; Scranton-Wilkes-Barre, PA; and Birmingham-Hoover, AL, were ranked in the top half of the group in first, second, third, fourth, fifth, and sixth place respectively, because each gained moderately in employment growth. The remaining MSAs, inclusive of the three Ohio MSAs−Youngstown, Canton and Toledo−did not fare so well. While Toledo ranked eighth with a loss of 8,862 employees, Youngstown ranked tenth with a loss of 9,078, and Canton ranked ninth with a loss of 6,180 employees during the period.

***Unemployment Rate:***

In the 2004 base year, the national unemployment rate was 5.5%. Of the twelve MSAs analyzed, five had unemployment rates ***lower*** than the nation: 4.1% for Knoxville, TN; 4.5% for Harrisburg-Carlisle, PA; 4.8% for Birmingham-Hoover, AL; 5.2% for Fort Wayne, IN; and 5.3% for Allentown-Bethlehem-Easton, PA. Of the remaining seven MSAs with higher unemployment rates than the national average, the Flint, MI, MSA

had the highest unemployment rate at 8.3%, followed by Youngstown-Warren-Boardman, OH, MSA at 7.2%.

***Per Capita Personal Income (PCPI):***

Between 1999 and 2003, the following six MSAs were ranked in the top six tiers of per capita personal income growth: Birmingham-Hoover, AL; Knoxville, TN; Scranton-Wilkes-Barre, PA; Harrisburg-Carlisle, PA; Allentown-Bethlehem-Easton, PA; and Toledo, OH. The remaining three Ohio MSAs−Youngstown-Warren-Boardman, Akron, and Canton-Massillon−respectively ranked in the seventh, eighth, and tenth place.

***Average Annual Wages:***

Three of Ohio's MSAs were ranked in the top seven tiers of annual wage growth between 2001 and 2004. These included the Akron MSA in third place, the Youngstown-Warren-Boardman MSA in fourth place, and the Toledo MSA in seventh place. On the other hand, the Birmingham-Hoover, AL, MSA and Harrisburg-Carlisle, PA, MSA ranked in first and second place respectively.

***Gross Metropolitan Product:***

Between 2000 and 2004, the Knoxville, TN, MSA had the highest percentage growth with 32.93%, followed by the Allentown-Bethlehem-Easton, PA, MSA in second place with 26.12%; the Birmingham-Hoover,

AL, MSA in third place with 21.27%; and the Harrisburg-Carlisle, PA, MSA in fourth place with 21.05%; while the Akron, OH, MSA came in fifth with a growth rate of 19.9%. The remaining three Ohio MSAs of Youngstown-Warren-Boardman, Canton and Toledo, respectively scored 9.46%, 10.12% and 12.29% and ranked eleventh, tenth and ninth place respectively.

***Employee Productivity (Value Added):***

When employee productivity was assessed between 2000-2004, the following MSAs were ranked in the top five positions: Knoxville, Birmingham, Allentown, Gary, and Akron in first, second, third, fourth, and fifth place respectively. During the same period, employee productivity rates in the Youngstown-Warren-Boardman, OH, MSA and Flint, MI, MSA were at the bottom of the pile in eleventh and twelfth place respectively.

***Scores Aggregation:***

The variable scores were subsequently normalized, aggregated, and ranked to delineate overall levels of competitiveness among the MSAs (see Appendix A, Table 1). The MSA that ranked first with an overall aggregate score of 7.40 out of a maximum of 10 points was the **Allentown-Bethlehem-Easton, PA, MSA;** followed by the **Birmingham-Hoover, AL, MSA** with an aggregate score of 7.00; while the **Akron, OH, MSA** and the **Harrisburg-Carlisle, PA, MSA** ranked fourth and fifth with aggregate

scores of 5.40 and 5.30 respectively. The **Youngstown-Warren-Boardman MSA** ranked eleventh with an aggregate score of 2.83; while the **Canton-Massillon, OH, MSA** ranked twelfth and last with aggregate score of 2.11.

In retrospect, an earlier, similar study was conducted by the staff of the Levin College of Urban Affairs at Cleveland State University, Ohio, in which the Youngstown-Warren-Boardman MSA was compared with 35 other larger metropolitan areas in the Midwest and the nation. The study drew strong criticism from local media from the Mahoning Valley because the Youngstown MSA ranked last in all categories. The basis for the media's disenchantment was that the researchers were basically comparing apples and oranges based on the fact that the Youngstown MSA was unfavorably compared with other much larger and stronger metropolitan areas in the Midwest and the nation.

This study, on the other hand, has leveled the playing field in terms of metropolitan size selection, comparable labor force, and traditional manufacturing culture. Still, the outcome remains virtually the same, as the Youngstown MSA is seen to be ***second*** from the bottom of the twelve comparable MSAs nationwide. What this means is that the Youngstown-Warren-Boardman MSA has a long way to go to catch up economically with

its counterparts both in the Midwest and the nation. The economic development decision-makers in the region need to do something, albeit quickly, to make the Youngstown-Warren-Boardman MSA as competitive as other comparable MSAs of its size in the Midwest and nation, if not in the world.

## TABLE OF CONTENTS

**Page Number**

## LIST OF TABLES

**Page Number**



## LIST OF FIGURES

# TRADITIONAL ECONOMIC INDICATORS FOR MEASURING THE COMPETITIVENESS OF THE YOUNGSTOWN-WARREN-BOARDMAN METROPOLITAN STATISTICAL AREA (MSA)

## INTRODUCTTION

In an increasingly competitive New World Economy, where a region's comparative advantage is the key to attracting companies to locate in it, metropolitan areas large and small across the country continue to benchmark their regions against selected competitors, examining economic indicators that are critical to attracting businesses and industries. Correspondingly, we will evaluate the Youngstown-Warren-Boardman MSA using the oft-touted traditional economic indicators.

Included among these traditional economic indicators will be total employment, per capita personal income, average annual wages (income), gross metropolitan product, productivity per employee, and unemployment. A comparative analysis of sub-indicator variables such as percentage changes over time will also be carried out. For example, the per capita income and average wages of a metropolitan area (among others) have been traditionally used as an economic barometer for reading the strength or

weakness of a target region for objective business decision-making by a prospective investor.

## OBJECTIVE

The primary objective of this analysis is to see how the new Youngstown-Warren-Boardman MSA compares, favorably or unfavorably, with other metropolitan areas of its size and traditional manufacturing industrial structure in the Midwest, Northeast region, and other parts of the country. Accordingly, this analysis will assist economic development decision-makers in the Youngstown-Warren-Boardman MSA and other comparable MSAs utilized in this study in developing effective strategies to improve the status quo of their MSAs, in order to facilitate the competitive growth and expansion of economic activities of their regions.

## SELECTION CRITERIA FOR COMPARABLE METROPOLITAN STATISTICAL AREAS

From the stated objective above, the variables impacting the selection process of comparable MSAs were: size of the metropolitan area (total population and labor force); structure of the area (traditional industrial sectors); percentage annual unemployment (percentage annual

unemployment rate of the target MSA); and location (comparable Midwest metropolitan areas and others across the nation). For this study, eleven comparable Metropolitan Areas were selected as benchmarks to the Youngstown-Warren-Boardman MSA in which at least two of the three variables above were considered the best fit. Accordingly, the eleven MSAs selected were: the Akron, OH, MSA; Allentown-Bethlehem-Easton, PA-NJ, MSA; Birmingham-Hoover, AL, MSA; Canton-Massillon, OH, MSA; Flint, MI, MSA; Fort Wayne, IN, MSA; Gary, IN, MSA; Harrisburg-Carlisle, PA, MSA; Knoxville, TN, MSA; Scranton-Wilkes-Barre, PA, MSA; and Toledo, OH, MSA.

This study is divided into ***two*** specific sections. The first section analyzes the performances of the twelve metropolitan areas based on ***nominal or raw rankings*** of each of the traditional indicator and sub-indicator variables. The second section involves the neutralization of the different variable units through a ***normalization process***, followed by aggregation of the scores and final rankings of each of the twelve metropolitan areas. It will be seen that the ***raw score ranking positions*** of the metropolitan areas on variable indicators will be different from the ranking positions of these metropolitan

areas using the *aggregate scores.* The aggregate rankings show the actual competitive level of each of the metropolitan areas vis-à-vis its counterparts.

## SECTION I - TRADITIONAL INDICATORS INDEX

This section of the analysis deals with nominal or raw score rankings of the twelve metropolitan areas using the indicator and sub-indicator variables shown below (see Table 1).

### TABLE 1

### INDICATOR VARIABLES

| Indicator Variables | Sub-Indicator Variables |
|---|---|
| **Per Capita Personal Income (PCPI)** | **2003 Per Capita Personal Income, and Percent Change in Income, 1999-2003** |
| **Average Annual Wages** | **2004 Average Wages, and Percent Change in Wages, 2001-2004** |
| **Total Employment** | **Percent Change in Employment, 2000-2004** |
| **Unemployment** | **2004 Unemployment Rate** |
| **Gross Metropolitan Product (GMP)** | **2004 GMP Analysis,<br>2012 GMP Projection Analysis<br>Projection Percentage Growth Changes in GMP, 2004-2012** |
| **Productivity Per Employee (PPE)** | **2004 Productivity per Employee; and Percent Change in Employee Productivity** |

## TRADITIONAL ECONOMIC INDICATORS
## PER CAPITA PERSONAL INCOME

**Definition:**

The U.S Bureau of Economic Analysis defines per capita personal income (PCPI) as "the personal income of the residents of an area divided by the population of that area as of July 1 for the reference year." The PCPI is one of the most popular measures of an area's economic health, and is used here as one of the key economic indicators used to probe the comparative well-being of the residents of the MSAs analyzed.

**Nominal Ranking**:

The per capita personal income of each of the study metropolitan statistical areas is evaluated. Using 2003 as the base year, the twelve MSAs were nominally ranked to show which MSA had the highest per capita personal income. Based on this criterion, the Harrisburg-Carlisle, PA, MSA ranked number one with the highest per capita personal income of $32,541; followed by the Allentown-Bethlehem-Easton, PA, MSA with $31,707; while the Birmingham-Hoover, AL, MSA ranked third with $31,540. The Akron and Toledo MSAs ranked fourth and fifth with $30,978 and $29,963 respectively. The Youngstown-Warren-Boardman, OH, MSA, on the other

hand, ranked twelfth and last with $26,361, while the Canton-Massillon MSA ranked eleventh with 27,274 (see Table 2 and Fig. 1) below.

## TABLE 2

## PER CAPITA PERSONAL INCOME, 2003
## (Nominal/Raw Ranking)

| Metropolitan Area | 1999 | 2000 | 2001 | 2002 | 2003 | 2003 Ranking |
|---|---|---|---|---|---|---|
| Akron, OH, MSA | $28,003 | $29,590 | $29,466 | $29,942 | $30,878 | 4 |
| Allentown-Bethlehem-Easton, PA, MSA | $28,106 | $29,946 | $30,280 | $31,124 | $31,707 | 2 |
| Birmingham-Hoover, AL, MSA | $26,757 | $28,383 | $29,572 | $30,723 | $31,540 | 3 |
| Canton-Massillon, OH, MSA | $25,056 | $26,408 | $26,404 | $26,925 | $27,274 | 11 |
| Flint, MI, MSA | $25,593 | $26,430 | $26,034 | $26,311 | $27,521 | 10 |
| Fort Wayne, IN, MSA | $27,394 | $28,665 | $28,592 | $29,390 | $29,943 | 6 |
| Gary, IN, MSA | $25,814 | $27,170 | $27,074 | $27,250 | $27,773 | 9 |
| Harrisburg-Carlisle, PA, MSA | $28,612 | $29,727 | $30,669 | $31,698 | $32,541 | 1 |
| Knoxville, TN, MSA | $25,149 | $26,834 | $27,425 | $28,284 | $29,124 | 7 |
| Scranton-Wilkes-Barre, PA, MSA | $24,411 | $26,169 | $26,785 | $27,521 | $28,189 | 8 |
| Toledo, OH, MSA | $26,758 | $27,769 | $27,870 | $28,673 | $29,963 | 5 |
| Youngstown-Warren-Boardman, OH, MSA | $23,628 | $24,584 | $24,621 | $25,371 | $26,361 | 12 |

**Data Source: U.S. Department of Commerce**
**Bureau of Economic Analysis**
**Regional Economic Accounts**
**http://www. bea.gov**

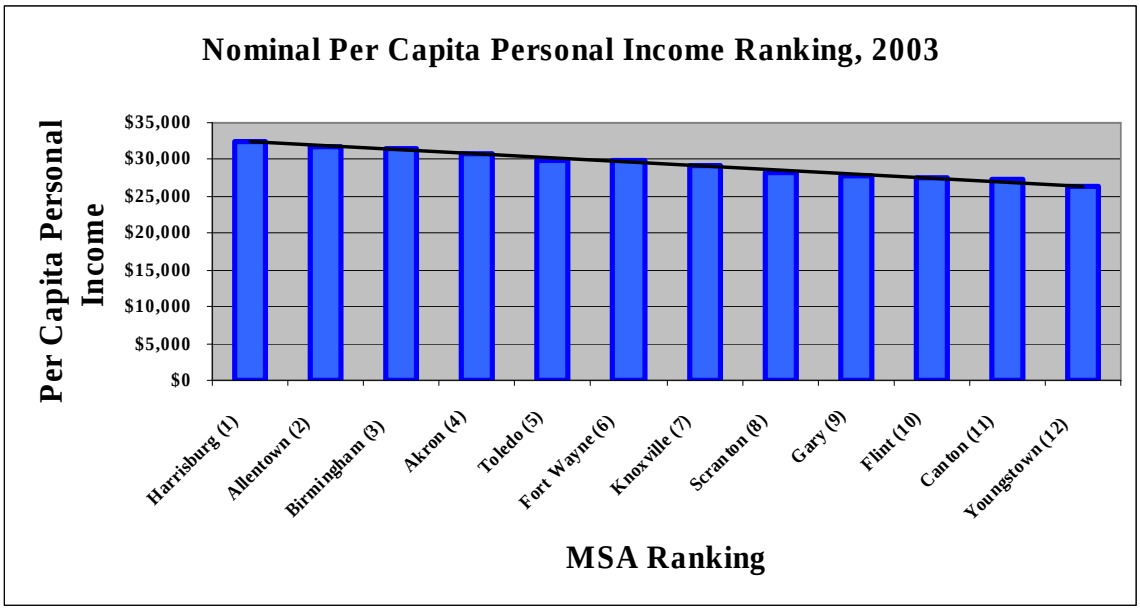


**Fig. 1**

## Percentage Growth Change:

On the flip side, when the MSAs were ranked based on percentage growth changes over time between 1999 and 2003, the ranking positions dramatically changed among the MSAs. For example, the Harrisburg-Carlisle, PA, MSA, which ranked number one nominally, now ranked fourth because between 1999 and 2003, per capita personal income in the MSA managed to grow by $3,929, or 12.1%; while the Birmingham-Hoover, AL, MSA, which ranked third nominally, now ranked first in percentage growth rate because its per capita personal income for the same period grew by $4,783, or 15.2%.

By comparison, the Youngstown-Warren-Boardman, OH, MSA, which ranked twelfth and last nominally, moved to the seventh position in the percentage change ranking even when its per capita personal income only grew by $2,733, or 10.4%, for the same period. While the Toledo, OH, MSA narrowly outperformed the Youngstown MSA to rank sixth, Youngstown outperformed both the Akron, OH, and Canton-Massillon, OH, MSAs, which were respectively ranked in eighth and tenth place. On the other hand, the Flint, MI, MSA, which ranked tenth nominally, ranked twelfth and last with $1,928, or a 7.0% change, during the same period. Statistically speaking, it is the percentage growth change rather than the nominal values that is the true growth barometer for any variable between any selected base and terminal years (see Table 3 and Fig. 2).

# TABLE 3

## PER CAPITA PERSONAL INCOME, 1999-2003
## (Percentage Change Ranking)

| Metropolitan Area | 1999 | 2000 | 2001 | 2002 | 2003 | Change 1999-2003 | % Change | % Change Ranking |
|---|---|---|---|---|---|---|---|---|
| Akron, OH, MSA | $28,003 | $29,590 | $29,466 | $29,942 | $30,878 | $2,875 | 9.3% | 8 |
| Allentown-Bethlehem-Easton, PA, MSA | $28,106 | $29,946 | $30,280 | $31,124 | $31,707 | $3,601 | 11.4% | 5 |
| Birmingham-Hoover, AL, MSA | $26,757 | $28,383 | $29,572 | $30,723 | $31,540 | $4,783 | 15.2% | 1 |
| Canton-Massillon, OH, MSA | $25,056 | $26,408 | $26,404 | $26,925 | $27,274 | $2,218 | 8.1% | 10 |
| Flint, MI, MSA | $25,593 | $26,430 | $26,034 | $26,311 | $27,521 | $1,928 | 7.0% | 12 |
| Fort Wayne, IN, MSA | $27,394 | $28,665 | $28,592 | $29,390 | $29,943 | $2,549 | 8.5% | 9 |
| Gary, IN, MSA | $25,814 | $27,170 | $27,074 | $27,250 | $27,773 | $1,959 | 7.1% | 11 |
| Harrisburg-Carlisle, PA, MSA | $28,612 | $29,727 | $30,669 | $31,698 | $32,541 | $3,929 | 12.1% | 4 |
| Knoxville, TN, MSA | $25,149 | $26,834 | $27,425 | $28,284 | $29,124 | $3,975 | 13.6% | 2 |
| Scranton-Wilkes-Barre, PA, MSA | $24,411 | $26,169 | $26,785 | $27,521 | $28,189 | $3,778 | 13.4% | 3 |
| Toledo, OH, MSA | $26,758 | $27,769 | $27,870 | $28,673 | $29,963 | $3,205 | 10.7% | 6 |
| Youngstown-Warren-Boardman, OH, MSA | $23,628 | $24,584 | $24,621 | $25,371 | $26,361 | $2,733 | 10.4% | 7 |

**Data Source: U.S. Department of Commerce**
**Bureau of Economic Analysis**
**Regional Economic Accounts**
**http://www. bea.gov**

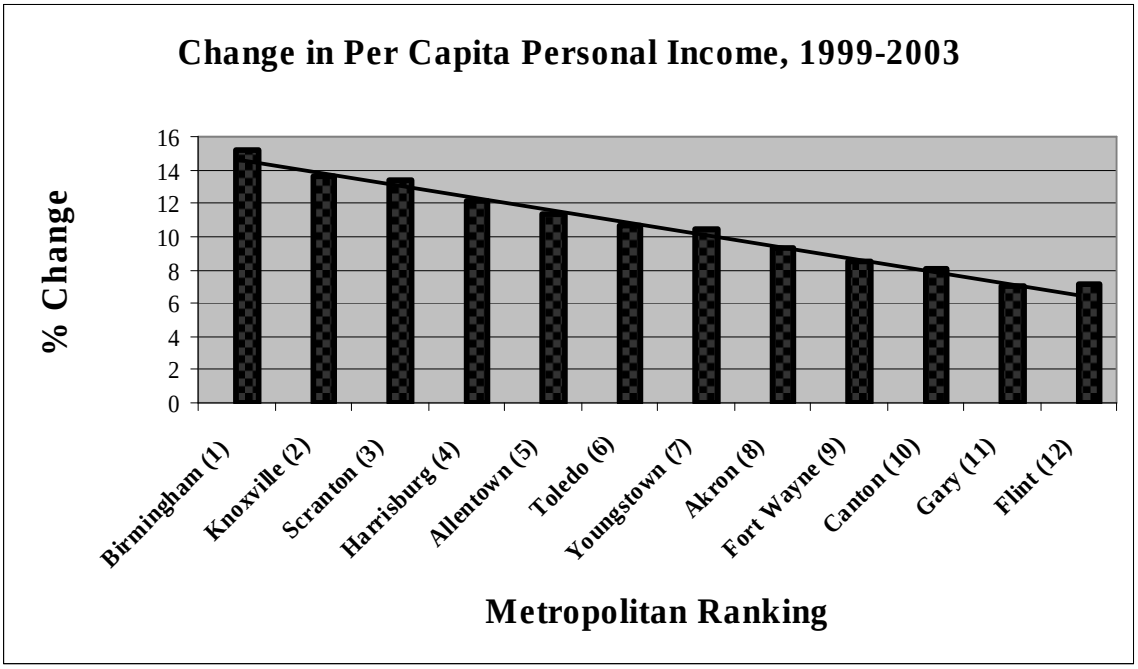
Change in Per Capita Personal Income, 1999-2003
% Change
16
14
12
10
8
6
4
2
0
Birmingham (1)
Knoxville (2)
Scranton (3)
Harrisburg (4)
Allentown (5)
Toledo (6)
Youngstown (7)
Akron (8)
Fort Wayne (9)
Canton (10)
Gary (11)
Flint (12)
Metropolitan Ranking

**Fig. 2**

## AVERAGE WAGES

**Definition**:

The U.S Bureau of Economic Analysis (BEA) defines average wages as "total wages divided by total employment," [which] include "wages and salary disbursements, other labor income and proprietor's income." In this context, BEA defines wage and salary disbursements "as monetary remuneration of employees, including corporate officers; commissions, tips, and bonuses; and pay-in-kind that represents income to the recipient." These disbursements are measured before union dues and social security deductions are made. The pay-in-kind includes such items as allowances for food, clothing, and lodging that are a form of income to the employees, and a cost to the employer.

**Nominal Ranking:**

During the nominal rankings of the average wages of Metropolitan Statistical Areas for the 2004 base year, it was found that the Flint, MI, MSA ranked first, followed by the Harrisburg-Carlisle, PA, MSA in second position. The Ohio Metropolitan Statistical Areas inclusive of Akron, Toledo, Youngstown, and Canton ranked in fifth, sixth, tenth, and twelfth place respectively (see Table 4 and Fig. 3).

# TABLE 4

# PAYROLL INCOME, 2004

# (Nominal/Raw Ranking)

| Metropolitan Area | 2001 | 2002 | 2003 | 2004 | 2004 Ranking |
|---|---|---|---|---|---|
| Akron, OH, MSA | $32,930 | $34,037 | $35,379 | $36,548 | 5 |
| Allentown-Bethlehem-Easton, PA, MSA | $33,909 | $35,153 | $36,145 | $37,461 | 4 |
| Birmingham-Hoover, AL, MSA | $33,864 | $35,257 | $36,367 | $37,983 | 3 |
| Canton-Massillon, OH, MSA | $29,020 | $29,689 | $30,287 | $31,304 | 12 |
| Flint, MI, MSA | $35,995 | $36,507 | $37,580 | $38,243 | 1 |
| Fort Wayne, IN, MSA | $32,168 | $32,743 | $33,397 | $34,204 | 8 |
| Gary, IN, MSA | $31,640 | $33,560 | $33,750 | $33,680 | 9 |
| Harrisburg-Carlisle, PA, MSA | $34,180 | $35,364 | $36,480 | $38,204 | 2 |
| Knoxville, TN, MSA | $32,455 | $32,486 | $33,713 | $34,718 | 7 |
| Scranton-Wilkes-Barre, PA, MSA | $28,826 | $29,482 | $30,160 | $31,329 | 11 |
| Toledo, OH, MSA | $32,096 | $33,297 | $34,499 | $35,122 | 6 |
| Youngstown-Warren-Boardman, OH, MSA | $28,849 | $29,923 | $31,012 | $31,943 | 10 |

**Data Source: U.S. Department of Commerce**
**Bureau of Economic Analysis**
**Regional Economic Accounts**
**http://www. bea.gov**

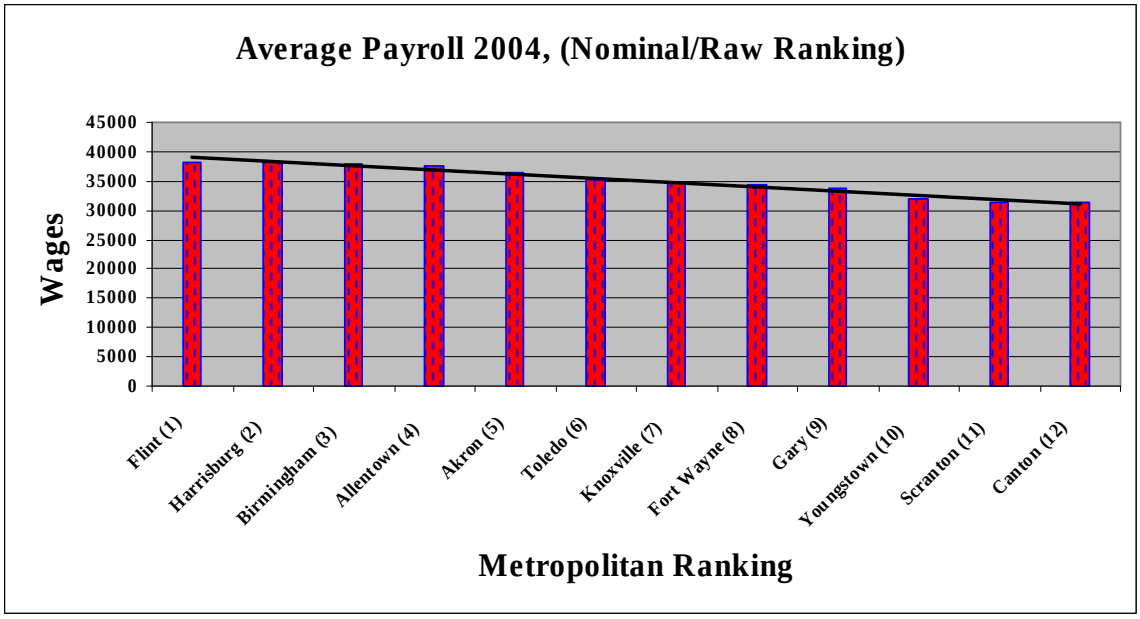


**Fig. 3**

## Percentage Growth Change:

As seen in Fig. 4 following, the raw number rankings do not reveal the real growth rates of individual MSAs until the percentage growth rates between the base and terminal years are factored into the ranking equation. In this exercise, the Flint, MI, MSA, which ranked first nominally, ranked twelfth when percentage growth change was analyzed. Three of Ohio's MSAs, Akron, Youngstown, and Canton, ranked significantly higher on average wage growth rates between 2001 and 2004 at third, fourth, and ninth, except for Toledo, which dropped a notch to the seventh position. The Harrisburg MSA exhibited an anomaly by retaining its second ranking position both in the nominal and percentage growth rate rankings (see Table 5 and Fig. 4).

# TABLE 5

## AVERAGE PAYROLL, 2001-2004
**(**Percentage Growth **Ranking)**

| Metropolitan Area | 2001 | 2002 | 2003 | 2004 | Change 2001-2004 | % Change | % Change Ranking |
|---|---|---|---|---|---|---|---|
| Akron, OH, MSA | $32,930 | $34,037 | $35,379 | $36,548 | $3,618 | 11.0% | 3 |
| Allentown-Bethlehem-Easton, PA, MSA | $33,909 | $35,153 | $36,145 | $37,461 | $3,552 | 10.5% | 5 |
| Birmingham-Hoover, AL, MSA | $33,864 | $35,257 | $36,367 | $37,983 | $4,119 | 12.2% | 1 |
| Canton-Massillon, OH, MSA | $29,020 | $29,689 | $30,287 | $31,304 | $2,284 | 7.9% | 9 |
| Flint, MI, MSA | $35,995 | $36,507 | $37,580 | $38,243 | $2,248 | 6.2% | 12 |
| Fort Wayne, IN, MSA | $32,168 | $32,743 | $33,397 | $34,204 | $2,036 | 6.3% | 11 |
| Gary, IN, MSA | $31,640 | $33,560 | $33,750 | $33,680 | $2040 | 6.45 | 10 |
| Harrisburg-Carlisle, PA, MSA | $34,180 | $35,364 | $36,480 | $38,204 | $4,024 | 11.8% | 2 |
| Knoxville, TN, MSA | $32,455 | $32,486 | $33,713 | $34,718 | $2,263 | 7.0% | 6 |
| Scranton-Wilkes-Barre, PA, MSA | $28,826 | $29,482 | $30,160 | $31,329 | $2,503 | 8.7% | 8 |
| Toledo, OH, MSA | $32,096 | $33,297 | $34,499 | $35,122 | $3,026 | 9.4% | 7 |
| Youngstown-Warren-Boardman, OH, MSA | $28,849 | $29,923 | $31,012 | $31,943 | $3,094 | 10.7% | 4 |

**Data Sources: U.S. Department of Labor, Bureau of Labor Statistics**
**Quarterly Census of Employment and Wages**
***http://www.bls.gov/cew***

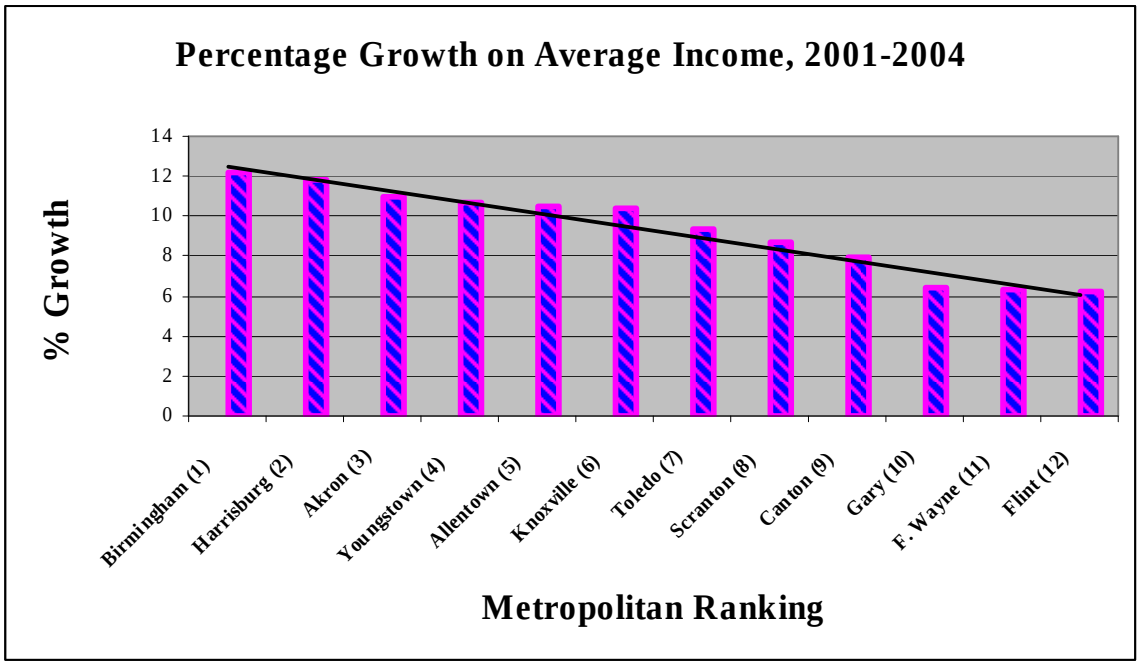


**Fig. 4**

## EMPLOYMENT

**Nominal Ranking**:

In the employment category, the nominal ranking for the 2004 base year had the Birmingham MSA in first place with the highest number of 507,217employees, followed by Allentown at a distant second with 383,440 employees, while Akron ranked third overall with 350,920 employees. Youngstown ranked eighth with 260,111, while Canton ranked twelfth and last with 191,442 employees (see Table 6 and Fig. 5 ).

# TABLE 6

## EMPLOYMENT
## (Nominal/Raw Ranking)

| Metropolitan Area | 2000 | 2001 | 2002 | 2003 | 2004 | 2004 Ranking |
|---|---|---|---|---|---|---|
| Akron, OH, MSA | 348593 | 347027 | 343215 | 347252 | 350920 | 3 |
| Allentown-Bethlehem -Easton, PA, MSA | 371011 | 375616 | 377567 | 377558 | 383440 | 2 |
| Birmingham-Hoover, AL, MSA | 516131 | 511157 | 501992 | 503124 | 507217 | 1 |
| Canton-Massillon, OH, MSA | 197622 | 197840 | 193616 | 191148 | 191442 | 12 |
| Flint, MI, MSA | 204846 | 202882 | 194952 | 193104 | 195897 | 11 |
| Fort Wayne, IN, MSA | 203393 | 199325 | 197790 | 199749 | 198759 | 10 |
| Gary, IN, MSA | 315351 | 311569 | 306597 | 305586 | 304352 | 6 |
| Harrisburg-Carlisle, PA, MSA | 259296 | 260990 | 265641 | 262336 | 267326 | 7 |
| Knoxville, TN, MSA | 306966 | 312542 | 319430 | 320782 | 323180 | 4 |
| Scranton-Wilkes-Barre, PA, MSA | 259598 | 257327 | 257327 | 256843 | 260026 | 9 |
| Toledo, OH, MSA | 321715 | 319709 | 31`2463 | 310897 | 312853 | 5 |
| Youngstown-Warren-Boardman, OH, MSA | 269189 | 263479 | 260629 | 259993 | 260111 | 8 |

Source: U.S. Department of Labor, Bureau of Labor Statistics.,
Quarterly Census of Employment and Wages,
*http://www.bls.gov/cew*.

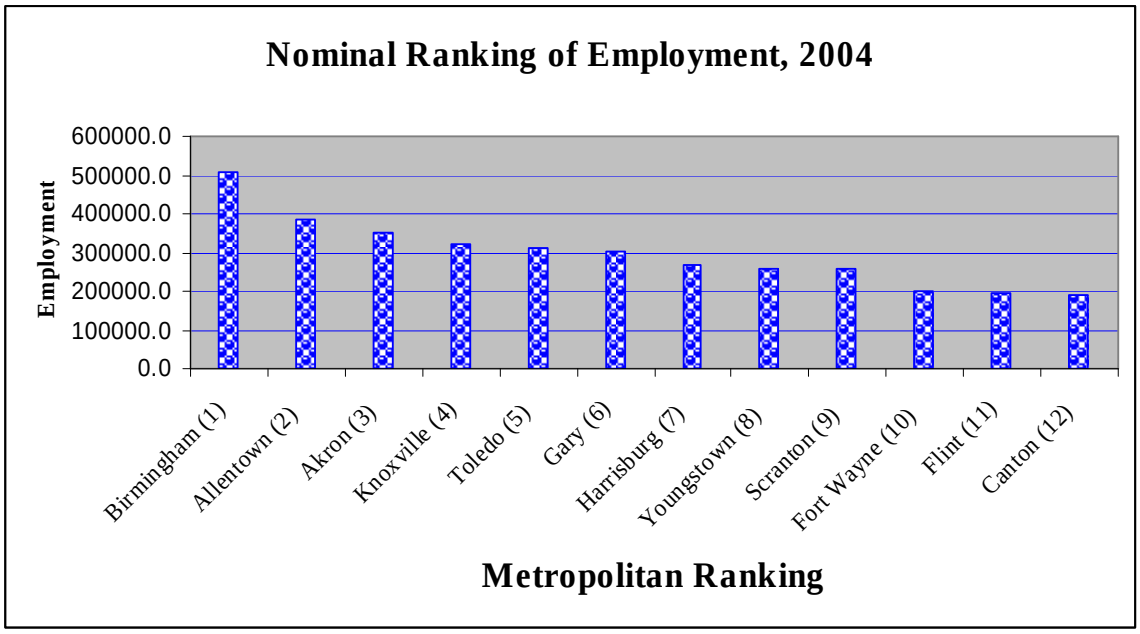
Nominal Ranking of Employment, 2004
Employment
600000.0
500000.0
400000.0
300000.0
200000.0
100000.0
0.0
Birmingham (1)
Allentown (2)
Akron (3)
Knoxville (4)
Toledo (5)
Gary (6)
Harrisburg (7)
Youngstown (8)
Scranton (9)
Fort Wayne (10)
Flint (11)
Canton (12)
Metropolitan Ranking

**Fig. 5**

**Percentage Growth Change:**

Between 2000 and 2004 most of these MSAs faced hard economic times which was reflected in the loss of employment positions. For example, Birmingham, which ranked first nominally in terminal year 2004, lost 8,914 employees, or -1.7%, between 2000 and 2004. This loss reduced its ranking to the sixth position in the overall standings. The Knoxville MSA ranked fifth in 2004, but ranked first with employment growth of 16,214, or 5.3%, in four years (2000-2004). The Youngstown MSA, which ranked fourth nominally in 2004, suffered an employment loss of 9,078, or -3.4%, between 2000 and 2004 and was ranked tenth, while Flint, which ranked eleventh nominally, was ranked twelfth and last in the overall standings because of a loss of 8,949 employees, or -4.4%, between 2000 and 2004 (see Table 7 and Fig. 6).

# TABLE 7

## TOTAL EMPLOYMENT, 2000-2004
## (Percentage Growth Ranking)

| Metropolitan Area | 2000 | 2001 | 2002 | 2003 | 2004 | Change 2000-2004 | % Change | % Change Ranking |
|---|---|---|---|---|---|---|---|---|
| Akron, OH, MSA | 348593 | 347027 | 343215 | 347252 | 350920 | 2327 | 0.7% | 4 |
| Allentown-Bethlehem-Easton, PA, MSA | 371011 | 375616 | 377567 | 377558 | 383440 | 12429 | 3.4% | 2 |
| Birmingham-Hoover AL, MSA | 516131 | 511157 | 501992 | 503124 | 507217 | -8914 | -1.7% | 6 |
| Canton-Massillon, OH, MSA | 197622 | 197840 | 193616 | 191148 | 191442 | -6180 | -3.1% | 9 |
| Flint, MI, MSA | 204846 | 202882 | 194952 | 193104 | 195897 | -8949 | -4.4% | 12 |
| Fort Wayne, IN, MSA | 203393 | 199325 | 197790 | 199749 | 198759 | -4634 | -2.3% | 7 |
| Gary, IN, MSA | 315351 | 311569 | 306597 | 305586 | 304352 | -10999 | -3.5% | 11 |
| Harrisburg-Carlisle, PA, MSA | 259296 | 260990 | 265641 | 262336 | 267326 | 8030 | 3.1% | 3 |
| Knoxville, TN, MSA | 306966 | 312542 | 319430 | 320782 | 323180 | 16214 | 5.3% | 1 |
| Scranton-Wilkes-Barre, PA, MSA | 259598 | 257327 | 257327 | 256843 | 260026 | 428 | 0.2% | 5 |
| Toledo, OH, MSA | 321715 | 319709 | 31`2463 | 310897 | 312853 | -8862 | -2.8% | 8 |
| Youngstown-Warren-Boardman, OH, MSA | 269189 | 263479 | 260629 | 259993 | 260111 | -9078 | -3.4% | 10 |

Source: U.S. Department of Labor, Bureau of Labor Statistics.,
Quarterly Census of Employment and Wages.
*http://www.bls.gov/cew*.

**Total and Percentage Change in Employment Ranking, 2000-2004**

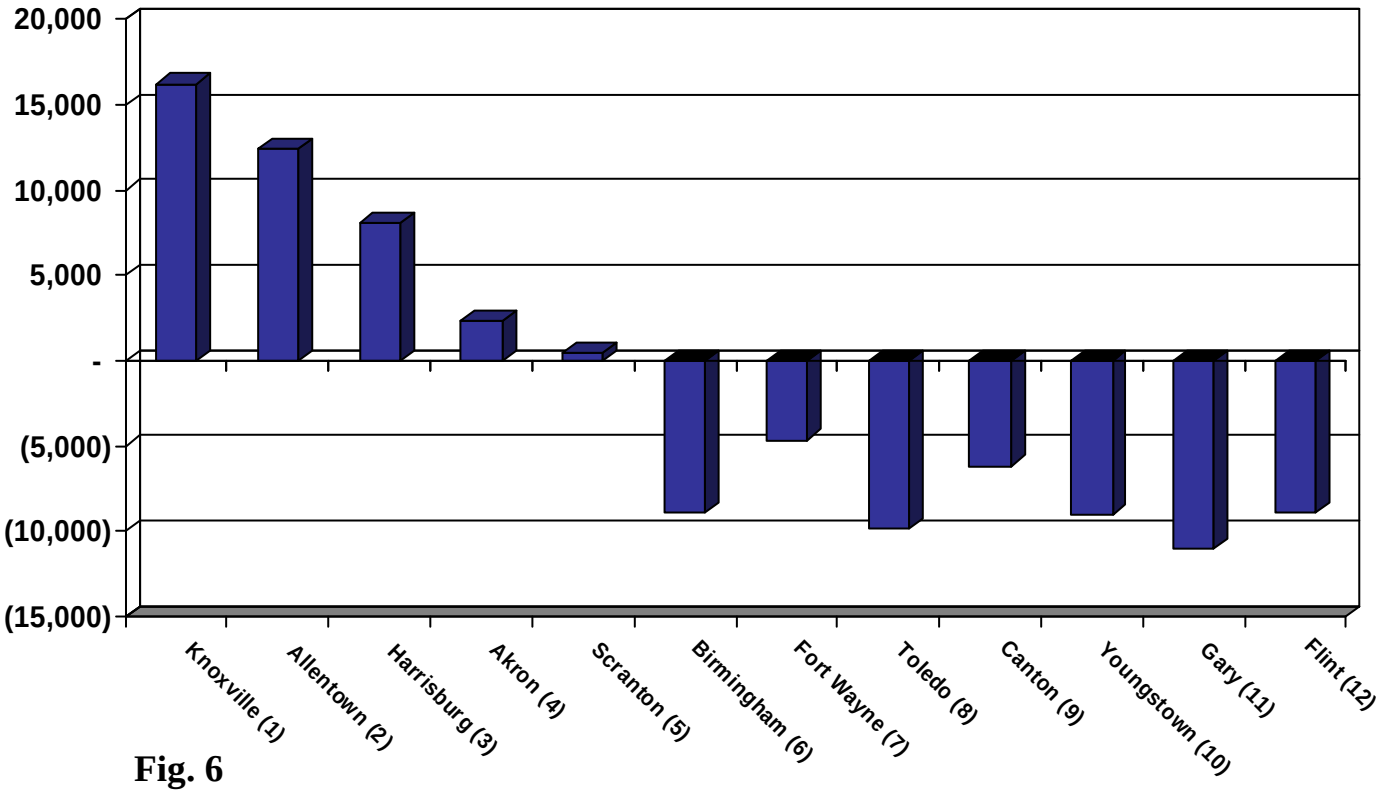


**Fig. 6**

## UNEMPLOYMENT RATE

**Definition:**

Unemployment rate is generally defined as the percent of the labor force that is actively seeking employment. Put it differently, it means the percentage of viable and employable people actively seeking employment. The national unemployment rate can rise or fall in any given time of the year depending on what happens to the economy internally or externally, and when this happens, the rest of the economy is also affected by a snowball effect. In short, when the nation sneezes, each metropolitan area in the nation has a cold.

For example, the Associated Press (AP) and the CBS News in 2003 reported that the National Bureau of Economic Research (NBER) Committee said that the 2001 recession in the U.S, the first such downturn in a decade, ended in November of that year, some eight months after it started. The report also stated that "The committee did not conclude that economic conditions since [November of 2001] have been favorable or that the economy has returned to operating at normal capacity." During the recession period, the national unemployment rate was found to rise to a nine-year high of 6.4 %.

In light of the rise in the national unemployment rate due to the 1981 recession, it is expected that a domino effect of a spike in unemployment rates in the states, metropolitan areas, counties, cities, townships and boroughs throughout the nation would be the rule rather than the exception. However, the percentage rise in unemployment rates in these economic entities would depend largely on the inherent economic strengths or weaknesses prevailing in these economic units, including the twelve metropolitan areas under analysis.

Using the base year of 2004, while the national unemployment rate was found to be 5.5%, the Knoxville MSA registered a rate of 4.1%, followed by the Harrisburg MSA in second place with 4.5%, while the Birmingham MSA ranked third lowest at 5.3%. The Youngstown MSA, on the other hand, had the second highest unemployment rate (7.2%) among the twelve MSAs analyzed, and ranked eleventh, while the Flint MSA ranked twelfth and last with the highest unemployment rate of 8.3% (see Table 8 and Fig.7).

# TABLE 8

## UNEMPLOYMENT RATE, 2004
## (NOMINAL/RAW) RANKING

| Metropolitan Area | 2000 | 2001 | 2002 | 2003 | 2004 | 2004 Ranking (Low to High)[I] |
|---|---|---|---|---|---|---|
| Akron, OH, MSA | 4.1 | 4.5 | 5.9 | 6.1 | 6.0 | 7 |
| Allentown-Bethlehem-Easton, PA, MSA | 3.7 | 4.3 | 5.5 | 5.6 | 5.3 | 5 |
| Birmingham-Hoover, AL, MSA | 3.5 | 4.0 | 4.8 | 5.0 | 4.8 | 3 |
| Canton-Massillon, OH, MSA | 4.1 | 4.4 | 5.9 | 6.8 | 6.6 | 9 |
| Flint, MI, MSA | 4.5 | 6.0 | 7.4 | 8.3 | 8.3 | 12 |
| Fort Wayne, IN, MSA | 2.6 | 4.1 | 4.9 | 5.3 | 5.2 | 4 |
| Gary, IN, MSA | 3.4 | 4.6 | 6.1 | 5.9 | 5.8 | 6 |
| Harrisburg-Carlisle, PA, MSA | 3.4 | 4.1 | 4.6 | 4.6 | 4.5 | 2 |
| Knoxville, TN, MSA | 3.4 | 3.7 | 3.9 | 4.1 | 4.1 | 1 |
| Scranton-Wilkes-Barre, PA, MSA | 4.9 | 5.5 | 6.3 | 6.2 | 6.5 | 8 |
| Toledo, OH, MSA | 4.3 | 4.8 | 6.5 | 7.1 | 7.0 | 10 |
| Youngstown-Warren-Boardman, OH, MSA | 5.0 | 5.8 | 6.7 | 7.2 | 7.2 | 11 |

**Source:** Source: U.S. Department of Labor, Bureau of Labor Statistics. Quarterly Census of Employment and Wages. *http://www.bls.gov/cew*.

**[I] Unemployment ranking for 2004 base year is from *lowest to highest*. For example, in 2004, Knoxville recorded a 4.1% unemployment rate, and is ranked number 1 (lowest), while Flint recorded an 8.3% unemployment rate and is ranked the twelfth-highest of the twelve Metropolitan areas studied.**

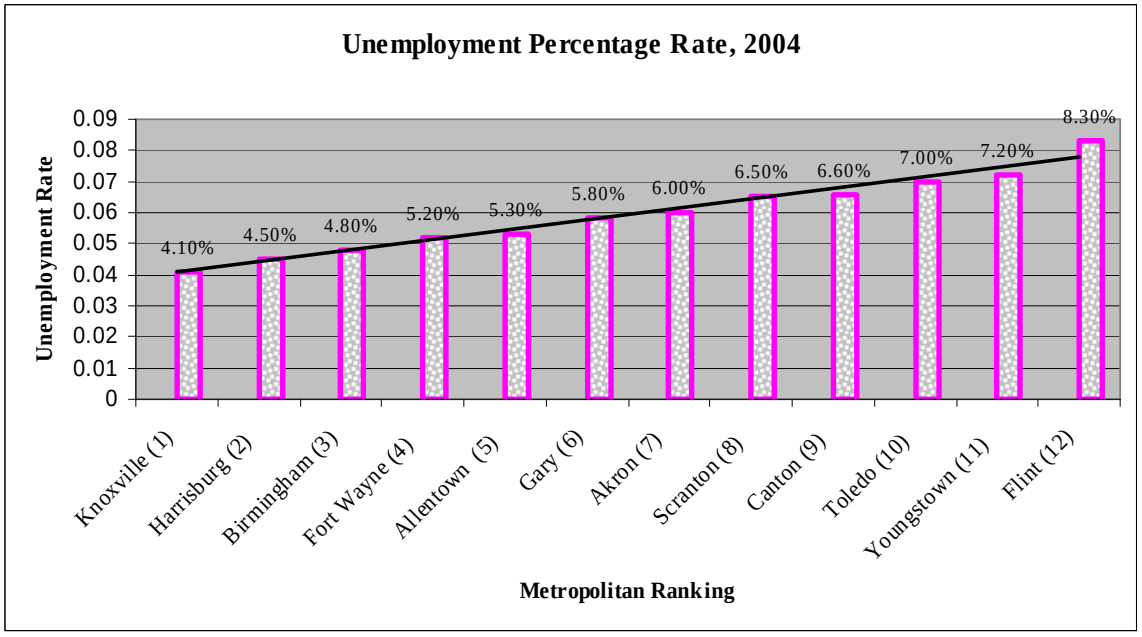


**Fig. 7**

## GROSS METROPOLITAN PRODUCT (GMP)

**Definition:**

The Bureau of Economic Analysis (BEA) defines the gross state product (GSP) as the "product originating in all industries in the state," and then goes on to explain that "an industry's GSP or its value-added is equal to its gross output (sales or receipts and other operating income, commodity taxes and inventory changes) minus its intermediate inputs (consumption of goods and services purchased from other industries or imported." Based on this definition, the Gross Metropolitan Product is defined here as the sum of the

value-added output of all industries in an area. The term value-added is the revenue generated from the sales of the final products minus the intermediate inputs purchased from other industries to produce the final products.

**Nominal Ranking:**

Using 2004 as the base year for the nominal ranking of the GMP for the twelve metropolitan areas, the Birmingham MSA ranked first with $38.77 billion, followed by the Allentown MSA at a distant second with $28.25 billion, while the Harrisburg MSA ranked third with $25.36 billion. The Youngstown MSA ranked ninth with $17.59 billion, the Flint MSA ranked eleventh with $13.06 billion, while the Canton MSA ranked last with $12.62 billion (see Table 9 and Fig. 8).

# TABLE 9

## Gross Metropolitan Product, 2004
## (NOMINAL/RAW) RANKING

| Metropolitan Area | 2000 | 2001 | 2002 | 2003 | 2004 | 2004 Ranking |
|---|---|---|---|---|---|---|
| Akron, OH.MSA | 20.95 | 21.65 | 22.49 | 23.78 | 25.12 | 6 |
| Allentown-Bethlehem-Easton, PA, MSA | 22.4 | 24 | 25.39 | 26.83 | 28.25 | 2 |
| Birmingham-Hoover AL, MSA | 31.97 | 33.39 | 34.67 | 36.29 | 38.77 | 1 |
| Canton-Massillon, OH, MSA | 11.46 | 11.6 | 11.97 | 12.11 | 12.62 | 12 |
| Flint, MI, MSA | 12.11 | 12.39 | 12.72 | 12.67 | 13.06 | 11 |
| Fort Wayne, IN, MSA | 13.71 | 13.9 | 14.4 | 15.05 | 15.7 | 10 |
| Gary, IN, MSA | 18.24 | 18.72 | 18.87 | 19.91 | 21 | 7 |
| Harrisburg-Carlisle, PA, MSA | 20.95 | 21.86 | 23.01 | 23.86 | 25.36 | 3 |
| Knoxville, TN, MSA | 19.04 | 20.15 | 21.97 | 23.66 | 25.31 | 4 |
| Scranton-Wilkes-Barre, PA, MSA | 16.94 | 17.6 | 18.2 | 19.09 | 19.99 | 8 |
| Toledo, OH, MSA | 22.45 | 22.67 | 23.12 | 24.1 | 25.21 | 5 |
| Youngstown-Warren-Boardman, OH, MSA | 16.07 | 15.68 | 16.4 | 16.93 | 17.59 | 9 |

**Source: Economy.com, Inc.**
**121 North Walnut Street, Suite 500**
**West Chester, PA 19380**
**http://www.economy.com**

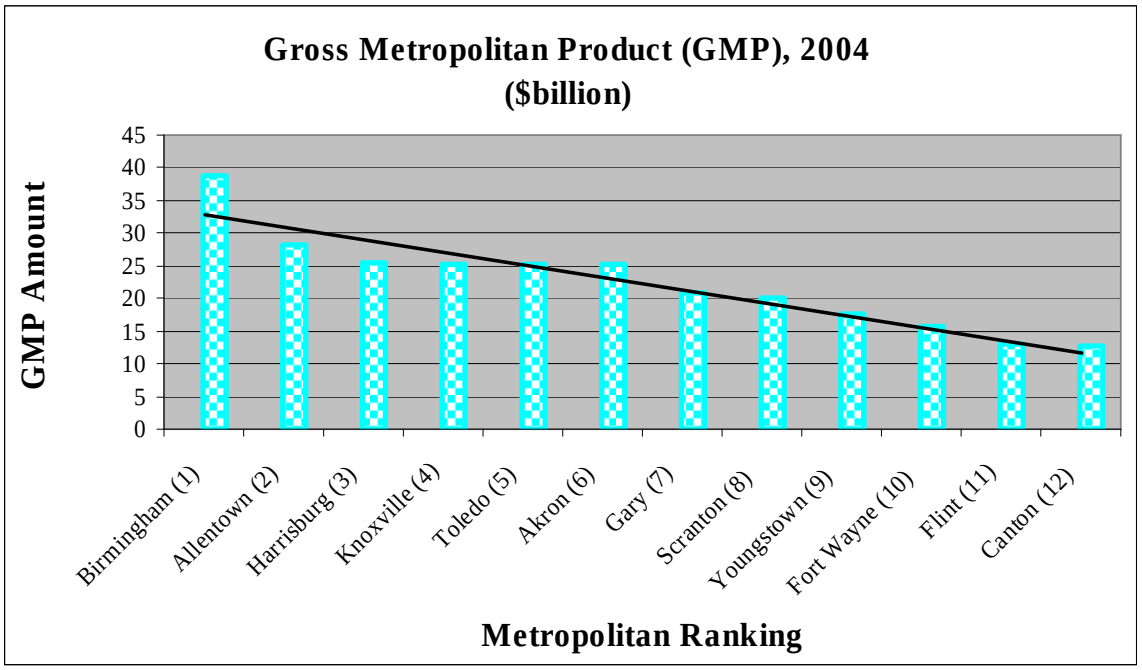


**Fig. 8**

**Percentage Growth Change:**

The twelve metropolitan areas were then evaluated between 2000 and 2004 to show the real percentage growth changes. During the analysis, the Knoxville MSA, which ranked fourth nominally in 2004, ranked first between 2000 and 2004 with a percentage growth rate of 32.93%, followed by the Allentown-Bethlehem-Easton, PA, MSA in second place with 26.12%, while the Birmingham MSA which ranked first nominally, ranked third with 21.27%. The Youngstown MSA, which had a growth rate of

9.46%, ranked eleventh, while the Flint MSA ranked twelfth and last with 7.84% (see Table 10 and Fig. 9).

## TABLE 10

### GROSS METROPOLITAN PRODUCT, 2000-2004
### (Percentage Growth Change)
### ($ billion)

| Metropolitan Area | 2000 | 2001 | 2002 | 2003 | 2004 | Change 2000-2004 | % Change | % Change Ranking |
|---|---|---|---|---|---|---|---|---|
| Akron, OH, MSA | 20.95 | 21.65 | 22.49 | 23.78 | 25.12 | 4.17 | 19.90% | 5 |
| Allentown-Bethlehem-Easton, PA, MSA | 22.4 | 24 | 25.39 | 26.83 | 28.25 | 5.85 | 26.12% | 2 |
| Birmingham-Hoover, AL, MSA | 31.97 | 33.39 | 34.67 | 36.29 | 38.77 | 6.8 | 21.27% | 3 |
| Canton-Massillon, OH, MSA | 11.46 | 11.6 | 11.97 | 12.11 | 12.62 | 1.16 | 10.12% | 10 |
| Flint, MI, MSA | 12.11 | 12.39 | 12.72 | 12.67 | 13.06 | 0.95 | 7.84% | 12 |
| Fort Wayne, IN, MSA | 13.71 | 13.9 | 14.4 | 15.05 | 15.7 | 1.99 | 14.51% | 8 |
| Gary, IN, MSA | 18.24 | 18.72 | 18.87 | 19.91 | 21 | 2.76 | 15.13% | 7 |
| Harrisburg-Carlisle, PA, MSA | 20.95 | 21.86 | 23.01 | 23.86 | 25.36 | 4.41 | 21.05% | 4 |
| Knoxville, TN, MSA | 19.04 | 20.15 | 21.97 | 23.66 | 25.31 | 6.27 | 32.93% | 1 |
| Scranton-Wilkes-Barre, PA, MSA | 16.94 | 17.6 | 18.2 | 19.09 | 19.99 | 3.05 | 18.00% | 6 |
| Toledo, OH, MSA | 22.45 | 22.67 | 23.12 | 24.1 | 25.21 | 2.76 | 12.29% | 9 |
| Youngstown-Warren-Boardman, OH, MSA | 16.07 | 15.68 | 16.4 | 16.93 | 17.59 | 1.52 | 9.46% | 11 |

Source: Data from **Economy.com, Inc.**
**http://www.economy.com**

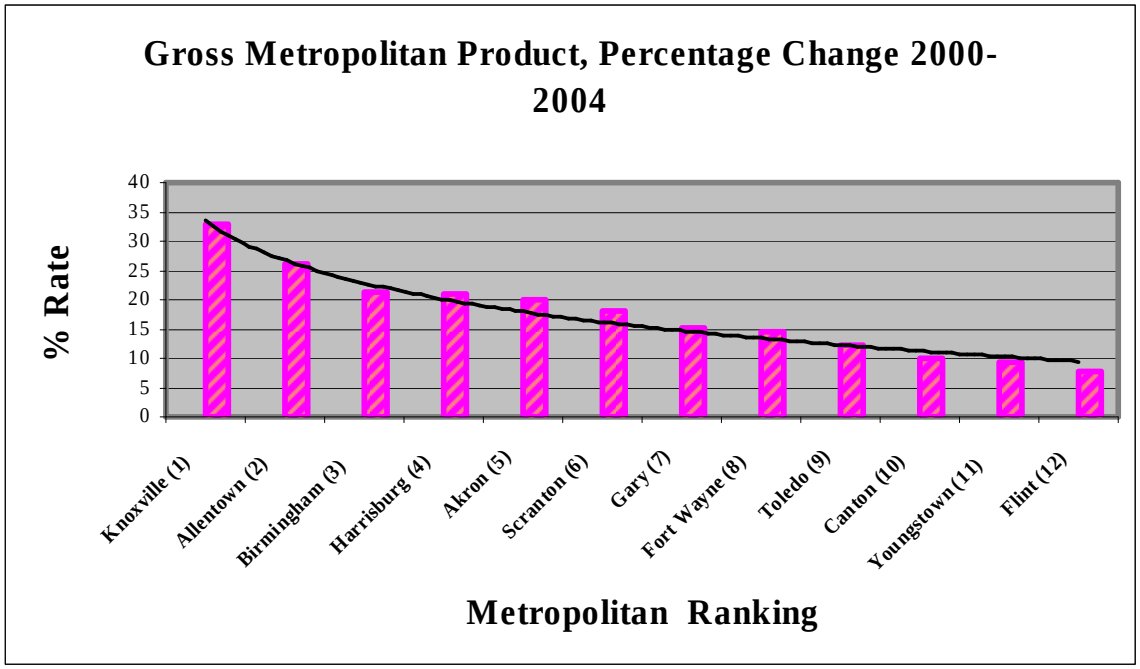


**Fig. 9**

## GROSS METROPOLITAN PRODUCT PROJECTION ANALYSIS, 2004-2012

Based on the statistical projections of the GMP by the Bureau of Economic Analysis (BEA), Bureau of Labor Statistics (BLS) and Moody's Economy.com, for both short and long terms, this study would like to rank the performances of the twelve metropolitan areas using the projection trends.

**Nominal Ranking:**

Starting with the base year projection of 2012, the twelve metropolitan areas were nominally ranked. The Birmingham MSA was first with $56.67 billion, followed by the Allentown MSA in second position with $40.87 billion, while Harrisburg ranked third with $36.72 billion. The Toledo MSA ranked fourth with $35.62 billion, while the Akron MSA ranked fifth with $35.36 billion. The Youngstown MSA clinched the tenth position with $23.42 billion, while the Fort Wayne MSA slightly edged the Youngstown MSA with $23.46 billion to claim the ninth position. The Flint and Canton MSAs ranked eleventh and twelfth with $17.66 billion and $17.3 billion respectively (see Table 11 and Fig. 10).

# TABLE 11

## GROSS METROPOLITAN PRODUCT, 2012
### (NOMINAL/RAW RANKING)
### ($ billion)

| Metropolitan Area | 2004 | 2012 | 2012 Ranking |
|---|---|---|---|
| Akron, OH, MSA | 25.12 | 35.36 | 5 |
| Allentown-Bethlehem-Easton, PA, MSA | 28.25 | 40.87 | 2 |
| Birmingham-Hoover AL, MSA | 38.77 | 56.67 | 1 |
| Canton-Massillon, OH, MSA | 12.62 | 17.3 | 12 |
| Flint, MI, MSA | 13.06 | 17.66 | 11 |
| Fort Wayne, IN, MSA | 15.7 | 23.46 | 9 |
| Gary, IN, MSA | 21 | 30.42 | 7 |
| Harrisburg-Carlisle, PA, MSA | 25.36 | 36.72 | 3 |
| Knoxville, TN, MSA | 25.31 | 34.69 | 6 |
| Scranton-Wilkes-Barre, PA, MSA | 19.99 | 27.14 | 8 |
| Toledo, OH, MSA | 25.21 | 35.62 | 4 |
| Youngstown-Warren-Boardman, OH, MSA | 17.59 | 23.42 | 10 |

**Source: Economy.com, Inc.**
**121 North Walnut Street, Suite 500**
**West Chester, PA 19380**
**http://www.economy.com**

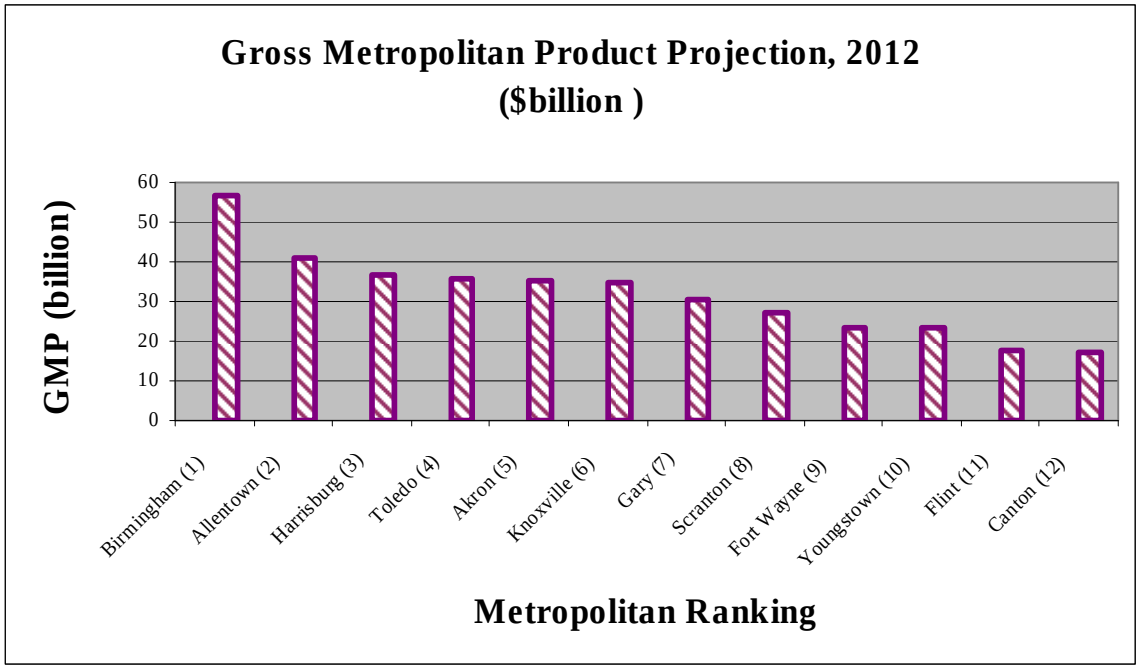


**Fig. 10.**

**Projected Percentage Growth Change:**

When the percentage growth projection analysis was performed between 2004 and 2012, the ranking positions of the twelve metropolitan areas changed compared to the nominal rankings of the 2004 base year. For example, the Birmingham MSA, which ranked first nominally in 2004, now ranked second when projected to 2012 with a growth rate of 46.17%, while the Fort Wayne MSA, which ranked ninth nominally, ranked first with 49.43%. Also, the Allentown MSA, which ranked second in 2004, now ranked fifth when projected to 2012 with a growth rate of 44.67 %. The

Youngstown MSA, which ranked tenth nominally in 2004, when projected to 2012, ranked last and twelfth with a growth rate of 33.14% (see Table 12 and Fig. 11).

## TABLE 12

**GROSS METROPOLITAN PRODUCT PROJECTION, 2004-2012**
**(Percentage Growth Change)**
**($ billion)**

| Metropolitan Area | 2004 | 2012 | % Change 2004-2012 | % Change Ranking |
|---|---|---|---|---|
| Akron, OH, MSA | 25.12 | 35.36 | 40.76% | 7 |
| Allentown-Bethlehem-Easton, PA, MSA | 28.25 | 40.87 | 44.67% | 5 |
| Birmingham-Hoover, AL, MSA | 38.77 | 56.67 | 46.17% | 2 |
| Canton-Massillon, OH, MSA | 12.62 | 17.3 | 37.08% | 8 |
| Flint, MI, MSA | 13.06 | 17.66 | 35.22% | 11 |
| Fort Wayne, IN, MSA | 15.7 | 23.46 | 49.43% | 1 |
| Gary, IN, MSA | 21 | 30.42 | 44.86% | 3 |
| Harrisburg-Carlisle, PA, MSA | 25.36 | 36.72 | 44.79% | 4 |
| Knoxville, TN, MSA | 25.31 | 34.69 | 37.06% | 9 |
| Scranton-Wilkes-Barre, PA, MSA | 19.99 | 27.14 | 35.77% | 10 |
| Toledo, OH, MSA | 25.21 | 35.62 | 41.29% | 6 |
| Youngstown-Warren-Boardman, OH, MSA | 17.59 | 23.42 | 33.14% | 12 |

**Source: Economy.com, Inc.**
**http://www.economy.com**

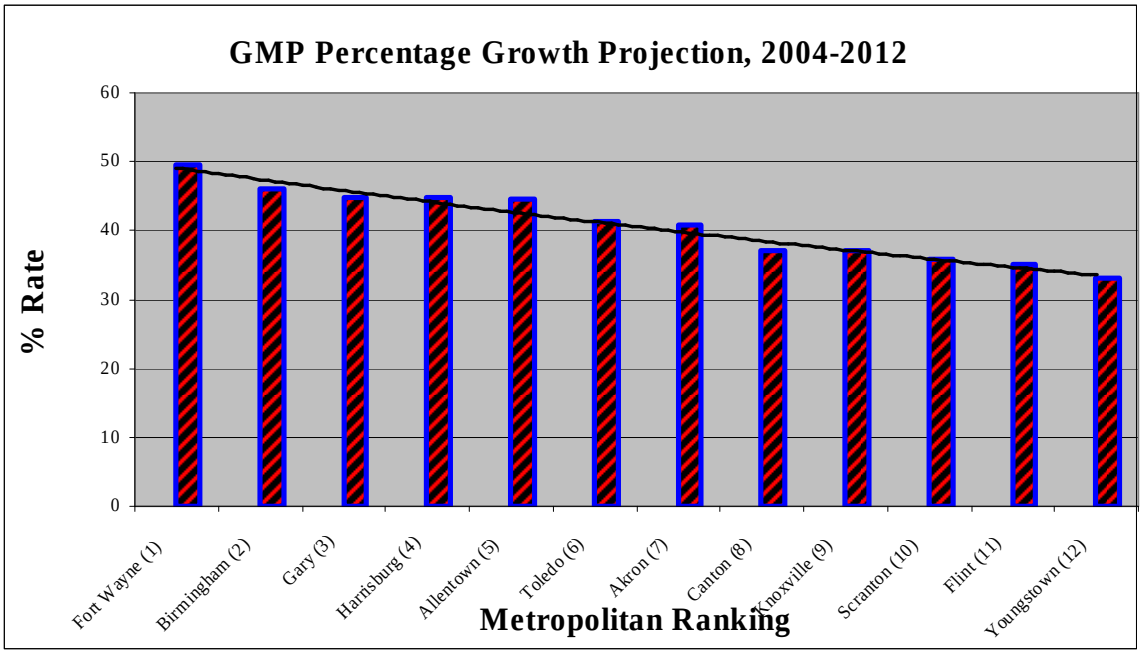


**Fig. 11**

## EMPLOYEE PRODUCTIVITY (VALUE-ADDED) IN A METROPOLITAN AREA

**Definition**:

Productivity per employee is defined as the value-added output by an employee. Since the Gross Metropolitan Product has already been defined as a value-added output measure, invariably, productivity per employee in a metropolitan area is the value-added output per employee in the production of the final product. In order to calculate employee productivity in a

metropolitan setting, we divided the GMP of the metropolitan area by the number of employees in that metropolitan area for a given period of time.

**Nominal Ranking:**

Based on the above definition, employee productivity for each of the twelve metropolitan areas was calculated for 2004. The Harrisburg MSA was found to top the list with $95,865.45, followed by the Toledo and Fort Wayne MSAs in second and third positions with $80,580.98 and $78,990.13 respectively. The Akron MSA, on the other hand, ranked eighth with $71,583.27, while the Youngstown MSA ranked tenth with $67,624.98. The Flint and Canton MSAs ranked eleventh and twelfth with $66,667.69 and $65,920.75 respectively in employee productivity (see Table 13 and Fig. 12).

# TABLE 13

## EMPLOYEE PRODUCTIVITY, 2004
## (NOMINAL/RAW RANKING)

| Metropolitan Area | 2001 | 2002 | 2003 | 2004 | 2004 Ranking |
|---|---|---|---|---|---|
| Akron, OH.MSA | $62,387 | $65,527 | $68,481 | $71,583 | 8 |
| Allentown-Bethlehem-Easton, PA, MSA | $63,895 | $67,246 | $71,062 | $73,675 | 7 |
| Birmingham-Hoover, AL, MSA | $65,322 | $69,065 | $72,129 | $76,437 | 6 |
| Canton-Massillon, OH, MSA | $58,633 | $61,823 | $63,354 | $65,921 | 12 |
| Flint, MI, MSA | $61,070 | $65,247 | $65,612 | $66,668 | 11 |
| Fort Wayne, IN, MSA | $69,735 | $72,804 | $75,345 | $78,990 | 3 |
| Gary, IN, MSA | $60,083 | $61,547 | $65,154 | $68,999 | 9 |
| Harrisburg-Carlisle, PA, MSA | $83,758 | $86,621 | $90,952 | $94,865 | 1 |
| Knoxville, TN, MSA | $$64,471 | $68,779 | $73,757 | $78,315 | 4 |
| Scranton-Wilkes-Barre, PA, MSA | $68,395 | $70,727 | $74,326 | $76,877 | 5 |
| Toledo, OH, MSA | $70,908 | $73,993 | $77,518 | $80,581 | 2 |
| Youngstown-Warren-Boardman, OH, MSA | $59,511 | $62,925 | $65,117 | $67,625 | 10 |

Source: Calculated by author from data generated by Economy.com and U.S. Department of Labor, Bureau of Labor Statistics
*http://www.economy.com and http://www.bls.gov*

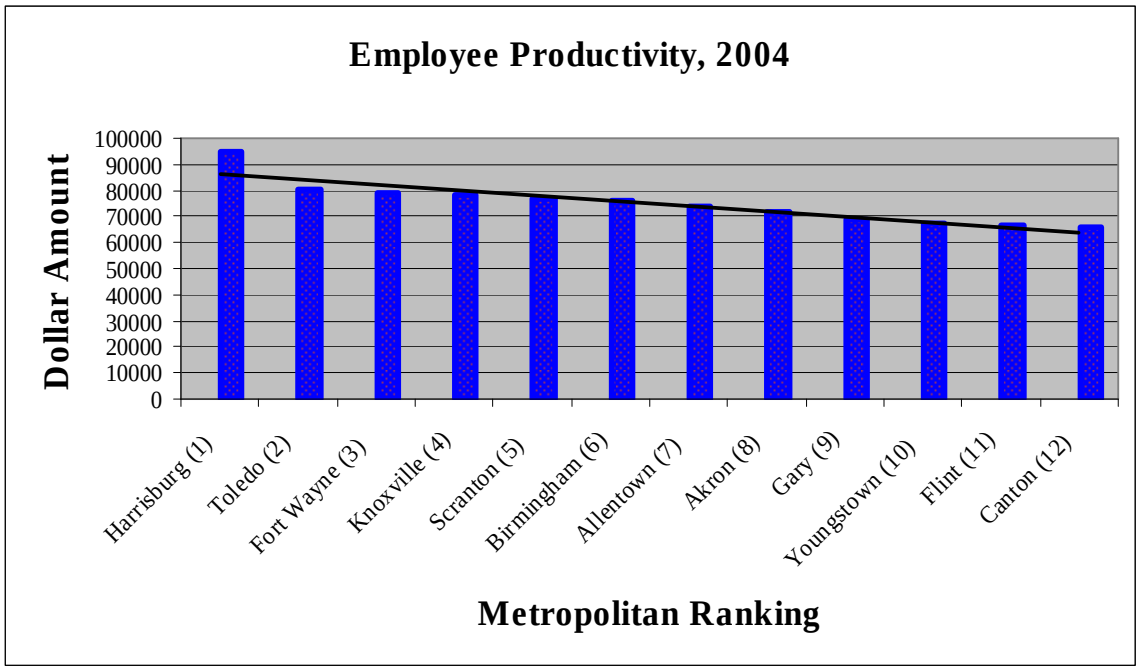


**Fig. 12**

**Percentage Growth Change:**

In order to assess the real employee productivity growth change in these metropolitan areas, the percentage growth in employee productivity was calculated between 2000 and 2004 and ranked. The analysis showed that the Birmingham MSA topped the list of employee productivity between 2000 and 2004 at 26.26%, followed by the Knoxville MSA at 23.40%, and the Allentown MSA in third position at 22.03%. The Toledo and Akron MSAs were neck in neck for the fourth and fifth positions at 19.29% and 19.11%

respectively. Also, the Harrisburg and Youngstown MSAs were ranked close to each other for the tenth and eleventh positions at 13.68% and 13.28% respectively, while the Scranton MSA ranked last at 12.77% in employee productivity for the period analyzed (see Table 14 and Fig. 13).

## TABLE 14

### EMPLOYEE PRODUCTIVITY, 2000-2004
### (Percentage Growth Change)

| Metropolitan Area | 2000 | 2002 | 2003 | 2004 | % Change 2000-2004 | % Change Ranking |
|---|---|---|---|---|---|---|
| Akron, OH, MSA | $60,099 | $65,527 | $68,481 | $71,583 | 19.11% | 5 |
| Allentown-Bethlehem-Easton, PA, MSA | $60,376 | $67,246 | $71,062 | $73,675 | 22.03% | 3 |
| Birmingham-Hoover, AL, MSA | $61,942 | $69,065 | $72,129 | $76,437 | 23.40% | 2 |
| Canton-Massillon, OH, MSA | $57,990 | $61,823 | $63,354 | $65,921 | 13.68% | 10 |
| Flint, MI, MSA | $59,118 | $65,247 | $65,612 | $66,668 | 12.77% | 12 |
| Fort Wayne, IN, MSA | $67,406 | $72,804 | $75,345 | $78,990 | 17.18% | 8 |
| Gary, IN, MSA | $57.840 | $61,547 | $65,154 | $68,999 | 19.29% | 4 |
| Harrisburg-Carlisle, PA, MSA | $80,796 | $86,621 | $90,952 | $94,865 | 17.41% | 7 |
| Knoxville, TN, MSA | $62,026 | $68,779 | $73,757 | $78,315 | 26.26 | 1 |
| Scranton-Wilkes-Barre, PA, MSA | $65,255 | $70,727 | $74,326 | $76,877 | 17.81% | 6 |
| Toledo, OH, MSA | $68,980 | $73,993 | $77,518 | $80,581 | 16.82% | 9 |
| Youngstown-Warren-Boardman, OH, MSA | $59,698 | $62,925 | $65,117 | $67,625 | 13.28% | 11 |

Source: Calculated by author from data generated by Economy.com and U.S. Department of Labor, Bureau of Labor Statistics
*http://www.economy.com and http://www.bls.gov*

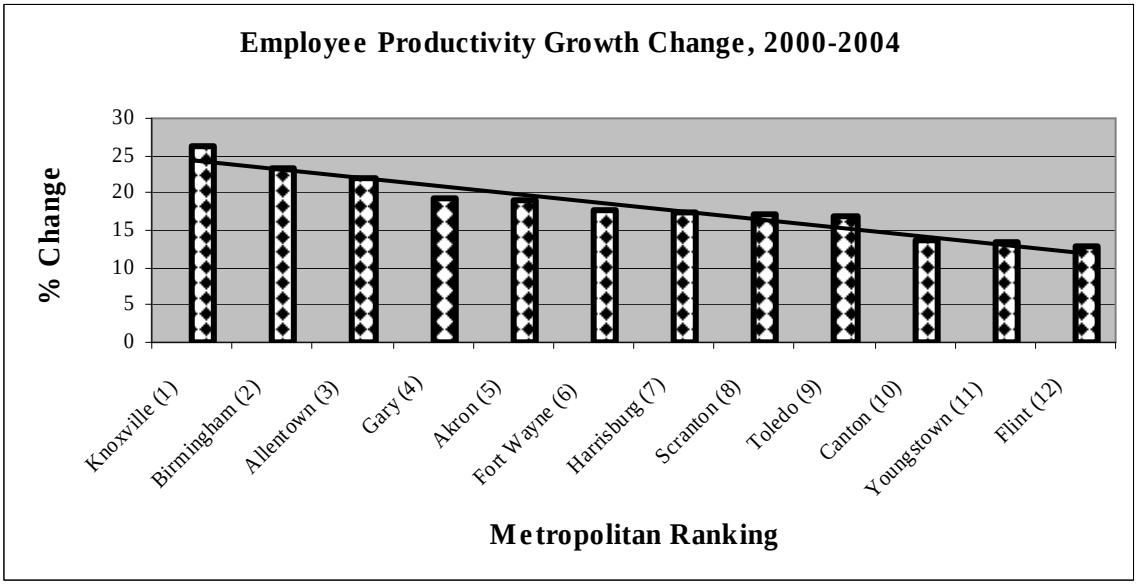
Employee Productivity Growth Change, 2000-2004
% Change
30
25
20
15
10
5
0
Knoxville (1)
Birmingham (2)
Allentown (3)
Gary (4)
Akron (5)
Fort Wayne (6)
Harrisburg (7)
Scranton (8)
Toledo (9)
Canton (10)
Youngstown (11)
Flint (12)
Metropolitan Ranking

Fig. 13

## SUMMARY OBSERVATION

This analysis was conducted to see how the new Youngstown-Warren-Boardman MSA, consisting of Mahoning and Trumbull counties, both in Ohio, and Mercer County, PA, would perform compared to other comparable Metropolitan Areas of its size in northeast Ohio and the Midwest region, as well as MSAs from the nation in *total employment, unemployment rates, average annual wages, per capita personal income, gross metropolitan products and employee productivity* over time. The whole analyses indicate and the graphs show that the new Youngstown MSA does not compare favorably with its counterparts in any of these variables as follows:

***Total Employment***: When employment growth change was analyzed between 2000 and 2004, the Knoxville, TN, MSA; Allentown-Bethlehem-Easton, PA, MSA; Harrisburg-Carlisle, PA, MSA; Akron, OH, MSA; and Scranton-Wilkes-Barre PA, MSA; ranked first, second, third, fourth, and fifth respectively because each gained a modest employment growth over the period. The remaining seven MSAs, including the Youngstown-Warren-

Boardman MSA, each lost employment over the same time period, and were ranked in the lower tier of the group.

***Unemployment Rate***: While the nation had an unemployment rate of 5.5% in 2004, the Youngstown-Warren-Boardman MSA had the second-highest unemployment rate of 7.2% and ranked eleventh, while Flint had the highest unemployment rate of 8.3% of the twelve MSAs. The remaining Ohio MSAs including Akron (6.00%), Canton (6.6%), and Toledo (7.0%), all exceeded the national average.

***Average Annual Wages:*** With this variable, three Ohio MSAs: Akron, Youngstown, and Toledo, were ranked among the seven top tiers in average wage growth rates in third, fourth, and seventh place respectively, while Canton ranked in ninth place between 2001 and 2004. The Birmingham-Hoover, AL, and Harrisburg-Carlisle, PA, MSAs captured first and second place respectively, while the Flint, MI, MSA ranked twelfth and last. This was the first time that the Youngstown-Warren-Boardman MSA was in the fourth top tier of the ranking position in the analysis.

***Per Capita Personal Income (PCPI):*** During the per capita personal income analysis, the Birmingham-Hoover, AL, MSA; Knoxville, TN, MSA; and

Scranton-Wilkes-Barre, PA, MSA respectively took first, second, and third place. On the Ohio side, the Youngstown-Warren-Boardman MSA ranked seventh, below the Toledo, MSA in sixth place, but above the Akron MSA in eighth, while the Canton-Massillon MSA captured the tenth position.

***Gross Metropolitan Product*** **:** During the nominal ranking of this variable, the following MSAs: Birmingham, Allentown, Harrisburg and Knoxville claimed first, second, third, and fourth place respectively. While the Toledo and Akron MSAs respectively captured the fifth and sixth positions, Youngstown ranked ninth, followed by Fort Wayne in tenth place, while Flint ranked eleventh, and Canton was in the twelfth and last place.

However, during the percentage growth analysis, the top three positions were captured by the Knoxville, TN, MSA in first place; the Allentown-Bethlehem-Easton PA, MSA in second place; and the Birmingham-Hoover, AL, MSA in third place. Of Ohio's MSAs, only Akron took the fifth top tier position, while Toledo, Canton, and Youngstown ranked in the lower tiers at ninth, tenth, and eleventh positions respectively.

***Productivity (Value Added) Per Employee***: When employee productivity was ranked nominally for the 2004 base year, the following MSAs: Harrisburg, Toledo, Fort Wayne, and Knoxville, captured first, second, third, and fourth place respectively. On the other hand, the Akron, Youngstown, and Canton MSAs respectively ranked in eighth, tenth, and twelfth place respectively.

***Employee Productivity Growth Rate***: When the employee productivity growth rate analysis was conducted between 2000 and 2004, the following MSAs ranked in the top five positions: Knoxville, Birmingham, Allentown, Gary, and Akron at first, second, third, fourth, and fifth place respectively. During the same period, the employee productivity rate in the Youngstown-Warren-Boardman, OH, MSA and Flint, MI, MSA were at the bottom of the pile in eleventh and twelfth place respectively.

## IS THERE A CORRELATION BETWEEN GROSS METROPOLITAN PRODUCT AND EMPLOYEES' PRODUCTIVITY IN A METROPOLITAN ECONOMY?

As a case in point, between 2000-2004, the Knoxville, TN, MSA's Gross Metropolitan Product ranked first, followed by the Allentown-Bethlehem-Easton, PA, MSA in second place, while the Birmingham-Hoover, AL,

MSA ranked third (see Fig. 9 above). However, when the employee productivity of these metropolitan areas was calculated for the same period, 2000-2004, Knoxville again ranked first, followed by Birmingham in second place, while Allentown ranked third. The Akron, OH, MSA replicated fifth place rankings in both calculations (see Fig. 13). In other words, the growth metropolitan product rankings of these metropolitan areas also mirrored their productivity rankings.

On the flip side of the argument, those metropolitan areas with lower rankings in the gross domestic product also ranked lower in employee productivity. For example, the Youngstown-Warren-Boardman, OH, MSA, which ranked eleventh in Gross Metropolitan Product, also ranked eleventh in employee productivity. The Flint, MI, MSA also replicated its twelfth place position in both analyses for the same time interval, 2000-2004. Accordingly, the replications of these ranking positions shown above beg the question: Is there a linear, albeit holistic relationship between the gross metropolitan product and employee productivity of a metropolitan economy?

In order to further shed light on this relationship, it may be worthwhile to look at the Gross Metropolitan Product in terms of this simple economic equation relationship:

GMP = f (K, L, M, Tech….);

***where*:**

GMP = Gross Metropolitan Product

f = function,

K = capital,

L = labor,

M = market, and

Tech = technology.

What this equation implies is that the more investment you put into your production function, the more you get out in the form of output, in this case (GMP). In fact, Michael Porter (1990) in his celebrated "Diamond of Competitive Advantage," succinctly gave the following guidelines to affirm the above statement when he said that a firm's competitiveness and increased productivity is a function of:

1. The national or regional level capacity in terms of the quality of available inputs associated with "factor-creating investments;"

2. the "firm strategy, structure and rivalry" in the form of cluster development;
3. the sophistication of local demand associated with market availability; and,
4. the business climate associated with the rules and regulations of institutions as catalysts for stimulating innovation and creativity.

In short, does employee productivity impact the gross output of a firm and vice-versa? Maybe a longitudinal analysis involving more variables would try to answer this question for a metropolitan economy.

## SECTION II

## VARIABLE STANDARDIZATION, INDEXING, AND RANKING: LITERATURE REVIEW

A literature review of one of the methodologies used in the creation of an index was undertaken including David Tuerck (2003) of the Beacon Hill Institute at Suffolk University in Boston, Massachusetts. In a study titled: ***Metro Area and State Competitiveness Report***, Tuerck analyzed all the states in the country for their competitiveness. Using variables with different measuring units such as infrastructure availability, technology,

openness, environmental policy, domestic competition, etc., he described the model he applied for standardizing and indexing variables with different units of measurements in order to delineate and rank these states and metropolitan areas.

He selected a performance range or scale from 0 (worst) variable performer to 10 (best) performer in the development of index. In the end, he said: “A competitiveness index is simply a summary measure based on a large number of variables. The difficulty, and controversial part is choosing a weighting scheme. Our approach is the simplest and most transparent: within each sub-index, each variable carries equal weight.” (p. 11). Other researchers using a similar methodology to develop metropolitan indices include Atkinson and Gottlieb (2001) of the Progressive Policy Institute and Center for Regional Economic Issues; and Flynn et al. (2001) of the Massachusetts Technology Collaborative, Westborough, Massachusetts, to name only two.

In short, in order to develop a common index for variables with different units of measurements such as dollars, percentages, and growth rates, etc., all in the same calculation, one has to normalize/standardize those variables.

Without subjecting the variables to normalization processes, it is impossible to simply add the raw (nominal) variable scores and weight the result to have the ***arithmetical mean***. Any effort to interpret the mean derived by simple arithmetical summation of these variables, presents a much distorted interpretation of what unit name the mean represents as a measure of central tendency.

In layman's terms, you cannot group a flock of sheep, goats and birds together and call them animals because birds are not animals, but birds. An umbrella term to use would be ***creatures***—to encompass the four-legged (goats and sheep) and two-legged (birds). In much the same way, to neutralize the various name units among the variables, these variables have to be **standardized** through a set of formulated mathematical processes called ***centering and scaling*** processes. As one can see, deriving the "acceptable mean" becomes the key in variable standardization and indexing processes associated with variables with different unit names.

## USE OF THE MEDIAN-SCORE FOR VARIABLE-SCORE STANDARDIZATION

A study by Furdell, Wolman and Hill (2004) titled "Have central cities come back?" in which variable scores had to be standardized, they used "median-score" rather than the "mean-score" because of skewed results associated with variable outliers. They argued that whether the measure is that of population or income or a combination of both, "…these data typically have means to the right of the median with large standard deviations. The shapes of these distributions cause both real and conceptual problems when constructing indices using standardized (z) scores that use the mean as their measure of central tendency."

They went on to say that the disadvantages of using the standardized z-scores include, but are not limited to: difficulties in interpreting the resulting intermediate variable, complexity in computation, loss of face validity and outlier non-resistance. They felt that the solution to these problems lies in using "..a transformation that retains the desirable computational and interpretive properties of a z-score but is outlier resistant," and the *mean-score* was the solution. Cementing their argument, they said:

> Both the mean and standard deviation have no resistance, but the median (M) and the pseudo-standard deviation [PSD] are resistant

> estimators of the distribution. The median is the middle value of the sample. The PSD is based on the inter-quartile range which is the difference between the first and third quartile and captures the width or spread of the middle half of the distribution. The PSD is divided by 1.349, which is frequently rounded to 1.35, because in the case of the normal distribution, the ratio of the IQR to 1.349 is equal to the standard deviation. P.43

In effect, Furdell et al. used a similar methodology used by Tuerck above. This analysis will use the same methodology employed by both Tuerck and Furdell et al. in standardizing the six traditional regional economic indicator variables associated with median score application. The median score, as has already been cited above, is analogous to the z-score, but uses a set of measures that are resistant to the influence of the outliers especially when the variables under study have highly skewed distributions. Meanwhile, as per Furdell et al. study, the median-transformation is given in equation (1), while the z-transformation is in equation (2) as follows:

**The median-score** (transformation) is :

$M_i = (x_i\text{-}M/PSD)$ ……(1)

where: $M_i$ is the transformed observation of variable x

$x_i$ is the observation

M is the median of the distribution

PSD is the pseudo-standard deviation or pseudo-sigma defined as the interquartile range (IQR) divided by 1.349.

IQR = $q_{0.75} - q_{0.25;}$ also written as (Q3-Q1)

**The z-score** (transformation) is defined as:

$z_i = (x_i - \mu) / \delta$

where: $z_i$ is the observation

μ is the mean of the distribution of x

δ is the standard deviation of variable x.

# CONCLUSION

## ANALYSIS OF THE COMPETITIVE RANKING LEVELS OF THE METROPOLITAN AREAS AFTER AGGREGATION

As shown below in Appendix A, Table 1, the performance scores of the twelve metropolitan areas in each category of the six indicator variables were lumped together (i.e. aggregated) and ranked. The rankings show the competitive positions of each of the twelve metropolitan areas studied vis-à-vis the rest. The metropolitan area that ranked first of the twelve metropolitan areas was Allentown-Bethlehem-Easton, PA; followed by the Birmingham-Hoover, AL, MSA; in second place, while the Akron, OH, MSA ranked third. Fourth place went to the Harrisburg-Carlisle, PA, MSA, followed by the Toledo, OH, MSA in fifth place, while the Flint, MI, MSA came in sixth place.

The Youngstown-Warren-Boardman, OH MSA ranked in eleventh place, followed by the Canton-Massillon, OH, MSA in twelfth and last place. Even though these metropolitan statistical areas took various top and low ranking positions with raw scores at one time or another, after due normalization process and aggregation, their ranking positions changed dramatically. The whole process is analogous to a school ***science competition*** at the county,

regional, state and ultimately at the national levels. It is only the best of the best that will win the national trophy in first, second, and third place. In this case, the metropolitan statistical areas that are comparatively and competitively the strongest are the ones in the top tiers of the ranking in which they have outperformed their rival MSAs.

Again, the  decision-makers of those metropolitan areas at the bottom rung of the ladder need to assess their areas of weaknesses and plan on strategies to improve on them if they are to survive in today's increasingly competitive world economy.

# APPENDIX

# APPENDIX A

## TABLE 1

## Standardized Aggregated Traditional Economic Indicators Index

| | | | INDICATOR VARIABLES | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Metropolitan Statistical Area** | **Aggregated Index** | **Rank** | **Employ.** | **Income (PCPI)** | **Wages** | **GMP** | **Prod.** | **Unemp.** |
| **Akron, OH, MSA** | **5.40** | **3** | 5.55 | 7.57 | 7.82 | 5.30 | 1.08 | 5.07 |
| **Allentown-Bethlehem-Easton, PA, MSA** | **7.40** | **1** | 6.47 | 8.77 | 9.00 | 6.38 | 10 | 3.57 |
| **Birmingham-Hoover, AL, MSA** | **7.00** | **2** | 10.00 | 8.55 | 9.69 | 10.00 | 1.14 | 2.50 |
| **Canton-Massillon, OH, MSA** | **2.11** | **12** | 1.00 | 2.30 | 1.00 | 1.00 | 1.00 | 6.34 |
| **Flint, MI, MSA** | **4.32** | **6** | 1.11 | 2.67 | 10.00 | 1.17 | 1.01 | 9.98 |
| **Fort Wayne, IN, MSA** | **3.12** | **10** | 1.21 | 6.19 | 4.73 | 2.01 | 1.18 | 3.37 |
| **Gary, IN, MSA** | **3.49** | **8** | 4.21 | 3.03 | 4.1 | 3.89 | 1.04 | 4.64 |
| **Harrisburg-Carlisle, PA, MSA** | **5.30** | **4** | 3.16 | 10.00 | 9.95 | 5.38 | 1.39 | 1.88 |
| **Knoxville, TN, MSA** | **3.79** | **7** | 4.73 | 5.03 | 5.42 | 5.38 | 1.17 | 1.00 |
| **Scranton-Wilkes-Barre, PA, MSA** | **3.25** | **9** | 2.95 | 3.65 | 1.0 | 3.54 | 1.15 | 7.21 |
| **Toledo, OH, MSA** | **5.10** | **5** | 4.45 | 6.23 | 6.00 | 5.33 | 1.20 | 7.21 |
| **Youngstown-Warren-Boardman, OH, MSA** | **2.83** | **11** | 2.95 | 1.00 | 1.8 | 2.71 | 1.02 | 7.50 |

**Source: Calculated by Author**

# APPENDIX B

## DATA SOURCE INFORMATION

**Per Capita Personal Income (PCPI)**

**U.S. Department of Commerce**
**Bureau of Economic Analysis**
**Regional Economic Accounts**
**http://www. bea.gov**

**Average Wages**

**U.S. Department of Labor**
**Bureau of Labor Statistics**
**Quarterly Census of Employment and Wages**
**http://www.bls.gov/cew**

**Gross Metropolitan Product**

**Economy.com, Inc.**
**121 North Walnut Street, Suite 500**
**West Chester, PA 19380**
**610-235-5000**
**http://www.economy.com**

**Total Employment**

**U.S. Department of Labor**
**Bureau of Labor Statistics**
**Quarterly Census of Employment and Wages**
**http://www.bls.gov/cew**

**Unemployment Rate**

**U.S. Department of Labor**
**Bureau of Labor Statistics**
**Daniel Conti, Economist**
**202-691-6481**

# REFERENCES

**Atkinson, Robert, and Gottlieb, Paul, 2001. "The Metropolitan New Economy Index." Progressive Policy Institute and Center for Regional Economic Issues.**

**Flynn et al., 2001. "Index of the Massachusetts Innovation Economy." Massachusetts Technology Collaborative, Westborough, Massachusetts.**

**Furdell, Kimberly, et al., 2004. "Have Central Cities Come Back?" Paper presented at the Annual International Urban Affairs Association in Washington, D.C.**

**Tuerck, David G., 2003. "Metro Area and State Competitiveness Report." BEACON Hill Institute at Suffolk University, Boston, Massachusetts.**

**U.S. Department of Commerce, Bureau of Economic Analysis (BEA), Washington D.C.**