



# CULTIVATING INNOVATION:

*Is metro Milwaukee prepared for the new  
knowledge-based economy?*

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# INTRODUCTION

*“As today’s global economy undergoes a fundamental transformation driven by knowledge-based assets, regions need to capitalize on innovation - the only long-term driver of overall growth.”<sup>i</sup>*

– Milwaukee 7 Framework for Economic Growth

In 2010, as new cluster strategies were developing and efforts to support entrepreneurship were expanding in metro Milwaukee, the Public Policy Forum set out to benchmark those efforts against other cities as a tool for current and future evaluation. The result was *Pursuing Innovation*,<sup>ii</sup> a report designed to assist business and elected leaders in assessing the region’s progress in transitioning to a 21<sup>st</sup> century knowledge-based economy.

At that time, we described the transition as a work in progress. Many regional indicators were trending in a positive direction, including growing university research and development spending, higher educational attainment levels, and attraction of more federal research and technology transfer dollars for area businesses. Others were less encouraging, however, including the region’s negative or flat trends in patent activity, its number of scientists and engineers, and its knowledge workers per capita.

Seven years later, Foxconn Technology Group’s plan to develop a massive flat screen display plant in Southeast Wisconsin is poised to shake up the region’s economic development landscape. That development – as well as the time that has elapsed since our last analysis – makes this an opportune time to re-assess the current state of innovation in the regional economy. While the Foxconn development is being hailed by many as potentially transformational for the advanced manufacturing industry and for local startup activity, it is important to gauge our region’s readiness to maximize the opportunity and, irrespective of Foxconn, to grow and thrive in the digital age.

This report assesses the Milwaukee metropolitan area’s current strengths and weaknesses – as well as progress made since the Great Recession – on a range of metrics associated with economic innovation and dynamism.<sup>1</sup> We use 20 indicators that gauge our region’s success in developing a skilled workforce; cultivating new ideas and transferring them to market; creating new businesses and entrepreneurs; and attracting financial resources needed to help enterprises innovate and grow. In addition to tracking metro Milwaukee’s progress over the last decade, we compare the region’s performance with 10 other metro areas to ascertain how we are doing in relation both to geographical peers and to other regions that are viewed as national leaders in innovation.

No individual metric does a perfect job of capturing the dynamics of metro Milwaukee’s economic progress or its performance in relation to other regions, and it is beyond the scope of this study to assess the relative importance of one metric compared to the others. Taken together, however, we hope that this set of indicators – and our ongoing monitoring of them over time – will provide insight to local policymakers, business leaders, and the broader community as to how our region is advancing and which economic development strategies we may wish to prioritize in the future.

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<sup>1</sup> The Milwaukee metropolitan statistical area (MSA) is defined as Milwaukee, Ozaukee, Washington, and Waukesha counties.



## METHODOLOGY

This analysis involved collecting and analyzing data from a number of federal, state, and private sector sources. While our 2010 study exclusively used data from before the Great Recession, this update shows trends extending from before the recession to the present day whenever possible. For many indicators, 2015 data were the most recently available.

For our comparative analysis of metro Milwaukee with peer and leader metro areas, we level the playing field by comparing metrics on a per-capita basis and/or based on the rate of recent change, rather than by raw totals alone. We also include national data or averages whenever possible for additional context.

**Table 1** provides general information about each metro area included in this study. Our comparison focuses primarily on midsized metro areas located in the Midwest and/or Rust Belt. These metro regions share many of our region's characteristics, including a historic focus on manufacturing. For additional perspective, we also include two metro areas from our 2010 study that often are identified as national leaders in innovation (Austin and Portland) and one other with which Milwaukee is frequently compared (Oklahoma City).

**Table 1: Basic characteristics of metro Milwaukee and comparison metro areas**

| National population rank | Metropolitan statistical area (MSA) | Population 2016  | Population Change 2005-2016 | Counties in MSA | Universities reporting R&D expenditures | Regional Poverty Rate |
|--------------------------|-------------------------------------|------------------|-----------------------------|-----------------|---|-----------------------|
| 16                       | Minneapolis, MN                     | 3,551,036        | 15.4%                       | 13              | 10                                      | 10.3%                 |
| 24                       | Portland, OR                        | 2,434,955        | 18.0%                       | 7               | 8                                       | 13.6%                 |
| 26                       | Pittsburgh, PA                      | 2,342,299        | 1.2%                        | 7               | 10                                      | 12.3%                 |
| 28                       | Cincinnati, OH                      | 2,165,139        | 6.9%                        | 15              | 3                                       | 14.1%                 |
| 30                       | Kansas City, MO                     | 2,104,509        | 10.2%                       | 15              | 2                                       | 12.6%                 |
| 31                       | Austin, TX                          | 2,056,405        | 46.2%                       | 5               | 2                                       | 14.2%                 |
| 32                       | Cleveland, OH                       | 2,055,612        | -1.3%                       | 5               | 5                                       | 15.5%                 |
| 34                       | Indianapolis, IN                    | 2,004,230        | 24.6%                       | 10              | 4                                       | 14.4%                 |
| <b>39</b>                | <b>Milwaukee, WI</b>                | <b>1,572,482</b> | <b>6.2%</b>                 | <b>4</b>        | <b>6</b>                                | <b>15.2%</b>          |
| 41                       | Oklahoma City, OK                   | 1,373,211        | 22.1%                       | 7               | 3                                       | 15.3%                 |
| 50                       | Buffalo, NY                         | 1,132,804        | 1.9%                        | 2               | 3                                       | 14.8%                 |

Sources: U.S. Census Bureau; National Science Foundation<sup>iii</sup>

As the data above show, each of these metro areas is distinct in size, pace of growth, and many other factors. Collectively, however, they represent a relevant and diverse set of peers with which to compare metro Milwaukee's economic performance.



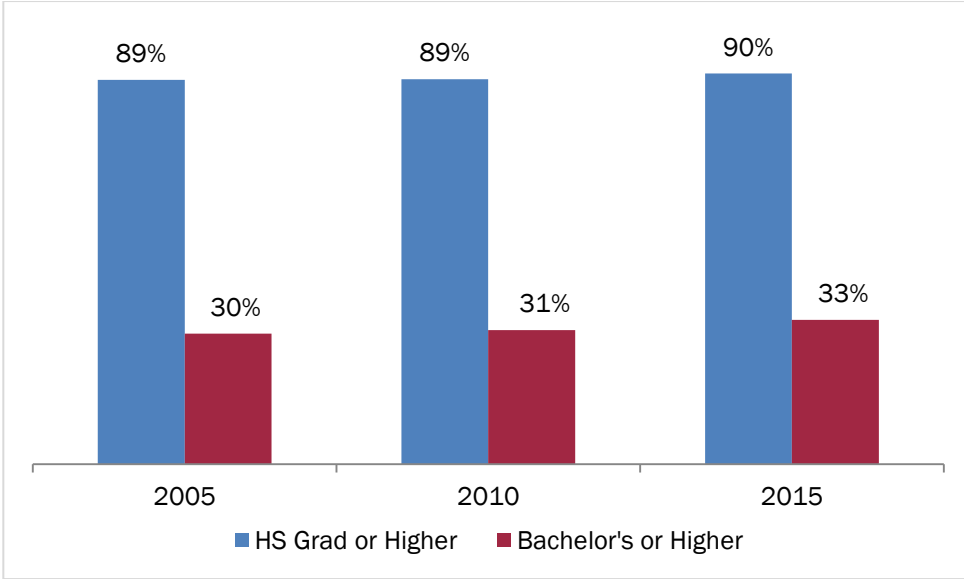
# REGIONAL TALENT

A skilled workforce is fundamental to creating, attracting, and retaining businesses in a regional economy. In this section, we track metro Milwaukee’s progress in increasing educational attainment and cultivating a skilled workforce in several key categories associated with innovation and the 21<sup>st</sup> century knowledge economy.

## EDUCATIONAL ATTAINMENT

Educational attainment in our region is slowly but steadily increasing. In 2015, for the first time ever, the share of metro Milwaukee adults ages 25 and over who have earned at least a high school diploma or GED reached 90%, as shown in **Chart 1**. At the same time, the share that has earned a bachelor’s degree or higher has bumped up from 30% in 2005 to 33% in 2015.

**Chart 1: Educational attainment in metro Milwaukee (adults ages 25 and over)**



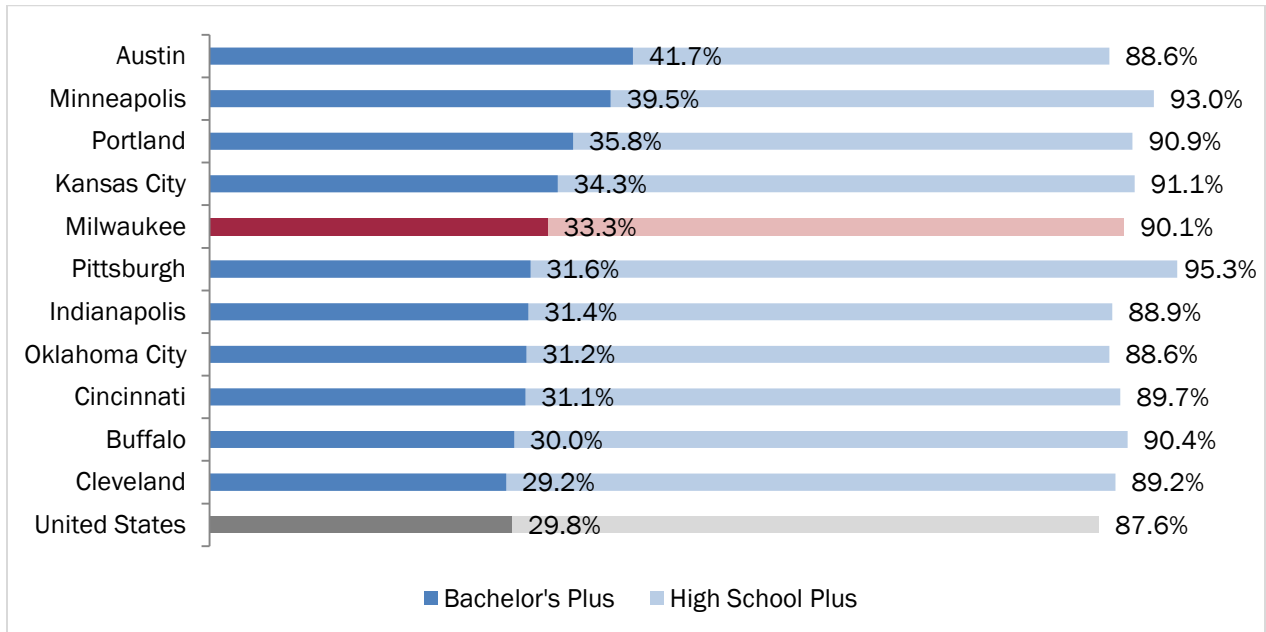
Source: U.S. Census Bureau

Metro Milwaukee’s educational attainment is competitive with our comparison metro areas (**Chart 2**). Among the 11 metro areas included in our study, Milwaukee has the fifth highest share of adults ages 25 and over with at least a bachelor’s degree and it also has a higher rate of bachelor’s degree attainment than the national average. Our region ranks sixth (the middle of the pack) for its share of adults with at least a high school diploma or GED.

Milwaukee also is keeping pace with other metro areas in *increasing* its share of adults with college degrees, as shown in **Chart 3**. The percentage of adults ages 25 and over with at least a bachelor’s degree increased by 3.2 percentage points between 2005 and 2015, which was higher than the U.S. average of 2.5%.

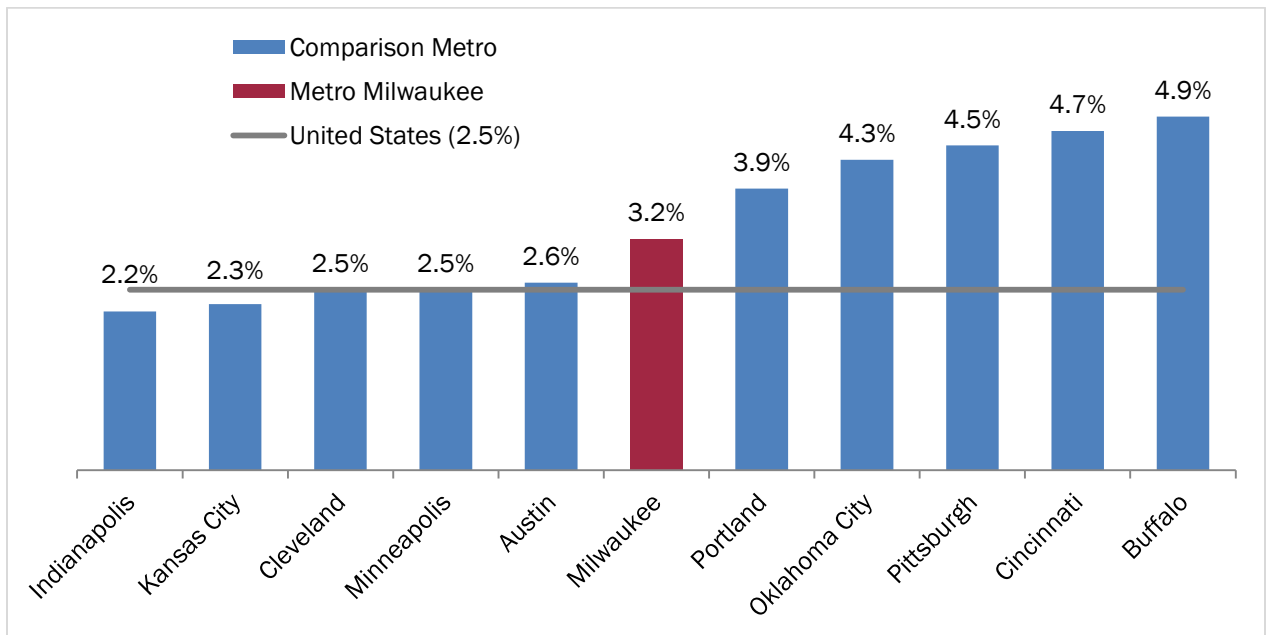


**Chart 2: Educational attainment comparison, 2015 (adults ages 25 and over)**



Source: U.S. Census Bureau

**Chart 3: Percentage point increase in adults with bachelor's degree or higher, 2005-2015**



Source: U.S. Census Bureau

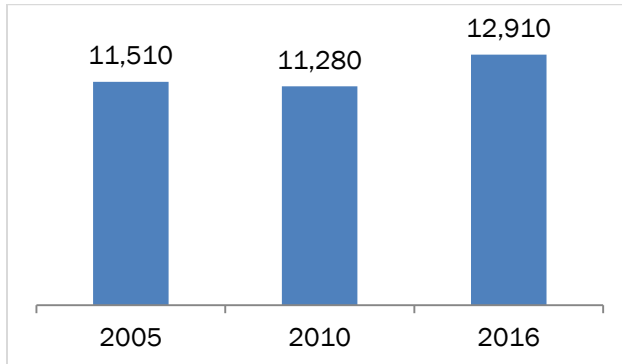
While significant racial disparities in educational achievement continue to persist in metro Milwaukee (as discussed in previous Forum research<sup>iv</sup>), the educational attainment of the metro area's population overall appears to be comparable with our peers and the nation and is moving in the right direction.



## SCIENTISTS & ENGINEERS

While scientists and engineers make up a relatively small share of the overall workforce, they are responsible for much of the research and development activity that defines innovation, making them a highly valued group. As **Chart 4** shows, metro Milwaukee added 1,400 scientists and engineers between 2005 and 2016 (an increase of 14%), with all of the net growth occurring since 2010.<sup>2</sup>

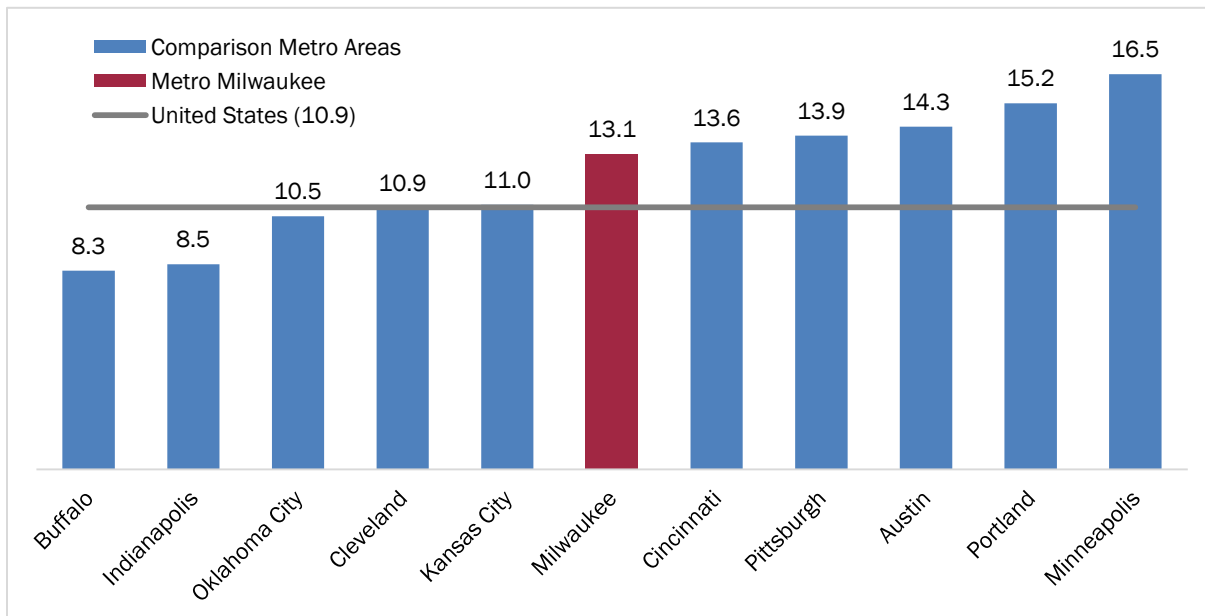
**Chart 4: Total scientists and engineers in metro Milwaukee, 2005-2016**



Source: U.S. Bureau of Labor Statistics<sup>v</sup>

In relation to our comparison regions, Milwaukee falls in the middle when it comes to the current share of working age adults (ages 18-64) who are employed as scientists and engineers, as shown in **Chart 5**. Our region does have a stronger concentration of scientists and engineers than the U.S. average.

**Chart 5: Scientists and engineers per 1,000 working age adults (2016)**



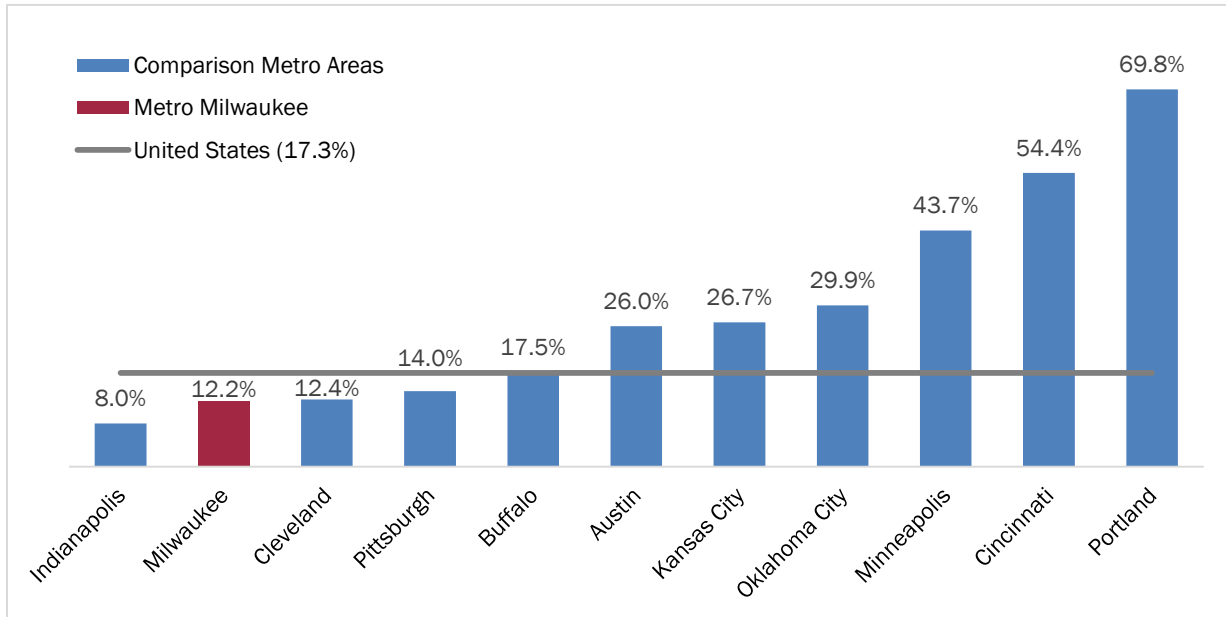
Source: U.S. Bureau of Labor Statistics

<sup>2</sup> "Scientists and engineers" includes 18 engineering occupations and 21 physical and life science occupations. The BLS tracks the number of individuals employed in each occupation through the Occupational Employment Statistics (OES) database.



Since 2005, however, the U.S. and all but one of the comparison metro areas have increased their populations of scientists and engineers at a faster rate than metro Milwaukee (**Chart 6**). Thus, the Milwaukee area could fall below the median in its concentration of this valuable talent pool if its pace of growth does not increase in the future.

**Chart 6: Percentage increase in total scientists and engineers, 2005-2016**



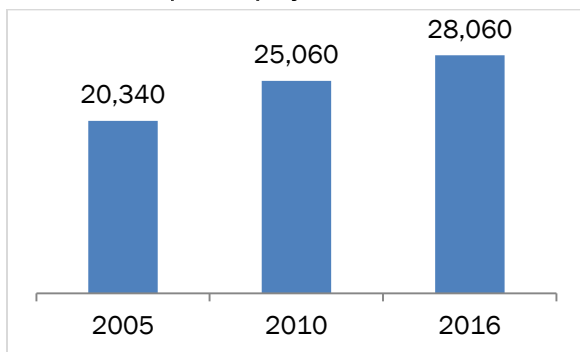
Source: U.S. Bureau of Labor Statistics

## TECH/IT WORKERS

Information technology (IT) is another industry often associated with innovation in today’s economy.

**Chart 7** shows the substantial (38%) growth in tech/IT workers that has occurred in metro Milwaukee since 2005. Tech/IT workers here are defined as those who work in 18 computer-focused occupations, including software and web developers, computer programmers, and computer systems analysts.

**Chart 7: Tech/IT employment in metro Milwaukee, 2005-2016**



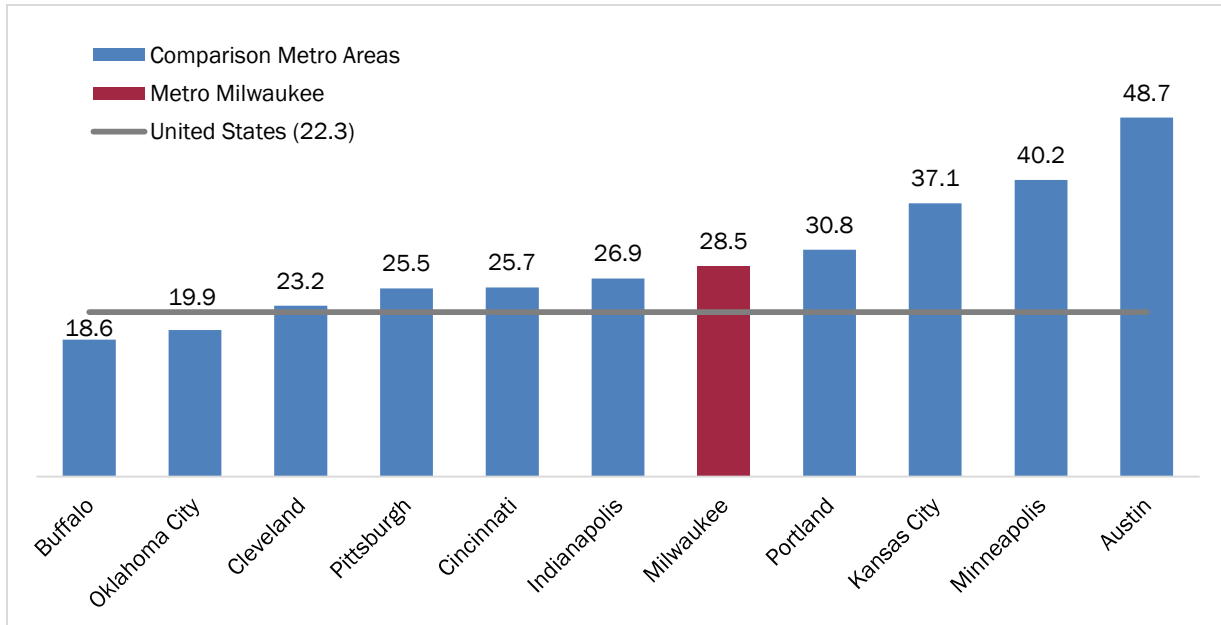
Source: U.S. Bureau of Labor Statistics





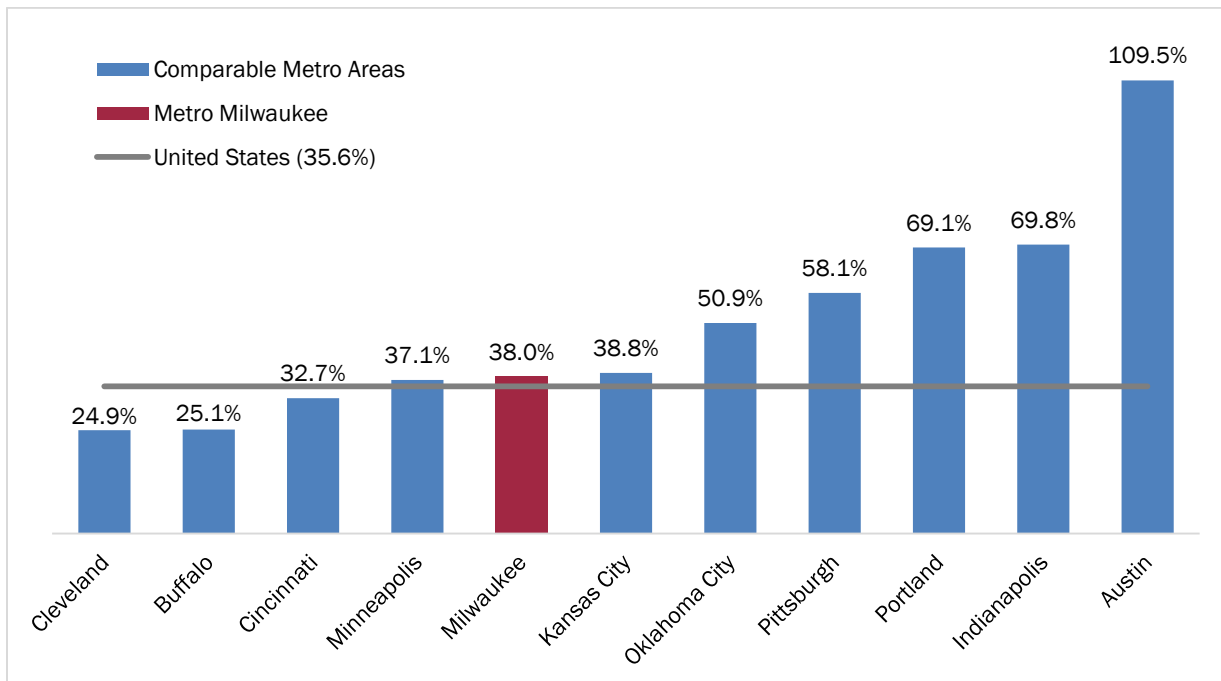
As with scientists and engineers, metro Milwaukee is competitive with most of our comparison metro areas and the nation in its current concentration of tech/IT workers, as shown in **Chart 8**. Our region also has added tech/IT jobs at a slightly faster rate than the national average during the past decade – another positive indication that this sector is strengthening in the Milwaukee area (**Chart 9**).

**Chart 8: Tech/IT workers per 1,000 working age adults (2016)**



Source: U.S. Bureau of Labor Statistics

**Chart 9: Percentage increase in total tech/IT workers, 2005-2016**



Source: U.S. Bureau of Labor Statistics



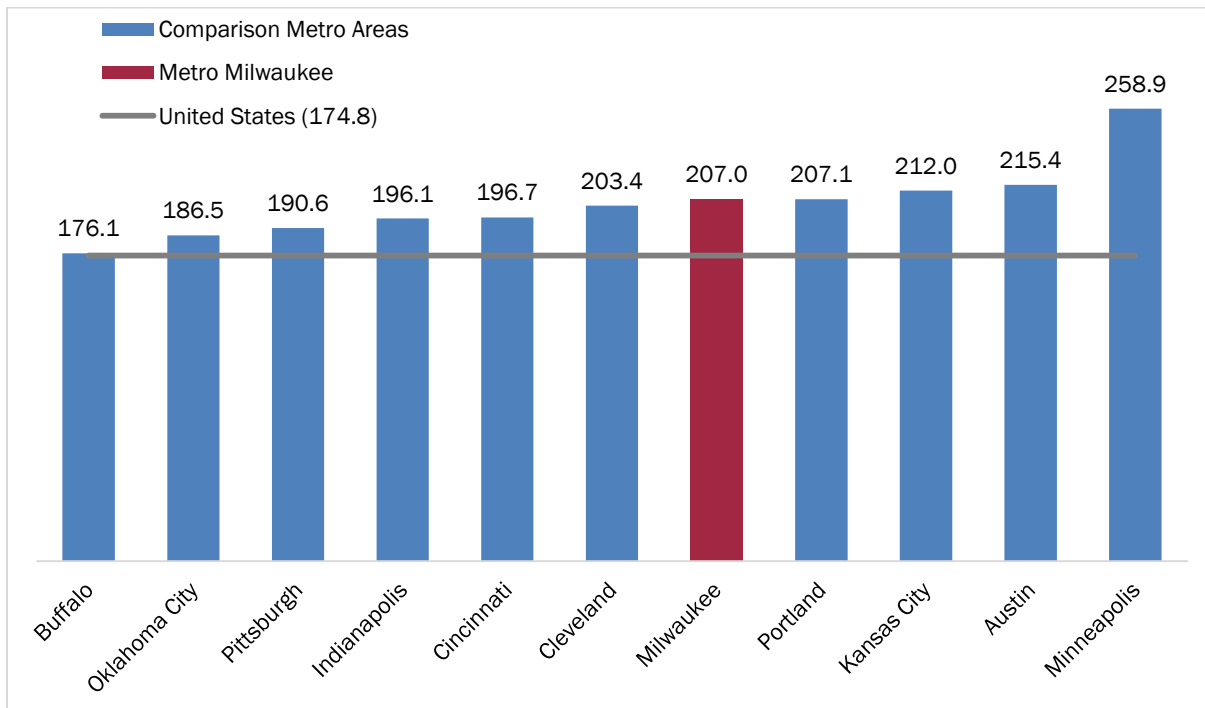
## KNOWLEDGE WORKERS

Knowledge workers are a larger category of individuals employed not only as scientists, engineers, and tech workers, but also in several additional occupations that require the use of information to make specialized decisions in the workplace. Those occupations typically require at least a bachelor's degree, as defined by the U.S. Bureau of Labor Statistics.<sup>vi</sup> Knowledge workers are primarily employed in the following broad occupational categories:

- Architecture and Engineering
- Art, Design, and Media
- Business and Financial Operations
- Computer and Mathematical Occupations
- Education, Training, and Library Occupations
- Healthcare
- Legal Occupations
- Life, Physical, and Social Sciences
- Management

Metro Milwaukee again falls roughly in the middle of the comparison metro areas and above the national average in its concentration of knowledge workers, as shown in **Chart 10**. Minneapolis, which ranked first for scientists and engineers and second for tech workers, clearly outpaces all of the other metro areas in its concentration of this broader pool of knowledge workers.

**Chart 10: Knowledge workers per 1,000 working age adults (2016)**



Source: U.S. Bureau of Labor Statistics



The data source we used for this analysis did not allow us to track and compare the growth of knowledge workers over the last decade. However, metro Milwaukee also was in the middle of the pack for knowledge workers among the comparison metro areas we used in our 2010 index. Similarly, Minneapolis ranked first for knowledge workers at that time.

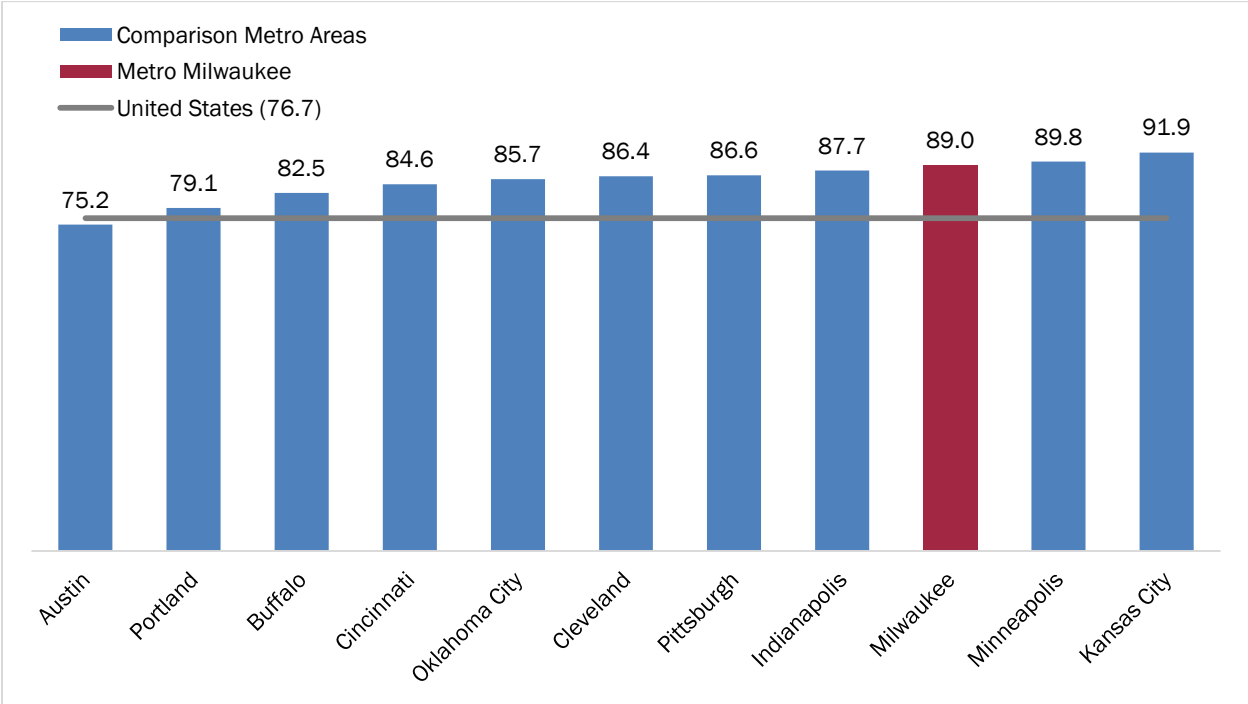
## SKILLED AND TECHNICAL WORKERS

While not all work in the 21<sup>st</sup> century knowledge economy requires a bachelor’s degree or higher, many additional jobs require some form of technical training beyond a high school diploma. For example, the number of jobs in U.S. manufacturing has dwindled, in part, because of an increase in automation. That development simultaneously has increased the level of training required for many of the more technical manufacturing jobs that remain or that are newly created.

For purposes of our analysis, occupations are included in the “skilled and technical” category if they typically require at least some college and at most an associate degree per the U.S. Bureau of Labor Statistics.<sup>vii</sup> We do not include occupations that only require on-the-job training (and no post-secondary education) for ease of comparison. According to State projections, in 2024, approximately 10.8% of all jobs in the four-county Milwaukee metro area will fall into the definition of “skilled and technical” occupations we use in this analysis, as compared to 10.0% in 2014.<sup>viii</sup>

As **Chart 11** shows, metro Milwaukee ranks relatively high in its concentration of skilled and technical workers, falling behind only Kansas City and Minneapolis. As with knowledge workers, the data source we used for this analysis did not allow us to track the growth of skilled and technical workers over time. However, our 2010 index ranked Milwaukee first among our comparison metro areas at that time, indicating that this has been a long-term strength of our region.

**Chart 11: Skilled and technical workers per 1,000 working age adults (2016)**



Source: U.S. Bureau of Labor Statistics

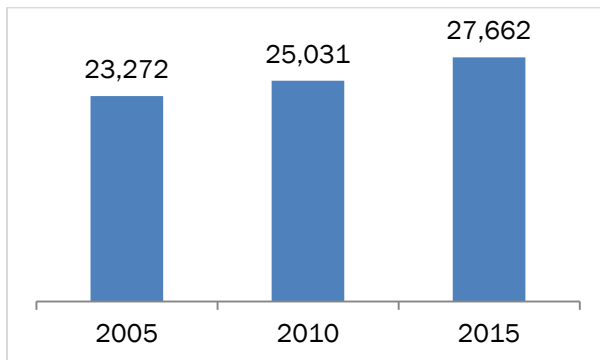


## COLLEGE-EDUCATED, FOREIGN BORN

National research has shown that immigrants are more likely to start new businesses and file for patents than their native counterparts.<sup>x</sup> Immigrants also are responsible for creating roughly half of the U.S. companies valued at \$1 billion or more.<sup>x</sup> For these reasons, the presence of college-educated immigrants in a city or region often is associated with entrepreneurial strength.

Metro Milwaukee's population of college-educated, foreign born individuals (adults ages 25 and over with a bachelor's degree or higher) increased by almost 19% between 2005 and 2015 (**Chart 12**).

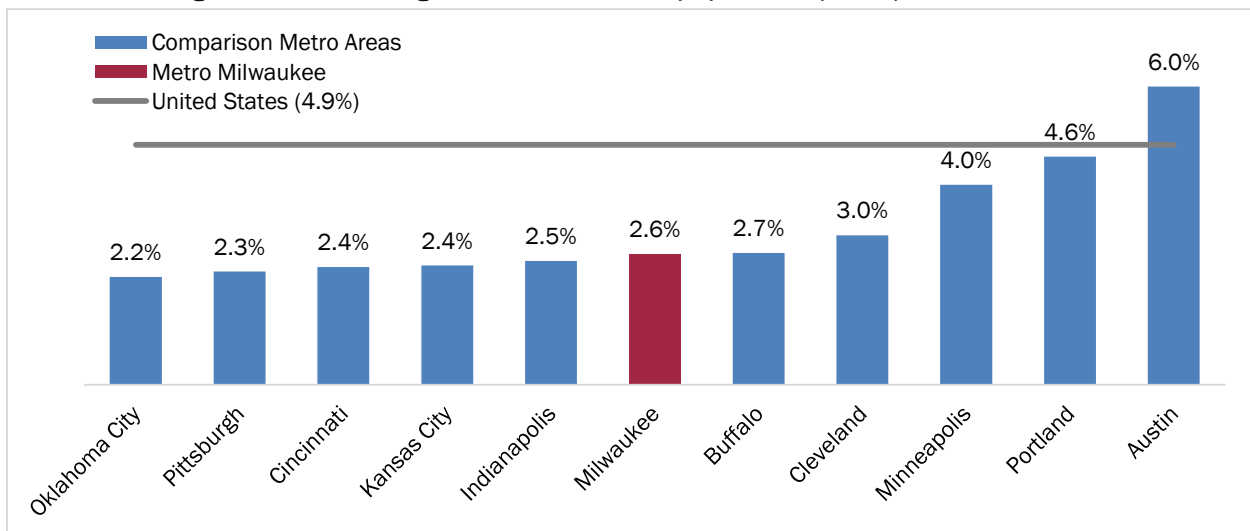
**Chart 12: College-educated, foreign born population in metro Milwaukee, 2005-2015**



Source: U.S. Census Bureau<sup>xi</sup>

Milwaukee is in the middle of the comparison metro areas in its concentration of college-educated, foreign born individuals (**Chart 13**). Those individuals comprise 2.6% of metro Milwaukee's total adult population. Among the comparison metro areas, only Austin (6.0%) has a higher concentration of college-educated, foreign born individuals than the U.S. average (4.9%). That is likely because highly-educated immigrants are heavily concentrated in other large metro areas, including San Jose (23.7%), San Francisco (14.8%), Washington D.C. (11.9%), and New York (11.6%).

**Chart 13: College-educated, foreign born as % of total population (2015)**

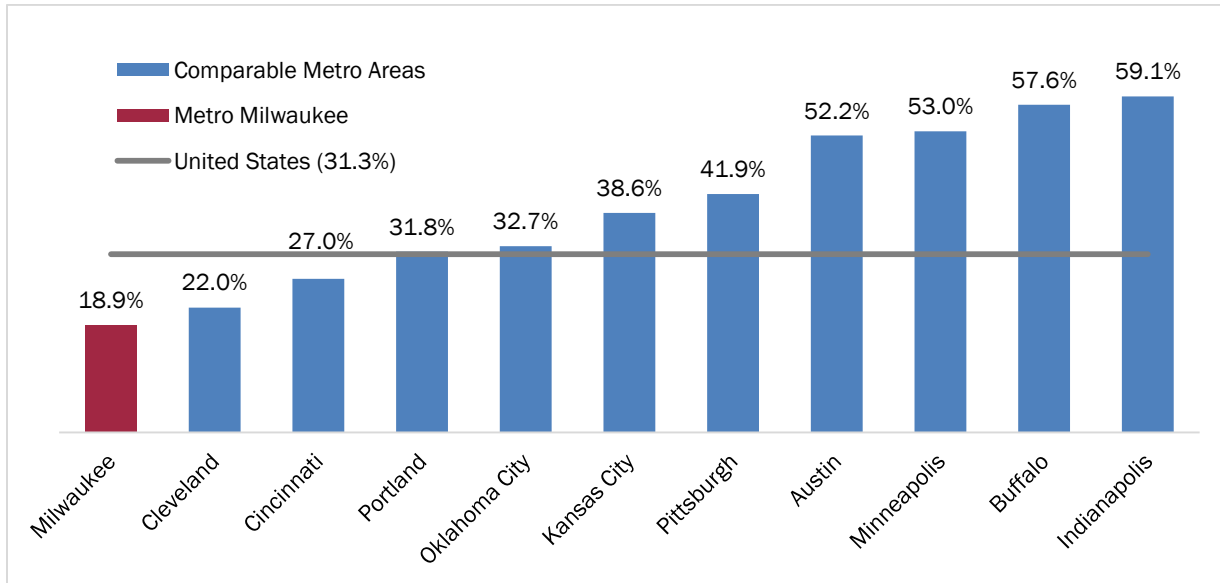


Source: U.S. Census Bureau



While metro Milwaukee’s college-educated immigrant population is growing, it is doing so at the slowest pace among the comparison metro areas and slower than the national average (Chart 14). In fact, metro Milwaukee’s concentration of college-educated immigrants ranked fourth among the 11 metro areas in 2005 and fell to sixth in 2015.

**Chart 14: Percentage increase in college-educated, foreign born population, 2005-2015**



Source: U.S. Census Bureau

## SUMMARY

The chart below (and those at the end of each subsequent section) summarizes the findings of our analysis in two ways. For each indicator, the first column shows whether the recent trend for metro Milwaukee is positive (green), neutral (yellow), or negative (red). The column on the right signifies how metro Milwaukee *currently* is performing relative to our 10 comparison metro areas; green indicates a current ranking in the top four, while yellow means Milwaukee falls among the middle three regions and red signifies a ranking in the bottom four.

| REGIONAL TALENT                | REGIONAL TREND | RANKING AMONG COMPARISON REGIONS |
|--------------------------------|----------------|----------------------------------|
| Educational Attainment         |                |                                  |
| Scientists & Engineers         |                |                                  |
| Tech/IT Workers                |                |                                  |
| Knowledge Workers              |                |                                  |
| Skilled & Technical Workers    |                |                                  |
| College-Educated, Foreign Born |                |                                  |



Overall, metro Milwaukee is experiencing positive growth in most of the metrics we analyzed related to regional talent. The region's performance also is in line with our comparison metros, with a notable strength in our concentration of skilled and technical workers. While the data paint a generally positive picture, they do show that the Milwaukee area has not been keeping pace with many of our comparison metro areas in its recent growth of some key groups linked to business growth and innovation, including scientists and engineers and college-educated immigrants.



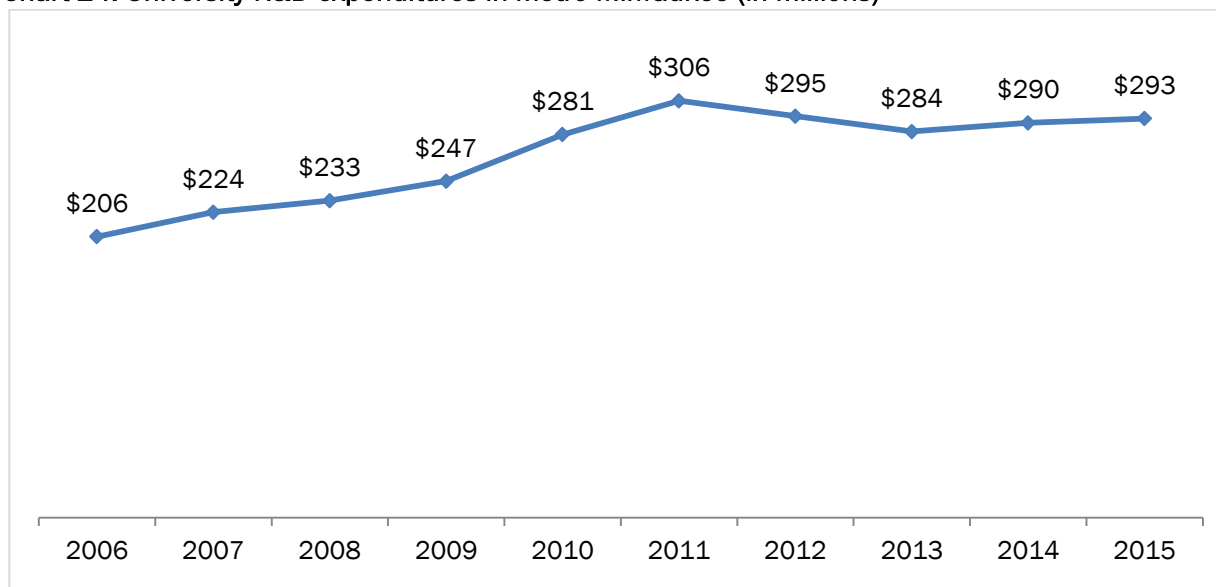
## IDEA DEVELOPMENT

Innovation can be defined in many different ways. In the business world, however, it typically refers to the generation of new ideas that lead to business creation and growth. This section gauges the level of research and development activity at area universities and in the region's private sector, which are the two primary arenas in which new ideas are cultivated.

### UNIVERSITY R&D

University research and development (R&D) expenditures can generate innovative ideas that lead to the creation of original products and services. Metro Milwaukee is home to six universities that together have increased their R&D expenditures in nominal terms from approximately \$206 million in 2006 to \$293 million in 2015, an increase of 42% (**Chart 24**).<sup>3</sup> The Medical College of Wisconsin (MCW) was responsible for \$199 million (68%) of the region's total in 2015, while UW-Milwaukee was next with \$63 million (22%).

**Chart 24: University R&D expenditures in metro Milwaukee (in millions)**



Source: National Science Foundation<sup>xii</sup>

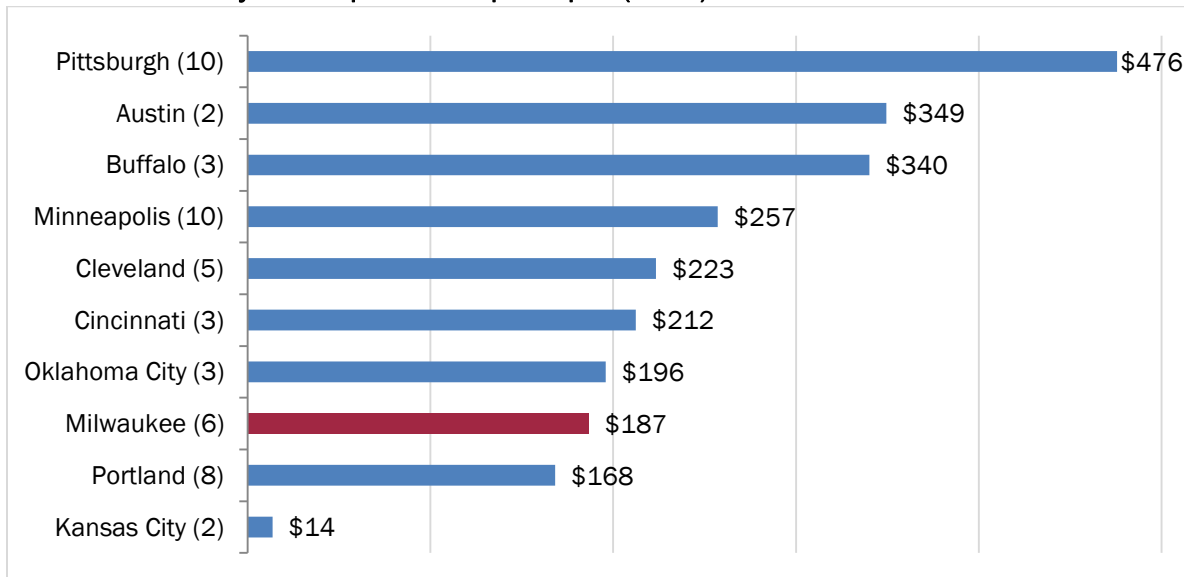
Despite this growth, university R&D activity remains lower on a per-capita basis in metro Milwaukee than in several peer metro areas that are home to public universities that engage in substantial research activity, including Pittsburgh (University of Pittsburgh) and Austin (University of Texas). Overall, Milwaukee ranks eighth per capita among the 10 metro areas for which data are available, as shown in **Chart 25**.<sup>4</sup> The chart also notes the number of universities reporting R&D activities in each metro area in parentheses.

<sup>3</sup> The universities with R&D expenditures are Medical College of Wisconsin, University of Wisconsin-Milwaukee, Marquette University, Milwaukee School of Engineering, Concordia University, and Alverno College.

<sup>4</sup> Data for the Indianapolis metro area are incomplete and they are thus excluded from our analysis.



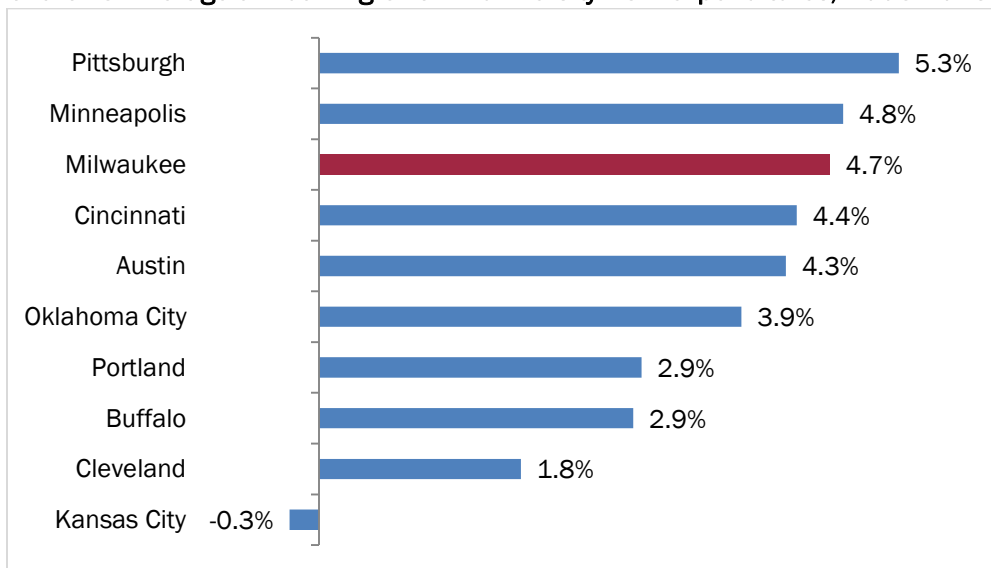
**Chart 25: University R&D expenditures per capita (2015)**



Source: National Science Foundation

On the positive side, university R&D activity has been growing at a faster rate in metro Milwaukee than in most of the comparison metros (**Chart 26**).

**Chart 26: Average annual % growth in university R&D expenditures, 2006-2015**



Source: National Science Foundation

## PATENTS

Businesses themselves conduct important research and development to create and improve products and processes. Since data on the expenditures of area businesses are not publicly

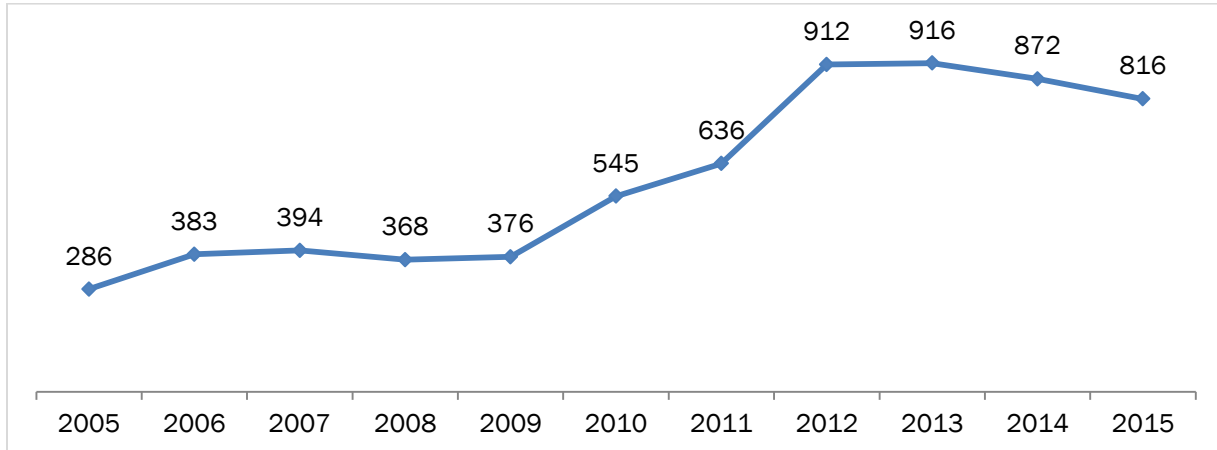




available, we use patent activity as a proxy. Patent origin is determined by the residence of the first inventor named in the patent filing.

As **Chart 27** shows, patent activity has been increasing in metro Milwaukee since the recession. The number of patent filings has risen from 429 in 2008 to 689 in 2015, an increase of over 60%.

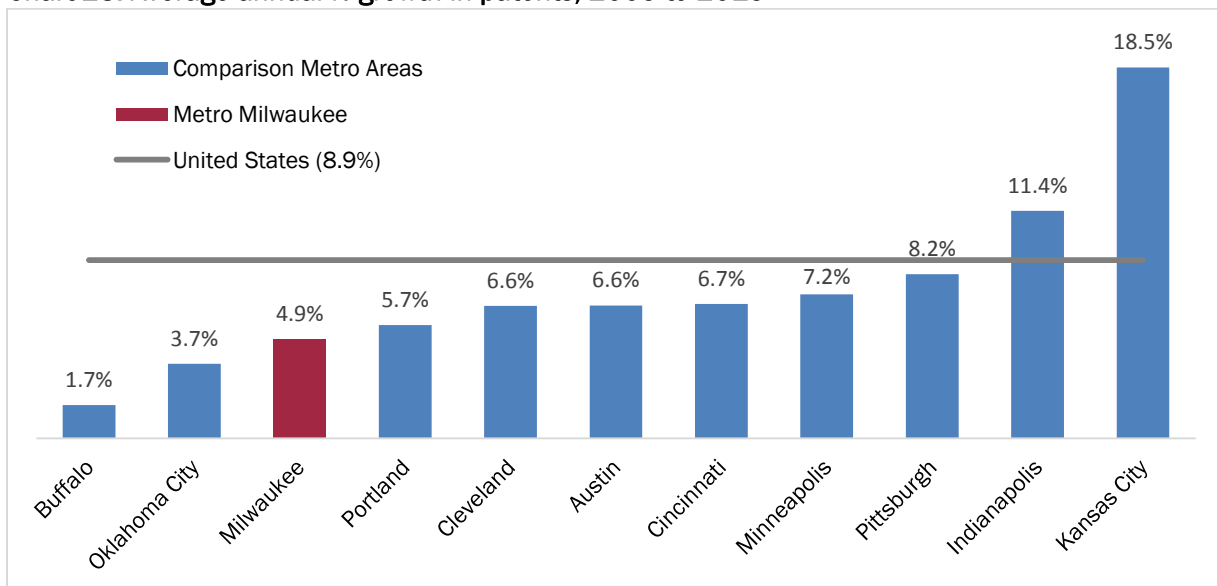
**Chart 27: Patents in metro Milwaukee, 2005-2015**



Source: U.S. Patent and Trademark Office<sup>xiii</sup>

Over the 10-year period, however, the rate at which metro Milwaukee has increased its patent activity trails that of most of our comparison metros and the national average (**Chart 28**). The Milwaukee region ranked in the middle of the 11 comparison metros in patents established per 10,000 total employees in 2015, but below the national average (**Chart 29**). It is important to note that regional variation in patent activity may be influenced by the size of businesses and mix of industries in each region.

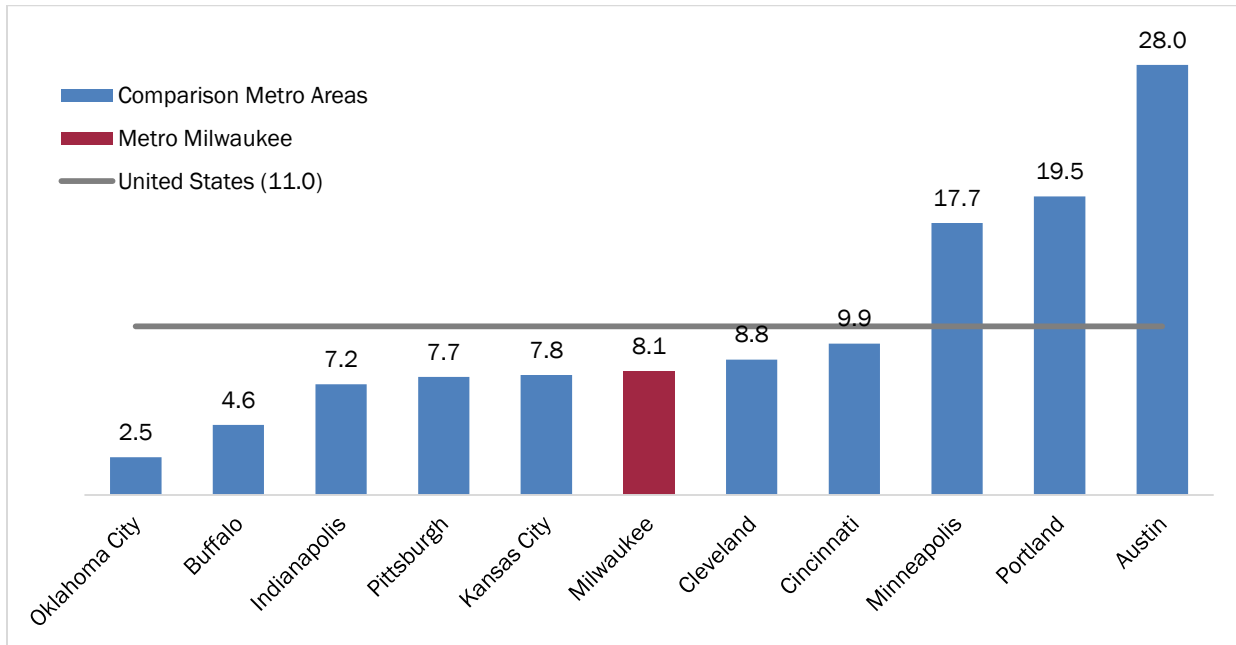
**Chart 28: Average annual % growth in patents, 2005 to 2015**



Source: U.S. Patent and Trademark Office



Chart 29: Patents per 10,000 employees (2015)



Source: U.S. Patent and Trademark Office

## SUMMARY

Over the last decade, metro Milwaukee has experienced positive growth in research and development activities at area universities and in private sector patent activity. On the university side, the region's total R&D expenditures per capita are below many of its peers, though the rate of recent growth has been strong. Conversely, patent data show that the combined efforts of Milwaukee area businesses are yielding a similar level of patent activity as is occurring in the peer metros, but the rate of recent growth in patent activity has been relatively slow.

| IDEA DEVELOPMENT | REGIONAL TREND | RANKING AMONG COMPARISON REGIONS |
|------------------|----------------|----------------------------------|
| University R&D   |                |                                  |
| Patents          |                |                                  |



## CAPITAL FORMATION

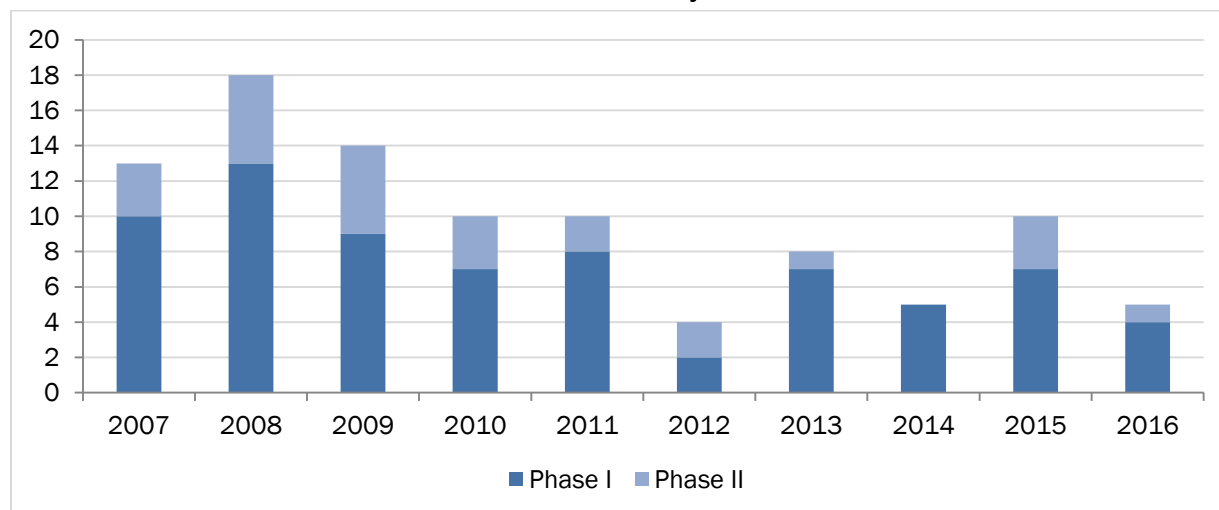
Translating research and development activities into new businesses and jobs requires its own set of investments. The process of developing viable products from new innovations – and then patenting, licensing, and marketing those products (often referred to as “technology transfer”) – can be expensive, time-consuming, and risky. A number of public and private funding sources help to facilitate those processes, and their usage in the region is another important indicator of our economy’s progress in advancing knowledge and innovation.

### SBIR & STTR GRANTS

The federal Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grant programs are among the “largest sources of early-stage capital for technology commercialization in the United States.”<sup>xiv</sup> The programs, which provide grants through several federal departments and agencies, support the efforts of small businesses to engage in R&D activities for the development of products that have strong potential for commercial success. Phase I grants fund exploration of the feasibility of new ideas, while Phase II grants support further R&D and evaluation of commercialization potential.<sup>5</sup> Receiving an SBIR or STTR grant can raise confidence in the feasibility of a product, which also can help businesses attract additional private funding.

Metro Milwaukee's receipt of SBIR and STTR grants has declined in recent years, as shown in **Chart 30**. During the most recent five-year period (2012-2016), metro Milwaukee businesses secured 32 total SBIR and STTR grants – less than half the number received (65) during the previous five-year period.<sup>6</sup> Nationally, there was a much smaller decline in grant activity, with 20.4% fewer grants distributed between 2012 and 2016 compared with the previous five-year period.

**Chart 30: Number of SBIR and STTR awards received by businesses in metro Milwaukee**



Source: U.S. Small Business Administration<sup>xv</sup>

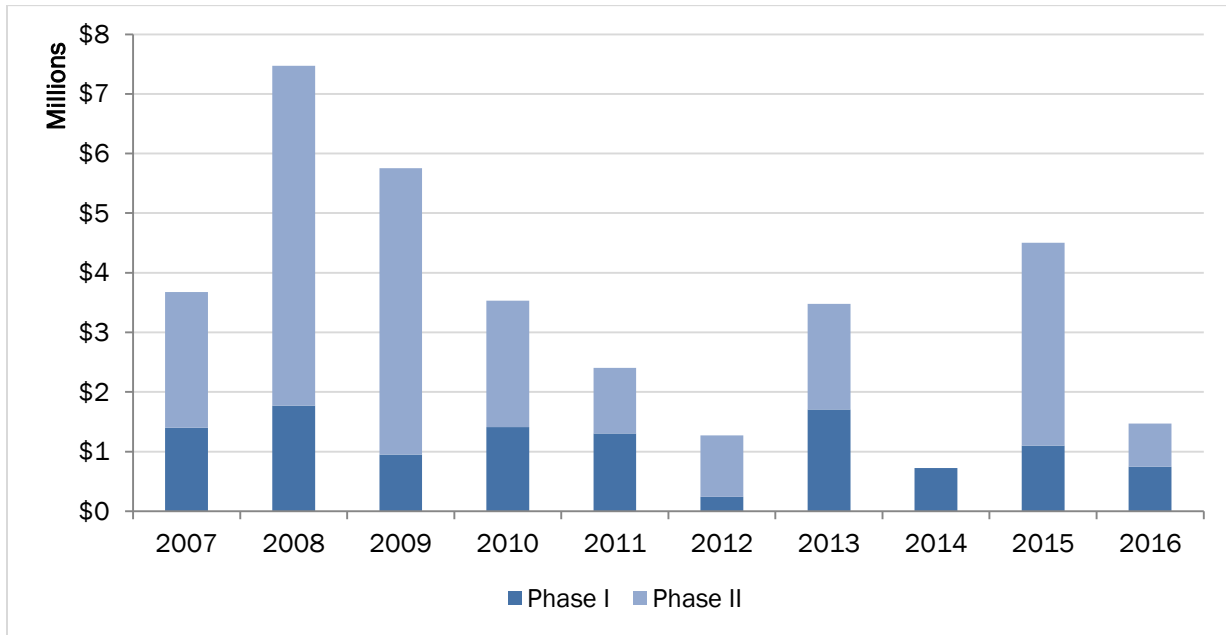
<sup>5</sup> These grants do not support marketing activities.

<sup>6</sup> In metro Milwaukee, several businesses have been successful in accessing SBIR/STTR grants multiple times in the last 10 years, including Prism Clinical Imaging (seven awards), V-Glass (five), and Eskra Technical Products (four).



The reduced number of grants also has resulted in a substantial reduction in the flow of funds to area businesses, as shown in **Chart 31**. In fact, the total value of grants received during the most recent five-year period (2012-2016) was less than \$11.5 million, which is roughly 50% lower than the amount received during the previous five-year period, when that total exceeded \$22.8 million. Nationally, the total value of grants awarded dipped by only 7.2% during the same period.

**Chart 31: Total value of SBIR and STTR awards received by businesses in metro Milwaukee**



Source: U.S. Small Business Administration

Because of our inability to collect SBIR-STTR grant data at the metro level, we were unable to include data for each comparison region for this indicator.

## SBA LOANS

Many small businesses access loans through banks, credit unions, and other financial institutions to assist with startup costs and expenses for business improvements and expansions. The U.S. Small Business Administration (SBA) guarantees some of those loans through its 7(a) and 504 loan programs. Data from those programs provide a publicly-accessible way to track lending to small businesses in our region.

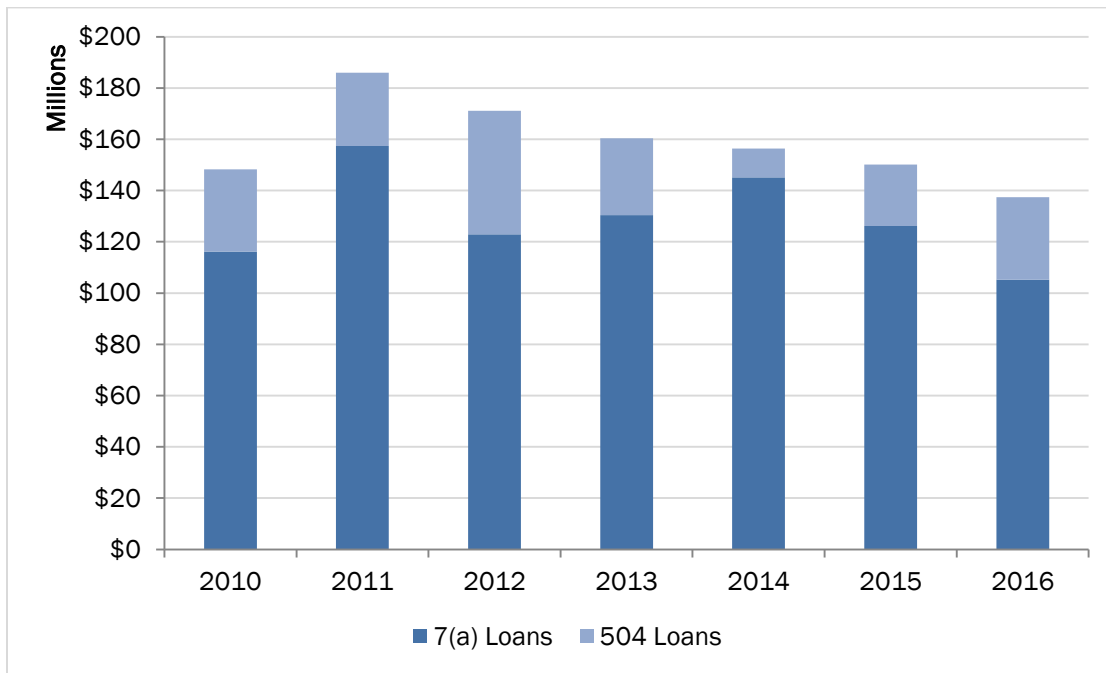
The 7(a) loan program provides SBA-guaranteed funding to startups and existing small businesses through commercial financial institutions for general business purposes. The 504 program provides long-term, SBA-guaranteed loans to small businesses for fixed assets (e.g. real estate or equipment) through Certified Development Companies (CDCs), which are regulated nonprofits that work with lenders on behalf of small businesses.

The total value of SBA loans flowing to metro Milwaukee businesses has been on the decline in recent years (**Chart 32**), decreasing from a high of almost \$186 million in 2011 to less than \$138 million in 2016, a 26% drop. Nationally, during the same period, the total value of SBA-backed loans



distributed was at its lowest in 2010 at \$14.6 billion and highest in 2016 at \$22.7 billion (a 56% increase), which indicates that metro Milwaukee’s decline did not follow a national trend.

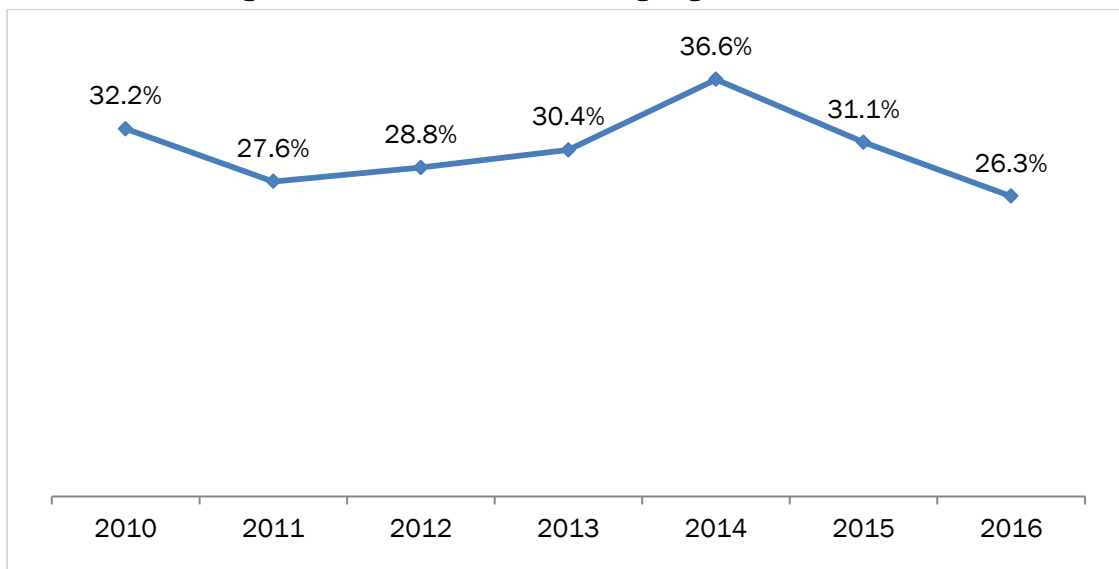
**Chart 32: Total value of SBA loans received by businesses in metro Milwaukee**



Source: U.S. Small Business Administration<sup>xvi</sup>

When we consider how metro Milwaukee is faring with regard to the rest of the state, we see that the region’s share of the total SBA loan value distributed in Wisconsin has fluctuated since 2010 with no clear trend (**Chart 33**), though its lowest point during that period was in 2016 at 26.3%.

**Chart 33: Percentage of Wisconsin SBA loan value going to metro Milwaukee businesses**



Source: U.S. Small Business Administration



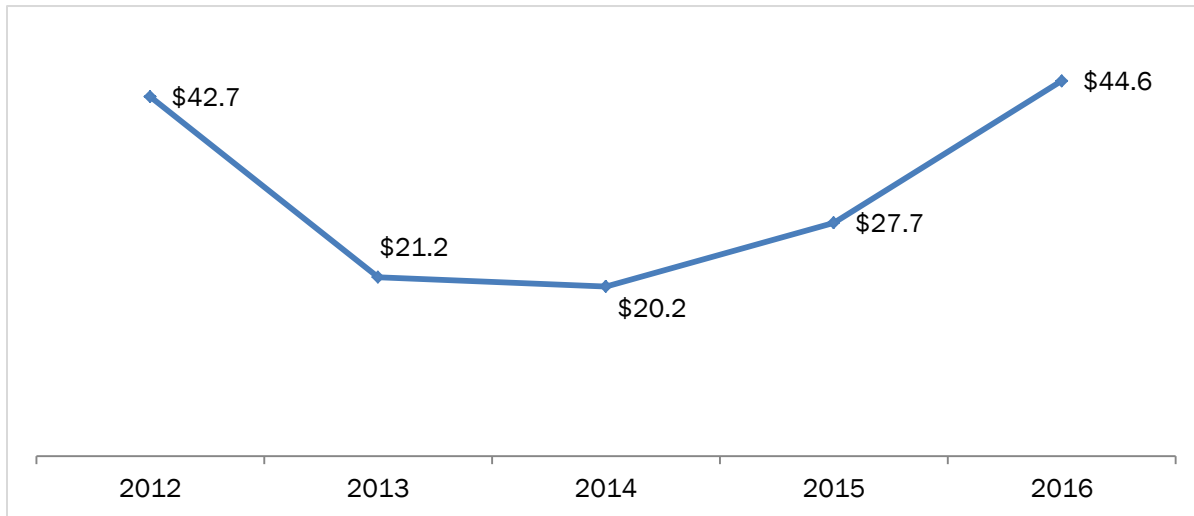
One factor that could be contributing to the decline in SBA loans is increased competition from traditional bank loans, which have become easier to access. Reporting requirements also have become more complex for the CDCs that assist businesses to access SBA loans. These factors do not explain metro Milwaukee's performance relative to other metro areas, however.

## VENTURE CAPITAL FUNDING

While most business startups and expansions are financed through loans and other means, venture capital funding is a helpful source of financial support for those who can access it. Venture capital (VC) funds facilitate entrepreneurial activity by pooling investments by groups of individuals to support businesses that show strong potential for growth. These are often high-risk investments, but also can be highly profitable.

According to the National Venture Capital Association, annual VC investing in support of metro Milwaukee businesses has been in the \$20-45 million range for the last five years, as shown in **Chart 34**. These data include investments made not only by venture capital firms, but also by individual angel investors, angel groups, seed funds, corporate venture firms, and corporate investors.<sup>xvii</sup>

**Chart 34: Venture capital investing in metro Milwaukee businesses (in millions)**



Source: National Venture Capital Association & PitchBook<sup>xviii</sup>

Investment was at its highest in 2016 at nearly \$45 million, but it is difficult to identify a definitive trend in the five years of data. The number of area companies that received venture capital funding support in 2016 was actually at its lowest during the five-year period at 17 and at its highest in 2014 at 22. Thus, larger deals – rather than more deals – produced the funding spike in 2016.

Metro Milwaukee does not attract as much venture capital investing as many of its peers. In fact, among the comparison metro areas, metro Milwaukee attracted the second lowest total amount of VC investment in 2016, as shown in **Table 5**. The same was true on a per-capita basis (**Chart 35**). The Milwaukee region was among the bottom three metro areas in total VC investment in each of the last five years.

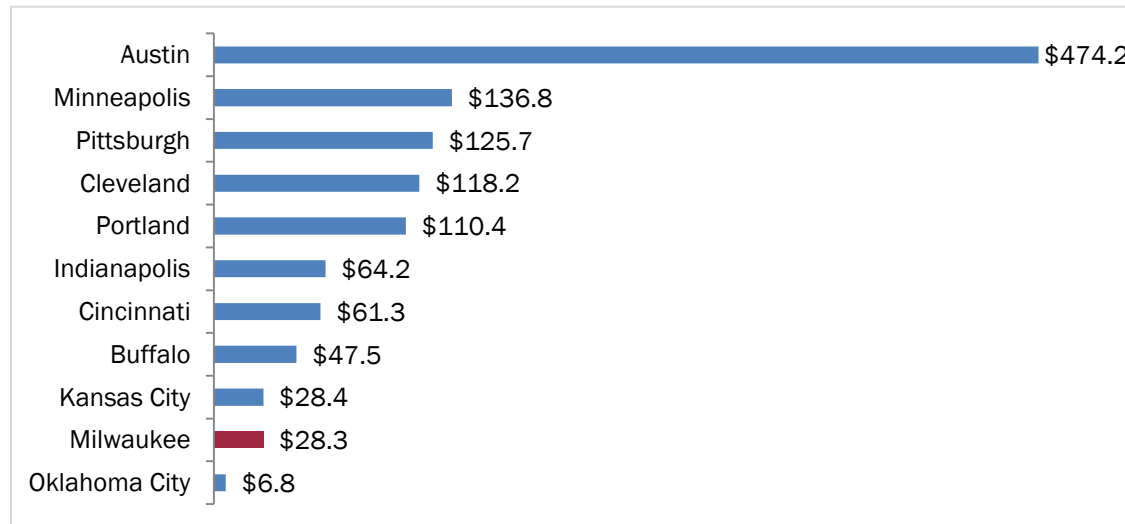


**Table 5: Venture capital investment (2016)**

|                  | Total investment (millions) | Companies receiving \$ | Avg. \$ per company (millions) |
|------------------|-----------------------------|------------------------|--------------------------------|
| Austin           | \$975.09                    | 199                    | \$4.9                          |
| Minneapolis      | \$485.75                    | 81                     | \$6.0                          |
| Pittsburgh       | \$294.54                    | 73                     | \$4.0                          |
| Portland         | \$268.78                    | 77                     | \$3.5                          |
| Cleveland        | \$242.91                    | 35                     | \$6.9                          |
| Cincinnati       | \$132.67                    | 38                     | \$3.5                          |
| Indianapolis     | \$128.68                    | 47                     | \$2.7                          |
| Kansas City      | \$59.80                     | 26                     | \$2.3                          |
| Buffalo          | \$53.80                     | 11                     | \$4.9                          |
| <b>Milwaukee</b> | <b>\$44.57</b>              | <b>17</b>              | <b>\$2.6</b>                   |
| Oklahoma City    | \$9.29                      | 4                      | \$2.3                          |

Source: National Venture Capital Association & PitchBook

**Chart 35: Venture capital investment per capita (2016)**



Source: National Venture Capital Association & PitchBook

It is important to note that data for venture capital investing is imperfect and inconsistent across sources. For example, the Wisconsin Technology Council also tracks venture capital and angel investing in Wisconsin. According to its analysis, 37 companies in metro Milwaukee received VC and angel investments in 2016 at a combined value of nearly \$56 million. However, while the National Venture Capital Association’s data presented above may provide an incomplete picture of private investment activity, it does allow for comparative analysis across metro areas.



## SUMMARY

Our analysis reveals negative trends for several important funding sources that support business startups and expansions in metro Milwaukee. Federal SBIR/STTR grants and federally-guaranteed SBA loans have both trended downward in recent years, and metro Milwaukee businesses attracted less investment from venture capital funds overall and on a per-capita basis in 2016 than almost all of our comparison metro areas.

| CAPITAL FORMATION       | REGIONAL TREND  | RANKING AMONG COMPARISON REGIONS  |
|-------------------------|---|---|
| SBIR & STTR Grants      |  |  |
| SBA Loans               |  |  |
| Venture Capital Funding |  |  |





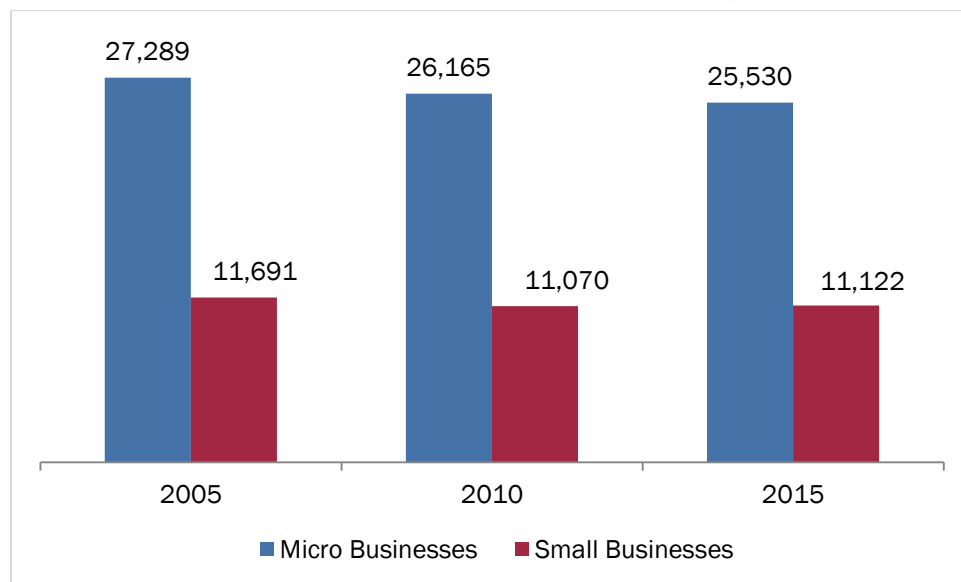
## BUSINESS DYNAMISM

According to recent Kauffman Foundation research, new businesses account for nearly all net new jobs created in the United States.<sup>xix</sup> In light of the importance of small business development to economic growth, we analyze recent data on startup and small business creation and business survival below.

### SMALL BUSINESS FORMATION

The number of micro businesses (those with between one and nine employees) and small businesses (10-99 employees) in metro Milwaukee has not recovered since the Great Recession, as shown in **Chart 15**. There were 1,759 fewer micro businesses (a 6.4% decline) and 569 fewer small businesses (a 4.9% decline) in the region in 2015 than there were in 2005.

**Chart 15: Micro and small businesses in metro Milwaukee, 2005-2015**

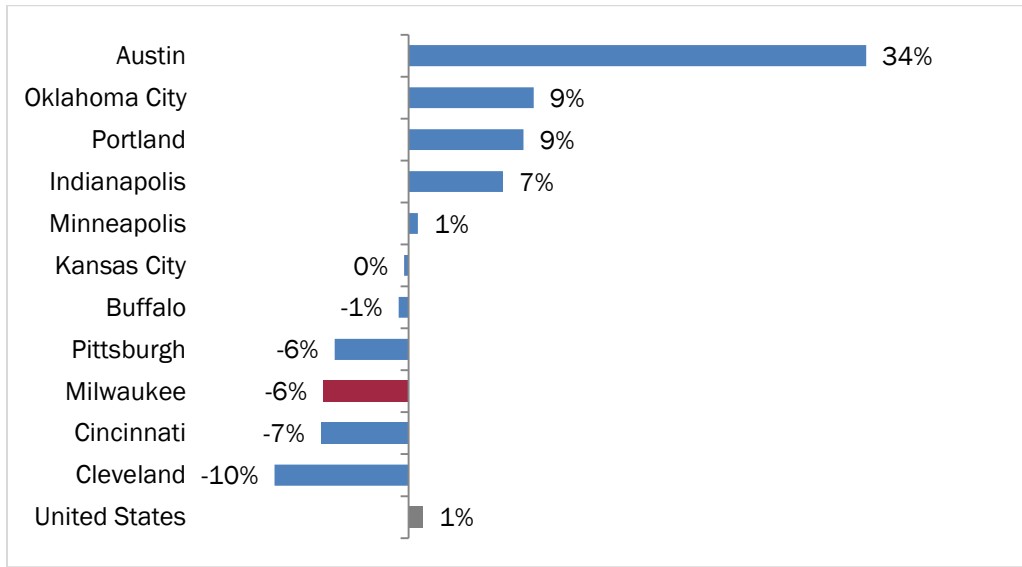


Source: U.S. Census Bureau – County Business Patterns<sup>xx</sup>

Metro Milwaukee's decline in micro and small businesses is striking in relation to the comparison metro areas. In fact, Milwaukee is one of only three metros to have seen its number of businesses in both categories decline between 2005 and 2015, as shown in **Chart 16** and **Chart 17**. The data also show that our region trailed the national average for both micro and small business creation during that period.

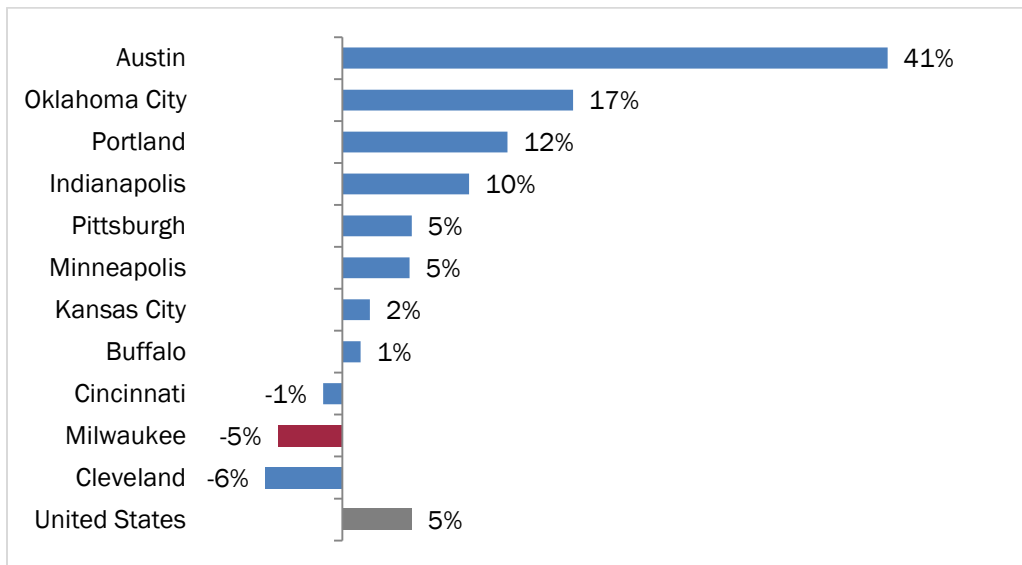


**Chart 16: Percentage change in number of micro businesses (1-9 employees), 2005-2015**



Source: U.S. Census Bureau – County Business Patterns

**Chart 17: Percentage change in number of small businesses (10-99 employees), 2005-2015**



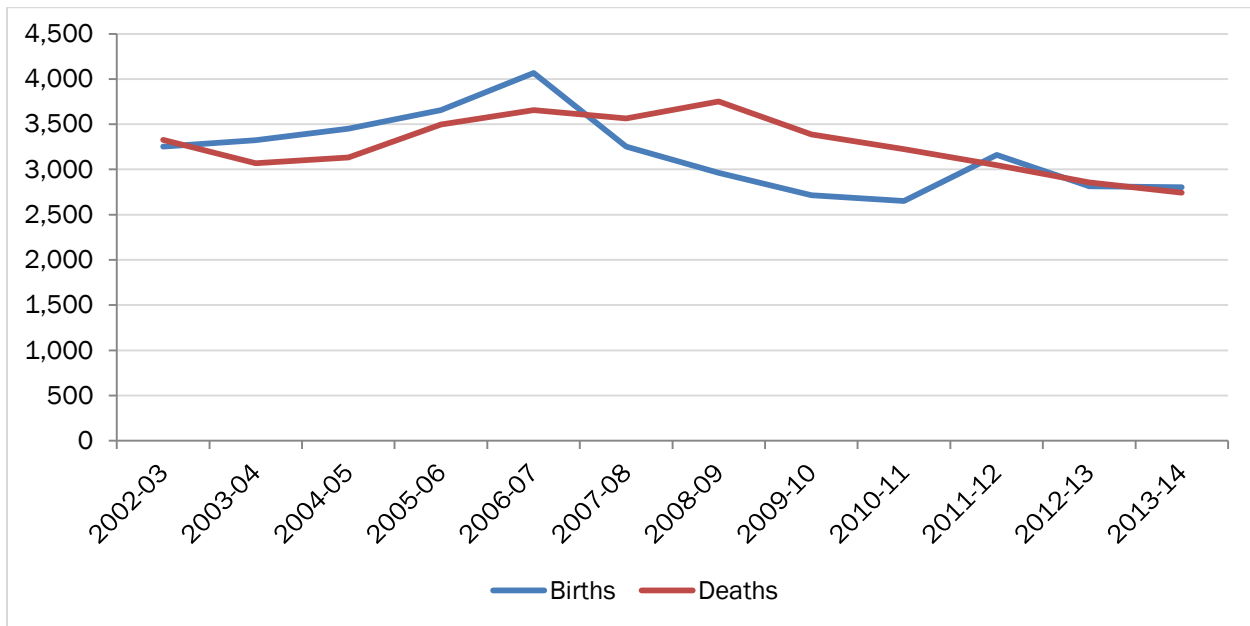
Source: U.S. Census Bureau – County Business Patterns

## BUSINESS BIRTHS & DEATHS

Another way to measure business dynamism is to examine the ratio of business openings (births) to closings (deaths) over time. In the Milwaukee metro area, more businesses opened than closed for several years leading up to the Great Recession (**Chart 18**). That trend reversed during and immediately following the recession (2008-2011) and has leveled off to a roughly one-to-one ratio since 2011. These data only are available through 2014, and it is possible that changes have occurred since that time.



**Chart 18: Business births and deaths in metro Milwaukee, 2002-2014**



Source: U.S. Census Bureau – Statistics of U.S. Businesses<sup>xxi</sup>

As **Table 2** illustrates, this trend in metro Milwaukee was not unique. In fact, with the exception of Austin, all of the comparison metro areas had more businesses close than open for multiple years during the Great Recession.<sup>7</sup> What may be concerning, however, is that during the most recent five years for which data are available (2010-2014), metro Milwaukee’s birth-to-death ratio was consistently one of the weakest. The region’s birth-to-death ratio also was below that of the nation in every year except 2008-2009, when both bottomed out with the same ratio of 0.79.

**Table 2: Ratio of establishment births to deaths, 2004-2014**

| Year                 | 2004-05     | 2005-06     | 2006-07     | 2007-08     | 2008-09     | 2009-10     | 2010-11     | 2011-12     | 2012-13     | 2013-14     |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Austin               | 1.26        | 1.41        | 1.50        | 1.21        | 1.01        | 1.15        | 1.16        | 1.38        | 1.36        | 1.38        |
| Kansas City          | 1.13        | 1.06        | 1.11        | 0.92        | 0.76        | 0.84        | 0.93        | 1.14        | 1.04        | 1.30        |
| Portland             | 1.26        | 1.37        | 1.35        | 1.05        | 0.74        | 0.97        | 0.99        | 1.17        | 1.15        | 1.21        |
| Oklahoma City        | 1.18        | 1.14        | 1.34        | 1.10        | 0.98        | 0.98        | 1.04        | 1.27        | 1.12        | 1.17        |
| Minneapolis          | 1.16        | 1.23        | 1.10        | 0.87        | 0.79        | 0.88        | 0.97        | 1.18        | 1.08        | 1.16        |
| Pittsburgh           | 1.05        | 1.01        | 1.03        | 0.89        | 0.85        | 0.90        | 0.99        | 1.12        | 1.00        | 1.06        |
| Cincinnati           | 1.05        | 1.14        | 1.15        | 0.86        | 0.74        | 0.79        | 0.87        | 1.07        | 0.98        | 1.06        |
| Buffalo              | 0.99        | 1.05        | 1.03        | 1.00        | 0.87        | 1.00        | 0.93        | 1.17        | 0.91        | 1.05        |
| Indianapolis         | 1.05        | 1.24        | 1.24        | 0.97        | 0.79        | 0.86        | 0.99        | 1.14        | 1.00        | 1.05        |
| <b>Milwaukee</b>     | <b>1.10</b> | <b>1.05</b> | <b>1.11</b> | <b>0.91</b> | <b>0.79</b> | <b>0.80</b> | <b>0.82</b> | <b>1.04</b> | <b>0.98</b> | <b>1.02</b> |
| Cleveland            | 1.02        | 1.01        | 1.02        | 0.82        | 0.68        | 0.82        | 0.90        | 1.11        | 0.98        | 0.98        |
| <b>United States</b> | <b>1.14</b> | <b>1.17</b> | <b>1.20</b> | <b>0.95</b> | <b>0.79</b> | <b>0.90</b> | <b>0.94</b> | <b>1.15</b> | <b>1.06</b> | <b>1.11</b> |

Source: U.S. Census Bureau – Statistics of U.S. Businesses

<sup>7</sup> During the recession, many businesses merged or were acquired by others, which likely factors into this trend.

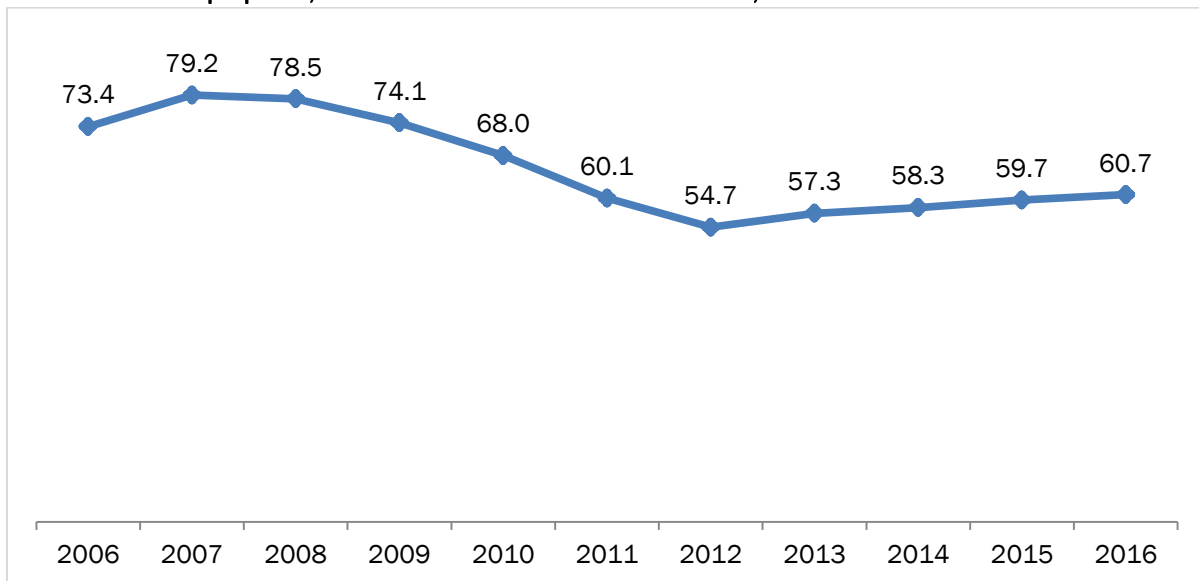


## STARTUP DENSITY

Yet another way to evaluate business dynamism is by measuring the pace of startup activity. Startups often are defined as businesses that are less than one year old and that employ at least one person other than the owner. As previously mentioned, startups are a key area of focus for economic development efforts because of their importance to job creation.

Each year, the Kauffman Foundation publishes an index that compares the startup activities of the 40 largest U.S. metro areas.<sup>xxii</sup> One of the three indicators the Kauffman Foundation uses to evaluate the relative strength of each community's startup scene is the number of startups per 1,000 total firms.<sup>8</sup> As **Chart 19** shows, metro Milwaukee's startup density fell sharply during the recent recession, from more than 79 startups per 1,000 total firms in 2008 to less than 55 in 2013. Startup density has ticked up in each of the last four years but remains well below pre-recession levels.

**Chart 19: Startups per 1,000 total firms in metro Milwaukee, 2007-2017**



Source: Kauffman Foundation

The decline in metro Milwaukee again was part of a national trend. According to a recent study by the bipartisan Economic Innovation Group, there has been a long-term decline in business startup activity nationally that was exacerbated by the Great Recession and that was not specific to certain industries.<sup>xxiii</sup>

As **Table 3** illustrates, startup activity has been lower since the recession for all of the comparison metro areas included in Kauffman's Index of Startup Activity (Buffalo and Oklahoma City are not among the 40 largest U.S. metros and thus are not included.) Milwaukee consistently has outperformed Pittsburgh and Cleveland but remained below the six other metro areas. Austin is a

<sup>8</sup> The other two indicators are the rate of new entrepreneurs (percentage of adults who became entrepreneurs in a given month); and the "opportunity share" of new entrepreneurs (percentage of new entrepreneurs who were not unemployed before starting their businesses).



national leader for startups, ranking fourth nationally in startup density in 2017 and second on the Index overall.

**Table 3: Startups per 1,000 total firms**

|                  | 2006        | 2007        | 2008        | 2009        | 2010        | 2011        | 2012        | 2013        | 2014        | 2015        | 2016        |
|------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Austin           | 118.2       | 115.1       | 121.4       | 117.0       | 114.4       | 98.7        | 98.6        | 104.1       | 107.0       | 105.4       | 104.5       |
| Kansas City      | 104.0       | 104.0       | 98.6        | 88.7        | 82.5        | 72.2        | 68.7        | 72.4        | 80.3        | 78.4        | 83.6        |
| Portland         | 102.5       | 108.1       | 114.6       | 104.0       | 98.3        | 80.1        | 80.8        | 83.7        | 83.3        | 81.0        | 82.8        |
| Indianapolis     | 94.8        | 92.6        | 96.8        | 94.1        | 89.5        | 74.3        | 72.0        | 74.2        | 75.8        | 76.3        | 72.7        |
| Minneapolis      | 99.7        | 97.6        | 100.3       | 90.7        | 82.5        | 74.9        | 69.7        | 72.1        | 71.5        | 70.5        | 72.5        |
| Cincinnati       | 79.2        | 80.0        | 83.9        | 75.8        | 73.9        | 61.1        | 58.6        | 61.7        | 64.9        | 62.7        | 61.6        |
| <b>Milwaukee</b> | <b>73.4</b> | <b>79.2</b> | <b>78.5</b> | <b>74.1</b> | <b>68.0</b> | <b>60.1</b> | <b>54.7</b> | <b>57.3</b> | <b>58.3</b> | <b>59.7</b> | <b>60.7</b> |
| Pittsburgh       | 73.0        | 78.5        | 70.6        | 67.9        | 60.7        | 54.6        | 49.3        | 55.0        | 56.1        | 52.7        | 57.2        |
| Cleveland        | 75.6        | 78.5        | 79.4        | 68.9        | 65.5        | 56.0        | 56.5        | 58.5        | 60.0        | 55.4        | 54.3        |

Source: Kauffman Foundation

It is noteworthy that Milwaukee has consistently outperformed Pittsburgh in startup activity. Pittsburgh has garnered national attention for transforming its economy from a historic focus on steel and manufacturing to a more diverse set of strengths in health care, tech, and other knowledge-based sectors.<sup>xxiv</sup> The fact that Pittsburgh has enjoyed success in diversifying its economy and transforming its national image without apparent success on the entrepreneurial front may temper concerns about Milwaukee's similar poor showing in this area.

## BUSINESS SURVIVAL

State economic development leaders often contest the results of the Kauffman Index of Startup Activity by pointing to Wisconsin's relatively strong rate of business survival.<sup>xxv</sup> They contend that even if the state fared better in its rate of business formation, the value of that success only would be significant if it continued to maintain a strong business survival rate.

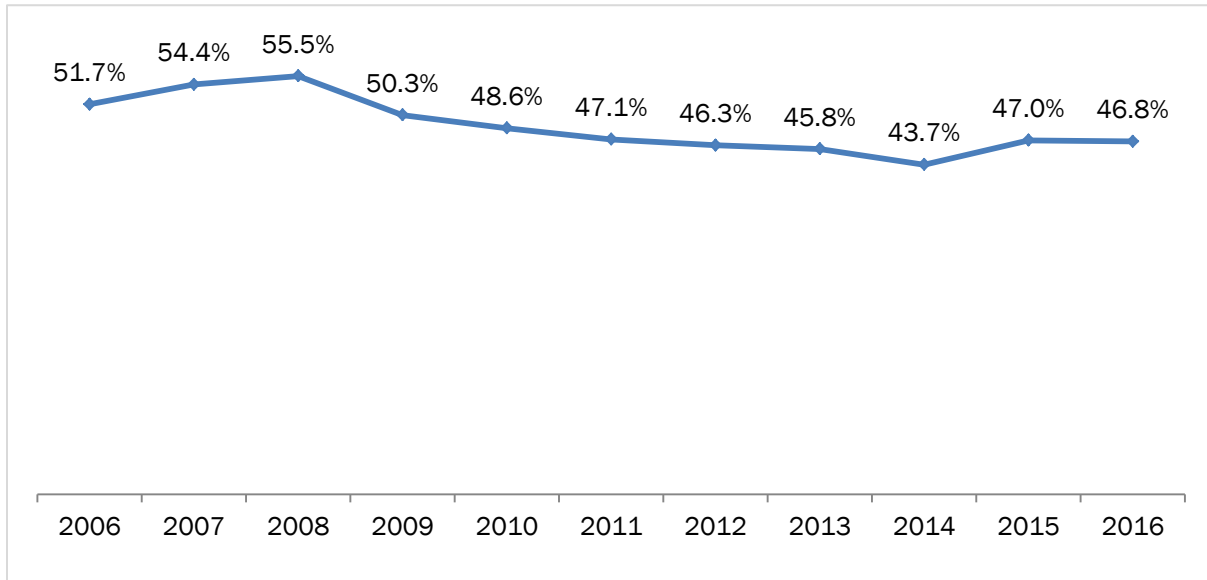
Kauffman's 2016 data indeed show that Wisconsin ranked high (sixth among the 25 largest states) in the percentage of firms that remained in operation through their first five years (50.8%).<sup>9</sup> The data also reveal that metro Milwaukee was less successful, however, with a 5-year business survival rate of only 46.8% (**Chart 20**).<sup>xxvi</sup>

According to Kauffman's 2016 Index of Main Street Entrepreneurship, metro Milwaukee ranked 34<sup>th</sup> for business survival among the 40 largest metro areas and last among our comparison metros (**Chart 21**). Since the index only includes the 40 largest metro areas in the U.S., Buffalo and Oklahoma City again are not included.

<sup>9</sup> The underlying data for Kauffman's business survival rates come from the U.S. Census Business Dynamics Statistics (BDS) and "are taken from the universe of businesses with payroll tax records in the United States, as recorded by the Internal Revenue Service."

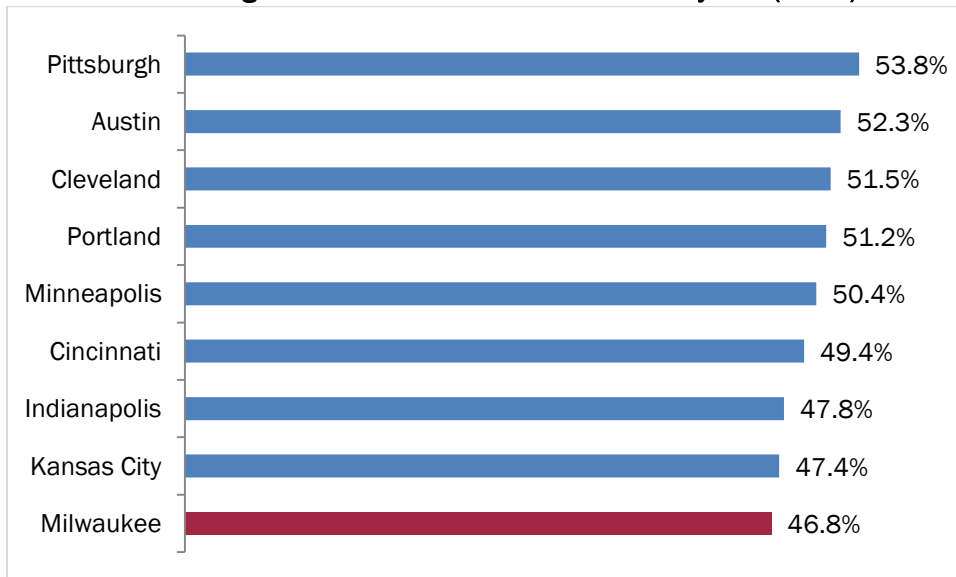


**Chart 20: Percentage of metro Milwaukee firms that survived at least five years (2016)**



Source: Kauffman Foundation - U.S. Census Business Dynamics Statistics

**Chart 21: Percentage of firms that survived at least five years (2016)**



Source: Kauffman Foundation - U.S. Census Business Dynamics Statistics

Notably, while Pittsburgh and Cleveland are similar to Milwaukee in terms of being among the lowest performing metros when it comes to business startups, those two metros are among the leaders for business survival. Thus, while the data support the notion that strong business survival at least partially makes up for a less dynamic startup scene at the state level, it is harder to make a similar case for metro Milwaukee.

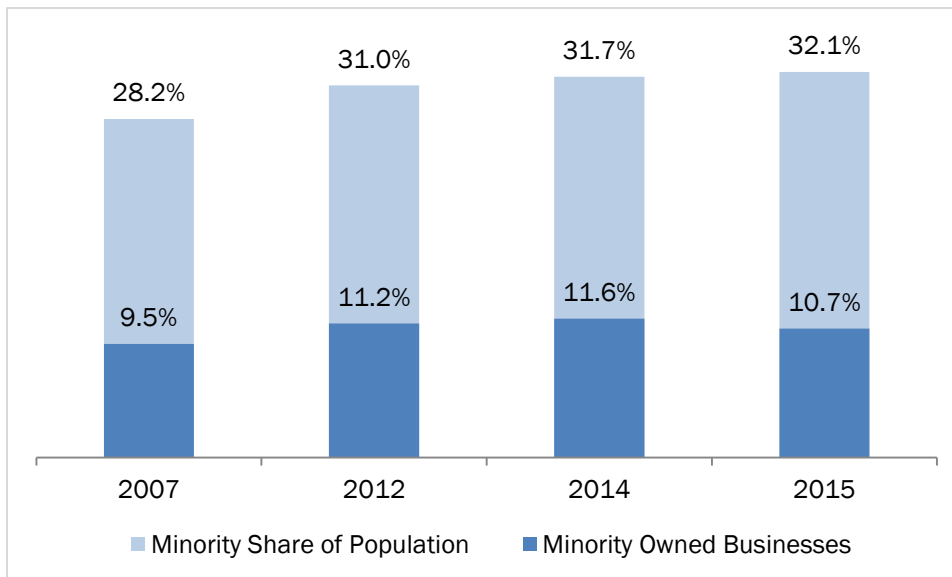


## MINORITY BUSINESS OWNERSHIP

The Milwaukee metro area already is home to a diverse population, and that diversity is growing over time. Thus, the rate of business ownership among racial and ethnic minority populations provides both an indicator of current regional economic equity and valuable perspective on the region's future.<sup>10</sup>

As **Chart 22** shows, metro Milwaukee's minority business ownership rate increased between 2007 and 2014 and dipped in 2015. What has remained consistent, however, is the very low rate of minority business ownership relative to the minority share of the region's total population.<sup>11</sup> In 2015, for example, only 10.7% of all businesses were minority-owned, while minority populations comprised 32.1% of the region's total population.

**Chart 22: Minority business ownership relative to share of population in metro Milwaukee**



Source: U.S. Census Bureau<sup>xxvii</sup>

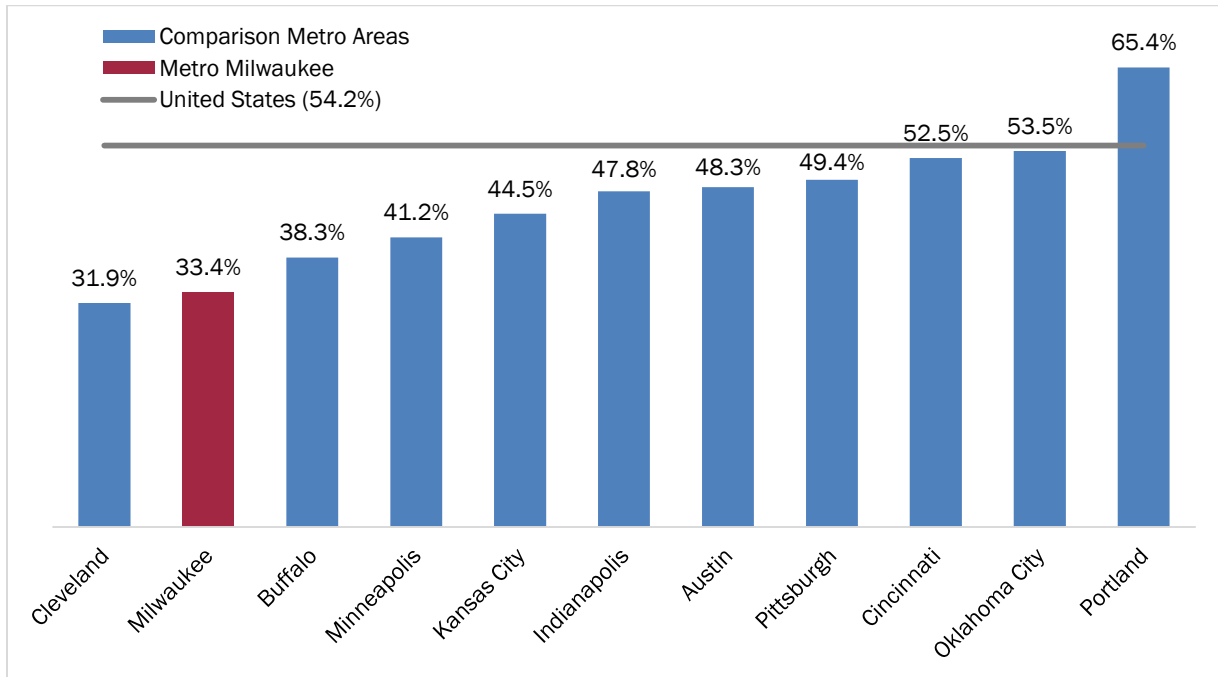
Metro Milwaukee is not unique in this regard. In fact, minority populations are underrepresented among business owners in all of our comparison metro areas and the nation. **Chart 23** shows how close each metro area is to closing these gaps and reveals that this problem is particularly acute in metro Milwaukee. For example, while Portland has almost two minority-owned businesses for every three that should be expected based on that region's demographics, metro Milwaukee only has one minority-owned business for every three that should be expected. Only Cleveland performs worse than Milwaukee in this regard.

<sup>10</sup> "Minority" owned businesses is defined as those owned by individuals of all non-White racial and ethnic groups, including African Americans, Hispanics/Latinos, Asians, American Indians and Alaska Natives, Native Hawaiians and Other Pacific Islanders.

<sup>11</sup> Minority owned business is defined here as businesses that are at least 50% minority owned, though the vast majority of businesses that fall into this category are entirely minority owned.



**Chart 23: Minority business ownership relative to minority population (2015)**



Source: U.S. Census Bureau - Annual Survey of Entrepreneurs

Given that entrepreneurship within minority populations in Milwaukee lags behind most other metros areas and the nation as a whole, efforts to boost minority business ownership in our region may merit prioritization.

## SUMMARY

All of the metrics we track related to entrepreneurship activity indicate that metro Milwaukee is underperforming when compared to its peers. Perhaps most concerning is the region’s low ranking in business survival relative to other metro areas, including its low ratio of business births to deaths.

| BUSINESS DYNAMISM           | REGIONAL TREND | RANKING AMONG COMPARISON REGIONS |
|-----------------------------|----------------|----------------------------------|
| Small Business Formation    |                |                                  |
| Business Births & Deaths    |                |                                  |
| Startup Density             |                |                                  |
| Business Survival           |                |                                  |
| Minority Business Ownership |                |                                  |





Notably, a number of new organizations and facilities have been created in recent years to support entrepreneurship and business acceleration in the Milwaukee area, including gener8tor, Startup Milwaukee, Scale Up Milwaukee, 96Square, Ward 4, and Marquette University's 707 Hub, which complement more established organizations like BizStarts and the Wisconsin Women's Business Initiative Corporation. In addition, UWM is developing its new Lubar Center for Entrepreneurship, which will focus on "innovation, research and development, and new business ventures."<sup>xxviii</sup>

Together, these efforts show that area economic development leaders recognize the region's relatively poor performance when it comes to startup activity and are developing new initiatives to boost performance. However, the effectiveness of these efforts should be closely monitored given the importance of entrepreneurship to the region's overall economic health.

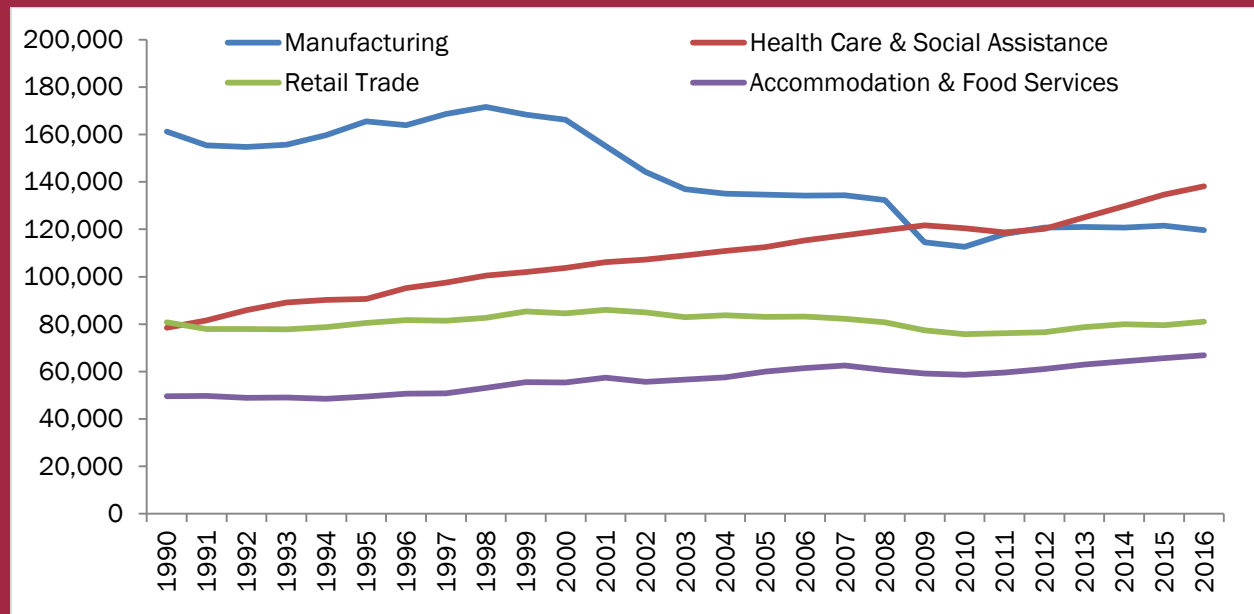


## INDUSTRY CONCENTRATIONS

While not directly tied to innovation, which is the focus of this report, our research uncovered interesting data related to the continued evolution of metro Milwaukee’s economy. Indeed, as the chart below shows, the regional economy has moved away from its primary reliance on manufacturing to a more diversified employment picture that also is led by health care, retail, and food services.

Since 2013, the Health Care and Social Assistance sector has employed more people in our region than any other sector, including Manufacturing.<sup>12</sup> A look back further in time reveals long-term shifts in the industries that lead the regional economy. Since 2000, employment in the Manufacturing sector has fallen by 28%, while employment in Health Care and Social Assistance has climbed by more than 33% and employment in Accommodation and Food Services has increased by more than 20%.

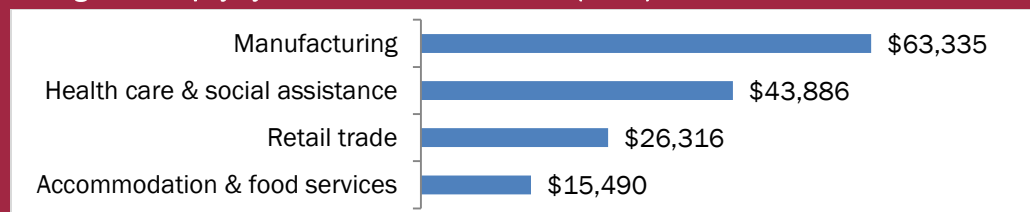
Employment by sector in metro Milwaukee, 1990-2016



Source: U.S. Bureau of Labor Statistics – Current Employment Statistics

At the same time, the average annual pay for jobs in Manufacturing is significantly higher than in all three of the other largest sectors in metro Milwaukee, as shown below. Thus, the shifts in our regional economy do not appear to be beneficial for the region’s workforce, and may be particularly harmful for those with lower levels of educational attainment.

Average annual pay by sector in metro Milwaukee (2015)

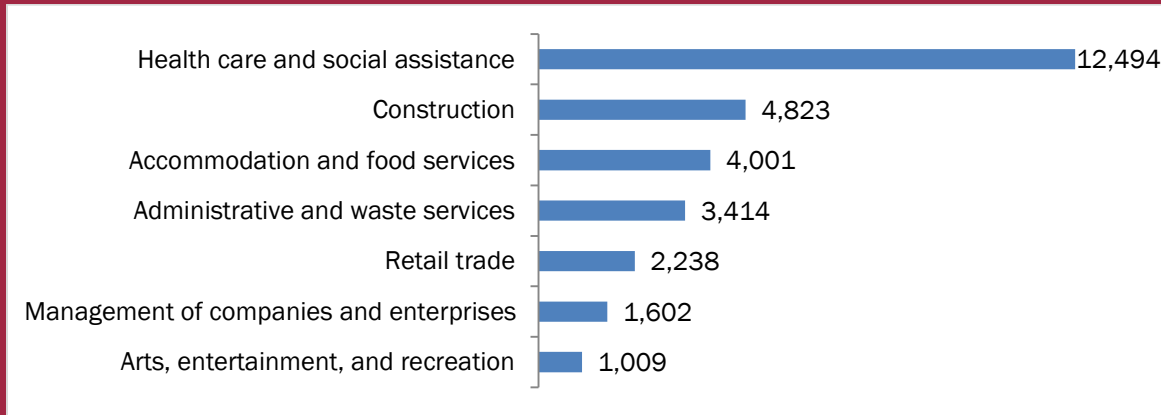


Source: U.S. Bureau of Labor Statistics - Current Employment Statistics

<sup>12</sup> While “health care” may be self-explanatory, “social assistance” includes services for children and youth, the elderly and disabled, and the poor, including services related to housing, vocational rehabilitation, and child care.

Regional changes are further illustrated by data on the fastest-growing sectors. The chart below shows the seven sectors that added at least 1,000 jobs in the Milwaukee metro area between 2012 and 2015. Health Care and Social Assistance added more jobs than the next three leading sectors combined. Manufacturing added an estimated 589 jobs during the same period.

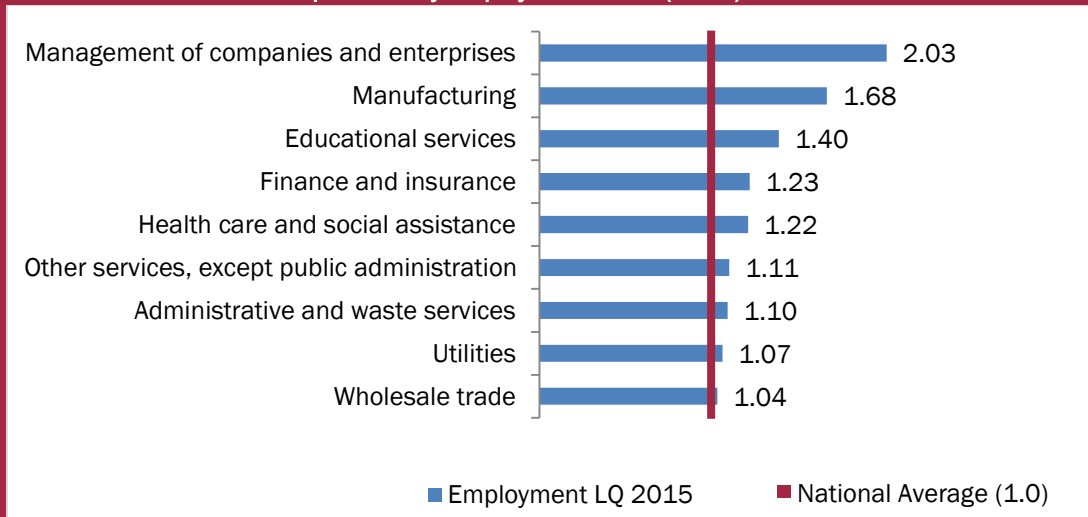
#### Fastest growing sectors by total employment, 2012-2015



Source: U.S. Bureau of Labor Statistics - Quarterly Census of Employment and Wages

Another way to identify industry strengths is through the use of *location quotients* (LQ), which measure the concentration of businesses or jobs in a city or region compared with national averages. The chart below shows all of the sectors for which metro Milwaukee has stronger job concentrations than the U.S. as a whole. An LQ of 1.0 indicates that metro Milwaukee has one job in that sector for every one job nationally, while higher LQs signal better-than-average job concentrations.

#### Metro Milwaukee location quotients by employment totals (2015)



Source: U.S. Bureau of Labor Statistics - Quarterly Census of Employment and Wages

Management and Manufacturing are the two sectors for which metro Milwaukee's employment figures far outpace the nation. Thus, while the number of jobs in Manufacturing in our region has declined substantially over the last 15 years, the *concentration* of jobs in Manufacturing remains relatively robust. Educational Services, Finance and Insurance, and Health Care and Social Assistance also are strengths of our regional economy relative to national averages.

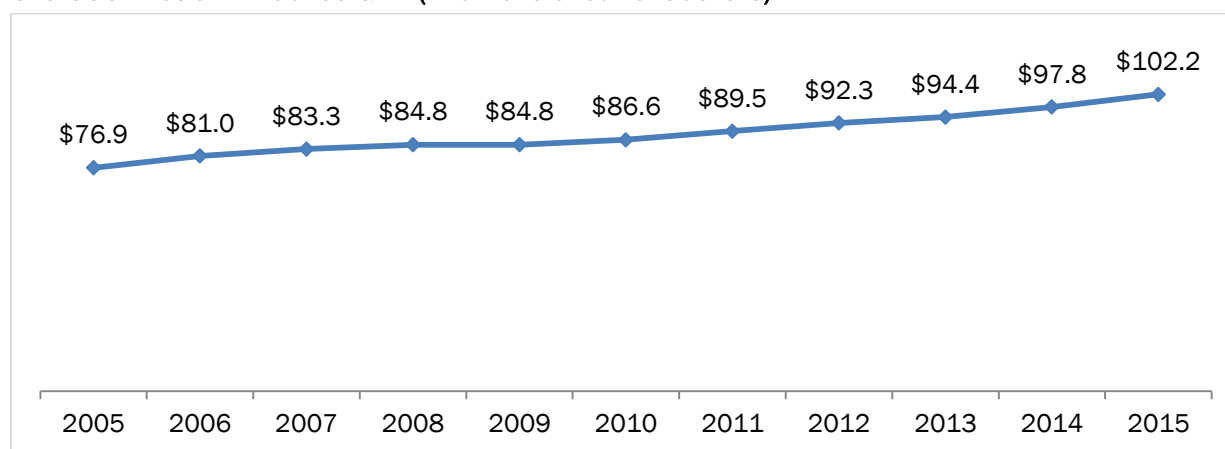
# ECONOMIC OUTPUTS

Shifting the regional economy toward a greater focus on knowledge and innovation should lead to stronger economic outputs in general. In this section, we gauge metro Milwaukee's productivity and prosperity over time and benchmark the region's recent performance with our comparison metros.

## PRODUCTIVITY

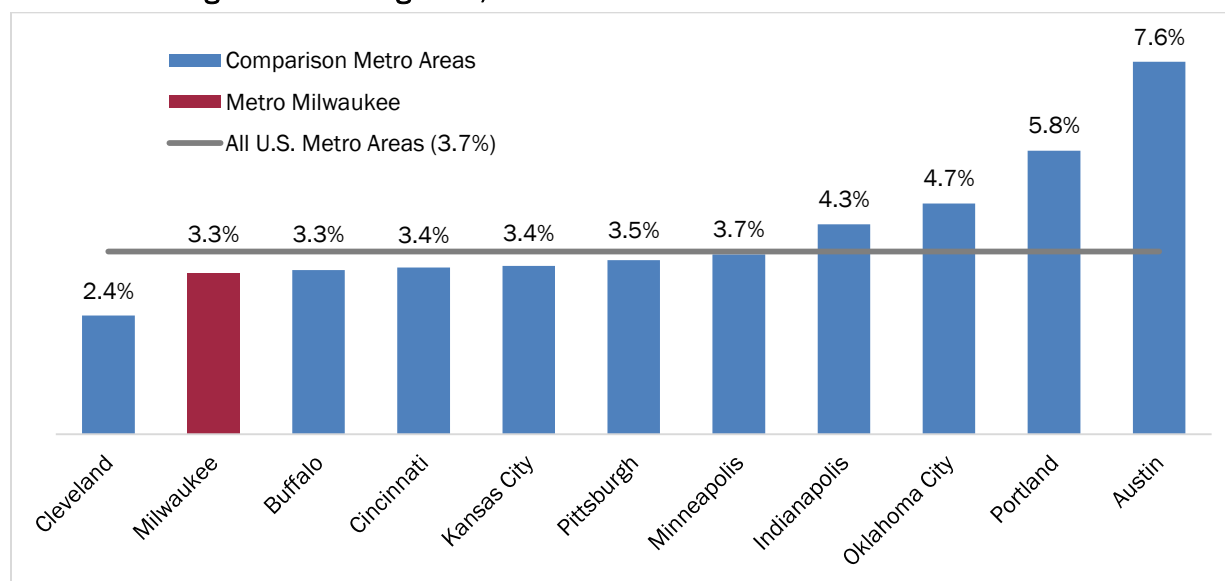
Gross domestic product (GDP) measures the value of all finished goods and services produced within an area. Adjusted for inflation, metro Milwaukee's GDP rose steadily between 2005 and 2015 to just over \$102 billion (Chart 36), though that growth occurred at a slower pace than in most of our comparison metro areas and the nation (Chart 37).

Chart 36: Metro Milwaukee GDP (in billions of current dollars)



Source: U.S. Department of Commerce<sup>xxix</sup>

Chart 37: Average annual GDP growth, 2005-2015



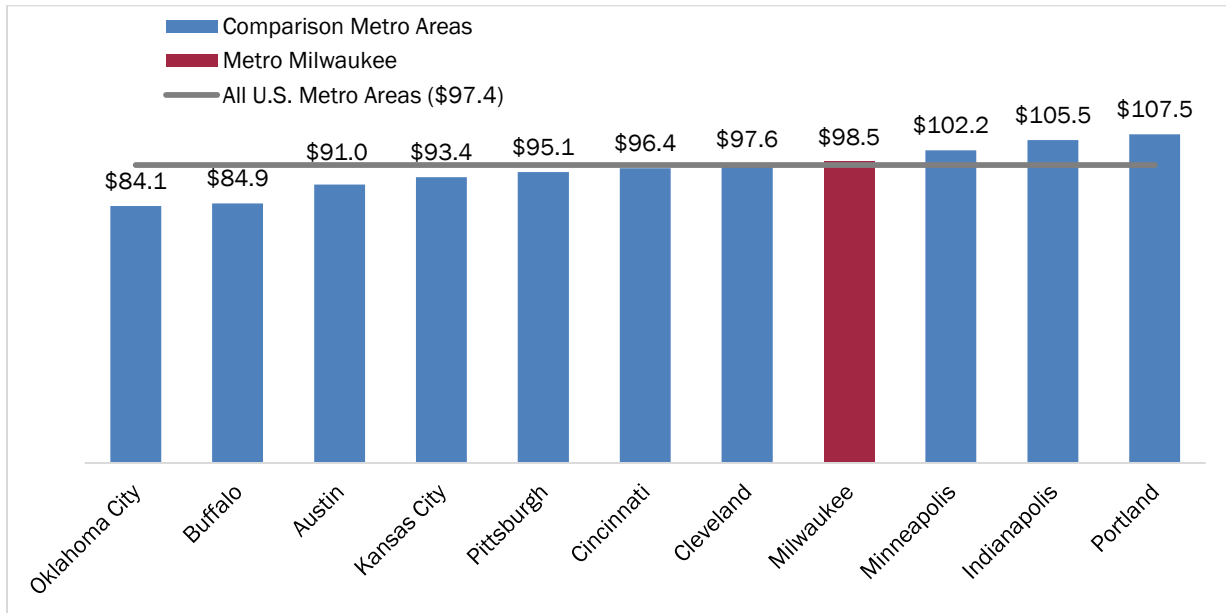
Source: U.S. Department of Commerce – Bureau of Economic Analysis



One factor that could contribute to the Milwaukee area’s relatively slow rate of GDP growth is the high concentration of large businesses in the region. Metro Milwaukee is home to seven Fortune 500 companies that have a disproportionate impact on the region’s GDP and that do not grow at a significant pace because of their very large sizes.

Metro Milwaukee competes favorably with our comparison metro areas in output per employee, as shown in **Chart 38**. At \$98,455 per employee, the Milwaukee region’s GDP per employee is higher than a majority of the comparison metros and slightly above the average among all U.S. metro areas.

**Chart 38: GDP per employee, 2015 (in thousands of current dollars)**



Source: U.S. Department of Commerce – Bureau of Economic Analysis

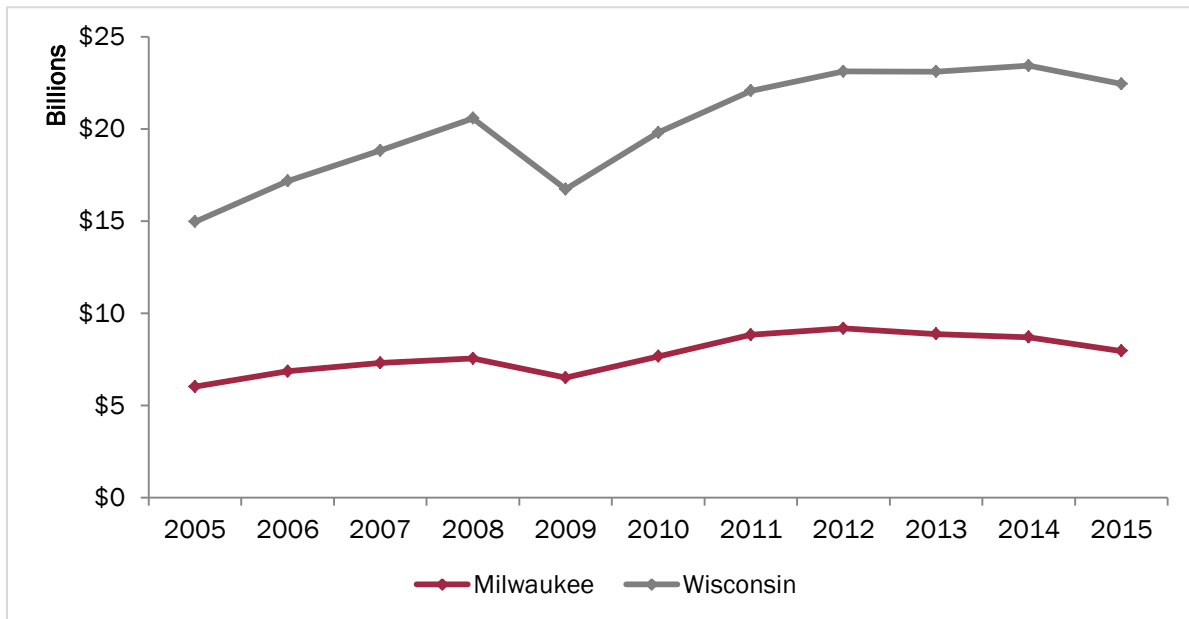
## GLOBAL EXPORTS

The value of metro Milwaukee’s annual global exports is an indicator of the competitiveness of the goods and services produced in the region in an increasingly globalized economy. As **Chart 39** on the following page illustrates, the value of the region’s exports rose in nominal terms for several years following the Great Recession but has declined somewhat over the past several years. That flattening of global exports followed a statewide and national trend.<sup>xxx</sup>

In 2015, metro Milwaukee was in the middle of the comparison metro areas in global exports per employee (**Chart 40**), though at \$9,295 per employee, the region lags behind the national average of \$10,599. All but two of the comparison metro areas are below the national average for global exports, which may be because exports are particularly concentrated in some of the nation’s largest metro areas, including Houston, New York, Seattle, and Los Angeles.

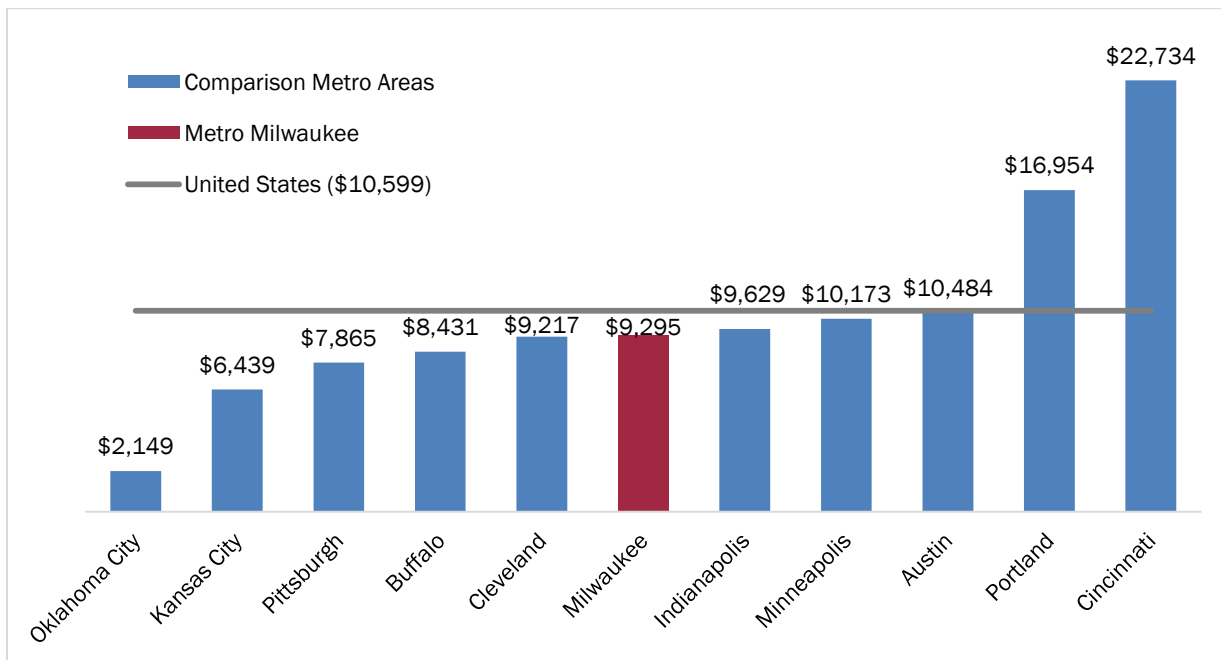


**Chart 39: Value of metro Milwaukee's global exports, 2005-2015**



Source: U.S. Department of Commerce<sup>xxxi</sup>

**Chart 40: Global exports per employee (2015)**

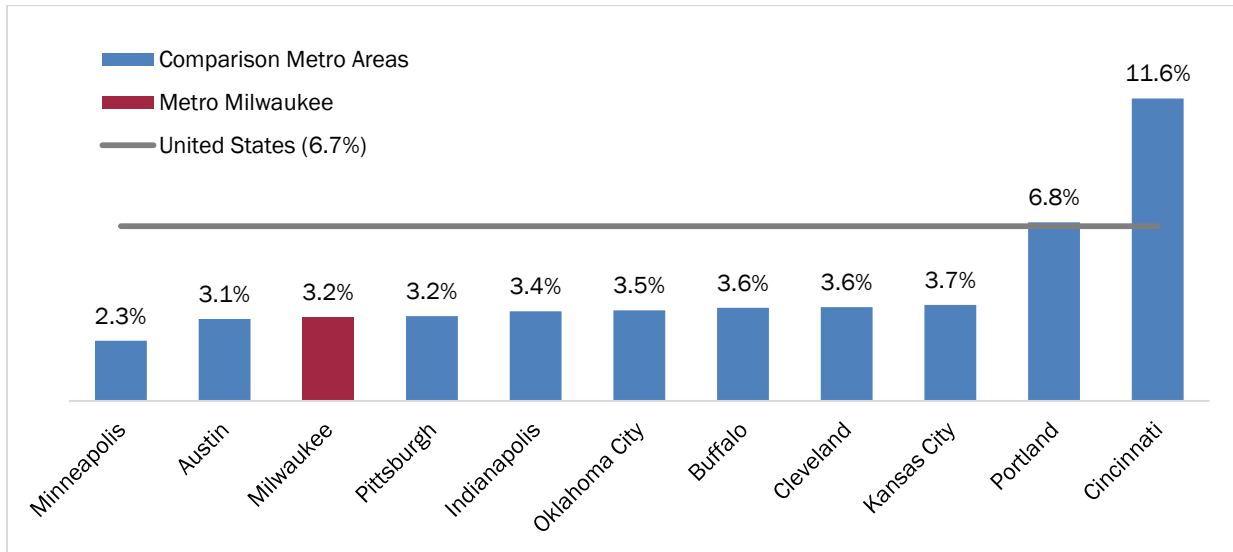


Source: U.S. Department of Commerce

The pace at which metro Milwaukee has increased its global exports has been slightly slower than most of the comparison metro areas and significantly slower than the nation as a whole, as shown in **Chart 41**. Cincinnati and Portland have grown their exports much faster than the other regions. Milwaukee was one of only three metro areas to see exports decline in each of the last three years.



**Chart 41: Average annual change in exports, 2005-2015**



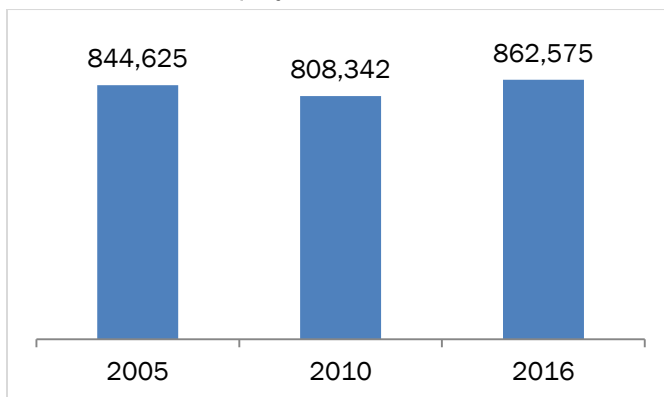
Source: U.S. Department of Commerce

In 2015, the Milwaukee 7 and the Wisconsin Economic Development Corporation (WEDC) added new programs focused on increasing exports.<sup>xxxii</sup> These actions show that regional and state leaders recognize the importance of global exports. The impacts of both programs should be closely monitored.

## PROSPERITY

The ultimate goal of economic development efforts is to increase local prosperity by creating jobs and boosting incomes. After dropping significantly during the recent recession, metro Milwaukee's total employment has bounced back to above pre-recession levels, as shown in **Chart 42**.<sup>13</sup> While this is positive news, our region has gained jobs at a slower rate than all of the comparison regions except Cleveland, and at a slower rate than the national average (**Chart 43**).

**Chart 42: Total employment in metro Milwaukee, 2005-2016**

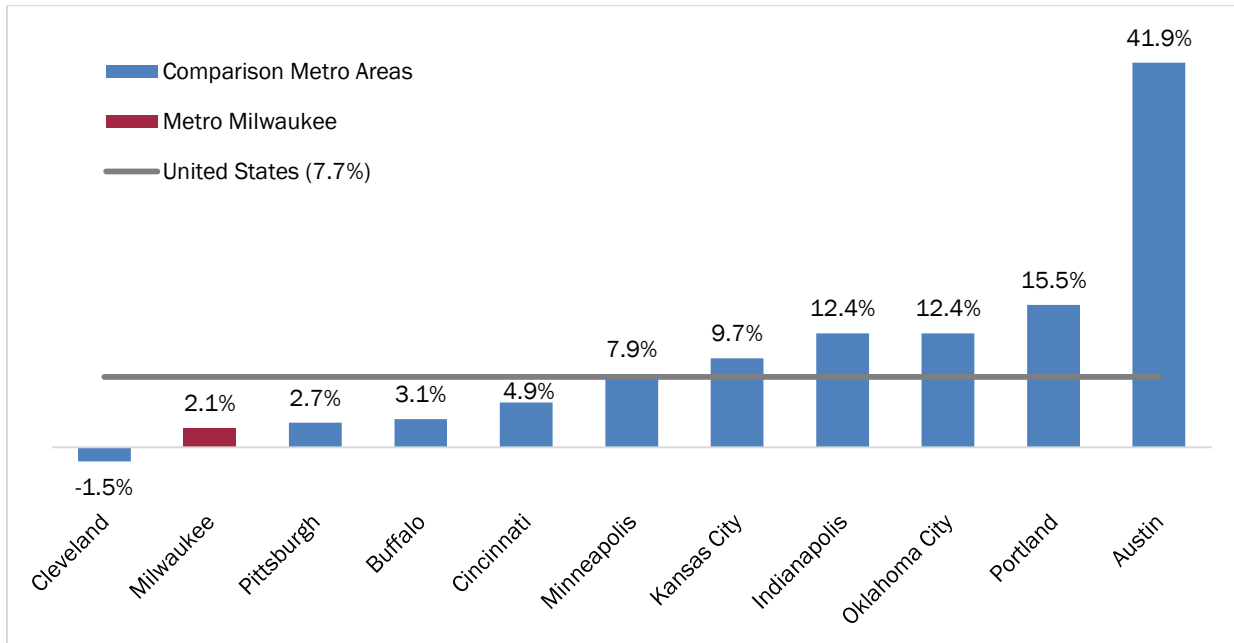


Source: U.S. Bureau of Labor Statistics<sup>xxxiii</sup>

<sup>13</sup> Total nonfarm employees; seasonally adjusted. These are averages of figures recorded for all 12 months during each calendar year.



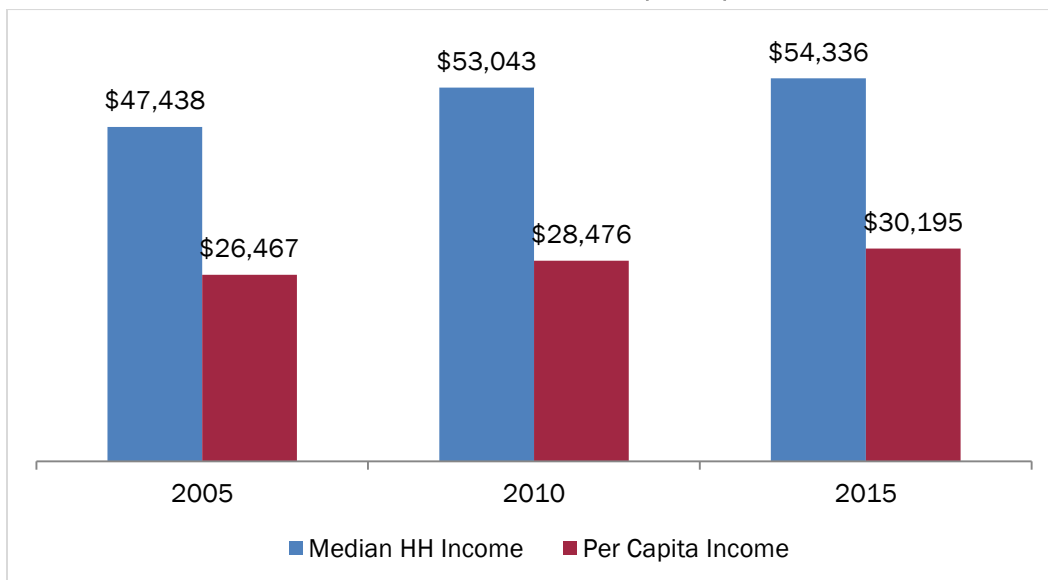
**Chart 43: Percentage change in total employment, 2005-2016**



Source: U.S. Bureau of Labor Statistics

Both per capita and median household incomes have risen in the Milwaukee metro area by more than 14% since 2005, as shown in **Chart 44**. Yet, while the region was in the middle of the comparison metros with regard to median household income in 2015 (**Chart 45**), incomes rose a bit slower in metro Milwaukee than in many of the other regions over the past decade (**Chart 46**) and did not keep pace with inflation (roughly 21%).

**Chart 44: Metro Milwaukee median household and per capita income, 2005-2015**

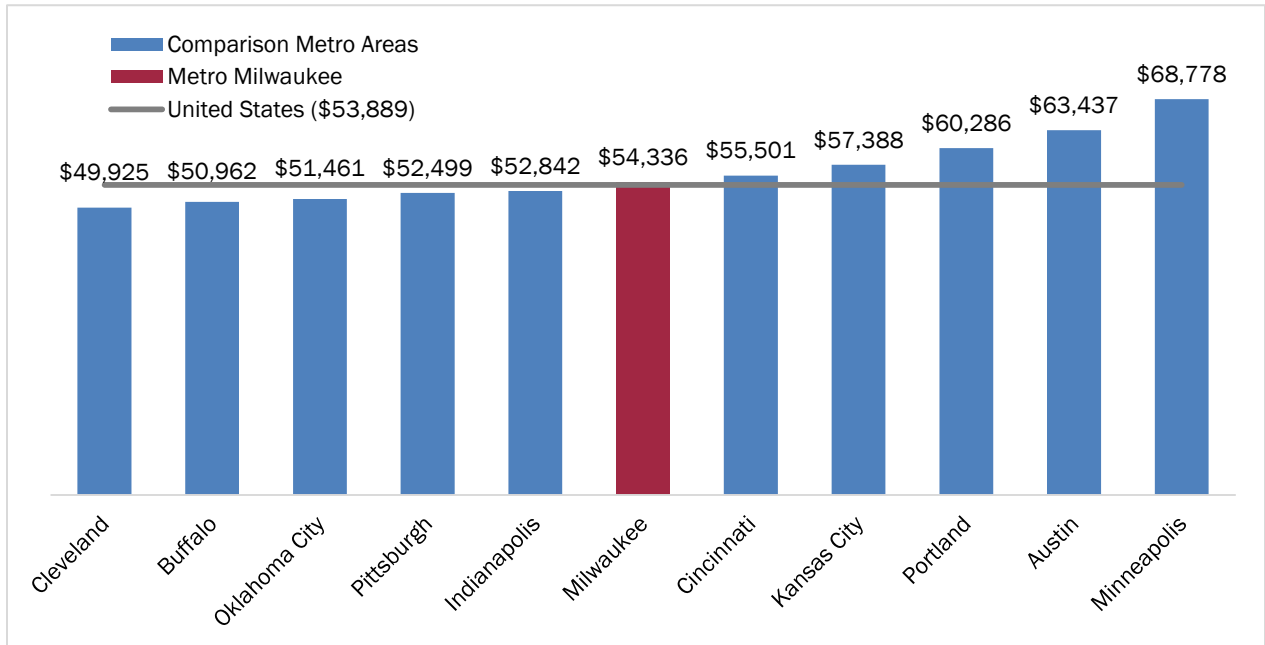


Source: U.S. Census Bureau<sup>xxxiv</sup>



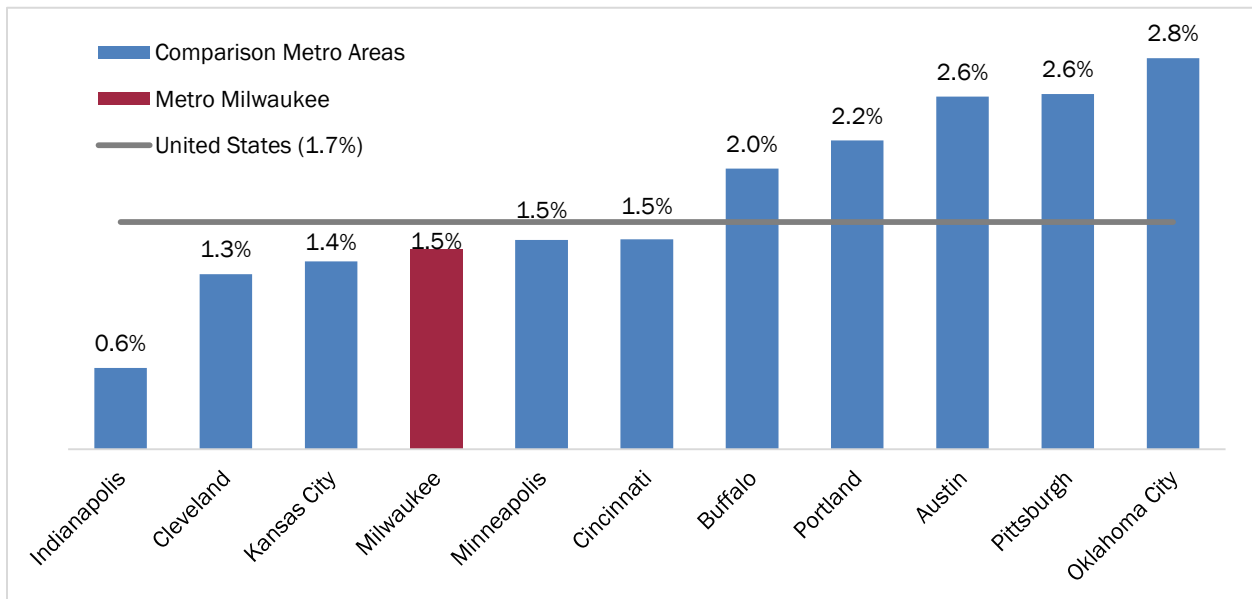


**Chart 45: Median household income comparison (2015)**



Source: U.S. Census Bureau

**Chart 46: Average annual change in median household income, 2005-2015**



Source: U.S. Census Bureau

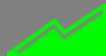





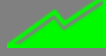

## SUMMARY

A number of economic output indicators show positive trends for metro Milwaukee. Our region's productivity (GDP) and incomes (both median and per capita) have increased steadily over the last 10 years and are in line with our peers and the nation as a whole. In fact, GDP-per-worker is one of



only two indicators in our study for which metro Milwaukee is outperforming most of our comparison metro areas.

Two other indicators show a more mixed picture for our region, however. The Milwaukee metro area’s global exports have declined in the past few years, though we remain about average in global exports per capita relative to our comparison regions. Meanwhile, total employment has increased in metro Milwaukee since the Great Recession, but has grown at a slow rate compared with many of our peers.

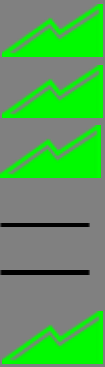

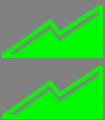


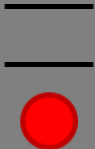


| ECONOMIC OUTPUTS                      | REGIONAL TREND  | RANKING AMONG COMPARISON REGIONS  |
|---------------------------------------|---|---|
| Productivity                          |  |  |
| Global Exports                        |  |  |
| Total Employment Growth <sup>14</sup> |  |  |
| Income                                |  |  |

<sup>14</sup> Rankings for total employment are based on percentage changes from 2005 to 2016.

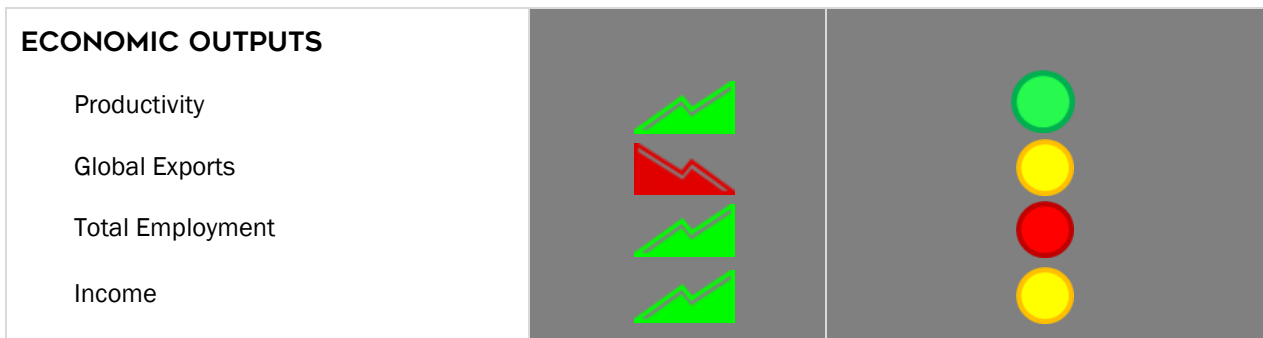


# CONCLUSION

The chart below summarizes the findings of our analysis for our entire array of indicators. Here again, the first column reflects metro Milwaukee’s recent trajectory for each indicator, while the column on the right shows where the Milwaukee area *currently* ranks among the regions included in our analysis. Viewing this information collectively provides a clear picture of metro Milwaukee's strengths and weaknesses when it comes to knowledge and innovation.

| INDICATOR  | REGIONAL TREND  | RANKING AMONG COMPARISON REGIONS  |
|--|---|---|
| <b>REGIONAL TALENT</b><br>Educational Attainment<br>Scientists & Engineers<br>Tech Workers<br>Knowledge Workers<br>Skilled & Technical Workers<br>College-Educated, Foreign Born |   |   |
| <b>IDEA DEVELOPMENT</b><br>University R&D<br>Patents   |  |  |
| <b>CAPITAL FORMATION</b><br>SBIR & STTR Grants<br>SBA Loans<br>Venture Capital Funding   |  |  |
| <b>BUSINESS DYNAMISM</b><br>Small Business Formation<br>Business Births & Deaths<br>Startup Density<br>Business Survival<br>Minority Business Ownership                          |  |  |





Specifically, our analysis of 20 indicators tied to innovation and the 21<sup>st</sup> century knowledge economy paints a mixed picture for metro Milwaukee and prompts the following key observations:

- The Milwaukee area’s talent pool is strengthening and appears to be competitive with our peers.** Educational attainment is rising and the region’s workforce is competitive with our comparison metro areas in its concentration of individuals employed in occupations associated with knowledge and innovation. Attention is needed, however, to ensure that those key talent pools continue to grow.
- Our region is underperforming in its rates of business development and business survival.** Between 2004 and 2014, fewer new businesses were created than those that closed in metro Milwaukee. While entrepreneurship activity appears to have slowed nationally over the long term, the problem appears to be particularly acute in our region. In addition, metro Milwaukee’s rate of business survival does not appear to make up for its sluggish pace of business creation.
- Capital formation remains an area of concern for the region.** One possible factor contributing to our region’s slow pace of business creation is a reduction in the flow of several major forms of public and private capital to area businesses. Federal grants and federally-guaranteed loans for business startups, expansions, and R&D activities have declined at a faster rate in metro Milwaukee than nationally, and Milwaukee underperforms almost all of our comparison metro areas in attracting venture capital funding. While the relative importance of each of these sources of capital may be debatable, the combined picture does not bode well for the region.

Many area business leaders are optimistic that the planned Foxconn plant could shift the needle on several of the region's areas of economic weakness, in part by providing a major stimulus for startup activity in southeastern Wisconsin. Others caution, however, that the Foxconn development won't be a "panacea" for Wisconsin's entrepreneurial woes.<sup>xxxv</sup>

While we do not possess the knowledge or expertise to determine the magnitude of this potential opportunity, our findings suggest that any increased startup activity and prolonged business dynamism that may result from the Foxconn development will not simply happen on its own, but will require diligent and strategic efforts to shore up some of the weaknesses identified in this report. Furthermore, our research reveals that whether or not the Foxconn development happens and lives up to its potential, efforts should be undertaken to strengthen business creation activity and business survival in our region more generally.



It is worth noting that a key strategy of the Milwaukee 7's Framework for Economic Growth is to “foster a dynamic, richly networked innovation and entrepreneurship ecosystem.”<sup>xxxvi</sup> As discussed earlier in this report, it is encouraging that several new organizations and facilities have been created in recent years to spur business startups and expansions. Given that the region's performance in this area remains a concern, however, it may make sense to analyze how effectively these organizations are meshing with one another, and whether there is a need for additional capacity in this arena and/or better coordination in working toward collective goals.

We acknowledge that efforts to enhance innovation are challenging and complex. Indeed, improving metro Milwaukee's performance on the indicators included in this analysis will require not only the cooperative efforts of area businesses, elected officials, and educational institutions, but also good fortune with regard to national and global economic factors that are out of their control. Yet, at the same time, we hope that this research – and our continued efforts to update it on a periodic basis – will be a useful source of information to economic development leaders and will help them set appropriate priorities in their pursuit of a strong regional economy.



# NOTES

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