CENTER OF THE AMERICAN EXPERIMENT

Minnesota's Think Tank

The State of Minnesota's Economy: 2017

Performance continues to be lackluster

JOHN PHELAN, WITH ASSISTANCE FROM TORI ROLOFF,
BASED ON A REPORT BY DR. JOSEPH KENNEDY

John Phelan is an economist at the Center of the American Experiment. He is a graduate of Birkbeck College, University of London, where he earned a BSc in Economics, and of the London School of Economics where he earned an MSc. He worked in finance for ten years before becoming a professional economist. He worked at Capital Economics in London, where he wrote reports ranging from the impact of Brexit on the British economy to the effect of government regulation on cell phone coverage. John has written for City AM in London and for the *Wall Street Journal* in both Europe and the U.S. He has also been published in the journal Economic Affairs.

Bulk orders of this publication are available by contacting Peter Zeller at Peter.Zeller@AmericanExperiment.org or 612-338-3605.

8421 Wayzata Boulevard ★ Suite 110 ★ Golden Valley, MN 55426

CENTER OF THE AMERICAN EXPERIMENT
Minnesota's Think Tank

NOVEMBER 2017

The State of Minnesota's Economy: 2017

Performance continues to be lackluster

JOHN PHELAN, WITH ASSISTANCE FROM TORI ROLOFF,
BASED ON A REPORT BY DR. JOSEPH KENNEDY

Executive Summary

Money isn't everything, but a strong and growing economy is vital for many of the things we take for granted living in Minnesota. Without high incomes we would struggle to cope with the harsh winter weather or support the vibrant cultural life we take pride in. Nor would we be able to fund public services such as education and policing.

Last year, Center of the American Experiment took an in depth look at Minnesota's economy, with a report authored by Dr. Joseph Kennedy. A source of pride for many in the state, we found that, in fact, the data showed our state's economic performance to be only mediocre. We concluded that Minnesota can do better.

A year later we look again at Minnesota's economy. We use the most current data to assess its health. And we apply a framework of economic growth theory to look at where it might be headed in the future.

We find that:

- Minnesota's GDP growth has lagged that of the nation generally. As a result, it has not made back the ground it lost in the mid-2000s, and is 2.5 percent below what it would have been had it grown at the national rate since 2000.

- Minnesota's private sector productivity is below the national average. The average Minnesota worker produces just 92 percent as much as the average U.S. worker.

- Personal income growth has been almost exactly equal to the national average, but that growth has been driven by government transfer payments. These account for 47 percent of the rise in personal income.

- Minnesota has a high household income compared to the national average, but, reflecting lower productivity, this is a result of more workers per household.

- Minnesota's rate of job growth has tracked the national average, but new jobs have been concentrated in less productive sectors. Since the onset of the recession in December 2007, Mining & Logging, which contributes $447,603 of value per worker, has added just 700 new jobs. Health care, which adds just $88,761 of value per worker, has added 93,300 jobs.

- The Twin Cities are lagging comparable urban areas in GDP growth and job creation. Of the 15 Metropolitan Areas with the largest GDP, the Twin Cities rank 12th for GDP growth and 11th for job growth since 2000.

- There are wide variations in economic strength across the state. Some counties in Greater Minnesota, notably in the southwest of the state, have narrowed the income gap with the Twin Cities.

- Minnesota's urban areas—its MSAs—compare poorly with those in neighboring states. In terms of economic growth this millennium, only Mankato is in the top ten. Iowa has three MSAs on that list.

- Minnesota's declining labor force participation rate will be a drag on per capita GDP growth for the next 20 years. From 69.9 percent now, it is forecast to fall to 64.6 percent in 2035.

- Increasing per worker productivity could offset this, but Minnesota is suffering a net outflow of workers earning over $25,000 a year. And it is losing residents in all age categories.

- To increase per capita GDP, Minnesota will need more capital per worker, but its high tax rates discourage such investment. Minnesota has the third highest rate of corporate taxation in the U.S. Coupled with the federal tax, Minnesota has one of the highest corporate tax rates in the developed world. In 2015, Minnesota attracted only $108 of venture capital per worker, compared to a national average of $391.

- Partly as a result of this, the share of new and young businesses in Minnesota increasingly lags the national average. In 2000, Minnesota's rate was two percentage points behind the national rate. In 2015, the gap was four percentage points.

- Minnesota's educational system is a positive for growth, but the state slightly lags the nation in Research & Development spending. In 2014, Research & Development spending accounted for 2.47 percent of Minnesota's GDP compared to 2.53 percent nationally.

Contents

I. MINNESOTA'S ECONOMY CONTINUES TO UNDERPERFORM

To assess Minnesota's economic health, we begin by looking at the state's economic performance in three key areas: output, income, and jobs. We see that in recent years our state's growth has been mediocre by national standards, with productivity a particular problem. Personal income growth has been driven by a rise in government transfer payments. What job growth there has been in Minnesota, has increasingly been found in labor intensive, low productivity sectors.

1. ECONOMIC OUTPUT

Here we examine Minnesota's economy on two key macro-metrics, GDP and productivity. These give us an overall, "big picture" view of the health of the Minnesotan economy.

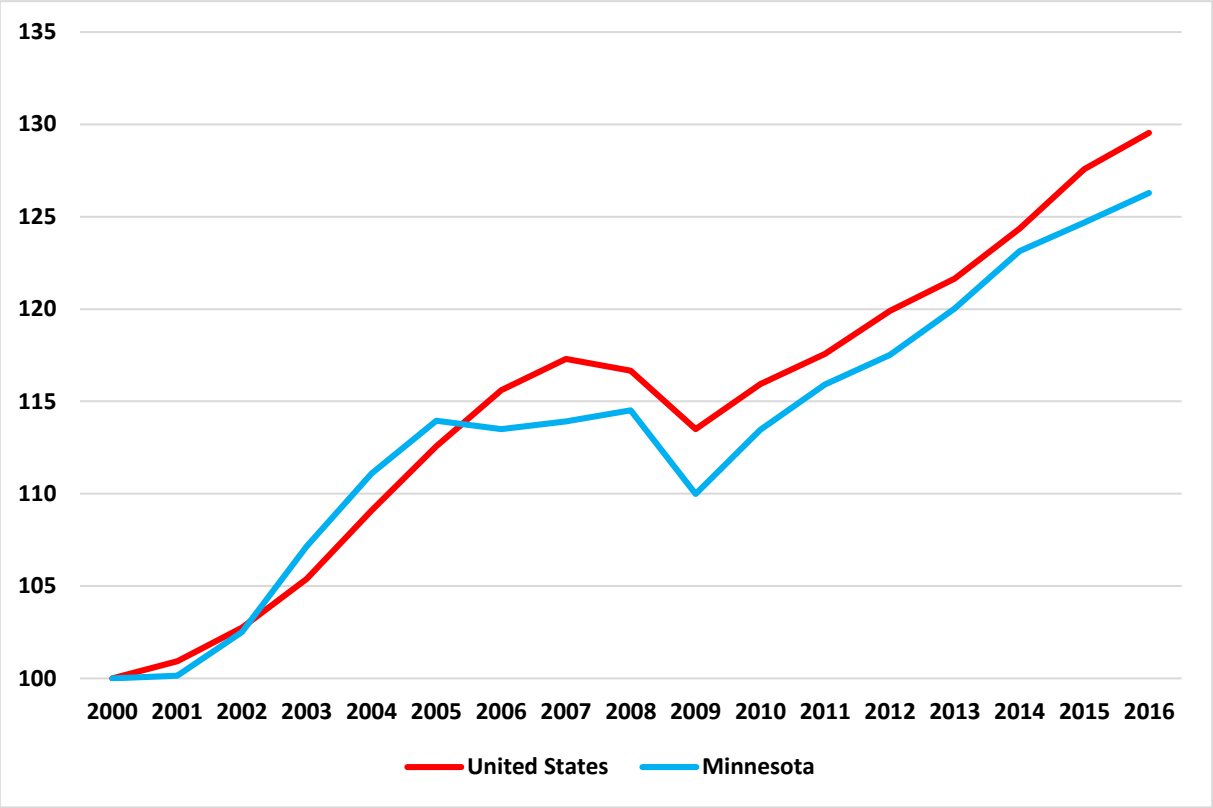
a. Gross Domestic Product

Gross Domestic Product (GDP), also referred to as Gross State Product (GSP), is the most commonly used measure of economic performance. It measures the total market value of goods and services produced within an economy.

Minnesota was once a strong performer compared with other states. From 1965 to 1997, our state's average annual growth rate of real GDP was 3.1 percent, a little above the national rate of 2.9 percent. Since then, however, Minnesota's rate of GDP growth has dipped below the national average of 2.0 percent to 1.9 percent.[1] As shown in Figure 1, Minnesota's output remained more or less flat from about 2005 to 2008. Then the recession struck, which impacted our state more than the nation as a whole. Since then Minnesota's growth has lagged the national average. It has not regained any of the relative ground it lost in the mid-2000s. If Minnesota's economic growth rate had matched that of the nation since 2000, the state's GDP would be 2.5 percent higher.

[1] 1997 is chosen because there is a break there in the data. As the Bureau of Economic Analysis explains, "There is a discontinuity in the GDP-by-state time series at 1997, where the data change from SIC industry definitions to NAICS industry definitions…Users of GDP by state are strongly cautioned against appending the two data series in an attempt to construct a single time series."

Figure 1: GDP Growth in the U.S. and Minnesota, 2000-2016 (2000=100)



Source: Bureau of Economic Analysis

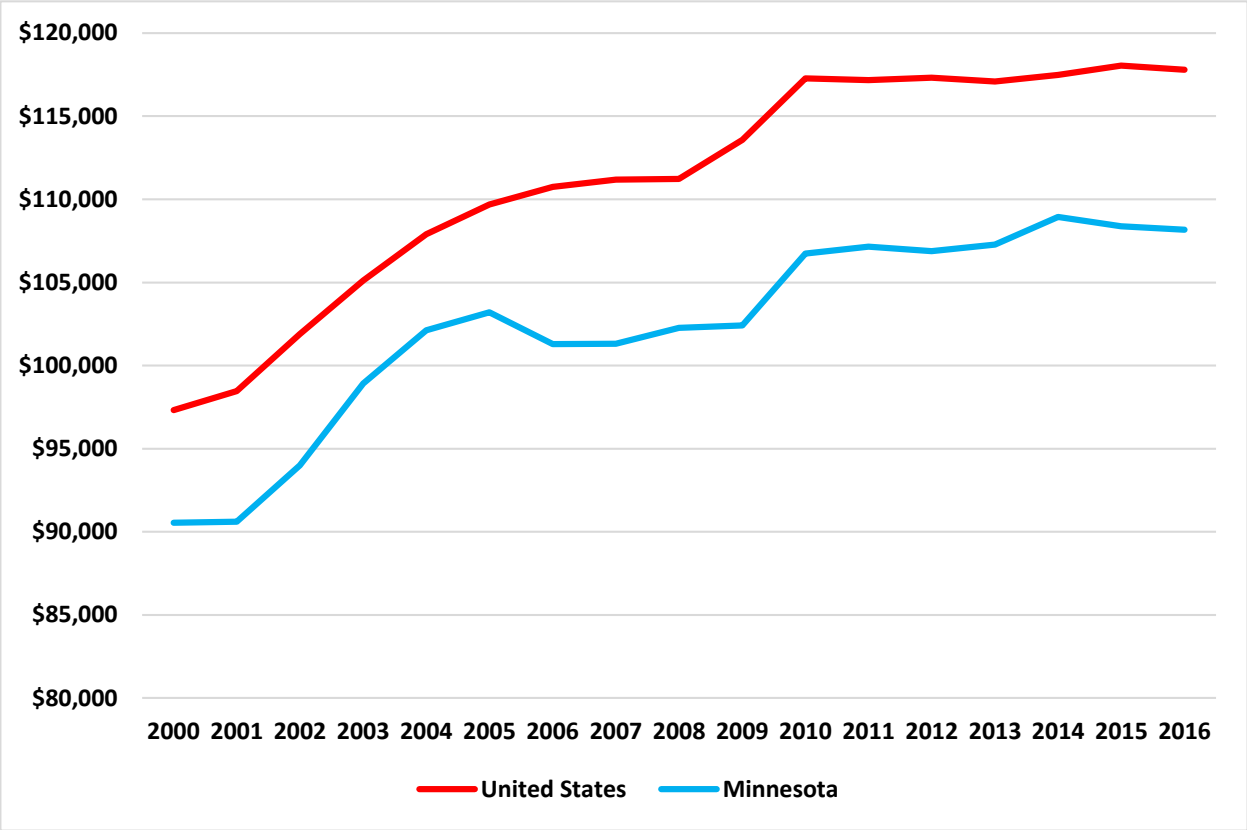
b. Productivity

What matters most for long-term growth is productivity. The ability to produce more outputs from a given amount of inputs, is the essence of economic growth.[2] Here we look at Minnesota's per worker productivity, and productivity per hour in the production of goods and services.

We can measure state productivity as state GDP per worker. As Figure 2 shows, Minnesota's per worker productivity has consistently been below the national average since at least 2000. In 2016, Minnesota produced 8.2 percent less GDP per worker than the national average. Minnesota lost relative ground between 2004 and 2009 and has not regained that lost ground since.

[2] Considering the importance of productivity, it is surprising how little data exists at the state level. While the Bureau of Labor Statistics (BLS) measures national productivity, its data sources do not provide the information necessary to construct state productivity measures.

Figure 2: Private Sector Productivity, 2000-2016 (Real GDP per Employee)

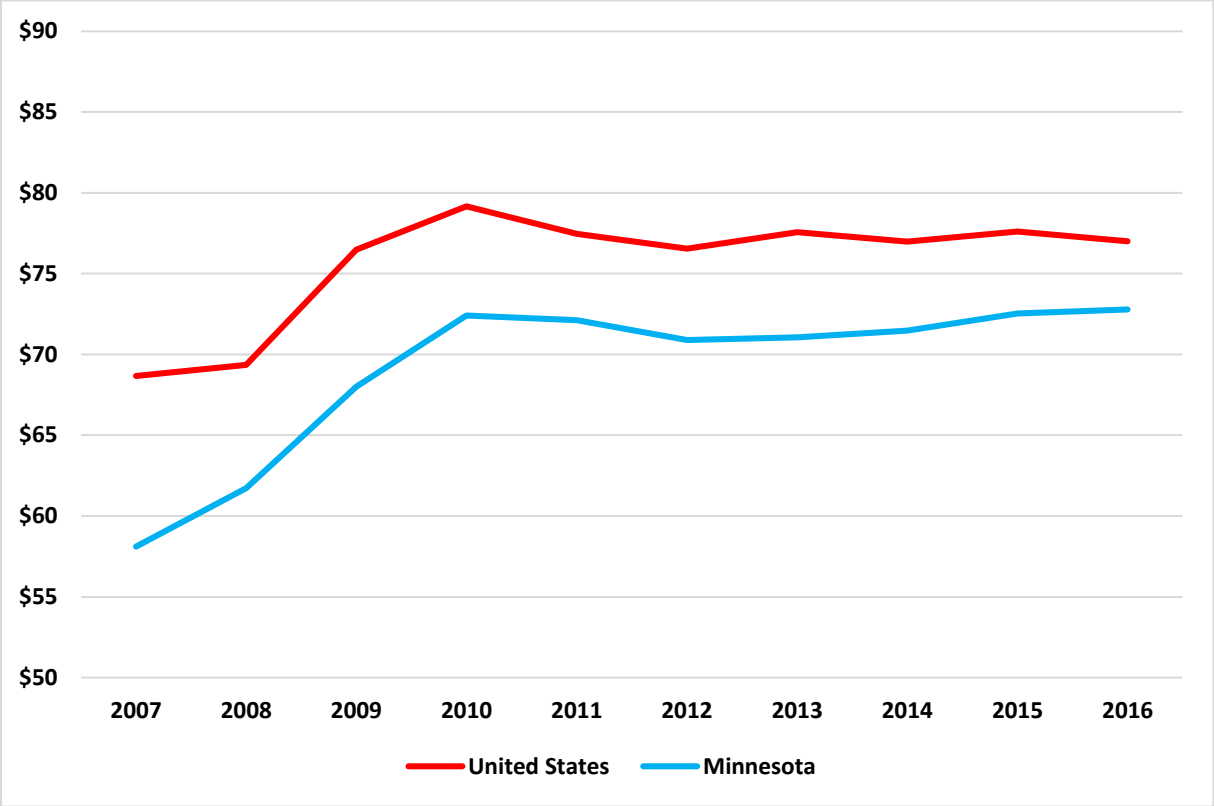


Source: Bureau of Economic Analysis (2009 Dollars); Bureau of Labor Statistics

A measure of GDP per worker, while useful, can be skewed by part time workers, who count the same as full time ones but work fewer hours and produce less. It can also obscure the variation between sectors.

To take this into account, Figure 3 shows GDP per hour worked in Minnesota's goods producing sector. The data for hour worked only goes back to 2007. This shows that the state's workers in this part of the economy are less productive than the U.S. average, producing 5.5 percent less GDP per hour worked. The gap has narrowed a little over time, but this is more a reflection of the poor performance on productivity nationally than any growth locally. Indeed, the average Minnesota goods producing worker's productivity has stagnated for the last six years.

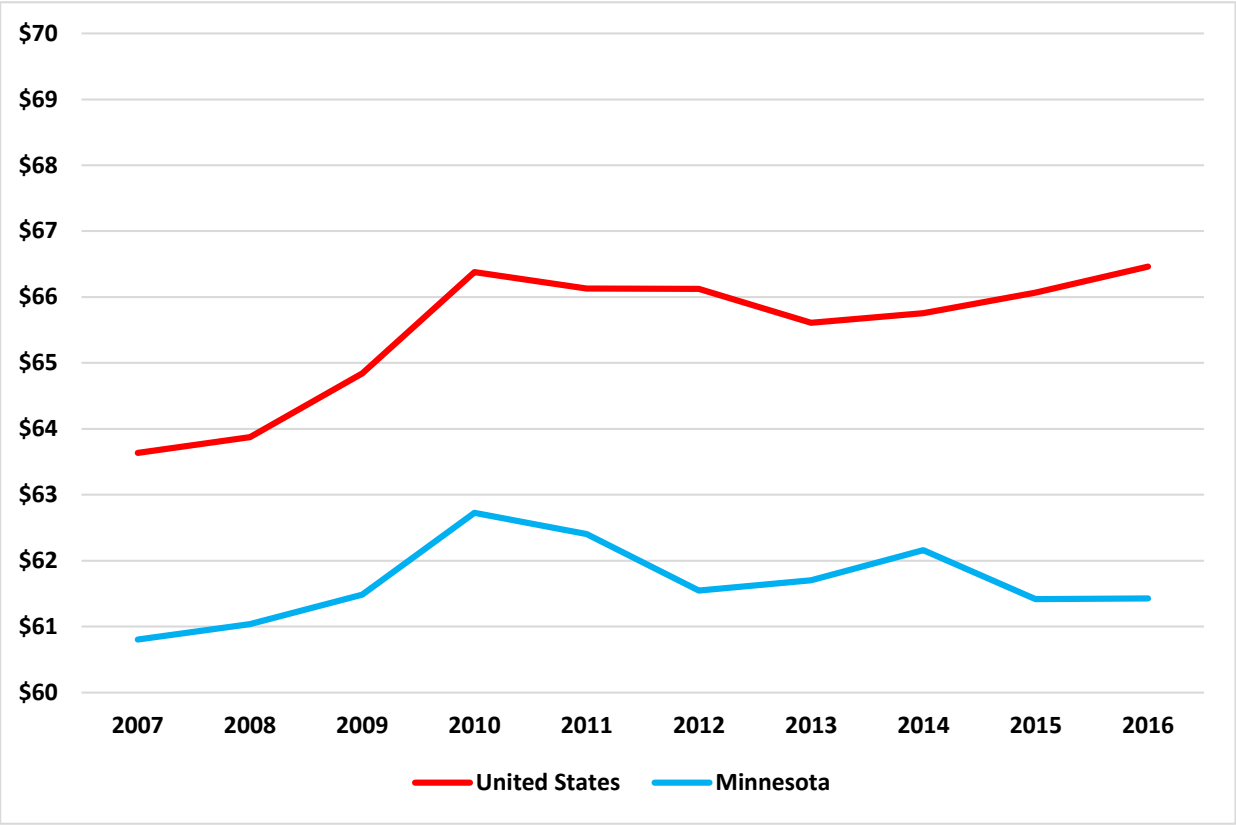
Figure 3: Goods Producing Productivity, 2007-2016 (Real GDP per Hour Worked)



Source: Bureau of Economic Analysis (2009 Dollars); Bureau of Labor Statistics

Figure 4 shows GDP per hour worked for the service producing sector. Here, too, Minnesota is below the national average, producing 7.6 percent less GDP per hour worked. But whereas productivity has more or less flat lined since 2010 in the goods producing sector, in services it has drifted downwards. This is bad news for Minnesota, as a growing share of the state's jobs are to be found in service industries (see next section).

Figure 4: Service Producing Productivity, 2007-2016 (Real GDP per Hour Worked)



Source: Bureau of Economic Analysis (2009 Dollars); Bureau of Labor Statistics

2. INCOME GROWTH

GDP and productivity are important starting points, but people experience the economy through their income and spending. Here we look at Minnesota's wages, personal income, disposable income, and household income.

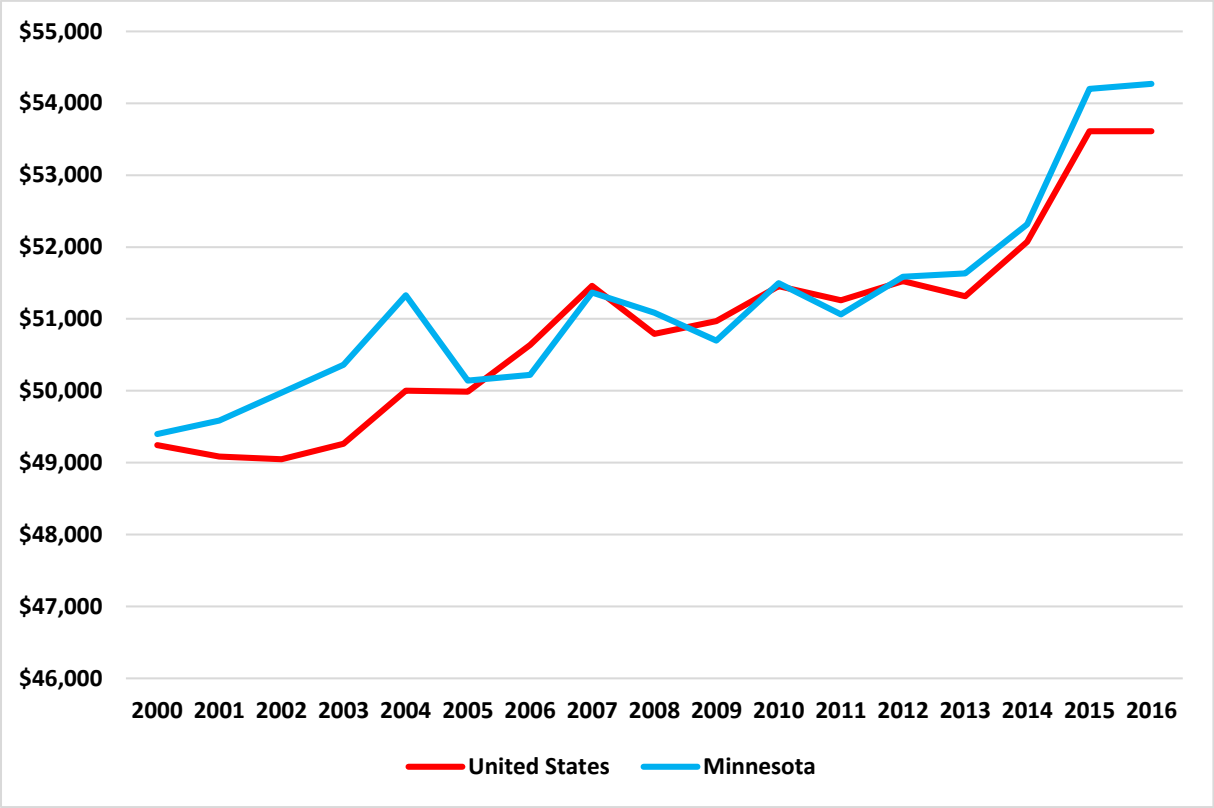
a. Wages

Most people rely solely on labor earnings for their income. So, to better understand the economic status of the average worker, it is helpful to look specifically at the average wage people receive.

Here, Minnesota tracks very closely to national averages. As Figure 5 shows, in 2016, Minnesota's average wage of $54,270 was just $659, or 1.2 percent, more than the U.S.[3]

[3] Respectively $53,519; $582; and 1.1 percent in 2016's report.

Figure 5: Average Annual Wage in the U.S. and Minnesota, 2000-2016



Source: Bureau of Labor Statistics (2016 Dollars)

b. Growth in Personal Income and Disposable Income

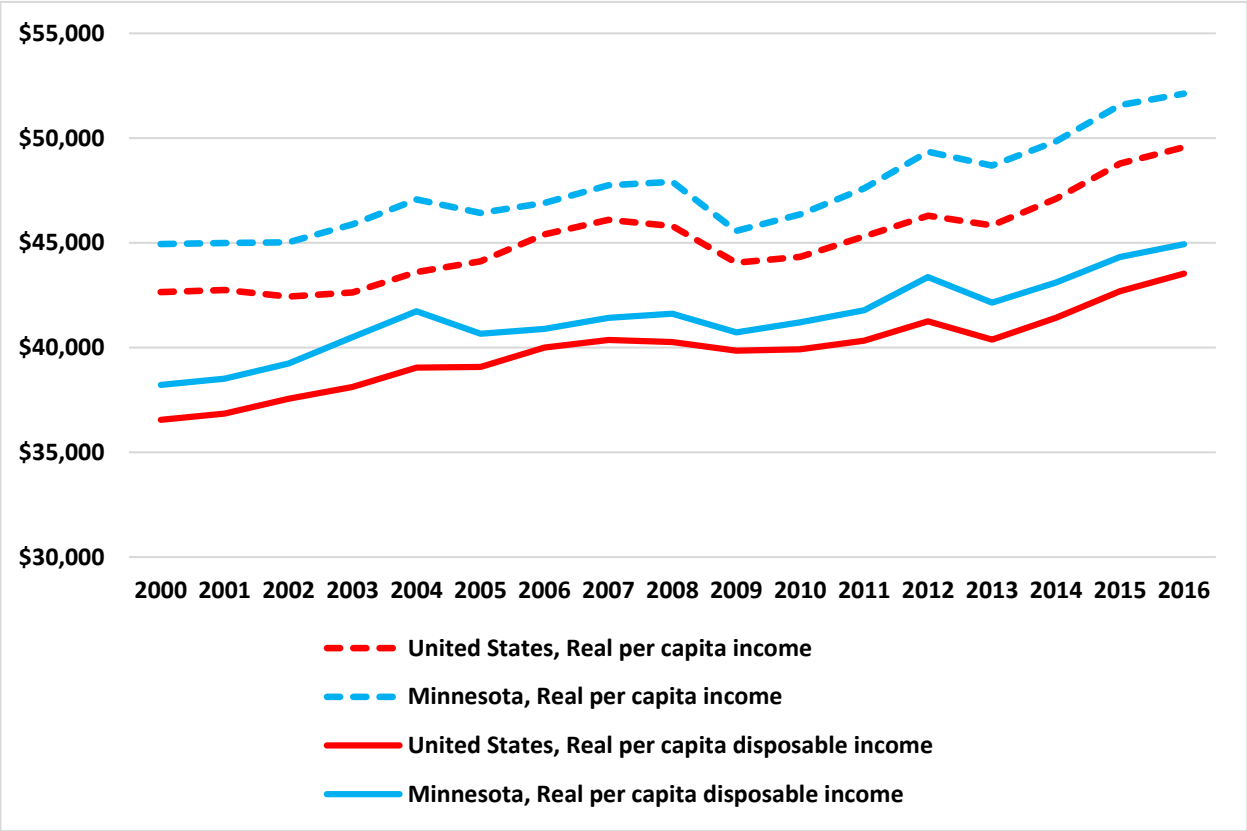
Personal income measures the total income people receive from all sources, including wages, salaries, dividends, interest, rental income, and government transfer payments. It is a useful barometer of economic wellbeing, but it is only a starting point. Minnesotans pay tax on this income. To account for this, we look at per capita disposable income, which is personal income minus income taxes.

Minnesotans' personal incomes grew at a slightly faster pace than the national average over the past 50 years. In 1965, per capita personal income in Minnesota was 4.1 percent below the U.S. level. Since then, it has grown to be 5.1 percent higher.[4] Minnesota's per capita income now ranks fourteenth in the country.[5] Since the 1990s, as shown in Figure 6, Minnesota's per capita income has grown slightly ahead of the national rate.

[4] Down from 6.0 percent higher in 2016's report.
[5] Down from 13th in 2016's report.

But because of its high income taxes—Minnesota has the third highest top rate of income tax in the country—a hefty chunk of this is taken in taxes. In 2009, Minnesotans' disposable income was 89.4 percent of their total income. By 2016, that was down to 86.2 percent, as Figure 6 shows.

Figure 6: Real per Capita Income and per Capita Disposable Income, 2000-2016

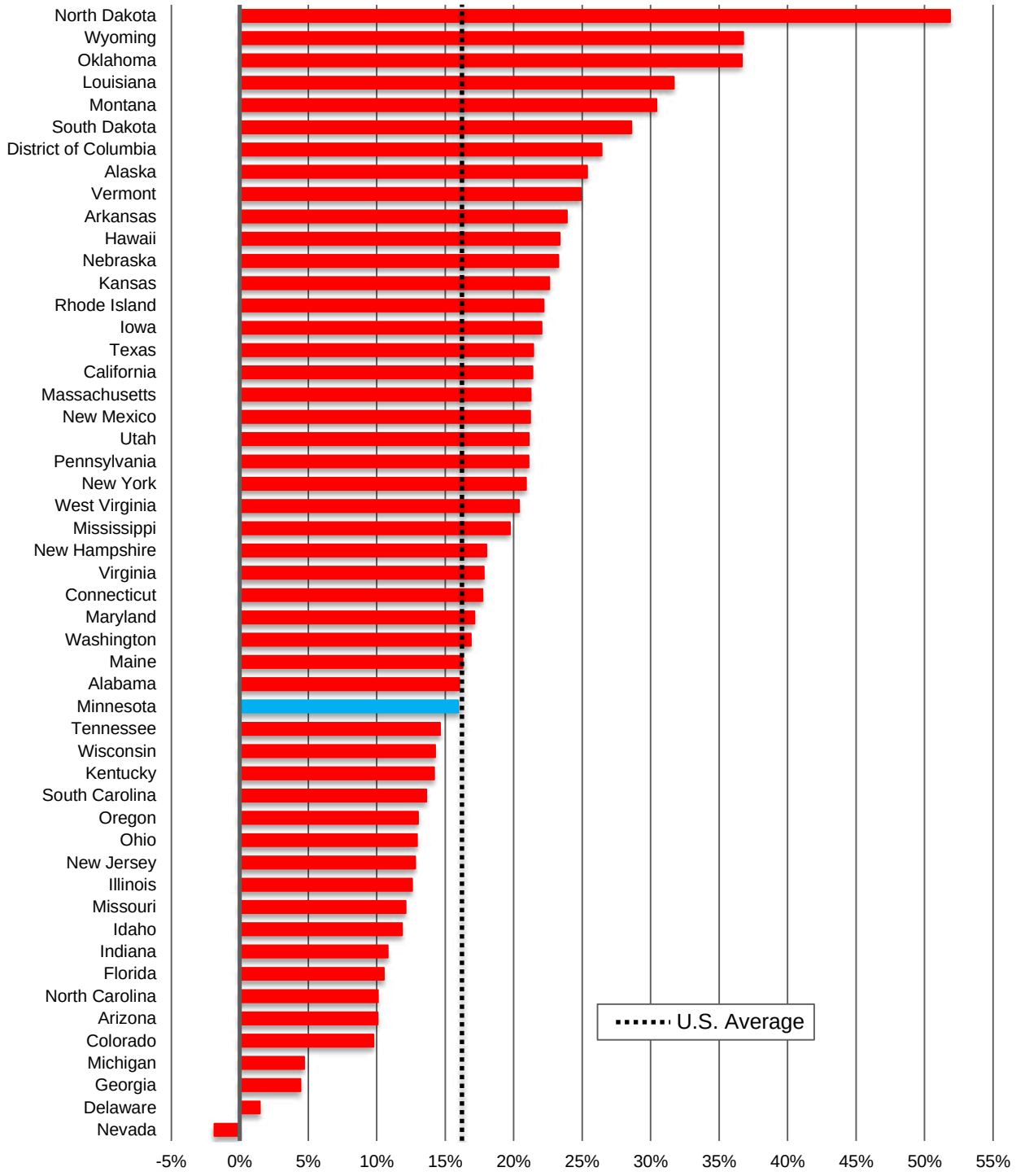


Source: Bureau of Economic Analysis (2016 Dollars)

Though Minnesota's growth in total personal income kept pace with the national average, a majority of states still outperformed Minnesota. As shown in Figure 7, Minnesota's per capita income growth from 2000 to 2016 ranked 32nd overall among the states.[6]

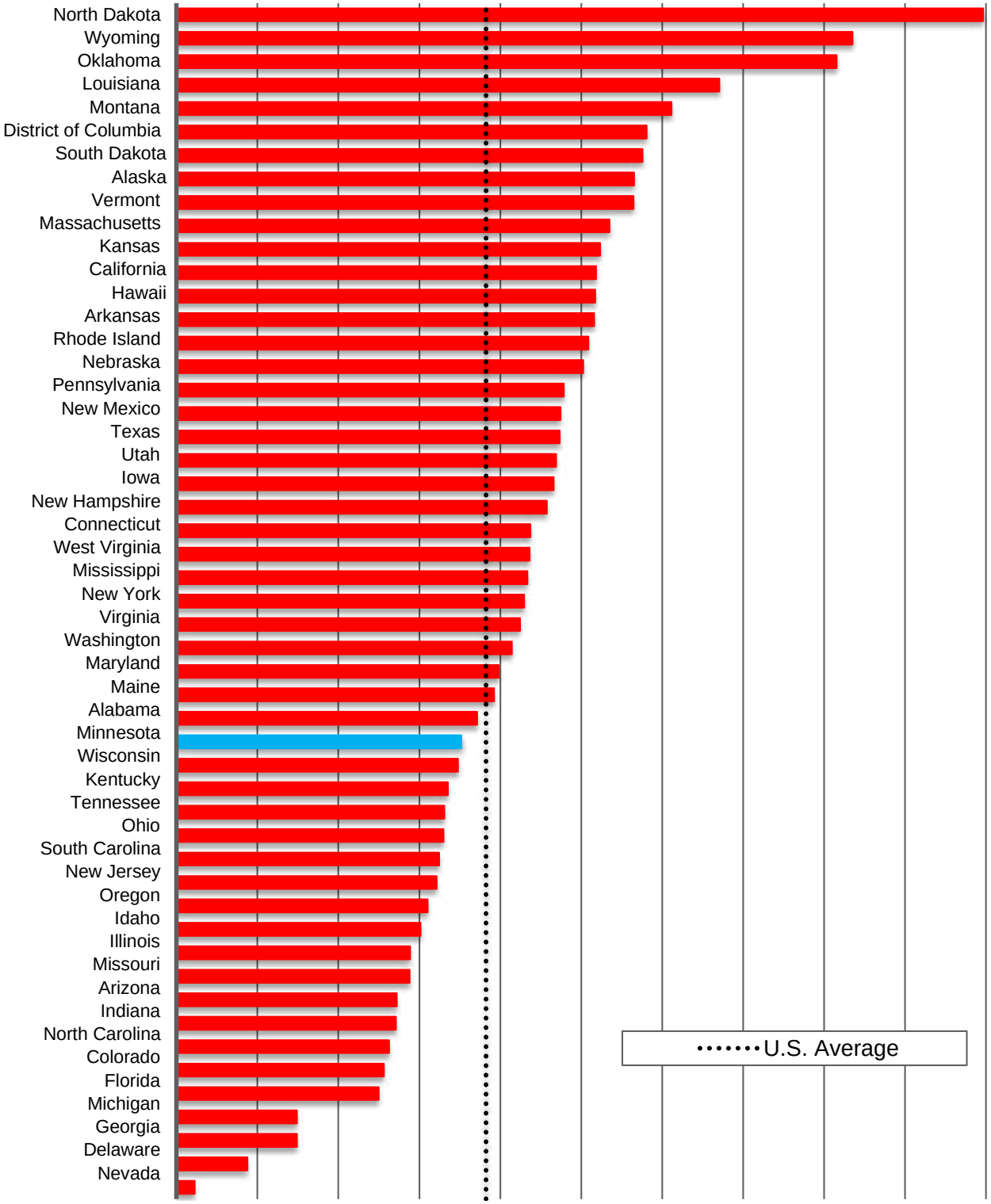
[6] Down from 30th for 2000 to 2015.

Figure 7: Real per Capita Income Growth, 2000-2016



Source: Bureau of Economic Analysis (2016 Dollars)

Figure 8: Real per Capita Disposable Income Growth, 2000-2016



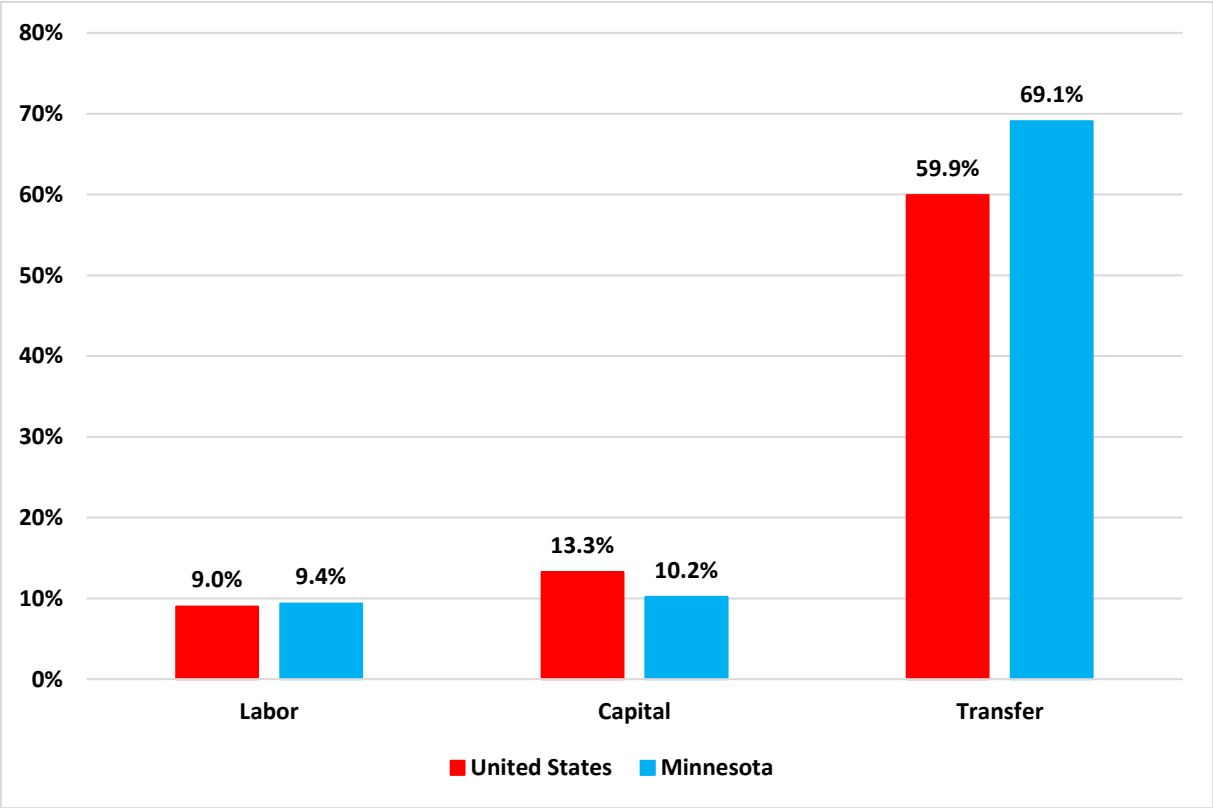
Source: Bureau of Economic Analysis (2016 Dollars)

The story is much the same with disposable income. Over the last 16 years, as shown in Figure 8, Minnesota ranks 31st among the states in per capita growth of disposable income.[7]

Personal income can be separated into three categories: labor income, capital income, and transfer income. As Figure 9 shows, Minnesota has experienced much stronger growth in transfer income—e.g., Social Security, Medicaid, Medicare, welfare, and other government program distributions—than in other categories, compared to the nation as a whole.

As a result of this, as Figure 10 shows, the growth in government transfer payments accounts for 47 percent of the increase in Minnesota's personal income gains since 2000.

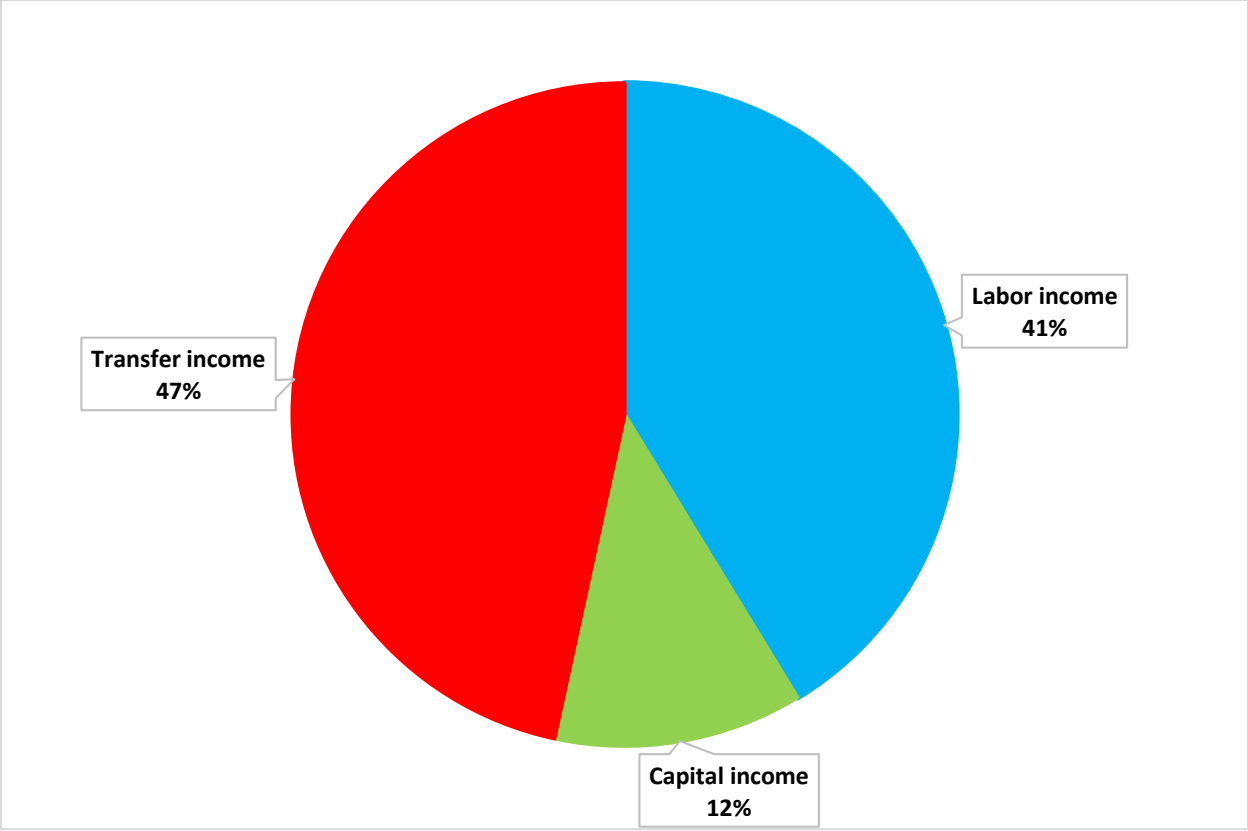
Figure 9: Real per Capita Income Growth by Component of Income, 2000-2016



Source: Bureau of Economic Analysis (2016 Dollars)

[7] Up from 34th in 2016.

Figure 10: Sources of Growth of Real per Capita Income by Component of Income, 2000-2016



Source: Bureau of Economic Analysis (2016 Dollars)

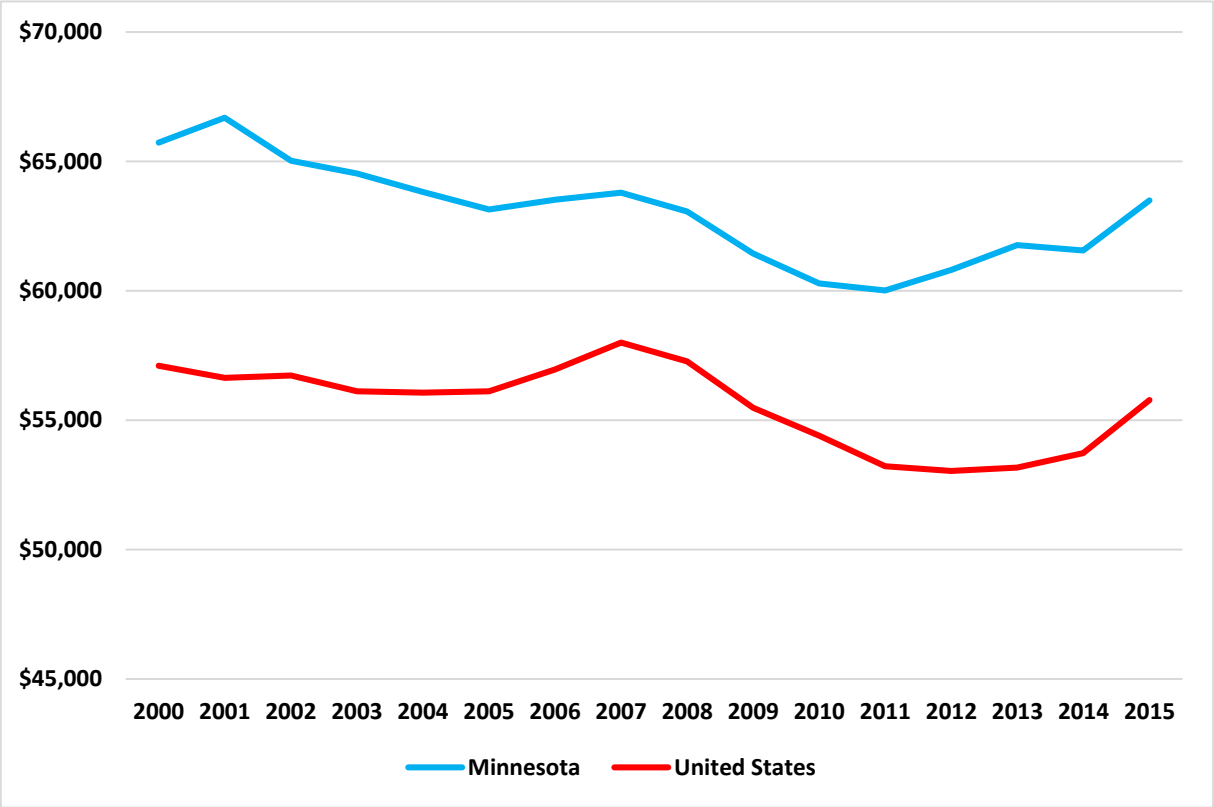
c. Household Income

Another measure of the typical family's wellbeing is median household income.

On this measure, the median Minnesota household earns a higher income than the median U.S. household. As Figure 11 shows, median household income in Minnesota was $63,488 in 2016, 13.8 percent above the national median of $55,775.[8]

[8] Respectively $61,481; 15 percent; and $53,657 in 2016's report.

Figure 11: Median Household Income for the U.S. and Minnesota, 2000-2015

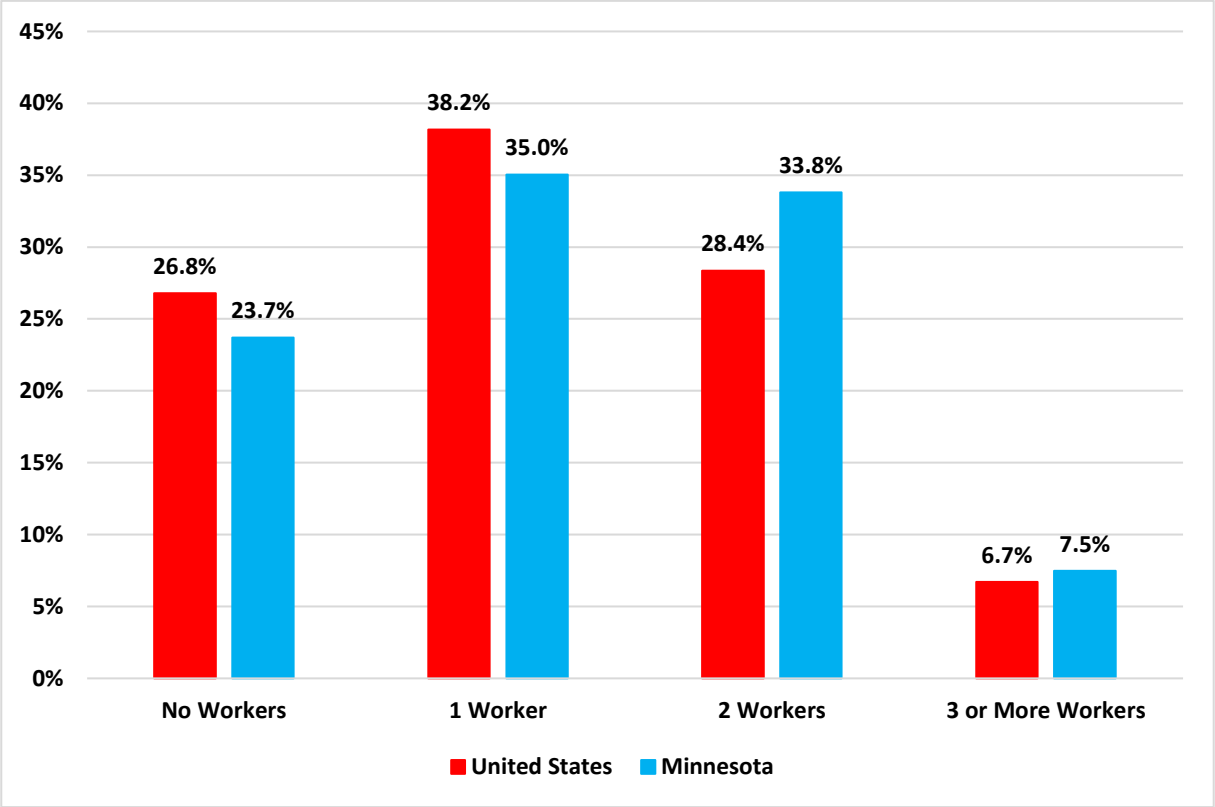


Source: Census Bureau, (2015 Dollars)

A large factor behind Minnesota's relatively high median household income is the fact that our state has a greater than average percentage of households with two or more income earners. As Figure 12 shows, households with two workers account for 33.8 percent of Minnesota households, but only 28.4 percent of households nationally.[9] Minnesota also has a smaller portion of households with one worker or no workers.

[9] Respectively 33.6 percent and 28.2 percent in 2015.

Figure 12: Proportion of Households by Number of Workers, 2015



Source: Census Bureau

3. JOBS

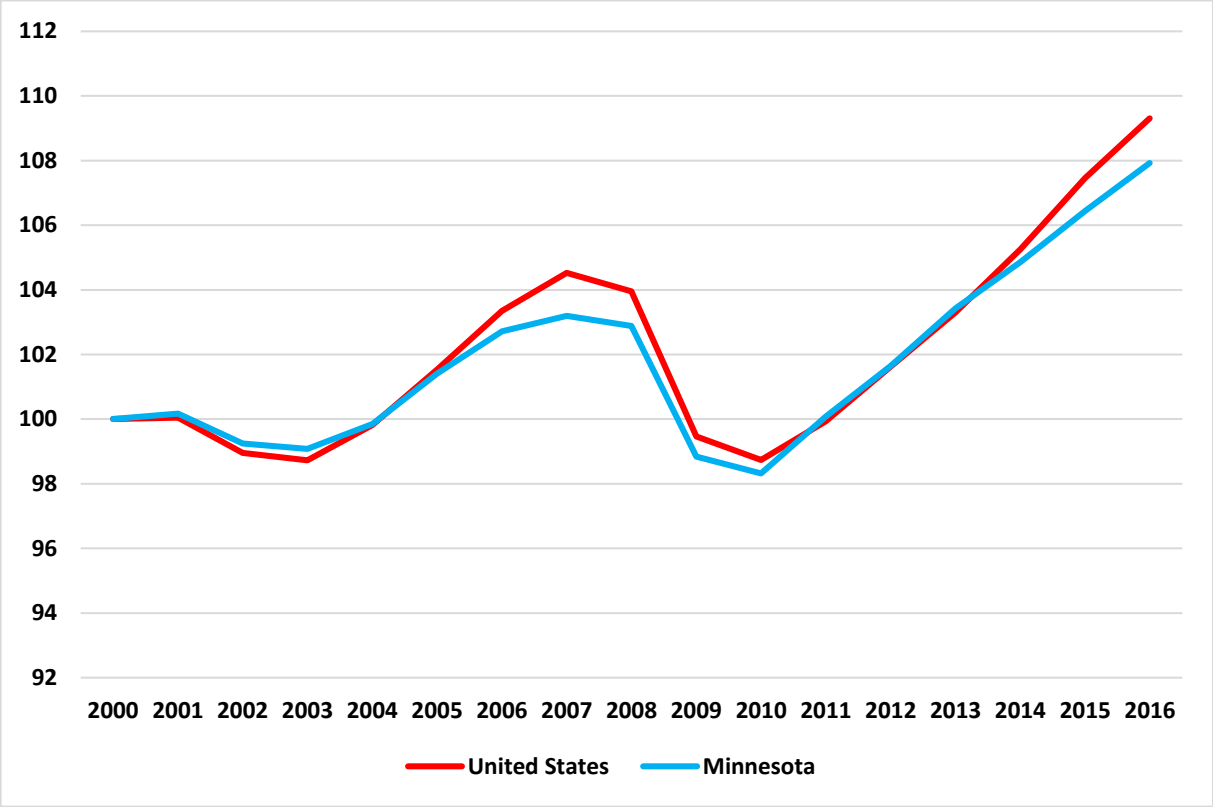
Here we assess the state of Minnesota's labor market. We look at four measures: job growth, unemployment, labor force participation, and job gains and losses by industrial sector.

a. Job Growth

Since 2000, the rate of job growth in Minnesota has lagged the nation as a whole.

As Figure 13 shows, Minnesota fell behind between 2005 and 2008. It recovered somewhat from 2010, but in each of the last five years the rate of job growth in Minnesota has been below the national average.

Figure 13: Employment Growth in the U.S. and Minnesota, (2000=100)

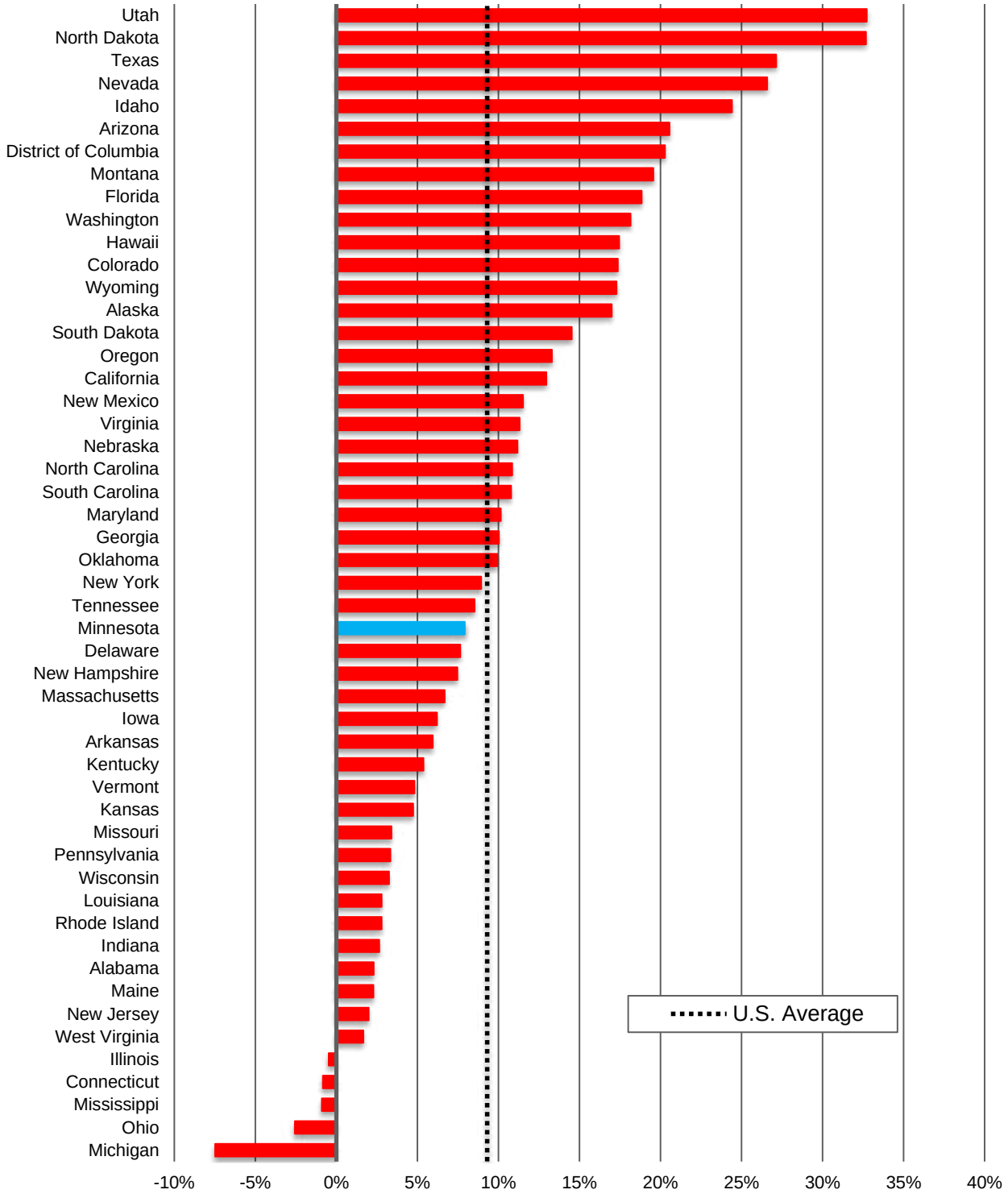


Source: Bureau of Labor Statistics

Figure 14 shows that between 2000 and 2016, Minnesota ranked 28th among the 50 states and the District of Columbia in the rate of job creation.[10]

[10] Unchanged from 28th in 2016's report.

Figure 14: Employment Growth, 2000-2016

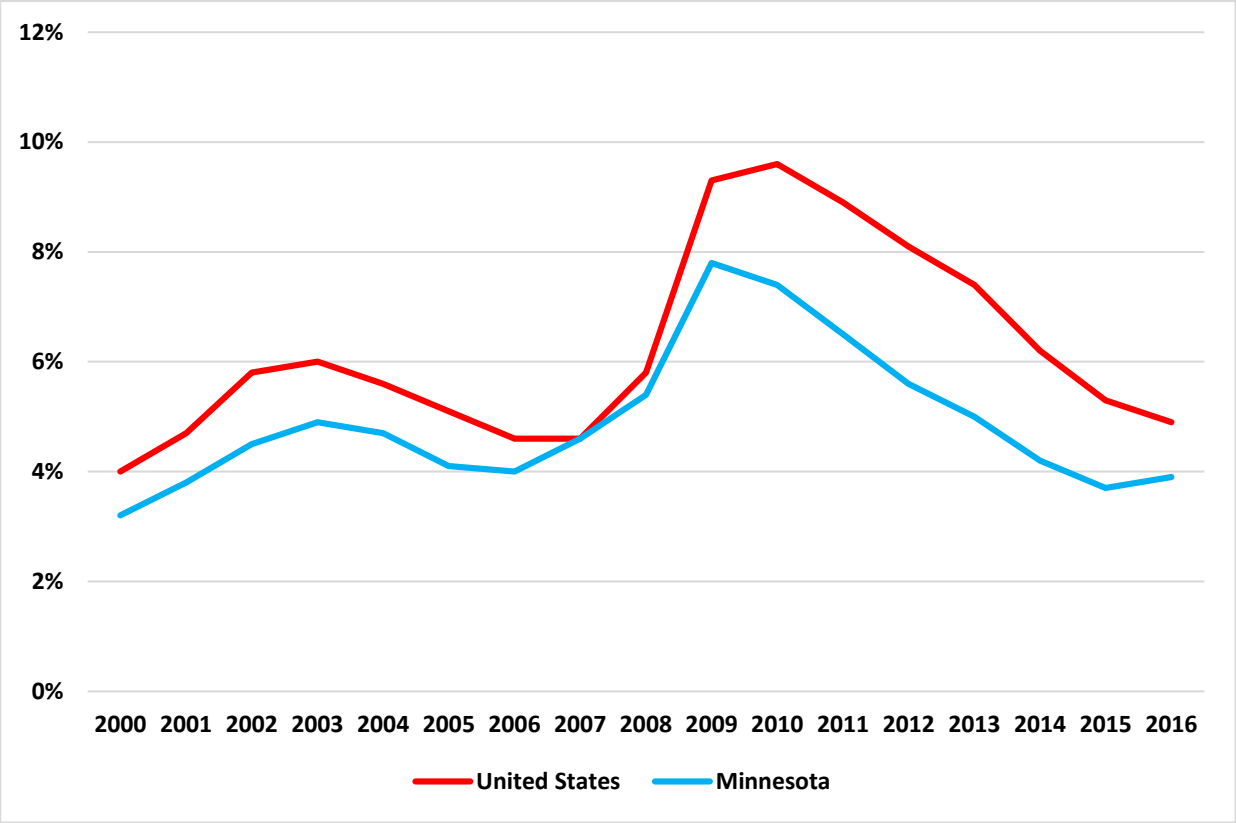


Source: Bureau of Labor Statistics

b. Unemployment Rate

In recent years, Minnesota's unemployment rate has been below the national average, as Figure 15 shows. Through 2016, Minnesota's average unemployment rate of 3.9 percent was well below the national average of 4.7 percent, although the gap narrowed somewhat.

Figure 15: Unemployment Rates in the U.S. and Minnesota, 2000-2016

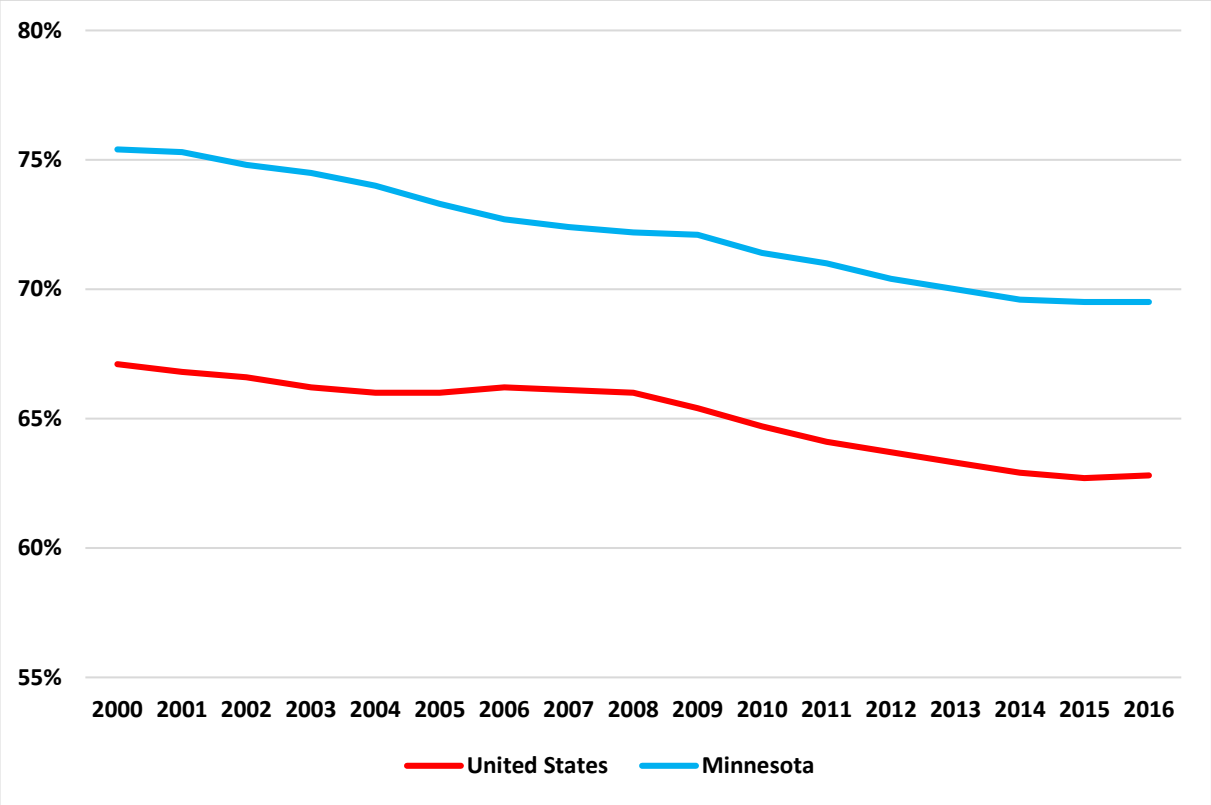


Source: Bureau of Labor Statistics

c. Labor Force Participation Rate

Minnesota's labor force participation rate—69.5 percent in 2016—has long been among the highest in the country. But demographic changes are impacting Minnesota's labor force. As Figure 16 shows, over the last 16 years, as the nation's participation rate has declined due to an aging population, so has Minnesota's, by 5.9 percentage points since 2000.

Figure 16: Labor Force Participation Rates in the U.S. and Minnesota, 2000-2016



Source: Bureau of Labor Statistics

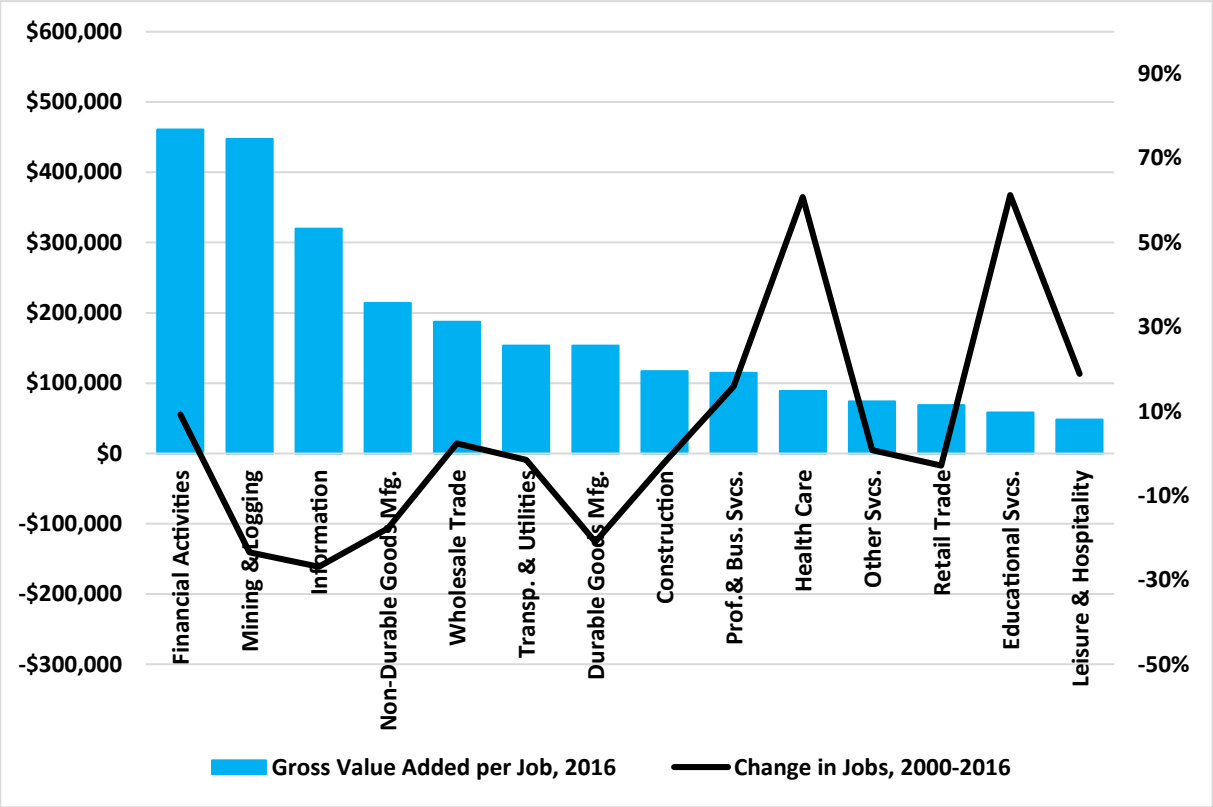
d. Job Growth by Industry

Jobs may be growing in Minnesota at close to the same rate as the U.S. as a whole, but what types of jobs are we getting?

Figure 17 shows the Gross Value Added[11] (GVA) associated with the average job in various occupational categories as well as the percentage increase or decrease in those jobs since 2000. In some occupations with a high GVA per job, such as mining, information, and manufacturing, the number of jobs has stagnated or even fallen. Mining & Logging, for example, generated $447,603 per job in 2016 and Information $319,596. But, in the previous sixteen years, Minnesota lost 23.5 percent of its jobs in Mining & Logging and 26.9 percent of those in Information. In contrast, the fastest growing occupations, Health Care and Educational Services, have a relatively low GVA per job. Health Care jobs, for example, generate an average of $88,761 of GVA annually, but jobs there have increased by 60.8 percent since 2000. Educational Services jobs generate an average of $58,239 of GVA annually, and employment in that sector has risen by 61.2 percent over the same period. For as long as this continues to be the case, net job growth may not imply rising per capita GDP.

[11] Another measure of the value of goods and services produced in an area, industry, or sector of an economy.

Figure 17: Minnesota GVA and Job Growth



Sources: Bureau of Labor Statistics; Bureau of Economic Analysis

II. THE TWIN CITIES LAG OTHER URBAN CENTERS AND GREATER MINNESOTA PERFORMS POORLY COMPARED TO NEIGHBORS

Minnesota has long been noted for the diversity of its economy. Northern Minnesota has a long history of logging and mining. The southern and western areas have a large agricultural base. There are manufacturing clusters dotted around the state, such as St. Cloud. Rochester is a hub of the healthcare industry. And the Twin Cities are a center of high-value innovation. To capture some of this variation, we look here at some of the economic statistics for the Twin Cities and Greater Minnesota. We find that, so far this century, the Twin Cities lag comparable urban areas for GDP and job growth. Across Minnesota, the Twin Cities areas have led in job growth, but southern and western counties have led in income growth. Comparing GDP growth in Minnesota's metropolitan statistical areas (MSAs) to those of neighboring states, shows that our state has lagged.

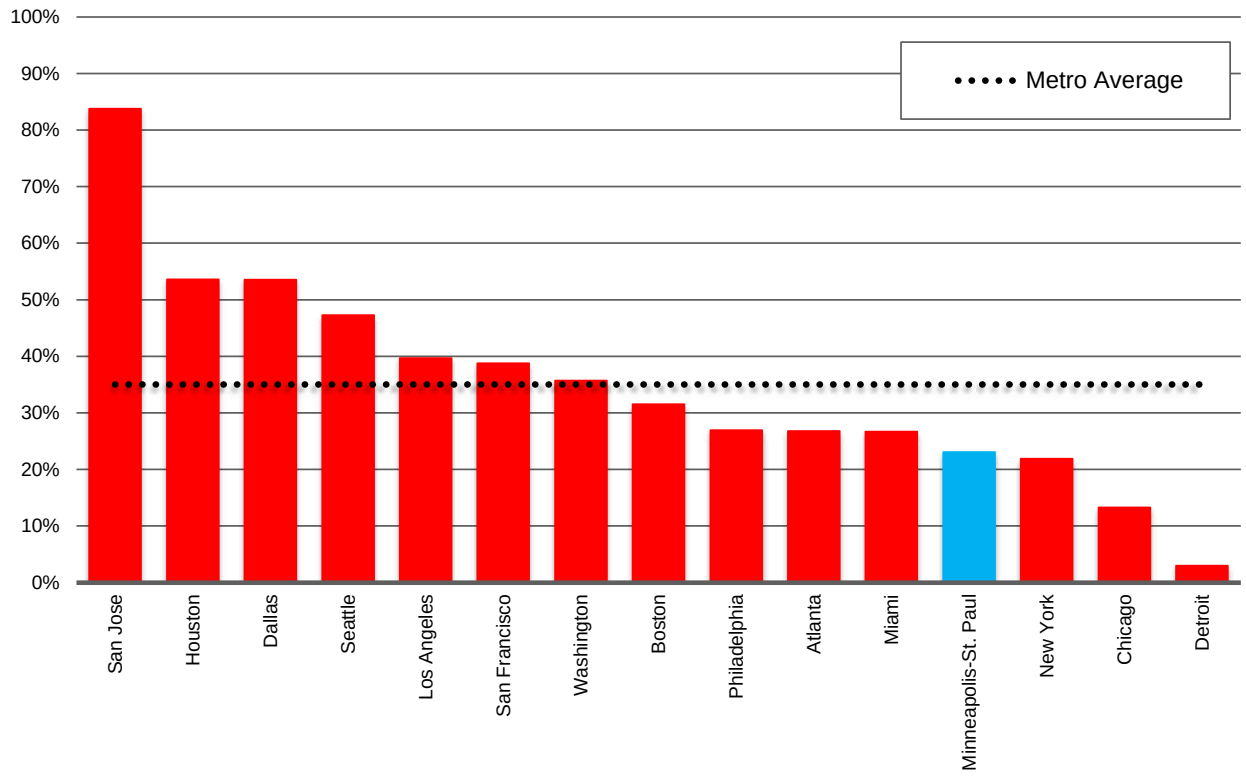
1. THE TWIN CITIES METROPOLITAN AREA IS FALLING BEHIND COMPARABLE URBAN AREAS

The Twin Cities are the state's dominant economic center. To get a sense of how they are performing, this section takes a look at GDP growth and job creation to see how the Twin Cities metropolitan area compares with the 15 largest MSAs by GDP.

a. Gross Domestic Product

Since the beginning of the century, GDP growth in the Twin Cities metropolitan area has lagged behind many of the nation's more dynamic cities. Figure 18 shows the GDP growth between 2001 and 2016 for the fifteen MSAs with the largest GDP in 2016. Minneapolis/St. Paul is now ranked twelfth.

Figure 18: Percentage Change in Real GDP, Top 15 MSAs, 2001-2016



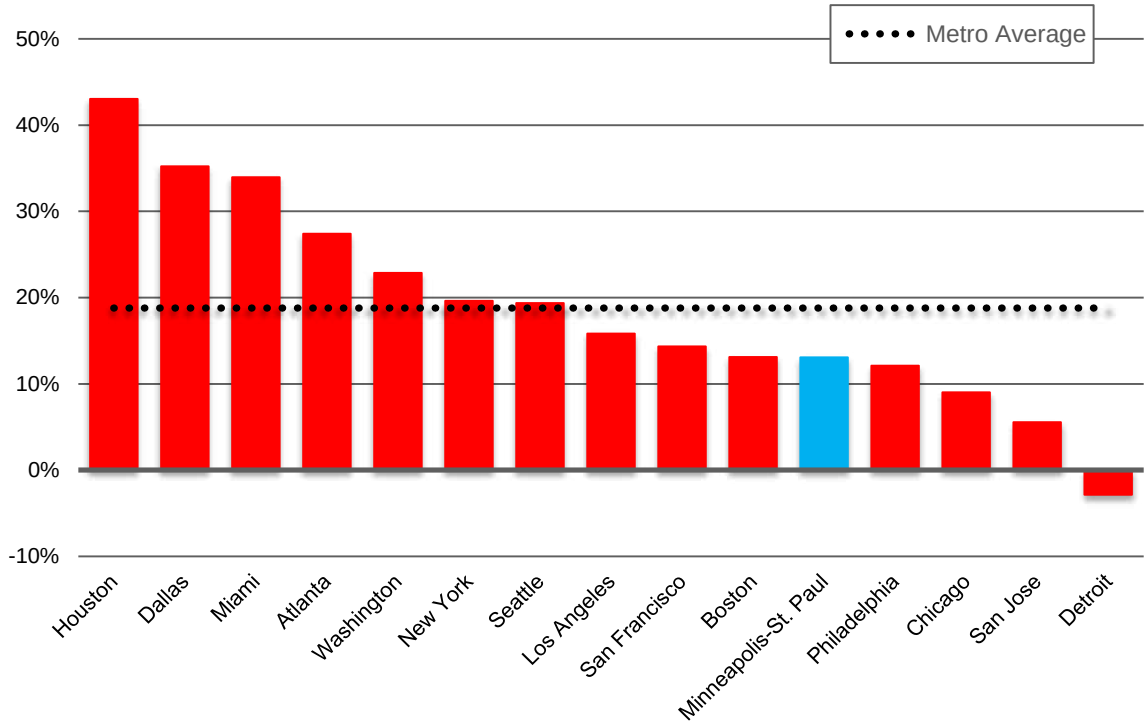
Source: Bureau of Economic Analysis (2009 dollars)

b. Job Creation

The picture is similar with regard to job creation, as Figure 19 shows. The Twin Cities lag behind other major metropolitan areas, ranking 11th out of the 15.[12]

[12] The charts corresponding to Figures 18 and 19 in last year's report were based on a different selection of MSAs and are not directly comparable.

Figure 19: Percentage Change in Total Employment, 2000-2015



Source: Bureau of Economic Analysis

It should be noted, too, that some of the MSAs that have done worse than the Twin Cities over this period have widely acknowledged structural problems that have built up over decades. The Twin Cities are not in the position of, say, Detroit or Chicago, but that should not be the relevant standard. When the field is narrowed to MSAs without obvious long-term problems, and with which the Twin Cities compete for business and job creation, the region has clearly trailed most other large urban areas.

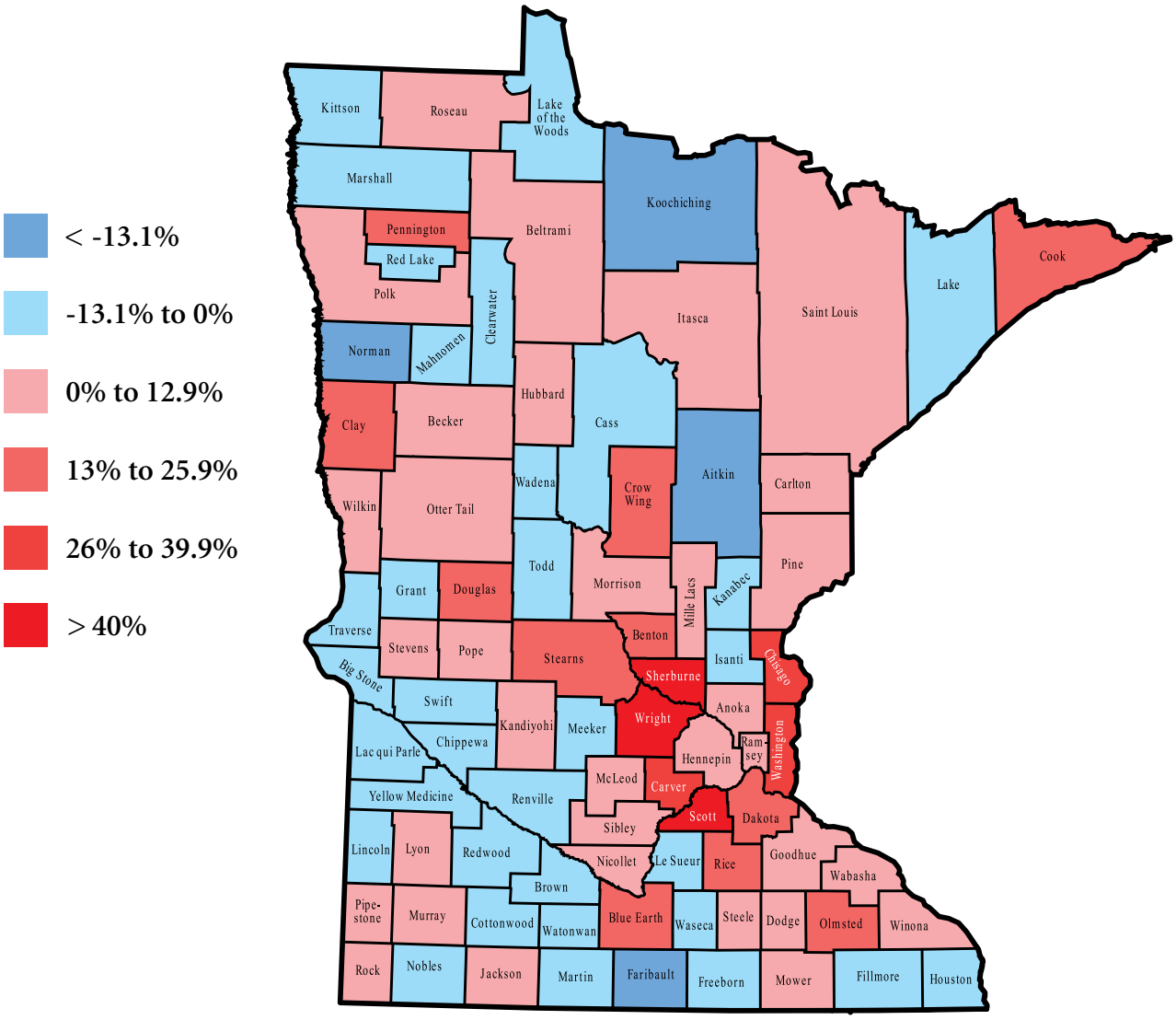
1. GREATER MINNESOTA

Policymakers in St. Paul all too often fail to see much beyond highways 494 and 694. Here, we take a look at Minnesota beyond the Metro. We look at employment growth, per capita incomes, and GDP for Minnesota's counties. For comparison, we also look at MSAs in neighboring states.

a. Employment Growth

Figure 20 shows that the strongest employment growth springs from the suburban and exurban areas in the western portion of the Twin Cities and along the St. Croix. In Greater Minnesota, such as along the Minnesota River valley, however, the number of jobs has fallen.

Figure 20: Change in Total Employment, 2000-2015

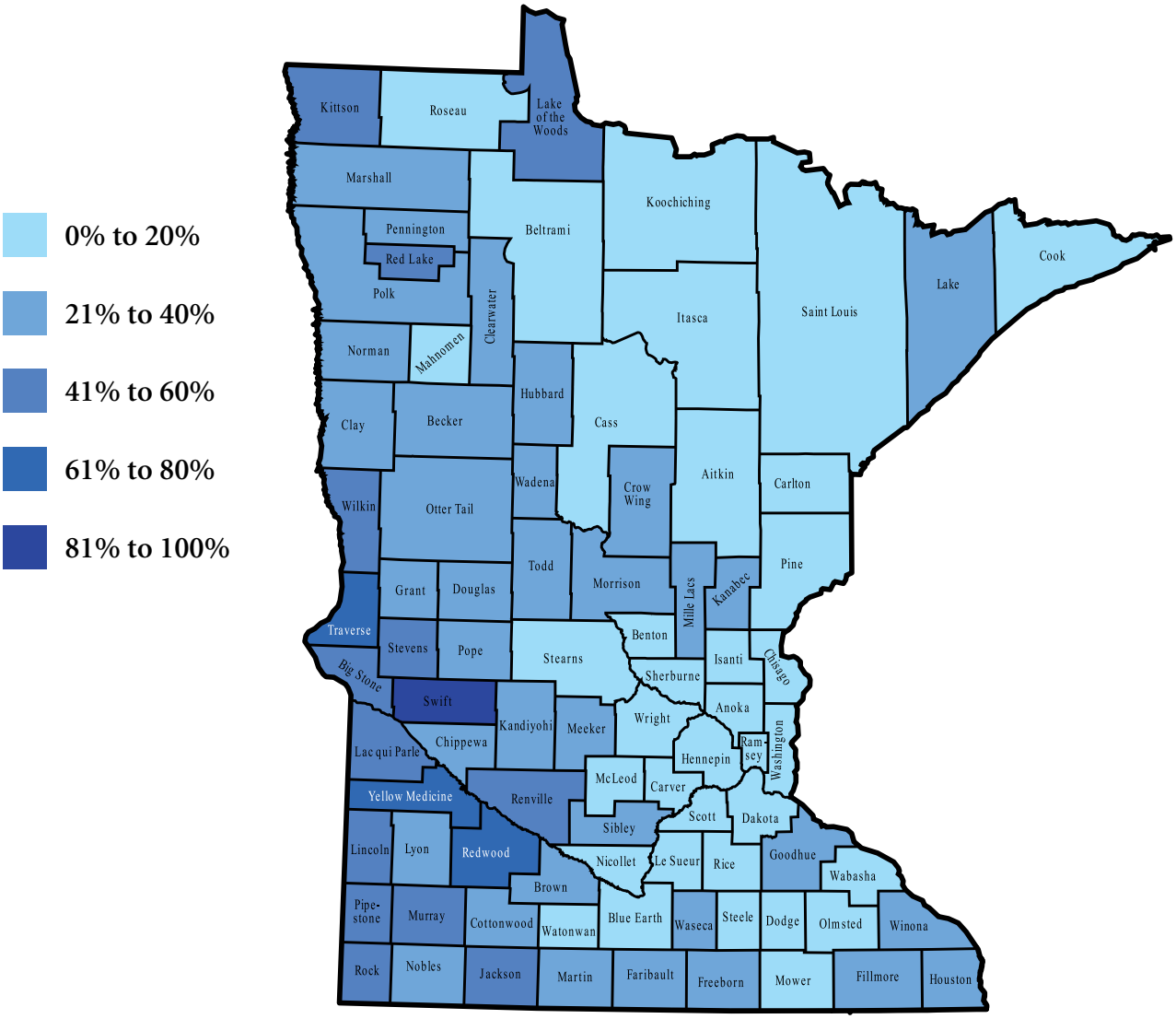


Source: Bureau of Economic Analysis

b. Per Capita Incomes

Per capita incomes remain much higher in Hennepin and Carver counties than elsewhere. However, incomes are catching up across Minnesota, as Figure 21 shows. The most substantial gains have occurred in the agricultural southwest portion of Minnesota. By contrast, growth has been lower in the urban counties, which already had high levels, and those towards the northeast of the state, where they were lower.

Figure 21: Change in Real Personal Income Per Capita, 2000-2015



Source: Bureau of Economic Analysis

c. Gross Domestic Product

Over the period from 2001 to 2016, Mankato and Rochester show the strongest growth in real GDP among Minnesota's MSAs. As Table 1 shows, Rochester's GDP grew by 35.5 percent, behind Mankato's at 45.1 percent. In contrast, the Twin Cities area GDP grew by 23.1 percent.

Though growth might be strongest in Rochester and Mankato, only the latter breaks into the top ten when compared with the thirty MSAs in Minnesota and bordering states. Fargo and Bismarck, North Dakota, take the top two spots. Notably, three of the top ten cities are located in Iowa.

Table 1: GDP by MSAs in Minnesota and Bordering States

Rank	Area	2001	2016	% growth, 2001-2016
1	Fargo, ND-MN	$7,799	$13,534	73.5
2	Bismarck, ND	$3,977	$6,890	73.2
3	Sioux Falls, SD	$9,493	$15,768	66.1
4	Des Moines-West Des Moines, IA	$28,118	$43,873	56.0
5	Mankato-North Mankato, MN	$3,357	$4,871	45.1
6	Cedar Rapids, IA	$10,967	$15,839	44.4
7	Eau Claire, WI	$5,077	$7,325	44.3
8	Madison, WI	$29,854	$42,029	40.8
9	Grand Forks, ND-MN	$3,333	$4,612	38.4
10	Dubuque, IA	$3,500	$4,827	37.9
11	Iowa City, IA	$6,330	$8,661	36.8
12	Ames, IA	$3,193	$4,358	36.5
13	Rochester, MN	$8,051	$10,910	35.5
14	Wausau, WI	$5,167	$6,764	30.9
15	St. Cloud, MN	$6,815	$8,749	28.4
16	Waterloo-Cedar Falls, IA	$6,206	$7,936	27.9
17	La Crosse-Onalaska, WI-MN	$5,005	$6,321	26.3
18	Oshkosh-Neenah, WI	$7,191	$9,060	26.0
19	Minneapolis-St. Paul-Bloomington, MN-WI	$176,780	$217,566	23.1
20	Fond du Lac, WI	$3,474	$4,183	20.4
21	Appleton, WI	$9,137	$10,943	19.8
22	Rapid City, SD	$4,716	$5,637	19.5
23	Green Bay, WI	$13,712	$16,321	19.0
24	Sioux City, IA-NE-SD	$7,117	$8,290	16.5
25	Duluth, MN-WI	$9,681	$11,117	14.8
26	Milwaukee-Waukesha-West Allis, WI	$77,852	$89,155	14.5
27	Janesville-Beloit, WI	$4,908	$5,617	14.4
28	Davenport-Moline-Rock Island, IA-IL	$15,319	$16,765	9.4
29	Sheboygan, WI	$4,925	$5,326	8.1
30	Racine, WI	$7,130	$6,799	-4.6

Source: Bureau of Economic Analysis (millions of 2009 dollars)

III. THE PROSPECTS FOR ECONOMIC GROWTH IN MINNESOTA ARE MIXED

Parts I and II of this report looked at Minnesota's economic performance in recent years up to the present day. What might the future hold? What matters for Minnesotans is per capita or *per person* economic growth. If the number of Minnesotans increases by 50 percent and state GDP also increases by 50 percent, then the average person is no better off. With this in mind, here we identify the sources of per capita income growth and look at indicators and prospects for Minnesota.

1. SOURCES OF PER CAPITA INCOME GROWTH

There are three sources of per capita GDP growth: an increase in the Labor Force Participation rate; a rise in capital per worker; and higher Total Factor Productivity.[13]

Older economic growth theories held that there were constant returns to scale. This means that any increase of labor or capital will increase the rate of growth.[14] Subsequent theories held that there were, beyond a point, diminishing returns. In this case, the addition of an extra unit of labor or capital would increase output, but by less than the addition of the previous unit. According to this theory, increases in long run economic growth came from improvements in technology which were driven by factors, such as innovation, which were determined outside the model.[15]

Still more modern, are theories of increasing returns to scale. This theory states that knowledge and entrepreneurship are key for economic growth in the long run. These economists argue that policymakers can have some influence on this and on technological improvements through education and research and development spending. As a result, with these factors being determined inside the model they are known as endogenous growth theories.[16] The two key factors, technological change and productivity, are what make up Total Factor Productivity. Theory and evidence have shown that this is the main driver of long-run growth.[17]

---

[13] David Weil, Economic Growth (Prentice Hall, New Jersey), 2004.

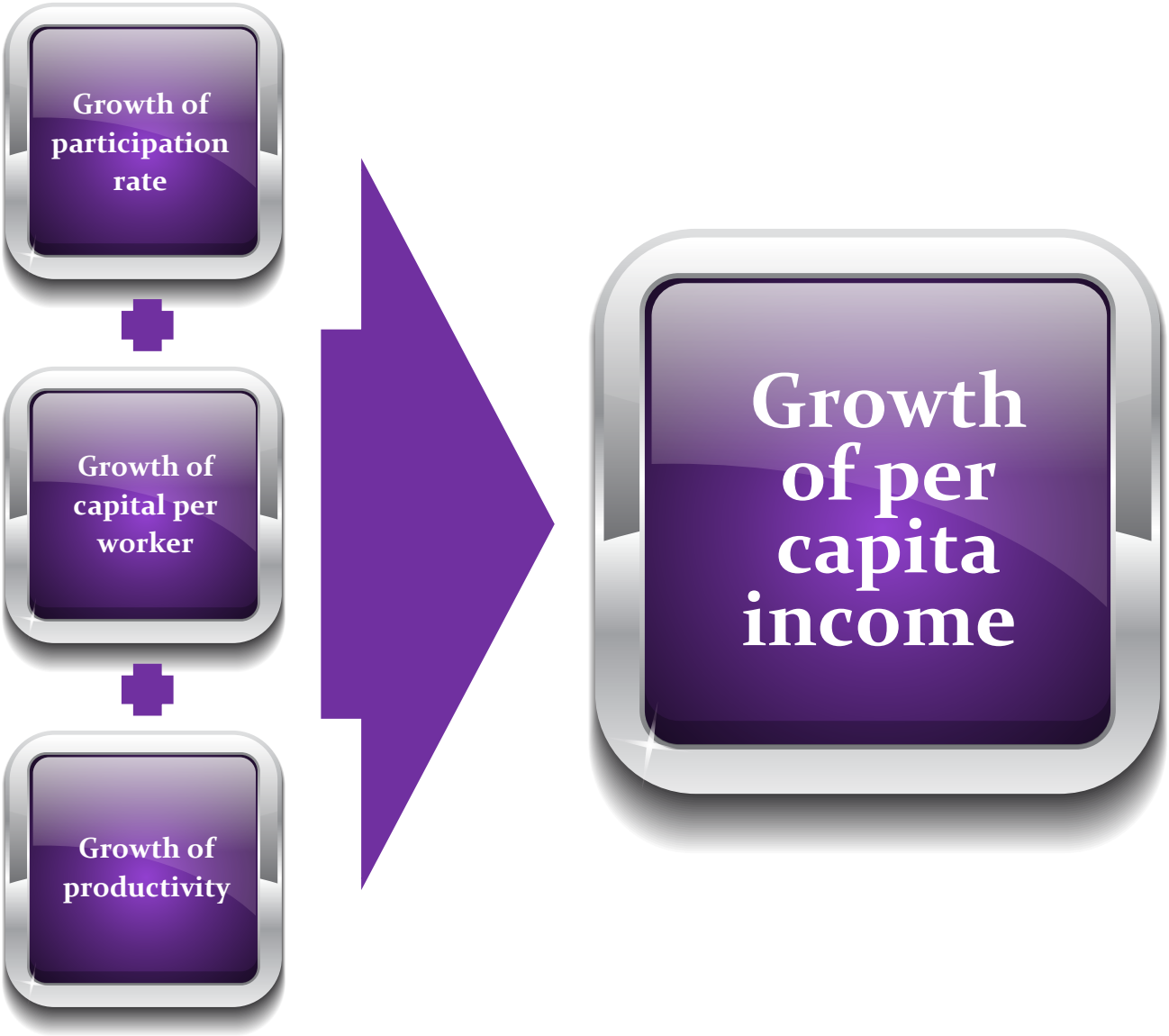
[14] Roy F. Harrod, "An Essay in Dynamic Theory," *The Economic Journal*, Vol. 49, No. 193, 1939. pp. 14-33 and Evsey Domar, "Capital Expansion, Rate of Growth, and Employment," *Econometrica*, Vol. 14, No. 2, 1946. pp. 137-147.

[15] Robert M. Solow, "A contribution to the theory of economic growth," *Quarterly Journal of Economics*, Vol. 70, No. 1, 1956. pp. 65-94.

[16] Paul Romer, "The Origins of Endogenous Growth," *The Journal of Economic Perspectives*, Vol. 8, No. 1, 1994. pp. 3-22 and David Warsh, Knowledge and the Wealth of Nations: A story of economic discovery (W.W. Norton & Company, New York), 2006.

[17] YiLi Chien, What Drives Long-Run Economic Growth? available at https://www.stlouisfed.org/on-the-economy/2015/june/what-drives-long-run-economic-growth (accessed August 2, 2017).

Figure 22: The Sources of Per Capita GDP Growth



Source: Louis D. Johnston, How Can Minnesota Stay Above Average?

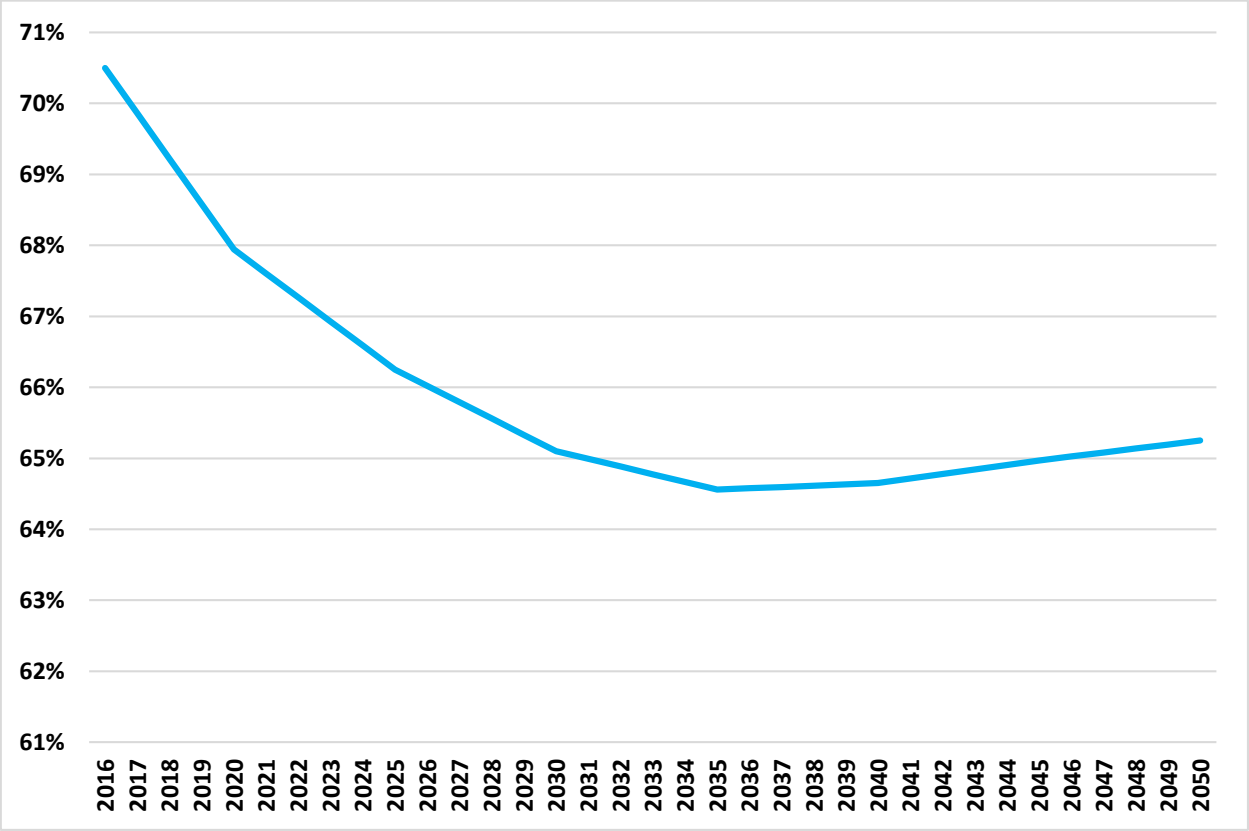
a. Minnesota's Labor Force Participation Rate

The labor force participation rate is the percentage of the population that is either employed or unemployed and actively seeking work.

GDP per capita is defined as total GDP divided by the number of people in the state. If more of those people are working then there is more GDP to divide among them. As a result, a higher Labor Force Participation Rate can drive greater per capita GDP.

The outlook here is not good, as Figure 23 shows. The decline in Labor Force Participation shown in Figure 15 has been driven largely by the retirement of Baby Boomers, those born between 1946 and 1964. As this trend continues, the Participation Rate will continue to decline. The Minnesota State Demographic Center projects that the Labor Force Participation rate will fall to 64.6 percent in 2035, as shown in Figure 23.[18]

Figure 23: Minnesota's Labor Force Participation Rate, 2016-2050



Source: Minnesota State Demographic Center

Labor Force Productivity

Minnesota's dwindling share of workers will be able to generate the wealth to maintain growth and sustain retirees only if they become more productive. As we saw in Section I, there is scope for this in Minnesota. In the next two sections, we look at ways productivity might be improved with increased capital per worker and improved Total Factor Productivity (TFP). But here we can say a few words about the prospects for the average Minnesota worker's productivity.

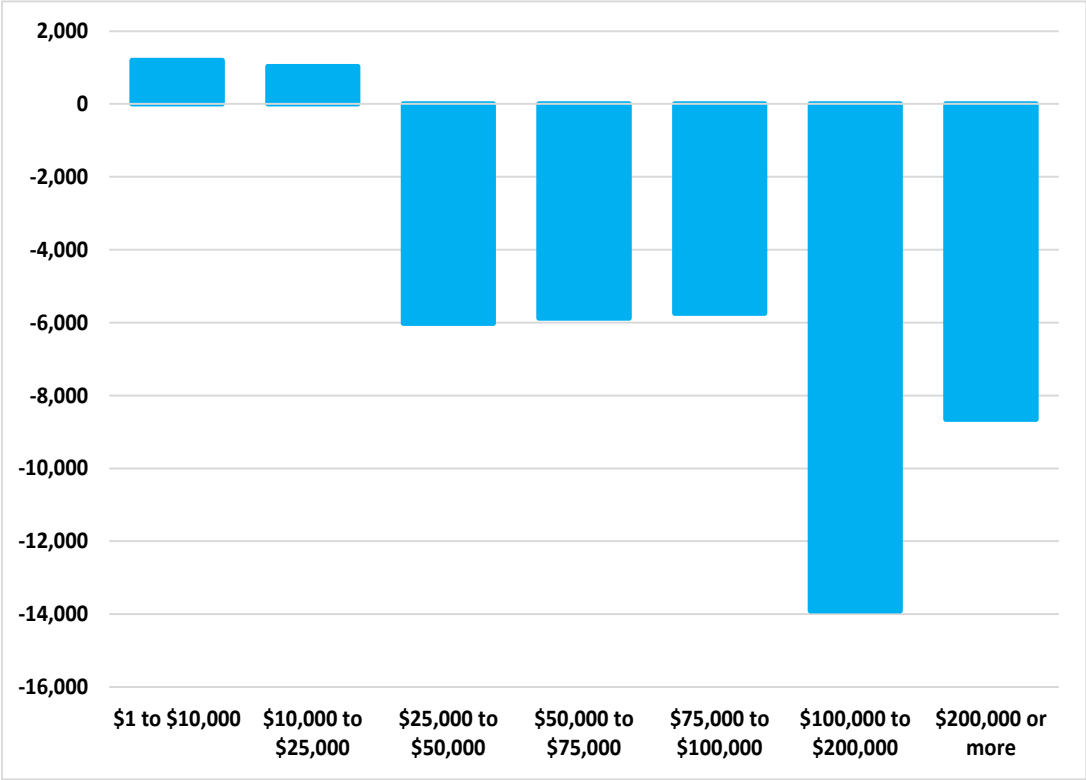
Minnesota's Brain Drain

Minnesota's per worker productivity will suffer if more productive workers move out of the state and less productive workers move in. There is evidence to show that this is currently happening. Using income as a proxy for productivity, Figure 24 shows that Minnesota attracts low-income residents and loses higher-in-

[18] MN State Demographic Center, In the shadow of the Boomers: Minnesota's labor force outlook (MN State Demographic Center, St. Paul), 2013.

come ones. Furthermore, these losses are not limited to the so-called "rich" who might be fleeing the state's high top rate of tax. Between 2011 and 2015, Minnesota saw a net outflow of people earning more than a modest $25,000 annually.

Figure 24: Net Flow of Taxpayers and Dependents to Minnesota by Income of Primary Taxpayer, 2011-2015



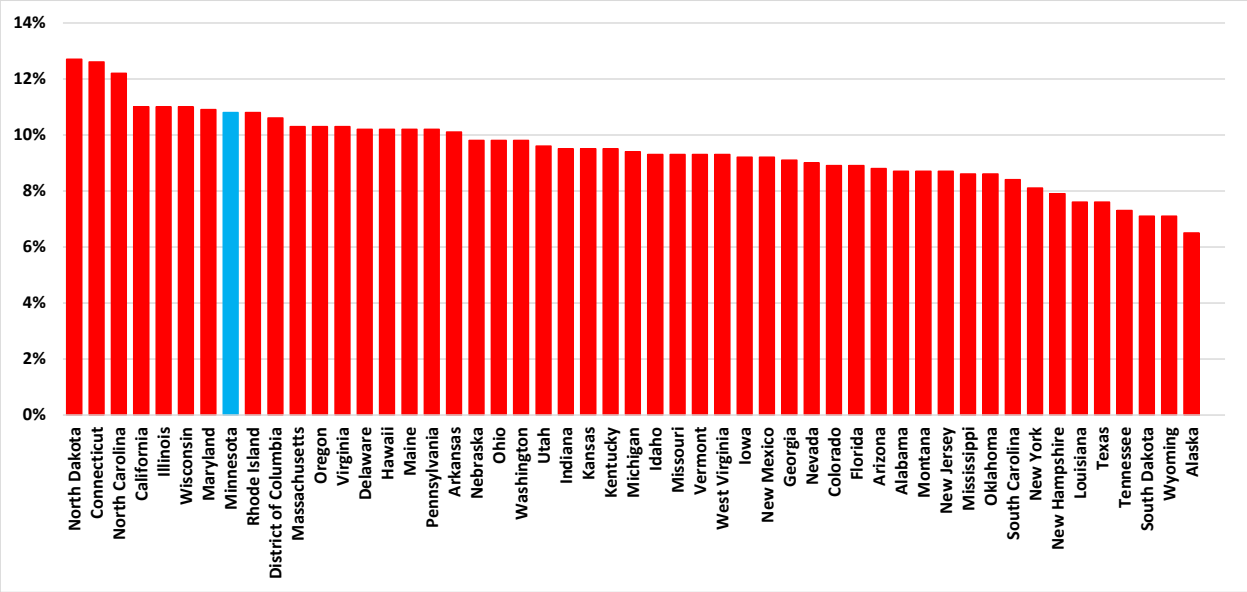
Source: Internal Revenue Service, Statistics Income Division, U.S. Population Migration Data

There is evidence that Minnesota's high personal tax rates are a factor in these movements.[19] As a share of personal income, state-local taxes are higher in Minnesota than in all but seven other states, as Figure 25

[19] Peter J. Nelson, Minnesotans on the Move to Lower Tax States 2016 (Center of the American Experiment, Minneapolis), 2016, and Peter J. Nelson, Do Minnesotans Move to Escape the Estate Tax? (Center of the American Experiment, Minneapolis), 2016. For more general evidence on the impact of taxes on interstate migration see Roger Cohen, Andrew Lai and Charles Steindel, "State Income Taxes and Interstate Migration," *Business Economics*, Volume 49, Issue 3, July 2014. pp. 176-190, Enrico Moretti and Daniel Wilson, "The Effect of State Taxes on the Geographical Location of Top Earners: Evidence from Star Scientists," Federal Reserve Bank of San Francisco Working Paper, No. 215-06, March 2017.

shows. Minnesota is one of the 43 states to have its own income tax, but the top rate—9.850 percent on incomes over $156,911—is higher than anywhere else apart from California, Maine, and Oregon. Equally significant, perhaps, is the fact that Minnesota's lowest income tax rate of 5.35 percent is higher than the highest tax bracket in 23 states.

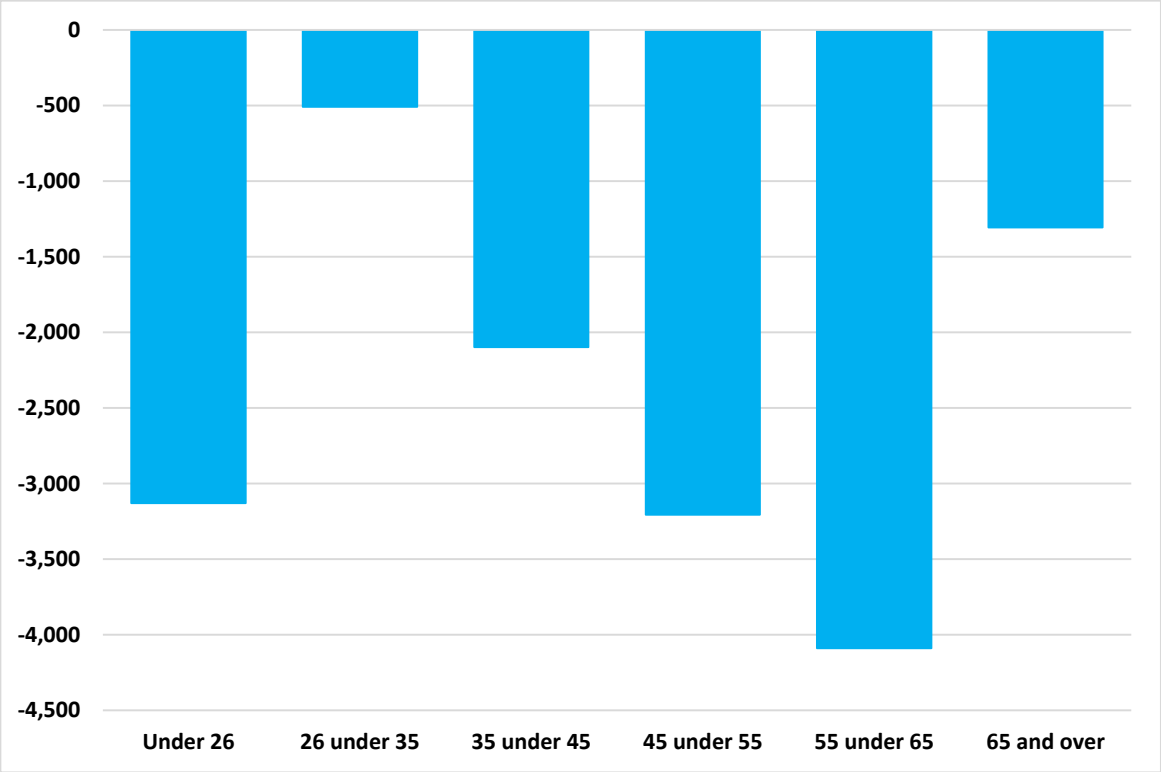
Figure 25: State-Local Tax Burdens per Capita as a Percentage of Income



Source: The Tax Foundation

A common misconception is that this out-migration is primarily accounted for by "snow birds," older Minnesotans leaving the state for friendlier climates. This is not the case. As Figure 26 shows, between 2011 and 2015 Minnesota lost residents in every age group. Those less than 26 years old made up a large share of the loss. People aged 45 to 54—people in the prime of their working lives—also made up a substantial share of the loss.

Figure 26: Net Flow of Taxpayers and Dependents to Minnesota by Age of Primary Taxpayer, 2011-2015



Source: Internal Revenue Service, Statistics Income Division, U.S. Population Migration Data

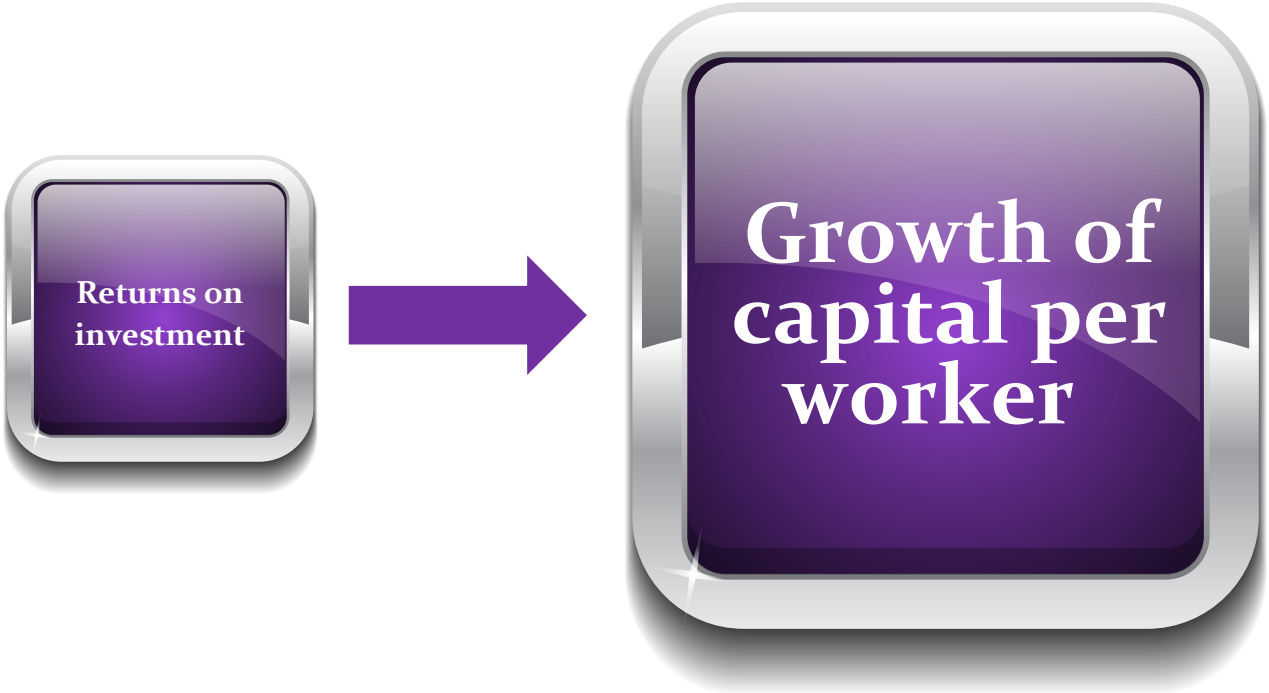
b. Capital per Worker

Capital per worker refers to the amount of capital each worker has to work with.

Increasing capital per worker makes workers more productive, until the point where diminishing returns set in. By enabling workers to produce more, it raises wages and GDP per capita. Growth in the capital available to Minnesota's workers will be driven by the amount of investment capital business owners have access to. This will move with the expected after-tax rate of return on investment, which is a measure of the flow of income generated by an investment in the stock of capital. It is primarily affected by tax rates.[20] Evidence indicates that corporate income taxes have a large negative effect on aggregate investment and entrepreneurial activity.[21]

[20] Along with the growth rate of TFP, discussed below. See Congressional Budget Office, The 2017 Long-Term Budget Outlook (Congressional Budget Office, Washington D.C.) March 2017.
[21] Djankov et al, "The Effect of Corporate Taxes on Investment and Entrepreneurship," National Bureau of Economic Research working paper, No. 13756, 2008.

Figure 27: Sources of Growth in Capital per Worker

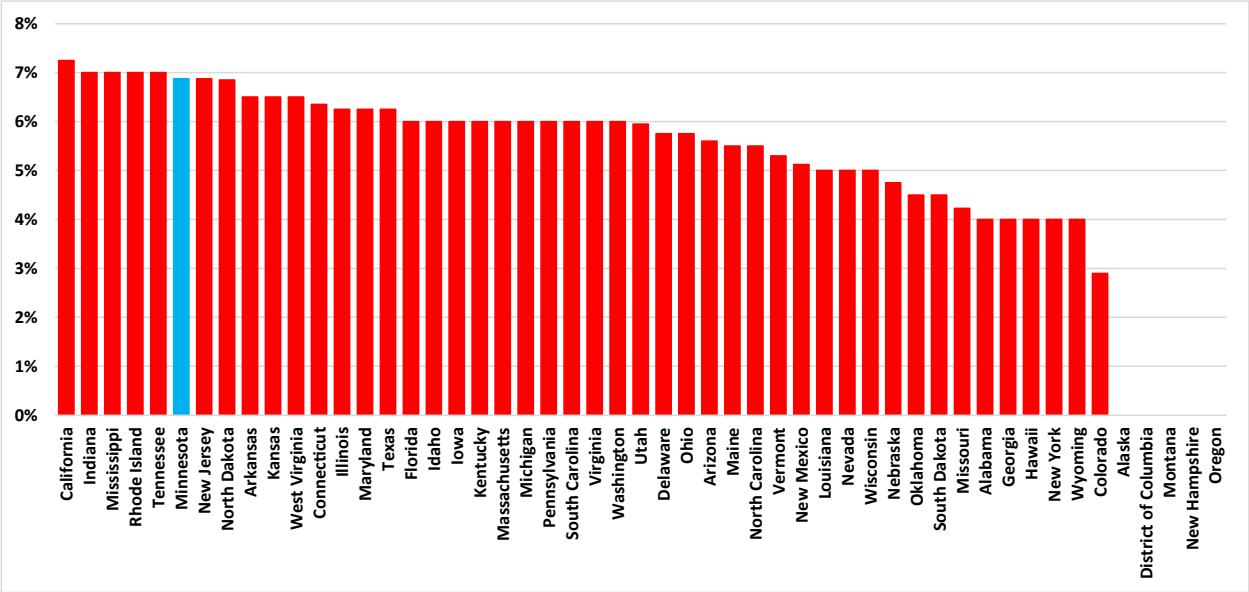


Taxation in Minnesota

Minnesota's taxes are not conducive to capital investment.

The Tax Foundation ranks Minnesota 46th out of the 50 states for its business tax climate. Minnesota imposes a deduction schedule for natural resource depletion on top of the federal one, and is one of only eight states to have an Alternative Minimum Tax on corporations. These add another layer of compliance difficulties beyond the federal. Furthermore, as Figure 28 shows, while we exempt items like food and clothing, we have the eighth highest state sales tax in the country.

Figure 28: State Sales Tax Rates

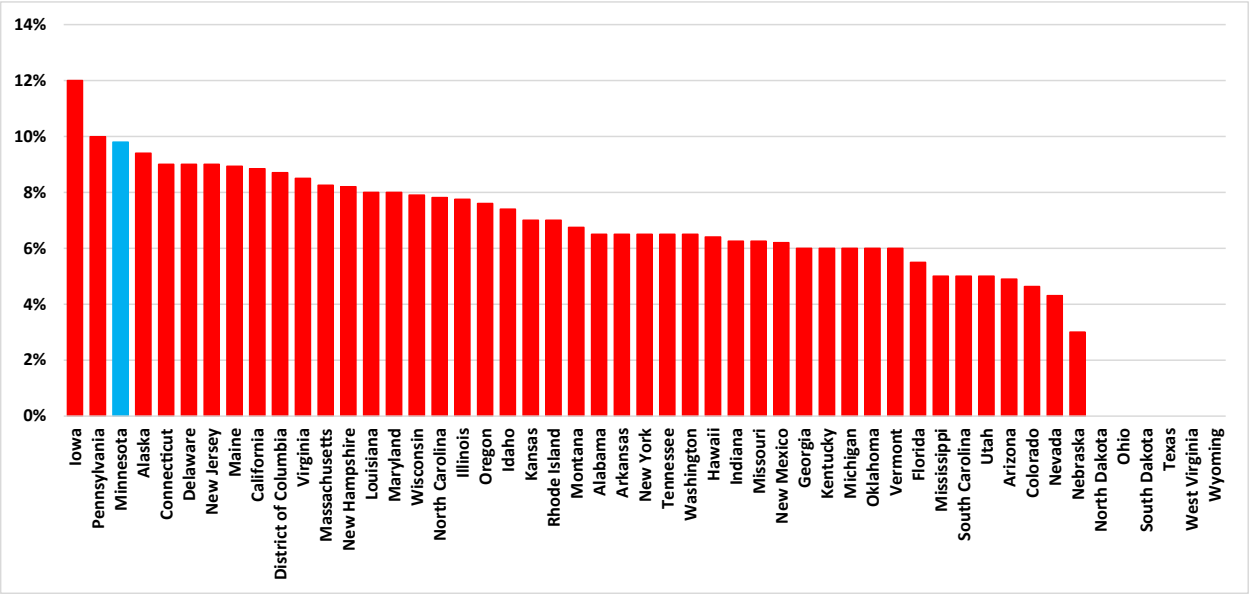


Source: The Tax Foundation's State Business Tax Climate Index

More importantly perhaps, Minnesota's top rate of Corporate Income Tax is 9.8 percent. As Figure 29 shows, this is the third highest in the U.S. Only Iowa (12 percent) and Pennsylvania (9.99 percent) have higher rates. Evidence shows that corporate income tax rates are a big influence in foreign investment decisions. [22]

[22] See James R. Hines Jr, "Altered States: Taxes and the Location of Foreign Direct Investment in America," National Bureau of Economic Research working paper, No. 4397, 1993.

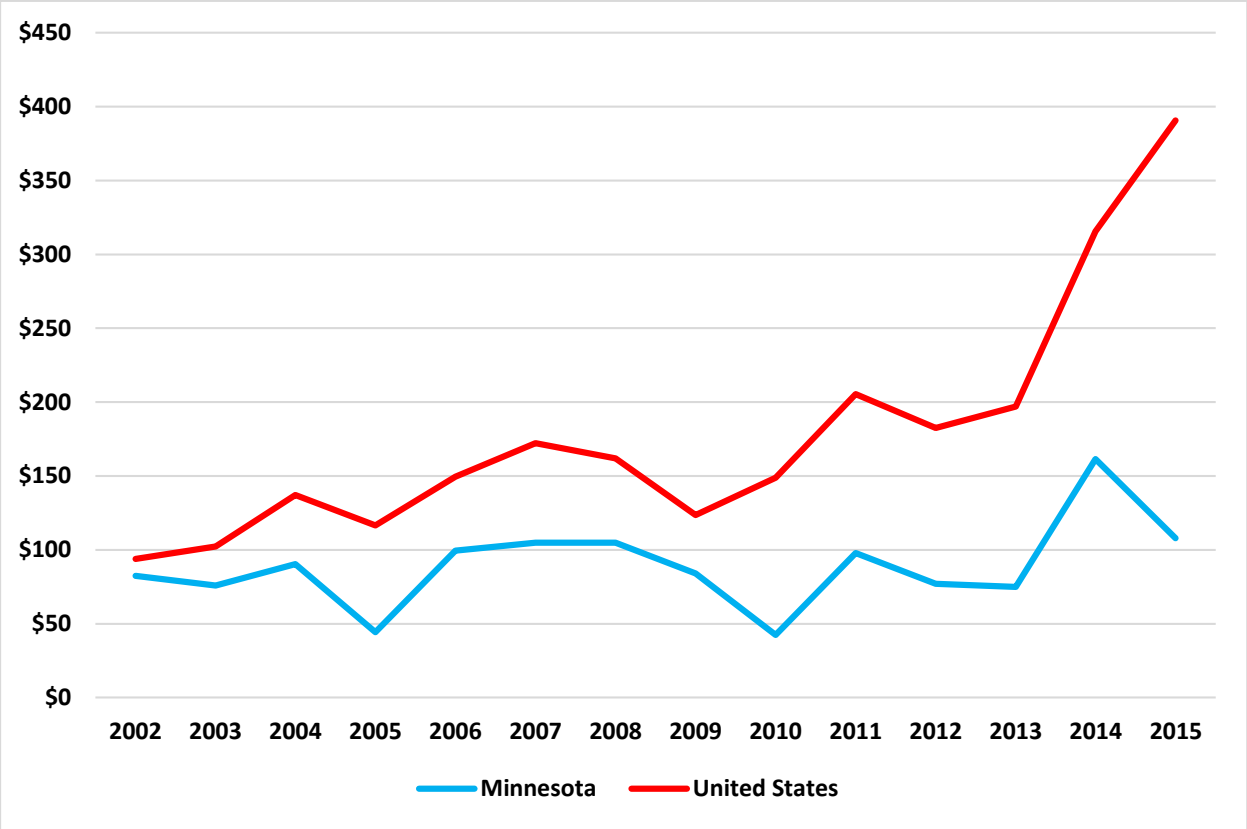
Figure 29: Top Rates of Corporate Income Tax



Source: The Tax Foundation's State Business Tax Climate Index

Countries increasingly have to compete on a global level for investment capital. Added to the federal Corporate Tax rate of 35 percent—one of the highest in the developed world—Minnesota has one of the highest rates of corporate taxation of any advanced economy. The state's relatively uncompetitive position can be seen in its poor recent record in attracting venture capital, shown in Figure 30. In 2015, the average American worker had $391 of venture capital behind him or her. In Minnesota, the figure was just $108.

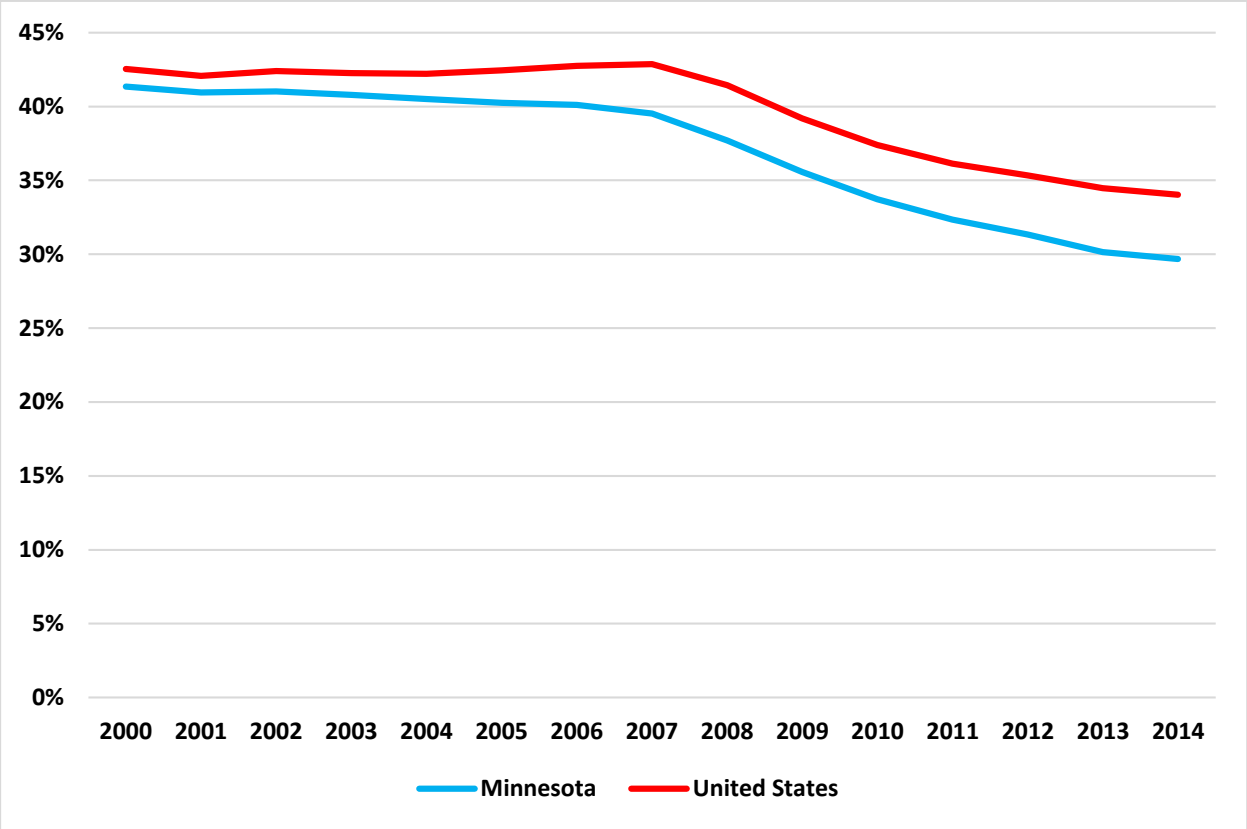
Figure 30: Venture Capital per Worker, 2002-2015



Source: PwC/NVAC Money Tree Report, Bureau of Economic Analysis

In turn, the effects of this lack of venture capital can be seen in Minnesota's relatively poor record on new business creation. Figure 31 shows the share of new and young businesses (those aged 0 through 5 years) for Minnesota and the U.S. These businesses are of vital economic importance. They create the majority of new jobs and the small companies of today are the big companies of tomorrow. In 2000, new and young businesses as a share of all businesses were 41 percent in Minnesota and 43 percent nationally. By 2014, that number had fallen nationally to 34 percent but in Minnesota to 30 percent.

Figure 31: New and Young Businesses as a Share of All Businesses, 2000-2014



Source: Census Bureau

c. Total Factor Productivity

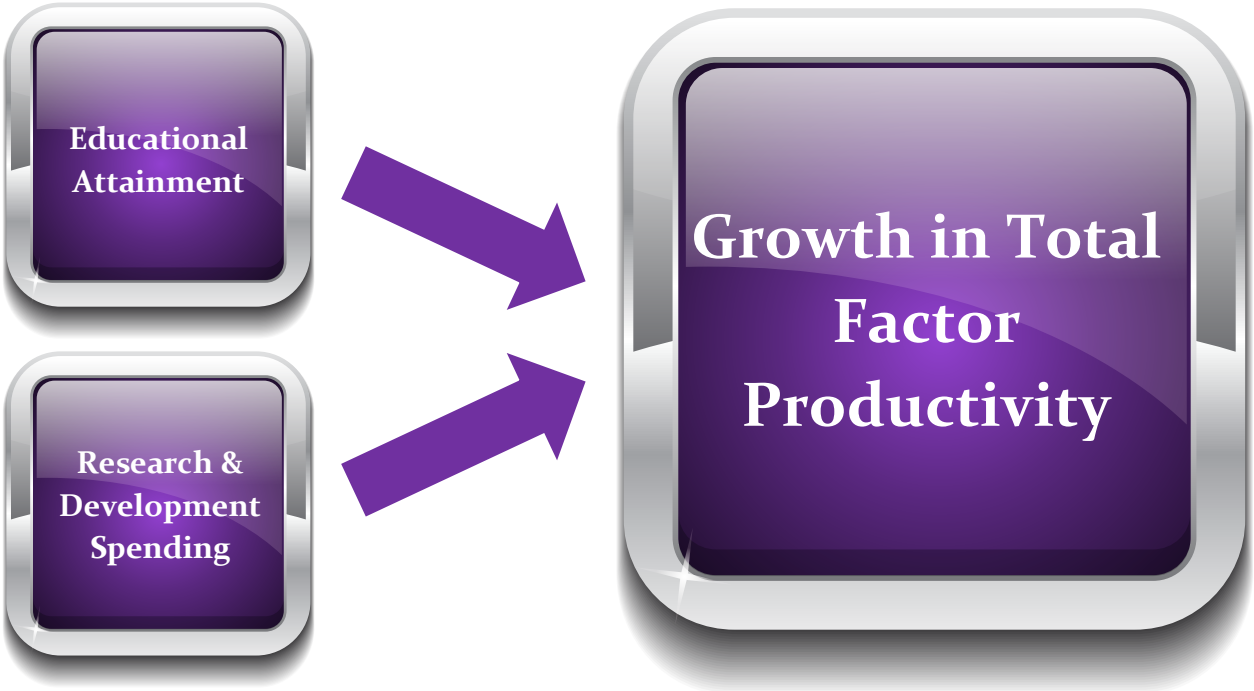
The third source of per capita GDP growth is an increase in Total Factor Productivity. This is a measure of technological improvement and productivity.

The first, technological improvement, simply refers to the improvement in the quality of capital, rather than its quantity (which is discussed above). A farm's workers, for example, might initially become more productive if they were given more tractors. But, if they had more than one tractor each or too many to operate usefully on the farm's land, then any further increase in the number of tractors would bring diminishing returns. By contrast, the adoption of new technology, such as enhancement of seed planting efficiency, will raise productivity by raising the quality of technology.

The second refers to the skill with which inputs such as land, labor, and capital are combined. It might be termed entrepreneurship. An example here would be Henry Ford's pioneering of the production line technique which enabled his workforce to produce a vastly greater quantity of motor cars.

Research shows that U.S. states with better educational attainment and greater investment in research and development see faster growth in TFP.[23]

Figure 32: Sources of Growth in Total Factor Productivity



Education in Minnesota

Education can play an important economic role.

First, we can think of the workforce in the same way we think of our capital stock. Increasing the investment in our stock of human capital can yield rewards just as can investments in physical capital.[24]

---

[23] Roberto Cardarelli and Lusine Lusinyan, "U.S. Total Factor Productivity Slowdown: Evidence from the U.S. States," IMF Working Paper 15/116, 2015. The paper uses average years of schooling as proxy for "educational attainment." This, however, is a measure of an input—time in school—when "educational attainment" is an output—test scores, for example. For that reason, our analysis looks at educational attainment directly using measures of academic performance.

[24] Gary S. Becker, Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education (University of Chicago Press, Chicago), 1993.

Minnesota's educational system has long been one of its economic trump cards. Table 2 shows comparisons of the state's educational attainment with the national average. Minnesota compares favorably on a range of educational outcomes, though the mediocre performance on AP test scores should be noted. Overall, if a focus on academic excellence and these standards can be maintained, education will continue to boost the state's economic future.

Table 2: Minnesota's Education Achievement Indicators

National Assessment of Educational Progress	State average	Rank	National Average
8th grade math	47.80 percent	2	32.1 percent
8th grade reading	39.70 percent	6	32.7 percent
Achievement Gains			
8th grade math	+3.5 percent	30	+5.2 percent
8th grade reading	+2.5 percent	25	+2.7 percent
Poverty Gap			
Reading gap	31.2 percent	45	27.5 percent
Math gap	29.8 percent	41	27.8 percent
Achieving Excellence			
Math excellence	13.3 percent	3	7.8 percent
High School Graduation			
Graduation rate	88.0 percent	7	81.0 percent
Advanced Placement			
High AP test scores	29.1 percent	17	29.3 percent
GRADE	C	6	C-

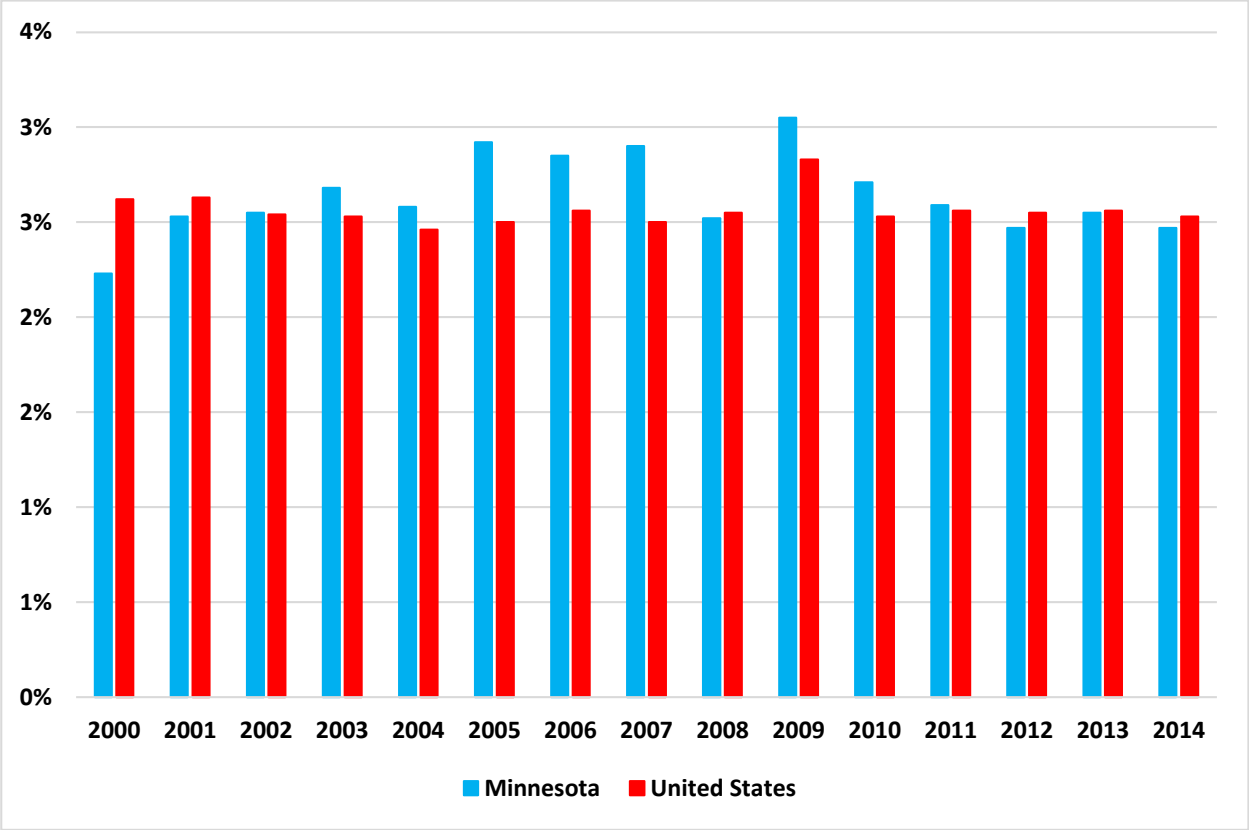
Source: Education Week Research Center

Research and Development Spending in Minnesota

Broadly speaking, if education can be seen as improving the quality of human capital, research and development (R&D) can be seen as improving the quality of physical capital.

Figure 33 shows the R&D intensity for Minnesota and the national average. This is the ratio of total R&D performed in a state to its state GDP. It may come as a surprise to Minnesotans who are apt to think of their state as a technology leader, but the state currently lags the national average on this measure of R&D spending. Between 2003 and 2011, as a share of GDP, Minnesota devoted more resources to R&D than the national average. But since 2012, our state has lagged the nation. In 2014 the figure for the U.S. was 2.53 percent, in Minnesota it was 2.47 percent.

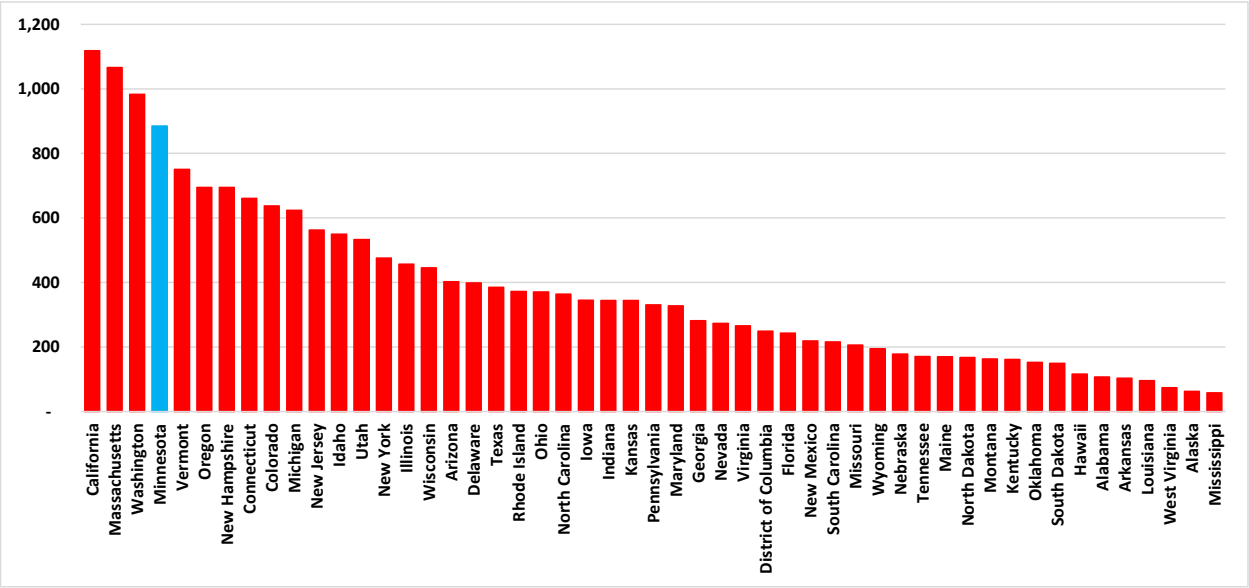
Figure 33: R&D Intensity, 2000-2014



Source: National Science Foundation's National Patterns of R&D Resources

This spending has, however, brought impressive results in terms of patents. As Figure 34 shows, Minnesotans generated 885 patents per million people in 2015, the fourth best in the U.S.

Figure 34: Patents per Million of Population, 2015



Source: U.S. Patent Office, Bureau of Economic Analysis

IV. CONCLUSION – THE STATE OF THE STATE

Our findings for 2017 echo those of 2016.

Overall, the evidence reviewed in sections I and II shows that, so far this century, Minnesota has not been one of the country's stronger economic performers. Over the past 16 years, the state's GDP grew at a rate below the national average. The state's per capita personal income is higher than average, but growth is just average and even this moderate growth is a result of increases in transfer income, not income related to productive activities. Minnesota ranks in the bottom half of states with respect to both income growth and job growth. A high median household income and a low unemployment rate are positive factors. Yet, as discussed, these apparent strengths do not necessarily reflect superior overall economic performance by Minnesota. The state's economy is not in the doldrums, but the sum of these measures points to average economic performance at best. Mediocre continues to be an apt label, considering the many advantages Minnesota still possesses that should produce stronger growth.

Looking to the future, Minnesota will face economic challenges. The state's relatively well educated workforce will be a definite asset if academic standards are maintained. But Minnesota also faces some headwinds that could hinder future growth. As Baby Boomers retire, the state's labor force will shrink, providing a drag on growth for perhaps the next two decades. An increasing share of seniors will need workers in productive jobs to support them and the growing number of workers who will be required in low productivity sectors such as personal healthcare services. Yet, the high rate of corporate tax will deter the investment needed to make workers more productive. And Minnesota lags the rest of the nation in Research & Development spending.

Minnesota retains some historic advantages, but prosperity should not be taken for granted. Minnesotans and their policymakers will have to make their state more competitive to assure Minnesota's future prosperity. ■

CENTER OF THE AMERICAN EXPERIMENT
Minnesota's Think Tank

8421 Wayzata Boulevard ★ Suite 110
Golden Valley, MN 55426

AmericanExperiment.org

NON-PROFIT ORG
U.S. POSTAGE
PAID
TWIN CITIES, MN
PERMIT NO. 4546

To obtain copies of American Experiment's recent reports—Steven F. Hayward and Peter Nelson's "Energy Policy in Minnesota: The High Cost of Failure", Amanda L. Griffith's "No Four-Year Degree Required: A look at a selection of in-demand careers in Minnesota," and Randall O'Toole's "Twin Cities Traffic Congestion: It's No Accident," or to subscribe to the Center's free quarterly magazine, *Thinking Minnesota*, email Peter Zeller at Peter.Zeller@AmericanExperiment.org, or call (612) 338-3605.