

WEST VIRGINIA ECONOMIC OUTLOOK

2015

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2015

WEST VIRGINIA ECONOMIC OUTLOOK

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GREETINGS!

I am happy to present the *2015 West Virginia Economic Outlook* to you. My intent is for this document to serve as a thorough and rigorous reference for where our state's economy is today and where it is likely heading in coming years. And my sincere hope is that you will find this document useful as you lead your business, government agency, or community organization through the economic opportunities and challenges we face in West Virginia.

Since the 1940s, our mission here at the Bureau of Business & Economic Research, a unit within WVU's College of Business & Economics, has been to serve the people of West Virginia by providing you, the state's business, policymaking, and advocacy communities, with reliable and timely data as well as rigorous applied economic analysis. We hope that the data and analysis we provide ultimately enables you to design and implement better business practices and public policies.

Our research is sponsored by public- and private-sector clients throughout West Virginia and nationally. For instance, our recent public-sector clients include the West Virginia Legislature, the West Virginia Department of Revenue, the West Virginia Higher Education Policy Commission, the American Cancer Society, and the Appalachian Regional Commission. We have also been engaged by several private-sector companies in the state.

Please feel free to call on me personally anytime concerning your economic research needs. We are always interested in pursuing new opportunities to provide research and data in areas such as public policy analysis, health economics, energy economics, economic development, economic impact analysis, economic forecasting, tourism and leisure economics, and education policy, among others.

To learn more about our research, to find contact information for myself or any of our staff, or to find an electronic version of this document, please visit our website at bber.wvu.edu.

Sincerely,

John Deskins

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EXECUTIVE SUMMARY

West Virginia's economy saw mixed results in 2013. The state lost jobs more than 2,600 jobs during the year, but enjoyed a strong increase in economic output. Recent months have produced some encouraging economic news, and the current economic situation points to a return to job growth, as well as continued improvement in output and income over the near term. Overall, we expect that employment growth, income growth, and the unemployment rate to be stronger in the coming five years, compared to what we have observed over the past decade. However, we expect that the state will lag the nation in terms of employment, income, and population growth over the next five years.

Highlights of this report related to the West Virginia's recent economic performance are as follows:

- After consistent job growth from 2010 through mid-2012, **the state lost jobs from mid-2012 through 2013**. On a more positive note, however, more recent preliminary data do indicate an uptick in job growth.
- **The natural resources and mining sector has been volatile**. Significant job losses have occurred in the coal mining and mining support services industries, while the state's oil and gas producers have added jobs. However, the job gains in oil and natural gas have not been enough to offset the losses in coal.
- **Unemployment in West Virginia continued to fall through most of 2013**, although the state has experienced a slight rise in unemployment in recent months. The unemployment rate in West Virginia is near its lowest level in around five years.
- **Only 54 percent of West Virginia's adult population is either working or looking for work**. This labor force participation rate of 54 percent places West Virginia lowest among the 50 states and represent a significant hurdle if West Virginia is ever to achieve a level of income per capita that is on par with the nation.
- **Per capita personal income in West Virginia grew at a diminished pace in 2013, rising to approximately \$35,600**. The state has generally enjoyed stronger growth over the past five years compared to the rest of the nation. However, despite this growth, per capita personal income in the state still ranks low overall, surpassing only three other states.
- **Overall, the state's real GDP expanded 5.1 percent during 2013, noticeably above the national rate**. West Virginia ranked 3rd among all

states in terms of economic output growth during 2013, with most of this growth attributed to rapidly-rising oil and gas production.

FIGURE ES.1: West Virginia and US Forecast Summary

	West Virginia		United States	
	2003-2013	2014-2019	2003-2013	2014-2019
Population (average annual growth, %)	0.2	0.0	0.9	0.8
Employment (average annual growth, %)	0.4	0.9	0.5	1.5
Unemployment Rate (annual average at end of time period, %)	6.5	5.1	7.4	5.2
Real Per Capita Personal Income (average annual growth, %)	1.6	2.3	1.1	2.8

Sources: US Census Bureau; Workforce WV; US Bureau of Labor Statistics; US Bureau of Economic Analysis; WVU BBER Econometric Model; IHS Global Insight

Highlights related to West Virginia's economic outlook are as follows:

- **Employment in West Virginia is estimated to increase 0.9 percent per year through 2019**, compared to an expectation of 1.5 percent for the rest of the nation.
- **Job growth in natural resources and mining is expected to drop off considerably from the pace experienced in the previous decade**, diminishing to a 0.2 percent annual rate.
- Construction is expected to add jobs at the fastest rate going forward, but **service-providing sectors will tend to pace the state's overall performance over the next five years**, led by professional and business services and education and health services.
- **The state's unemployment is expected to remain relatively stable through early 2016**, but will fall later in the outlook period, reaching 5 percent by the end of 2019. However, this decline is attributable to not only job gains, but also demographic trends, since a larger share of the state's workforce will be retiring and exiting the labor force.
- **Per capita personal income is expected to grow at an annual average rate of 2.3 percent over the next five years**, below the national rate of 2.6 percent.

A key bright spot in West Virginia's economy in recent years has been the growth of export markets, although export demand did weaken somewhat in 2013. Consider the following:

- **Exports have grown dramatically in terms of their importance to the West Virginia economy.** In 2000, exports accounted for 5.4 percent of West Virginia's GDP. By 2012, that figure had exploded to 16.3 percent. **Exports have since cooled to account for an equivalent of less than 12 percent of state economic output during 2013.**
- **Changes in export activity from West Virginia since 2008 have been driven primarily by fluctuations in coal exports.**

A key concern for The Mountain State moving forward relates to its key underlying demographics. Consider the following:

- **Population growth has been slow in recent years, and we project the state to lose more than 19,000 residents between 2010 and 2030.** This loss is primarily due to natural population decline in which deaths fall short of births.
- **A positive shock to encourage in-migration is essential to avoid or lessen the severity of natural population decline.**
- **The state's population is significantly older than the nation as a whole,** and will continue to age significantly over the next 15 years or so.
- **The state's population is relatively unhealthy** and ranks at or near the bottom among the 50 states in terms of basic health outcome measures, such as the overall mortality rate.

Economic performance is expected to remain extremely variable across West Virginia's counties. Consider the following:

- While the state overall is expected to lose population in coming years, **16 counties are expected to add residents.** Population gains will be most heavily concentrated in North central West Virginia and the Eastern Panhandle.
- Seven counties are expected to lose jobs in coming years and expected growth rates among the remaining counties vary widely. **The highest rates of job growth tend to be in the North-Central and Northwestern parts of the state.**

We also consider the overall United States economic outlook. The US economy remains below its full economic potential after the 2007-2009 recession, but several encouraging signs provide hope for a stronger US economy moving forward. Highlights of this report related to the US economy are as follows:

- **US real GDP growth is expected to improve to a rate of around 3 percent annual growth in the near future.** This will represent a return to the economy's typical long-run rate of economic growth and an improvement over what the economy has generally enjoyed over the past five years.
- **Employment growth has improved substantially in recent months.** Overall the US has added around 250 jobs during the typical month so far in 2014, representing a significant improvement over growth observed through most of 2009 through 2013. **However, total employment remains several million jobs below the economy's full-employment level.**
- **The US unemployment rate has fallen substantially over the past year stands at its lowest level in over 5 years.** The rate is expected to continue to fall gradually over the next several years.
- **The share of unemployed persons who have been unemployed for 27 weeks or longer remains substantially elevated,** suggesting a long-run structural shift in the nation's unemployment picture.
- **Housing starts have been stagnant over the past year, but are expected to rise substantially over the next two to three years.**
- **Challenges exist that could threaten the positive outlook for the US economy,** including the following: a potential slowdown in the economies of major US trading partners could threaten exports; a high level of US federal government debt; the potential for inflation to destabilize as bank lending and the broader economy improve; and the coming rise in interest rates.

CHAPTER 1: THE UNITED STATES ECONOMY

OVERVIEW

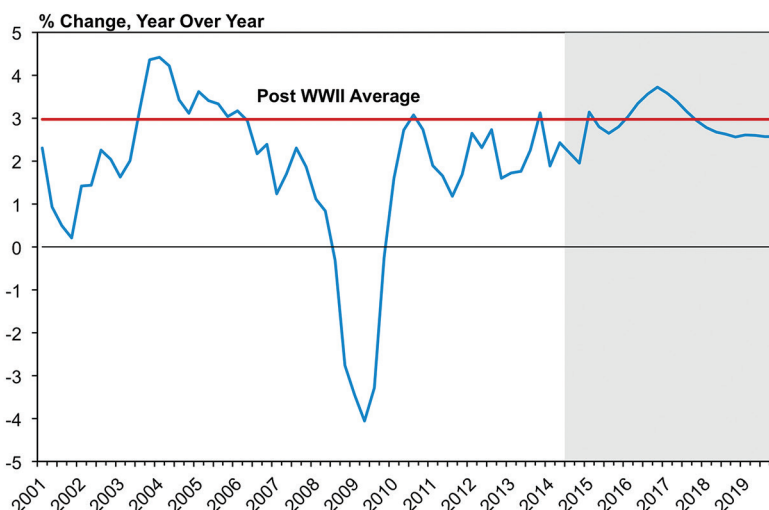
The United States economy remains below its full economic potential despite five years of growth after the recent recession.¹ This recovery, which began in mid-2009, has proven to be the most lethargic, by most measures, of any economic recovery in the post-World War II era in the United States. However, several fundamental encouraging signs of economic growth are apparent—such as a significant rise in employment growth in recent months—that provide hope for a stronger economy moving forward. In this chapter we a) explore recent trends in the United States economy, b) provide a forecast of how the US economy is likely to evolve over the near-term, and c) explore several major challenges that have the potential to threaten the US economic recovery.

RECENT TRENDS AND SHORT-TERM ECONOMIC OUTLOOK

After the United States' total economic output fell by more than 4 percent over the course of the 2007 to 2009 recession, growth has generally fallen below the nation's long-run average during the five years of economic recovery we have experienced. As illustrated in Figure 1.1, economic growth, as measured by Real Gross Domestic Product (GDP), has grown at an average annual rate of only slightly above 2 percent in the recovery period, noticeably below the economy's long-run average. This growth has been slow enough such that, after five years, economic output, and correspondingly employment, still fall short of what is considered to be the economy's sustainable long-run potential. Despite a setback in early-2014, generally stronger growth over the past year, combined with signals gleaned from many leading indicators, suggest an improvement in the near term to an annualized growth rate of around 3 percent in 2014 and over the coming years.

Figure 1.2 shows three of the major elements that comprise US GDP: spending on consumer goods and services, spending on investment goods, and exports. Spending on consumer goods and services, which is by far the largest component of GDP, has shown a great deal of relative stability over recent years, as is typically the case. While growth in consumer spending has fallen short of the rate that prevailed before the recession in recent years, growth is expected to gradually return to a pre-recession norm over the coming few years. Several factors that have suppressed consumer spending in recent years - such as reduction in household debt levels (which leaves less room for consumer goods), weak housing prices, and low consumer confidence - seem to be abating. Despite this expected gradual

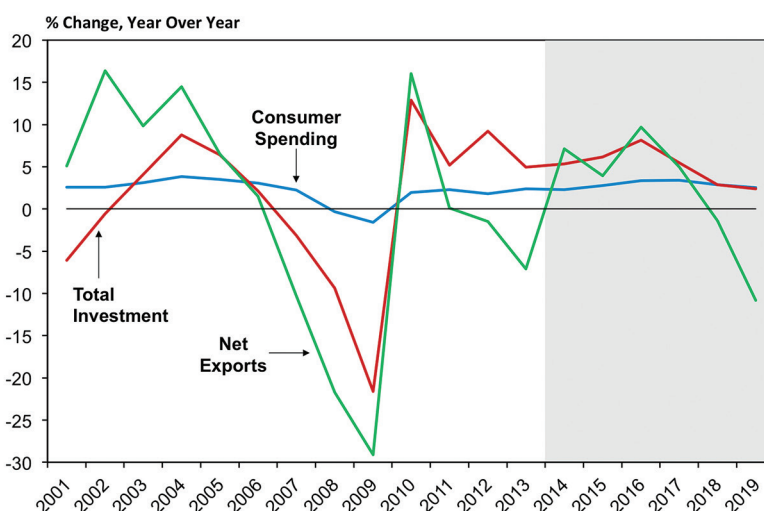
FIGURE 1.1: United States Real GDP Growth



Sources: US Bureau of Economic Analysis; IHS Global Insight

Note: Quarterly GDP data used. Figure is adjusted for inflation, presented here in 2009 \$.

FIGURE 1.2: Growth in Components of United States GDP



Sources: US Bureau of Economic Analysis; IHS Global Insight

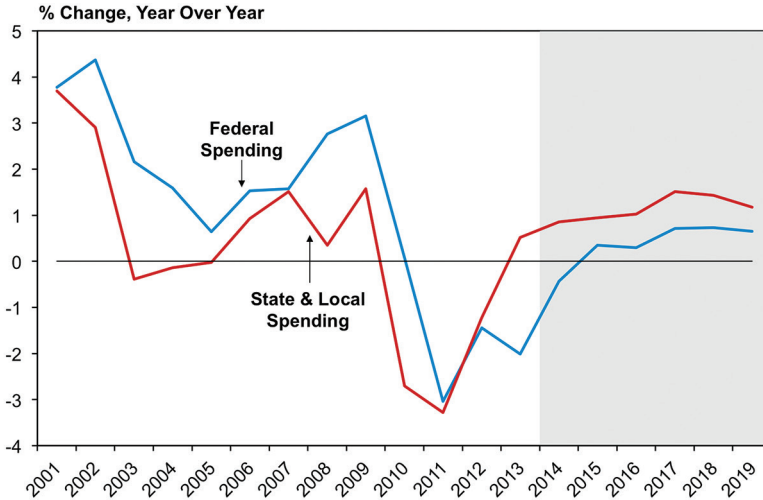
Note: Figure is adjusted for inflation, presented here in 2009 \$.

improvement, however, consumer spending is unlikely to be the driving force behind further economic expansion.

Spending on investment goods—capital goods that will enhance future productivity, such as industrial facilities and equipment—has been far more volatile over the recent business cycle. Total investment spending collapsed at an annualized rate of more than 20 percent at the nadir of the recent recession, then recovered rapidly, growing at a rate of between 5 percent and 8 percent over much of 2010 through 2012. Growth in investment spending diminished somewhat over the

¹ This section represents the authors' review, analysis, interpretation, and summary of information presented in the International Monetary Fund's World Economic Outlook (2014) and IHS Global Insight's US Economic Outlook (2014).

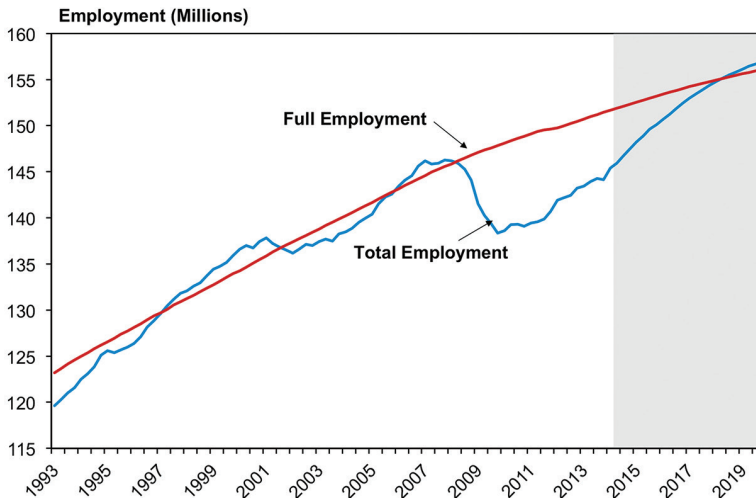
FIGURE 1.3: Growth in United States Government Spending



Sources: US Bureau of Economic Analysis; IHS Global Insight
 Note: Quarterly GDP data used. Figure is adjusted for inflation, presented here in 2009 \$.

past year, perhaps due in part to the expiration of a federal tax investment incentive. This likely contributed to a sharp increase in investment at the end of 2012, thereby shifting that activity away from 2013. Investment activity is expected to return to a growth rate of approximately 6 percent over the coming two to three years and is looked to as a potential source of future economic growth. However, consistent with its volatile nature, capital investment activity is uncertain, and there are potential challenges that raise doubt about whether businesses will enhance their investment activities as expected. We discuss several of these major concerns below.

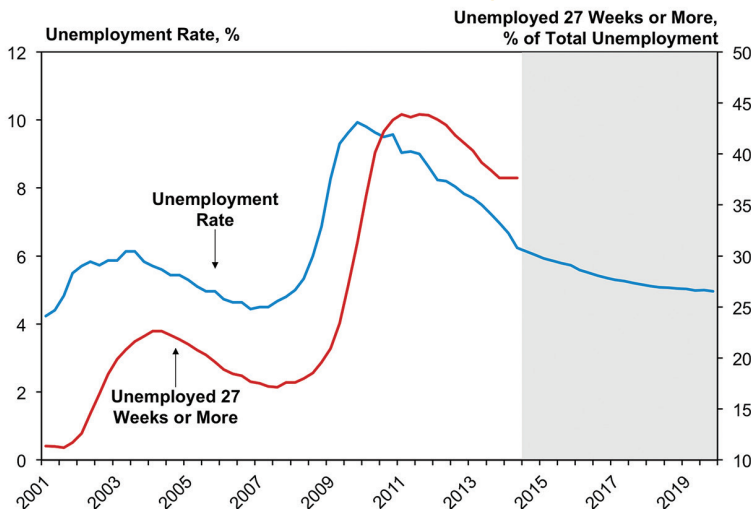
FIGURE 1.4: United States Total Employment



Sources: US Bureau of Economic Analysis; IHS Global Insight

US exports, while a relatively small share of total output, were nonetheless an important contributor to the volatility in GDP over the recent business cycle, and are also viewed as a potentially important source of future economic growth. Exports have shown extreme volatility over the past several years. The value of total US exports collapsed at an annualized rate of nearly 30 percent during the pit of the recent recession, exploded at an annual rate of more than 15 percent in early-2010, fell through much of 2011 through 2013, and have begun to grow again in recent months. Much of this volatility in exports is driven by fluctuations in economic growth rates in important US export markets, such as China and the European Union. Net export growth is expected to maintain its recent pace of around 5 to 6 percent growth over the next two years, but this is projected to fall beginning in 2017 as imports rise at an appreciably faster pace than exports. Unfortunately, in the same vein as investment activity, the health of US exports is uncertain given the myriad sources of potential economic pressure across the world, such as the ongoing economic struggles in Europe, a potential economic slowdown in China, sluggish economic growth in Japan, and political unrest in many other parts of the world.

FIGURE 1.5: United States Unemployment Statistics



Sources: US Bureau of Economic Analysis; IHS Global Insight
 Note: Quarterly data used.

The recent evolution of government spending in the US is represented in Figure 1.3. Total government spending, which amounts to around one-third of US GDP, increased substantially during the recent recession in 2008 and 2009. This rise was driven by a concerted economic stimulus effort that actively increased government spending and as safety net expenditures rose naturally as the economy went into recession. After economic recovery became consistent by 2010, government spending started to fall, reaching an annualized rate of decline of around 3 percent by 2011 for both federal and state and local government spending. This decline held down broader economic growth in a direct sense to some degree, since much government spending is itself part of economic output. Federal government spending is expected to continue to decline through 2014, but to begin to grow at a modest

rate thereafter. State and local government spending began rising in 2013 and is expected to continue to grow at a rate of between 1 and 2 percent annually – a modest pace, but noticeably faster pace than that at the federal level. A continued decline in transfer payments from the government, as unemployment continues to fall, is a major contributing factor driving the outlook for federal government spending.

Employment growth has been sluggish through most of this economic recovery since 2009. It is not uncommon for employment to recover more slowly than output, as businesses typically increase output through eliminating excess capacity, through capital investment, and through increasing worker hours, before adding new workers. But employment has become increasingly slow to recover: employment growth in each recession of the past two decades—in the early-1990s, the early-2000s, and through the recent cycle—has progressively slowed compared to earlier recessions of the modern era. As depicted in Figure 1.4, total US employment from the household survey fell substantially during the recent recession, with an overall loss in excess of 7 million jobs. Employment growth since early-2010 has been slow such that, as of mid-2014, the US is just reaching its previous employment high of approximately

146 million, set in 2007.² Further, the degree to which the US economy fell below its full sustainable level of employment (termed “full employment” in Figure 1.4) was the most severe of any recession in the modern era. The US economy remains several million jobs below what is considered to be its sustainable level of employment. Employment growth has been more consistently strong over the first half of 2014 with the addition of around 250 thousand jobs in a typical month. We expect this accelerated rate of employment growth to continue through at least the coming year. However, we expect employment to remain below its sustainable level until around 2018.

Turning to the unemployment situation, as noted in Figure 1.5, the national unemployment rate peaked at 10 percent during October 2009. This was the second-highest rate experienced during the post-World War II era, exceeded only by the 1982/1983 recession (a peak of 10.8 percent in late-1982). Unemployment has improved substantially over the past four years, and the pace of improvement has increased in the past year. Currently, the US unemployment rate is at its lowest level in five years. Unemployment is forecast to continue to improve at a gradual pace over the next several years. The US economy is approaching what is believed to be

2. The statement that employment in the US economy is approximately equal to its 2007 high does not account for population growth over the period; doing so would darken the employment growth figure.

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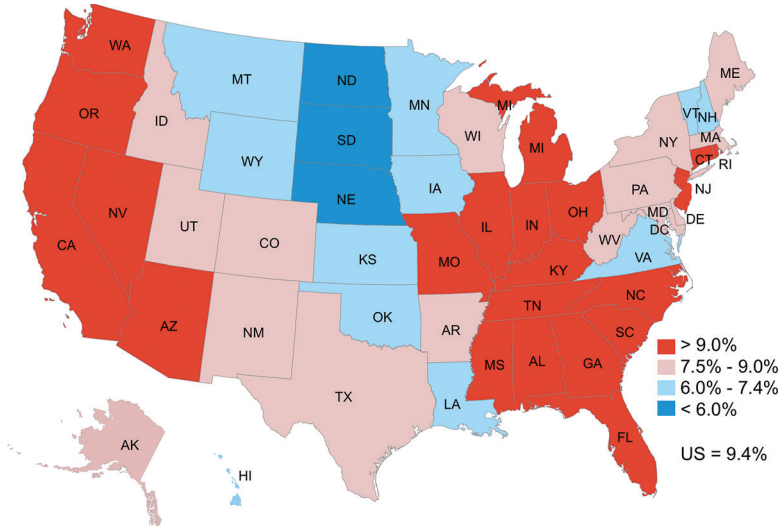
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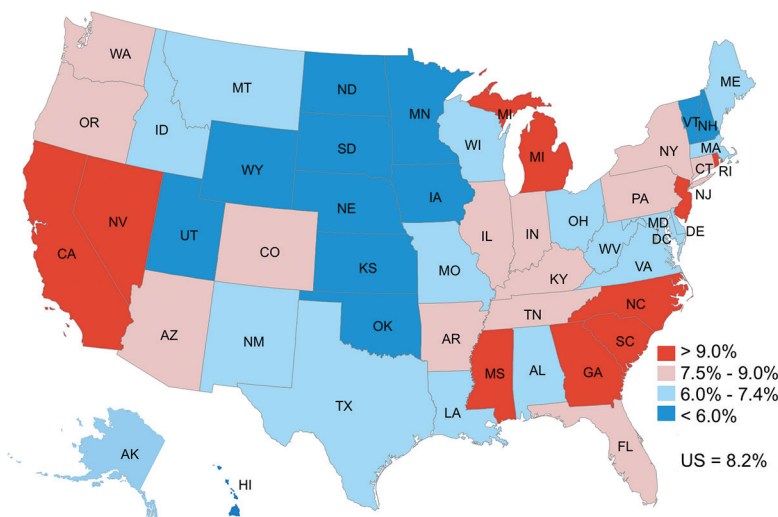
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FIGURE 1.6: Unemployment Rate, June 2010



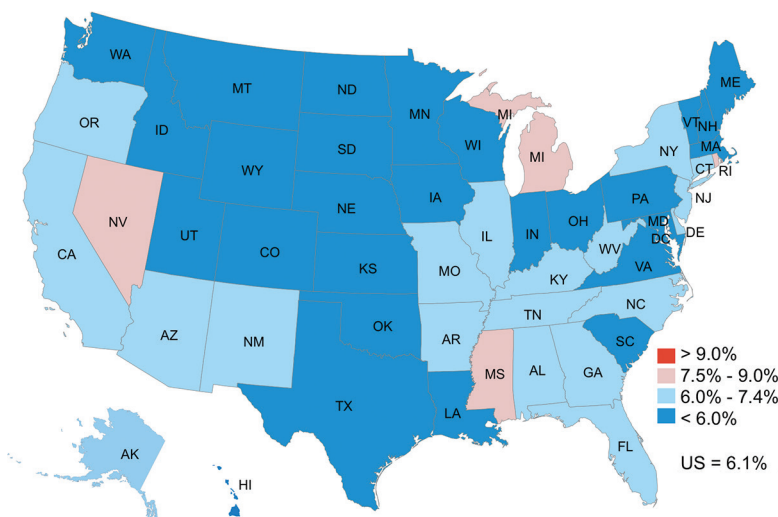
Source: US Bureau of Labor Statistics

FIGURE 1.7: Unemployment Rate, June 2012



Source: US Bureau of Labor Statistics

FIGURE 1.8: Unemployment Rate, June 2014



Source: US Bureau of Labor Statistics

its lowest sustainable rate of unemployment—a rate in the 5 to 6 percent range—but, as discussed above, that rate will not be reached fully for another three years or so.

It is worth noting that the share of all unemployed persons who have been unemployed for the long term (typically defined as 27 weeks or more) rose substantially during the recent recession, and remains at a level that is well above the historic average. As illustrated, the share of all unemployed persons who have been unemployed for the long term rose from 15 percent of unemployed persons in 2007 to around 45 percent by 2010, and remains at around 37 percent. This figure has remained substantially elevated, despite the overall improvement in unemployment, suggesting a longer-term, structural, shift in the economy.

In Figure 1.6 we report the relative position of each of the 50 US states in terms of unemployment as of June 2010, at which time the US unemployment rate was 9.4 percent. We contrast this with the by-state unemployment situation as of June 2012 (Figure 1.7), when the US rate was 8.2 percent, and June 2014, when the US rate was 6.1 percent (Figure 1.8). The figures reveal universal improvement in unemployment across the states over the four-year period. They also reveal sustained and significant variation in the unemployment situation across states.

As is well known, the catalyst for the recent financial crisis and economic recession was the dramatic decline that was suffered in the housing market from 2007 to 2009. Single-family housing starts showed notable improvement between 2011 and 2013, but the rate of improvement has been less stable over the past year, likely due, in part, to unseasonably bad weather in early-2014. As illustrated in Figure 1.9, the forecast does show continued optimism in calling for rapid improvement over the coming two years or so, stabilizing around 2017. Multi-family housing starts returned to their pre-recession level around early-2013, and are expected to continue to grow further over the coming year, further contributing to the economic recovery.

While recessions typically have a catalyst in some exogenous shock (such as the bursting of a housing bubble), falling consumer sentiment is often the key driver of demand during recessions. Typically, the initial recession catalyst reduces demand directly, and thereby output. This drop in output reduces confidence, which reduces demand further, and a vicious cycle ensues. On the upswing of the business cycle, an economic system is unlikely to ever achieve its full potential until confidence is restored.

As reported in Figure 1.10, US consumer confidence was in free fall in 2007 and 2008, and hit its all-time low in 2009.³ However, despite a brief setback during the summer of 2011, consumer confidence has risen, although in a jagged manner, since the 2009 low. The overall upward trend that is apparent within this volatile measure points to a return to a pre-recession level of confidence in the coming years.

CHALLENGES FACING THE US ECONOMY

While the US economic outlook is improving, the recovery remains fragile as numerous potential threats to sustained growth exist. Prominent on this list is the possibility of an economic slowdown among the United States’ trading partners, which could threaten US exports. Figure 1.11 illustrates economic growth for the world, as well as for China, Japan, and the European Union – some major US trading partners. As illustrated, by 2014, economic output in China has risen to 4.5 times its 2001 level (as illustrated by an index value of 450). Output in the Euro zone, and for the world as a whole, has risen by around 70 percent since 2001 (an index value of around 170). In contrast, output in Japan and the US has risen by around 30 percent over the period.

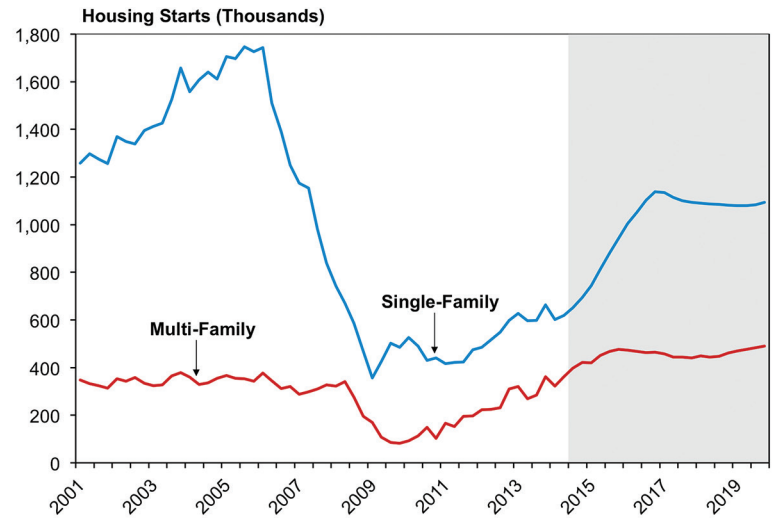
Economic growth is expected to be relatively slow in Japan, the Euro zone, and for the world as a whole in coming years, as illustrated by the relatively flat lines representing these economic units in the figure. While output in all of these economies is expected to grow in coming years, risk remains that growth could be weaker than expected. The European Union (EU), which receives nearly one-fifth of total US exports, experienced a mild recession in 2012 and 2013, and growth continues to be weak; EU growth is expected to be only 1.1 percent in 2014 and will remain under 2 percent in later years.

Turning to another important US trading partner, Chinese growth is forecast to be in the lower-7-percent-range, far exceeding the global average. However, that rate is lower than what the country has experienced over most of the past two decades. If Chinese growth continues to slow, it could impact the US economy, especially given that China accounts for over 7 percent of US exports. Japan’s economy remains sluggish, and this trend will likely continue going forward as Japanese growth is expected to be in the one-percent-range in coming years.

Although the situation has improved markedly in recent years, issues related to the long-run sustainability of the US federal government budget remain a potential

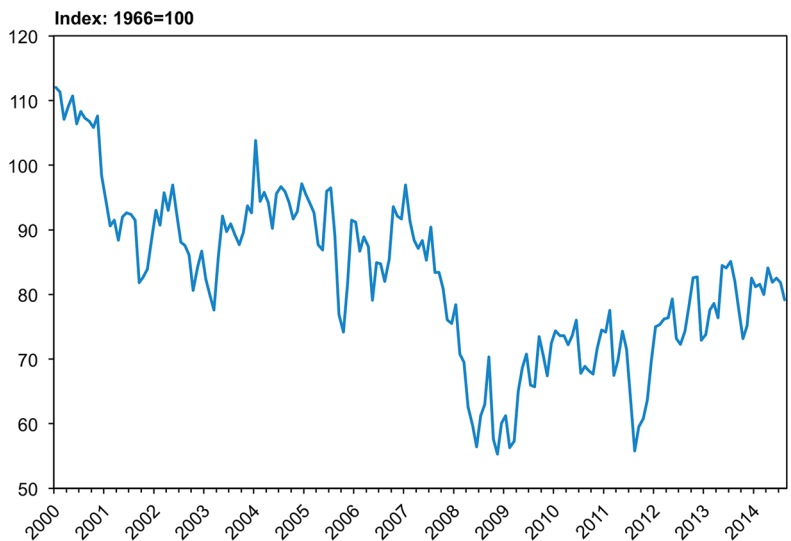
3. Economists have tracked consumer confidence since the late 1960s.

FIGURE 1.9: United States Housing Starts



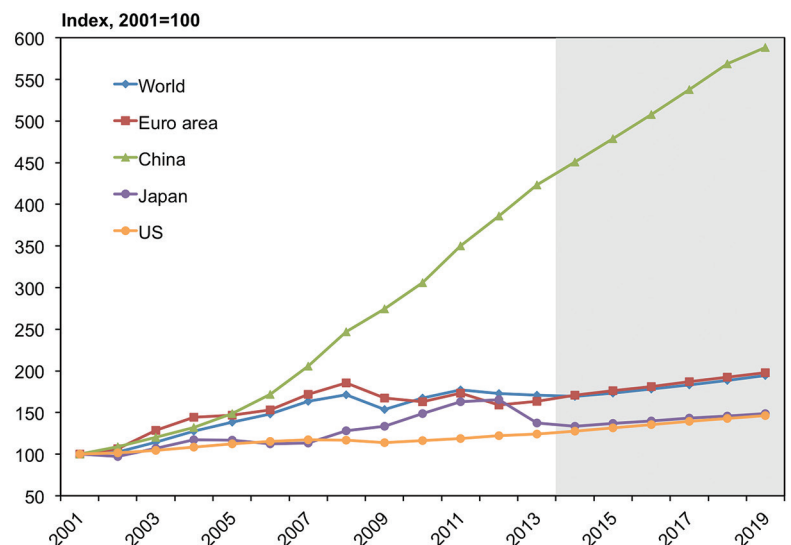
Sources: US Census Bureau; IHS Global Insight Note: Housing starts statistics use quarterly data.

FIGURE 1.10: Index of Consumer Sentiment



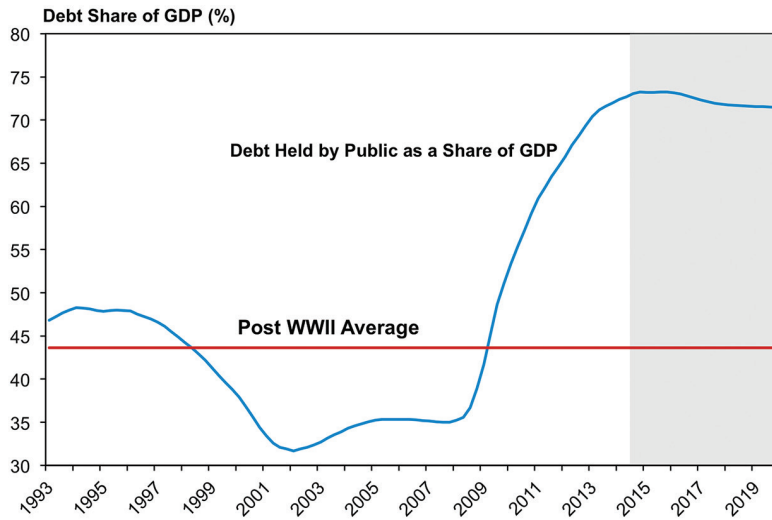
Source: Thomson Reuters and University of Michigan Surveys of Consumers Note: Monthly data used.

FIGURE 1.11: Real GDP Growth of the World and Selected Economies



Source: International Monetary Fund

FIGURE 1.12: US Federal Debt Held by the Public as a Share of GDP

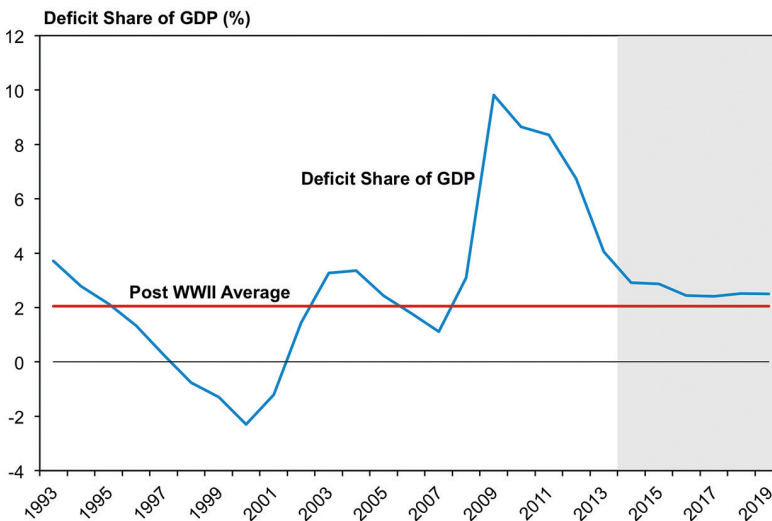


Sources: US Bureau of Economic Analysis; IHS Global Insight

concern for long-run economic growth. As such, we explore US federal government budgetary issues through figures 1.12 through 1.14.

As depicted in Figure 1.12, federal debt held by the public, which hovered between 31 percent and 35 percent of GDP between 2000 and 2007, began rising dramatically in 2008 as tax revenues plunged and the federal government ramped up spending in part to stimulate the weakening economy. As of mid-2014, the figure was around 73 percent of GDP, a rate that is far above the post-World War II average of around 44 percent. The figure is forecast to remain relatively stable over the next five years. However, in the long-run (not shown) the figure is forecast to explode given the aging of the US population and the additional public benefits that an older population receives, barring any change in public policy. A public debt level that surpasses a critical level can be detrimental to long-run economic prosperity if the public debt reduces private-sector savings and investment activity—a key driver of productivity growth in the long-run.

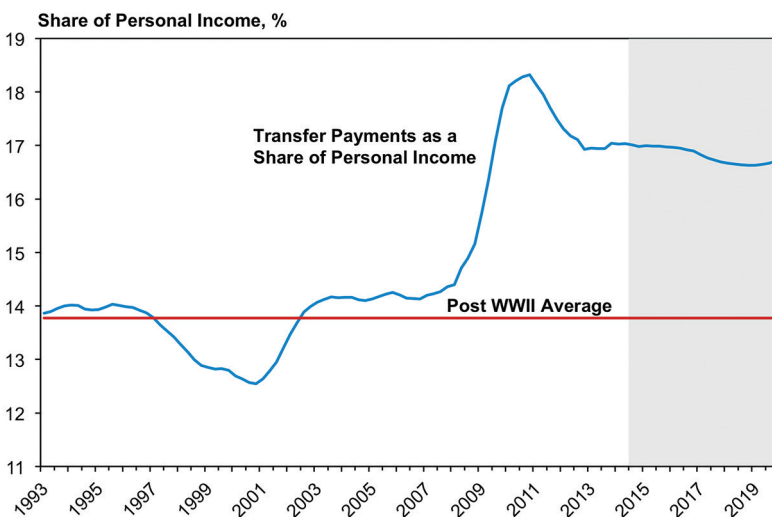
FIGURE 1.13: Federal Deficit Share of GDP



Sources: US Bureau of Economic Analysis; IHS Global Insight

In a similar vein, in Figure 1.13 we report the federal deficit as a share of GDP. While the historical average deficit/GDP ratio is around 2 percent, the ratio surged to nearly 10 percent in 2009—its highest level since the World War II-era. After remaining at an exceptionally high level through 2012, the ratio has fallen substantially as the US economy has improved and as federal spending has fallen. The deficit for 2014 is expected to be around 3 percent of GDP, and is predicted to continue to fall through 2016 and remain relatively stable through the short-term. However, the deficit is expected to rise substantially over the longer-term (not shown in the figure) for the reasons described above.

FIGURE 1.14: US Transfer Payments as a Share of Personal Income

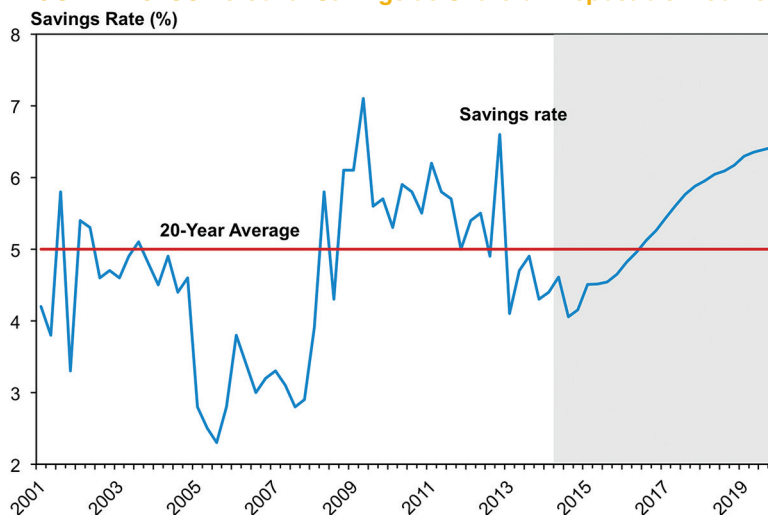


Sources: US Bureau of Economic Analysis; IHS Global Insight

The recent dynamic involving US federal government debt is closely related to the increase in transfer payments from the US federal government. Examples of transfer payments include Social Security, unemployment benefits, welfare benefits, Medicare, and Medicaid. As illustrated in Figure 1.14, transfer payments increased substantially in 2008, reaching a high of more than 18 percent of personal income, compared to a post-World War II average of just under 14 percent. This increase is attributable to two major factors: a) falling income and rising unemployment during the recession, and b) more generous public policy, such as the extension of unemployment benefits. Since recovery began, the share has fallen to just over 17 percent of GDP and is expected to remain stable for the near term. In the long-run, the figure is expected to rise again substantially with the aging of the US population, barring any policy changes, such as a reduction in benefits or an increase in the social security retirement age.

Savings is another potential factor that can affect the US economy in coming years. The rate of national savings, as reported in Figure 1.15, has fluctuated fairly widely over the past decade or so. It fell to a low of around 2.5 percent in the mid-2000s, and then rose to a high of around 7 percent during the recent recession. Savings has since fallen back to around 4.5 percent, which is slightly below the 20-year average for the figure. However, savings is expected to increase substantially over the coming five years, mainly driven by changing demographics in the economy. This projected, short-term rise in savings has the potential to harm consumption spending, and thereby overall demand in the economy. However, the expected rise in savings will likely be an overall positive in the economy over the long-run, as a higher savings rate enables a higher level of capital investment.

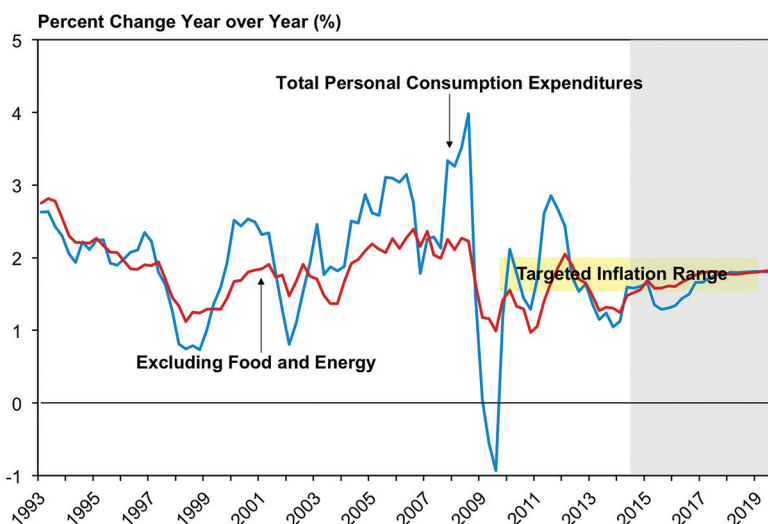
FIGURE 1.15: US Personal Savings as Share of Disposable Income



Sources: US Bureau of Economic Analysis; IHS Global Insight

As reported in Figure 1.16, inflation has been stable by historic standards in the US since the mid-1980s, rarely moving outside of the 1 to 3 percent range. While overall inflation did reach a slight spike of close to 4 percent for a brief period in 2008 due to rising oil prices, inflation has been modest for the past few years. When food and energy prices are excluded from consideration (red line in figure), inflation has been below the range of approximately 1.5-2 percent that monetary policymakers targeted for most of the past five years. Inflation is expected to remain stable in coming years.

FIGURE 1.16: United States Inflation Rates



Sources: US Bureau of Economic Analysis; IHS Global Insight

Note: Quarterly data used.

However, there is a chance that the threat of inflation could reemerge. The US Federal Reserve (Fed) has taken unprecedented steps to stabilize the economy since 2008, and in doing so has increased the monetary base—primarily the volume of reserves held by banks—dramatically through its purchase of US Treasury Securities and other assets, such as private-sector mortgage-backed-securities. Thus far, this monetary stimulus has not translated into higher inflation due to continued modest demand and banks' continued reluctance to lend. However, inflationary pressures have the potential to build as lending and the broader economy improve. As that happens, the Fed will be required to remove liquidity from the monetary system to avoid rising inflation. The uncertainty stems from the fact that monetary policy is in uncharted territory given the volume of the recent monetary stimulus and the nature of the asset purchases.

A related concern is the inevitable rise in interest rates in the US economy in coming years. This rise will, in part, stem from the Fed's actions to reverse the monetary stimulus discussed above. While interest rates have been at or near historic lows in the past year or so, their coming rise is inevitable. If the rise is too sudden, it could weaken investment and consumer spending growth in the US considerably. On the other hand, if the

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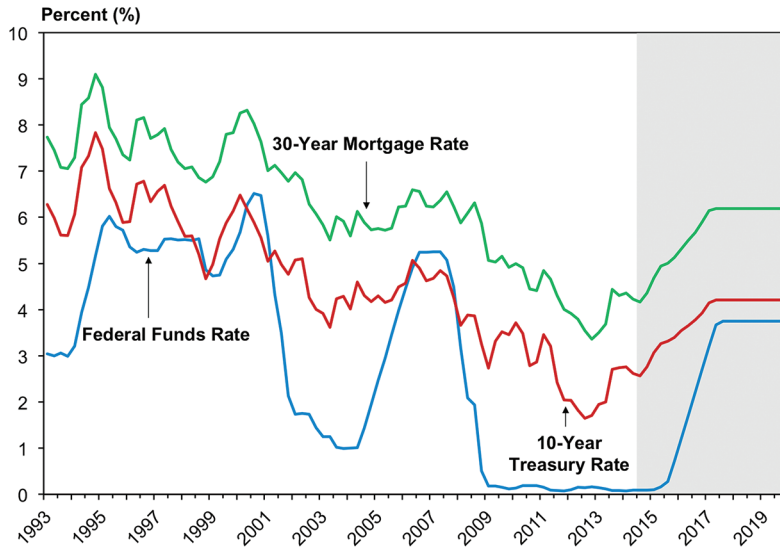
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FIGURE 1.17: Select United States Interest Rates



Sources: Federal Reserve Board of Governors; Freddie Mac; IHS Global Insight

Fed waits until too late to allow rates to rise, inflation would be a concern. Given the anticipation surrounding the rise in interest rates, financial markets can move very quickly, as evidenced by this summer's brief and sudden rise in interest rates in response to Fed commentary. Figure 1.17 reports the forecast for three key US interest rates, although much debate and uncertainty remains surrounding the exact timeframe of this coming increase.

The world's demand for oil has increased steadily over the past decade—mostly due to continued growth in the developing countries such as China and India—except for a short-lived decline during the recent recession. The supply, while increasing, has not been able to keep up with the rising demand, causing oil prices to increase considerably for most of the past decade. However, oil prices have been generally stable over the past year or so, and are forecast to decline overall over the next three years. Continued instability in the Middle East and in Eastern Europe could threaten this expected decline and a substantial rise in oil prices could put the US economic recovery in jeopardy.

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CHAPTER 2: THE WEST VIRGINIA ECONOMY

RECENT ECONOMIC PERFORMANCE

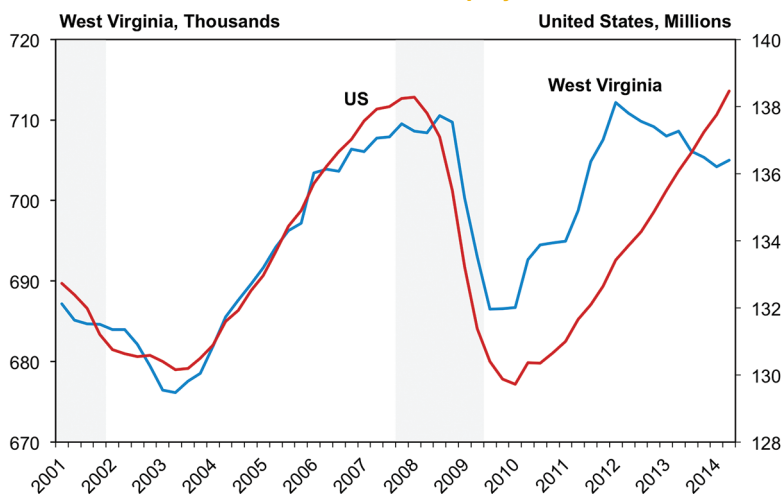
West Virginia's economic recovery lost momentum by some measures in 2013, as the state continued to see total employment slip from its mid-2012 peak, and personal income grew at a diminished pace.⁴ Overall, total payrolls in the state contracted nearly 0.5 percent for 2013 as a whole, as employers cut over 2,600 jobs. Despite this weak employment performance, however, 2013 proved to be an unusual year for the state economically as output grew at a pace that was well above the US average. While the employment picture remains uncertain given various economic pressures and opportunities, preliminary data indicate that a slight uptick in hiring activity has occurred during the first half of 2014, providing some degree of optimism for the employment outlook.

Natural resources and mining struggled more than any of the state's major sectors during 2013, shedding nearly 1,900 jobs last year and more job losses have occurred in early-2014. Performance within this sector has been very volatile as the sector's two primary underlying industries have had significantly different experiences in recent years. According to the Energy Information Administration, total coal output from West Virginia underground and surface mine operations fell to 113 million short tons in 2013, marking the lowest amount produced in the state since the early-1980s. As a result of this downturn in production, which has been largely concentrated in the state's southern coalfields, employment in the coal mining and mining support services industries declined by more than 2,600 in 2013. Moreover, on a cumulative basis, these industries have lost nearly 7,000 jobs between the fourth quarter of 2011 and first quarter of 2014—a decline of more than 26 percent.

By contrast, the state's oil and natural gas industry has enjoyed rapid growth since 2011. Indeed, natural gas production has jumped at an average annual rate of more than 39 percent over that time period thanks to robust well productivity in the Marcellus and Utica Shale plays, especially in the Northern Panhandle and northwestern section of the state. Employment at oil and gas extraction, drillers and their support operations increased by more than 10 percent (approximately 800 jobs) in 2013, with an overall gain of roughly 1,900 jobs since production began to take off during the first quarter of 2011. Preliminary data for the first half of this year indicate the natural gas industry's robust growth in production has continued into 2014.

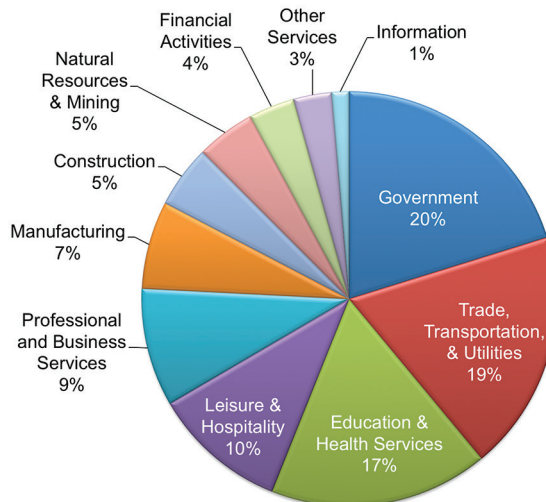
After registering a strong improvement during 2012, the construction sector suffered somewhat of a setback

FIGURE 2.1: Total Employment



Source: US Bureau of Labor Statistics *Shaded regions indicate recessions

FIGURE 2.2: West Virginia Employment Distribution by Sector (2013)



Source: US Bureau of Labor Statistics

during 2013. A modest rebound in housing construction activity did buoy the sector, but the winding down and completion of several major energy-related projects and a persistent slump in public infrastructure spending caused an appreciable decline in employment as the year progressed. More recently, a colder-than-normal winter caused significant disruptions to the sector as major snowfalls and cold spells led to major delays to residential and nonresidential construction projects throughout the state. The manufacturing sector lost more than 1,000 jobs in 2013, but the majority of these losses were concentrated in fabricated metals, whose performance is often closely linked with the coal

4. Data sources are noted in each figure.

industry, and a handful of miscellaneous durable and nondurable goods manufacturing industries.

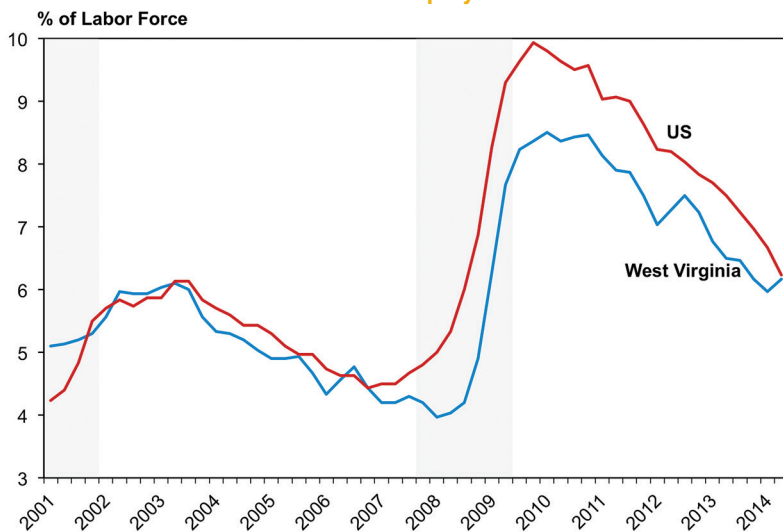
Despite some noticeable weakness in several of the state's goods-producing industries, the major service-providing sectors in the state were generally stable or showed signs of improvement. Although hiring activity within the education and health services sector slowed considerably from the previous year, it has managed to post a calendar year increase in payrolls in each of the last 23 years. The transportation and warehousing sector expanded significantly during 2013, as employment rose 7 percent statewide largely as a result of the Macy's fulfillment center in Martinsburg and transportation companies supporting oil and natural gas operations.

Retail activity was generally stable in 2013. After seeing two years of solid gains, the sector experienced a dramatic slowdown in growth as the weaker labor market and end of payroll tax cuts weighed on consumers'

disposable incomes. Growth was also slower for the state's leisure and hospitality sector in 2013. Businesses more connected to broader national tourism and travel activity performed better on average, as did portions of southern West Virginia who benefited from the spending associated with the National Boy Scout Jamboree at Summit Bechtel Reserve. By contrast, the state's gaming industry has faced significant, and growing, pressure from competition created by venues in Pennsylvania, Maryland and Ohio.

While provisional data indicate a significant uptick in employment during the first half of 2014, the professional and business services sector saw new job growth decelerate between 2012 and 2013. Reduced hiring activity at management offices and administrative support services offset gains recorded at professional and technical services firms. Finally, public sector employment, which represents one in five jobs statewide, declined during 2013, reflecting a cutback in staffing at state and local government offices.

FIGURE 2.3: Unemployment Rate

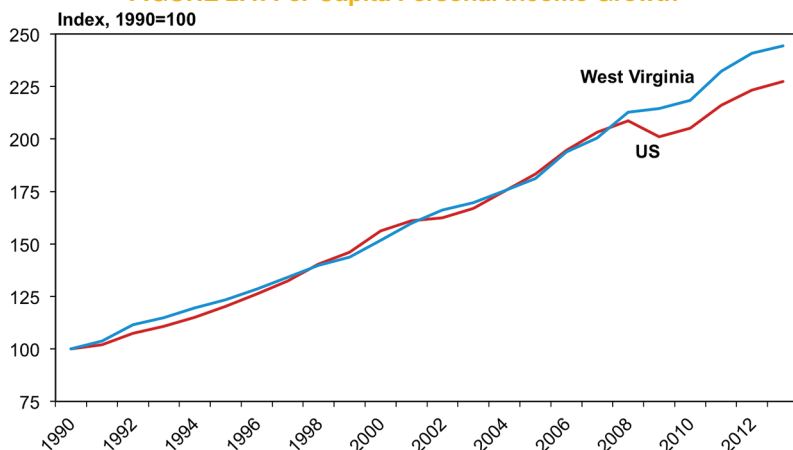


Source: US Bureau of Labor Statistics *Shaded regions indicate recessions

The state's unemployment rate fell in a fairly steady fashion from the beginning of 2010 through the beginning of 2014, with a brief rise in early-2012. Overall the unemployment rate declined to 6 percent from 8 percent over that time period. This marked the lowest reported statewide unemployment rate since the beginning of 2009. However, the jobless rate experienced a slight increase during the second quarter of 2014 and currently is roughly on par with the national rate for the first time since the end of 2006.

Although the rise in the state's unemployment rate is not good news, as it likely reflects—at least in part—a weakening of the labor market, it cannot be viewed strictly as bad news. Indeed, one cause for the uptick in the jobless rate has been an appreciable increase in the number of unemployed people rejoining the labor force, which might suggest at least a modest improvement in labor force participation. Low labor force participation has long been a structural problem for West Virginia. During the first half of 2014, this metric has averaged 53.8 percent in West Virginia, compared to 62.8 percent at the national level. It is unlikely that West Virginia can ever achieve a level of income per capita that is on par with the nation as long as the state's labor force participation rate lags the national average by such a margin.

FIGURE 2.4: Per Capita Personal Income Growth



Source: Bureau of Economic Analysis

Per capita personal income in West Virginia reached approximately \$35,600 in 2013, which represented a 1.5 percent gain over the previous calendar year. This represents an appreciable deceleration from the 6.4 percent increase recorded in 2011 and is also the slowest rate of growth since 2009. In addition, it marks only the second time since 2008 in which the state lagged the national rate of per capita income growth.

Even after the sluggish growth observed in 2013, West Virginia’s comparatively solid economic performance of recent years has allowed it to close its per capita personal income gap with the rest of the nation. In fact, the state’s per capita personal income has remained at roughly 80 percent of the national average in each of the last three years, the highest this ratio has been since personal income data collection began in 1929. Despite seeing its income deficit with the rest of the nation shrink, average income levels within the state still rank low from a broader national perspective, as per capita income in West Virginia exceeds that of just Mississippi, Idaho and South Carolina, respectively.

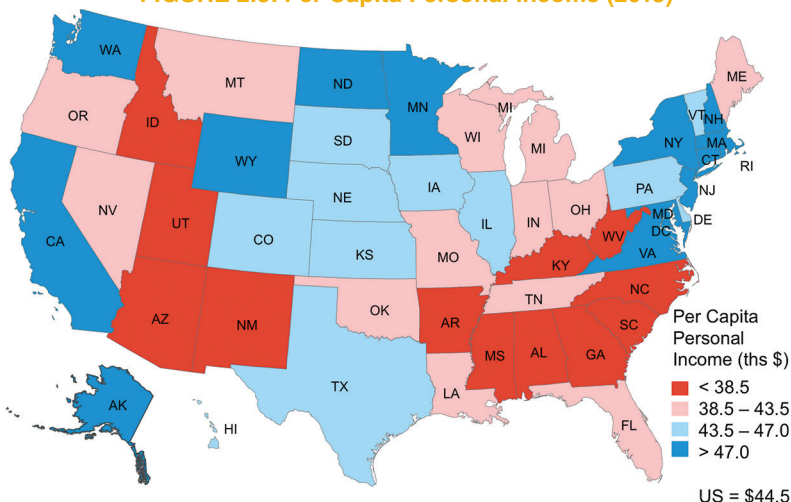
Softer demand for labor in certain sectors had a noticeable impact on wage growth in 2013. Average annual pay increased 1.2 percent to approximately \$40,200 during 2013, marking the lowest year-over-year gain in wages since 1993. Workers in the utilities sector received the highest average annual wage at more than \$81,300 – roughly double the statewide average. Average annual wages for the natural resources and mining sector have increased less than 1 percent in each of the last two years, but remain the sector with the second highest average annual wage at \$77,600. Preliminary data for the first quarter of 2014 indicate a modest pickup in wages, led in part by the oil and gas and transportation industries.

Overall, the fact that growth in wage income lags growth in per capita personal income can be explained by faster growth in transfer payments from the US federal government. Transfer payments, such as Social Security benefits, are counted as part of per capita personal income but are not part of wage income.

Preliminary data indicate that real GDP in West Virginia expanded 5.1 percent during 2013, ranking third among all states, and nearly three times the 1.8 percent gain observed nationwide. However, revised data for 2012 indicate real economic output from state businesses declined 1.4 percent. The mining sector, which combines both coal and the oil/gas industries, registered a 40 percent increase in output during 2013, more than offsetting the 10 percent decline the sector experienced in the previous year.

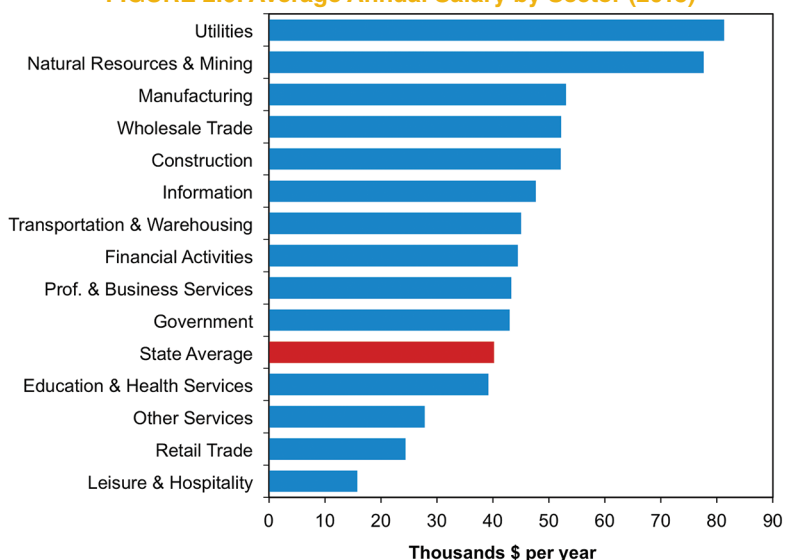
Output from the construction sector fell 7.5 percent in 2013, reflecting the pullback in nonresidential and infrastructure building activity that overwhelmed some improvement in single family home construction. The manufacturing sector posted a modest decline in output compared to 2012, slipping 0.3 percent. Total real output from the private service-providing industries was slightly higher during 2013, with the largest percentage increase occurring in the education and health services sector.

FIGURE 2.5: Per Capita Personal Income (2013)



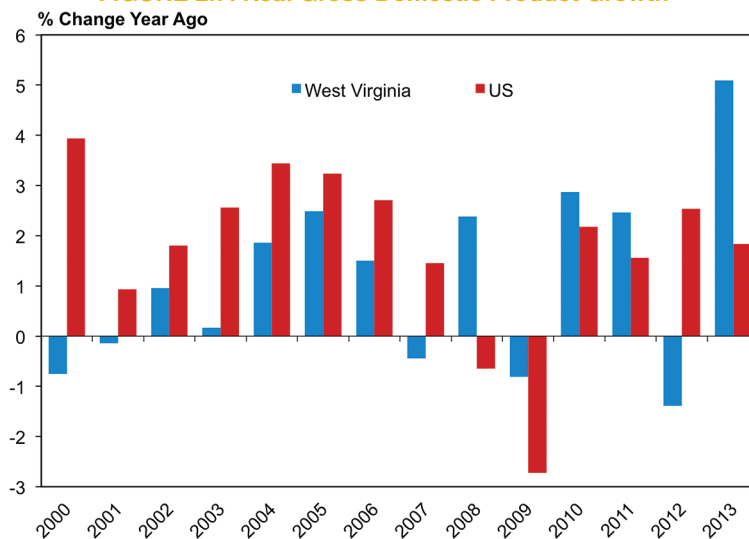
Source: US Bureau of Economic Analysis

FIGURE 2.6: Average Annual Salary by Sector (2013)



Source: US Bureau of Labor Statistics

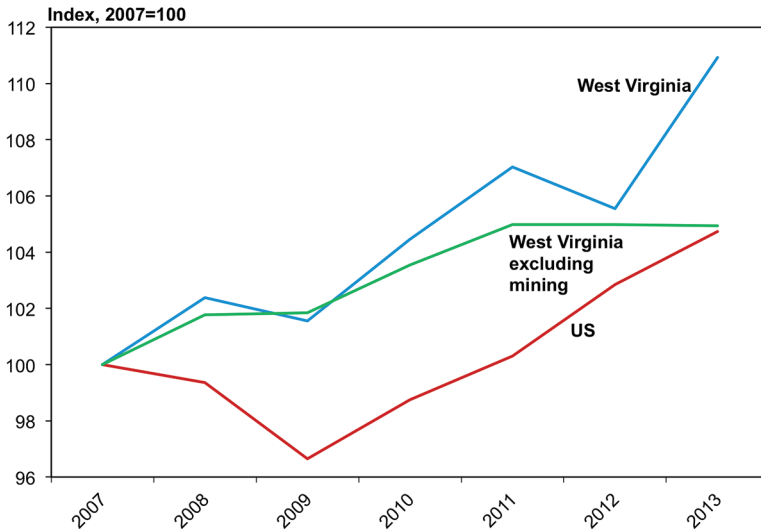
FIGURE 2.7: Real Gross Domestic Product Growth



Source: Bureau of Economic Analysis

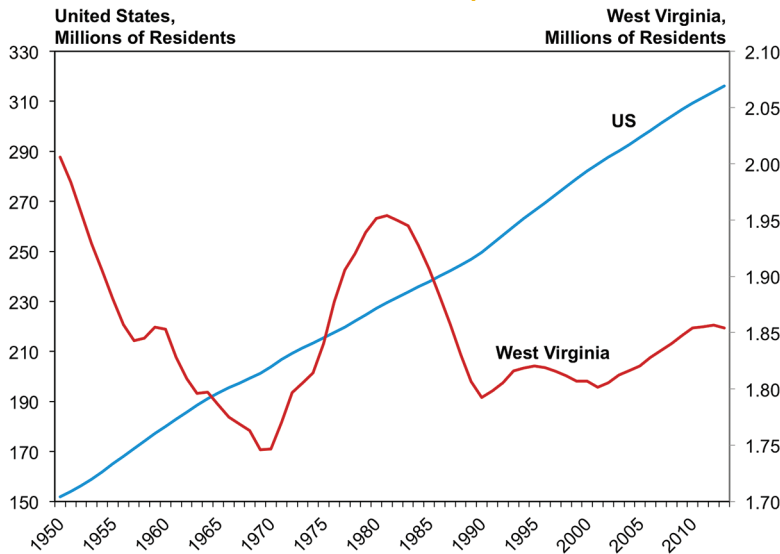
In Figure 2.8 we illustrate how real GDP has grown in West Virginia and in the US since 2007. We also include a depiction of real growth in West Virginia that does not include the mining sector. As illustrated, without the contribution from mining, real GDP growth in West Virginia has been extremely limited in recent years. Indeed, since 2011 the state has virtually shown no growth in real GDP except for growth linked to the mining sector.

FIGURE 2.8: Real GDP Growth



Source: US Bureau of Economic Analysis

FIGURE 2.9: Total Population



Source: US Census Bureau

RECENT DEMOGRAPHIC TRENDS

West Virginia’s population declined during 2013, as the state lost nearly 2,400 residents over the previous year. This marked the first year-to-year drop in the state’s population in more than a decade and nearly offset the cumulative gains that occurred over the previous two years, which saw appreciably slower growth than what occurred over the course of the late-2000s. With the state having received no net gain in population due to natural increase, i.e. the difference between births and deaths, and limited inflows of international immigrants, changes in the state’s population are largely influenced by shifts in net domestic migration flows. According to the Census Bureau, the state experienced a net outflow of migrants totaling nearly 1,900 residents likely due in part to weakening economic conditions in the state’s coal industry.

Overall, 41 counties experienced a decline in population during 2013. This represents the largest number of counties in the state to lose residents on a calendar year basis since 1990. The largest absolute loss in population occurred in Kanawha; however, in percentage terms, 11 counties registered population declines of more than 1 percent compared to 2012. Although the number of counties posting an annual gain in population declined in 2013, most of the statewide gain in residents over the past decade has been concentrated in a handful of counties. That trend accelerated last year as Berkeley and Monongalia counties combined to account for more than 71 percent of the gross increase in population between 2012 and 2013.

One of the defining demographic characteristics of the state’s population is its age structure. West Virginia’s median age increased slightly in 2013 and now stands at 41.9 years, placing it as the second oldest state in the U.S. and more than 4 years older than the corresponding national figure. Nearly one-fourth of the state’s residents were near or past the traditional retirement age (60+ years old), compared to 20 percent for the nation as a whole.

In addition to containing a higher-than-average share of elderly residents, West Virginia’s population also tends to be less healthy than other states in the US. According to the Centers for Disease Control, the overall mortality rate, even after adjusting for age, in West Virginia is the second highest in the nation. High incidences of heart disease, cancer and diabetes have been key contributors to the state’s comparatively high mortality rate, as well as behavioral or lifestyle factors such as relatively little physical activity during leisure time.

WEST VIRGINIA OUTLOOK

Expectations for the US and broader global economy during the forecast horizon will have a significant impact on West Virginia's performance in coming years.⁵ The forecast calls for the economic recovery to continue over the next five years with a rate of job growth of nearly 0.9 percent per year through 2019. This pace of growth will cause the state to lag the 1.5 percent average annual rate of growth anticipated for total US employment over the next five years.

The outlook for the natural resources and mining sector as a whole has been revised lower, as the sector is now expected to see jobs increase at an average annual rate of 0.2 percent over the next five years. This weakness will be driven by continuing struggles for the state's coal industry. Overall, coal industry employment is expected to fall at a rate of approximately 1.5 percent per year through the end of 2019. We anticipate most of these declines will occur during the first half of the forecast horizon as coal production from the state's mines, particularly in the southern coalfields, falls in response to weak domestic demand for thermal and metallurgical coal, as well as pressure on the international market.

In addition, the onset of Mercury and Air Toxicity Standards (MATS) in early 2015 will weigh on coal demand as well since coal-fired utilities will be retired if they cannot meet emission requirements or do not make the necessary equipment retrofits to comply. Although the Supreme Court's decision to re-instate federal Cross-State Air Pollution Rules will likely hurt coal demand further, the exact timing and magnitude of this legislation is unclear since a previous court-ordered stay remains in place. Proposed regulations by the Environmental Protection Agency to reduce carbon dioxide emissions from existing coal plants by as much as 20 percent by 2030 relative to 2005 levels will certainly affect West Virginia's coal industry. Currently, we view this proposal as a downside risk to the forecast since the final policy will likely differ from the initial proposal released in mid-2014 and is at least a few years away from implementation.

By contrast, the state's oil and natural gas industry is expected grow at a healthy pace during the outlook period. The forecast calls for employment with drilling and support services firms to increase nearly 3 percent on an average annual basis over the next five years. Production growth is expected to expand at a healthy pace of 14 percent per year through 2019, although this is significantly slower than the 40 percent average annual pace of growth over the past few years. Demand

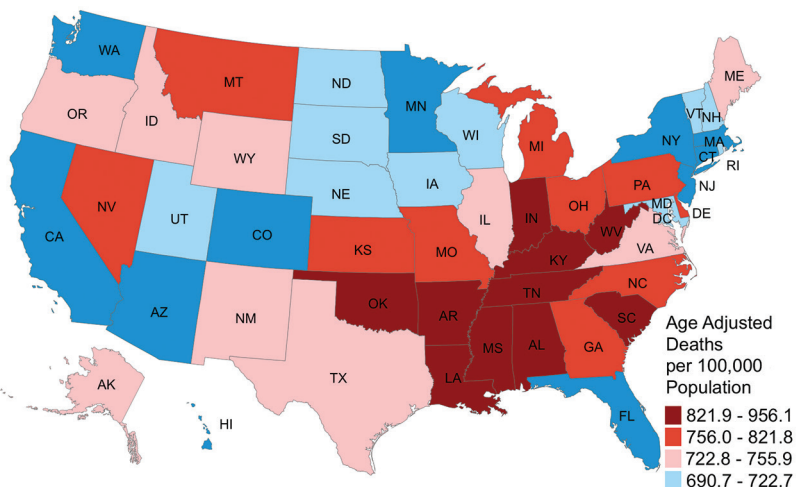
5. All forecast estimates for this document are derived from the West Virginia University Bureau of Business & Economic Research Econometric Model, unless otherwise noted. The model is based on an analysis of dozens of variables that characterize the West Virginia economy.

FIGURE 2.10: Summary Population Profiles

	West Virginia	United States
Total Population (2013)	1,854,304	316,128,839
% Population Under 18 (2013)	20.6%	23.3%
% Population 65 Years + (2013)	17.3%	13.7%
Population with Less than High School Diploma (2012, % of pop. 25 yrs. +)	15.5%	13.6%
Population with High School Diploma, No College (2012, % of pop. 25 yrs. +)	40.6%	28.0%
Population with Some College, No Degree (2012, % of pop. 25 yrs. +)	25.3%	29.2%
Population with Bachelor's Degree or Higher (2012, % of pop. 25 yrs.+)	18.7%	29.1%
Median Age (2013)	41.9	37.6
Mean Household Income (2012)	\$54,382	\$71,317
Average Household Size (2012)	2.44	2.64
Labor Force Participation Rate (2013)	53.8%	63.2%

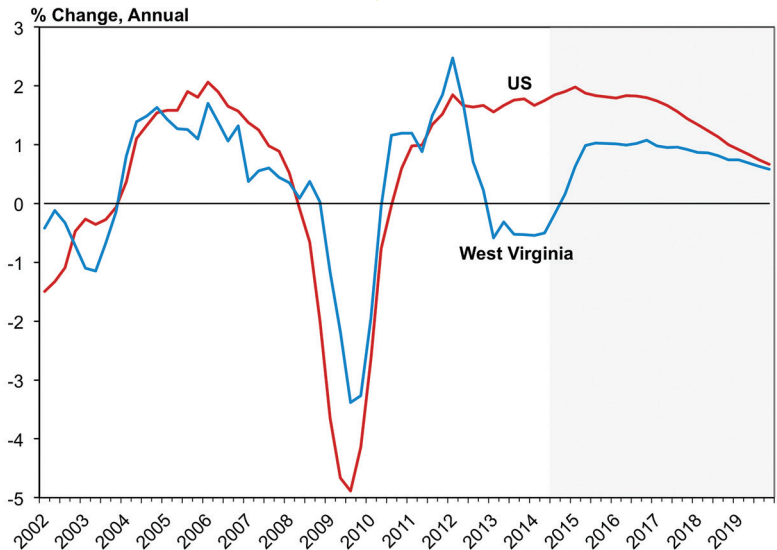
Sources: US Census Bureau; Bureau of Labor Statistics

FIGURE 2.11: All-Cause Mortality Rates, 2011



Source: US Centers for Disease Control

FIGURE 2.12: Employment Growth Forecast

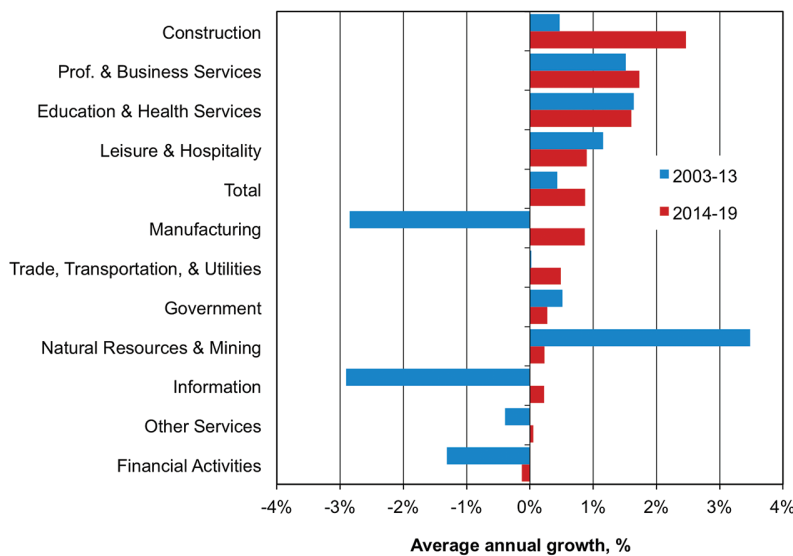


Sources: Bureau of Labor Statistics; WVU BBER Econometric Model; IHS Global Insight
 *Note: Shaded region represents the forecast period

from the utilities sector will continue to expand as shifting environmental regulatory requirements and plentiful supplies of natural gas from the Marcellus and Utica shale plays push utilities to install gas-powered generation. Also, emerging opportunities to process natural gas liquids is expected to bolster additional development of rich gas deposits in the Utica shale formation in and around the state's Northern Panhandle. While the construction sector's performance has been uneven over the past two years, we anticipate a steadier pace of recovery going forward. Overall we expect construction employment to grow at a rate of 2.5 percent per year during the outlook period. Stronger home-building activity, particularly in higher-growth

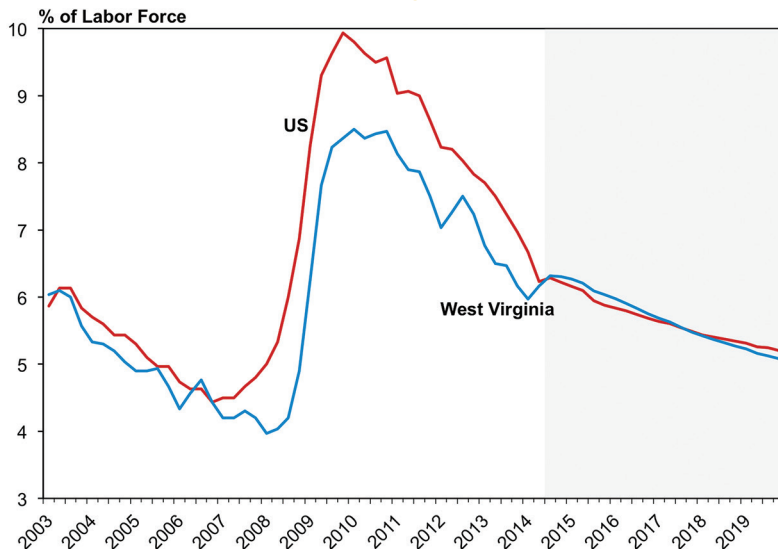
areas such as the Eastern Panhandle, and large-scale projects related to the energy sector are expected to provide a boost to the industry. Manufacturing activity is expected to pick up in the state over the next five years, resulting in an expected 0.9 percent average annual increase in payrolls. This represents a sharp divergence from the pattern experienced over the past decade. Healthy auto demand and a firming recovery in the US housing market will likely account for most of the sector's anticipated improvements. Moreover, portions of the state's chemicals industry face improved prospects as abundant supplies of natural gas offer not only a low-priced feedstock, but new capacity linked to fractionation and the processing of natural gas liquids.

FIGURE 2.13: West Virginia Employment Growth Forecast by Sector



Sources: Bureau of Labor Statistics; WVU BBER Econometric Model

FIGURE 2.14: Unemployment Rate Forecast



Sources: Bureau of Labor Statistics; WVU BBER Econometric Model; IHS Global Insight
 *Note: Shaded region represents the forecast period

In terms of the state's private service-providing sectors, the forecast calls for the strongest rates of growth to come from the professional and business services and education and health services sectors, which are expected to record average annual of 1.7 and 1.6 percent per year, respectively. A firming national economic recovery is expected to yield greater demand for a range of business support services that include legal services, management consulting and IT support. Gains in education and health services will largely come from steady increases in demand for health care services coming from the state's large (and growing) elderly population.

Retail activity is expected to increase at a steady pace over the course of the forecast horizon, leading retailers to expand payrolls at a pace of just above 0.4 percent per year. Broader gains in real per capita income and expanding retail developments in growing regions of the state are expected to offset population declines and slow growth in other parts of the state. Although competition from gaming venues in neighboring states will blunt the sector's overall prospects, the state's status as a regional tourism destination, combined with steady gains in travel and tourism, will boost leisure and hospitality employment. In addition, the hosting of the International Boy Scout Jamboree in 2019 should also bolster the sector's prospects toward the end of the outlook period.

Wholesale trade and transportation and warehousing sectors are expected to see similar rates of job growth over the next five years, due in part to continued development along major transportation corridors, such as the Eastern Panhandle. In addition, projected growth in the state's oil and gas industries will bolster demand for transportation companies providing materials hauling and distribution services. Public sector employment is projected to rise slowly at an average annual rate of 0.3 percent as a steady downward trend in federal employment partially offsets modest growth in state and local government hiring.

After a long-run trend of decline for the past four years, the forecast calls for the statewide unemployment rate to remain close to 6 percent through the end of 2015. While some segments of the state's economy will enjoy a healthier pace of job growth over the near term, the coal mining industry will likely suffer additional job losses over the next several quarters following the announcement of several mass layoff events and anticipated weakening in production discussed above. Longer term, sustained job growth in other segments of the economy combined with broader demographic trends, the forecast calls for the unemployment rate to fall slowly to an annual average of 5.1 percent by 2019.

Following a sluggish gain in 2013, real per capita income growth is expected to improve by 1.7 percent in 2014. For the outlook period as a whole, projected gains in employment will translate into real wages and salaries while non-wage forms of income, such as government transfer payments and interest, will increase because of population aging and other factors. Overall, our forecast calls for real per capita income in West Virginia to rise at an annual average rate of 2.3 percent, thereby lagging the 2.8 percent per annum rate expected for the rest of the nation. This slower pace of income growth will cause the state's per capita income levels to fall to approximately 78 percent of the national average by 2019.

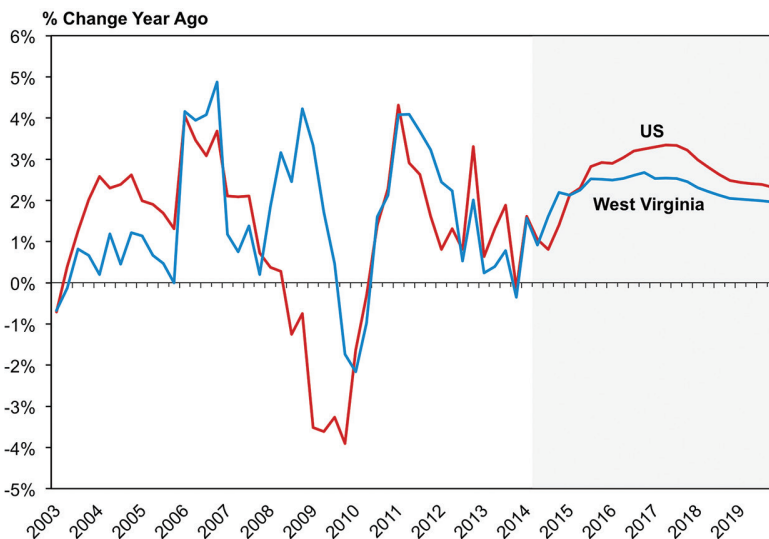
Since economic growth is expected to lag the national average during the outlook period, many regions in West Virginia will likely find it difficult to gain population due to in-migration. This factor, when combined with the fact that the number of deaths will likely continue to exceed births in most counties over the next five years, should cause the state's population to decline slightly over the next five years.

In addition, aging-in-place of the population will accelerate, wherein the state's under-65 age groups shrink and the 65-and-over cohort swells. This generally mirrors the broader national trend, where more members of the baby boom generation will likely move into the 65 and older age group. However, since West Virginia contains a higher-than-average share of residents close to the age of 65, the aging-in-place process will occur more rapidly in the state. Over the longer term, this process will eventually lead to nearly one in four residents to be at least 65 years of age.

WEST VIRGINIA'S EXPORTS

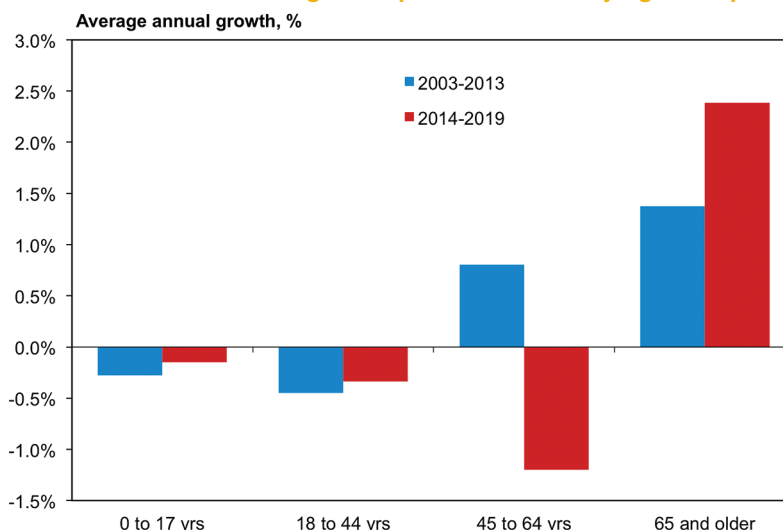
Export markets have always been a key source of demand for West Virginia businesses. However, they have become increasingly important in recent years and also served to buoy the state's economy during the Great Recession. In 2000, the total value of goods exported from West Virginia equaled just over 5 percent of the state's GDP, but exploded to a share of more than

FIGURE 2.15: Real Per Capita Personal Income Growth



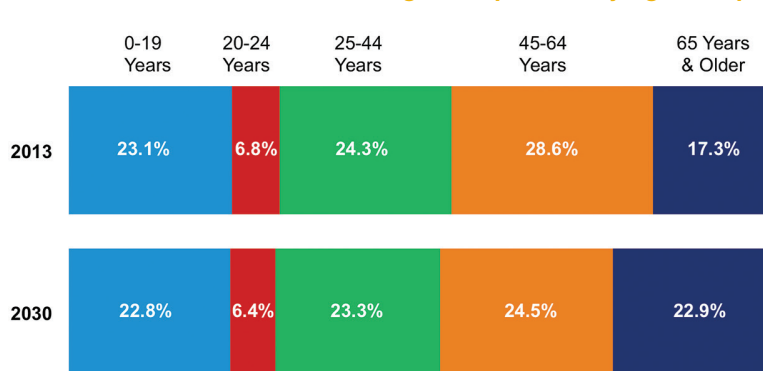
Sources: Bureau of Economic Analysis; WVU BBER Econometric Model; IHS Global Insight

FIGURE 2.16: West Virginia Population Growth by Age Group



Sources: US Census Bureau; WVU BBER Econometric Model

FIGURE 2.17: Share of West Virginia Population by Age Group



Sources: US Census Bureau; WVU BBER Population Projections

16 percent of total state output by 2012. A large share of manufacturing workers in West Virginia depend on exports for their jobs: more than one-fifth of manufacturing workers relied on exports for their jobs in 2011.⁶

Although exports did weaken in 2013, falling nearly 25 percent from their 2012 high to \$8.6 billion, they still represent the equivalent of nearly 12 percent of the state's economic output. In addition, even with the decline in export activity that occurred in 2013, the inflation-adjusted value of goods and commodities shipped to other countries from West Virginia busi-

6. <http://www.trade.gov/mas/ian/statereports/states/wv.pdf>

nesses has increased at a pace of 11 percent per year in the past decade.

Exports have continued to weaken through the first half of 2014. Through June 30th of 2014, West Virginia businesses have exported roughly \$4 billion to the rest of the world, representing a 12 percent fall from the first half of 2013.

West Virginia Export Commodities

Most of the state's fortunes in export markets have been driven primarily by foreign coal demand. In 2003, exports of minerals and ores, which in West Virginia's case, are made up largely by bituminous coal, totaled \$300 million in inflation-adjusted dollars, accounting for 10 percent of all exports. By 2010, this share increased to 43 percent, as the real value of exports reached \$2.9 billion.

The gains did not end there as coal exports reached an inflation-adjusted value of \$7.6 billion in 2012, accounting for nearly two-thirds of the state's entire export base. International coal shipments from West Virginia fell over the course of 2013, declining to \$4.6 billion, but still accounted for 53 percent of state export activity.

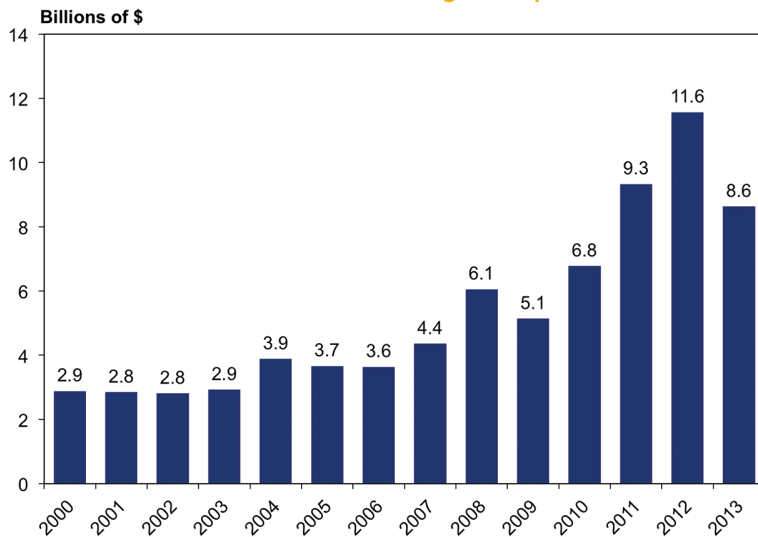
Through the first half of 2014, exports of minerals and ores have continued to fall. As of June 2014, exports of minerals and ores fell to \$1.8 billion. This represents a decline of roughly 35 percent from June of 2013. However, minerals and ores still make up the majority of West Virginia's exports globally at 45.3 percent of total exports.

Of course, coal is not the only good or commodity exported from the state. Indeed, the chemicals industry is the second largest source of exports from West Virginia, representing approximately 13 percent of the value of goods shipped internationally out of the state in 2013. Much of this can attributed to the healthy concentration of chemicals manufacturers throughout the Ohio and Kanawha Valleys. During 2013, approximately \$1.6 billion in products from the chemicals industry were exported from West Virginia to other countries. This marked a 1 percent gain versus 2012, but in general the inflation-adjusted value of chemicals exports from the state has been relatively stable since the mid-2000s.

Through the first half of 2014, exports of chemicals have totaled approximately \$850 million. Although continuing their relatively stable trend since the year 2000, chemicals exports are up roughly 5 percent compared to the first 6 months of 2013. The chemicals industry's share of overall export activity is also up slightly, representing 14.6 percent of total exports from West Virginia.

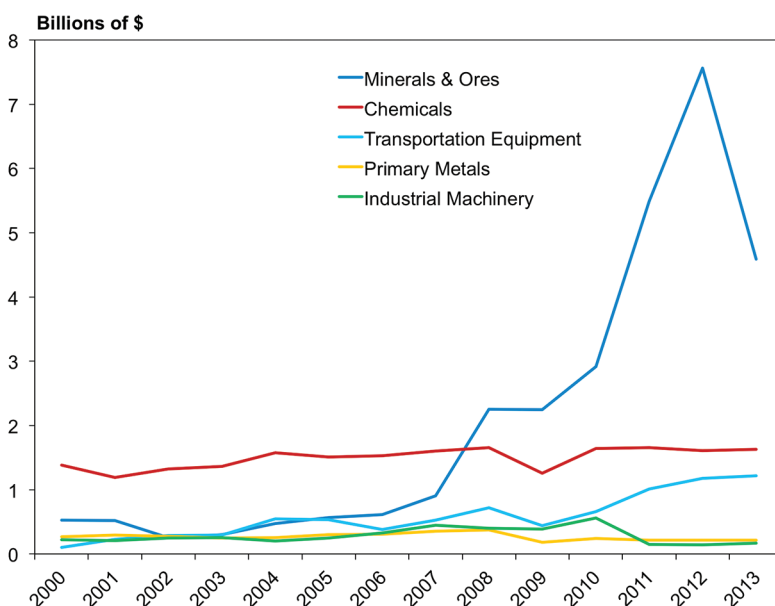
Aside from coal and chemicals, transportation equipment, such as auto engines and gear boxes as well as

FIGURE 2.18: West Virginia Exports



Source: International Trade Administration
*Note: Data are adjusted for inflation and expressed in 2013 dollars

FIGURE 2.19: West Virginia Top Five Exporting Industries



Source: International Trade Administration
*Note: Data are adjusted for inflation and expressed in 2013 dollars

civilian aircraft components, is the state's other major source of exported goods. More than \$1.2 billion of transportation equipment goods were shipped during 2013, a 3.3 percent increase from the previous year. Overall, automotive and aircraft exports (on an inflation-adjusted basis) from West Virginia increased at an average annual rate of 15 percent between 2003 and 2013.

Primary metal manufacturing saw small gains through 2013. Exports rose from roughly \$208 million to \$212 million, a gain of roughly 2 percent. Exports from the sector appear to be increasing through the first half of 2014. Through June 2014, exports of primary metals totaled \$143 million, up from \$109 million in the first six months of 2013.

Exports of oil and gas have risen and fallen over the past 13 years. In 2000, the value of West Virginia's oil and gas exports was very low. Oil and gas exports peaked in 2008 at \$58 million before declining to a low of \$2.8 million in 2012. With the increased oil and gas drilling activity occurring throughout the Marcellus and Utica Shale, West Virginia oil and gas exports increased to \$22 million in 2013 and has even exceeded that total through the first half of 2014. This value should grow higher in the years to come as oil and gas production continues to expand and the distribution and downstream processing infrastructure becomes increasingly better developed.

Where Do West Virginia Exports Go?

Exports connect West Virginia's economy to countries around the world. West Virginia businesses exported to 146 countries in total during 2013, with most of the state's exports going to familiar destination countries in North America, Europe, and Asia. Canada was easily the largest destination market for goods and commodities produced in the state, as our neighbor to the north received more than \$1.8 billion in exports (21 percent of all West Virginia exports). Through the first half of 2014, Canada received \$927 million in exports, marking a 4.4 percent increase over the same period a year ago.

The Netherlands checked in as the second-largest export destination country in 2013, but saw a significant decline compared to the previous year due to a drop-off in Dutch demand for coal. The Netherlands remains West Virginia's second largest export market in the first half of 2014, although their demand for coal has fallen slightly since June of 2013. As of June 2014, the Netherlands have imported \$330 million of West Virginia goods, down 26.5 percent from June 2013.

Rounding out the top five export destination countries during 2013 are China, Brazil and Italy. Interestingly, Brazil and Italy replaced India and Japan, respectively, in the top five from the previous year.

FIGURE 2.20: West Virginia Exports

Exports Commodity	Export Value (millions of 2013 \$)	Share of Total West Virginia Exports (%)
Bituminous Coal	4,548	52.7%
Reciprocating Piston Engine	505	5.9%
Gear Boxes for Motor Vehicles	464	5.4%
Nylon Polymers	248	2.9%
Civilian Aircraft, Engines and Parts	196	2.3%
Artificial Joints, Parts and Accessories	127	1.5%
Synthetic Rubber Compounds	110	1.3%
Polyethers	102	1.2%
Polyacetal Plastics	97	1.1%
Polyester Resins	86	1.0%
All Export Commodities	8,631	-

Source: US Census Bureau

FIGURE 2.21: Top Destination Countries for West Virginia Exports

Exports Destination Country	Export Value (millions of 2013 \$)	Coal as Share of Destination Country Exports
Canada	1,845	9.5%
Netherlands	665	80.8%
China	613	28.2%
Brazil	513	72.9%
Italy	470	93.7%
United Kingdom	449	89.1%
France	395	83.0%
Turkey	330	98.1%
Mexico	324	50.3%
India	324	50.3%

Source: US International Trade Administration

Overall, despite the weakening of exports from the state during 2013, international demand for manufactured goods and commodities produced in West Virginia will play a major role in supporting the state's economy going forward. While we anticipate an improvement in export demand over the near term, geopolitical risks do remain a threat to global economic growth and competition on the international coal supply market remains fierce, particularly from countries such as Australia. Consequently, this could jeopardize any longer-term rebound in global demand for West Virginia coal exports and further dampen any source of upside potential for the state's coal industry.

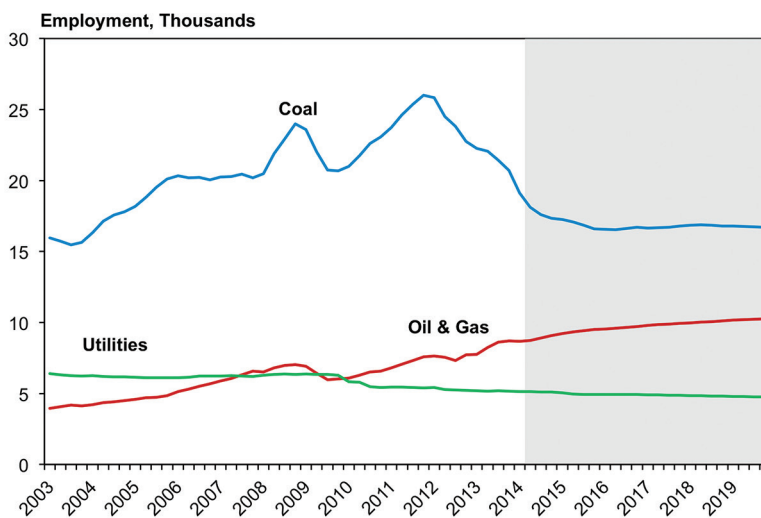
CHAPTER 3: WEST VIRGINIA'S ECONOMY, INDUSTRY FOCUS

ENERGY

West Virginia's energy sector has been extremely volatile over the last two years with steep declines in coal production and employment coupled with large-scale gains in the oil and gas sector. While the state's energy sector continues to be dominated by coal mining and coal-fired power generation, the shale gas revolution has dramatically altered the landscape in the state with rapid increases in gas production and employment bolstering an otherwise soft energy sector. Employment in the overall energy sector, which includes

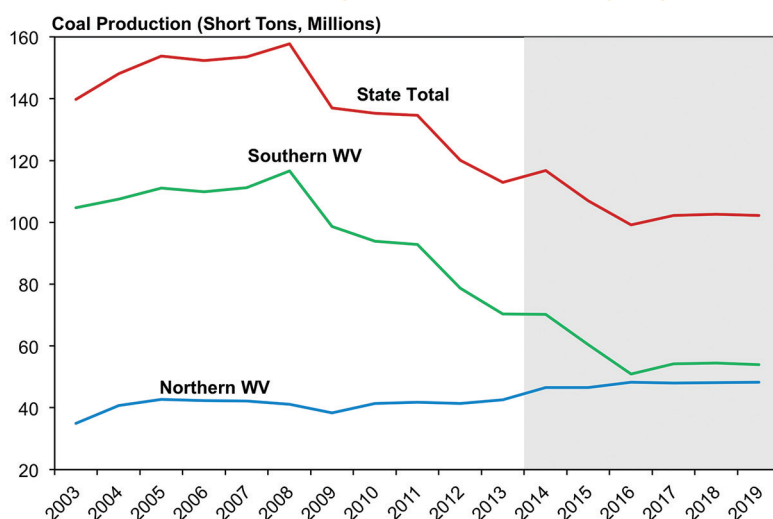
mining and utilities, declined by almost 2,000 jobs in 2013, a drop of more than 5 percent. These losses were not felt equally across industries, however. Coal mining suffered the deepest losses, with oil and gas extraction making up some, but not all, of the declines. We expect employment in the state's energy sector to expand slightly in coming years as anticipated growth in the oil and gas industries offsets additional job losses at coal mines and utilities. Overall, we forecast a gain in employment of 0.2 percent on an average annual basis between 2014 and 2019.

FIGURE 3.1: West Virginia Energy Sector Employment



Sources: US Bureau of Labor Statistics; WVU BBER Econometric Model

FIGURE 3.2: West Virginia Coal Production by Region



Sources: US Energy Information Administration; WVU BBER Econometric Model

Coal

The state's coal mining industry entered a period of decline starting at the beginning of 2012 and this continued over the course of 2013. West Virginia's coal industry shed more than 2,600 coal mining jobs in 2013, a drop of about 11 percent compared with 2012. Nearly 7,000 mining jobs have been lost between the recent peak in the fourth quarter of 2011 and the first quarter of 2013, a drop of more than 26 percent (see Figure 3.1).

Coal production in the state has followed a similar trajectory as employment (see Figure 3.2). Production fell to 113 million tons in 2013, which amounts to a 6 percent drop from the year before. The production losses were not uniform across West Virginia, however. Production in the southern part of the state, those counties that are part of the Central Appalachian coal region, fell starkly, dropping to about 70 million tons in 2013 from more than 78 million tons in 2012, a fall of more than 10 percent. Production in the state's northern coal counties, however, rose by nearly 3 percent in 2013 and has shown stability overall the past decade.

Various factors have played into the decline in the coal industry over the past two years. One of the main drivers has been a dramatic reduction in the price of natural gas as a result of the revolution in shale gas production following the widespread adoption of hydraulic fracturing techniques. This has caused utilities to switch to natural gas as a fuel for power generation (see the Utilities section below for more information). West Virginia's coal mines are also seeing increased competition from mines in Illinois, which has seen a production increase of nearly 40 percent in the past two years despite a falloff in overall US coal demand.

The divergent performance of the state's northern and southern coal regions is tied closely to declining productivity of the state's southern coal mines. As Figure 3.3 indicates, worker productivity, which is measured

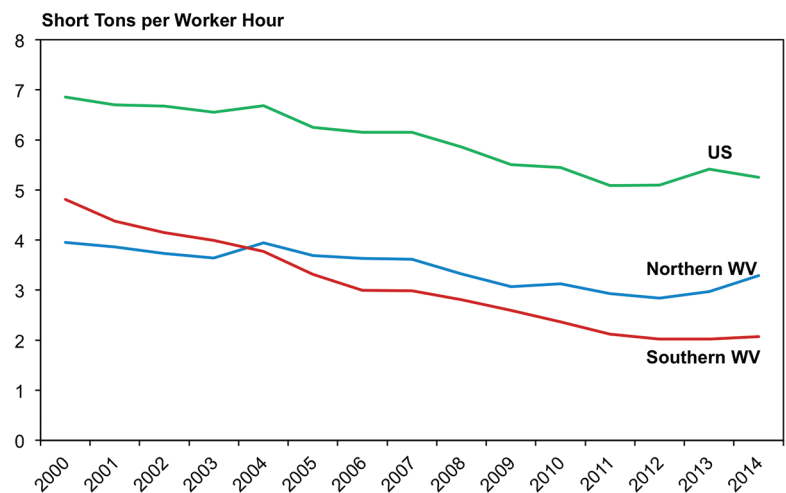
as short tons per worker hour, at the state's southern mines has been declining since 2000, dropping by more than half to about 2 tons per worker-hour in 2014 from almost 5 tons per worker-hour in 2000, a decline of almost 6 percent per year on average. The decline was significantly faster than in the United States overall, which fell 1.9 percent per year on average. During the same time frame, productivity at West Virginia's northern coal mines declined at a slower rate, falling from 4 tons per worker-hour to 3.3 tons per worker-hour, a drop of 1.3 percent on an average annual basis.

Another factor that reduced demand for the state's coal in the past year was a falloff in coal exports. After rising for most of the last decade, the value of West Virginia's foreign exports of minerals and ores fell to \$4.6 billion in 2013 from \$7.5 billion in 2012, a loss of 40 percent. Exports to India, South Korea and China, each of which had been among West Virginia's largest purchasers of coal in 2012, dropped by more than 60 percent. Coal exports have fallen even further during the first half of 2014, sliding 26 percent through the first six months of the year compared to the same time period in 2013.

Aside from a brief uptick in 2014, which is largely due to a harsh winter that depleted utilities' coal stockpiles, we forecast that coal production in the southern part of the state will continue to fall over the next two years. We forecast production in the northern part of the state will rise modestly, and roughly equal the production in the south by 2016. Over the longer term, coal production will rebound slightly, but still end up down by 2019, falling at an average annual rate of 2.6 percent over the forecast period.

Coal employment is forecast to fall through the middle of 2016, and then flatten out at fewer than 17 thousand jobs. This represents an average annual decline of 1.5 percent over the forecast period, with virtually all of the losses occurring in 2015 and 2016. This forecast reflects continuing market pressures from competition with natural gas. The coal industry will also continue to be affected by the regulatory environment in the utility sector, the largest purchaser of West Virginia coal—including a new proposed rule from the US Environmental Protection Agency to reduce carbon emissions. See the Air Pollution and Carbon Regulations section below for more information on these developments.

FIGURE 3.3: Coal Mine Worker Productivity



Source: Author calculations based on data from US Mine Safety and Health Administration
Note: 2014 data reflect first quarter

INDUSTRY INSIGHT:

TURBULENT TIMES FOR WEST VIRGINIA COAL

Despite challenging times, the West Virginia coal industry is proud to continue to be a major contributor to the state's economy. The state's coal is extracted by more than 19,000 of the best coal miners in the world, and is used in coal-based electricity generating plants throughout the State that are efficient and compliant with all regulatory policies. We are passionate about doing everything we can to protect our people's jobs and making sure we continue to be a significant compo-

nent of our economy. While we have experienced declining production over the past few years, we are blessed with some of the finest metallurgical coal in the world and we continue to be the nation's second leading coal-producing state in the country.

However, we need help, as do the other coal-producing states across Appalachia. The industry in West Virginia, and those states surrounding us, are experiencing as challenging of times as anytime in the last several decades. There are a number of reasons, but none greater than anti-



BILL RANEY, President
West Virginia
Coal Association

coal policies of the current federal administration.

While there have historically been ups and downs in the cycle of business, this time seems different in that we are experiencing a perfect storm of pressures, creating a paralyzing

situation that threatens the jobs of our people, the mining of our coal, the integrity of this nation's electric grid, and our country's security.

Some want to point to the geologic and geographic challenges resulting from 150 years of mining high-quality bituminous coal that fueled American victories in the World Wars and conflicts of the 20th century as well as the industrial revolution that provided the strong basis for the United States to become the true leader of the free world. Others point to the increased supply of natural gas that keeps its price low. But the real factor most directly affecting our ability to mine and use more West Virginia coal is, unquestionably, the anti-coal policies of our own federal government. This, in itself, is puzzling and amazing since America has more coal reserves than any other country in the world.

It is only logical to think the federal government of our country, which has for years cried for energy security and energy independence, would do everything possible to promote the extraction and use of our most prolific resource. If there are problems with its extraction or its use, one would, again, logically expect the government to undertake meaningful research and incentives to be sure America becomes a world leader in clean-coal based energy.

Can anyone imagine Saudi Arabia, Iraq or any of the other Middle Eastern countries treating their oil reserves the way this government is treating American coal reserves?

The future of West Virginia coal is all about the cost of production and the ability of our coal to compete in the domestic and international markets, particularly since we are competing with other countries that mine similar coals, but do not meet American standards. We would never seek a diminution of safety or environmental standards, as nothing is more important than the wellbeing of our professional miners and the health and welfare of their families. However, there must be a level of practicality injected into the current policies and laws in effect today or being proposed for the future.

Our coal miners are the "best practicing environmentalists" in the world as they do everything they can each day to protect the environment they work and live in throughout West Virginia. We are confident our operations are among the best, if not the best, in the world given the conditions in which we mine and use our coal. But, West Virginia policies and laws need to mirror those in most other states so as to achieve that ever-elusive "level playing field" for cost competitiveness. The changes, at the state level, will not diminish nor detract from our desire to be the best in safety and environmental protection, but the changes will allow us to continue to operate so we can improve each day and keep our people working, contributing to their communities and state.

There remains plenty of opportunity for our longtime contribution. According to the West Virginia Geologic and Economic Survey, West Virginia has some 50 billion tons of remaining coal reserves. Since record keeping began we have mined some 14 billion tons of coal in West Virginia. This means we literally have hundreds of years of coal we can mine and, therefore, continue to contribute to the State's well-being and America's energy security well into the future.

The ingenuity and devoted work ethic of our miners and managers will find answers to the geologic and geographic challenges, and to the competition from natural gas which will likely develop its own set of challenges, but for us to realize that future the behavior and proposed regulations of this federal administration has to change. This administration must understand that a working West Virginian is a healthier West Virginian. And they want to work right here, not in North Carolina, Michigan, Georgia or Florida. They want to remain here doing what they do best, mining and using West Virginia coal, so they can raise their families where they were raised.

Our miners will protect the streams and mountains, because they are the ones they fished and hunted when they were growing up and they want their children and grandchildren to be able

to enjoy those same natural benefits. There cannot be a higher level of protection than that familial preservation.

We have to create a mechanism that prompts an increased use of West Virginia coal in our West Virginia power plants, but one that does not affect the revenues of the state. An additional 16 million tons of West Virginia production would be a tremendous benefit to keep more of our people working and to bring increased revenues to the state.

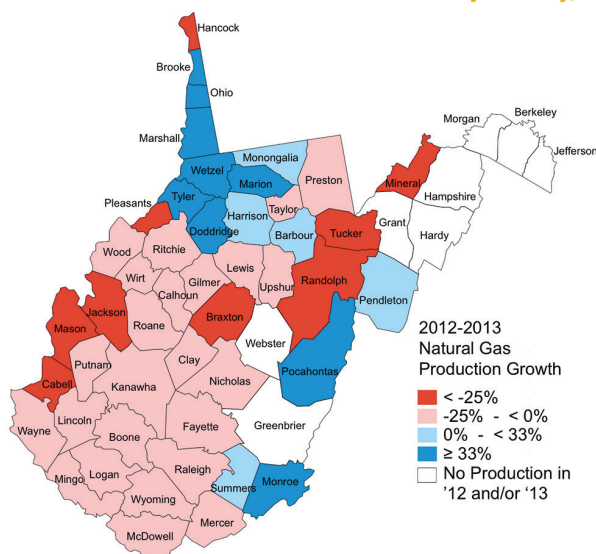
Our biggest problem today, as mentioned earlier, is the attitude and behavior of our own federal government toward our coal miners and our industry. There are specific federal issues that need to be changed, reversed and retracted. We will make every effort to work with everyone to reach a reasonable solution. But the overreaching problem is the lack of respect shown to our professional coal miners and managers by this administration.

Previous administrations had respect for the West Virginia and American coal miners and managers—and the tremendous job they do every day. Previous administrations—the Bushes, Clinton, Reagan, Carter, Nixon, all the way back to President Truman—knew that America has more coal than any other country in the world, and they recognized the tremendous contributions West Virginia coal miners—America's coal miners—made to improve the quality of life of Americans everywhere. Each of those previous administrations sought to strengthen our country through the electrification of America with coal-powered electricity. They each knew that our coal provided the reliable, low cost electricity that became the envy of the world, dependable feedstock for domestic steel, as well as America's manufacturing, chemical and technology industries. They didn't favor one region over another. They didn't favor one fuel over another, they were simply depending on the one fuel that would most likely bring energy security for America and improved lifestyles for all Americans. We must regain that respect.

However, production growth between 2012 and 2013 (Figure 3.6) was limited largely to the northwest part of the state where producers can tap into the Marcellus and Utica Shale formations and gain additional value from the extraction of petroleum liquids. Brooke and Ohio counties had the highest production growth in the state, rising more than 700 percent over 2012 levels. However, rapid growth rates were observed in these areas primarily because widespread natural gas drilling is relatively new. Ritchie and Doddridge counties, which have had gas-producing wells for many years, saw growth rates in excess of 80 percent last year. The state is also increasing its pipeline capacity to handle additional growth. Planned pipeline construction in and around West Virginia is set to increase the state's capacity by 11 percent over the next three years.

Natural gas production will likely continue to rise quickly over the next five years. Production is expected to increase by an annual average rate of 14 percent between 2014 and 2019. This rise is slower than it has been over the last five years, but will cause gas production to nearly double during the forecast horizon. Employment in the natural gas sector is forecast to rise at a more modest pace. Natural gas industry employment is expected to increase by nearly 1,500 jobs on average between 2014 and 2019. This increase represents a growth rate of 3 percent on an average annual basis. These gains will further cement the natural gas industry's importance in the state's energy economy. Natural gas's share of energy sector employment is expected to reach nearly one-third by 2019, up from 23 percent in 2013.

FIGURE 3.6: Natural Gas Production Growth by County, 2012-2013



Source: West Virginia Department of Environmental Protection

INDUSTRY INSIGHT: NATURAL GAS DEVELOPMENT IN WEST VIRGINIA

West Virginia is an energy state. West Virginia is an extractive state. With the United States embracing horizontal drilling and hydraulic fracturing, we are capable of sustaining economic growth and recovering fully from the recent recession. These factors have given our residents job opportunities, security, identity, and an integral role in our nation's future. Our residents will continue to see many positives from shale development, which includes the creation of direct jobs, as well as spillover benefits for other industries. For example, shale development also has the potential to revitalize manufacturing in West Virginia. Companies can depend on not only the state's vast natural resources, but on the advantages afforded by our intermodal transportation system and utility costs that are among the world's most affordable.

The development of technology to extract natural gas from the abundant shale formations in the United States has opened a door for West Virginia to become a critical link in the chain of supply that can lead to energy independence. Some reports suggest natural gas reserves in the Appalachian Basin could last far more than a century based on current usage demands, and that may be only the tip of the iceberg.

The oil and natural gas industry believes the Marcellus Shale, Utica Shale, Trenton Black River, and the Rome Trough, along with the gas that was left behind by inefficient vertical drilling techniques, provides a new world order of energy development. Geologists believe that vertical wells, drilled for both oil and natural gas, have only produced 10 to 20 percent of the resources available. Having access



NICHOLAS "CORKY" DEMARCO
Executive Director, West Virginia Oil and Natural Gas Association

to a vast supply gives West Virginia and the United States an advantage globally. The geopolitical landscape has changed since the nation now has access to the wealth of the shale in the Appalachian Basin and additional states. It is hard to believe that in 2006-07 the US imported natural gas from North Africa and Venezuela, and now we are retrofitting our port facilities to ship natural gas to our overseas trading partners.

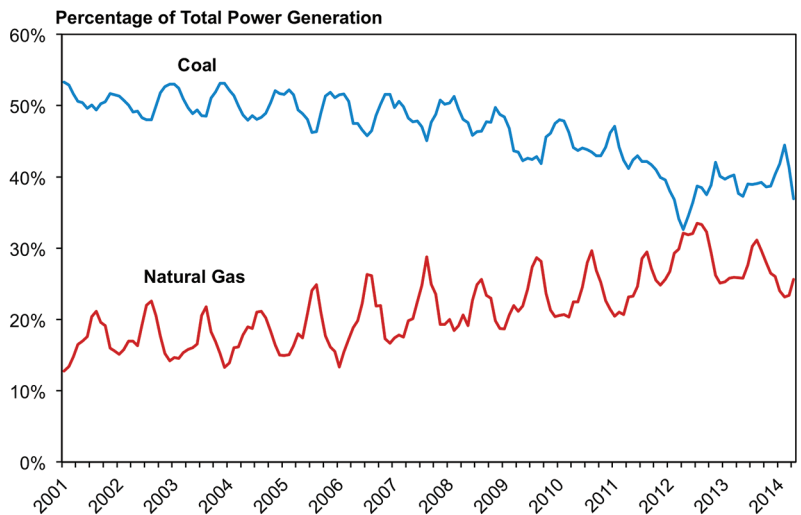
In the Appalachian Mountains, the second oldest mountain range in the world, several hundreds of millions of years of decaying, folded materials have produced coal that is among the highest in energy content in the world. Now we are able to unlock the hydrocarbon-rich shale formations that are rich in the building blocks for plastics, medicines, and chemicals. At the same time, supplies are vast enough to replace imported oil with methane-based transportation fuels.

The future is ours. The responsibility to use these enormous resources and opportunity is in our hands for now and years to come. How we take advantage of this natural gift is up to us and those who follow.

Utilities

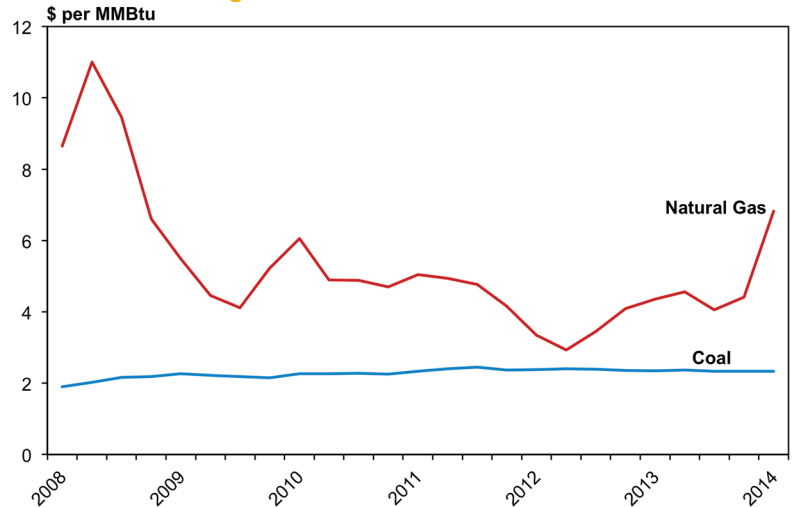
The utility sector in West Virginia continues to be pressured both from unfavorable market conditions and from new federal regulatory requirements. Employment in the state's utilities fell by a little more than 100 jobs in 2013, a reduction of 1.5 percent. Coal-fired power plants represented more than 95 percent of the state's power generation in 2013, but nationally natural gas has taken on a larger role in electricity generation over the last decade. As Figure 3.7 shows, natural gas has made significant market share gains over the last several years, rising from as low as 13 percent in 2001 to a high of 33 percent of total US power generation in 2012. In the same time period, coal's share of US power generation fell from 53 percent in 2001 to as low as 32 percent in 2012. As illustrated in Figure 3.8, as natural gas prices have risen in recent months, however, coal

FIGURE 3.7: US Electric Power Generation by Fuel Type



Source: US Energy Information Administration

FIGURE 3.8: Average US Cost of Fossil Fuels for Power Generation



Source: US Energy Information Administration

has regained its lead in power generation, with its share rising to as much as 44 percent in the early part of 2014. Natural gas generation has fallen to approximately one-quarter of power generation in the early part of 2014.

Despite these short-term gains, the prospect for coal-fired generation in the longer-term remains unfavorable. Capital costs for new coal-fired power plants remain high in comparison to natural gas combined cycle plants. The EIA predicts that for plants entering service in 2019, costs for natural gas will be almost one-third lower than for coal on a per megawatt hours (MWh) basis. The effect of this cost difference is apparent in the amount of proposed capacity changes nationally. Of the 72 GW of new capacity proposed to be built in the next 10 years, less than one percent will be powered by coal, and more than half will be powered by natural gas.

The falloff in demand for coal-fired power generation has taken its toll on the state's utilities. About 1,700 MW of coal capacity was set to be retired between 2013 and 2015 in West Virginia, amounting to 10 percent of the total capacity in the state. Yet, despite the difficulties in the coal-fired power sector, the state has begun to see renewed interest in building natural gas generation in the state. Moundsville Power, LLC recently received a permit to build a 549 megawatt natural gas combined cycle plant in Marshall County, which officials said could lead to 400 new jobs there. This plant would increase the state's existing natural gas capacity by 50 percent. The Willow Island hydroelectric plant in Pleasants County is currently under construction, which would add a total of 44 MW of renewable capacity.

The state's utility sector is expected to lose approximately 400 jobs between 2014 and 2019, a loss of slightly more than 1.4 percent on average annually. These job losses could be offset somewhat if we begin to see new natural gas power generation being built in the state. However, it's likely that the new carbon rules could induce additional coal-fired power plant closures during the next five years that are not accounted for in the forecast (see the next section for more details).

Air Pollution and Carbon Regulations

Several new federal regulations that have been proposed or have gone into effect recently are likely to have significant impacts on the state's energy sector in the coming years. Air pollution rules have already had an effect on the state's utility industry and demand for the state's coal. And new carbon pollution rules pose challenges for West Virginia's coal and utility sectors, while offering potential new opportunities for natural gas production.

The US EPA's Mercury and Air Toxics Standard (MATS) sets limits on emissions of mercury and other heavy metals from power plants. The rule was finalized in

2011, and gives utilities four years to comply with the standards, which will in many cases require new pollution control facilities to be installed at power plants. The EPA also finalized the Cross-State Air Pollution Rule (CSAPR) in the same year, which sets limits on air pollution that cross state boundaries. The CSAPR was challenged in court, but in April 2014 the US Supreme Court upheld the EPA's regulatory power. The EPA has since asked that the CSAPR be reinstated.

A number of utility operators have cited these two regulations as the driving factor in their decision to shut down coal-fired power plants. Estimates of the impact of CSAPR and MATS' indicate that roughly 4-5 GW of coal-fired capacity nationally will be shut down as a result of these rules, which is approximately 10 percent of the total power plant retirements scheduled between 2013 and 2015.

The EPA has also proposed two new rules to regulate carbon emissions in the power sector. The first of these rules covers new sources of carbon pollution. This rule was first proposed in 2012, but was substantially revised after the rule's comment period. New rules were proposed in September 2013, with the final rule published in January 2014. The new source carbon rules apply only to new power plants, and limit carbon emissions to 1,100 pounds of CO₂ per megawatt hour of generation. For coal-fired power plants, this emissions level would be difficult to achieve except through the use of carbon capture and storage technologies, thus making it unlikely that new coal-fired generating plants will be built in the near term. However, the EPA's economic impact study of these rules indicates that it is unlikely to have much of an impact in the short-term as most of the new proposed power generation plants in the country use natural gas as a fuel instead of coal.

In June, the EPA proposed another set of carbon pollution standards, part of the EPA's Clean Power Plan, that have the potential to have more significant effects on coal-fired power generation. The standards require states to reduce carbon emissions from the nation's power plants by 30 percent from 2005 levels by 2030. Because coal produces about 75 percent of the carbon emissions in the power generation sector, these rules will have a larger impact on coal than other fuel sources. Each state has its own emissions requirement, with West Virginia required to reduce carbon intensity of its power plants by about 20 percent. The rules give states wide flexibility in determining how to meet the standard, ranging from efficiency improvements at power plants, to increasing renewable power generation and encouraging consumers to reduce electricity usage.

Since these carbon rules are still in the proposal stage and since they are slated to take effect over a long period

7. Blair Beasley, Matt Woerman, Anthony Paul, Dallas Burtraw, and Karen Palmer. "Mercury and Air Toxics Standards Analysis Deconstructed." Washington DC: Resources for the Future, 2013.

of time, their effects have not been considered in the forecasts. Because of this, the actual outcomes for the utility sector and coal sector could come in well below our forecast. However, these carbon regulations tend to favor natural gas power production, because of its lower carbon content. Thus the regulations have the potential to increase demand for natural gas, as well as spur new development in natural gas generating plants in the state, such as the proposed facility in Marshall County.

MANUFACTURING IN WEST VIRGINIA

The manufacturing sector accounts for 7 percent of all jobs and roughly 10 percent of total economic output in West Virginia. Although these figures are well below the levels experienced in past decades, and also slightly below the current national average, several regions within the state remain quite dependent upon the sector and certain industries have retained their historical relevance.

The chemicals industry accounts for nearly one-fifth of all manufacturing jobs in the state and nearly 44 percent of the sector's overall economic output. Most of the state's chemical manufacturers (excluding pharmaceuticals) are concentrated within the Kanawha and Ohio River Valley regions and produce a range of organic and inorganic compounds as well as resins and synthetic fibers. In addition, the chemicals industry also heavily factors into West Virginia's global footprint, representing the second-largest source of exports from the state. After increasing 2.4 percent in 2013, chemicals exports have climbed more than 5 percent through the first half of 2014.

Beyond chemicals, other major industries within the state's manufacturing sector include the wood products industry, fabricated metals, transportation equipment (auto parts as well as defense and non-defense aerospace) and primary metals, i.e. steel and aluminum. Combined, these industries accounted for roughly three-fourths of the sector's output and 62 percent of all manufacturing jobs found in the state during 2013.

Since most of the state's manufacturers are affected by broader macroeconomic trends, the 2007-2009 recession certainly weighed on the sector as a whole; however, the rate of decline observed across these industries was far from uniform. West Virginia's wood products and furniture industry was by far the hardest hit of any segment. Following the collapse in single-family housing construction across much of the US, output from the state's sawmills, furniture, flooring and other building materials manufacturers plunged, causing business in the industry to cut payrolls nearly in half between early 2006 and 2012. Thanks to the recovery in home-building activity throughout much of the US, output from West Virginia's wood products industry

has been trending higher and allowed employers to increase jobs in the industry nearly 5 percent during calendar year 2013.

The downturn was less severe for the state's chemicals manufacturers as aggregate industry output declined less than 15 percent and employment levels fell by approximately 7 percent. Unfortunately, payroll levels in the state's chemicals industry have been on a downward trend due to a combination of increased technological innovation and greater competition from lower-cost producers overseas. This trend remained in place during 2013 as overall chemicals industry employment declined 2 percent for the year.

Fabricated metals tends to follow broader US manufacturing activity. However, with a significant percentage

FIGURE 3.9: Share of Total Manufacturing Employment (2013)

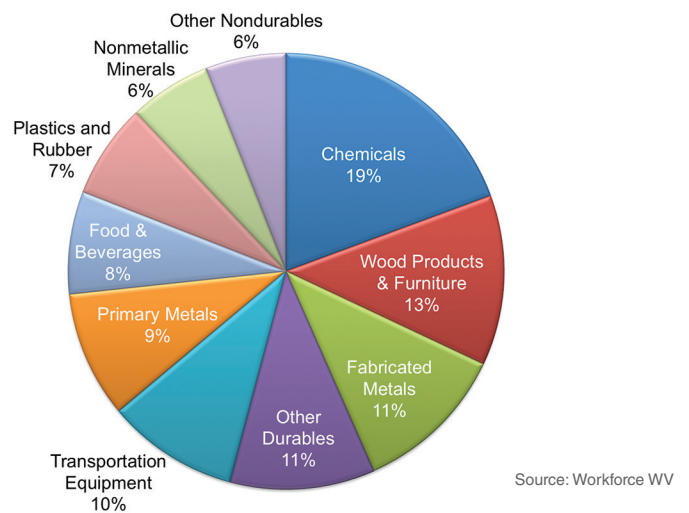
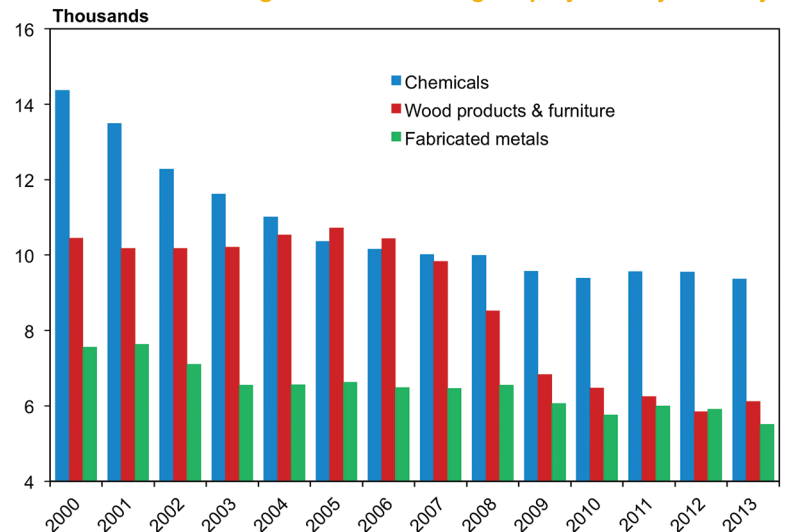


FIGURE 3.10: West Virginia Manufacturing Employment by Industry



of the industry coming from machine shops, turned product and screw/nut/bolt manufacturers that directly supply or are closely tied to the coal industry, conditions for the fabricated metals industry have deteriorated. Indeed, after registering a solid growth during 2011, industry output and employment have contracted by nearly 10 percent over the last two years.

A significant portion of the products manufactured by West Virginia's plastics producers are destined for the housing market, including items such as vinyl windows, siding and bathtubs. As was the case with the wood products and furniture industry, this manufacturing segment was hurt significantly by the downturn in the US housing market. However, the extent of declines was much less significant by comparison thanks to a solid pace of home remodeling activity and federal tax incentives for homeowners to install "green" equipment such as energy efficient windows. The state's transportation equipment industry lost nearly 1,000 jobs between mid-2006 and late-2010. Falling auto demand weighed heavily on the state's auto parts and equipment manufacturers while the defense and non-defense segments of aerospace weakened considerably over this time period. Nearly half of the jobs lost during the industry's downturn have been recovered, but virtually all of these gains have been added on the automotive side due to persistently weak demand for defense aerospace equipment.

Sector Outlook

The outlook for the West Virginia's manufacturing sector as a whole has improved, as the forecast calls for

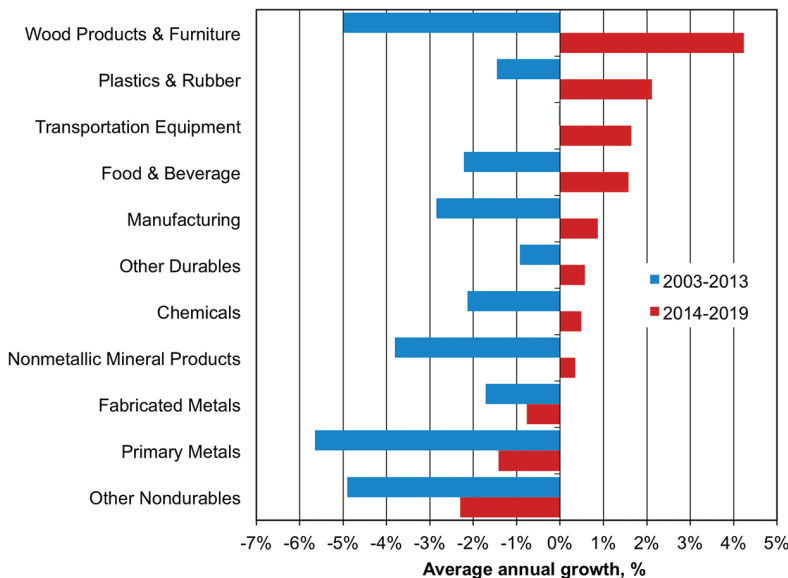
employment to increase 0.9 percent per year through the end of 2019. We anticipate the wood products industry will experience the fastest growth during the outlook period as the continued recovery in the US housing market boosts demand for framing lumber, flooring, and related products. The state's plastics industry will also enjoy growth that is above average for the sector thanks to the housing market recovery, expanded use of energy-efficient products in homes, as well as a broader cyclical increase in demand expected to bolster the state's plastics industry.

Transportation equipment manufacturing is expected to see strong growth of 1.6 percent per year over the next five years. The state's growing network of auto parts manufacturing bodes well for the outlook, as Toyota, Gestamp, Alleward Sogefi and other manufacturers expand their operations in light of rising U.S. vehicle demand. The aerospace segment of the industry will likely perform better in comparison to the past several years, but the state's defense aerospace manufacturers are expected to fall victim to realigned spending priorities as policymakers look for ways to reduce the deficit and public debt. Payrolls have already begun to increase at the state's food and beverage processing plants, and we anticipate this growth to continue going forward at a pace of 1.6 percent, or approximately 100 jobs, per year during the outlook period.

Perhaps the most significant change in the outlook is in the state's chemicals manufacturing industry. Instead of a continuation of the downward trend in employment that has existed over the past two decades, we now anticipate a modest increase of 0.5 percent per year between 2014 and 2019. Most of the anticipated job growth will come from the state's pharmaceutical manufacturers, but the explosive growth in natural gas production bolsters prospects for the industry in several fundamental ways. First of all, natural gas serves as a feedstock in producing an array of chemicals and/or to fire cogeneration plants. As a result, abundant reserves of a vital input to the production process will likely help chemicals producers to cut costs and enabled companies to implemented domestic capacity expansion plans on a widespread basis for the first time in decades.

In addition to lowering input costs, the availability of rich gas deposits in the Marcellus and Utica shale has already prompted growth in downstream processing of natural gas and natural gas liquids at fractionation and cryo-processing plants. These establishments fall under the mining sector, but the products created from the fractionation process, such as ethylene, are significant inputs for producing an array of industrial chemicals, resins and plastics.

FIGURE 3.11: West Virginia Manufacturing Industry Employment Growth Forecast



Source: Workforce WV; WVU BBER Macro-Econometric Forecast Model

Numerous plants have surfaced over the past several years in locales such as Wetzel, Doddridge and Marshall counties as well as neighboring counties in Pennsylvania and Ohio. MarkWest recently announced plans to add a new processing plant at its Doddridge County operations by late 2015, increasing its processing capacity to 1.4 billion cubic feet per day. However, the most significant prospect to integrate natural gas and by-product liquids into manufacturing processes and other uses is the proposed multi-billion dollar Braskem/Odebrecht ethane cracker plant.

We anticipate continued job losses in the state's fabricated and primary metals industries, but the rates of decline are expected to be measurably slower in comparison to the past ten years. A significant portion of the fabricated metals industry will be hurt by the weak outlook for coal demand. While growth in natural gas exploration, production and distribution have bolstered demand for steel and aluminum tubing, West Virginia's primary metals manufacturers are not expected to add jobs going forward as they continue to grapple with intense international competition and high legacy costs.

INDUSTRY INSIGHT:

A RESURGENT MANUFACTURING INDUSTRY IN WEST VIRGINIA

Perhaps the most important opportunity for manufacturing in West Virginia in over 50 years is the development of the Marcellus shale. Thanks to an abundant and affordable supply of shale gas, West Virginia is poised for a manufacturing renaissance that starts with the chemical industry and ripples throughout the state's economy. After years of high energy costs and industrial decline, the new economics of shale gas create a competitive advantage for West Virginia and US chemical manufacturers, which translates into increased investment, economic growth and tens of thousands of new manufacturing jobs, with the big prize of growing the manufacturing sector in West Virginia. We rely on natural gas, not just to produce heat and power, but also as the key ingredient or feedstock to create the chemicals that go into the products that we all use every day.

The security and stability of an affordable and abundant supply of natural gas for heating, processing, electric power generation, and as a chemical feedstock have helped make US manufacturing more competitive in the global marketplace. An expanding manufacturing sector is also important to the natural gas industry, as manufacturing represents over 30 percent of the natural gas market. This shared energy and manufacturing

expansion is helping transform the US energy outlook and is opening up new opportunities for the future of manufacturing.

Cal Dooley, President and CEO of the American Chemistry Council, notes that "natural gas is to the chemical industry, as flour is to the baking industry," and "in 2008 no chemical company was planning investments in the US, today they all are." That's mainly because we are able to produce natural gas so cheaply that the entire global chemical industry is relocating here. Many companies that spent decades moving chemical production to the Middle East and Asia are now leading the biggest expansion back into the US as shale gas revives the chemical industry's economics.

Benefits for West Virginia

West Virginia lies in the middle of the Appalachian Basin on top of two of the most prolific shale plays in the US, the Marcellus and the Utica. The Marcellus shale is considered one of the largest shale fields in the world and has the key benefit in that it produces wet gas, containing not only methane, but also valuable natural gas liquids. West Virginia is already realizing significant economic benefits from both upstream-leasing, drilling, completions and production, as well as midstream-pipelines, gas separation and fractionation plant construction

and utilization. This activity is literally in the beginning stages of development, with investment in the Marcellus and Utica shale estimated as high as \$200 billion for upstream and midstream assets in the next 10 years, mainly in West Virginia.

Current Benefits Realized

The "downstream" economic benefits of a secure supply of low-cost natural gas is restoring a global competitive advantage to West Virginia's many energy intensive industries—chemical, aluminum, steel, glass, cement, plastics, automotive—many of which are beginning to invest millions of dollars to increase their operations. West Virginia industry also realizes the benefits of having direct access to river, rail, roads and other raw materials - including proximity to markets (domestic and international) and a strong workforce.

This new globally advantaged gas supply is attracting new international manufacturers to West Virginia—like Brazil's Odebrecht/Braskem, with plans to build a world-scale ethane cracker in Wood County, Spanish automotive parts maker, Gestamp, in Charleston, and Italian gas meter and valve manufacturer, Pietro Fiorentini,



JOE EDDY, President and CEO, Eagle Manufacturing Company

in Wheeling. Lower gas costs are also helping hold down electricity prices as natural gas' share of power generation increases. The development of shale gas infrastructure has also given a considerable boost to manufacturing by increasing demand for steel tubular goods used for drilling, production, transportation and distribution, as well as increased demand for chemicals, cement, environmental and safety products, and heavy equipment used in the gas industry.

Ethane to Ethylene is Key

The most important "downstream" economic benefit lies in the fact that the chemical industry also utilizes the natural gas liquid, ethane, as the primary feedstock in the production of ethylene, the world's largest volume petrochemical and the basic building block used to manufacture polyethylene and other products for the construction, food packaging, textile, apparel, automotive and many other industries. Ethane supply conditions are so favorable that it is now cheaper to produce ethylene in the US (\$300/ton) than in Saudi Arabia (\$455/ton), Europe (\$1,250/ton) or Asia (\$1,700/ton).

US ethane supply is projected to increase an additional 50 percent by 2016 to 1.4 million barrels per day (bpd), which more than doubles the supply since the beginning of the shale gas boom. This increased availability of inexpensive ethane affords a significant competitive advantage to manufacture ethylene domestically. A recent ACC study notes a 30 percent increase in ethane supply, and a 15 percent decrease in natural gas prices, should result in 1.2 million additional jobs, \$72 billion in capital investment, a 7 percent increase in U.S. manufacturing expansion, \$342 billion in total economic expansion and over \$26 billion annually in federal, state and local tax revenue. Chevron, Dow, ExxonMobil, Formosa, Lyondell-Basell, Occidental, Indorama and SABIC have all announced intent to build new ethane "crackers" to support this chemical industry expansion, most of which would be located in the Gulf Coast region.

Keeping Value in West Virginia

This represents the potential nature of the "downstream" economic benefits for West Virginia. The real "value proposition" is in keeping the ethane here and cracking it into ethylene. Producing the ethylene in West Virginia allows for additional downstream industry expansion to produce polyethylene, polypropylene and hundreds of other chemicals and finished products. Braskem's planned ethane cracker and three polyethylene units in Wood County is a great first step. Their proposed world-scale cracker will likely use about 70,000 barrels of ethane feedstock per day. However, current ethane production can support two to three additional crackers in West Virginia, with each returning an estimated 20:1 value added ratio of downstream economy, over shipping each gallon of ethane out of West Virginia via pipeline. This represents billions of dollars annually of potential economic value for our State.

Economic growth requires added responsibility for all of us. The responsible development of our natural resources, including downstream manufacturing, is important to West Virginia's future. Business, community, education and state leaders must work together to ensure we take advantage of this opportunity, while understanding that technology, innovation and education will be critical to our long-term success.

Preparing for our Future

Technology and innovation have an active role in revitalizing manufacturing in West Virginia. Not by replacing workers, but by requiring a more highly skilled workforce to produce more complex products, with improved efficiency and productivity. Additionally, educating the future workforce about opportunities here in West Virginia is critical to our success. We must have a ready workforce, complete with the skills, work ethic and drug-free mentality to take advantage of these jobs. Companies look for a competent workforce when deciding to locate in a community.

For this reason, the West Virginia Manufacturers Association and its partnerships with West Virginia's public education system, community and technical college system, universities and the energy industry have developed career path programs for high school and college students for vocational/technical and STEM education to assure the availability of skilled workers for the future of industry in West Virginia.

This opportunity for a manufacturing resurgence in our state can and is restructuring our entire economic outlook. With abundant and affordable supplies of shale gas, responsible development of downstream opportunities, and an educated and highly skilled workforce, West Virginia is poised for a manufacturing renaissance that starts with the chemical industry and ripples throughout the state's economy, providing jobs, economic certainty, stability and prosperity for West Virginia for many years to come.

CONSTRUCTION IN WEST VIRGINIA

West Virginia's construction sector slipped in 2013. Residential construction employment (including contractors) increased modestly for the third consecutive year, while the state's nonresidential and nonbuilding sectors lost jobs during the year. Approximately three-fourths of the sector's job losses occurred within heavy and civil engineering construction. This particular industry not only includes private companies providing construction and maintenance work for highways, water/sewer systems and other types of infrastructure, but also oil and gas pipeline and power plant construction.

After gaining more than 3,200 jobs between 2010 and 2012, the combined effects of continued weakness in infrastructure spending and the completion of several pipeline and other energy-sector projects caused the industry to lose more than 900 jobs during 2013. Even with this decline, payroll levels in this industry segment remain 20 percent above the average levels observed over the past decade thanks to substantial growth in the distribution infrastructure for the state's expanding oil and gas industries.

Residential Construction

According to data from McGraw-Hill, more than 2,200 single-family homes were started during 2013, a 23 percent increase compared to the previous year. The cumulative number of homes started during the first half of 2014 has declined nearly 14 percent compared to the same period a year ago, although much of this weakness can be attributed to colder- and snowier-than-normal winter weather during the first quarter. Notwithstanding the sluggish start to 2014, the annualized pace of single-family housing starts have increased 35 percent compared to the low point in 2011, but remain nearly 70 percent off the peak observed in mid-2006.

Multifamily construction activity is generally a smaller share of the overall residential market, primarily due to the state's low population density and high homeownership rate. Apartment construction peaked just after the single-family, reaching a total of 2,400 units started in 2007, with Berkeley County accounting for approximately 80 percent of the units started that year. Fewer than 300 units were reported to have been started during 2013, and the wide majority of those occurred in Monongalia County due to the construction of the University Place development.

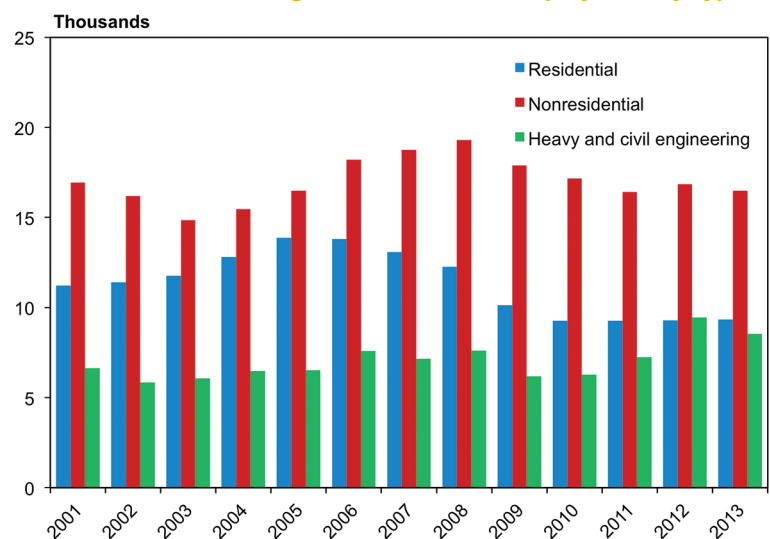
Nonbuilding and Nonresidential Construction

Although the recovery has been relatively mild for the residential construction sector, nonbuilding activity in the state remains quite weak. Nonbuilding typically consists of infrastructure projects such as highways, bridges and water/sewer systems, as well as utility distribution systems. Generally, these projects are

backed by federal, state and/or local capital funding sources and often have long lead times between approval and the physical construction occurring. With many states having only recently begun to see broader-based improvements in tax collections, along with congressional gridlock in approving a multi-year transportation funding bill, more substantial projects have faced delays.

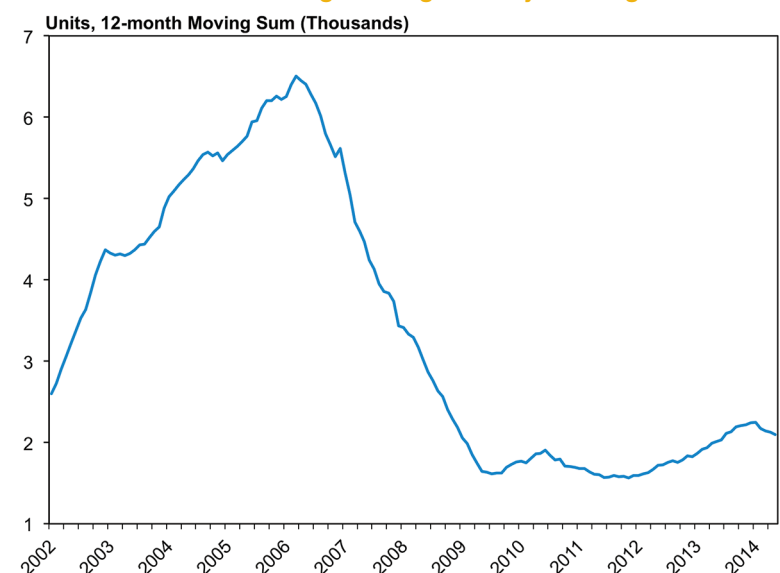
Spending on nonbuilding projects totaled \$724 million in West Virginia over calendar year 2013, which represents a 19 percent decline from the previous year and nearly one-third of the volume of spending that took place in 2009. During the first half of 2014, new

FIGURE 3.12: West Virginia Construction Employment by Type



Source: Workforce WV

FIGURE 3.13: West Virginia Single-Family Housing Starts



Source: McGraw-Hill Construction

nonbuilding projects started have totaled \$228 million statewide, marking a 30 percent drop-off compared to the prior year.

Nonresidential construction spending surged to more than \$2.2 billion in 2013. However, a substantial proportion of this spending was related to projects led by Williams Energy in Marshall County. Thus far, over the first half of 2014, spending activity on new nonresidential construction projects has risen 34 percent to more than \$360 million. Growth in Monongalia County has accounted for the bulk of improvements seen this year, chiefly the construction of a new baseball stadium and a new outpatient center for WVU Hospitals.

House Prices

Although West Virginia experienced a downturn in house prices after the housing bubble burst, the rate of house price deflation was measurably smaller in comparison to the rest of the nation. Indeed, the overall peak-to-trough decline in home prices in the state was approximately 6.8, compared to an 18 percent decline for the US.⁸ Since bottoming out in the second quarter of 2011, prices for single-family homes in West Virginia have rebounded 5.4 percent compared to a 10.3 percent gain nationally.

House prices corrected at a dramatically different pace across the state. After experiencing a dramatic run-up in prices during the bubble years, West Virginia counties that were part of the Hagerstown (Berkeley and Morgan counties), Winchester (Hampshire County) and Washington, DC (which includes Jefferson County) metro saw prices plunge by as much as 36 percent.

The rate of price declines registered in the state's other counties located within metro areas was significantly smaller, ranging from a 2 percent drop in Morgantown (Monongalia and Preston counties) to a 10 percent loss in Weirton-Steubenville (Brooke and Hancock counties).

As house prices have started to recover nationally, prices within many of the state's largest markets have also shown signs of improvement. The Cumberland metro area (which includes Mineral County) remains the only metro area to see home prices fall further over the past two years. Not surprisingly, the strongest growth in house prices since mid-2012 has taken place in those parts of the state experiencing the healthiest gains in employment and population.

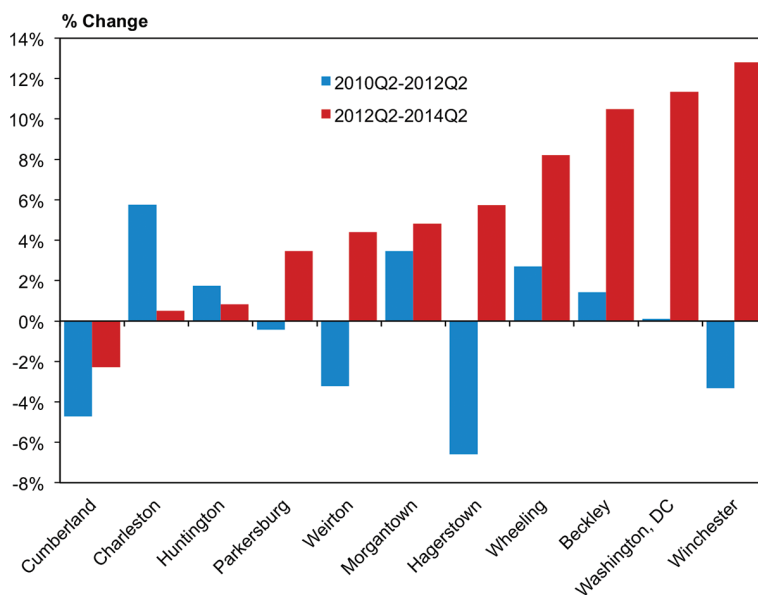
Sector Outlook

After an up-an-down performance over the past few years, the forecast calls for the construction sector to see average annual growth of 2.5 percent through the end of 2019. However, growth will not be spread evenly across the sector. The state's energy industry is expected to be a significant contributor to the sector's growth prospects going forward. New pipeline and distribution system capacity has already been planned for the next several years in order to transport natural gas to industrial customers and utilities or moving natural gas liquids to fractionation plants for downstream processing.

Additional fractionation and processing capacity is already currently under construction or slated for development in Marshall, Wetzel and Doddridge counties. While the state's coal-fired power plants will face even greater pressure from several major federal environmental policy shifts, electricity generated from natural gas will likely increase in the state thanks to the proposed combined-cycle power plant in Moundsville.

Homebuilding is expected to improve over the course of the forecast horizon. New single-family home construction will likely pick up some momentum from a weaker-than-expected first half of 2014. Healthy rates of in-migration and rising per capita incomes will support demand for new single-family housing construction in areas such as the Eastern Panhandle over the long-term. Additions to the state's stock of multifamily housing are expected to remain limited, with a significant portion

FIGURE 3.14: Single-Family House Price Growth by Metro Area



Source: Federal Finance Housing Agency - All Transactions House Price Index

⁸ The measure for house prices used in this section is the Federal Housing Finance Agency's All-Transactions Index, which is available at the state level and for all metropolitan statistical areas. In articles concerning housing prices, readers often find references to a 35 percent decline between the peak of the housing market and the trough. The source for this statistic, the Case-Shiller House Price Index, is not available at the state level and is only provided for a sub-set of metro areas. For additional information between the two indexes, readers can visit <http://www.fhfa.gov/DataTools/Downloads/Pages/House-Price-Index-Datasets.aspx#qpo>.

of construction activity associated with an ongoing student apartment project at West Virginia University.

Publicly-funded infrastructure spending in West Virginia, as well as other states, will remain under pressure during the forecast horizon. Funding sources, namely the state and federal highway trust funds, will likely be strained by persistently weak gas tax collections. In addition, planning for some long-term projects is expected to be disrupted by U.S. congressional gridlock in reauthorizing a multi-year federal transportation funding bill. Finally, attempts at broader federal tax reform and other plans connected to reducing the federal debt could have a significant effect on the availability of funding for future highway construction and other infrastructure development in the state.

HEALTH AND HEALTH CARE IN WEST VIRGINIA

West Virginia is often described as the second most rural state in the nation. More than 60 percent of the population lives in counties that the Census Bureau defines as rural. Rugged terrain and long travel times have limited many West Virginians' access to healthcare services. More recently construction of new roads and the expansion of health care services have made access easier. The following section details the status of health and healthcare in West Virginia and discusses the future of the health care industry in West Virginia.

Healthcare Sector Trends and Outlook

Healthcare accounted for approximately 16 percent of all jobs in the state and generated 9.3 percent of the state's nearly \$74 billion in economic output during 2013. Figure 3.15 provides a breakdown of the broad types of employment that fall under the umbrella of the Healthcare and Social Assistance sector. More than 79,000 individuals were employed in the state's hospital and ambulatory healthcare services industry in 2013, accounting for 69 percent of workers in the overall healthcare sector. The average annual wage of hospital workers was \$49,713 while the average annual wage at ambulatory care centers was \$45,113. The remaining 31 percent of employees worked at nursing and residential care facilities (18,756 employees) and social assistance centers (17,186 employees). For those working at nursing and residential care facilities, average annual wages were \$26,446 during 2013 while the social assistance industry earned the least per year in the overall healthcare sector (\$16,718).

Figure 3.16 shows healthcare sector employment growth in West Virginia and the United States since 2003 and projected growth through 2019. Employment in West Virginia's healthcare sector has grown at variable annualized growth rates since hitting a low in 2006. In 2006, the average annualized growth rate

was only 0.3 percent, but accelerated to 2.7 percent in 2008. In 2014, healthcare payrolls are expected to rise approximately 1 percent, a modest improvement from the 0.8 percent gain realized during 2013. The overall trend in growth since 2006 might be attributed to several factors, including the poor overall health status of West Virginians, challenges in accessing health care—particularly in rural areas, and an older-than-average population. Including the 1 percent gain expected for 2014, the forecast calls for healthcare sector employment to increase approximately 1.7 percent over the next 5 years, with growth likely peaking in 2015 and 2016 before slowing steadily in the latter portion of the outlook period.

Health Determinants and Outcomes for West Virginia

America's Health Rankings® Annual Report provides a detailed assessment of the nation's health on a state-by-state basis.⁹ The overall health score reflects each state's performance on 27 health indicators relative to the national average. The indicators fall into two categories:

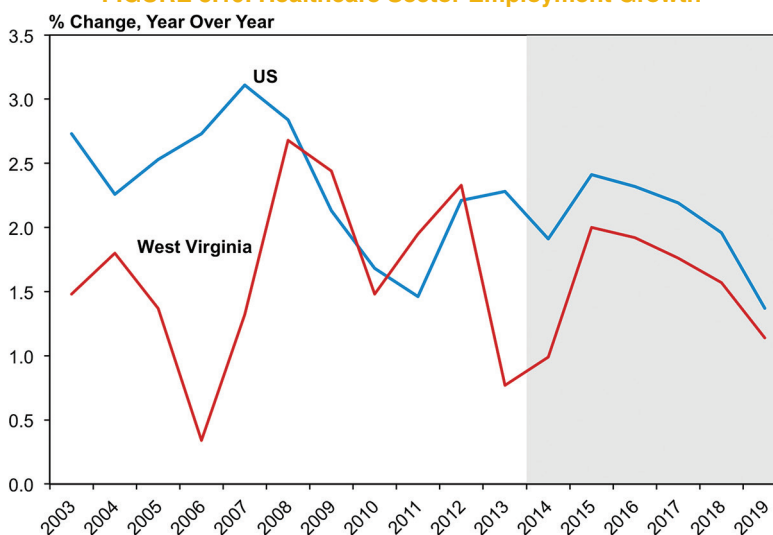
9. <http://www.americashealthrankings.org/reports/annual>, accessed August 10, 2014.

FIGURE 3.15: WV Healthcare Sector Employment and Wages (2013)

Sector	Total Employment	Total Wages (ths \$)	Average Annual Wage
Ambulatory Healthcare Services	39,354	\$1,775,377	\$45,113
Hospitals	40,013	\$1,989,164	\$49,713
Nursing and Residential Care Facilities	18,756	\$496,028	\$26,446
Social Assistance	17,186	\$287,322	\$16,718
Total	115,309	\$4,457,891	\$39,441

Source: Workforce WV

FIGURE 3.16: Healthcare Sector Employment Growth



Sources: US Bureau of Labor Statistics; WVU BBER Econometric Model; IHS Global Insight

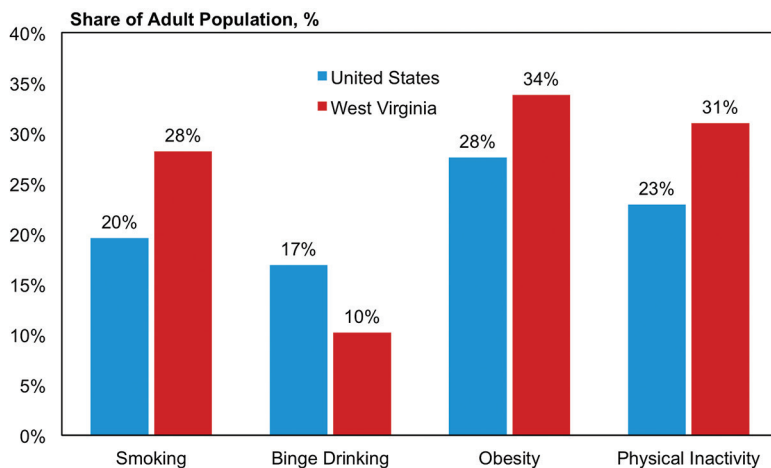
determinants of health, accounting for 75 percent of the overall score and health outcomes, accounting for 25 percent of the overall score. The determinants of health are further categorized into behaviors (e.g. smoking, physical inactivity, high school graduation); community and environment (e.g. violent crime, infectious disease); policy (e.g. lack of health insurance, public health funding); and clinical care (e.g. preventable hospitalizations, low birth-weight). The health outcomes include measures of chronic disease, like diabetes and cardiovascular deaths as well as measures of health status, like poor physical health days and disparity in health status. Each measure is assigned a weight and the weights across all measures total to 100 percent. For example, the weight on smoking is 7.5 while the weight on public health funding is 2.5. The overall score is calculated by adding the scores of each measure multiplied by its percentage of total overall ranking and the effect it has on health.¹⁰ In 2013, West Virginia's overall health score was -0.727 for a rank of 46 out of 50.¹¹ West Virginia improved its ranking by one place from 47 in 2012.

Figure 3.17 reports the detailed statistics for the health behaviors measures for West Virginia and the US average. A major contributor to West Virginia's poor overall health is obesity.¹² Obesity is a major risk factor for many diseases and chronic conditions including heart disease, cancer, Type 2 diabetes and stroke. In 1990, West Virginia and Mississippi had the highest rates of obesity in the nation with 15 percent of the adult population classified as obese. The prevalence of obesity in West Virginia has increased dramatically since 1990. The percent of obese adults increased from just over 32 percent in 2012 to nearly 34 percent in 2013, representing 490,000 adults. West Virginia ranked 47th in obesity.

A key factor to reducing and preventing obesity and other related chronic conditions is getting regular exercise (physical activity). Unfortunately, West Virginia ranks low in this important lifestyle behavior. West Virginia has the second highest rate of physical activity at 31 percent representing 450,000 adults. The good news in this statistic is that it is an improvement over 2012 when 35.1 percent of the population reporting being physically inactive.¹³ Although down slightly from 2012, West Virginia continues to have the second highest rate of smoking in the country at 28.2 percent of the adult population. In 2012, 28.6 percent of the adult population indicated that they currently smoke daily. A bright spot in the health behaviors statistics for West Virginia is binge drinking. West Virginia ranks first on this measure with the lowest prevalence of binge drinking in the country at 10.2 percent of the adult population.

Figure 3.17 shows West Virginia's performance for the health outcomes used in the overall health score. West Virginia ranks among the bottom 10 states in all of the measures except disparity in health status, where West Virginia ranks among the top 10 states.¹⁴ For West Virginia the disparity in health status measure

FIGURE 3.17: Health Behavior Statistics, 2013



Source: America's Health Rankings®

FIGURE 3.18: Health Outcomes Statistics, 2013

	West Virginia	United States	WV Rank
Diabetes (% of adult population)	13%	9.7%	50
Poor Mental Health Days (days in previous 30 days)	4.5	3.9	47
Poor Physical Health Days (days in previous 30 days)	5.1	4	49
Disparity in Health Status (by educational attainment)	24.6	32.5	9
Infant Mortality per 1,000 Live Births	7.5	6.3	41
Cardiovascular Deaths per 100,000	311	258.7	45
Cancer Deaths per 100,000	219.1	190.6	47
Premature Deaths per 100,000	9,959	6,981	48

Source: America's Health Rankings®

10. <http://www.americashealthrankings.org/reports/annual>, accessed August 10, 2014. The data for each of the 27 measures are obtained from a various sources and for various years. The data for most of the measures are for 2011 or 2012.

11. The score is a Z-score indicating the number of weighted standard deviations WV is below the national norm. The calculation is: SCORE = (State Value - National Mean) / Standard Deviation of All State Values. (America's Health Rankings Annual Report, 2013, p. 32).

12. Obesity is defined by the Center for Disease Control (CDC) as having a body mass index (BMI) of 30.0 or higher. BMI, as defined by the CDC, is equal to weight in pounds divided by height in inches squared multiplied by 703.

13. Physical inactivity is the percentage of population over the age of 18 who report doing no leisure time physical activity or exercise in the last 30 days.

14. America's Health Rankings® measures disparity in health status as the difference in the percent of adults aged 25 and older who did not graduate high school and adults with at least a high school education who self-report being in excellent or very good health. (America's Health Rankings Annual Report, 2013, p. 55).

is 24.6 percent compared to 32.5 percent for the U.S. This means that the gap in the percent of adults aged 25 years or older with at least a high school education who reported being in excellent or very good health compared to those without a high school education was 24.6 percent.

West Virginia has the highest prevalence of diabetes in the country at 13 percent of the adult population. West Virginia ranks 45th in cardiovascular deaths (311 deaths per 100,000 population), 47th in cancer deaths (219 per 100,000 population), and 48th in premature deaths (9,959 years lost per 100,000 population).

An important factor affecting the future of the healthcare sector and the health of West Virginians is the implementation of the Affordable Care Act. The ACA initially required states to expand Medicaid coverage or lose all federal funding for Medicaid, even for currently funded programs. The Supreme Court struck down this enforcement mechanism leaving states with a choice about Medicaid expansion. West Virginia announced plans to expand Medicaid in January 2013. As of June 2014, 128,000 people joined Medicaid through the expansion, much more than the actuarial projection by CCRC

Actuaries of 91,500.¹⁵ The CCRC Actuaries study also projected that, combined with other ACA mandates, the number of uninsured West Virginians is expected to drop from 246,000 to 76,000 by 2016.¹⁶ The overall impact of this increase in insured individuals on the healthcare sector is unclear. Insured individuals use more health care services than uninsured individuals.

In the near-term, it is quite likely that a pent-up demand for healthcare will be realized. Uninsured individuals also tend to be less healthy than insured individuals suggesting that realization of this pent-up demand will result in higher healthcare costs associated with providing care to a potentially sicker population. This expansion in demand will likely create a need for more healthcare professionals in the near-term. On the other hand, the ACA also places an emphasis on preventive care; encouraging healthy lifestyles; and active patient involvement in chronic disease management. This emphasis should reduce the demand for inpatient hospital services and should reduce preventable hospitalizations resulting in a reduction in overall healthcare sector costs. The net effect on the healthcare sector remains to be seen as the provisions of the ACA are implemented in the coming years.

- 15. State Praised for Medicaid early enrollments. David Boucher, Charleston Daily Mail, June 29, 2014.
- 16. Expanding Medicaid: West Virginia's Best Choice in A Dynamic Healthcare Landscape

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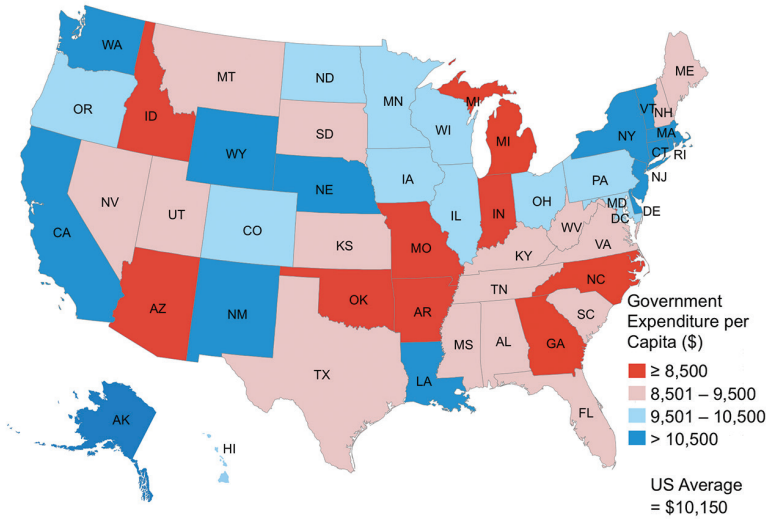
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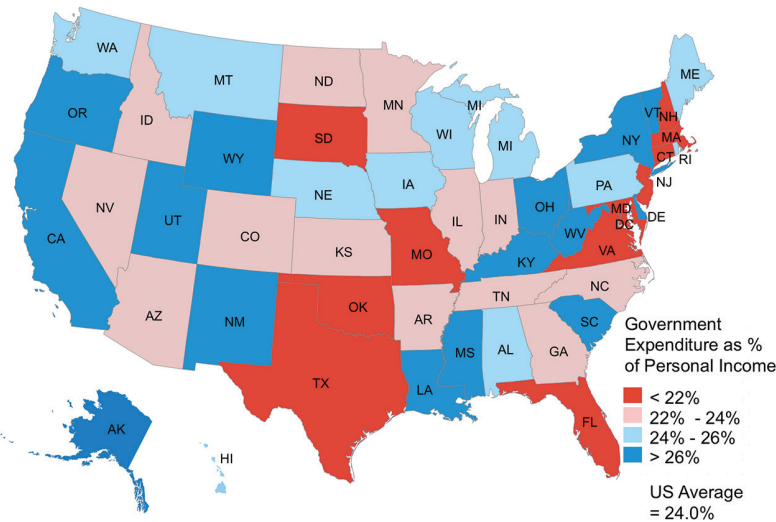
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FIGURE 4.1: State and Local Government Expenditure per Capita, 2011



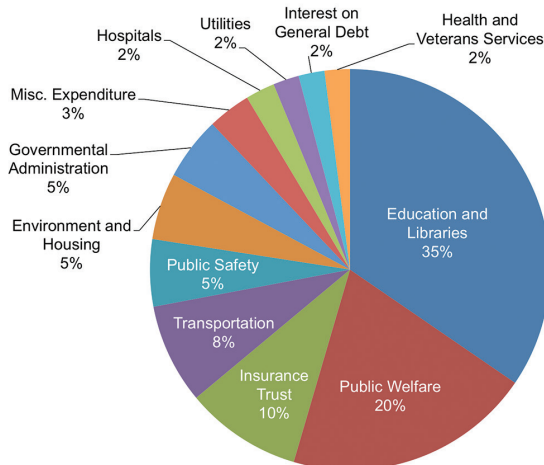
Source: US Census Bureau

FIGURE 4.2: State and Local Government Expenditure as Share of Personal Income, 2011



Source: US Census Bureau

FIGURE 4.3: West Virginia State and Local Government Expenditure Composition, 2011



Sources: US Census Bureau; Total 2011 Expenditures = \$16.4 billion

CHAPTER 4: GOVERNMENT IN WEST VIRGINIA

As reported in previous sections, government is the largest employer in West Virginia, accounting for one-fifth of all jobs in the state.¹⁷ Further, total state and local government spending in the state is equivalent to nearly 27 percent of West Virginia's total personal income, and the US federal government transfers a significant amount of income into the state. Taken together, it is clear that government has a significant economic influence in the state, and as such, in this section we explore the role of government in West Virginia in two ways. First, we detail the size and composition of state and local government activity in the state. Second, we consider public assistance in West Virginia that is provided by the federal government in conjunction with the West Virginia government.

WEST VIRGINIA GOVERNMENT

As illustrated in Figure 4.1, West Virginia ranks near the bottom among the US states in terms of the size of overall state and local government spending when measured on a per capita basis. Indeed only 16 states have smaller state and local governments when measured by this metric.¹⁸ However, it is important to also consider government spending measured relative to state personal income, especially since personal income per person in West Virginia falls below the national average. As reported in Figure 4.2, West Virginia's state and local governments are actually among the largest in the US when measured relative to personal income. Total state and local government spending in West Virginia equals 26.5 percent of state personal income, compared to the US average of 24.4 percent; only 11 states have larger governments by this metric. Overall, the answer to the question "How large is state and local government in West Virginia?" is mixed depending on the metric used: The absolute size of the government is relatively small, but a relatively large portion of the state's resources are devoted to government activities.

In Figure 4.3 we report the composition of state and local government spending in West Virginia. As illustrated, West Virginia devotes 35 percent of its overall government resources to education and libraries. This compares to a national average of just under 28 percent. West Virginia also devotes a relatively large

¹⁷ This figure includes federal government employment in West Virginia, in addition to state and local government employment.

¹⁸ Data are for the 2011 fiscal year. Unfortunately data for the 2012 fiscal year are delayed are not scheduled for release by the US Census Bureau until December of 2014.

share of its government resources to public welfare: West Virginia governments devote 20 percent of their overall spending to this category - programs such as Medicare and the State Children's Health Insurance Program - compared to a national average of 15.5 percent. West Virginia governments direct 10 percent of their expenditures to insurance trust expenditures for public employees, which is slightly less than the national average of 11.4 percent. Further, governments in the state focus relatively heavily on transportation spending: in West Virginia 8 percent of total spending goes to transportation related projects, compared to a national average of 5.8 percent.

In Figure 4.4 we report the growth in state and local government expenditures per person in West Virginia over the past three decades. As illustrated, West Virginia governments have increased their aggregate size from around \$4,800 in total spending per capita in 1980 to around \$8,800 by 2011, in inflation adjusted terms. However, over the entire period West Virginia governments have remained below the national average in terms of spending per capita. Further, the degree to which West Virginia state and local government spending falls short of the national average has widened over the period.

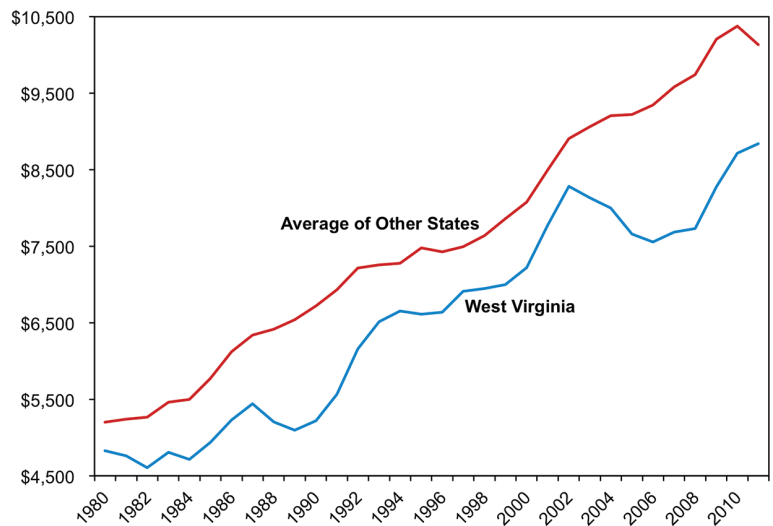
In Figure 4.5 we report state and local government own-source revenue per capita across the US states. Similar to the case with expenditures per capita as discussed above, West Virginia falls in the third lowest grouping among the states in terms of own-source revenues per capita.

Figure 4.6 illustrates the sources of West Virginia state and local government revenue. West Virginia receives the largest share of its total revenue from the federal government. Overall, 26 percent of total revenue received by West Virginia governments is a transfer from the US Federal government, which is significantly higher than the national average of just under 19 percent. West Virginia governments are in alignment with most states in terms of their reliance on sales taxation: West Virginia governments derive 14 percent of their total revenues from sales taxation, compared to a national average of 13.4 percent. Similarly, West Virginia governments derive 9 percent of their total revenues from individual income taxation, compared to a national average of 8.3 percent. In slight contrast, the reliance on the property tax in West Virginia - 8 percent of total revenues - falls short of the national average of nearly 13 percent.

PUBLIC ASSISTANCE IN WEST VIRGINIA

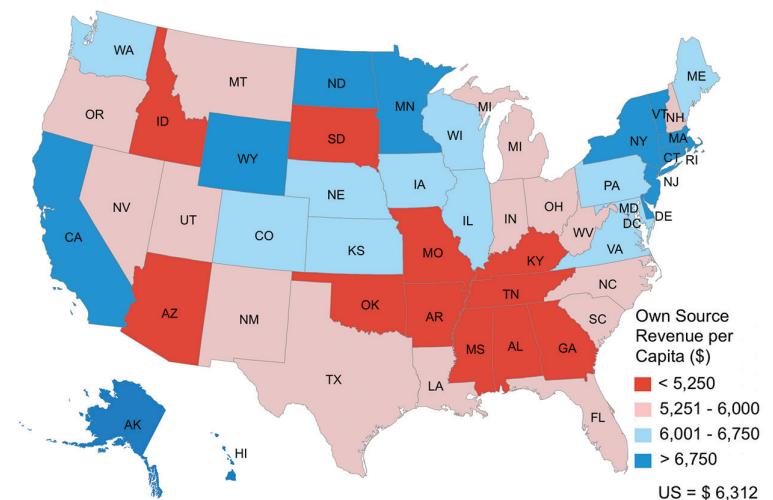
Total transfer payments made in West Virginia in 2012 amounted to around 27 percent of personal income in the state, as depicted in Figure 4.7. That figure fell from

FIGURE 4.4: West Virginia Real State and Local Government Expenditures per Capita



Source: US Census Bureau; US Bureau of Economic Analysis.
 Note: Figure is adjusted for inflation, presented here in 2011\$.

FIGURE 4.5: State and Local Government Own Source Revenue per Capita, 2011



Source: US Census Bureau

FIGURE 4.6: West Virginia State and Local Government Revenue Composition, 2011

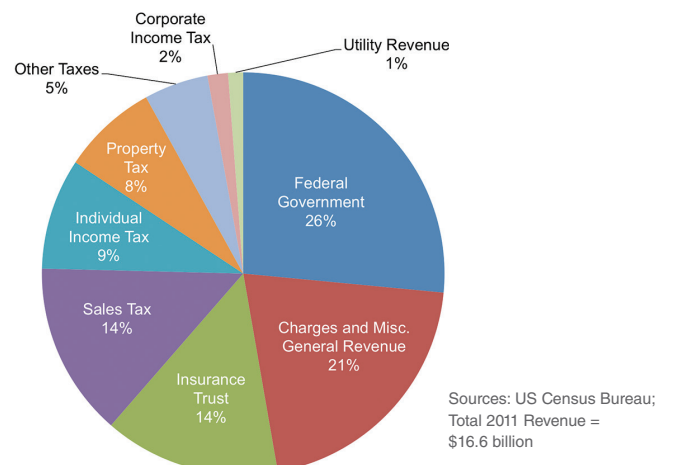
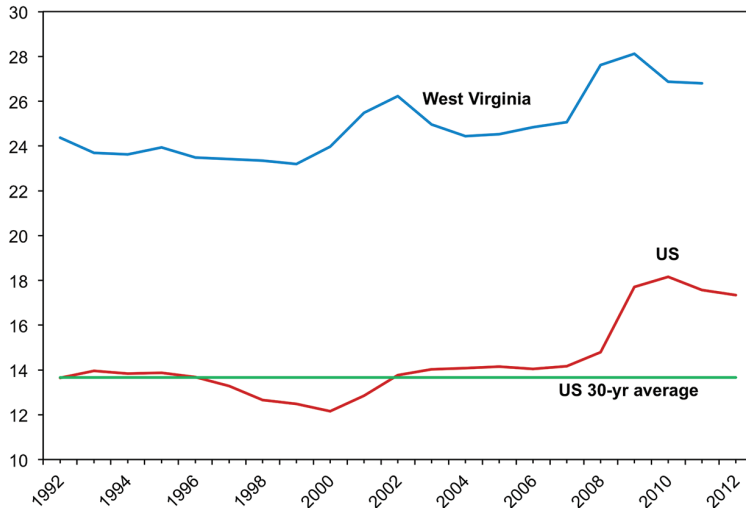


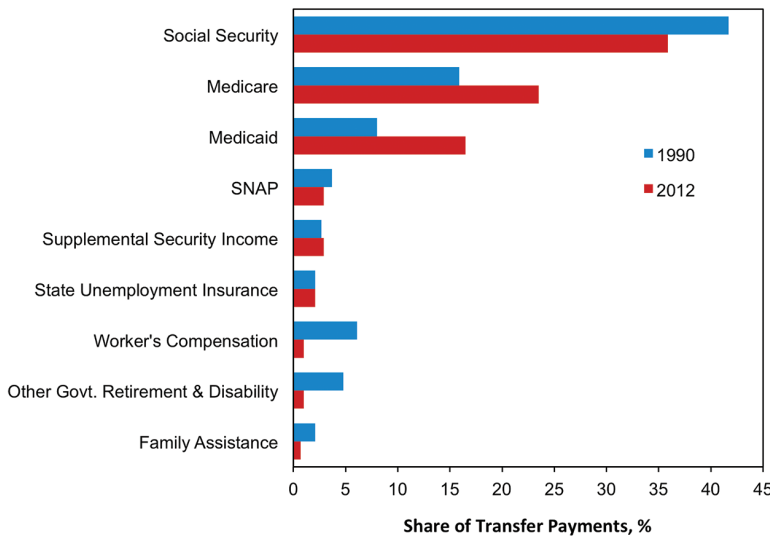
FIGURE 4.7: Transfer Payments as a Share of Personal Income



Source: US Bureau of Economic Analysis

2010 to 2012, as the economy improved, but the 2012 level remains higher than was typically observed over the past two decades. Further, transfer payments in West Virginia are substantially higher when measured against personal income when compared to the national average; for the nation as a whole, transfer payments were equivalent to around 17 percent of personal income in 2012. Indeed, the 27 percent figure placed West Virginia highest among the 50 states in 2012 in terms of reliance on transfer payments.

FIGURE 4.8: Distribution of Transfer Payments by Program, WV

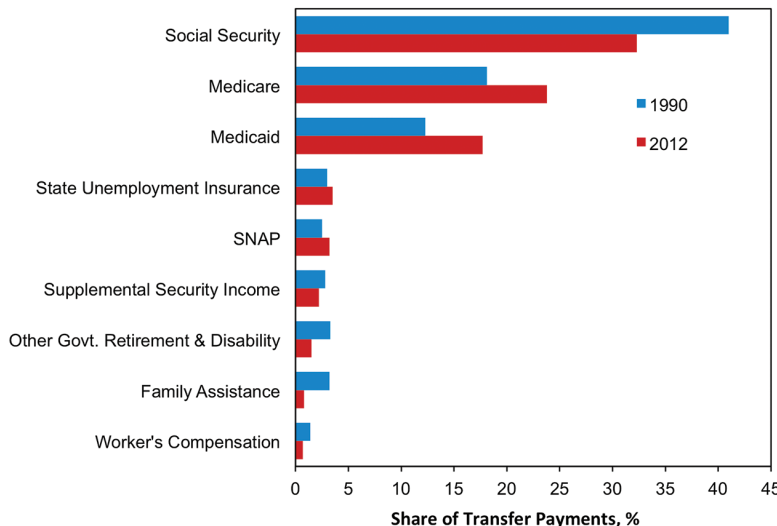


Source: US Bureau of Economic Analysis.

Note: Select programs are reported in chart.

In Figure 4.8 we disaggregate transfer payments into various broader categories. As illustrated, social security is by far the largest individual program, accounting for nearly 36 percent of total transfer payments made in West Virginia in 2012. Medicare and Medicaid came in second and third, accounting for around 24 and 17 percent of total transfer payments, respectively. All other transfer programs pale in comparison to these three when represented as a share of total expenditures in the category. The Supplement Nutrition Assistance Program (SNAP) in the state comes in at a distance fourth in terms of its spending share, accounting for less than three percent of total expenditures.

FIGURE 4.9: Distribution of Transfer of Payments, United States



Source: US Bureau of Economic Analysis.

Note: Select programs are reported in chart.

It is interesting to note how the composition of transfer payments has evolved over the past two decades. Spending on Medicare and Medicaid has increased substantially since 1990 as a share of total transfer payments. Social Security spending has fallen in relative terms, along with various government retirement and disability programs, worker's compensation, family assistance programs, and to a lesser degree, SNAP spending. Supplemental Security Income (SSI) and state unemployment insurance spending have remained relatively constant over the period as a share of total transfer payments.

In Figure 4.9 we illustrate the composition of transfer payments nationally. The figure illustrates a significant degree of similarity to the pattern observed in West Virginia.

Figures 4.10 and 4.11 illustrate the size of specific public assistance programs in West Virginia. In Figure 4.10, we report the number of individuals who receive benefits from specific public assistance programs in West Virginia. In Figure 4.11 we report the share of the population receiving benefits from each program, and offer a comparison to the national share. With 455 thousand recipients, social security benefits are enjoyed by the largest number of West Virginians, representing nearly one-fourth of the state's population. This figure is substantially higher than the corresponding figure at the national level of 17 percent, largely due to the state's older population.

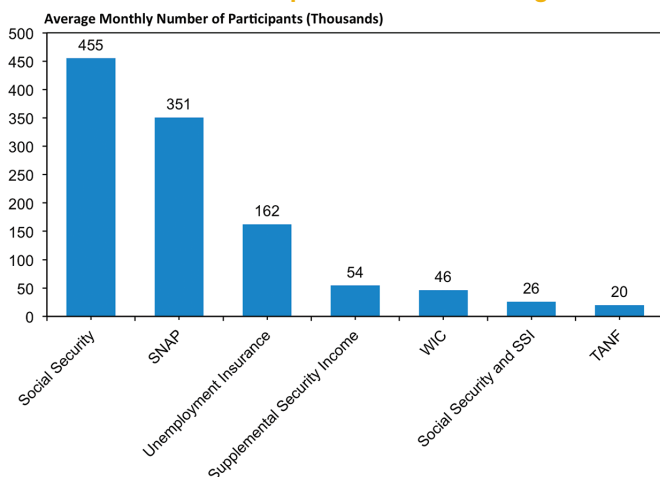
The SNAP program has the second highest number of recipients at nearly 351 thousand, or 19 percent of the state's population. This figure is also higher than the national figure of 15 percent. Unemployment insurance benefits were received by 162 thousand individuals in the typical month in West Virginia in 2012, representing nearly nine percent of the state's population, which is roughly on par with the national figure. SSI and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) were received by 54 thousand and 46 thousand West Virginians during the typical month in 2012.

SSI is received by a larger share of West Virginians compared to the nation, whereas WIC is received by a smaller population share in West Virginia. Temporary Assistance to Needy Families (TANF), was received by fewer than 20 thousand West Virginians during

the typical month in 2012, which represents one percent of the state's population. TANF is received by approximately 1.3 percent of the population nationally.

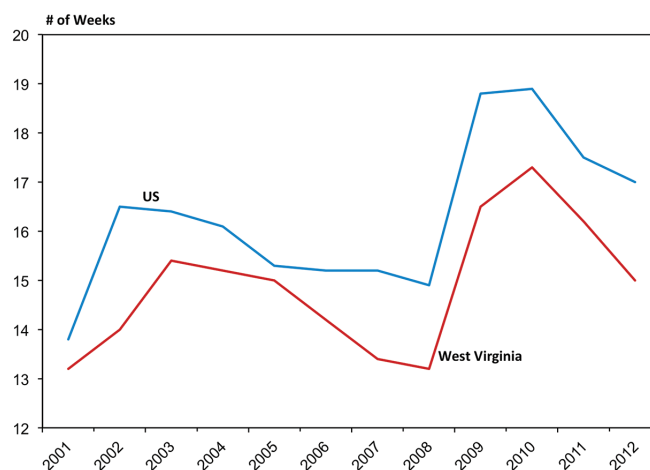
Figures 4.12 and 4.13 examine the receipt of unemployment insurance benefits in West Virginia. As illustrated, the duration of unemployment insurance benefits fell significantly between 2010 and 2012, both nationally and in West Virginia. By 2012 the average unemployment insurance recipient received benefits for around 15 weeks, shorter than the comparable figure for the US. In Figure 4.13 we illustrate the average weekly unemployment insurance benefit amount. As illustrated, benefits have been rising in nominal terms since 2001, except for a sharp spike during 2009. Overall, the typical West Virginian who received unemployment insurance benefits received around \$270 per week, compared to around \$300 per week nationally.

FIGURE 4.10: Participation in Transfer Programs



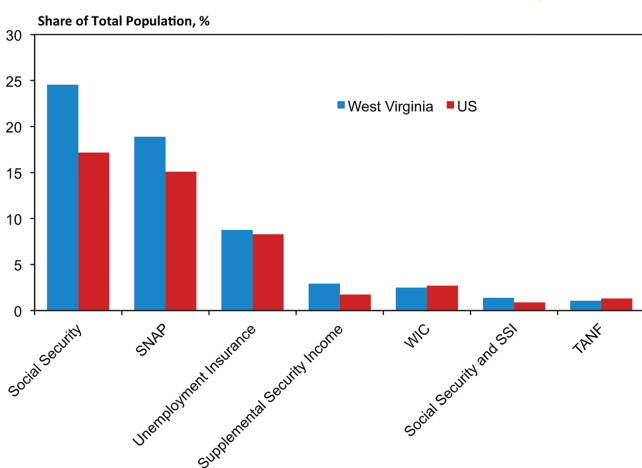
Sources: US Department of Labor; US Social Security Administration; US Department of Agriculture; US Department of Health and Human Services. Note: Data presented here is for 2013, except for Unemployment Insurance data (2012).

FIGURE 4.12: Average Weekly Duration Collecting Unemployment Insurance



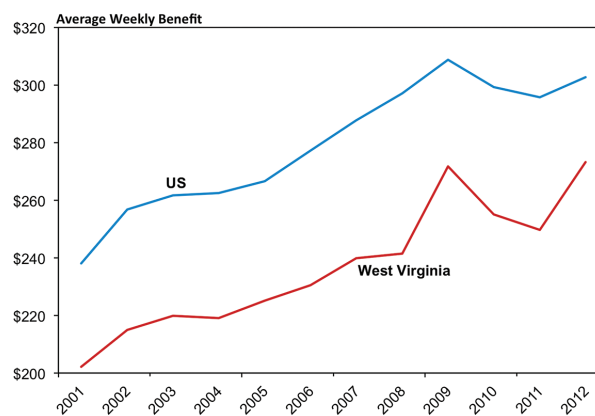
Sources: US Department of Labor

FIGURE 4.11: Participation Share in Transfer Programs, 2013



Source: US Department of Labor; US Social Security Administration; US Department of Agriculture; US Department of Health and Human Services. Note: Data for Unemployment Insurance is from 2012.

FIGURE 4.13: Average Weekly Unemployment Insurance Benefits



Source: US Department of Labor

INDUSTRY INSIGHT: WEST VIRGINIA FISCAL FORECAST

West Virginia is in the midst of a significant transition from a coal dominated energy producing economy to an economy more dependent on the fortunes of the natural gas sector. Both sectors play a key role in providing employment opportunities for residents choosing to live and work in rural areas of the State. However, the production of natural gas is far less labor intensive than the production of coal. This is a contributing factor to the general lack of overall state tax collection growth in recent years. Also, changes within the energy sector favor several northern counties over southern counties. Over the past six years, several northern counties have experienced near double digit annual local tax revenue increases due to activities associated with natural gas production. Although the local tax revenue growth pattern tends to be highly volatile, the recent strength in local tax collections, particularly within the major Marcellus shale producing counties, is likely to continue over the next few years.

Other than gains in the production of natural gas and related products and a small rebound in the wood products sector, the West Virginia economy experienced little or no net economic growth over the past two fiscal years. State General Revenue Fund collections decreased for the second consecutive year in Fiscal Year 2014, as overall economic growth fell short of original projections. When the US Bureau of Economic Analysis released its initial estimates of 2013 GDP in June 2014¹⁹, West Virginia's growth rate for 2012 was revised sharply downward from 3.3 percent to -1.4 percent. A 25.3 percent decline in foreign exports should contribute to a similar significant downward revision to the initial 2013 West Virginia GDP

growth estimate of 5.1 percent. According to the initial estimates, the GDP gain in West Virginia was largely attributable to growth in the mining sector. Initial West Virginia payroll employment statistics for 2013 indicated job growth of roughly 1.0 percent. However, the annual re-benchmarking in March resulted in a significant downward statistical revision to an increase of just 0.1 percent and the final 2013 numbers showed an actual decline rate of nearly 0.3 percent or the loss of 2,000 jobs. Significant downward revisions occurred in the broad classifications of natural resources and mining employment (-11.4%) and construction employment (-3.2%) among others. Wages declined by 4.6 percent in the mining sector and by 1.3 percent in the construction sector. Overall wages increased by just 0.2 percent, a level far below the original projection of 2.1 percent. This sluggish income growth was a major contributing factor to a 1.4 percent decline in overall Personal Income Tax collections and to a similar decline in Sales and Use Tax collections in Fiscal Year 2014. In response to lower than expected tax collections, the Legislature appropriated \$70 million in one-time funds to fill the budget gap and a general hiring freeze was also imposed resulting in additional savings of roughly \$33 million. As a result of these actions and other steps, the State ended Fiscal Year 2014 with a balanced budget.

Lower than expected economic growth and revenue growth that occurred in Fiscal Year 2014 will necessitate "better than expected" revenue growth to balance the current Fiscal Year 2015 budget. For balance, the current Fiscal Year 2015 budget required the combination of: (i) budget reductions for a number of State agencies, (ii) \$100 million in appropriations from the Revenue



**MARK MUCHOW, Deputy
Cabinet Secretary, West Virginia
Department of Revenue**

Shortfall Reserve Fund and (iii) 4.4 percent growth in General Revenue Fund collections. This revenue growth rate is slightly above the long-term average annual revenue growth rate for West Virginia. However, the FY2015 revenue forecast was developed last November under assumptions of 2.5 percent growth in the National economy in 2014 and slightly less than 3.3 percent growth in baseline revenues for West Virginia. In July 2014, IHS Economics revised its 2014 national growth estimate downward to 1.7 percent. Given this revised estimate, the continuation of a general State hiring freeze, significant increases in natural gas production above original projections and overall energy price firmness will all be necessary elements for a balanced budget in West Virginia in Fiscal Year 2015. Total State and local regular natural gas severance tax collections more than doubled from \$76.1 million in Fiscal Year 2013 to \$163.4 million in Fiscal Year 2014 due to a combination of higher prices and an estimated 57 percent increase in production to nearly 900 thousand million cubic feet. The Official Fiscal Year 2015 forecast (November 2013) is based on the projection of an additional 19 percent growth in natural gas production this fiscal year. Actual production growth may need to exceed these projections to achieve the aim of balancing this year's budget.

The trend of very weak revenue growth necessitated development of

conservative budgets in recent years and budget reductions affecting many government functions - in an effort to free up funds for areas of persistent cost pressure, mainly Corrections and Medicaid. After rising at an average annual rate of less than 0.5 percent over the past six years, the pace of revenue growth is expected to slowly improve over the next couple of years to a level closer to 3.0 percent per year as employment and income growth resume and growth in the natural gas extraction sector continues to accelerate. However, because actual prior year collections were lower than originally forecast, computations now show that West Virginia revenues will need to grow by nearly 4.4 percent this year in order to meet those estimates.

Collection growth over the next two years will be heavily dependent upon the performance of the natural gas extraction industry. Severance tax collections are forecast to rise by more than 10 percent between Fiscal Year 2014 and Fiscal Year 2016 largely due to increasing natural gas production and a more stable pricing environment. Increasing revenues from natural gas production will generally offset an anticipated decrease in coal severance tax revenues over the forecast period. In addition to severance tax collection growth, both personal income tax revenues and consumer sales tax revenues are anticipated to grow modestly in response to a trend toward higher employment and to greater growth in wage and salary income over the forecast period. In addition to the natural gas sector, significant employment and wage increases are also anticipated from the professional and business service sector, health care sector and durable goods manufacturing sector. Personal income tax collections are expected to grow from no growth in Fiscal Year 2014 to roughly 4.9 percent growth by Fiscal Year 2016. Sales tax collections are expected to rise by up to 3.0 percent per year by Fiscal Year 2016. A rebound in the housing sector and growth in service-related sectors,

such as health care, and leisure and hospitality, should also contribute to tax collection growth. In addition, relatively low natural gas prices and an ample supply should lead to some increase in manufacturing activity by the end of the forecast period.

In the short-term, revenue growth is not anticipated to keep pace with growth in state government expenditures. The published FY2015 Executive Budget presented by the Governor to the Legislature in January of this year projected a FY2016 budget gap of more than \$126 million. This projected budget gap has increased since that time due to a continuing decline in baseline revenues. Both the FY2014 and FY2015 budgets were balanced with one-time adjustments averaging more than \$275 million per year. In addition, annual cost increases for programs such as Medicaid and Corrections were expected to average more than \$57 million per year. Additional adjustments will be necessary to bring the FY2016 budget in balance. Future projected budget gaps beyond FY2016 gradually narrow to a more balanced level by FY2019. Improved revenue growth along with on-going budget adjustments should gradually result in a more balanced fiscal outlook. In addition, the projected return of \$60.4 million in annual Personal Income Tax collections now dedicated to the Old Workers' Compensation Debt Fund by no later than Fiscal Year 2017 is a key factor toward balancing future budgets. Local governments may also play a bigger role over time in the financing of future local government services given that average local tax revenues are growing faster than State revenues. These additional potential resources will be keys to future budget balance.

19. U.S. Department of Commerce, Bureau of Economic Analysis, http://www.bea.gov/newsreleases/regional/gdp/state/gsp_newsrelease.htm

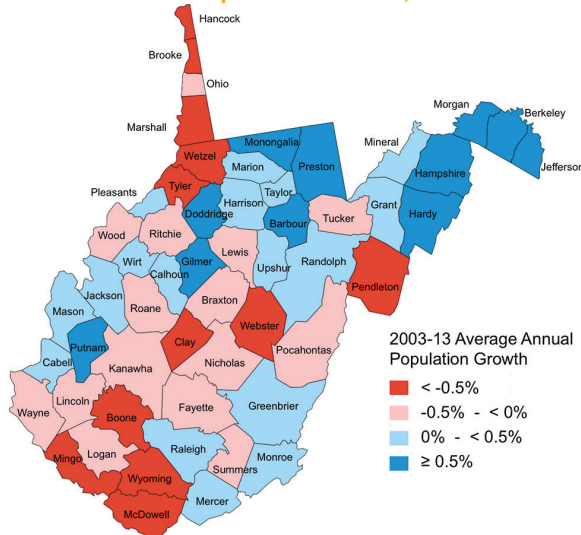


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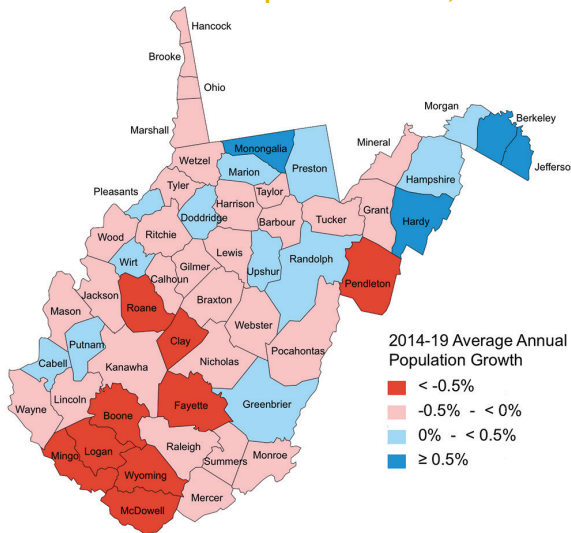
W BUSINESS and ECONOMICS

FIGURE 5.1: Annual Population Growth, 2003-2013



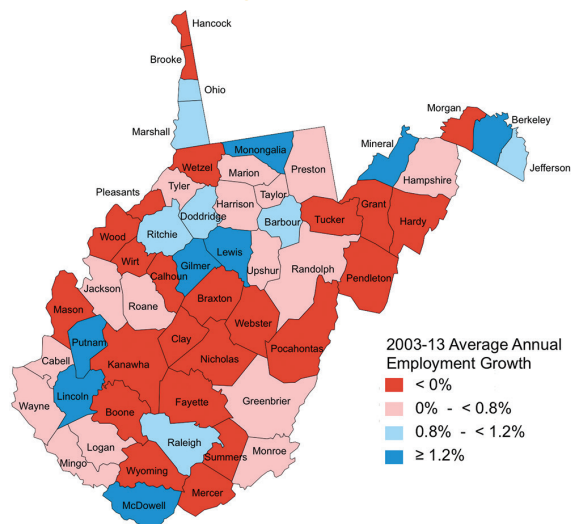
Source: WVU BBER County Econometric Model

FIGURE 5.2: Forecast Annual Population Growth, 2014-2019



Source: WVU BBER County Econometric Model

FIGURE 5.3: Annual Employment Growth, 2003-2013



Source: WVU BBER County Econometric Model

CHAPTER 5: WEST VIRGINIA'S COUNTIES

Economic performance has been far from uniform across West Virginia's 55 counties in recent years. Northwestern West Virginia and the Northern Panhandle benefited from skyrocketing oil and gas production, while consistent growth in Monongalia County and an upturn in the Eastern Panhandle's economy also helped to buoy West Virginia's overall performance. These gains were offset to a significant degree by job losses in the state's southern coal fields.

POPULATION

Over the past decade, 27 of the state's 55 counties have lost population. The largest absolute population decline occurred in the state's largest county, Kanawha, over this time period, but traditional coal-producing counties such as McDowell, Mingo, Wyoming and Boone recorded the largest percentage losses in population. Counties that have lost population have typically done so due to two reasons. First, they have suffered from a natural population decline—as deaths outnumber births—given that these counties tend to have older age distributions. Second, these counties tend to have suffered from a net out-migration as people moving out of the county outnumber those who are moving into the area.

While slightly more than half of state's counties gained population over the past decade, only a handful of counties made a significant contribution to the cumulative 42,000-person gain recorded statewide since 2003. For example, the Eastern Panhandle counties of Berkeley, Jefferson, and to a lesser extent Morgan, accounted for three of the five fastest-growing counties in the state between 2003 and 2013, due in part to in-migration from higher cost-of-living areas in Northern Virginia and Maryland. In fact, Berkeley County added more than 24,000 residents over the last decade. After ranking as the third fastest-growing county in the state from 2003 to 2013, adding approximately 16,300 residents, Monongalia County is now one of only three West Virginia counties with more than 100,000 residents.

A total of 16 counties are expected to register population gains during the outlook period, but as has been the case over the past decade, we anticipate the majority of that growth to be heavily concentrated in a handful of counties. Berkeley County is expected to expand at an average annual rate of 1.3 percent through 2019, followed by gains of 1.2 and 1.1 percent per year for Monongalia and Jefferson counties, respectively. Of the 39 counties expected to see some degree of population losses over the next five years, most will see only modest declines. However, we do

FIGURE 5.4: Forecast Annual Employment Growth, 2014-2019

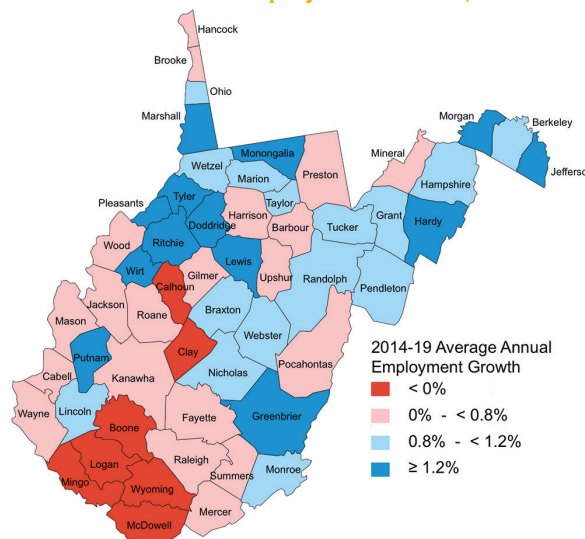
anticipate significant declines in population during the forecast horizon throughout much of the state's southern coalfields region, with Boone, Logan, McDowell and Wyoming counties expected to tally average annual losses of 1 percent or higher.

EMPLOYMENT

Overall, Lewis County experienced the largest percentage increase in employment (2.4 percent per year) in the state between 2003 and 2013; Putnam, Monongalia and Berkeley counties also recorded employment growth that was significantly above average in the last decade. Although falling coal production has weighed on parts of the state in recent years, the rapidly-expanding oil and gas industry has bolstered job growth significantly. In fact, Lewis, Doddridge, Ritchie, Wetzel, Tyler and Marshall counties all saw a significant jump in hiring activity since 2008 that easily outstripped state and national averages thanks to skyrocketing oil and gas production and downstream processing activity.

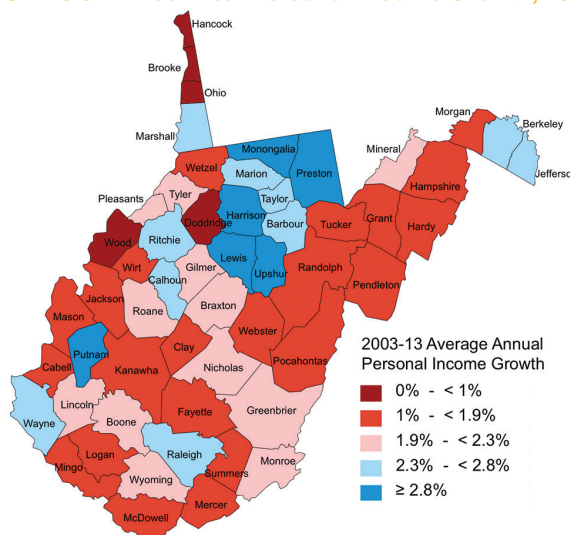
While their population bases have declined over the past decade, several counties in the state's southern coalfields region managed to register gains in employment between 2003 and 2013. Unfortunately, a large portion of these jobs were gained during the 2005 to 2011 time period when coal production was running at higher levels. In fact, job losses over the last two years have nearly erased all of the prior gains posted during the recent era of strong coal production in Boone, Mingo and Logan counties. McDowell County remains well above its 2003 employment levels, but has seen total payrolls drop nearly 10 percent in the last two years. Hancock County experienced the fastest rate of job losses over the past decade, as the steel industry's decline caused local employment to contract at a rate of approximately 2.5 percent per year.

During the 2014 to 2019 outlook period, Marshall County is expected to see the fastest rate of job growth, led mostly by continued expansion in the oil and gas industry and continued stability in Northern West Virginia coal production. From a regional perspective, the oil and gas boom counties in the Northern Panhandle and northwestern corner of the state will likely enjoy the fastest rates of growth through 2019, as will portions of the Eastern Panhandle and Potomac Highlands. In addition, Monongalia and Putnam counties should also see growth surpass state and national averages. By contrast, counties in the state's southern coalfields are expected to register job losses during the forecast horizon as a host of market- and regulatory-related



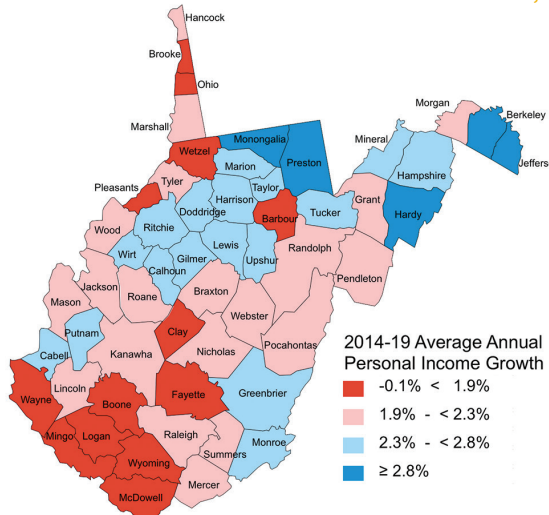
Source: WVU BBER County Econometric Model

FIGURE 5.5: Annual Real Personal Income Growth, 2003-2013



Source: WVU BBER County Econometric Model

FIGURE 5.6: Forecast Real Personal Income Growth, 2014-2019



Source: WVU BBER County Econometric Model

issues continue to weigh on the region's coal mining industry for the next several years.

INCOME

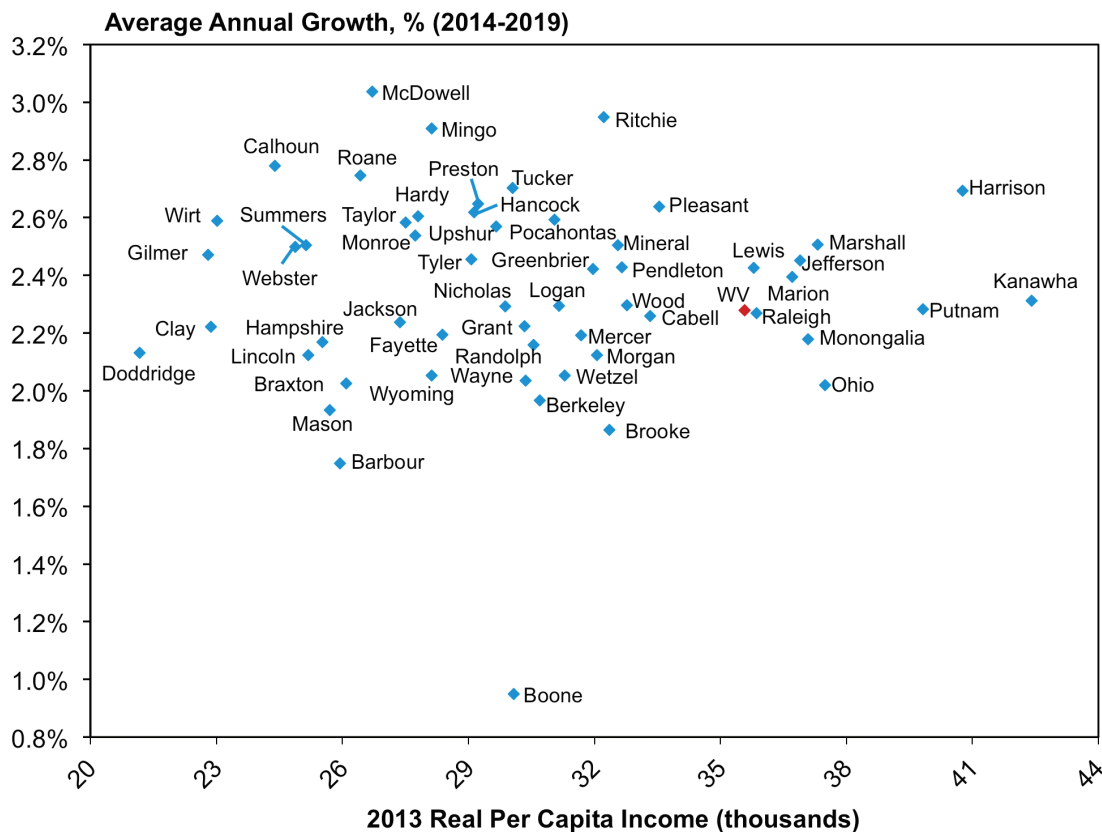
Inflation-adjusted personal income increased in all 55 counties during the 2003 to 2013 time period. Just over half (28 of 55) of the counties registered posted growth in real income well above the state and national average of nearly 2 percent, with the largest percentage gains coming from the North-Central portion of West Virginia. Lewis, Monongalia and Preston experienced the fastest rates of real income growth during the past ten years, driven largely by healthy increases in employment in high-wage industries. Surprisingly, Doddridge County, which has enjoyed strong job growth in recent years, registered a gain of less than 1 percent in real income since 2003; however, the reason for this slower rate of growth can be directly attributed to outright declines in transfer payments and less income coming from other regions. Indeed, inflation-adjusted wages and salaries received by Doddridge County residents surged more than 7 percent per year during the 2003 to 2013 time period.

The Morgantown metro area and Eastern Panhandle counties of Jefferson and Berkeley will experience the fastest growth in real income going forward, reflecting continued solid growth in both wage and non-wage sources of income, such as capital gains and dividends.

The state's leading oil- and gas-producing counties will see strong increases in worker wages and salaries, but will tend to see below-average income growth due primarily to weaker gains in non-wage income sources, such as transfer payments and investment income. During the next five years, we anticipate real personal income growth will tend to mirror broader regional patterns of job growth. Specifically, the state's coalfield counties are expected to see inflation-adjusted personal income growth slow considerably through the outlook period in response to the anticipated slump in mining employment and output.

Finally, we examine how growth in real personal income on a per capita basis over the next five years will be distributed across the state's 55 counties relative to average income levels in 2013. Several counties that were projected to experience below-average growth in total personal income through 2019 are expected to post above-average growth. This change is a direct result of these counties projected to suffer declines in population during the outlook period. By contrast, several counties expected to achieve high rates of inflation-adjusted personal income growth will likely see below-average gains in per capita income levels due to fast rates of population growth. However, several of these counties, including Berkeley and Monongalia, already possess per capita incomes that exceed the statewide average.

FIGURE 5.7: West Virginia County Real Per Capita Income



CHAPTER 6: SPECIAL TOPICS, SMALL BUSINESS ACTIVITY IN WEST VIRGINIA

Small businesses play an important role in the US economy. According to the US Small Business Administration (SBA), small businesses employ around half of all private-sector workers in the US.²⁰ SBA statistics also indicate that small businesses account for the vast majority of all businesses in the nation, and that small businesses are vital in terms of overall job creation.²¹ Further, evidence shows that small businesses are important for fostering innovation and overall long-run economic growth. Overall, ensuring that an economic system's foundation is fertile for small business prosperity and entrepreneurship is a crucial component of promoting economic development in the long run.

Given the potential importance of entrepreneurship and small business activity for an economy in the long run, in this chapter we explore small business activity in West Virginia. We examine a variety of metrics, including small business counts, small business employment, and small business income.

SMALL BUSINESS BIRTHS AND DEATHS

In Figure 6.1 we illustrate the overall number of business births and deaths in West Virginia over the past two decades or so. The periods in which births outnumber deaths, resulting in a net increase in the number of businesses, are illustrated by blue shading, while red shading illustrates a net decline in the number of businesses. Unsurprisingly, the late-1990s showed a net gain in the number of businesses in the state, whereas the 2001 recession and the 2008-2009 recession resulted in significant net declines in the business counts. Overall this indicates that net business creation in West Virginia largely reflects the broader business cycle. It is interesting to note that the overall number of business births (and deaths) has fallen significantly over time. For instance, through the late-1990s, around 4,500 new businesses were being created in the state annually. That figure fell to around 3000 during the mid-2000s, and further to the lower-2000-range in the aftermath of the recent recession.

Figure 6.2 illustrates the net change in small businesses annually—scaled by population—over the past decade or so in West Virginia and nationally. As illustrated, the US has enjoyed a higher rate of small business creation compared to West Virginia for every year depicted except for 2009. For instance, in 2007, the last year before the recent recession, the US enjoyed a rate of net small business creation of nearly 51 small businesses per 100 thousand residents, compared to around 18 in West Virginia. West Virginia has also

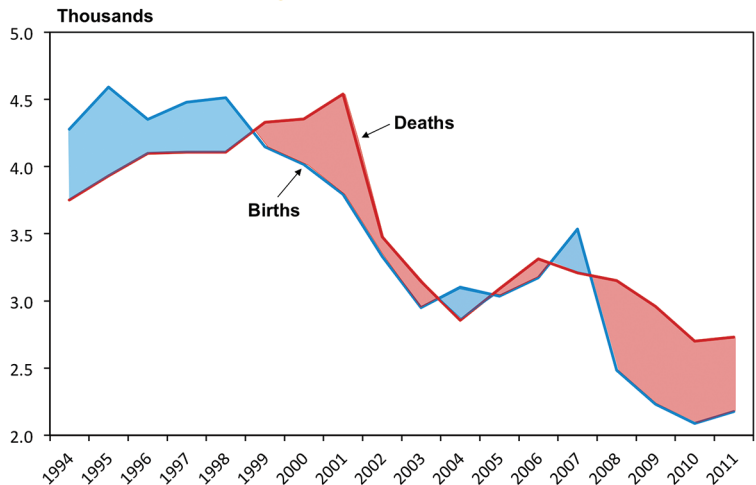
lost small businesses at a faster pace compared to the nation for most of the more recent years.

In Figure 6.3 we illustrate variation in the number of small businesses across states for 2011. As illustrated, West Virginia ranks in the lowest grouping, indicating a relatively small number of small businesses. States with the largest number of small businesses tend to cluster in the north-central, northwestern, and northeastern parts of the US. A concentration of states with low numbers of small businesses can be found beginning in West Virginia and running through the south to Texas. Similarly, we illustrate how growth in the total number of small businesses has varied across states over the

20. In this section we follow the standard US Small Business Administration approach of defining any business with fewer than 500 employees as a small business.

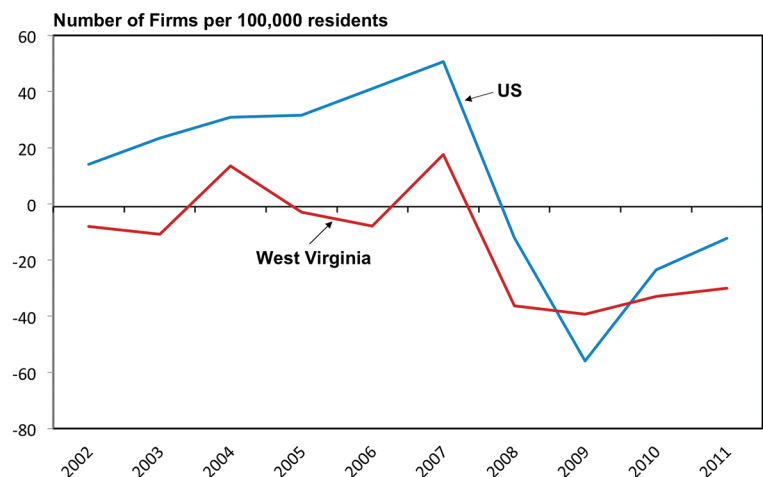
21. See www.sba.gov/advocacy for more information.

FIGURE 6.1: West Virginia Small Business Births and Deaths



Source: US Small Business Administration Office of Advocacy

FIGURE 6.2: Small Business Net Growth



Sources: US Small Business Administration Office of Advocacy; Bureau of Economic Analysis

past decade. Here we see that West Virginia falls into the group of 10 states that have seen an overall decline in the number of small businesses over the period. The highest growth rates tend to be found in the western states and in several of the southern states.

SMALL BUSINESS EMPLOYMENT

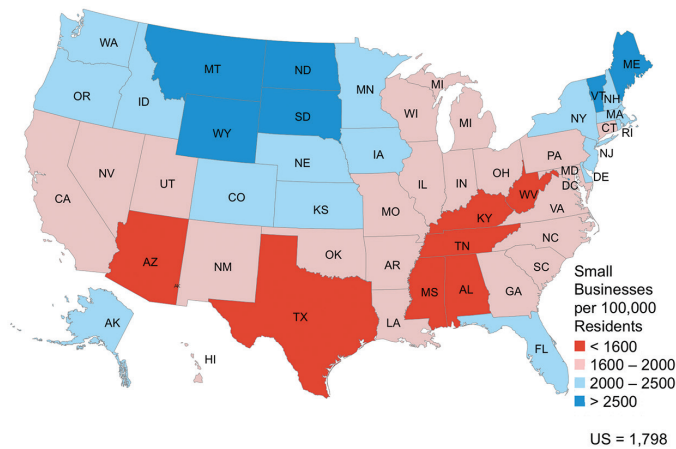
Overall small businesses employ more than 300 thousand men and women in West Virginia, a figure that has been relatively stable over the past decade or so. Overall the stability in small business employment, combined with the higher degree of volatility in small business births and deaths, discussed above, implies that most of the births and deaths likely involve relatively few workers. As illustrated in Figure 6.5, overall small businesses employed around 42 percent of the total West Virginia workforce in 2011. This figure is higher

than the large business employment share, and more than double the government employment share.

In Figure 6.6 we illustrate variation among the US states in terms of the overall share of private-sector employees who are employed by small businesses. In contrast to an earlier finding that West Virginia enjoys a relatively small number of small businesses relative to its population, here we see that West Virginia exceeds the national average in terms of the overall number of private-sector workers in the state who are employed by small businesses. As illustrated, West Virginia falls into the second highest grouping of states with a rate of private-sector employment by small businesses of between 50 and 60 percent.

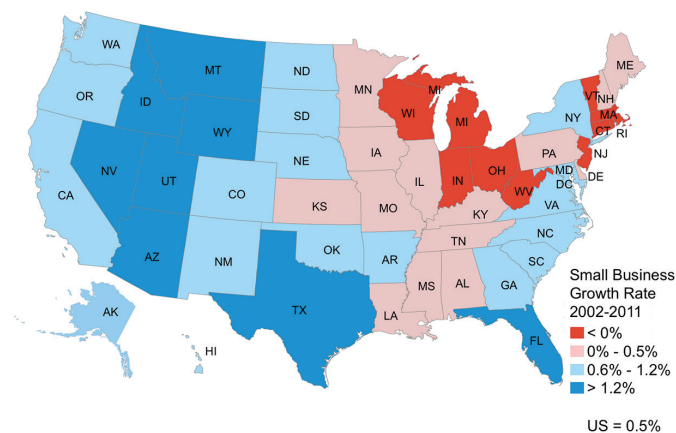
Figure 6.7 illustrates small business employment in West Virginia by firm size. Of the more than 300 thousand workers in West Virginia who are employed by small businesses, nearly 110 thousand are employed in businesses with between 5 and 19 employees, making this the most common small business size by far. Further, as illustrated, small businesses with fewer than 5 employees employ around 29 thousand worker in the state. Employment is distributed fairly evenly across the small business size categories of 20-49, 50-99, and 100-199, with employment levels in the range of 40 thousand for each category. Small businesses with between 300-399 and 400-499 workers employ relatively few of the overall small business employees in the state.

FIGURE 6.3: Small Businesses per 100,000 Residents, 2011



Sources: US Small Business Administration Office of Advocacy; Bureau of Economic Analysis

FIGURE 6.4: Growth in Small Business Counts, 2002-2011



Sources: US Bureau of Labor Statistics

Note: Growth rate calculations use average annualized growth.

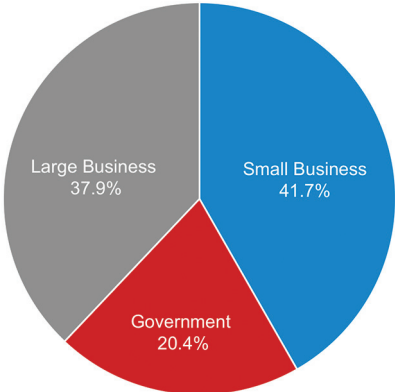
SMALL BUSINESS INCOME

As illustrated in Figure 6.8, small businesses in West Virginia generate 32 percent of all of the wage and salary income in the state. The fact that this figure is smaller than the 42 percent of total employment by small businesses, reported above, implies that wage and salary income tends to be lower for workers at small businesses compared to those of large businesses and government.

Figure 6.9 depicts variation in the share of wages and salaries received by employees of small businesses as a share of total private-sector employees across the US states. As illustrated, West Virginia ranks below the national median based on this metric.

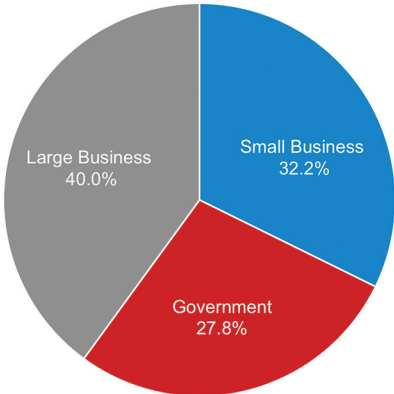
We close with a figure that offers an alternative measure of entrepreneurship—patents issued per 100,000 residents. As illustrated, West Virginia ranks in the lowest grouping among the states in terms of patents issued.

FIGURE 6.5: Employment in West Virginia by Employer Type, 2011



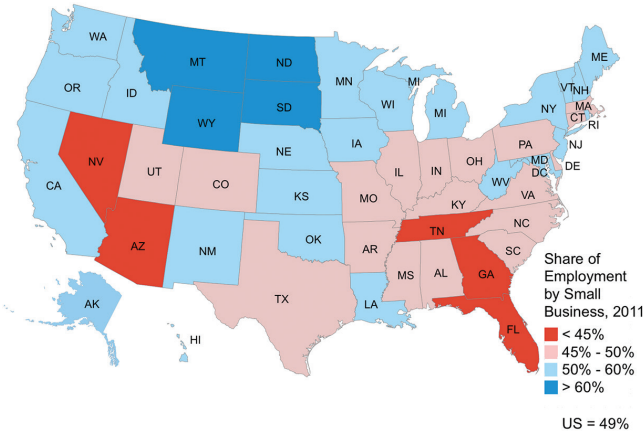
Sources: US Small Business Administration Office of Advocacy; Bureau of Economic Analysis

FIGURE 6.8: Wages and Salaries in West Virginia by Employer Type, 2011



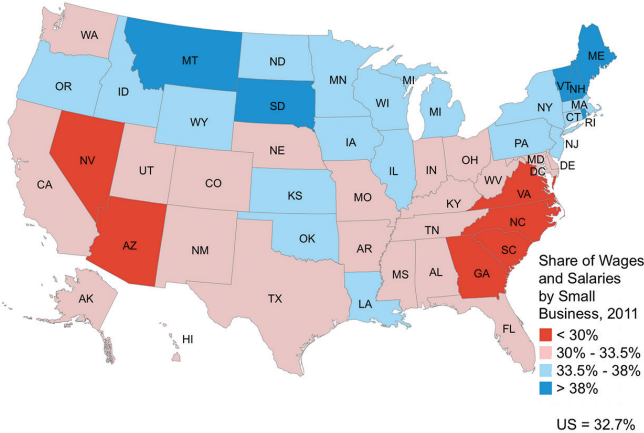
Sources: US Small Business Administration Office of Advocacy; Bureau of Economic Analysis

FIGURE 6.6: Small Business Employment Share, 2011



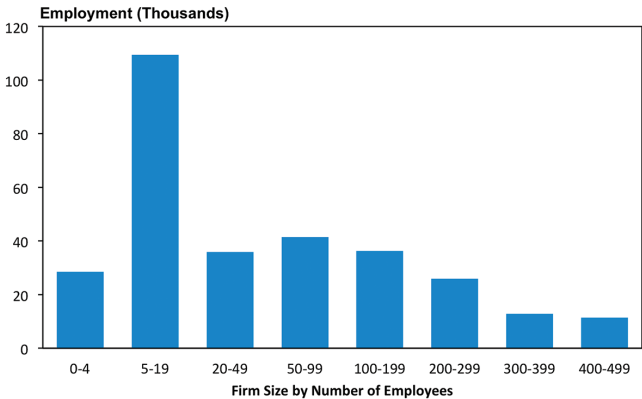
Source: US Small Business Administration Office of Advocacy

FIGURE 6.9: Share of Total Wages and Salaries by Small Businesses, 2011



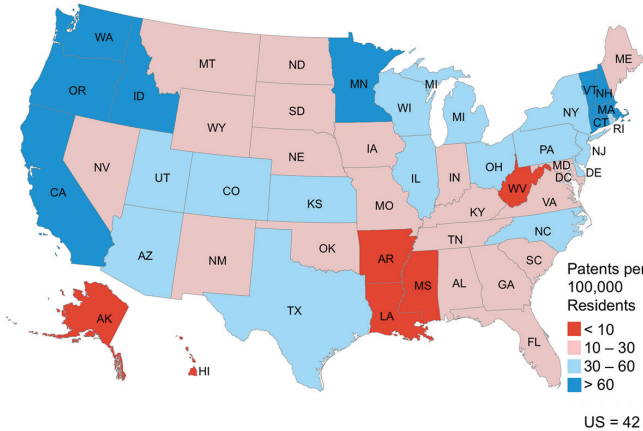
Sources: US Small Business Administration Office of Advocacy; Bureau of Economic Analysis

FIGURE 6.7: West Virginia Employment by Small Business Size, 2011



Source: US Small Business Administration Office of Advocacy

FIGURE 6.10: Patents Issued per 100,000 Residents, 2010-2013



Source: US Patent Office; Bureau of Economic Analysis

INDUSTRY INSIGHT:**SMALL BUSINESS IS BIG BUSINESS IN WEST VIRGINIA**

In 2005, Frances and Gene Brooks started a small business near Charleston making trophies. But they had bigger dreams. The husband and wife team combined their talents and began building a construction company.

When they were ready to take their growing business to the next level, they called in business coaches with the West Virginia Small Business Development Center (WWSBDC).

“The West Virginia small business coaches are in the game with us,” Frances says. “The WWSBDC has helped us with strategic planning, business development, marketing, budgeting and more. Whenever we have a problem, they can help us write the corrective action plan. We aren’t out there on our own. Many times, we’ve had desk-side help.”

BrooAlexa Construction has evolved into a nationally-recognized multistate construction business with multimillion dollar federal contracts. In April 2011, BrooAlexa was one of 16 companies in the US to be honored with the Small Business Achievement Award from the Department of Homeland Security. The company was chosen for exemplary work on the Advanced Training Center in Harpers Ferry. BrooAlexa will soon complete its biggest project to date: a training facility for the Federal Bureau of Prisons.

BrooAlexa shows what a small firm with a big vision—and the right coaching—can achieve. Small businesses employ about half—55 million—of the nation’s private workforce and account for 99.7 percent of all employers in the US. Many visitors from abroad are surprised to learn that the U.S. economy is by no means dominated by giant corporations. In fact, 99 percent of all independent enterprises in the country employ fewer than 500 people. These small enterprises account for 52 percent of all US workers,

according to the SBA. Some 19.6 million Americans work for companies employing fewer than 20 workers; 18.4 million work for firms employing between 20 and 99 workers; and 14.6 million work for firms with 100 to 499 workers.

The same holds true for West Virginia. In the Mountain State, small business is BIG business! Recent statistics show West Virginia’s small businesses employed more than half of the state’s private workforce. These companies play a vital role in the state’s economy.

The WWSBDC helps new small businesses get off to a strong start and established business expand with three key components: advice, connections and capital access.

With partners ranging from federal, state and local governments to economic development authorities to institutions of higher learning and funding from the SBA, the WWSBDC offers business coaching, connections and expert information resulting in greater access to capital and increased job creation. WWSBDC also collaborates and connects business owners with organizations in West Virginia who support small business growth.

The birth of her son Isaac inspired Isabella Yosucio to develop Mighty Tykes™ Infant & Child wrist and ankle weights, an invention that assists children aged six months to three years. Mighty Tykes™ Infant and Child Weights are cheerful wrist and ankle weights that may help with one-sided weakness, hypotonia (low muscle tone), weakness due to injury or illness, palsic movements, tremors and sensory issues. These and other issues are common in children with a variety of conditions like infant stroke, prematurity, cerebral palsy, Down syndrome, autism-spectrum disorders, muscular dystrophy and many others.

A WWSBDC business coach worked with the company from the



KRISTINA OLIVER, State Director, West Virginia Small Business Development Center

start. WWSBDC provided business coaching, business plan development and financial analysis needed to meet the investor’s requirements. Investment and support for Mighty Tykes™ was a collaborative effort involving the INNOVA Commercialization Group, (INNOVA®), an initiative of the West Virginia High Technology Consortium Foundation; the West Virginia Jobs Investment Trust (WVJIT); and the West Virginia Capital Access Program (WVCAP).

As part of the product development effort and to test the receptivity of the product to the market, Mighty Tykes™ initiated a market trial in 2012. Prototypes and a survey were sent to early intervention program families, professionals and institutions around the country. TechConnect West Virginia provided support for Mighty Tykes™ to attend the 2014 Abilities EXPO in New York City, where the product was officially introduced. The collaboration between INNOVA, WVJIT, WVCAP, WWSBDC, TechConnect and the company allowed each group to contribute vital resources to best position Mighty Tykes™ for future success.

The WWSBDC can also help established small businesses grow. In 2011, Linda Losey and Tom Kiefer opened Bloomery Plantation Distillery, making the sugary lemon-infused beverage found on the dessert menus of many Italian restaurants. After discovering the perfectly-unique 12-acre parcel with a rustic 1840s log cabin in Charles Town, West Virginia,

the team got to work. They found not only could they make the popular Italian liquor but they could make many succulent flavors of spirits. The Jefferson county mini-distillery has attracted tourists from every U.S. state and countries as far away as Laos and Iceland. In April 2012, they decided it was time to expand, so they reached out to the WWSBDC for guidance and assistance. Since then, they have doubled their revenue, generating nearly \$1 million in annual sales and employing 14 people.

West Virginia small businesses are major contributors to the strength of local economies. Investing in small businesses makes sense as an economic development strategy. Many organizations within West Virginia are committed to help new entrepreneurs realize their dream of business ownership and assist established businesses to remain competitive in the complex marketplace of an ever-changing global economy.

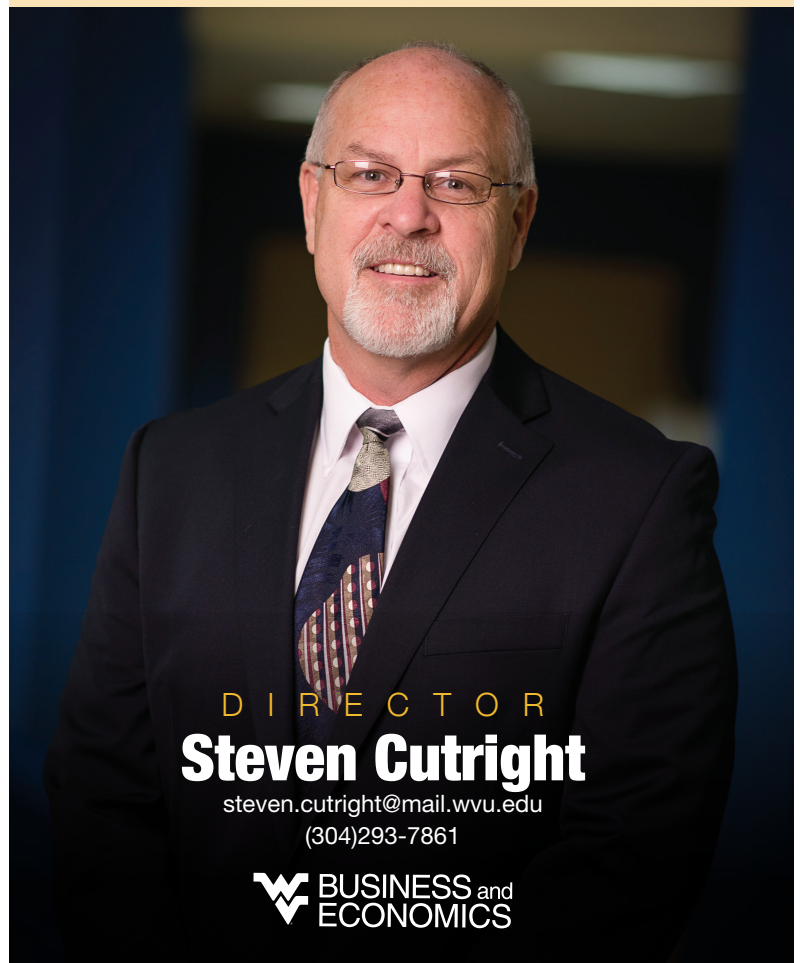
BRICKSTREET CENTER FOR INNOVATION & ENTREPRENEURSHIP

be.wvu.edu/cie

The Brickstreet Center for Innovation and Entrepreneurship provides a broad spectrum of business services for small businesses throughout West Virginia.

We offer "Concept through Operation" business services and assistance encompassing the following:

- **Feasibility Studies**
- **Business Plans**
- **Commercialization Plans**
- **Market Studies**
- **Process Re-Engineering**
- **Operational Efficiency Analysis**



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**W BUSINESS and
ECONOMICS**

APPENDIX A: GLOSSARY OF TERMS

Annual Growth Rate	between consecutive years is calculated as: $\left(\frac{X_t}{X_{t-N}} - 1 \right) \times 100$
Average Annual Growth Rate	is calculated for annual data as: $\left[\left(\frac{X_t}{X_{t-N}} \right)^{1/N} - 1 \right] \times 100$
Gross Product	is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products; calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Gross product can be calculated for various sized economies. This paper references Gross Product for counties (GCP), MSAs (GMP), states (GSP), and the domestic economy as a whole (GDP).
Metropolitan Statistical Area	is distinguished by a densely populated city or urban agglomeration with a population of 50,000 or more according to the US Office of Management and Budget; a county containing that city become the core of the MSA and if an adjacent county has at least 25 percent of its labor force commuting to or from the core area it is including in the MSA.
Personal Income	is the sum of the incomes of an area's residents; it is calculated as the sum of wages and salaries, proprietor's income with inventory valuation and capital consumption adjustments, rental income of persons with capital consumption adjustments, personal dividend income, personal interest income, and personal current transfer receipts less contributions for government social insurance.
Per Capita Personal Income	is the mean personal income within an economic aggregate, such as a country or city. It is calculated by taking a measure of personal income and dividing it by the total population. Per capita personal income is often used as average income, a measure of the wealth of the population of a nation, particularly in comparison to other nations.
Population	is the number of persons whose usual place of residence was within the area at the time the census was taken. It is also referred to as resident population. Persons in the military or institutionalized are counted where the military base or institution is located.
Real	data has been adjusted for inflation. Using real data eliminates the year-to-year changes in price and gives a clearer picture of the true changes in purchasing power, production, etc.
Real Dollars	dollar amounts have been adjusted for inflation. Using real dollars eliminates the year-to-year changes in price and gives a clearer picture of the true changes in purchasing power.
Unemployment Rate	is the percent of the civilian labor force that is unemployed. The civilian labor force is comprised of non-institutionalized persons 16 years of age or over who are employed or unemployed. A resident is considered to be unemployed for the month if that persona is at least 16 years old and is not currently employed but is available and actively looking for work during the survey week (the week including the 12th of the month).

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The **WVU BUREAU OF BUSINESS & ECONOMIC RESEARCH** happily introduced the new Mountain State Business Index earlier in 2014.

The index is motivated by the difficulty in processing the large and diverse volume of macroeconomic data that is produced regularly today. This monthly index serves as a single metric to consolidate the data that we read in the news into one simple and easy-to-follow statistic that communicates the likely growth path of the state's economy over the coming four to six months.

Signals of a contraction or expansion in the state's economy can be identified through the proper monitoring of changes in the index over time.

The index comprises seven economic indicators that were determined to lead expansions or contractions in the West Virginia economy. The seven indicators are related to the following factors: building permits; unemployment insurance claims; the value of the US dollar; stock prices related to West Virginia employers; interest rates; coal production; and natural gas production.

The structure of the West Virginia Expected Business Conditions Index generally follows that of the US Conference Board, which publishes a similar index for the nation as a whole. The MSBI is tailored to specific economic conditions in West Virginia, however.

Follow the State Journal and other media outlets through West Virginia for the Mountain State Business Index every month. The index and supporting technical document can also be found on the BBER website at bber.wvu.edu.

