Prairie Prosperity: An Economic Guide for the State of North Dakota

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ABSTRACT

In this report, we examine the history of North Dakota's state finances and explore the policies that led to the current environment. We evaluate the institutional settings and circumstances that caused North Dakota to move from being revered for its financial solvency to enacting massive spending cuts during the 2017 legislative session. We then turn to policy proposals that address state fiscal challenges and put North Dakota on a pathway to prosperity.

JEL codes: H7, N9, R0

Keywords: North Dakota, tax policy, education, transportation, pensions, budget stabilization, revenue, expenditure, entrepreneurship, economic freedom

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North Dakota recently experienced extraordinary growth and prosperity, which was accompanied by a proportional expansion in state spending. Currently, however, the state is experiencing financial strain amid a budgetary shortfall. Lackluster revenues caused primarily by slumping oil and agricultural prices, coupled with expanded state expenditures, have changed the fiscal environment of the state.

In this report, we examine the history of North Dakota's state finances and explore the policies that led to the current environment. We evaluate the institutional settings and circumstances that allowed North Dakota to move from being revered for its financial solvency to the governor calling for a spending reduction in excess of $1.4 billion in 2016, which later resulted in cutting nearly one-third of the budget during the 2017 legislative session (Smith 2017; MacPherson 2017). We then turn to policy proposals that address state fiscal challenges and put North Dakota on a pathway to prosperity.

A summary of our policy proposals is as follows:

- Tax Policy
  - Maintain income and property taxes while keeping rates low to ensure a diverse portfolio of financing to combat volatile revenue streams
  - Increase the transparency and simplicity of property taxation
  - Avoid property tax relief programs that create fiscal illusions and increase local spending
- Education Financing
  - Improve the effectiveness and efficiency of primary and secondary public education spending by measuring the dollars spent against student outcomes
  - Increase educational efficiency by implementing school choice proposals, such as a school voucher system and a constitutional

provision for charter schools, and shifting property taxes back to local governments

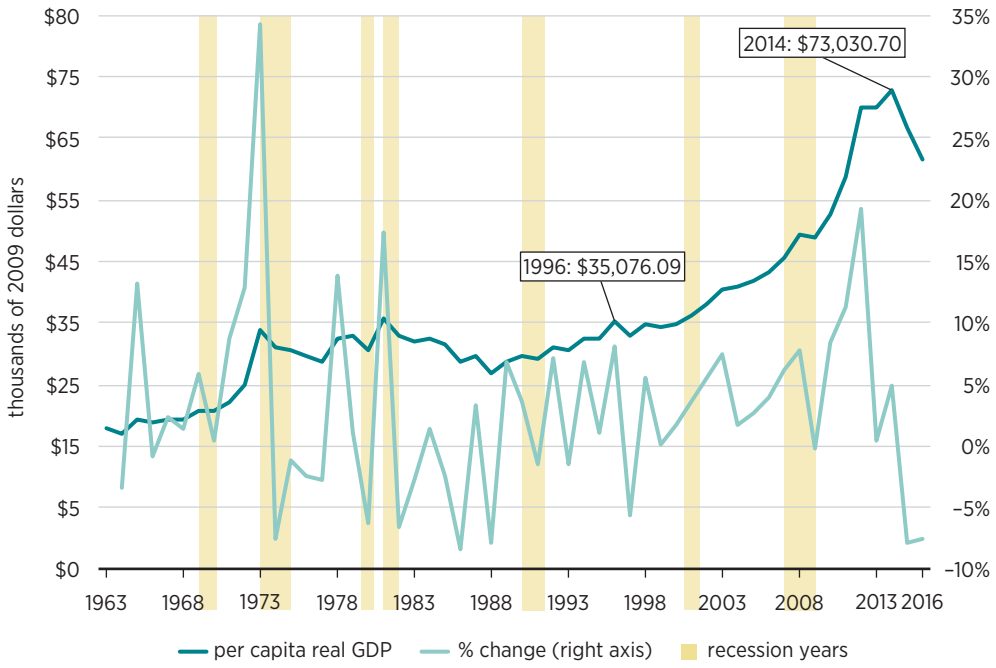
- Transportation
  - Continue to support infrastructure with strategic and targeted use of funds
- Pension System
  - Meet 100 percent of the required annual contributions to raise the funded ratio and ensure the long-term viability of pension funds
- Budget Stabilization Fund
  - Establish a permanent and constitutionally protected cap on the Budget Stabilization Fund at 15 percent of appropriations
  - Replenish the Budget Stabilization Fund to at least 15 percent of appropriations
  - Establish a tax and expenditure limit to restrict the boom-and-bust effect of commodity pricing and protect state finances in the future
- Legacy Fund
  - Clearly define the purpose of the Legacy Fund
  - Do not use the Legacy Fund as a second budget-stabilizing fund

THE STATE OF THE STATE

By almost all measures, the state of North Dakota has experienced a period of admirable growth. Over the past half century, North Dakota charted a 2.7 percent annual growth rate in real GDP per capita. In recent years, real per capita GDP more than doubled from $35,076.09 per person in 1996 to $73,030.70 in 2014 (see figure 1). Compare that with the per capita GDP of South Dakota, the state with the second-highest annual growth rate in the region, at 2.3 percent during the same period (see figure 2). Indeed, North Dakota's prosperity has been the envy of the prairie region and the nation.

North Dakota experienced rapid expansion from 2009 to 2012 (the three-year period after the Great Recession) with growth rates of 8.1, 11.1, and 19.1 percent, respectively. If those three years are removed from the calculations, North Dakota still has an average annual growth rate of 2.5 percent, which eclipses rival South Dakota. However, this period of expansion came to an abrupt end in 2015 when North Dakota registered a decrease of 8.41 percent

FIGURE 1. NORTH DAKOTA PER CAPITA GDP (IN 2009$)



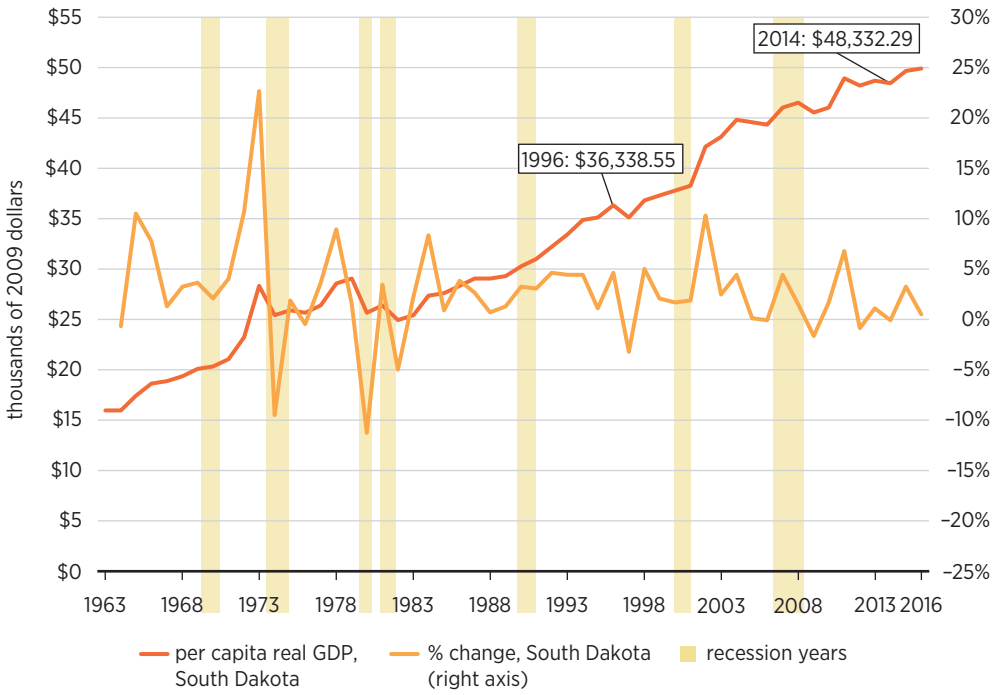
Data Note: The highlighted areas display recession years recognized by the National Bureau of Economic Research; see Federal Reserve Bank of St. Louis, "NBER Based Recession Indicators for the United States from the Period Following the Peak through the Trough (USREC)," accessed September 28, 2018, https://fred.stlouisfed.org/series/usrec.

Source: Bureau of Economic Analysis, nominal GDP converted to constant 2009 dollars using average annual Consumer Price Index for all Urban consumers (CPI-U).

in per capita GDP. In 2016, per capita real GDP fell by an additional 8.16 percent, which was the largest contraction in the region. Only Wyoming experienced comparable contractions, at 6.36 percent in 2015 and 4.98 percent in 2016 (see figure 3).

Even accounting for this contraction, North Dakota has outperformed all of its regional neighbors since 2009. Table 1 shows the average percentage change in per capita GDP for the region. North Dakota's economy performed exceptionally well from 1964 to 1974, with per capita GDP growing at an average rate of 5.7 percent. However, growth slowed substantially from 1975 to 1995 for the entire region. This slowdown was particularly pronounced in North Dakota. The state went from leading the region in the 1960s and early 1970s to falling behind its regional peers from 1975 to 1985. This trend began to reverse in the late 1980s with an average growth of 1.2 percent. Growth continued to improve during the 1990s, leading up to the oil boom in the decade after 2000.

FIGURE 2. SOUTH DAKOTA PER CAPITA GDP (IN 2009$)



Data Note: The highlighted areas display recession years recognized by the National Bureau of Economic Research.

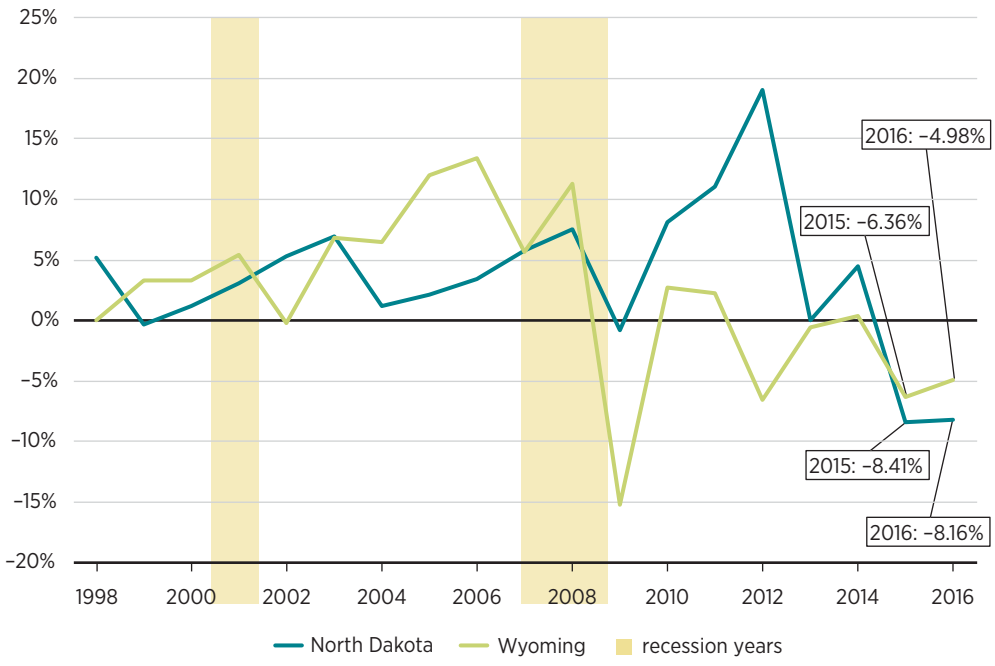
Source: Bureau of Economic Analysis, nominal GDP converted to constant 2009 dollars using average annual CPI-U.

TABLE 1. AVERAGE PERCENTAGE CHANGE IN PER CAPITA GDP (IN 2009$)

	(1964–1974)	(1975–1985)	(1986–1996)	(1997–2007)	(2008–2016)	(1964–2016)
Iowa	3.6	0.3	2.2	2.1	0.8	1.8
Minnesota	3.5	1.5	1.6	1.7	0.6	1.8
Montana	3.2	−0.2	0.6	2.9	0.3	1.4
Nebraska	3.6	0.9	2.1	2.5	1.5	1.9
North Dakota	**5.7**	**0.4**	**1.2**	**2.2**	**3.7**	**2.7**
South Dakota	4.6	0.8	2.6	1.6	0.9	2.3
Wisconsin	2.2	1.2	1.9	4.3	0.7	1.5
Wyoming	3.6	1.7	−0.6	4.3	−1.9	1.6
United States	**2.7**	**1.4**	**1.1**	**1.7**	**0.4**	**1.5**

Source: Bureau of Economic Analysis, nominal GDP converted to constant 2009 dollars using average annual CPI-U.

FIGURE 3. NORTH DAKOTA AND WYOMING CHANGE IN GDP (IN 2009$)



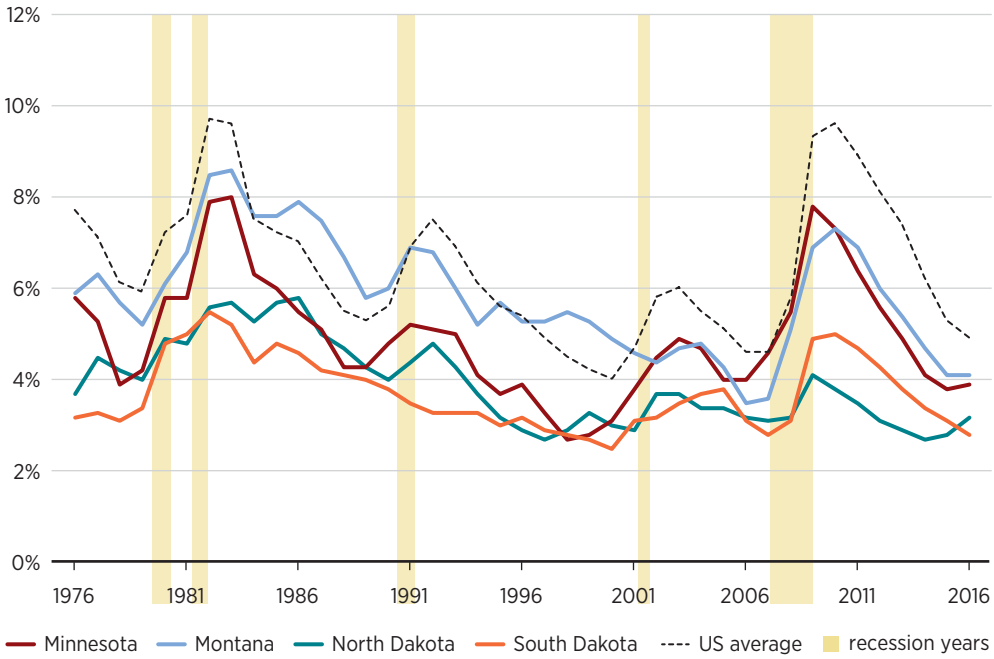
Data Note: The highlighted areas display recession years recognized by the National Bureau of Economic Research.

Source: Bureau of Economic Analysis, nominal GDP converted to constant 2009 dollars using average annual CPI-U.

The labor market data paint a similar picture. North Dakota had the lowest unemployment rate in the region from 2008 to 2015 with an average unemployment rate of 3.25 percent (see figure 4). During this period, North Dakota and its regional peers consistently boasted lower unemployment rates than the national average. In addition to presently low unemployment, the size of the North Dakota labor force grew from 275,558 in March 1976 to 420,903 in March 2017, at an average annual growth of 1 percent. This slow labor force growth and persistently low unemployment are evidence of the state's struggles to attract workers.

Figure 5 shows the year-over-year percentage change in labor force for all the states bordering North Dakota. The dotted black line represents national labor force growth. North Dakota's labor force growth has shown far more volatility than that of its immediate neighbors and the nation as a whole. North Dakota's labor force likely reflects the volatility of its commodity-based economy. The clearest example of this trend can be seen in the most recent oil boom and bust. Labor force growth spiked after 2008 when the boom began and then dropped when oil prices fell in 2013.

FIGURE 4. AVERAGE ANNUAL UNEMPLOYMENT RATE



Data Note: The highlighted areas display recession years recognized by the National Bureau of Economic Research.

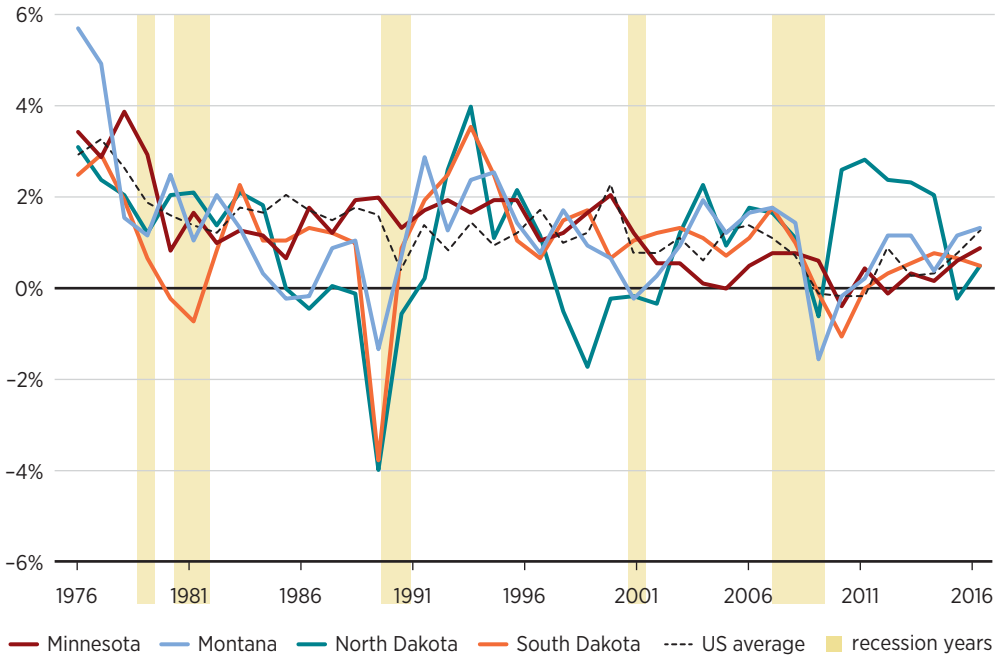
Source: Bureau of Labor Statistics, calculated using annual averages from seasonally adjusted monthly data.

Table 2 offers a more comprehensive look across all regional states. From 1977 to 2006, North Dakota's labor force grew more slowly than the national average, which appears characteristic of the region. However, the most recent observational period (2007–2016) tells a different story. High-paying oil jobs attracted workers to the state, causing labor force growth in North Dakota to greatly exceed regional and national norms. Despite this period of uncharacteristic growth, Wyoming was the only state in the region to surpass the average national rate of labor force growth from 1977 to 2016.

Real GDP per capita growth was exceptional in 2008 and in the period 2010–2012. This rapid economic growth represented a significant increase from previous trends, but it is unclear what the state should expect in the postboom period. An investigation into the composition of state GDP during and after this expansion can reveal the ways in which the North Dakota economy has changed.

The sectoral breakdown of North Dakota's GDP is shown in figure 6. The top three industries in 1997 were the following: (1) government; (2) finance, insurance, real estate, rental, and leasing; and (3) educational services, healthcare, and

FIGURE 5. REGIONAL LABOR FORCE GROWTH (YEAR-OVER-YEAR PERCENTAGE CHANGE)



Data Note: The highlighted areas display recession years recognized by the National Bureau of Economic Research.

Source: Bureau of Labor Statistics, calculated using annual averages from seasonally adjusted monthly data.

TABLE 2. AVERAGE PERCENTAGE CHANGE IN LABOR FORCE

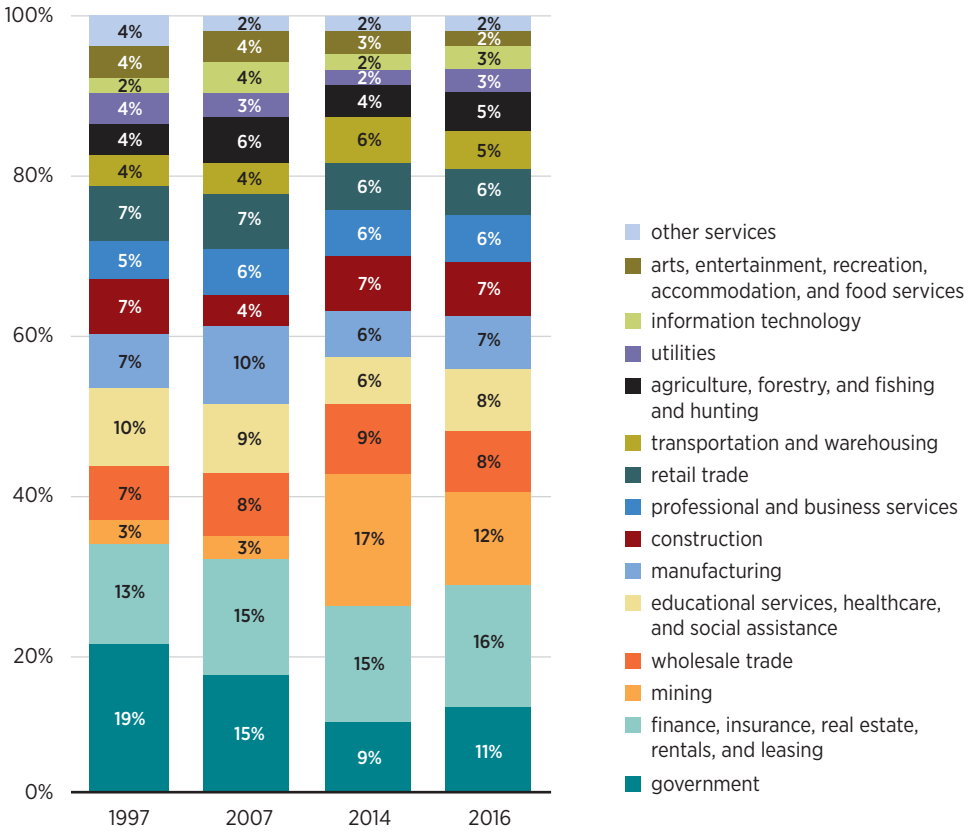
	(1977–1986)	(1987–1996)	(1997–2006)	(2007–2016)	(1977–2016)
Iowa	0.7	1.2	0.3	0.3	0.6
Minnesota	1.9	1.7	0.9	0.4	1.2
Montana	2.0	1.1	0.9	0.6	1.2
Nebraska	1.2	1.2	0.6	0.4	0.9
North Dakota	**1.8**	**0.5**	**0.4**	**1.4**	**1.0**
South Dakota	1.2	1.2	1.1	0.4	1.0
Wisconsin	1.2	2.0	0.4	0.2	1.0
Wyoming	3.4	0.2	1.0	0.7	1.4
United States	**2.1**	**1.3**	**1.2**	**0.5**	**1.3**

Source: Bureau of Labor Statistics, calculated using annual averages from seasonally adjusted monthly data.

social assistance. Other notable categories included (1) manufacturing; (2) retail trade; and (3) agriculture, forestry, fishing, and hunting.

As shown in figure 6, the sectoral composition of GDP has changed substantially since 1997. Finance, insurance, real estate, rental, and leasing increased

FIGURE 6. NORTH DAKOTA GDP 1997 THROUGH 2016



Source: Bureau of Economic Analysis, state GDP sector breakdown as percentage of real GDP in 2009 chained dollars.

from 13 percent of GDP in 1997 to 16 percent in 2016. Government decreased from 19 percent in 1997 to 11 percent in 2016. The agriculture, forestry, fishing, and hunting sector showed little change in terms of percentage of GDP composition. However, the biggest change occurred in the mining sector, which accounted for only 3 percent of North Dakota's GDP in 1997 and 2007, but accounted for 17 percent by 2014. Since then, the explosive growth of North Dakota's mining sector has slowed with the collapse of oil prices. In 2016, mining accounted for only 12 percent of North Dakota's GDP. The changes highlighted in figure 6 are evidence of sectoral shifts in industries' shares of the state GDP during the period of expansion.

A Boom-and-Bust History

North Dakota's economy is heavily dependent on commodity exports. The state has a long and rich agricultural history, and like many commodity-based economies, it has a turbulent economic history. Rising commodity prices in agriculture and energy lead to booms in economic activity, which turn into busts when prices fall.

Agriculture has been the state's largest industry since the first Americans traveled west with the expansion of the railroad, and that tradition continues today. To truly understand the nature of North Dakota's boom-and-bust economy, it is critical to understand the history of commodities, especially agricultural products, in the state. Unsurprisingly, agriculture birthed the first of North Dakota's economic boom-and-bust cycles, and the high variability of crop yields and prices has historically caused significant economic fluctuations.

This historical analysis covers North Dakota's boom-and-bust periods starting with data from the first boom in 1913. The period 1909–1914 is largely considered the "Golden Age of Agriculture" (Hurt 2002, 221). American agriculture rapidly expanded from 1890 to 1900 as the country experienced a 25.7 percent increase in the number of farms (Drache 1985). This increase led to surplus crop production, which kept prices low for agricultural commodities. By 1910, this trend had reversed as people started moving into cities to find work. This helped usher in the Golden Age.

When using the Golden Age (1909–1914) as a base period for farm purchasing power, the price of agricultural outputs in relation to the cost of agricultural inputs reached its peak during this time (Bean and Bollinger 1939). There was also an increase in mechanization during this period, which led to more efficient production. Finally, the Golden Age was fueled by heightened European demand during World War I. When the war ended, the reduction in European demand and increase in competition as European agriculture resumed created a postwar surplus, lowering prices (Hurt 2002). As prices fell, it became more difficult for farmers to meet their debt obligations, which were primarily incurred to finance mechanization, and the boom ended (Hurt 2002). The loss of revenue led the state budget board to cut appropriations by 12.5 percent (*Bismarck Tribune* 1921).

By 1929, the stock market collapse had the nation's economy in turmoil. Farms that struggled to stay afloat during the 1920s rapidly failed. North Dakota went the way of the nation. Additionally, North Dakota farmers experienced a devastating drought. According to a 1934 Adams County Extension Agent Report, poor yields and droughts led to only 9,000 out of 109,089 acres of wheat being harvested. The report states that "very little of this wheat [was] marketable, it

[was] not fit for seeds" (NDAC Extension 1934). Dissatisfaction among farmers and low farm incomes prompted legislative action in the form of price controls and regulated production. Lawmakers hoped to increase farm incomes back to the levels experienced during the Golden Age. To accomplish this at the national level, a range of New Deal policies was instituted. The most notable policy was the Agricultural Adjustment Act, which relied on the concept of parity—the belief that agriculture prices should return to the Golden Age highs of the period 1909–1914. The Agricultural Adjustment Act did raise prices, but parity was not achieved until World War II again put European farmers out of business (Boehm, Knutson, and Penn 1983).

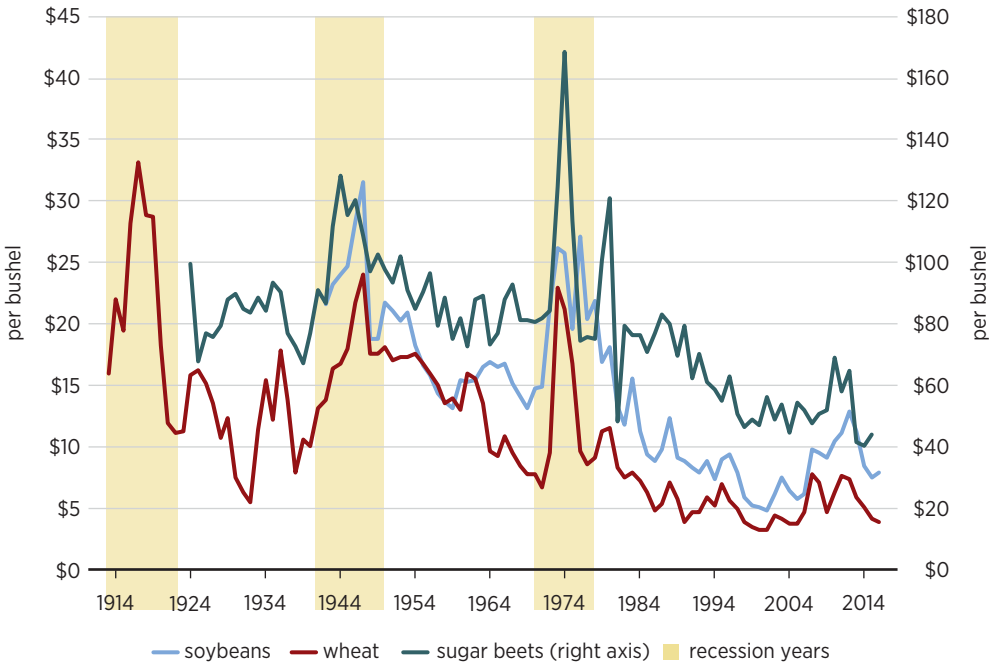
North Dakota has experienced three major agricultural commodity boom-and-bust cycles since the early 20th century. The Golden Age crashed with the conclusion of World War I, and a similar cycle followed World War II. The last and most infamous boom and bust was the Russian Wheat Deal, also known as the Great Grain Robbery, during the mid-1970s. The Soviet government took advantage of US export subsidies by purchasing 440 million bushels of wheat for about $700 million (Luttrell 1973). The Soviets received cheap wheat and other grain products, the American farmers got a handsome paycheck, and the US taxpayers were on the hook for a $300 million subsidy and substantially higher food prices (Luttrell 1973).

According to North Dakota agriculture expert Tim Faller, "When commodity (crop) prices fell in the 1980s, a crisis in the farm economy caused major problems for farmers. The combination of borrowing too much money, high interest rates, and low crop prices during the 1980s, forced many North Dakota farms into bankruptcy. Many farm operators were displaced, and many sons and daughters of farmers were encouraged to leave the farm and seek advanced education for jobs away from agriculture. Rural North Dakota lost population, and many rural communities struggled for existence" (n.d., para. 5). All of these events had national effects, but they can also be observed by looking at historical North Dakota agricultural commodity prices (see figure 7).

The collapse in agricultural commodity prices caused North Dakota to experience a revenue shortfall of 19 percent during the 1985–1987 biennium. In response, lawmakers established the Foundation Aid Stabilization Fund to constitutionally protect school funding. Additionally, the state created a rainy day fund to cover general expenses in the event of future revenue shortages (Hageman 2016a).

North Dakota's boom-and-bust history is not limited to farmers. The state also has a rich endowment of natural resources—the most important of which is arguably oil. The history of oil exploration in North Dakota dates to

FIGURE 7. MAJOR NORTH DAKOTA CROPS—AVERAGE PRICE RECEIVED IN NORTH DAKOTA (IN 2009$)

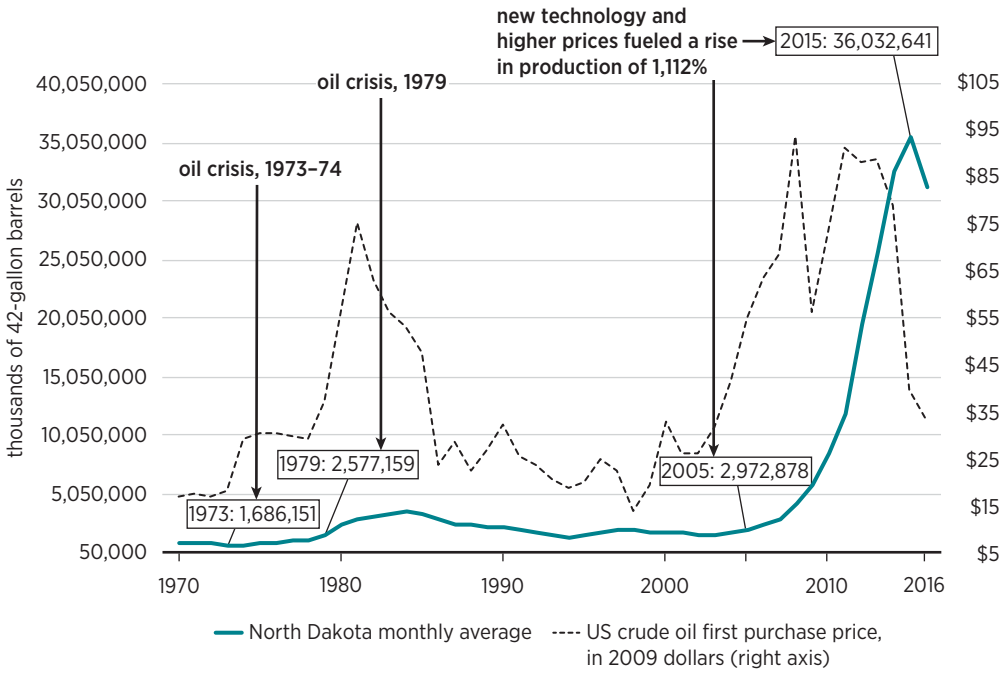


Source: United States Department of Agriculture National Agricultural Statistics Service Information Survey, using annualized average price received adjusted to 2009 dollars utilizing historical annualized average CPI-U. In dollars per bushel ($/BU).

the early 20th century. Around 1910, attempts to drill for oil yielded no results because of technological limitations. It was not until the first major oil discovery in 1951 that the first major oil-producing well, Clarence Iverson No. 1, was instituted. From 1951 to 1958, Clarence produced over 585,000 barrels of oil. Clarence's success established the feasibility of commercial oil production in the state. However, oil remained expensive to extract relative to other sources, which prevented North Dakota from experiencing the booms and busts felt by other states during the oil crises of the 1970s. The state's oil production held steady, and so did state government finances. This changed in 2005 when revolutionary extraction techniques, combined with record high prices, led to the state's first oil boom and bust (see figure 8).

Figure 9 uses state financial data from both the US Census Bureau and the North Dakota Office of Management and Budget. Their measures do not align owing to different accounting methods, but both federal- and state-level data tend to trend closely. Over the past decade, North Dakota has experienced

FIGURE 8. NORTH DAKOTA OIL PRODUCTION

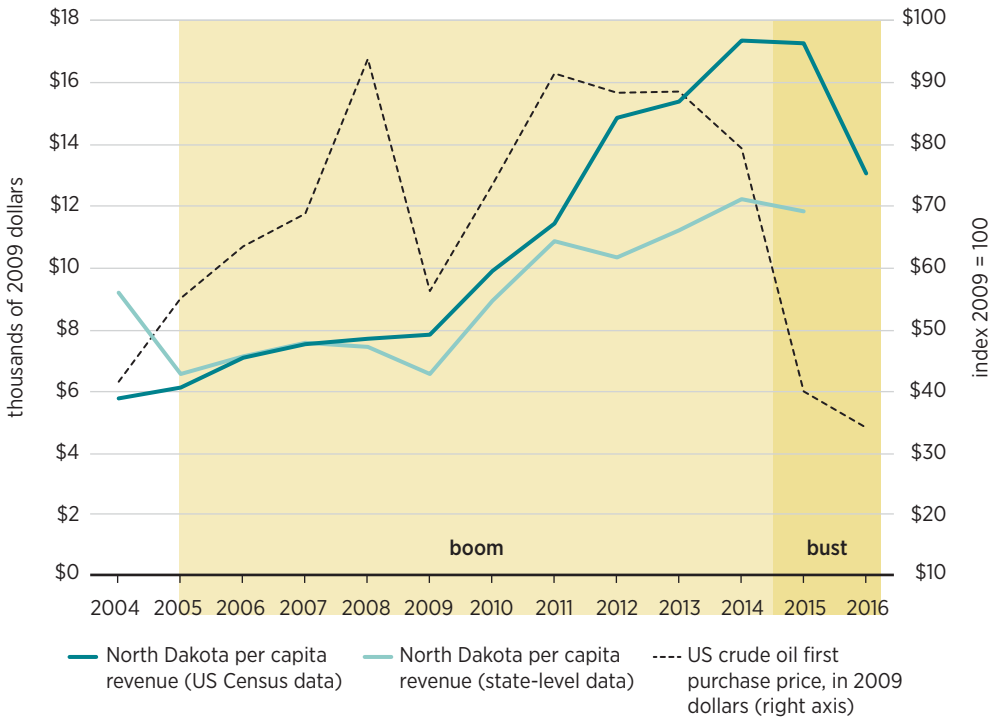


Sources: US Energy Information Administration, "U.S. Crude Oil First Purchase Price: Annual"; North Dakota Industrial Commission, Department of Mineral Resources, Oil and Gas Division, accessed September 28, 2018, https://www.dmr.nd.gov/oilgas/stats/historicaloilprodstats.pdf.

an economic boom and bust that can be directly attributed to the rapid rise and subsequent collapse in the price of oil. Unlike in the past, technological advancements have now made it possible for North Dakota to take advantage of rising prices. This has caused oil extraction and production tax revenues to soar, creating a boom in state revenue.

According to data collected from the North Dakota Office of Management and Budget, inflation-adjusted oil and natural gas production tax revenues increased by 2,407 percent from 2004 to 2014. During the same period, oil extraction tax revenues increased 5,361 percent. However, as oil prices began to fall in late 2014, so did the associated oil tax revenues. The oil and natural gas production tax revenues fell by 16 percent in 2015. This slide continued in 2016 with an astonishing 74 percent decrease. Similarly, oil extraction tax revenues fell 14 percent in 2015 and 52 percent in 2016. This sparked the state's current budget crisis. The collapse in oil prices had a lagging effect on state revenue, as shown in the state-level data in figure 9. After 2015, the bust becomes visible as overall

FIGURE 9. PER CAPITA REVENUE AND OIL PRICE (IN 2009$)



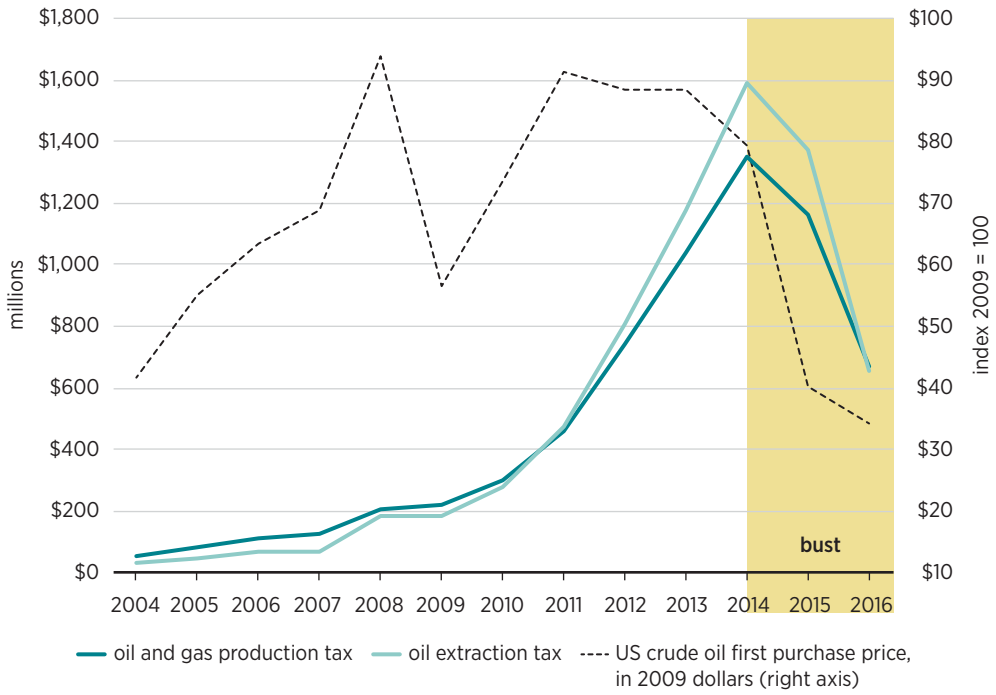
Sources: State revenue data provided upon request from the North Dakota Office of Management and Budget; oil data provided by the Energy Information Administration utilizing domestic first purchase cost per barrel. All monetary values adjusted to 2009 dollars utilizing average CPI-U.

per capita revenue declines with falling oil prices. Similarly, figure 10 shows the collapse in tax revenue. As oil prices fell, so did the corresponding tax revenue.

As further evidence of the effect boom-and-bust commodities have on North Dakota's economy, figure 11 shows their side-by-side fluctuations. The inflation-adjusted per capita GDP is measured in constant 2009 dollars, and the Commodity Export Price Index (End Use) (1984–2016) is used to measure commodity prices. Looking at figure 11, it is clear that a relationship exists between commodity prices and changes in North Dakota's per capita GDP. This is further supported by a correlation analysis, which shows a positive relationship correlation of 0.93 between the two metrics over the past 32 years.

While North Dakota cannot control the commodity markets that drive the state's boom-and-bust cycles, it can implement policies to encourage economic diversification and growth. One important factor known to positively influence economic growth and prosperity is economic freedom. Economic freedom has

FIGURE 10. NORTH DAKOTA OIL TAX AND OIL PRICE (IN 2009$)



Sources: State revenue data provided upon request from the North Dakota Office of Management and Budget; oil data provided by the Energy Information Administration utilizing domestic first purchase cost per barrel. All monetary values adjusted to 2009 dollars utilizing average CPI-U.

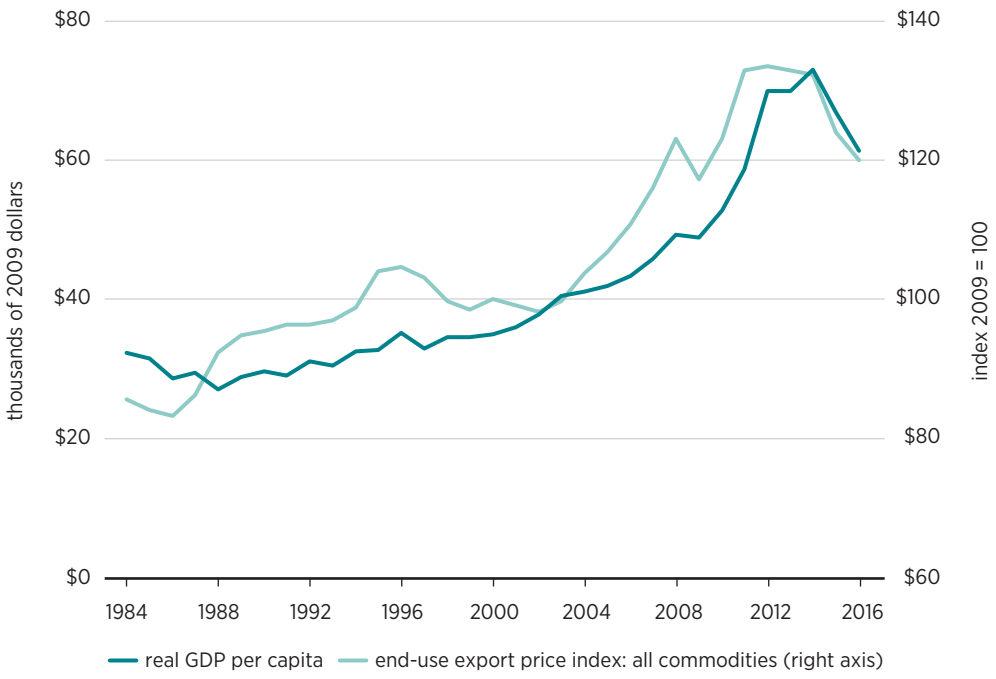
contributed to North Dakota's growth in the past and can play an important role in future expansion.

Economic Freedom

James Gwartney, Robert Lawson, and Walter Block have characterized economic freedom as follows:

> Individuals have economic freedom when (a) property they acquire without the use of force, fraud, or theft is protected from physical invasions by others and (b) they are free to use, exchange, or give their property as long as their actions do not violate the identical rights of others. Thus, an index of economic freedom should measure the extent to which rightly acquired property is protected and individuals are engaged in voluntary transactions. (Gwartney, Lawson, and Block 1996, 12)

FIGURE 11. CHANGE IN REAL PER CAPITA GDP VS. ALL COMMODITY EXPORT PRICES (INDEX 2009 = 100)



Source: Bureau of Economic Analysis, nominal GDP converted to constant 2009 dollars using average annual CPI-U 1982–84 = 100; Federal Reserve Bank of St. Louis, "Export Price Index (End Use): All Commodities," accessed September 27, 2018, https://fred.stlouisfed.org/series/IQ.

Economic freedom has been measured by several prominent indices, including the Economic Freedom of the World Index (Gwartney, Lawson, and Hall 2016) and the Economic Freedom of North America Index (Stansel, Torra, and McMahon 2016), both of which are produced by Canada's Fraser Institute. Numerous studies using both indices have demonstrated the importance of economic freedom on economic growth and prosperity (Compton, Giedeman, and Hoover 2011, 2014; Doucouliagos and Ulubasoglu 2006; Gwartney, Lawson, and Holcombe 1999; Haan and Sturm 2000). Recent literature has examined the social consequences of economic freedom (Ashby and Sobel 2008; Berggren and Jordahl 2006; Berggren and Nilsson 2013; Hoover, Compton, and Giedeman 2015; Jackson, Carden, and Compton 2015; Jackson 2017a, 2017b) and its impact on entrepreneurship (Kreft and Sobel 2005; Nyström 2008; Wiseman and Young 2013). These studies demonstrate that the institutions of economic freedom are foundational in creating a prosperous society both economically and socially.

For the purpose of this analysis, the Economic Freedom of North America (EFNA) index will be used to compare North Dakota and its regional neighbors. The EFNA index is composed of two indices: one to compare national governments and another to make comparisons across jurisdictions within the same country. This analysis utilizes the subnational index to compare North Dakota with other regional American states. The EFNA index examines variables related to government spending, taxes, and labor-market freedom. Each state within the United States is given a score ranging from 0 to 10, with a higher score corresponding to a more favorable degree of economic freedom. Once scored, each state is ranked against all 50 states. However, the rankings are inverted from the measured scale. Therefore, a lower state ranking represents more economic freedom (Stansel, Torra, and McMahon 2016).

The EFNA calculates its main index as an average of three component subindices: government spending, taxes, and labor-market freedom. As shown in table 3, there are several components to each subindex. Each component is equally weighted with no emphasis on any particular measure. By examining these components, it is easier to understand how North Dakota can work to improve its overall ranking.

TABLE 3. THE AREAS AND COMPONENTS OF THE ECONOMIC FREEDOM OF NORTH AMERICA INDEX

The Areas and Components of the Economic Freedom of North America Index	Index Weight (%)
1. Size of Government	**33.3**
1A. General Consumption Expenditures by Government as a Percentage of Income	11.1
1B. Transfers and Subsidies as a Percentage of Income	11.1
1C. Insurance and Retirement Payments as a Percentage of Income	11.1
2. Taxation	**33.3**
2A. Income and Payroll Tax Revenue as a Percentage of Income	8.33
2B. Top Marginal Income Tax Rate and the Income Threshold at Which It Applies	8.33
2C. Property Tax and Other Taxes as a Percentage of Income	8.33
2D. Sales Taxes as a Percentage of Income	8.33
3. Regulation	**33.3**
3A. Labor Market Freedom	8.33
3Ai. Minimum Wage Legislation	8.33
3Aii. Government Employment as a Percentage of Total State/Provincial Employment	8.33
3Aiii. Union Density	8.33

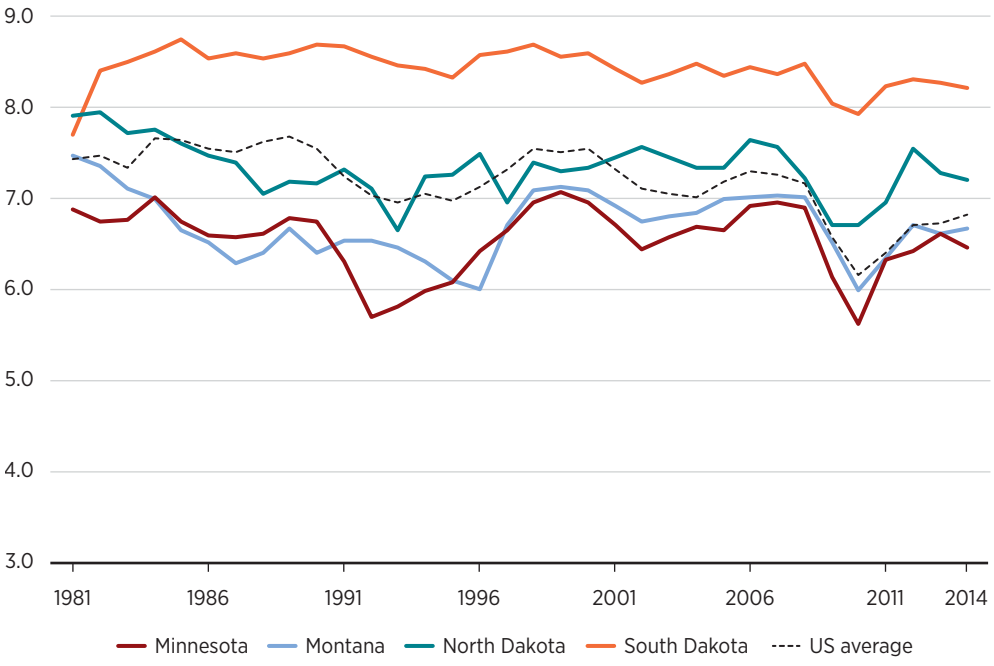
Note: For all components, each observation was transformed into a number from 0 to 10 using the following formula: (Vmax − Vi) / (Vmax − Vmin) × 10, where (unless otherwise stated) Vmax is the largest value found within a component, Vmin is the smallest, and Vi is the observation to be transformed.

Source: D. Stansel, J. Torra, and F. McMahon, *Economic Freedom of North America 2016* (Vancouver: Fraser Institute, 2016).

In 1984, North Dakota ranked 30th in the nation for overall economic freedom. However, over the past 20 years, North Dakota has made great strides to create state institutions that promote economic freedom. The state has lowered both corporate and individual income taxes (see "Income Taxes") and made attempts to provide property tax relief (see "Property Taxes"). In 2014, the most recent year for which EFNA rankings are available, North Dakota ranked 12th.

The pattern in economic freedom over time for North Dakota and its neighbors can be seen in figures 12–16. Figure 12 looks at the government spending component. This component is measured by an aggregate of three subareas: total government expenditures as a percentage of income, transfers and subsidies as a percentage of income, and insurance and retirement payments as a percentage of income. This component reflects the view that once government spending exceeds the minimal threshold needed to provide necessary protections and production, economic freedom decreases because citizen choice is reduced and crowded out by unnecessary government expenditure.

FIGURE 12. GOVERNMENT SPENDING SCORES



Note: A higher score indicates more freedom.

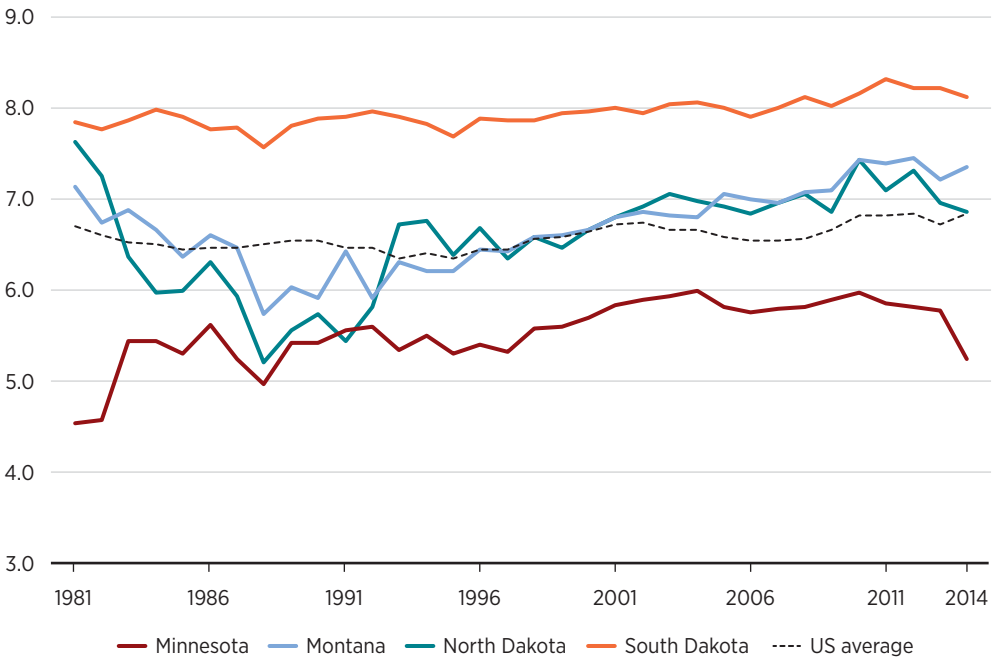
Source: D. Stansel, J. Torra, and F. McMahon, *Economic Freedom of North America 2016* (Vancouver: Fraser Institute, 2016).

Economic freedom is further affected by the tax burden private citizens face, which reduces their ability to use their property as they themselves determine best. The taxation component combines data on several types of taxation (income and payroll tax revenue, top marginal income or payroll tax rate, property taxes, and sales tax) to calculate a score for each state. The dynamics of this component of economic freedom are shown in figure 13.

During the 1980s, North Dakota's tax score fell as corporate and individual taxes increased. The score rebounded in the decade after 2000 as North Dakota improved tax freedom by implementing tax cuts (North Dakota State Tax Commissioner 2016). In the region, South Dakota has consistently received the highest score by having no corporate or individual income tax.

Labor market freedom is determined by minimum wage legislation, government employment, and unionization. Each of these reflects the ability of private citizens—both employees and employers—to enter into voluntary employment contracts with each other. The dynamics of the labor market freedom component can be seen in figure 14. Montana performs particularly poorly in this area because

FIGURE 13. TAX SCORES



Note: A higher score indicates more freedom.

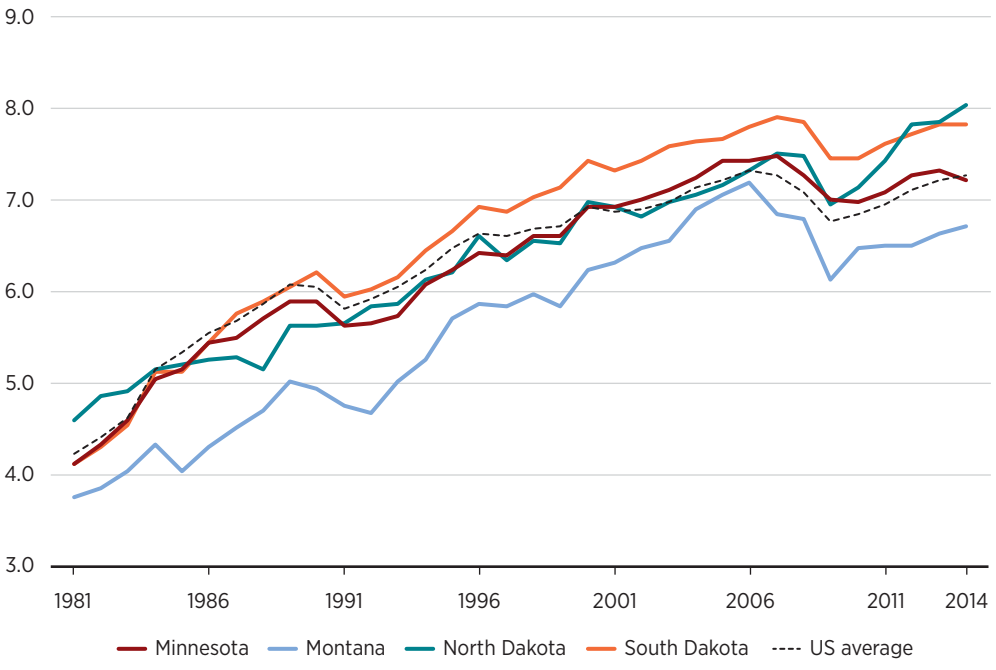
Source: D. Stansel, J. Torra, and F. McMahon, *Economic Freedom of North America 2016* (Vancouver: Fraser Institute, 2016).

of its unusually high density of union workers and its lack of right-to-work legislation. Minnesota also performs poorly in this area, but it has a lower concentration of state workers than Montana (Governing 2014). South Dakota recently increased its minimum wage and plans to hike it further, which will reduce its score. These factors are likely to ensure North Dakota's superior performance in this metric for the foreseeable future (National Conference of State Legislatures 2014). North Dakota is a right-to-work state that has actively tried to limit the impact of public unions. Legislators enacted Chapter 15.1-16 of the *North Dakota Century Code* in 2001, which made unions optional for public school teachers and employees.

Figure 15 shows the evolution of state rankings for the prairie region from 1981 to 2014. South Dakota has maintained the highest ranking in the region over almost the entire history of the index, with a current ranking of 3. North Dakota is next at 12.

These charts show that North Dakota's favorable economic freedom ranking is primarily based on its growth in the labor market freedom (area 3) and tax freedom (area 2) subcomponents (see figure 13 and figure 14). The state score in

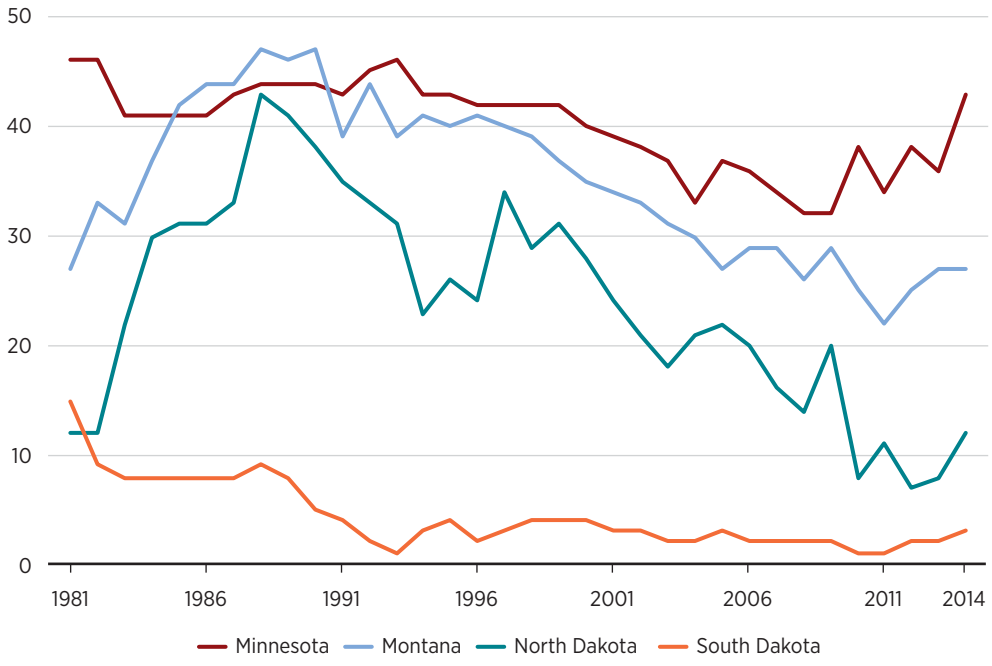
FIGURE 14. LABOR MARKET FREEDOM SCORES



Note: A higher score indicates more freedom.

Source: D. Stansel, J. Torra, and F. McMahon, *Economic Freedom of North America 2016* (Vancouver: Fraser Institute, 2016).

FIGURE 15. ECONOMIC FREEDOM RANKING



Note: Lower rank indicates more freedom.

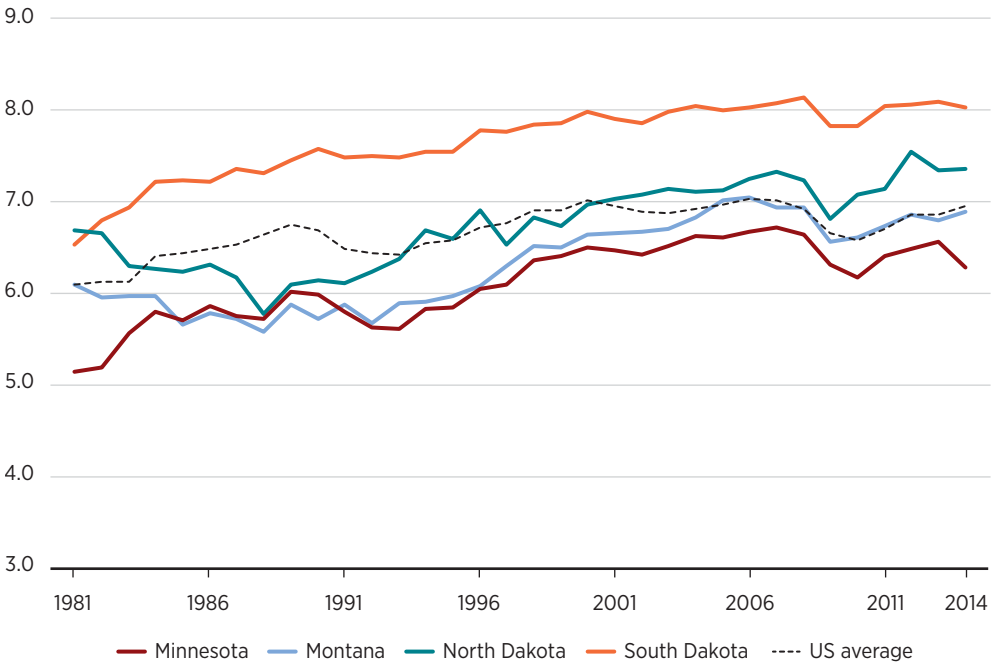
Source: D. Stansel, J. Torra, and F. McMahon, *Economic Freedom of North America 2016* (Vancouver: Fraser Institute, 2016).

both the government spending (area 1) and taxation (area 2) subcomponents has fallen as the oil boom caused a rise in tax collections, which has accompanied increases in spending (see "Revenue and Expenditures").

Because rankings are relative to the performance of other states, the dynamics of the EFNA over time can be better seen by examining a state's overall score. Figure 16 shows the EFNA overall score for all regional states from 1981 to 2014. It shows a decline in economic freedom for North Dakota in the 1980s, primarily due to tax hikes. However, this trend reversed as the state improved its worker freedom score and cut taxes. North Dakota further improved its economic freedom ranking by remaining worker friendly, resisting minimum wage hikes, and lowering income tax rates across the board (see "Tax Policy").

Because economic freedom is (causally) correlated to so many positive outcomes, North Dakota should continue to seek ways to protect and improve the economic freedoms of its citizens. Furthermore, economic freedom has also been linked to state migration flows, with workers flowing into regions with higher relative economic freedom (Ashby 2007; Cebula 2014). Labor market freedom

FIGURE 16. OVERALL ECONOMIC FREEDOM SCORES



Note: A higher score indicates more freedom.

Source: D. Stansel, J. Torra, and F. McMahon, *Economic Freedom of North America 2016* (Vancouver: Fraser Institute, 2016).

remains relatively high in North Dakota. Currently, North Dakota's score for the taxation subcomponent is at the national average, making this area a potential target for lawmakers who want to increase economic freedom. While North Dakota has a score above the national average in the government spending category, this area is another potential policy target.

Entrepreneurship

The entrepreneurial environment in North Dakota is unique, both in terms of the state's history and in comparison with other states in the region. In the past decade, entrepreneurship has been shaped by emerging technologies and the development of the state's oil industry. Growth in job opportunities attracted new inhabitants to North Dakota, which opened the door for more labor and entrepreneurs to enter the market. The increase in population and the development of online marketplaces helped lower costs for rural businesses. These changes expanded opportunities for value creation within the state, as evidenced

by the rise in real income per capita and other measures, including startup density and business survival rates.

These developments are reflected in the Kauffman Index of Entrepreneurship, which "offers in-depth measures of the people and businesses that contribute to America's overall economic dynamism" (Kauffman Foundation 2017a). According to the Kauffman Foundation, "The series consists of reports and accompanying interactive data visualizations presenting entrepreneurial trends nationally, at the state level, and for the 40 largest metropolitan areas" (Kauffman Foundation 2017b). The Kauffman Index allows researchers and policymakers to compare entrepreneurship in North Dakota with entrepreneurship in the surrounding states. It emphasizes outcomes as a measure of entrepreneurship in the state. These include, but are not limited to, the share of firms that are startups and small businesses, as well as the rate of survival of firms in their first 5 years of operation and the average size of such firms. Together, these measures reveal the nature of entrepreneurial activity and health in North Dakota.

According to the Kauffman Index, North Dakota is one of the best states for starting and owning a business. This is true in comparison with other states in the region and nationally. North Dakota is ranked seventh for startup activity in smaller states, placing it ahead of all states in the region except Wyoming (third) and Montana (fourth) (Kauffman Foundation 2017c). While conditions

TABLE 4. HISTORICAL REAL MEDIAN HOUSEHOLD INCOME FOR NORTH DAKOTA

Year	United States	North Dakota
2015	$57,230	$58,141
2014	$54,398	$61,568
2013	$55,214	$60,950
2012	$53,331	$58,296
2011	$53,401	$60,130
2010	$54,245	$56,150
2009	$55,683	$56,017
2008	$56,076	$55,327
2007	$58,149	$54,644
2006	$57,379	$48,863
2005	$56,935	$51,854

Sources: US Census Bureau, "Median Household Income in North Dakota [MEHOINUSNDA646N]," Federal Reserve Bank of St. Louis, August 14, 2018, https://fred.stlouisfed.org/series/MEHOINUSNDA646N; US Census Bureau, "Real Median Household Income in the United States [MEHOINUSA672N]," Federal Reserve Bank of St. Louis, August 14, 2018, https://fred.stlouisfed.org/series/MEHOINUSA672N.

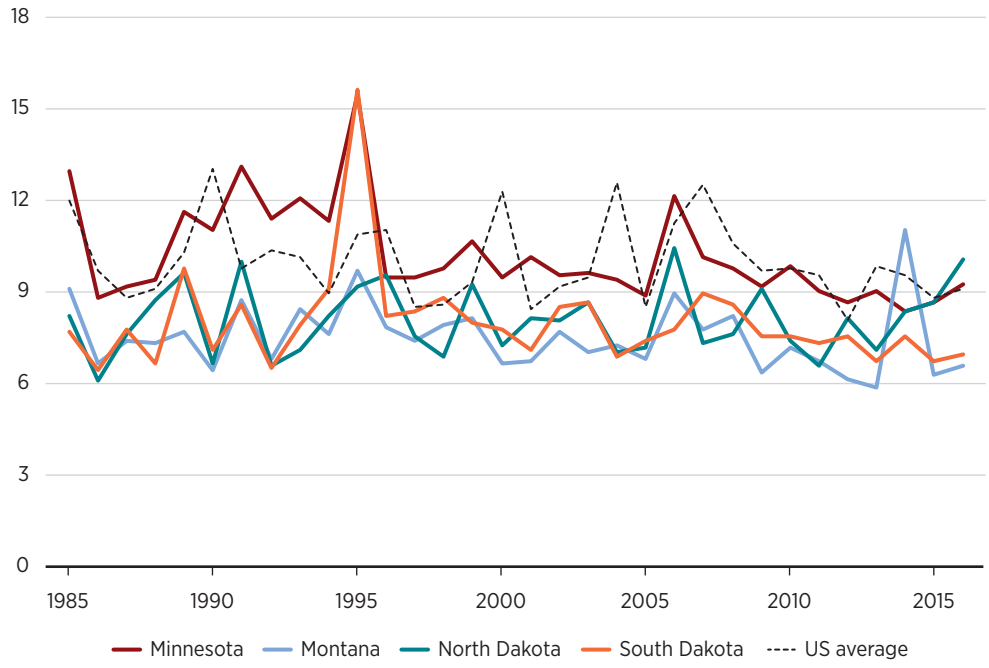
for entrepreneurs are relatively good, it is notable that the state's recent improvement in rank has occurred alongside a substantial increase in median household income associated with increases in oil revenues enabled by fracking technology (see table 4). This has aided North Dakota's emergence as an outlier for several Kauffman rankings compared with other states in the region (figures 17–21).

As a result of the substantial increase in real median household income brought on by the oil boom, the average size of North Dakota firms has increased. So too has the rate of firm survival. Likewise, real household income in North Dakota rose dramatically. An increase in median household income indicates an increase in the wealth of each person that can be used to purchase goods and services. Table 4 shows the median household income for the United States and North Dakota from 2005 to 2015. In 2005, North Dakota's median household income was 9.1 percent lower than the national median. By 2015, it had surpassed the national median by 1.6 percent. At its peak in 2014, North Dakota real median income surpassed the national median by 13.1 percent. Overall, real median income rose by 12.1 percent in North Dakota between 2005 to 2015.

Relative prosperity in North Dakota has had a substantial impact on entrepreneurship. The effect has become especially marked in the past few years. An increase in wealth has attracted new residents. In addition, the size of new businesses has tended to increase over the past five years. The average number of employees for five-year-old firms in North Dakota has also increased, and North Dakota now leads the region in firm size (see figure 17 and table 5). Similarly, North Dakota also leads the region in the percentage of businesses that are scale-ups—firms that start as small businesses and employ over 50 employees by their 10th year (see figure 18). The immediate effect of economic growth is for existing firms to grow in size. As the average firm size in North Dakota has increased, small firm density has decreased while startup density has increased. In 2016, North Dakota exhibited both the highest startup density and the lowest small business density of all states in the region (see figure 19 and figure 20). North Dakota has the highest firm survival rate in the region and the nation at 58 percent (see figure 21). These trends approximately track increases in real median income.

The state has many institutions to support nascent entrepreneurship, including incubators at North Dakota State University and the University of North Dakota. Furthermore, a significant portion of the business community is involved in supporting innovation and the development of business. Emerging Prairie, a prime nexus of entrepreneurship in Fargo, North Dakota, hosts events and provides support for local entrepreneurs. This includes the development

FIGURE 17. AVERAGE FIRM SIZE, AGE 5 (BY NUMBER OF EMPLOYEES)



Data Note: Average number of workers employed by firms in their first five years of operation.

Source: The Kauffman Foundation, Growth Entrepreneurship (dataset), accessed September 28, 2018, https://www.kauffman.org/api/indexdata/downloaddata?reports=growth.

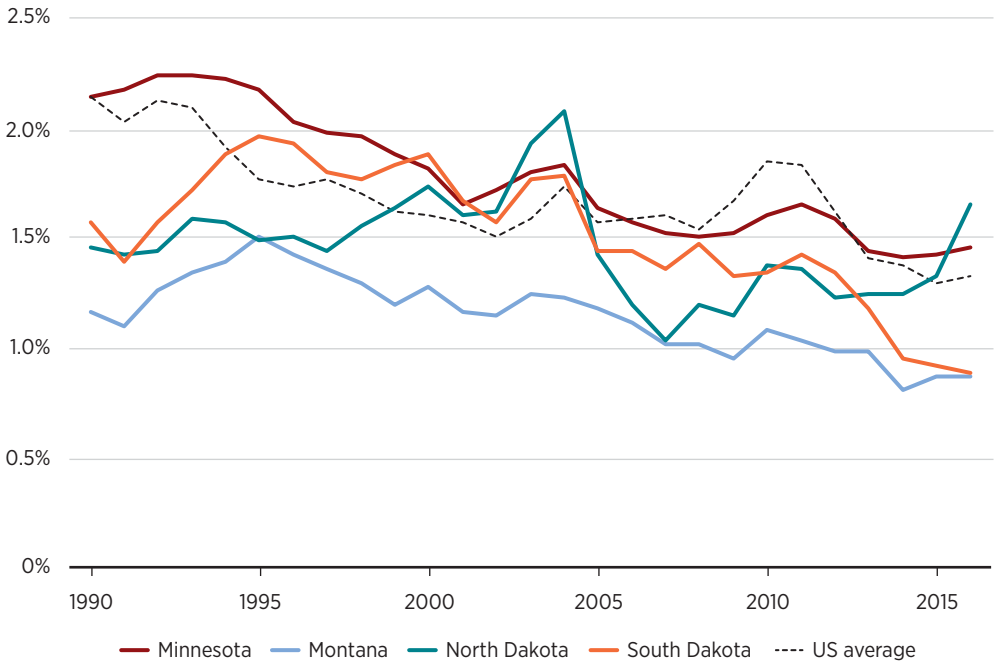
TABLE 5. AVERAGE FIRM SIZE IN NORTH DAKOTA, AGE 5

Year	Average Firm Size (by # of employees)
2016	10.0159
2015	8.60942
2014	8.28824
2013	7.03611
2012	8.04929
2011	6.53055
2010	7.32437
2009	9.06022
2008	7.57781
2007	7.27723
2006	10.3934
2005	7.13864
2004	6.9196

Data Note: Average number of workers employed by firms in their first five years of operation.

Source: The Kauffman Foundation, Growth Entrepreneurship (dataset), accessed September 28, 2018, https://www.kauffman.org/api/indexdata/downloaddata?reports=growth.

FIGURE 18. PERCENTAGE OF SUCCESSFUL SCALE-UPS (PER 100,000 BUSINESSES)



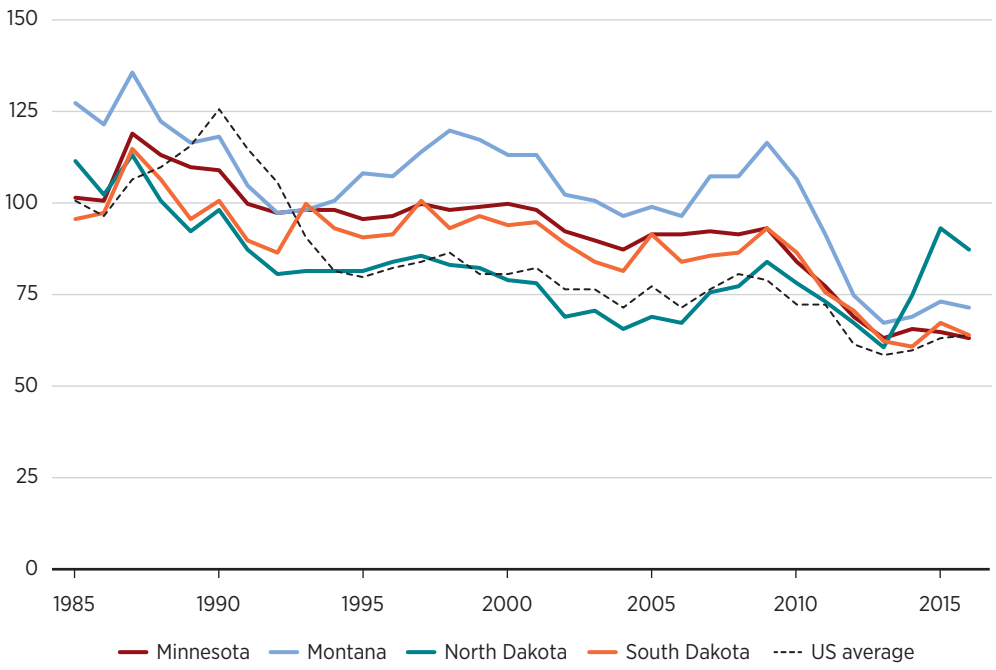
Data Note: Share of scaleups indicates the prevalence of firms that start with fewer than 50 employees and grow to employ at least 50 people by their 10th year of operation.

Source: The Kauffman Foundation, Growth Entrepreneurship (dataset), accessed September 28, 2018, https://www.kauffman.org/api/indexdata/downloaddata?reports=growth.

of 1 Million Cups, a program sponsored by the Kauffman Foundation to support entrepreneurship across the country. Emerging Prairie has also facilitated the development of the Prairie Den, which is described as "a vibrant space for co-working." This support has helped foster the development of businesses from a variety of fields, including, but not limited to, travel services, agriculture, and artificial intelligence.

North Dakota has experienced a surge in new entrepreneurial opportunities caused by changes in income, a growing population, and emerging technologies. Capital structure in North Dakota is still in flux, as evidenced by trends in the average firm size (see table 5) and the share of startups (see figure 19). The potential for increases in production, judging by increases in the median income, appears to have largely been met with expansion by existing firms. Policymakers will need to monitor the changing business landscape as shifts in oil revenues and new entrepreneurial ventures will impact tax revenues derived from these sectors.

FIGURE 19. STARTUP DENSITY (NUMBER OF START-UPS PER 1,000 BUSINESSES)



Data Note: The figure shows the number of new employer businesses, normalized by total business population. New employer businesses are defined as firms less than one year old employing at least one employee in addition to the owner.

Source: The Kauffman Foundation, Growth Entrepreneurship (dataset), accessed September 28, 2018, https://www.kauffman.org/api/indexdata/downloaddata?reports=growth.

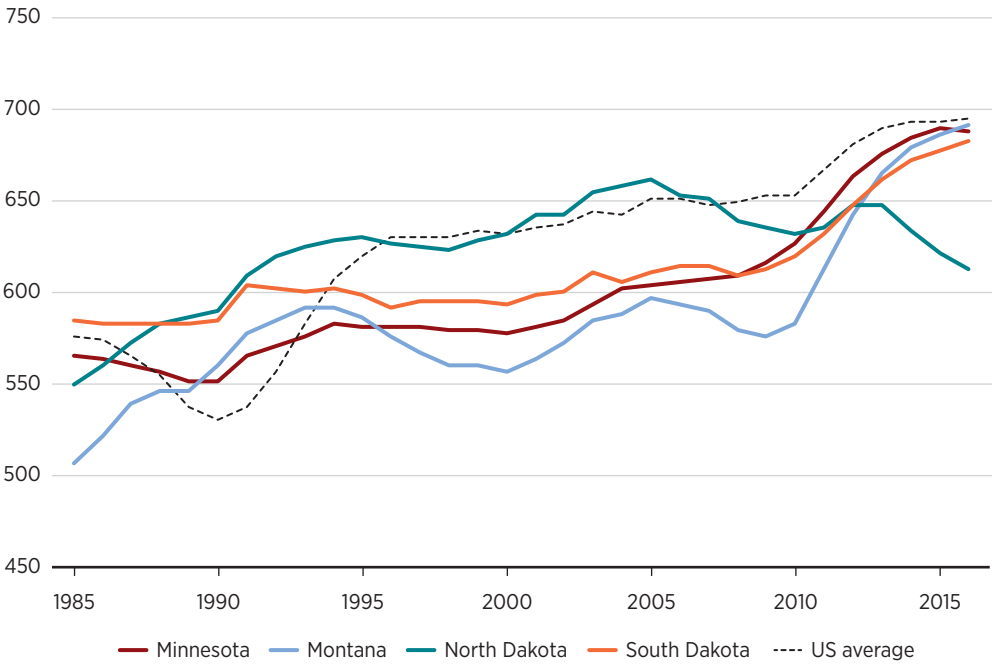
State Revenue, Expenditures, and Taxes

North Dakota is currently weathering an unexpected fiscal crisis. Unlike other states, North Dakota cannot directly attribute its budget issues to financial mismanagement. They are the result of the state's commodity-driven economy. The most notable difference between this crisis and any of the state's previous financial troubles is that oil—and not agriculture—is primarily to blame.

Revenue and Expenditures. State revenues are so volatile that the slightest shift in the price of a barrel of oil can impact revenue forecasts (Hageman 2017a). The recent collapse in oil prices and the corresponding loss of oil extraction taxes left the state with $1.07 billion less revenue than projected (Sharp 2016a). This forced the state to deplete its savings and make drastic cuts to public services.

When the budget shortfall that launched the current crisis was first announced, former governor Jack Dalrymple called for a 4.05 percent cut in state expenditures, totaling $245 million in February 2016. By August 2016,

FIGURE 20. SMALL BUSINESS DENSITY (NUMBER OF SMALL BUSINESSES PER 1,000 BUSINESSES)



Data Note: Established small business density is a measure of the number of established small businesses, normalized by the total number of firms. Established small businesses are defined as employer firms over the age of 5 employing at least 1 employee but fewer than 50 employees.

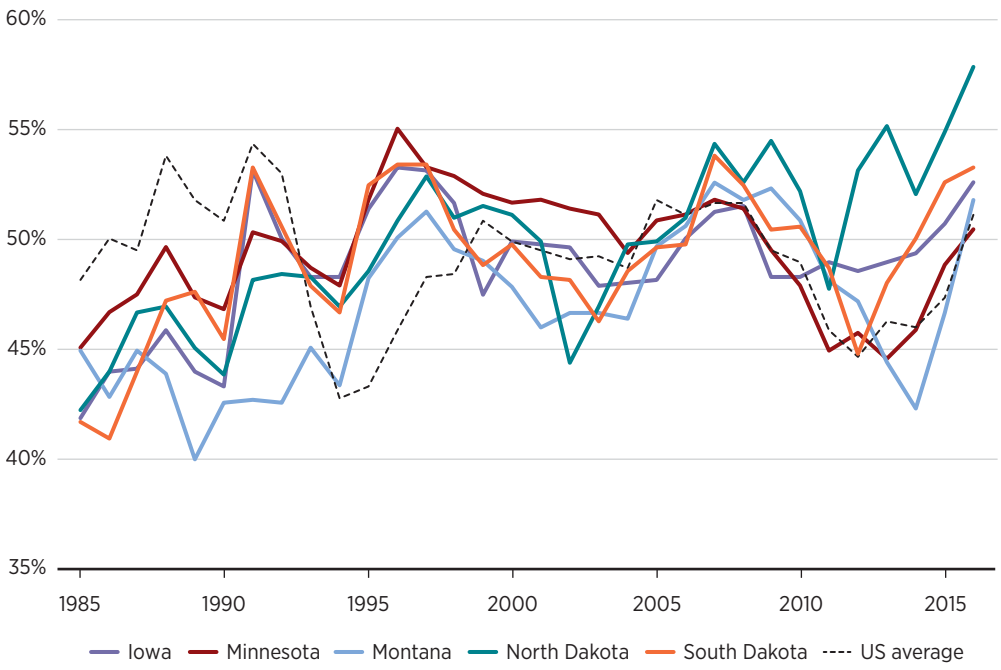
Source: The Kauffman Foundation, Growth Entrepreneurship (dataset), accessed September 28, 2018, https://www.kauffman.org/api/indexdata/downloaddata?reports=growth.

additional cuts of 2.5 percent were projected, totaling $152 million (Hageman 2016b; Nowatzki 2016). However, the planned cuts did not stop there. Shortly after taking office in late 2016, Governor Doug Burgum called for an additional $159 million in spending cuts, citing sluggish revenues (Hageman 2017a).

These cuts have not been without controversy. Higher education officials were particularly vocal in protesting cuts of 500 full-time positions, athletic programs, and proposed changes to the tenure termination process (Baumgarten 2017; Perez 2017; Tate 2017). During the oil boom, higher education spending spiked 38 percent with allocations of $896.6 million (Hageman 2017b). This made the economic bust particularly painful for the state university system. After the bust, higher education funding dropped to $624.9 million (Hageman 2017b).

The economic trends that guide North Dakota's fiscal environment are further explored in the following analysis. To understand the state's fiscal health, state revenues and expenditures and net tax collections need to be examined in the context of oil and agricultural performance.

FIGURE 21. SURVIVAL RATE (PERCENTAGE OF FIRMS OPERATING FIVE YEARS AFTER STARTUP)



Data Note: The survival rate is a measure of the percentage of businesses that become established and are still in operation five years after their founding.

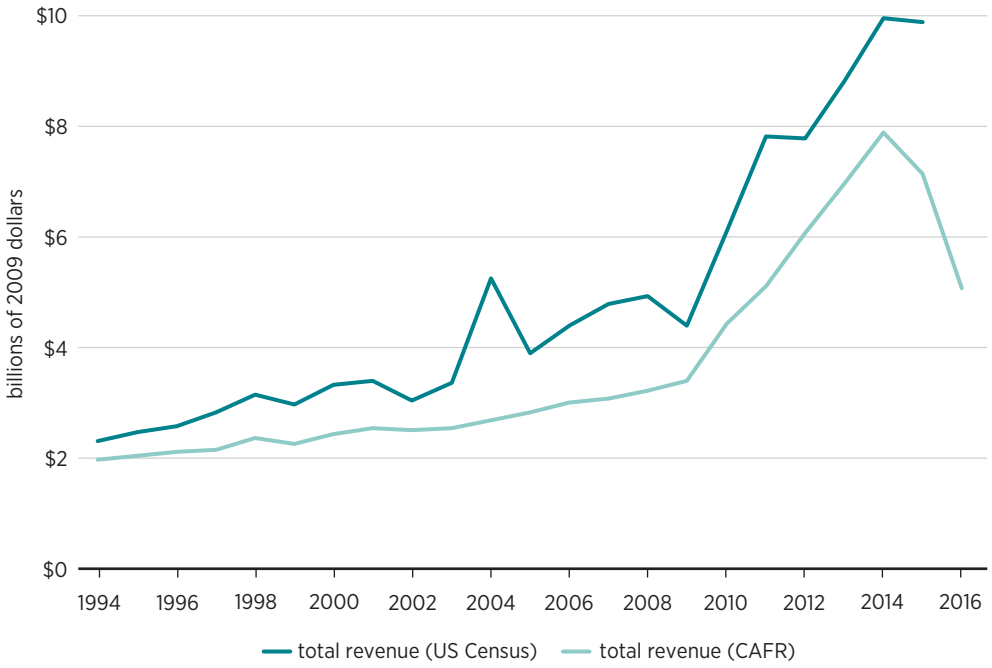
Source: The Kauffman Foundation, Growth Entrepreneurship (dataset), accessed September 28, 2018, https://www.kauffman.org/api/indexdata/downloaddata?reports=growth.

To accomplish this, data from both the US Census Bureau's Annual Survey of State Government Finances and North Dakota's comprehensive annual financial report (CAFR) are used. It should be noted that the Census Bureau warns against using its figures because it excludes several important accounting measures from its statistics. However, due to the limited availability of North Dakota's CAFRs, US Census data are used to develop an understanding of state finances before 1994.

Because of accounting differences, the US Census data trend closely but are not identical to the figures presented in North Dakota's CAFRs. Figure 22 shows revenue data from both primary sources. The CAFR data include inflation-adjusted 2016 figures, while the Census data are available only through 2015. Likewise, the full impact of the oil price collapse is absent from the Census data but clearly present in North Dakota's CAFR data from 2014 to 2016.

Figure 23 shows the corresponding expenditure data. Similar to the data on revenues, the Census expenditure data produce consistently higher expenditure figures. The expenditure data also display a lag after 2015, with the most recent

FIGURE 22. NORTH DAKOTA REVENUE: COMPREHENSIVE ANNUAL FINANCIAL REPORT AND CENSUS DATA (IN 2009$)



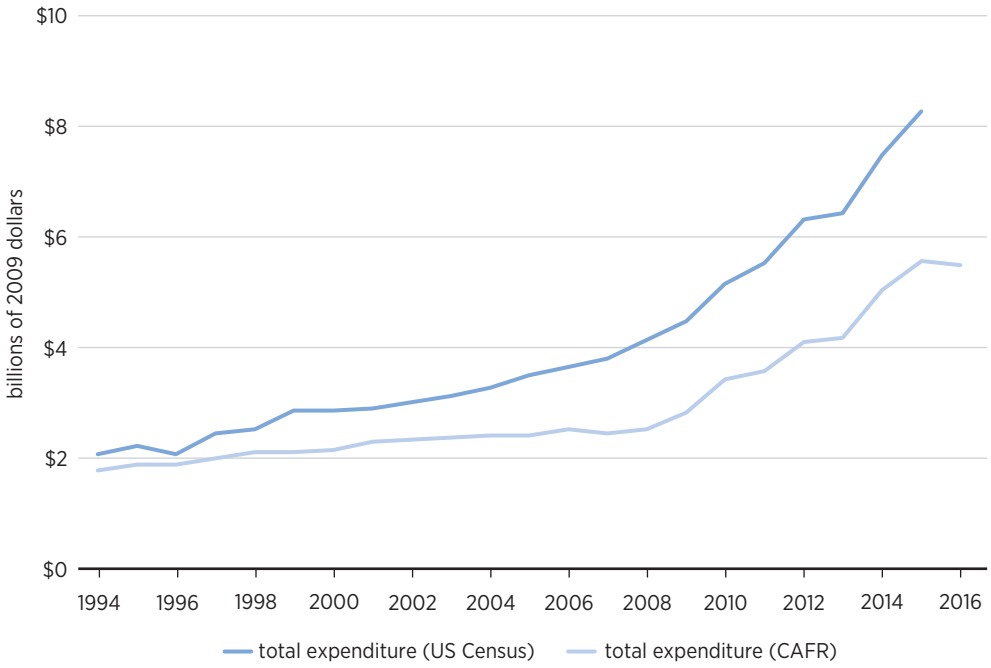
Sources: North Dakota's Comprehensive Annual Financial Report (CAFR) 1994–2016; US Census Bureau, *Annual Survey of State Government Finances*, 2015.

data trending positively in 2015 and the most recent CAFR data showing state expenditures tapering off in 2016.

Figure 22 and figure 23 are derived from North Dakota's CAFRs and the US Census Bureau. Revenue reporting from the state's CAFRs and the US Census shows a correlation coefficient of 0.98 over the past 21 years. Similarly, the expenditures reported by the state's CAFRs and the US Census show a correlation coefficient of 0.99. There is little reason to suspect this relationship would not hold for previous periods, allowing us to derive an understanding of the state's extended fiscal history from past Census data.

According to data from the US Census, North Dakota's inflation-adjusted revenue and expenditures appear relatively stable from the 1950s until the early 1970s (see figure 24). The right axis shows the inflation-adjusted price of oil. The spike in oil prices during the 1970s had little effect on state finances because the technology to efficiently extract oil from North Dakota's wells was not yet available (see "A Boom-and-Bust History" above). However, both revenue and spending began trending upward in the mid-1970s and then spiked with the oil

FIGURE 23. NORTH DAKOTA EXPENDITURES: COMPREHENSIVE ANNUAL FINANCIAL REPORT AND CENSUS DATA (IN 2009$)



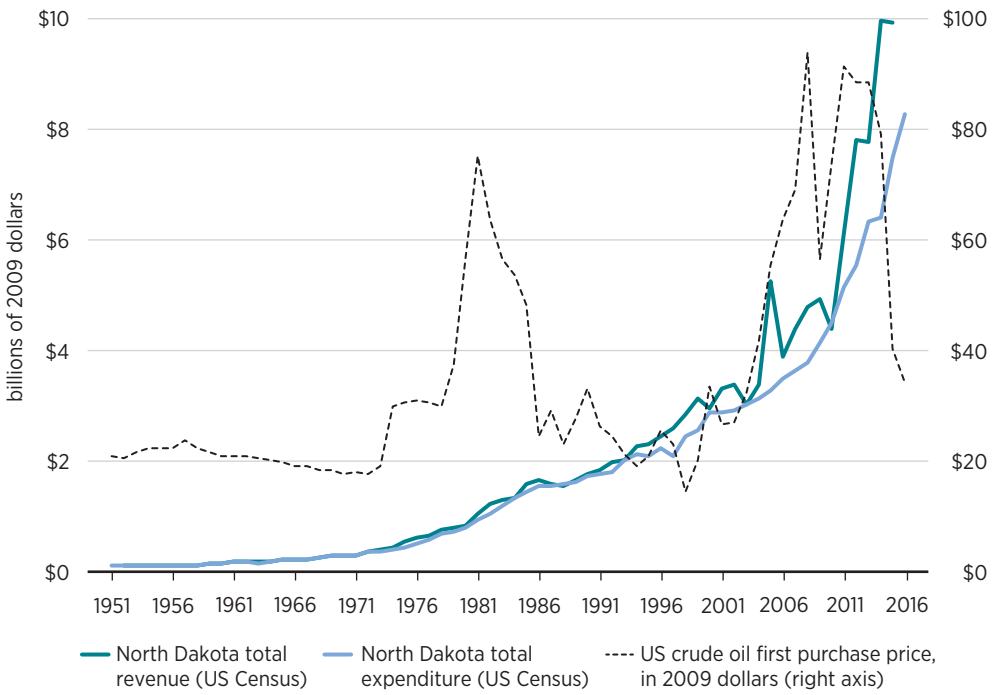
Sources: North Dakota's Comprehensive Annual Financial Report (CAFR) 1994–2016; US Census Bureau, *Annual Survey of State Government Finances*, 2002–2015, adjusted for inflation.

boom midway through the decade after 2000. This trend is consistent across the US Census data in figure 24 and the CAFR data in figure 25.

To gain a more complete understanding of the impact of falling oil prices on state revenues, figure 25 utilizes data from North Dakota's CAFRs. Figure 25 mirrors figure 24 excepting the addition of state-level data from 2016. Figure 25 shows a clear decline in revenue from 2015 to 2016 that follows falling oil prices (left axis). Unlike in the past (see figure 24), the spike in oil prices had a stronger effect on state revenues because better extraction technology allowed North Dakota to produce more oil and, in turn, collect more in severance tax revenues. Given the historically strong correlation coefficient for both datasets, it is likely that a similar decline in revenues will be evident after the US Census data become available for 2016.

North Dakota has a history of prudent fiscal management. A recent study by the Mercatus Center ranked each US state by its fiscal solvency. The study looked at five dimensions of fiscal health: cash solvency, budget solvency, long-run solvency, service-level solvency, and trust fund solvency. North Dakota

FIGURE 24. US CENSUS NORTH DAKOTA HISTORICAL REVENUE AND EXPENDITURES (IN 2009$)



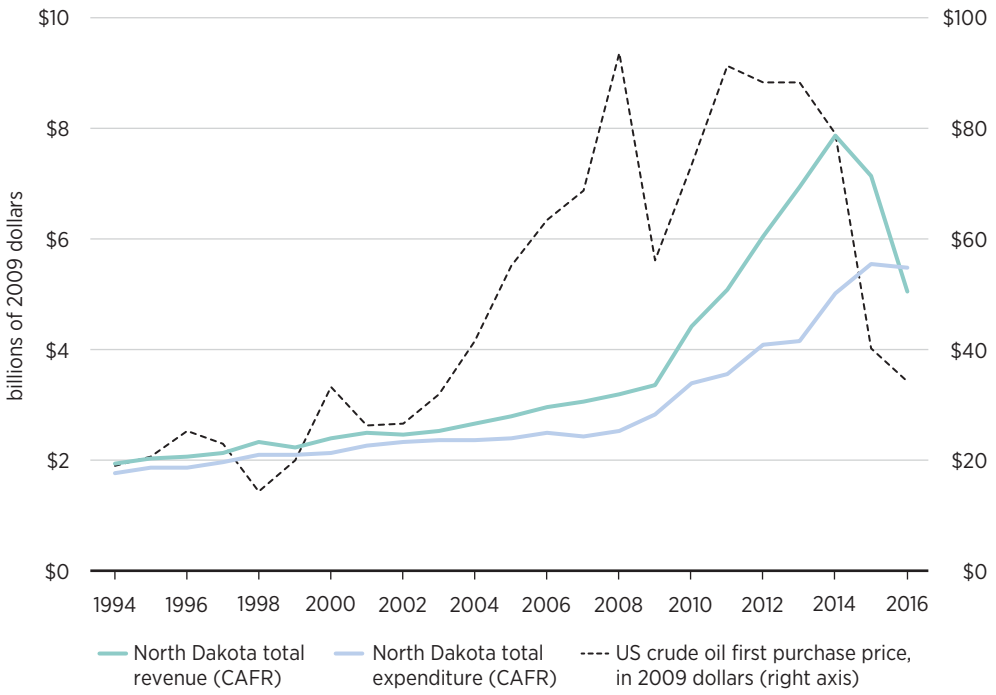
Sources: US Census Bureau, *Annual Survey of State Government Finances*, 2002–2015, adjusted for inflation (left axis); US Energy Information Administration, "U.S. Crude Oil First Purchase Price: Annual" (dollars per barrel). Oil prices are annualized to the regular calendar year. Fiscal data are annualized to the North Dakota fiscal year starting June 30 year over year.

ranked second overall, beating all regional neighbors. The report found that North Dakota had between 4.91 and 7.48 times the cash needed to meet short-term spending obligations; state revenues exceeded expenses by 27 percent. The report also showed the state's net fiscal position improved by $2,810 per capita (Norcross and Gonzalez 2017). However, the study relied on data from each state's CAFR in 2015, which shows only the beginning of the current collapse in oil prices. Since 2015, North Dakota's fiscal position has changed dramatically. Because the 2016 CAFR data are used in future rankings, substantial changes to North Dakota's position should be expected (Jackson 2017c).

Another way to measure the fiscal health of a state is to track total revenue as a share of total expenses. Examining the amount of money a state collects in comparison with the amount it spends can reveal the state's ability to meet its financial obligations (McKillop and Carges 2017).

Table 6 shows the number of years North Dakota and its regional neighbors ran a budget deficit—state spending exceeded state revenues. From 2002 to 2015,

FIGURE 25. NORTH DAKOTA COMPREHENSIVE ANNUAL FINANCIAL REPORT REVENUE AND EXPENDITURES (IN 2009$)



Sources: North Dakota's Comprehensive Annual Financial Report (CAFR) 1994–2016 (left axis); US Energy Information Administration, "U.S. Crude Oil First Purchase Price: Annual" (dollars per barrel). Oil prices are annualized to the regular calendar year. Fiscal data are annualized to the North Dakota fiscal year starting June 30 year over year.

North Dakota experienced only one deficit year, compared with the national average of four deficit years. The state performed notably better than Minnesota, Wisconsin, and Nebraska. Montana was the only regional state to avoid running a deficit during this period.

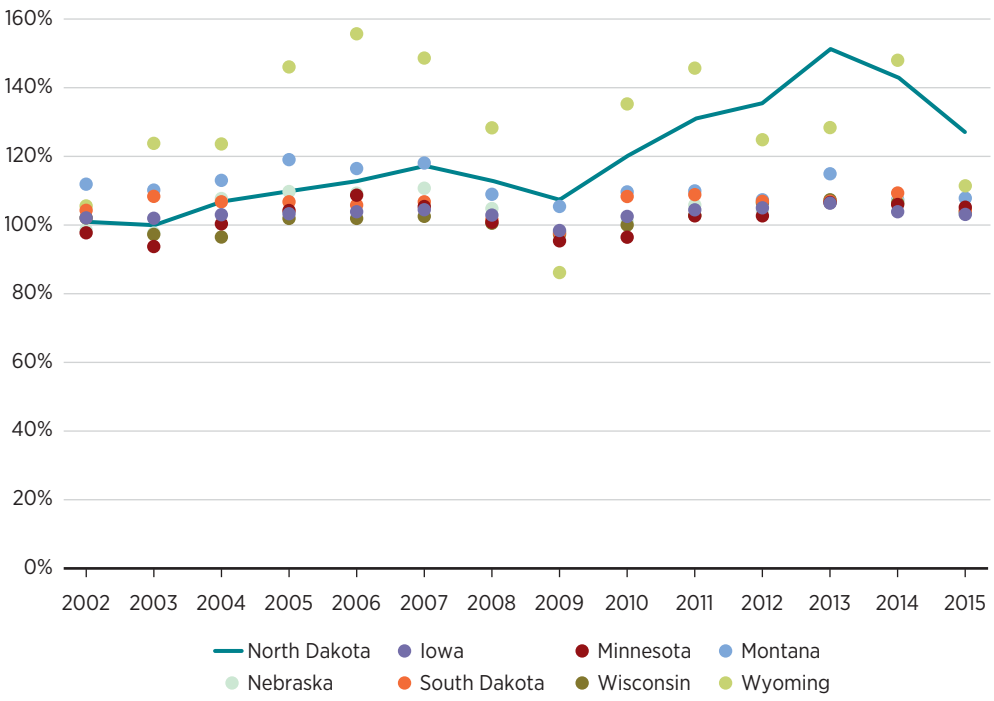
Figure 26 shows the changes in the percentage of expenses covered by revenues from 2002 to 2015. Values over 100 percent represent a budget surplus—state revenue exceeding state expenses. North Dakota's only deficit year was 2003, when the state ran a small deficit with revenues covering 99.91 percent of expenses. North Dakota's consistent budget surplus and lack of deficit years can be attributed in part to balanced budget requirements in the state constitution. Article X, Section 13 of the North Dakota Constitution obligates state lawmakers to balance the budget, which generally prevents deficit spending. In addition to fiscal prudence, the oil boom helped drive budget surpluses, allowing the state to stash large sums of cash and establish the Legacy Fund, a sovereign wealth fund (Alhashel 2015; North Dakota State Treasurer 2017).

TABLE 6. TOTAL REVENUE AS A SHARE OF TOTAL EXPENSES

State	Number of Years with a Deficit 2002–2015
Minnesota	4
Wisconsin	4
50-state median	4
Nebraska	3
Iowa	1
North Dakota	1
South Dakota	1
Wyoming	1
Montana	0

Source: Pew Charitable Trusts collected revenue and expenses from each state's CAFR using total "primary government" data.

FIGURE 26. PERCENTAGE OF ANNUAL EXPENSES COVERED BY REVENUE (IN 2015$)



Source: Pew Charitable Trusts collected revenue and expenses from each state's CAFR using total "primary government" data.

TABLE 7. PEW CHARITABLE TRUST STATE TAX REVENUE VOLATILITY

Rank	State	1997–2016 Volatility Score
2	North Dakota	15.8
3	Wyoming	12.9
18	Montana	6.2
19	Minnesota	6.1
	US Avg.	5.0
42	Wisconsin	4.1
43	Iowa	4.0
44	Nebraska	4.0
50	South Dakota	2.7

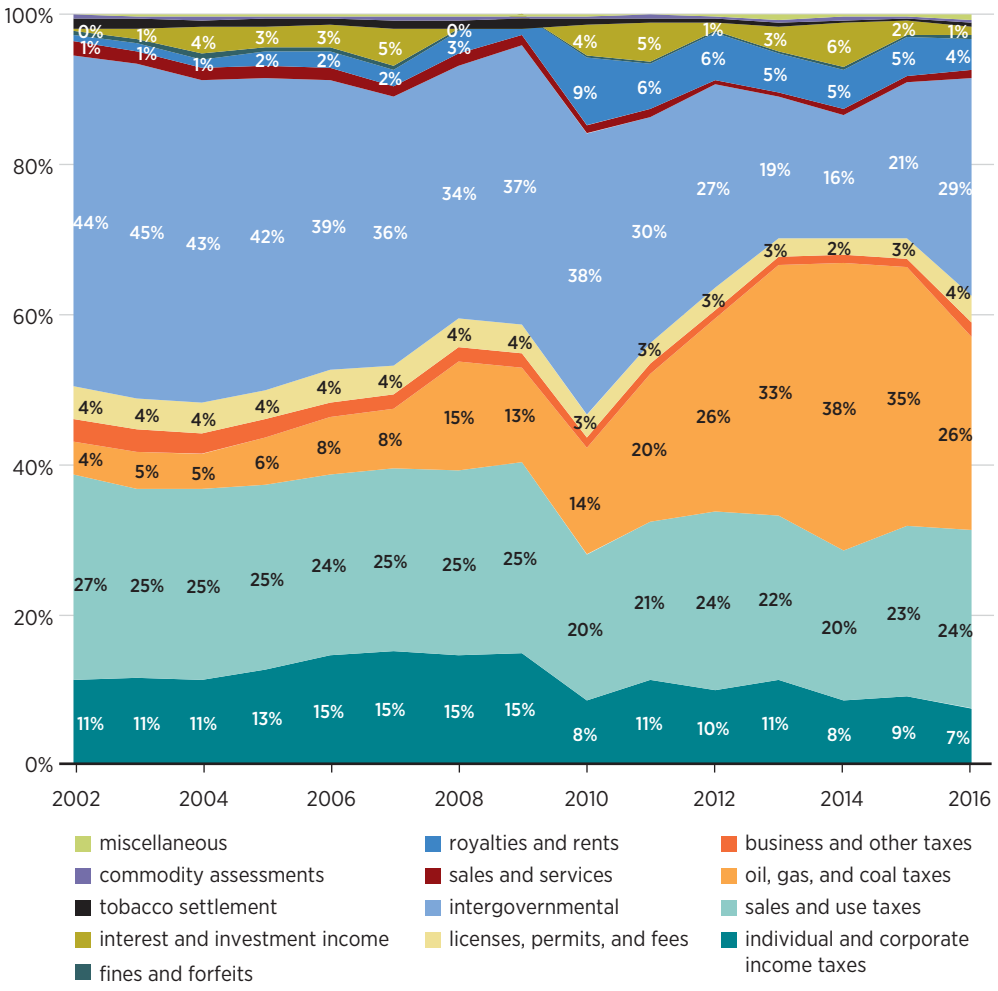
Source: Pew Charitable Trusts analysis is based on the US Census Bureau's *Quarterly Summary of State and Local Government Tax Revenue,* as adjusted by the Nelson A. Rockefeller Institute of Government. Data are adjusted for inflation using the US Bureau of Economic Analysis, "Gross Domestic Product: Implicit Price Deflator (GDPDEF)," Federal Reserve Bank of St. Louis, accessed March 20, 2016.

According to a report by the Pew Charitable Trusts (Zahradnik, Iyengar, and Zhang 2017), North Dakota ranks second in the nation for revenue volatility. This study calculated revenue volatility by using the standard deviation of the yearly percentage change in total tax revenue from 1997 to 2016 while controlling for tax policy changes. Based on the results, North Dakota has a volatility score more than three times the national average. Table 7 shows the volatility scores of North Dakota and its regional peers. Wyoming, with a score 3 points lower than North Dakota's, is the only state with revenue volatility comparable to North Dakota.

Figure 27 shows the percentage of state revenue by source for North Dakota's main revenue streams from 2002 to 2016. The percentage of revenue from oil, gas, and coal taxes is highlighted in orange. In 2002, oil, gas, and coal taxes accounted for only 4 percent of state revenue. Since then, oil, gas, and coal increased their share substantially, peaking at 38 percent in 2014. However, an unexpected decline in oil prices brought the share of oil revenues back down to 26 percent in 2016. The largest decrease occurred in intergovernmental revenue, which fell from 44 percent in 2002 to a low of 16 percent during the peak of the oil boom in 2014. Currently, it sits at 29 percent. These trends imply that the growth in oil revenues helped the state become less dependent on intergovernmental transfers.

Figure 28 shows CAFR inflation-adjusted state revenues (sources in different colors) and the price of US crude oil from 2002 to 2016. From 2002 to 2014, tax revenue from the oil boom exploded and increased the total state revenue. In 2002, inflation-adjusted oil, gas, and coal taxes accounted for almost $108 million

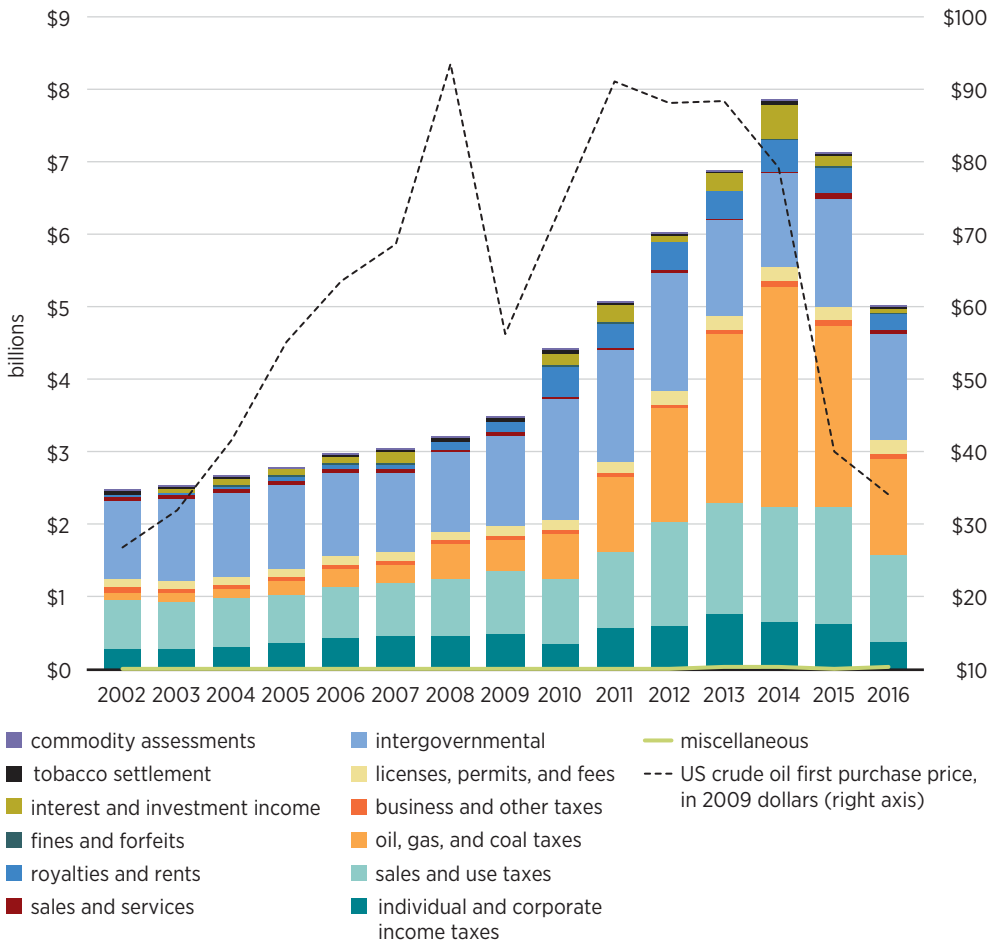
FIGURE 27. MAJOR REVENUE CATEGORIES BY PERCENTAGE OF REVENUE



Source: North Dakota's Comprehensive Annual Financial Report (CAFR) 2002–2016.

in revenue, or 4 percent of total revenues. By 2014, they had grown to more than $3.02 billion, increasing by a factor of 28 to account for 38 percent of total revenues. However, this explosive growth was followed by a major slump. Oil revenues unexpectedly decreased by 57 percent from 2014 to 2016, launching a fiscal crisis in the state. Accompanying the growth in oil revenues, royalties and rent grew from about $21.3 million in 2002 to $430 million in 2014, expanding by a factor of 20. The oil boom also contributed to increases in the sales and use taxes and individual and corporate income taxes. This influx of revenue and the subsequent collapse show the effect boom-and-bust economic cycles have on state finances. During the boom (2002–2014), total revenue grew by 138 percent

FIGURE 28. NORTH DAKOTA STATE REVENUE (IN 2009$)

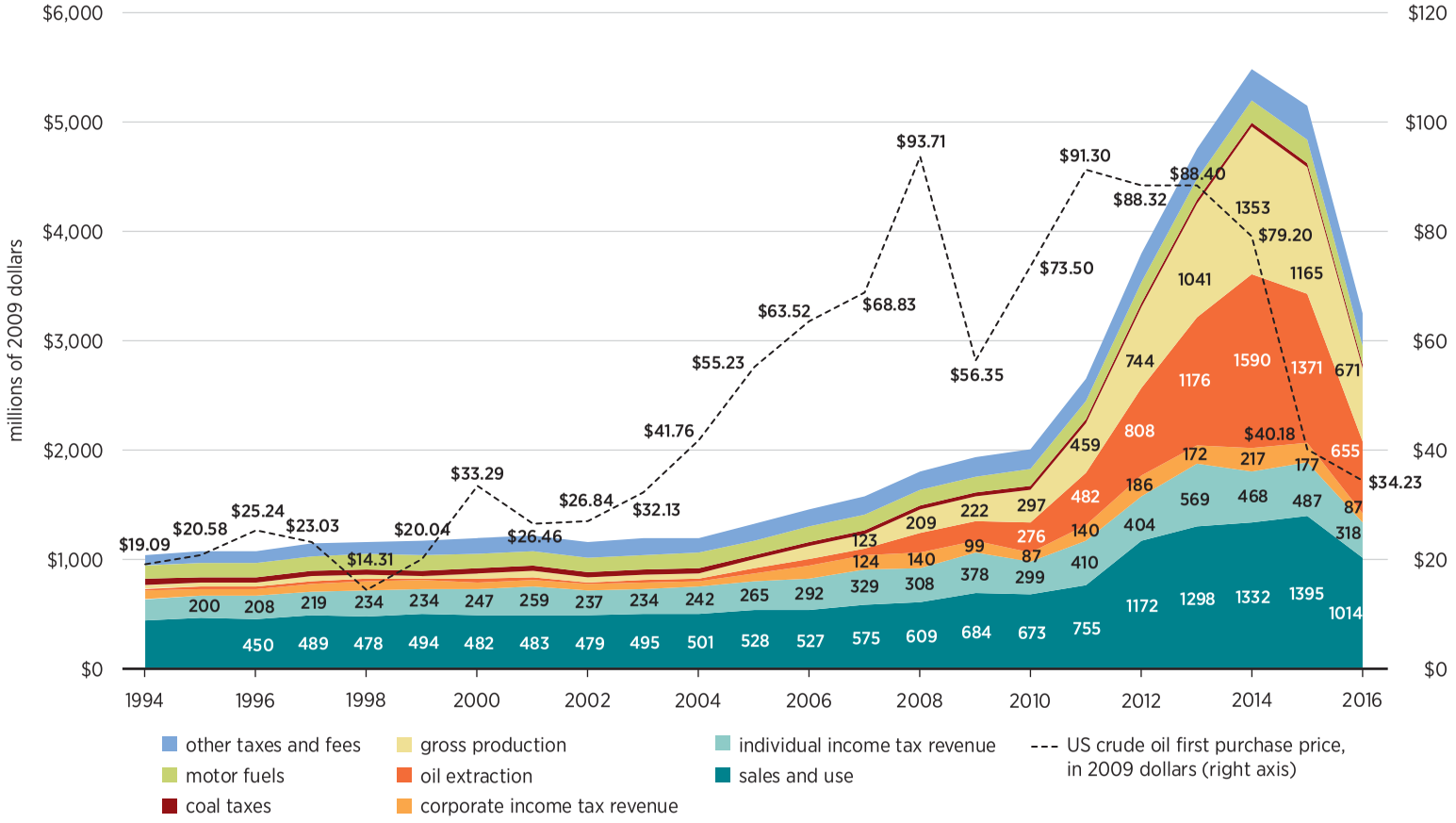


Sources: North Dakota's Comprehensive Annual Financial Report (CAFR) 2002–2015; US Energy Information Administration, "U.S. Crude Oil First Purchase Price: Annual" (dollars per barrel). Oil prices are annualized to the regular calendar year. Fiscal data are annualized to the North Dakota fiscal year starting June 30 year over year.

with an average annual growth rate of 9 percent. Of this increase, oil, gas, and coal taxes accounted for 54 percent. Since the bust (2014–2016), revenues have fallen by 36 percent, primarily due to reduced oil, gas, and coal tax collections.

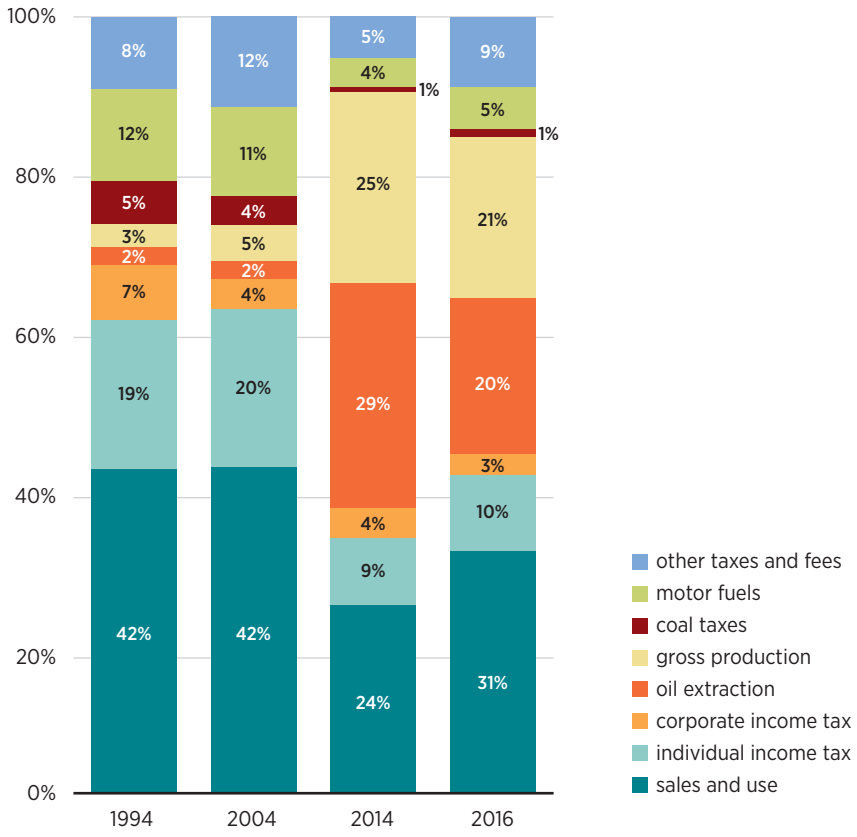
The collapse in state revenues can also be seen in net tax collections. North Dakota experienced a steep decrease in tax collections after oil prices fell. Because the state's secondary industries are often oriented around serving the primary commodity-based industries, changes in commodity prices create a domino effect with dramatic results across all major revenue categories. Figure 29

FIGURE 29. NET TAX COLLECTIONS (IN MILLIONS/2009$)



Sources: North Dakota State Tax Commissioner, *State and Local Taxes: An Overview and Comparative Guide*, 2000–2016; US Energy Information Administration, "U.S. Crude Oil First Purchase Price: Annual" (dollars per barrel). Oil prices are annualized to the regular calendar year.

FIGURE 30. NET TAX COLLECTIONS, 1994, 2004, 2014, 2016

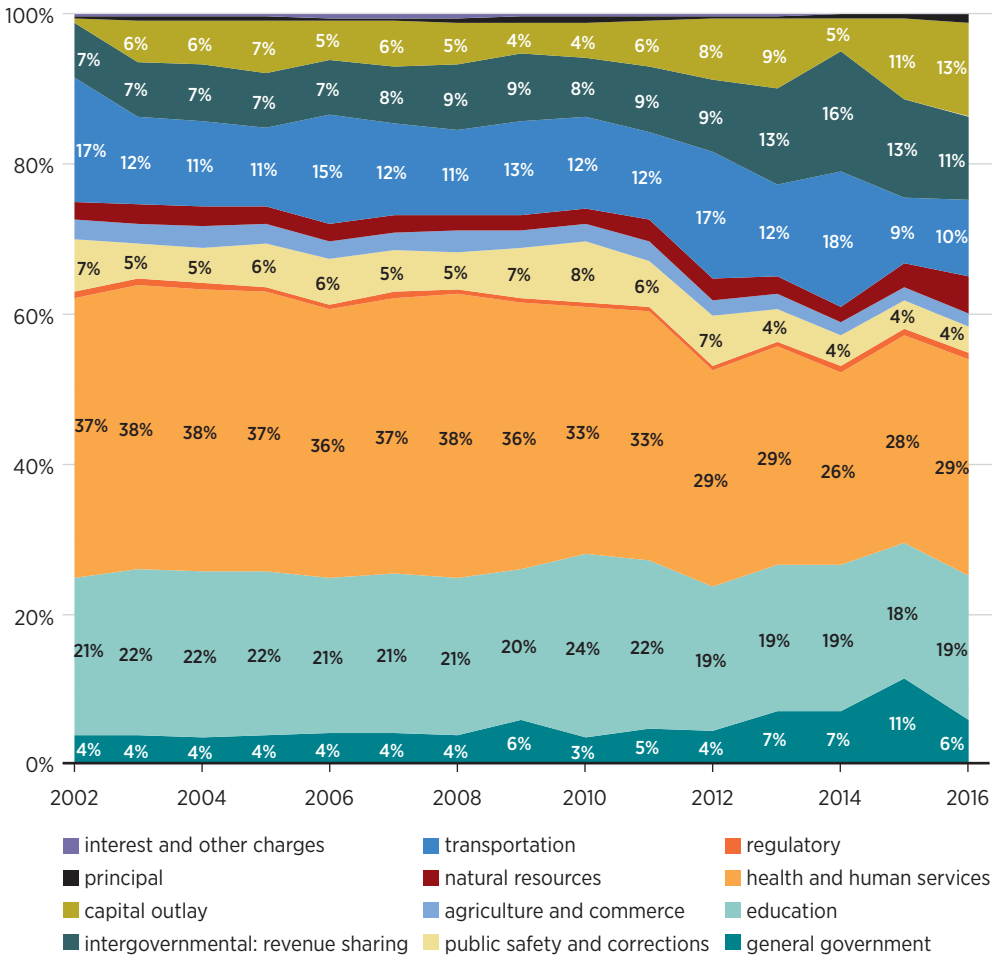


Source: North Dakota State Tax Commissioner, *State and Local Taxes: An Overview and Comparative Guide*, 1994. See also years 2004, 2014, and 2016.

shows how the decline in oil prices led to lower revenues from all major tax sources, highlighting the interdependence and volatility of the state economy. Inflation-adjusted data show that net tax collections peaked at $5.49 billion in 2014 before falling to $3.25 billion in 2016. This represented a 41 percent swing in net tax collections. North Dakota has experienced a boom-and-bust cycle in tax collections across all categories, which follows the rise and fall of oil prices.

Since 1994, North Dakota's tax collections have changed substantially. Not surprisingly, the most notable change has been to natural resource–related taxes, such as the oil extraction tax and gross production tax (an additional tax on oil and natural gas). In 1994, the oil extraction tax and gross production taxes accounted for a combined 7 percent of net tax collections. This remained relatively unchanged for 10 years (see figure 30). This period represents the pre–oil

FIGURE 31. MAJOR EXPENDITURE CATEGORIES BY PERCENTAGE OF EXPENSES



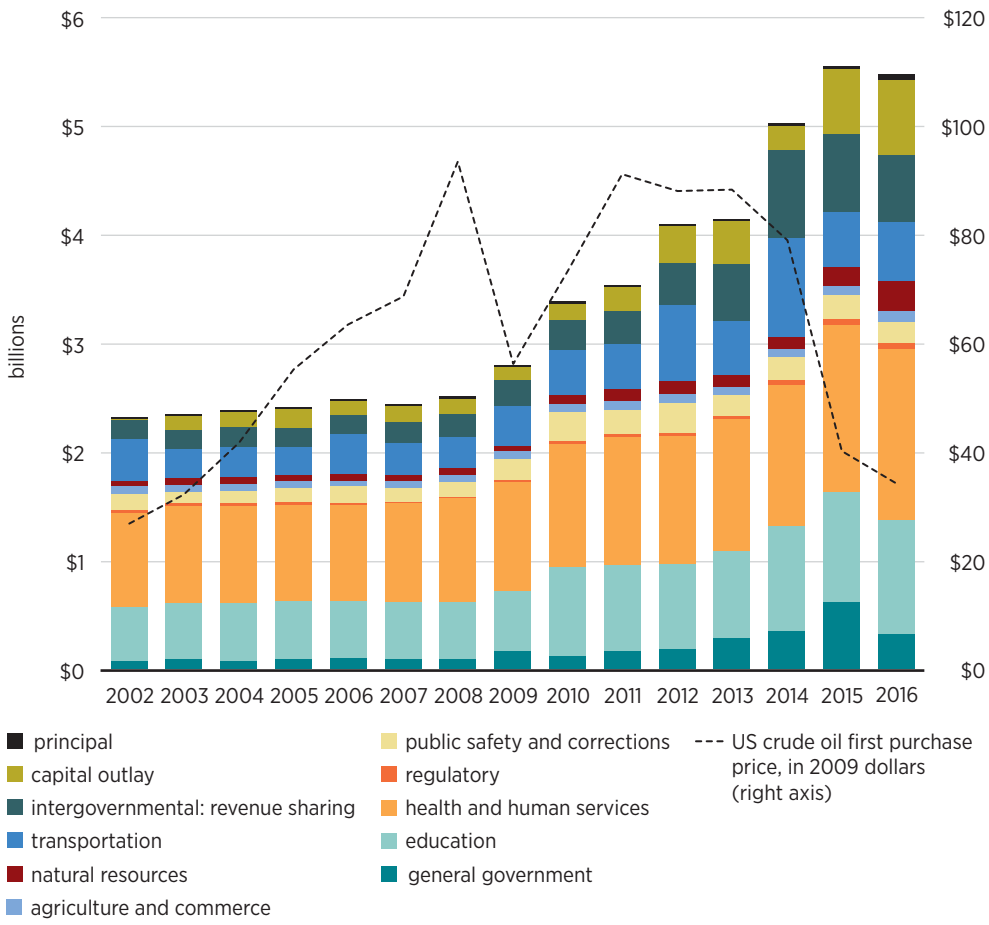
Source: North Dakota's Comprehensive Annual Financial Report (CAFR) 2002–2016.

boom period in which sales and use taxes composed the bulk of tax collections in North Dakota.

From 2004 to 2014, tax collections changed dramatically; the oil extraction tax and gross production taxes grew from 7 percent to 54 percent of net tax collections. During this same period, individual income taxes shrunk from 20 percent of net tax collections in 2004 to 9 percent in 2014 (see figure 30). By 2016, things had changed again as the collapse in oil prices caused a reduction in oil extraction and gross production tax collection (see figure 30).

Utilizing the CAFR data, figure 31 shows the percentage of total expenditures by major category from 2002 to 2016. These data help gauge North Dakota's

FIGURE 32. NORTH DAKOTA STATE EXPENDITURES (IN 2009$)



Sources: North Dakota's Comprehensive Annual Financial Report (CAFR) 2002–2016; US Energy Information Administration, "U.S. Crude Oil First Purchase Price: Annual" (dollars per barrel). Oil prices are annualized to the regular calendar year. Fiscal data are annualized to the North Dakota fiscal year starting June 30 year over year.

spending priorities. Health and human services has consistently been the state's largest expenditure. Education makes up the state's second-largest expense. Over the past decade, capital outlays experienced the largest increase of any category, more than doubling its share of state spending.

Figure 32 outlines inflation-adjusted expenses by total cost and shows the contribution of each category. As expected, health and human services accounts for the most spending with a total of nearly $1.6 billion in 2016. This represents a 44 percent increase from 2004 to 2014. Not far behind, education spending doubled from just over $524 million in 2004 to $1.05 billion in 2016. Overall expenditures increased 130 percent from 2004 to 2016. Expenditures increased

substantially across almost all categories. Notably, expenditures remained high despite the collapse in revenue. The inflation-adjusted net change in fund balances from 2015 to 2016 was −$965,896,872.77. This necessitated the deep spending cuts made during the most recent legislative session. It also contributed to the depletion of the state's rainy day fund.

State finances remained relatively unchanged during the decade preceding North Dakota's oil boom. However, the introduction of more efficient oil extraction technologies and higher oil prices created a boom of economic activity after 2004. This boom had a tremendous effect on the state budget. Thousands of high-paying oil jobs boosted income tax revenues. Furthermore, support activities gave rise to new companies, which led to an increase in corporate tax collections. Even sales and use tax collections grew as the oil boom attracted more people to the state and consumption increased.

Nearly all aspects of North Dakota's budget were directly or indirectly influenced by the oil boom and consequent bust. Because of the relationship between oil production and tax collections in North Dakota, it would be difficult for lawmakers to address revenue volatility with new tax categories. Therefore, policymakers should look to reduce the state's volatility by attracting and developing new, diverse industries, not by imposing new taxes.

Income Taxes. Like most states, North Dakota levies both individual and corporate income taxes. North Dakota first imposed an individual and corporate income tax in 1919. After the tax was imposed, tax law in North Dakota was reformed to mimic federal law in 1923 (North Dakota State Tax Commissioner 2016). In 2001, the state legislature made significant changes to the income tax law. The state modified its calculation method to establish federal taxable income as the starting point for deriving state-level income taxes. This method inherently includes federal tax deductions. In addition, the state reduced the total number of tax brackets for both individual and corporate taxes from eight to five (North Dakota State Tax Commissioner 2016).

Changes to the North Dakota income tax rates over time are displayed in table 8. Individual tax rates remained relatively constant from 2001 to 2008. However, individual income taxes in North Dakota have been steadily falling since the start of the oil boom. In 2009, the lowest marginal rate was lowered by 12.4 percent. In the same year, top marginal rates were lowered by 10 percent. In 2012, the state cut both the lowest and the top marginal individual income tax rates by 18 percent. These cuts brought the lowest individual income rate down from 2.1 percent in 2008 to 1.1 percent in 2015, and the top marginal rates dropped from 5.4 percent to 2.9 percent over the same period. Overall, the

TABLE 8. NORTH DAKOTA INDIVIDUAL AND CORPORATE INCOME TAX RATES

Individual Income Tax Rates			Corporate Income Tax Rates		
Year	Min. Rate	Max. Rate	Year	Min. Rate	Max. Rate
2000	2.67%	12.00%	2000	3.00%	10.50%
2001	2.10%	5.40%	2001	3.00%	10.50%
2002	2.10%	5.40%	2002	3.00%	10.50%
2003	2.10%	5.40%	2003	3.00%	10.50%
2004	2.10%	5.40%	2004	3.00%	10.50%
2005	2.10%	5.40%	2005	2.60%	7.00%
2006	2.10%	5.40%	2006	2.60%	7.00%
2007	2.10%	5.40%	2007	2.60%	7.00%
2008	2.10%	5.40%	2008	2.60%	7.00%
2009	1.84%	4.86%	2009	2.10%	6.40%
2010	1.84%	4.86%	2010	2.10%	6.40%
2011	1.84%	4.86%	2011	2.10%	6.40%
2012	1.51%	3.99%	2012	1.70%	5.20%
2013	1.51%	3.99%	2013	1.68%	5.15%
2014	1.22%	3.22%	2014	1.48%	4.53%
2015	1.10%	2.90%	2015	1.48%	4.53%
2016	1.10%	2.90%	2016	1.41%	4.31%
2017	1.10%	2.90%	2017	1.41%	4.31%

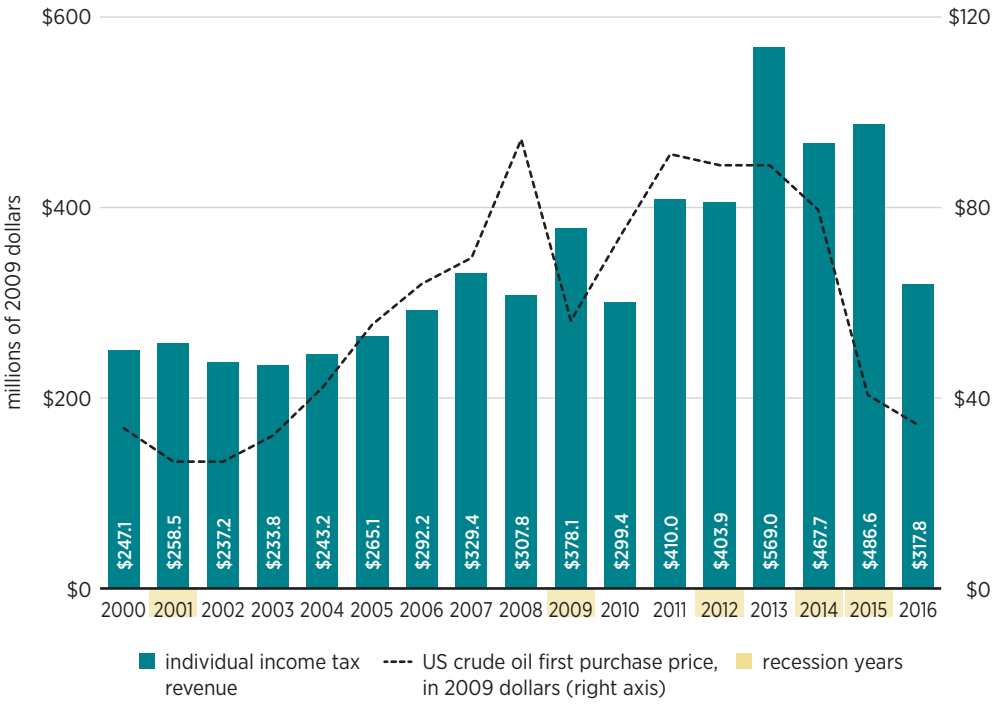
Source: North Dakota State Tax Commissioner, *State and Local Taxes: An Overview and Comparative Guide*, 2000–2016.

lowest marginal individual income tax rate fell by 48 percent, and the top marginal income tax rate fell by 46 percent from 2008 to 2016 (North Dakota State Tax Commissioner 2016).

The history of North Dakota's corporate income tax rates follows a similar pattern (see table 8). The state began reducing corporate income taxes in 2005 with a 13 percent reduction in the lowest marginal income rate and a 33 percent reduction in the top marginal rate. These cuts continued in 2009 with a 19 percent reduction in the lowest marginal rate and a 9 percent reduction in the top marginal rate. Starting in 2012 and ending in 2014, North Dakota cut both the lowest and the top marginal rates for corporate income taxes by 13 percent. In 2016, both the lowest and the top marginal rates dropped another 5 percent. Since 2004, the lowest marginal corporate tax rate was reduced by 53 percent, and the top marginal rate was reduced by almost 60 percent.

Patterns in North Dakota's income tax revenue can partially be explained by variations in oil and agricultural commodity prices. Figure 33 shows the

FIGURE 33. OIL PRICES AND STATE NET INDIVIDUAL INCOME TAX COLLECTIONS (IN 2009$)



Data Note: Highlighted years represent the fiscal years in which tax rates were cut.

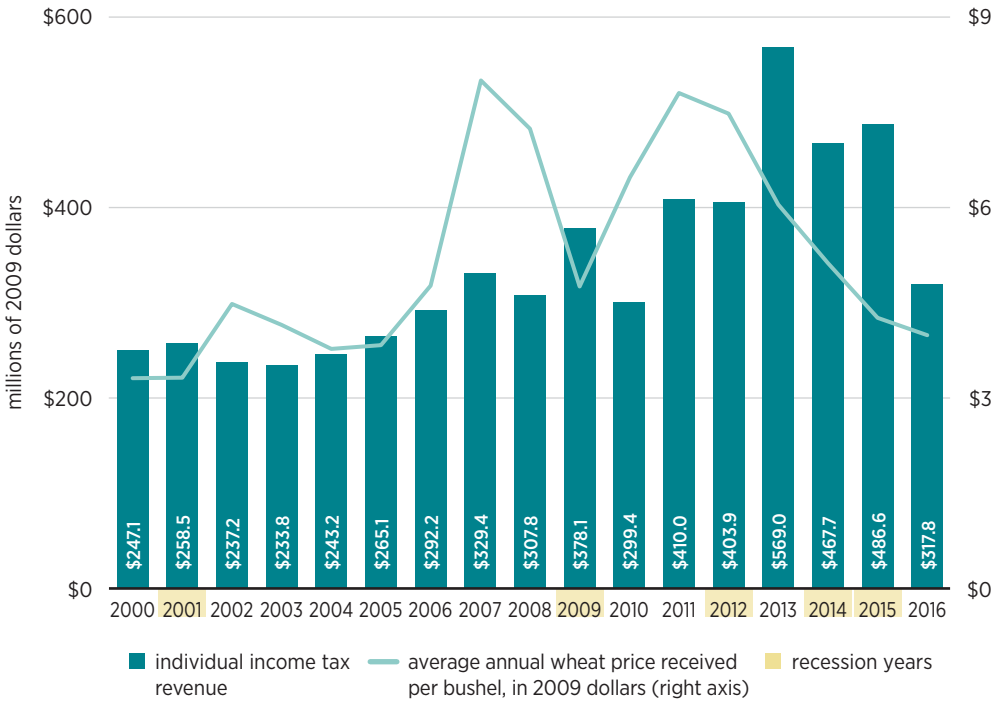
Sources: North Dakota State Tax Commissioner, *State and Local Taxes: An Overview and Comparative Guide*, 2016; US Energy Information Administration, "U.S. Crude Oil First Purchase Price: Annual" (dollars per barrel).

relationship between North Dakota's inflation-adjusted individual income tax revenues and the US first purchase price for a barrel of oil; figure 34 shows the relationship between North Dakota's inflation-adjusted individual income tax revenues and the annualized wheat price received per bushel; and figure 35 shows the relationship between North Dakota inflation-adjusted corporate income tax revenues and the US first purchase price for a barrel of oil.[1] Wheat prices serve as a proxy performance indicator for the agricultural sector,[2] and first purchase oil prices indicate the health of the state's energy sector (the

1. We omit comparing corporate income tax revenues with the inflation-adjusted wheat price because the state's anti–corporate farming laws are likely to limit the impact agricultural commodity prices would have on corporate tax revenue in the state (*North Dakota Century Code* §§ 10-06.1-01 through 10-06.1-27).

2. The exact impact of North Dakota's agricultural sector is difficult to calculate owing to industry crossover. Many other industries in the state service agriculture by manufacturing and selling farm equipment, providing food processing services, providing agricultural financial services, transporting and storing agricultural goods, and undertaking other activities.

FIGURE 34. AGRICULTURE PRICES (WHEAT) AND STATE NET INDIVIDUAL INCOME TAX COLLECTIONS (IN 2009$)



Data Note: Highlighted years represent the fiscal years in which tax rates were cut.

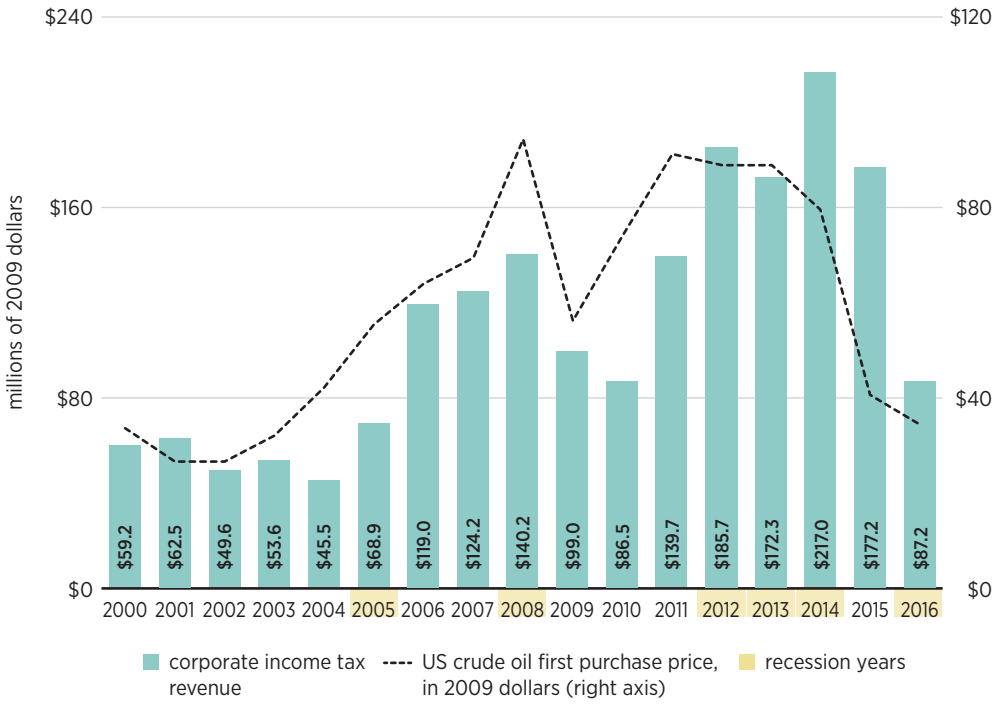
Sources: North Dakota State Tax Commissioner, *State and Local Taxes: An Overview and Comparative Guide,* 2016; United States Department of Agriculture, National Agricultural Statistics Service, "North Dakota Wheat Price Received," accessed September 28, 2018, https://quickstats.nass.usda.gov/results/1BAA0C7B-51C7-37BC-91B4-055572BF2A7C.

second-largest and fastest-growing industry). The years highlighted in each chart represent the fiscal years in which tax rates were cut.

Figure 33 shows the amount of individual income taxes collected and the price of oil adjusted for inflation from 2000 to 2016. Cuts in income tax rates in 2001 and 2009 were followed by a fall in income tax collections. However, the relationship inverted as rate cuts in 2012 were followed by an increase in individual income taxes collected. As oil prices collapsed in 2015, individual income tax revenue fell correspondingly. The oil boom helped increase income tax revenues with an influx of high-paying oil jobs, but this trend stopped and reversed with the price of oil.

Figure 34 shows a similar relationship between North Dakota's agricultural sector and individual income tax revenues. The agricultural sector is represented by the average annual wheat price per bushel. Agriculture has traditionally been an important economic indicator for North Dakota, despite its seemingly small contribution to GDP (see figure 6). Because the state's other major

FIGURE 35. OIL PRICE AND STATE NET CORPORATE INCOME TAX COLLECTIONS (IN 2009$)



Data Note: Highlighted years represent the fiscal years in which tax rates were cut.

Sources: North Dakota State Tax Commissioner, *State and Local Taxes: An Overview and Comparative Guide,* 2016; US Energy Information Administration, "U.S. Crude Oil First Purchase Price: Annual" (dollars per barrel).

industries—such as manufacturing, real estate and finance, transportation and storage, and others—primarily serve the agriculture sector, changes in agriculture have a large impact on the economy. However, the recent slump in agricultural commodity prices (wheat) had only a minimal impact on state individual income tax revenues. Revenues were relatively high from 2012 to 2014, despite a steady decline in the price of wheat. This likely indicates that the oil boom is masking the effects of low agricultural commodity prices on state finances.

North Dakota's economic dependence on agriculture and oil commodities increases the risk of instability if prices fall. Recently, the state has endured simultaneously sluggish agriculture and oil prices, with the current bust being primarily driven by oil. Figure 35 shows the relationship between the collapse in corporate income taxes and the price of oil. Similar to the trends in figure 33, the fall in corporate income taxes tracks closely with the decline in oil prices. As these graphs show, the oil boom has had an indirect effect on corporate and individual income tax collections.

Property Taxes. North Dakota taxes all real property with a few exceptions. Chapter 47-01-03 of the *North Dakota Century Code* defines real property as the following: immovable land; anything affixed to land, including mobile homes that are at least 27 feet; and anything that is appurtenant to land and immovable by law. In other words, the land and anything built on it or into it is subject to property taxes. Current state law allows select industries to avoid the conventional property tax and instead pay an in-lieu tax. These exempt industries include telecommunications, rural electric cooperatives, and coal conversion facilities (North Dakota State Tax Commissioner 2016).

In North Dakota, residential and commercial taxes are primarily collected locally. The local property tax rates are calculated using local mill rates. "Local mill rates are established to meet the revenue needs of the taxing district. Each taxing district prepares a proposed budget to determine the money needed to provide services. After public hearings, the elected governing bodies adopt final budgets and certify tax levies (total property taxes) to the county auditor. The tax levy may not exceed the legal maximum. To determine the mill rate, the county auditor divides the total property taxes to be collected for each taxing district by the district's total taxable value" (Tax Foundation Editorial Board 2009). Mill rates are established to meet the revenue needs of the community or tax district (North Dakota State Tax Commissioner 2016).

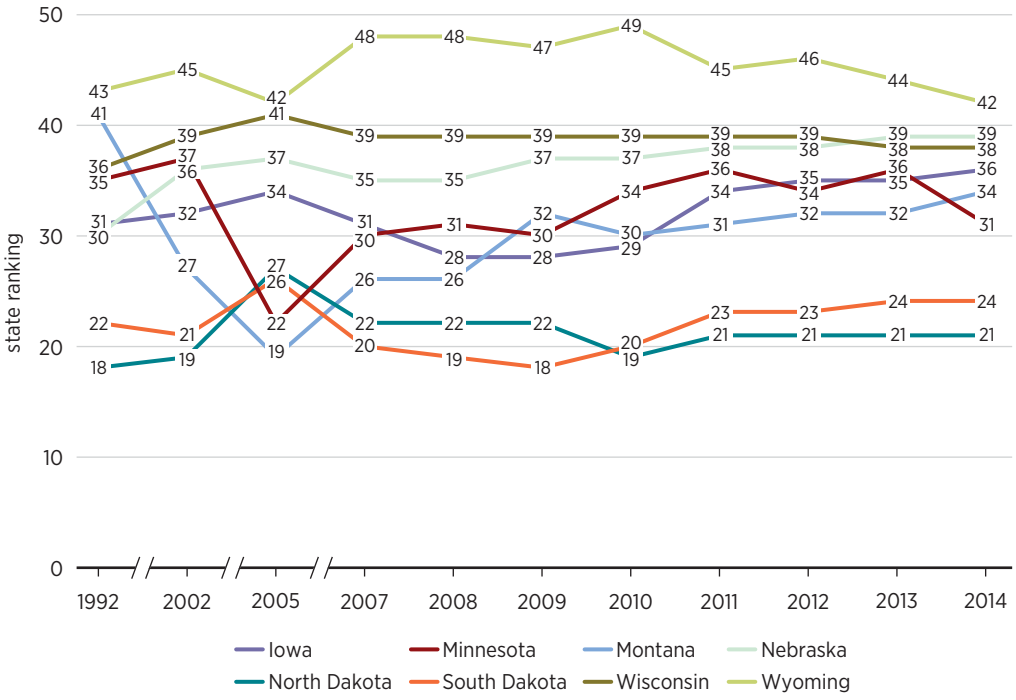
Owing to different revenue needs across communities, property tax rates often vary. In North Dakota, residential value is determined by a local assessor. The assessed value becomes 50 percent of the "true and full" value—market value as determined by the assessor. From the assessed value, 9 percent is the taxable value. However, the actual amount taxed depends on the local mill rate applied to the residential property tax (North Dakota State Tax Commissioner 2016).

Commercial property taxes utilize a similar method. The local assessor determines the true and full value,[3] and 50 percent becomes the assessed value. The total taxable value of commercial property is 10 percent of the assessed value (North Dakota State Tax Commissioner 2016).

Agricultural property taxes are assessed differently. They are based on agricultural productivity. The Department of Agribusiness and Applied Economics at North Dakota State University is responsible for computing the capitalized average annual return on agricultural property. Once the productivity of the land is calculated, the information is sent to the state tax commissioner, who works

3. With the exception of a few centrally assessed properties, such as railroads, public utilities, and airlines, which are assessed at the state level.

FIGURE 36. PER CAPITA STATE AND LOCAL PROPERTY TAXES



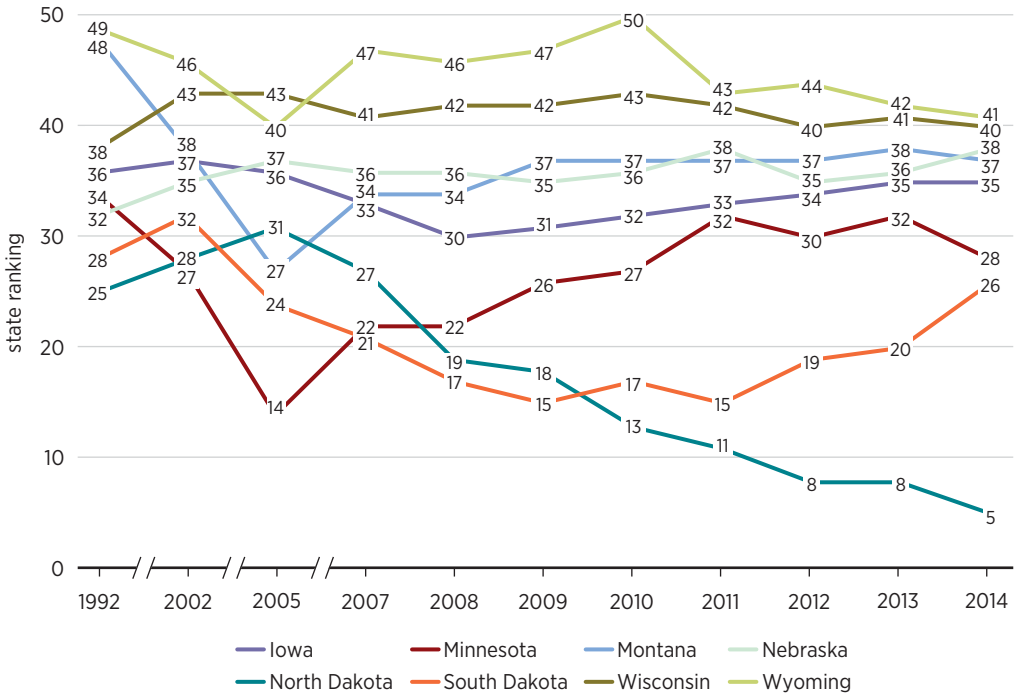
Source: US Census Bureau's Current Population Survey as provided by the Lincoln Institute of Land Policy, "State-by-State Property Tax at a Glance," 2017, https://datatoolkits.lincolninst.edu/subcenters/significant-features-property-tax/state-by-state-property-tax-at-a-glance.

with county directors of tax equalization to determine the true and full value of the land (North Dakota State Tax Commissioner 2016).

The property tax code in North Dakota allows for exemptions and tax credits for different types of properties. Residential tax exemptions or discounts are available for individuals who are disabled or elderly and for home upgrades. Likewise, commercial property taxes can be waived up to 10 years for some new businesses and up to five years for value-added renovations. Businesses located in special economic development areas or renaissance zones can also be exempt for up to five years (North Dakota State Tax Commissioner 2016).

Figure 36 shows the national rankings of per capita state and local property taxes for North Dakota and its neighbors. North Dakota has consistently ranked below other comparative states. The rankings are derived by calculating the combined state and local property tax collections divided by the state population. The calculation provides a sense of the comparative burden of property taxation across states. With this metric, North Dakota remains one of the most competitive states in the region, although it is ranked 21st nationally.

FIGURE 37. NATIONAL RANKING OF PROPERTY TAX AS A PERCENTAGE OF PERSONAL INCOME



Source: US Census Bureau's Current Population Survey as provided by the Lincoln Institute of Land Policy, "State-by-State Property Tax at a Glance," 2017, https://datatoolkits.lincolninst.edu/subcenters/significant-features-property-tax/state-by-state-property-tax-at-a-glance.

Figure 37 shows trends in the ranking of state and local property tax revenue as a percentage of personal income. Regional states are ranked against all 50 states, and the changes in those rankings are tracked over time. States ranked numerically higher are more dependent on property tax revenue to finance local and, to a lesser extent, state government. Over the past decade, North Dakotans have seen their property tax burden drop as a percentage of personal income. Since 2010, North Dakota has had the lowest property tax burden in the region and the fifth lowest in the nation.

PATHWAY TO PROSPERITY

Tax Policy

Income Tax. Studies suggest that state and local taxation may have a significant impact on economic growth. In 2008, economist Robert Reed examined the 48

continental states from 1970 to 1999 and found that state taxes had a statistically significant negative effect on state income. Likewise, economists Poulson and Kaplan (2008) found that higher marginal tax rates at the state level had a negative impact on economic growth. Studies throughout the academic literature come to similar conclusions about the negative impact of income taxes on state-level economic growth (Arnold et al. 2011; Lee and Gordon 2005). Differences in income tax rates have also been shown to affect net in-migration rates (Cebula and Alexander 2006; Coomes and Hoyt 2008), especially on people who are retired, elderly, or both (Conway and Houtenville 2001; Young and Varner 2011). There is also evidence that personal income taxes and business taxes influence where businesses choose to locate (Giroud and Rauh 2015).

The oil boom allowed North Dakota legislators to steadily cut income taxes for individuals and corporations without making sacrifices in state revenue. The recent decline in oil prices has now resulted in a significant reduction in tax collections, causing fiscal strain. State income taxes affect income, economic growth, and net in-migration patterns. Each of these is vital for a state trying to attract and retain new businesses and industry. Additionally, North Dakota has experienced persistently low unemployment rates, creating a need for more workers. Therefore, the state should maintain its commitment to low personal and corporate income tax rates and resist the temptation to raise them to make up for revenue shortfalls.

North Dakota has implemented generous income tax policies. It enjoys the lowest top marginal income tax rate in the region, excepting South Dakota and Wyoming, which have no personal or corporate income taxes. While eliminating the state income tax can remain a long-term policy goal for North Dakota, removing a steady stream of income at this time could prove devastating because of the state's reliance on volatile commodity revenues and the depletion of the Budget Stabilization Fund.

Property Tax. North Dakota is not unique in imposing a property tax, and it shares many of the same controversies as other states. Tax revolts, or popular voter initiatives to limit local taxes, spread throughout the late 1970s and early 1980s (Elder 1992; Lowery and Sigelman 1981). Property taxes are very unpopular throughout the nation, partly because of the way they are imposed.

To the extent that the property tax burden is visible and can be easily calculated and understood by the average citizen, it is more salient (Buchanan 1967; Chetty, Looney, and Kroft 2009). Indeed, the direct payment nature of property taxes contributes to its salience (Alm 2013). Research has shown that when property taxes are more salient, they tend to be lower (Cabral and Hoxby 2012). In

their own words, the results of a study by Cabral and Hoxby "imply that a non-benevolent, expansionist government will wish to enact taxes in forms that make them non-salient: indirect, complex, fragmented, withheld taxes" (2012, 30). In other words, a transparent government taxes its citizens in ways that are salient to them. Other researchers have argued that nonsalient, or hidden, taxes are still an important policy tool to be used (Schenk 2011). Property taxes themselves "might be more or less salient depending on how they are presented" (Gamage and Shanske 2011, 25). For example, the empirical strategy employed by Cabral and Hoxby (2012) exploits variations in paying property taxes through escrow compared with direct payment by property owners. Payment through escrow, which is common for mortgaged property, makes the property tax less salient.

> Transparency in taxation can aid the taxpayer who knows what to look for as a signal of cost. A prime example exists in local property taxes, which are widely regarded as transparent but are also commonly misunderstood. Other familiar taxes, like those on sales or income, require policymakers to first set a tax rate, which then produces revenue. Property taxes, by contrast, require policymakers to first determine the revenues to be raised, and then set a tax rate. This can cause property tax rates to be a misleading indicator of government cost, particularly when rising property values permit both lower tax rates and higher spending. Public policy should improve taxpayers' understanding by directing their attention to both property tax rates and property tax revenues.
>
> Since taxpayers generally pay more attention to the tax rate, changes in property values can change the visibility of the tax without actually making any changes in the tax rate. When property values rise, this decreases the visibility of the tax burden, and increasing home values allow policymakers to raise additional revenues without the transparency of a rate hike. (Ross and Gonzalez 2015, 1–2)

Recent efforts by voters to eliminate property taxes in North Dakota suggest that the current system may not be sufficiently salient, because such efforts are often caused by the perceived unfairness that accompanies a lack of transparency (Cabral and Hoxby 2012). Lawmakers should ensure that the North Dakota property tax system is as transparent and simple as possible. It should be made clear how property taxes are calculated and how much total revenue is raised by them.

Keeping taxes low during times of economic uncertainty will depend heavily on how lawmakers define the role of the state government moving forward. Although the state government has been reducing its role in the pockets of its citizens, it has been expanding its role in municipal government finance. The state government has taken on financial responsibility for an increasing share of local government activities. State financing now contributes almost 80 percent of K–12 education funding in the state (North Dakota Department of Public Instruction 2016). This has the potential to put both the state and local municipalities in an unfavorable financial position. The fiscal feasibility of these programs is decreasing as they become more difficult to manage during times of economic uncertainty.

In 2007, state legislators enacted S.B. 2032 to initiate state-funded income tax credits for all homeowners. This program ended in 2009 when it was determined to be too costly to sustain (Rauschenberger 2016). Instead, another form of property tax relief was enacted in 2009. Legislators used $295 million from oil taxes to offer mill levy reduction grants to school districts. This program distributed relief via a school funding formula, but allocations for the program jumped to $342 million for the 2011–2013 biennium; it also proved too costly to maintain.

During the 2013 Legislative Assembly, lawmakers attempted to address these issues by establishing the Tax Relief Fund to help pay for state-financed property tax credits (North Dakota State Treasurer 2017). Additionally, the mill levy reduction program was replaced with an updated school funding formula in hopes of lowering the cost of property tax relief. This formula combined property tax relief with a new methodology for calculating K–12 education funding. Nonetheless, the overall cost of property tax relief continued to grow as the state provided over $900 million in property tax relief during the 2013–2015 biennium and over $1.2 billion during the 2015–2017 biennium (Rauschenberger 2016).

Although there is evidence that efforts to reduce property taxes are working, there is ample reason to be cautious. State-funded tax credits aimed at reducing the property tax burden on homeowners have the potential to inflate local government expenditures—potentially offsetting savings. Researchers Brien and Sjoquist analyzed homestead tax credits in the state of Georgia. The researchers found that only two-thirds of state-funded tax credits went toward reducing property taxes (Brien and Sjoquist 2014). Moreover, research on New York's attempt to provide property tax relief by subsiding K–12 education costs—similar to North Dakota's current scheme—found an increase in inefficiency. The subsidies and credits inflated local government spending, particularly an unexpected

increase in school spending. This led to higher property tax rates that offset 28 percent of the tax savings (Eom, Duncombe, and Yinger 2005). These results were further corroborated by similar findings in other studies (Anderson 2011; Fisher and Rasche 1984; Zhao and Jung 2008).

North Dakota's attempt to provide property tax relief has tremendous potential to backfire. Some people have expressed "frustrations that a number of local governments have used the state tax relief to raise spending" (Hageman 2016b, para. 12). By attempting to pass on gains in oil revenue via property credits, the state risks inflating municipal-level spending (Fisher and Rasche 1984). This has two possible adverse effects: local governments can become increasingly dependent on a relatively unstable source of funding (oil prices), and boom-level spending can exacerbate the bust effect associated with oil price swings at the local level (Hageman 2016b). Therefore, property taxes should remain a local issue, and legislators should refrain from using state revenues to provide local tax relief.

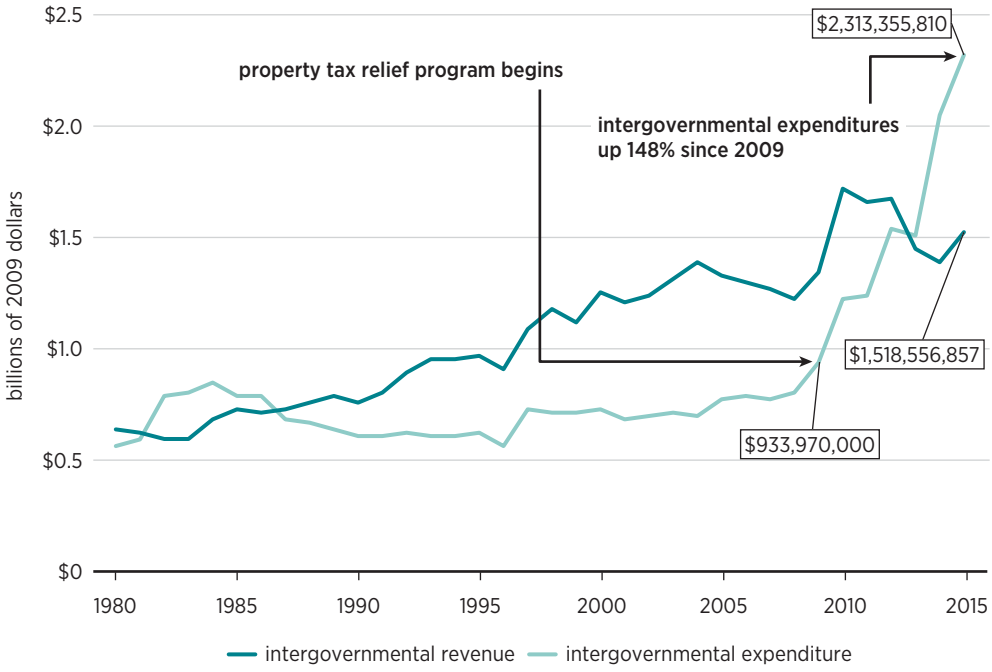
Education Finance

K–12 Education. North Dakota has an intricate system of K–12 education financing. The state has two major funds exclusively allocated to K–12 education: the Common Schools Trust Fund and the Foundation Aid Stabilization Fund. The Common Schools Trust Fund is a market investment account that was initiated in 1889 through the Enabling Act when North Dakota's state government was first established (North Dakota State Treasurer 2017). This fund is supported by investment returns, royalties, and oil extraction taxes; interest income from farm and energy construction loans; lease bonuses; rental income; unclaimed property collections; and tobacco settlement proceeds. The fund's biennial distributions are 10 percent of the five-year average value of the trust assets, excluding the value of land and minerals (North Dakota State Treasurer 2017). Historically, this fund has been the primary source of K–12 education funding from the state to local schools. As of June 2017, the value of the fund was $3.9 billion, with an expected distribution of $286.1 million over the 2017–2018 biennium.

In addition to the Common Schools Trust Fund, the state also relies on the Foundation Aid Stabilization Fund to cover unexpected revenue shortfalls. This constitutionally protected fund was established in 1994 to behave like a rainy day fund for education. The fund was traditionally limited to K–12 education spending[4] (North Dakota State Treasurer 2017). However, this changed in

4. *North Dakota Century Code* § 54-44.1-12

FIGURE 38. NORTH DAKOTA STATE GOVERNMENT TRANSFERS



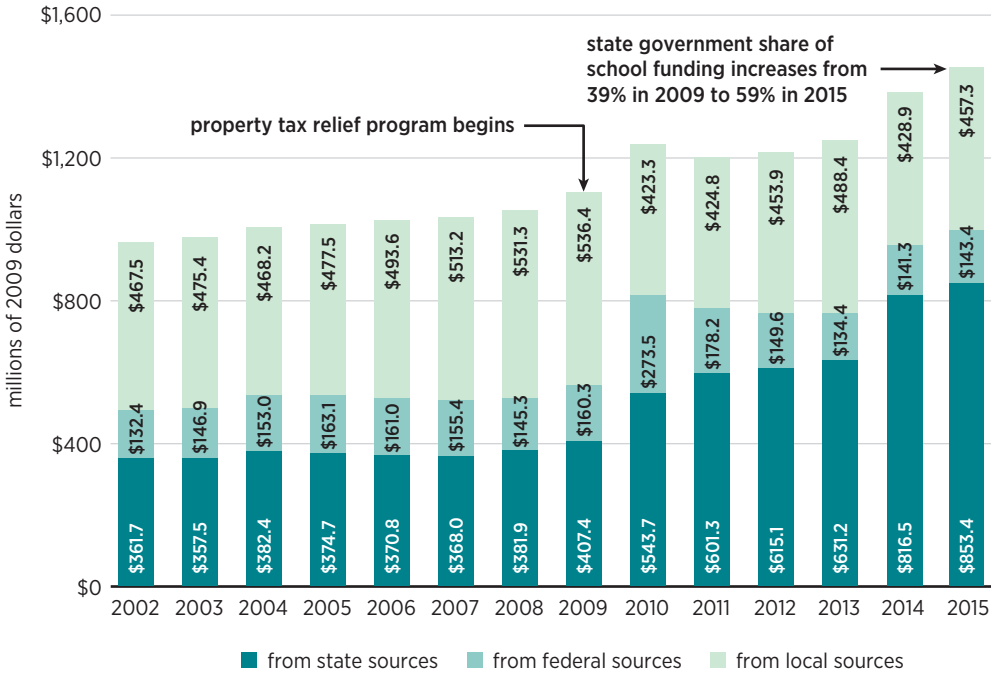
Source: US Census Bureau, *Annual Survey of State Government Finances: North Dakota*, 1980–2015, adjusted for inflation.

2016 when a statewide vote approved the use of excess funds for any education-related expenditures (Emerson 2016; Potter 2016). This fund proved beneficial when K–12 funding was spared from cuts during the postboom budgeting period. As of November 2017, this fund had a value of $566,428,174. North Dakota voters and lawmakers hold K–12 education spending in high regard, as evidenced by the more than $4 billion in allocated funds.

The value of these funds has made it possible for North Dakota to reduce its citizens' tax burden. This has largely been done by deriving revenue from severance taxes. North Dakota levied a 5 percent production tax as a substitute for local property taxes in 2009 (North Dakota State Tax Commissioner 2016). This method of property tax relief has driven most of the changes observed in the "Property Tax" section of this report. However, it also changed the relationship between the state and local governments as the state took on an increasing share of local government spending.

Attempts by state lawmakers to provide property tax relief can best be seen by looking at intergovernmental transfers. Figure 38 shows that intergovernmental transfer expenditures—payments the state government made to municipal

FIGURE 39. NORTH DAKOTA K–12 REVENUE SOURCES (IN MILLIONS/2009$)



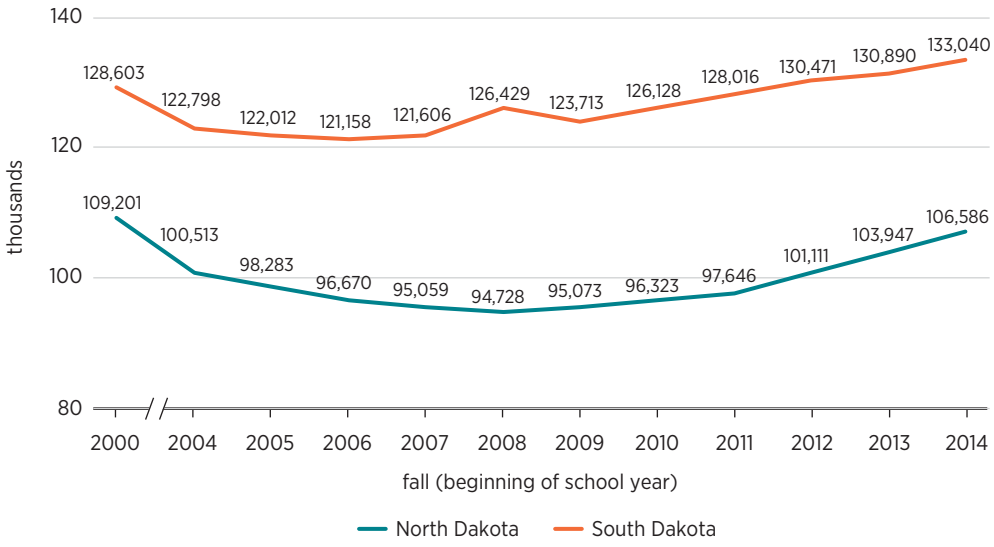
Source: US Census Bureau, *Annual Survey of State Government Finances: North Dakota,* 2002–2015, adjusted for inflation.

governments—increased by 148 percent during the oil boom from 2009 to 2015. This type of property tax relief risks creating a fiscal illusion in which voters perceive the costs of government services to be lower than they are (Grossman 1990).

North Dakota should resist expanding tax relief programs until further research can be conducted to understand the impact of its current programs. There is evidence that artificially lowering the cost of local government services, as has been done with state property tax relief, reduces efficiency by encouraging higher levels of local spending. Additionally, these programs may raise costs in the long term (Eom, Duncombe, and Yinger 2005). Given the current fiscal condition of the state, efforts should be made to reduce local reliance on state funds.

Since the application of property tax relief programs, the funding structure of K–12 education has dramatically changed in North Dakota (see figure 39). Before the program was introduced, spending remained relatively unchanged from 2002 to 2009. After the program was implemented, the state's contribution to K–12 funding more than doubled from $407.4 million in 2009 to $853.4 million in 2015. At the same time, local education spending decreased from $536.4 million to $457.3 million. While local governments have reduced their

FIGURE 40. NORTH DAKOTA VS. SOUTH DAKOTA K–12 PUBLIC SCHOOL ENROLLMENT



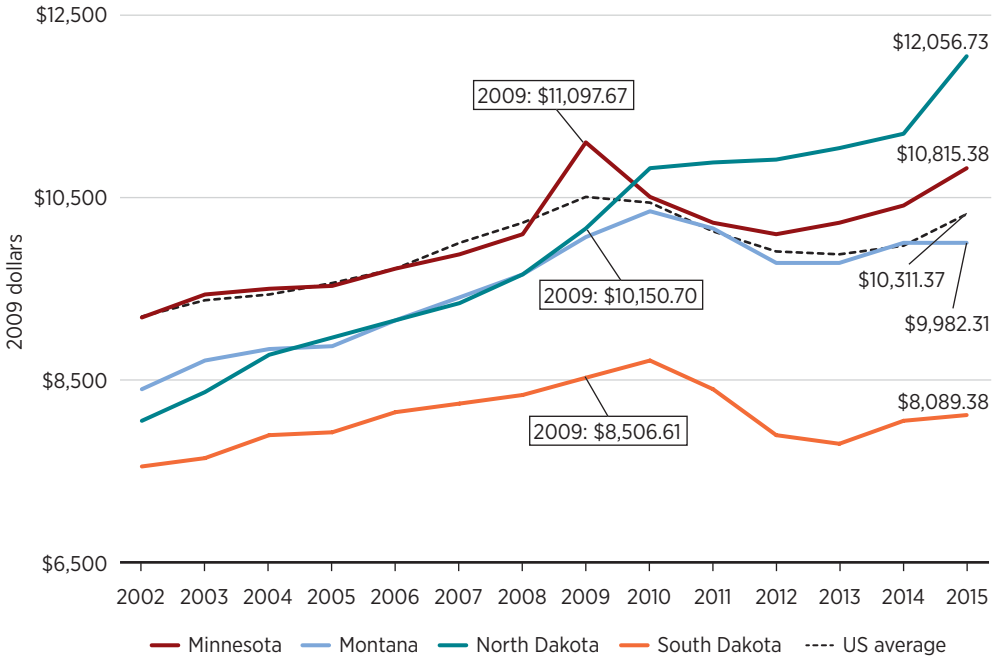
Source: National Center for Education Statistics, "Enrollment in Public Elementary and Secondary Schools, by Region, State, and Jurisdiction: Selected Years, Fall 1990 through Fall 2016," accessed September 17, 2018.

contributions since tax relief programs went into effect, overall education spending has increased by 46.7 percent since 2009.

This spending growth can partly be explained by an increase in the number of students. From 2009 to 2014 (the height of the oil boom), the number of students enrolled in North Dakota schools grew by 12.1 percent (see figure 40), well above the national average of 1.9 percent during this period. However, to put this growth in context, South Dakota experienced more growth than North Dakota, yet it spends substantially less per pupil (see figure 41). From 2004 to 2010, the number of K–12 public school students grew by 3 percent in South Dakota and declined by 4 percent in North Dakota.

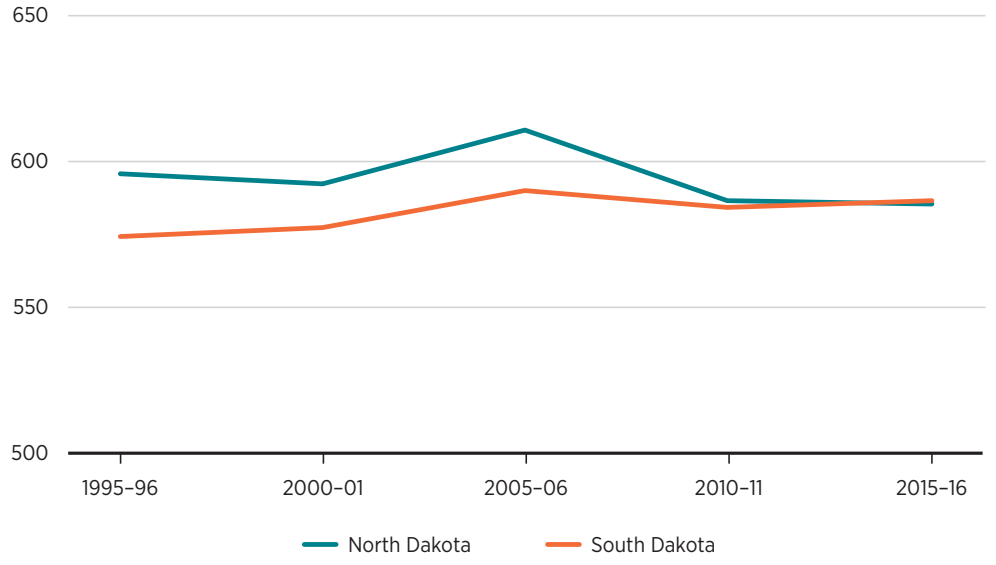
As shown in figure 41, South Dakota has managed to keep costs per pupil substantially lower than those of the border states while dealing with similar growth. Furthermore, when SAT scores are used as a proxy for education quality, it is clear that North Dakota's increase in spending has not resulted in better outcomes. Figure 42 and figure 43 compare the average critical reading and math SAT scores for graduating seniors in both states. South Dakota and North Dakota have similar scores and trends, and both are above the national average, but South Dakota spends substantially less to achieve its results. While the trends in SAT scores are cause for concern regarding educational efficiency in North Dakota, the majority of students in North Dakota do not take the SAT and instead take the ACT. In fact,

FIGURE 41. PER PUPIL SPENDING IN BORDER STATES (IN 2009$)



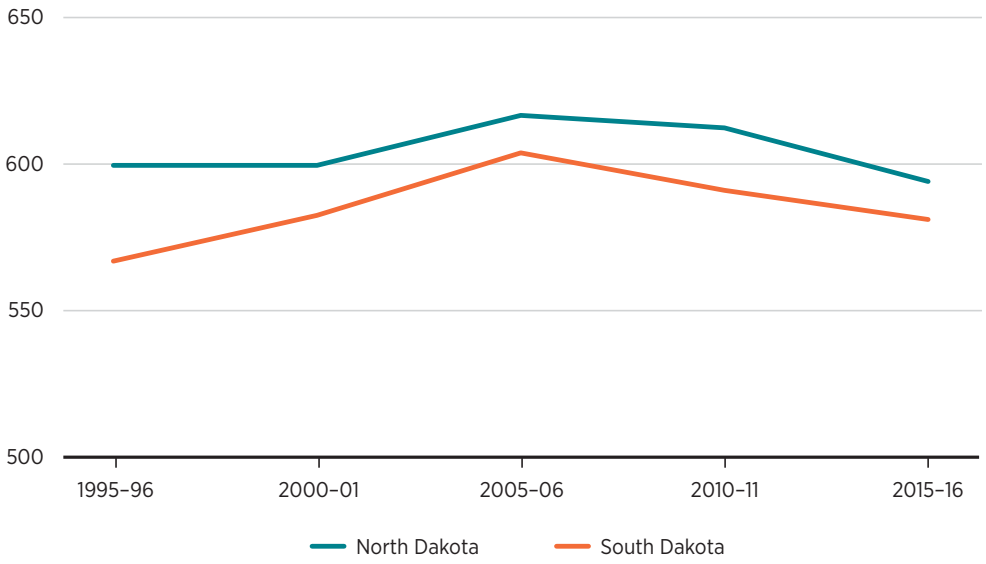
Source: US Census Bureau, *Annual Survey of State Government Finances: North Dakota,* 2002–2015, adjusted for inflation.

FIGURE 42. SAT AVERAGE CRITICAL READING SCORES



Source: National Center for Education Statistics, "Mean SAT Scores of College-Bound Seniors and Percentage of Graduates Taking the SAT, by State: Selected Years, Fall 1995 through Fall 2016," https://nces.ed.gov/programs/digest/d16/tables/dt16_226.40.asp.

FIGURE 43. SAT AVERAGE MATH SCORES



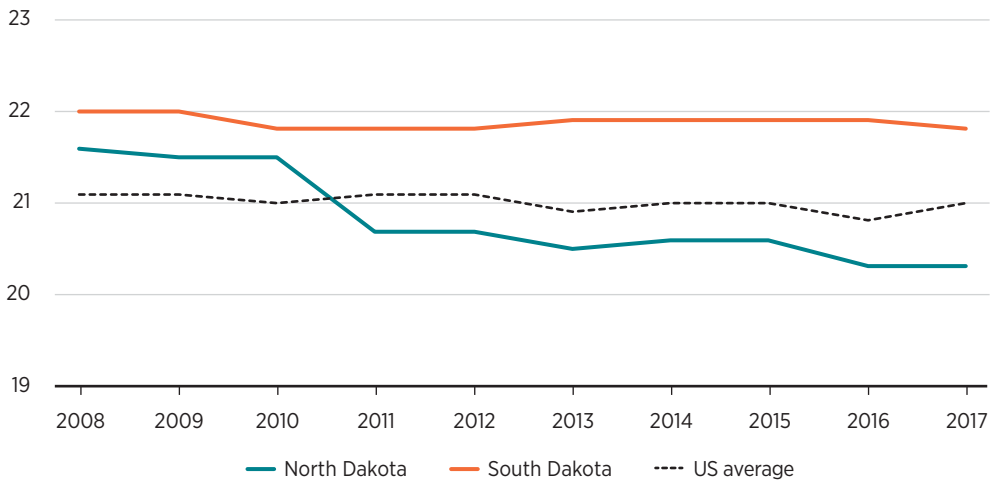
Source: National Center for Education Statistics, "Mean SAT Scores of College-Bound Seniors and Percentage of Graduates Taking the SAT, by State: Selected Years, Fall 1995 through Fall 2016," https://nces.ed.gov/programs/digest/d16/tables/dt16_226.40.asp.

some estimate that fewer than 2 percent of students who take either exam opt for the SAT in the state of North Dakota, with only 2.3 percent taking the test in South Dakota (Caffee 2018). More than 97 percent of students in both states take the ACT, making it a much better proxy for overall education quality in those states.

Figures 44, 45, and 46 plot trends in average ACT scores in North Dakota, South Dakota, and the United States. Prior to 2010 both North Dakota and South Dakota were above the national average in reading, math, and composite scores. However, North Dakota's averages dropped below the national average and fell even further behind the South Dakota average beginning in 2011. In 2017 the average ACT composite score in North Dakota was 0.7 points below the national average and a full 1.5 points below the South Dakota average ACT composite score.

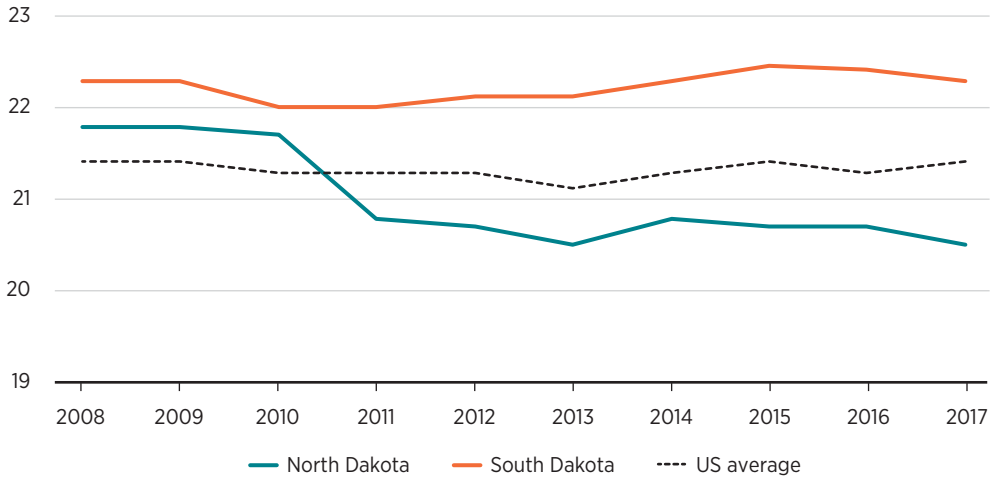
While it is beyond the scope of this report to propose exact spending levels, lawmakers should evaluate whether the extra education spending is worthwhile given the negligible improvements in education quality. The increased education spending per pupil demonstrated in figure 41 actually correlates with worse educational quality as measured by average ACT scores. Because of the potential for distortionary effects (i.e., fiscal illusions) by the states' property tax relief programs on local government finances, K–12 spending should be closely monitored to ensure the optimal use of taxpayer dollars.

FIGURE 44. ACT AVERAGE COMPOSITE SCORES



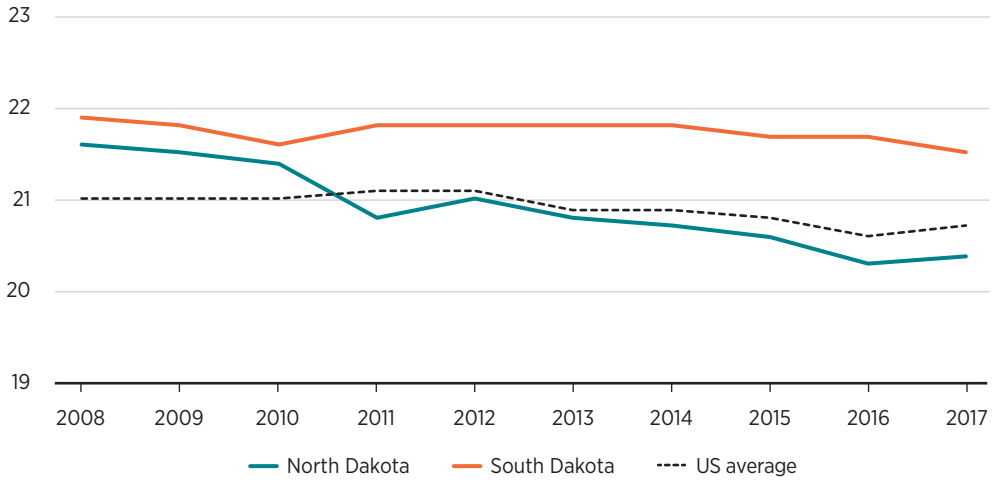
Source: ACT, Inc., *The ACT Profile Report—National,* 2012–2017; ACT, Inc., *The ACT Profile Report—State: North Dakota,* 2012–2017; ACT, Inc., *The ACT Profile Report—State: South Dakota,* 2012–2017.

FIGURE 45. ACT AVERAGE READING SCORES



Source: ACT, Inc., *The ACT Profile Report—National,* 2012–2017; ACT, Inc., *The ACT Profile Report—State: North Dakota,* 2012–2017; ACT, Inc., *The ACT Profile Report—State: South Dakota,* 2012–2017.

FIGURE 46. ACT AVERAGE MATH SCORES



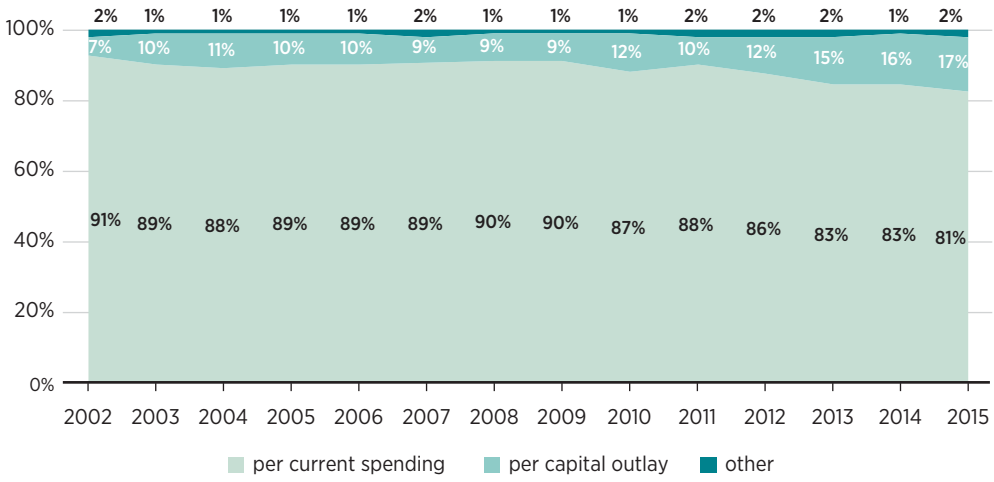
Source: ACT, Inc., *The ACT Profile Report—National,* 2012–2017; ACT, Inc., *The ACT Profile Report—State: North Dakota,* 2012–2017; ACT, Inc., *The ACT Profile Report—State: South Dakota,* 2012–2017.

Figure 47 shows the changing composition of K–12 expenditures. The share of spending dedicated to capital outlay suggests the state has made many of its recent expenditures on fixed assets, such as facilities. Capital outlay grew from 7 percent of expenditures in 2002 to 17 percent in 2015, more than doubling the share of the budget going to new construction, renovation, and equipment upgrades. While it is reasonable to expect more spending in this area to accommodate growth, state lawmakers should avoid the pitfalls of overinvesting. The oil boom provided the state with vast economic opportunities, attracting many new families, but the subsequent bust and a more favorable national economy threaten to upend this growth.

North Dakota's high levels of education spending demonstrate its commitment to its public schools and students. In this area, policy issues should focus less on whether the state is spending too much or too little and focus more on whether spending levels are justified by educational outcomes. In other words, policymakers should focus on increasing education efficiency.

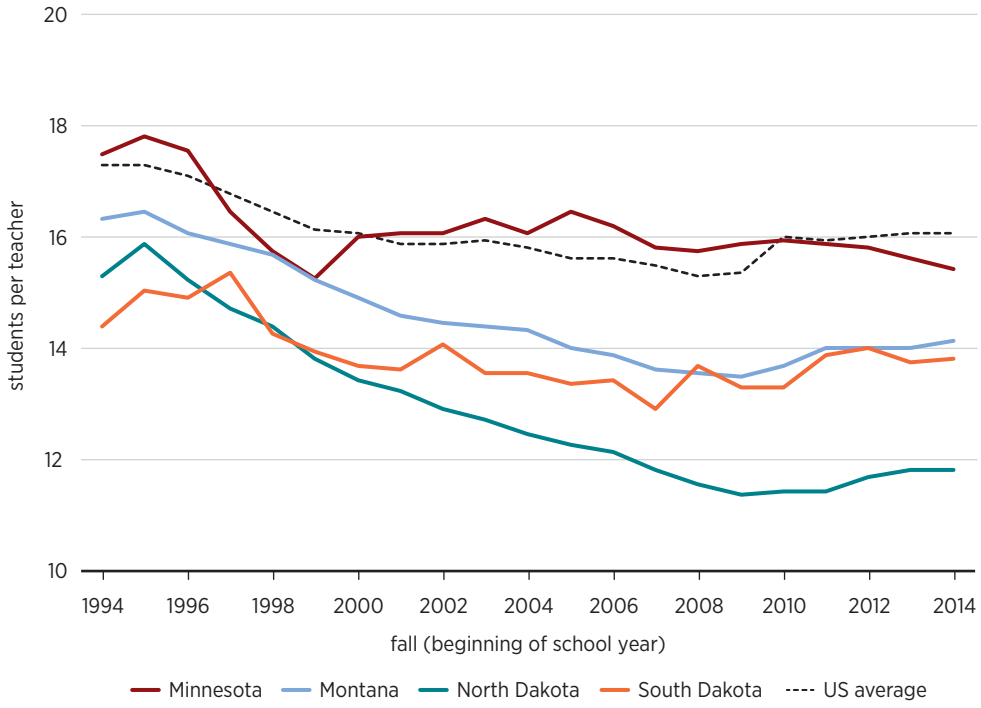
One measure that suggests North Dakota's public education system may not be operating at optimal efficiency is the state's low teacher-to-student ratio. North Dakota's teacher-to-student ratio consistently fell from 1995 to 2009. After the oil boom, the ratio began to increase slightly, but it remains the lowest in the region (see figure 48). In 2014 (the most recent year for which data are available), the average class size in North Dakota was 11.8 students per teacher. This was the

FIGURE 47. PERCENTAGE OF NORTH DAKOTA K–12 EXPENDITURES



Source: US Census Bureau, *Annual Survey of State Government Finances: North Dakota,* 2002–2015, adjusted for inflation.

FIGURE 48. PUBLIC SCHOOL TEACHER-TO-STUDENT RATIO



Source: National Center for Education Statistics, "Public Elementary and Secondary Teachers, Enrollment, and Pupil/Teacher Ratios, by State or Jurisdiction: Selected Years, Fall 2000 through Fall 2015," accessed September 17, 2018.

second-lowest teacher-to-student ratio in the country, above only Vermont. While other Midwestern and rural states also had ratios below the national average, none were as low as North Dakota's. This suggests the need for further investigation into what sets North Dakota apart from its neighboring states. Moreover, any latent inefficiencies were likely exacerbated by the fiscal illusion brought on by the state's property tax relief programs.

There are several ways North Dakota can improve the efficiency of its K–12 education system. Research has shown one way to increase efficiency is to advance school choice initiatives. Currently, North Dakota does not have a constitutional provision allowing the establishment of charter schools, nor has it approved any school voucher systems. These initiatives could increase efficiency and even result in savings. By allowing schools to compete for students and public dollars, lawmakers can encourage innovation, improvement, and efficiency gains (Hoxby 1996, 2003; Rouse 1998; Belfield and Levin 2002; Gronberg, Jansen, and Taylor 2012). A decision to expand school choice would come with many potential benefits and few associated risks for North Dakota.

Transportation

North Dakota is a geographically large state with 70,698 square miles in total area (Census Bureau 2010). North Dakota is also one of the least populated states with about 757,900 residents (Census Bureau 2016). The combination of vast tracts of land and a relatively small population makes North Dakota one of the least densely populated states in the United States. According to the latest data available from the Census Bureau (2010), there are 9.7 persons per square mile in the state. The rural makeup of the state creates transportation issues. Much of North Dakota's transportation system was developed to connect rural farmers to markets. As the agriculture and natural resource industries have grown, transportation and warehousing have become increasingly important.

The state agency in charge of overseeing North Dakota's network of roads and rail lines is the North Dakota Department of Transportation (NDDOT). The NDDOT has been tasked with developing the infrastructure to accommodate the recent growth of industry within the state. However, the state has often adopted a delayed approach to financing public infrastructure. By waiting to address transportation needs, the state has been forced to rapidly build infrastructure during periods of prosperity. When the economy slumps, these projects are left idle, often with workers and their families deciding to leave the area. This leaves communities with large infrastructure bills and a smaller tax base (Sisk 2017).

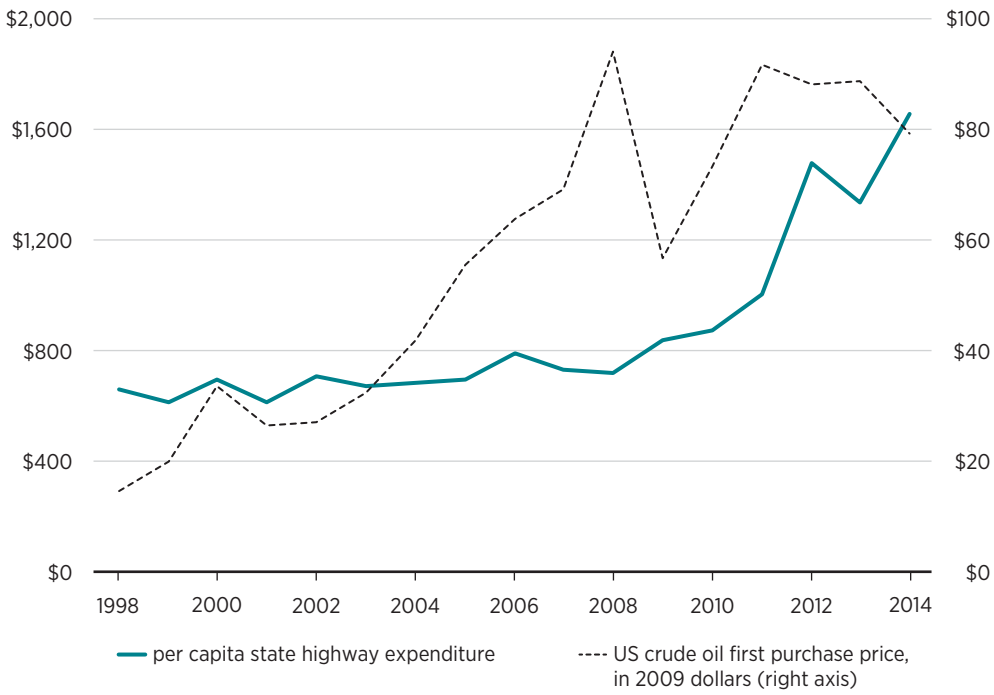
The NDDOT receives funding from three sources: the state budget, the federal government, and transportation user fees. The public transportation funds are allocated in the state budget under the General Fund and the Strategic Investment and Improvement Fund (SIIF). Federal funds are generally restricted to use on federal transit and safety projects. User fees are collected through a fuel consumption tax, motor vehicle registration fees, and regulatory fees for commercial trucking.

Highways and Roads. North Dakota has about 87,129 miles of roadway overseen by state and local governments: 7,407 miles of state highways, 19,611 miles of county roads, 56,008 miles of rural roads, and 4,103 miles of city streets (NDDOT 2016). Additionally, the state has 3,707 miles of national highways and 571 miles of interstate roads (NDDOT 2016). Over the past decade, the state's transportation system experienced substantial growth. From 2010 to 2014, North Dakota saw a 26 percent increase in statewide traffic. This growth was even more pronounced in western North Dakota, which saw a 71 percent increase in traffic movements due to oil extraction activities. Similarly, truck traffic increased by 87 percent statewide from 2008 to 2014 (NDDOT 2016). North Dakota was poorly equipped to handle this growth because of its piecemeal approach to public infrastructure—utilizing the SIIF to make large public transport investments on an as-needed basis.

Using the US crude oil first purchase price, a correlation exists between the rise in oil prices and an increase in highway infrastructure spending. Figure 49 shows the changes in inflation-adjusted per capita state highway spending (left axis) and the rise in inflation-adjusted crude oil prices (right axis). State highway investment spending was flat through the late 1990s and early in the decade after 2000. In 2007, natural resource mining accounted for only 3 percent of North Dakota's GDP (see figure 6). By 2014, it had grown to 17 percent (see figure 6), more than doubling its share of economic output. This boom in output was made possible by innovative extraction techniques and the high price of crude oil, which made extraction profitable. However, chronic underinvestment and lack of strategic planning forced state lawmakers to drastically increase infrastructure planning in a hurried effort to address the state's crumbling roads and bridges.

Despite this fairly recent increase in infrastructure planning and spending, North Dakota remains behind the rest of the nation in repairing its bridges. The data in table 9 show that 15.8 percent of all bridges 10 years or older are in dire need of repair or replacement. However, North Dakota is not alone; regional neighbors such as South Dakota, Iowa, and Nebraska have even higher percentages

FIGURE 49. STATE HIGHWAY SPENDING AND OIL PRICES (IN 2009$)



Source: US Census Bureau, *Annual Survey of State Government Finances: North Dakota*, 1998–2014, adjusted for inflation; US Energy Information Administration, "U.S. Crude Oil First Purchase Price: Annual," dollars per barrel, adjusted for inflation.

TABLE 9. BRIDGE CONDITIONS 2014

State	% Structurally Deficient	% Functionally Obsolete	National Ranking Structurally Deficient	National Ranking Functionally Obsolete
Iowa	20.7%	4.9%	49	3
Minnesota	6.4%	2.8%	15	1
Montana	7.6%	9.8%	19	15
Nebraska	17.3%	6.4%	46	6
North Dakota	15.8%	5.5%	45	5
South Dakota	20.0%	4.1%	48	2
Wisconsin	8.6%	5.4%	24	4
Wyoming	13.5%	9.1%	41	13

Source: US Department of Transportation, Federal Highway Administration, Office of Bridge Technology, "National Bridge Inventory: Functional Classification of Bridges by Highway System," accessed June 2015. Rankings include the District of Columbia.

of deteriorating bridges. Iowa and South Dakota lead the region with more than 20 percent of all bridges 10 years or older in need of critical repair or replacement.

The region fares better in terms of functionally obsolete bridges, which the Federal Highway Administration defines as bridges that are too low (under 15 ft. clearance) or too narrow or curved, requiring a reduction of speed. In this area, North Dakota ranks fifth in the nation with only 5.5 percent of its bridges functionally obsolete.

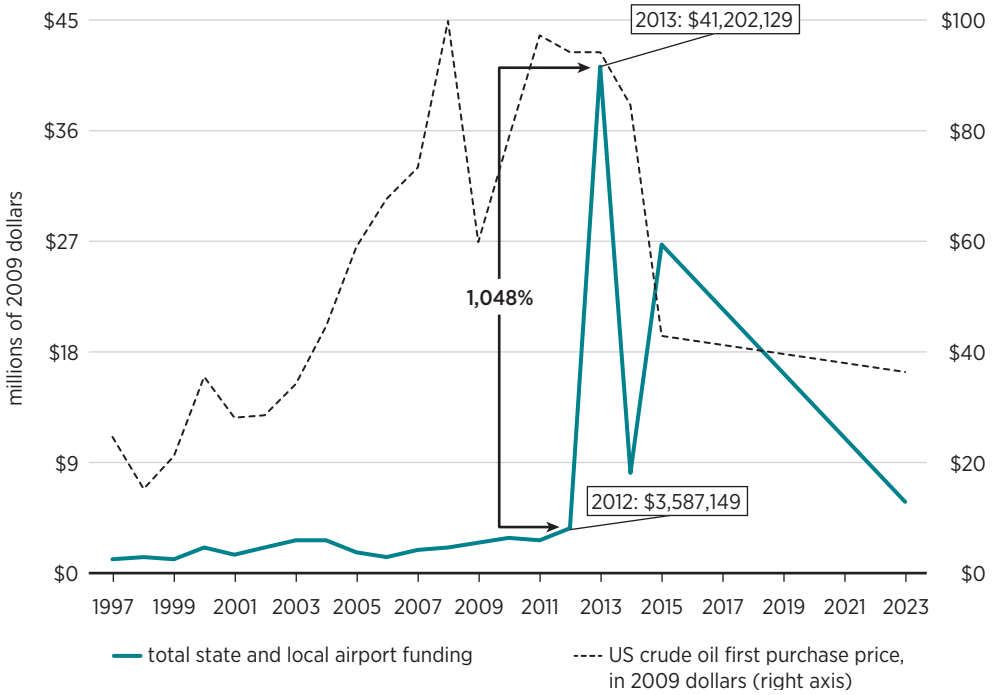
The deteriorating state of North Dakota's bridges is evidence of insufficient rural infrastructure investments, which can be understood as an issue of utilization. Lawmakers are hesitant to build or restore bridges that might go unused.

Rail Transport. North Dakota has a network of 3,389 miles of freight railroads. The state experienced a decline in railroad use from 1980 to 2008, during which over 1,800 miles of railroad were abandoned (NDDOT 2016). However, demand created by the energy boom effectively stopped this trend by starting rail traffic in the state. Rail traffic originating in North Dakota increased by 124 percent from 2011 to 2014. This growth was fueled by the need to transport oil out of the state. From 2011 to 2015, the amount of crude oil shipped out of North Dakota by rail lines increased by 55 percent (NDDOT 2016). However, current investments in pipeline infrastructure and increased concerns over safety mean the demand for shipping oil by rail will likely decrease in the future.

Airports. North Dakota has eight commercial airports. They are overseen by the North Dakota Aeronautics Commission (NDAC). According to data from the NDAC, economic growth has had a notable effect on the state's airports. From 2010 to 2015, airport-related employment increased by 38 percent. State and local tax revenues collected from public-use airports nearly doubled, growing from $31 million in 2010 to $60 million in 2015. This growth in flight traffic and tax revenue also corresponds with the oil boom, as shown in figure 50. Airport infrastructure spending dramatically increased from 2012 to 2013; it jumped from $3.6 million to $41.2 million, representing an increase of 1,048 percent. North Dakota's airport infrastructure is another example of the state's poor preparation before the economic boom brought on by the energy sector.

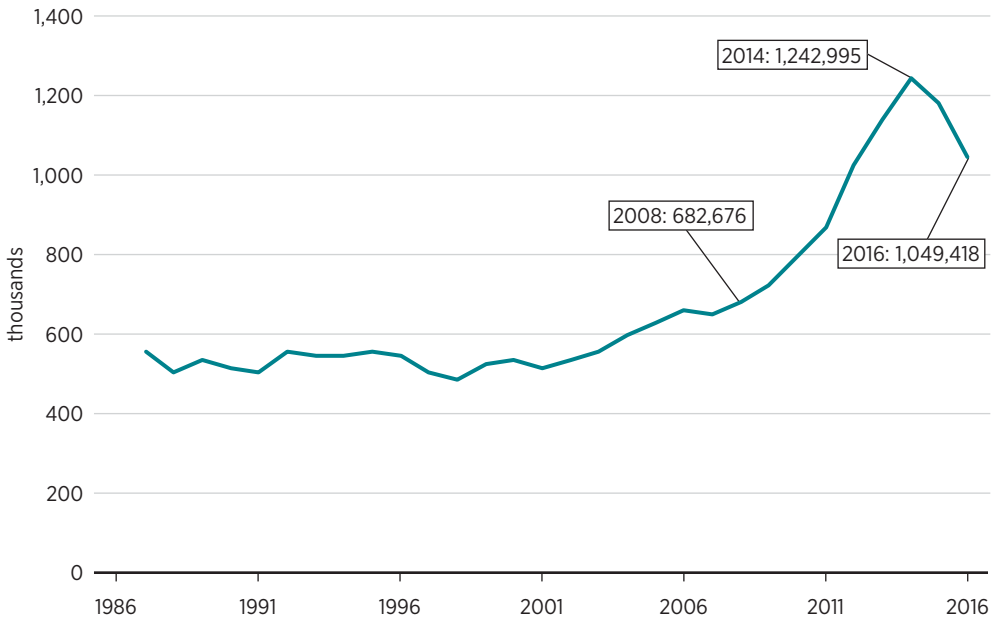
As shown in figure 51, the number of passengers boarding in the state increased dramatically from 2008 to 2014. These fluctuations correspond to changes in the price of crude oil. At the peak of the energy boom, commercial flight boarding increased by more than 82 percent—going from 682,676 passengers in 2008 to 1,242,995 passengers in 2014. Lower oil prices preceded a decrease to 1,049,418 in 2016. Increases in energy-related economic activity also

FIGURE 50. AIRPORT SPENDING AND OIL PRICES (IN 2009$)



Source: Data from the North Dakota Aeronautics Commission upon request; US Energy Information Administration, "U.S. Crude Oil First Purchase Price: Annual," dollars per barrel, adjusted for inflation.

FIGURE 51. COMMERCIAL FLIGHT BOARDINGS



Source: Data from North Dakota Aeronautics Commission upon request.

influenced the demand for travel, as evidenced by the flat rate of travel before 2008. However, this demand is subject to changes in commodity prices. Therefore, the state should be careful not to overinvest in infrastructure.

The state of North Dakota faces unique transportation problems. Lawmakers must maintain the current infrastructure without overinvesting in areas of the oil boom. In addition to avoiding the risk of overinvesting, lawmakers must justify the cost of maintaining rural transportation systems as population trends shift from rural to urban areas. Although fewer people are using these crumbling bridges, the largest sector of the state's economy is still highly dependent on a rural infrastructure system. Even as the rural population continues to decline, farming remains the state's most important industry. This presents a challenge for anyone addressing North Dakota's transportation issues. To facilitate future economic growth, the state will need to rely on the strategic and targeted use of public funds.

Pension System

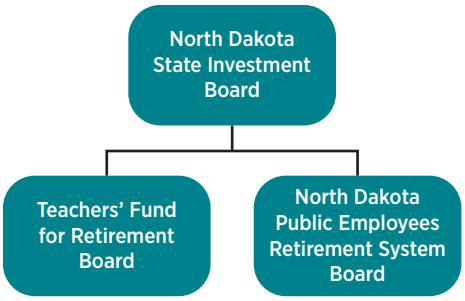
North Dakota manages five retirement funds, which are administered by two state agencies, as shown in figure 52: the North Dakota Public Employees Retirement System (PERS) Board and the Teachers' Fund for Retirement (TFFR) Board. These agencies handle benefit eligibility and allocation, while monetary investment decisions are made by a hybrid conglomeration of the two boards called the North Dakota State Investment Board (SIB).

Investment decisions for the state pension funds are made by the SIB, which is composed of the following 11 members: the governor, state treasurer, state insurance commissioner, commissioner of university and school lands, executive director of workforce safety and insurance, three members of the TFFR Board, two elected members of the PERS Board, and one member selected by the PERS Board (North Dakota Retirement and Investment Office, "State Investment Board," n.d.).

The TFFR Board consists of seven members: the state treasurer, the superintendent of public instruction, and five members appointed by the governor. The appointed members serve five-year terms that end on June 30 of alternate years. The appointed board members must include two classroom teachers or guidance counselors, a school administrator, and two members currently receiving benefits as retirees (North Dakota Retirement and Investment Office, "Teachers' Fund for Retirement," n.d.).

The PERS Board consists of nine members: a chairman appointed by the governor, a trustee appointed by the attorney general, a trustee appointed by the North Dakota Department of Health, a trustee representative elected by the

FIGURE 52. MANAGERS OF NORTH DAKOTA'S RETIREMENT FUNDS



retired public employees, and two trustees appointed by legislative management (North Dakota Public Employees Retirement System Board of Trustees, n.d.).

The fiscal health of a public pension system is measured by the funded ratio. The funded ratio is simply the value of the system's assets divided by its liabilities at any given time. According to an issue brief by the Pension Practice Council of the American Academy of Actuaries, the funded ratio is "a useful measure, [but] understanding a pension plan's funding progress should not be reduced to a single measure or benchmark at a single point in time" (American Academy of Actuaries 2012, 1). In other words, how the funded ratio changes over time is more meaningful than a static measurement. The same issue brief states, "Actuarial funding methods generally are designed with a target of 100 percent funding—not 80 percent. If the funded ratio is less than 100 percent, contribution patterns are structured with the objective of attaining a funded ratio of 100 percent over a reasonable period of time" (2). Therefore, the standard for measuring a pension system's health is whether it has a 100 percent funded ratio, with its distance from this benchmark as an indicator of fiscal problems. To understand the current and future health of the North Dakota pension system, it is important to look at the funded ratio of all five major retirement funds over the past 10 years.

Additionally, it is important to consider changes in the annual required contribution (ARC) for North Dakota's largest funds. The ARC is the employer contributions required to pay off the accrued liabilities for the current accounting period as well as any previously unfunded pension liabilities. The ARC provides a measure of how dedicated a state is to meeting its pension funding obligations (Brainard and Brown 2015). States that consistently fail to fund the actuarially estimated ARC slowly expose their pension systems to more instability (Munnell et al. 2008).

North Dakota Highway Patrolmen's Retirement System Fund. The Highway Patrolmen's Retirement System Fund has been consistently underfunded over

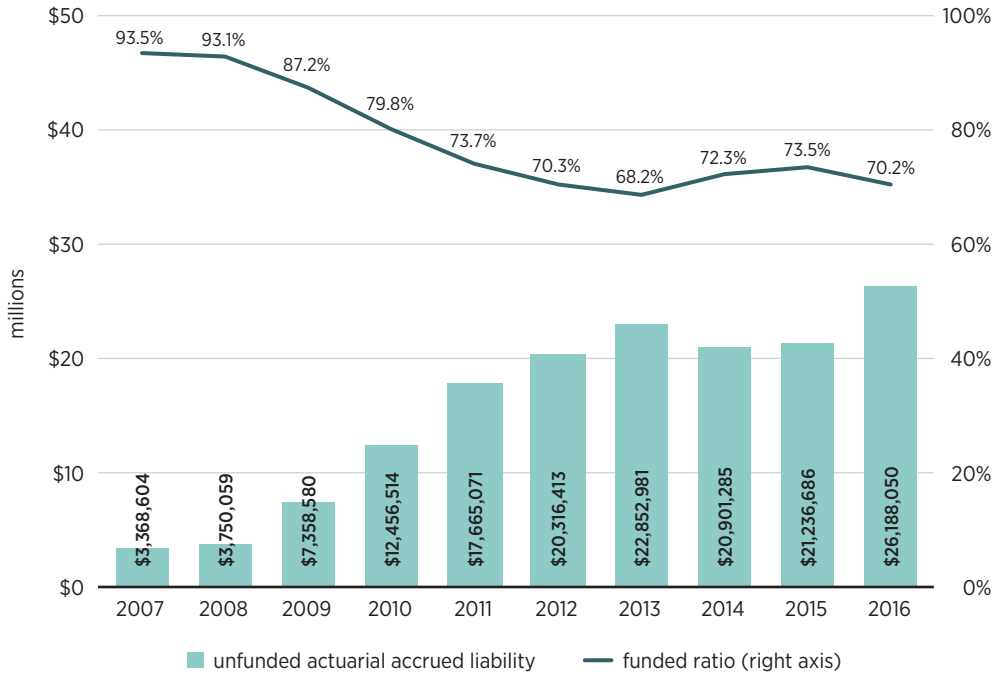
FIGURE 53. NORTH DAKOTA HIGHWAY PATROLMEN'S RETIREMENT SYSTEM FUND ASSETS AND LIABILITIES

Source: North Dakota Highway Patrolmen's Retirement System, *Actuarial Valuation Report as of July 1, 2016.* Prepared by Gabriel Roeder Smith & Company at the request of the state of North Dakota.

the past decade, as shown in figure 53. This situation has only worsened over time as the growth in accrued liability has outpaced growth in assets, pushing the funded ratio lower and lower. In 2009, the divergence between accrued liability and the actuarial value of fund assets began to widen substantially. This trend reflects a drop in the funded ratio, which continued until 2013 before leveling off around 70 percent. The longer this trend continues, the more difficult it will become to address. Additionally, more stress will be placed on state finances—and ultimately the taxpayers—to cover the fund. Figure 54 illustrates the year-over-year net position of the funds starting July 1, 2007, and ending July 1, 2016.

Figure 54 shows the unfunded actuarial accrued liability, which is the difference between the actuarial values of assets and actuarial accrued liabilities. This identifies the portion of the pension that is unfunded. As this portion grows, so does the amount of funding legislators need to allocate from other sources to meet pension obligations in the future. In other words, as the funded ratio falls, the fund's demand for taxpayer dollars grows.

FIGURE 54. NORTH DAKOTA HIGHWAY PATROLMEN'S RETIREMENT SYSTEM FUND, UNFUNDED ACTUARIAL ACCRUED LIABILITY

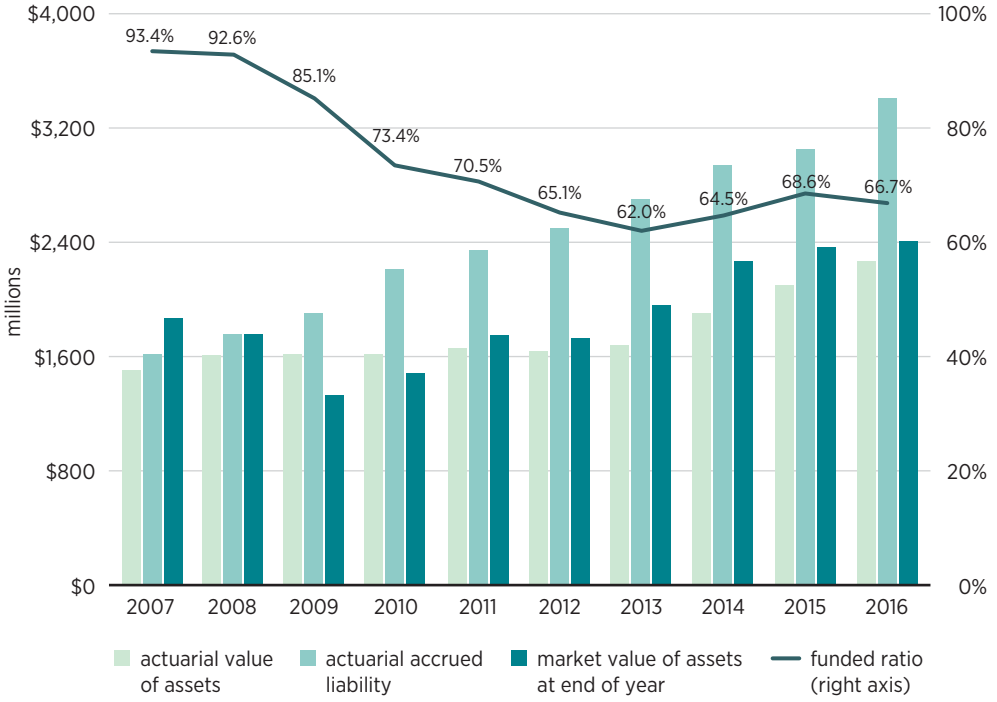


Source: North Dakota Highway Patrolmen's Retirement System, *Actuarial Valuation Report as of July 1, 2016.* Prepared by Gabriel Roeder Smith & Company at the request of the state of North Dakota.

North Dakota Public Employee Fund. The Public Employee Retirement Fund shows a similar trend (see figure 55). Since 2007, the funded ratio fell from a high of 93.4 percent in 2007 to a low of 62.0 percent in 2013. It increased slightly to 66.7 percent in 2016. Liabilities have outpaced both the actuarial value of assets and the market value since 2009. Unfortunately, this trend has shown no sign of reversing. Figure 56 shows the effect of the falling funded ratio. Since 2007, the unfunded actuarial accrued liability has grown by more than 1,067 percent. The ability for liabilities to grow exponentially should cause concern for lawmakers, because this trend is unsustainable.

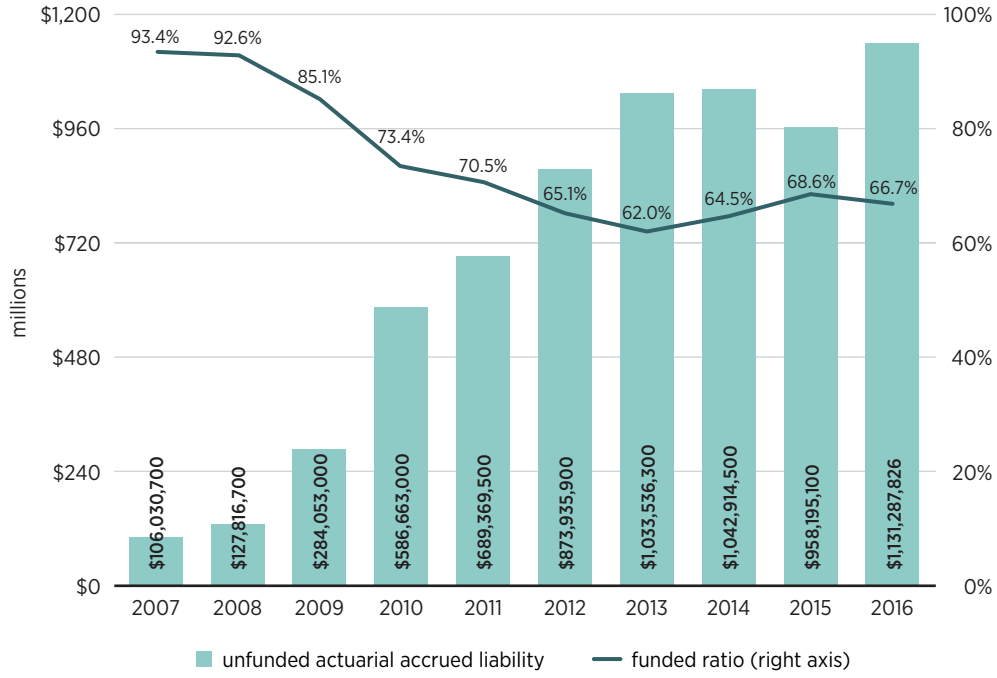
North Dakota Retirement Fund for Job Service Employees. The Retirement Fund for Job Service Employees has maintained a funded ratio above 100 percent over the past decade. In fact, the health of this fund has been steadily improving—climbing to 132 percent in 2016 (see figure 57). It is the best-performing retirement fund within the state pension system. Given the performance and structure of this fund, there is no reason for lawmakers to

FIGURE 55. NORTH DAKOTA PUBLIC EMPLOYEE RETIREMENT FUND ASSETS AND LIABILITIES



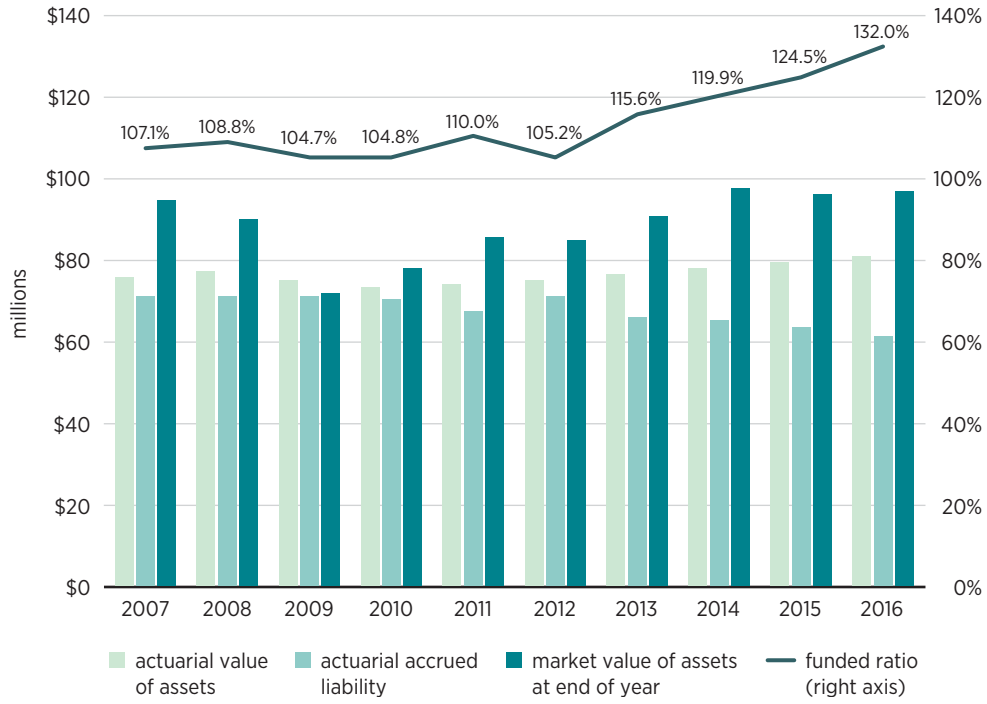
Source: North Dakota Public Employees Retirement System, *Actuarial Valuation Report as of July 1, 2016.* Prepared by Gabriel Roeder Smith & Company at the request of the state of North Dakota.

FIGURE 56. NORTH DAKOTA PUBLIC EMPLOYEE RETIREMENT FUND, UNFUNDED ACTUARIAL ACCRUED LIABILITY



Source: North Dakota Public Employees Retirement System, *Actuarial Valuation Report as of July 1, 2016.* Prepared by Gabriel Roeder Smith & Company at the request of the state of North Dakota.

FIGURE 57. NORTH DAKOTA RETIREMENT FUND FOR JOB SERVICE EMPLOYEES, ASSETS AND LIABILITIES

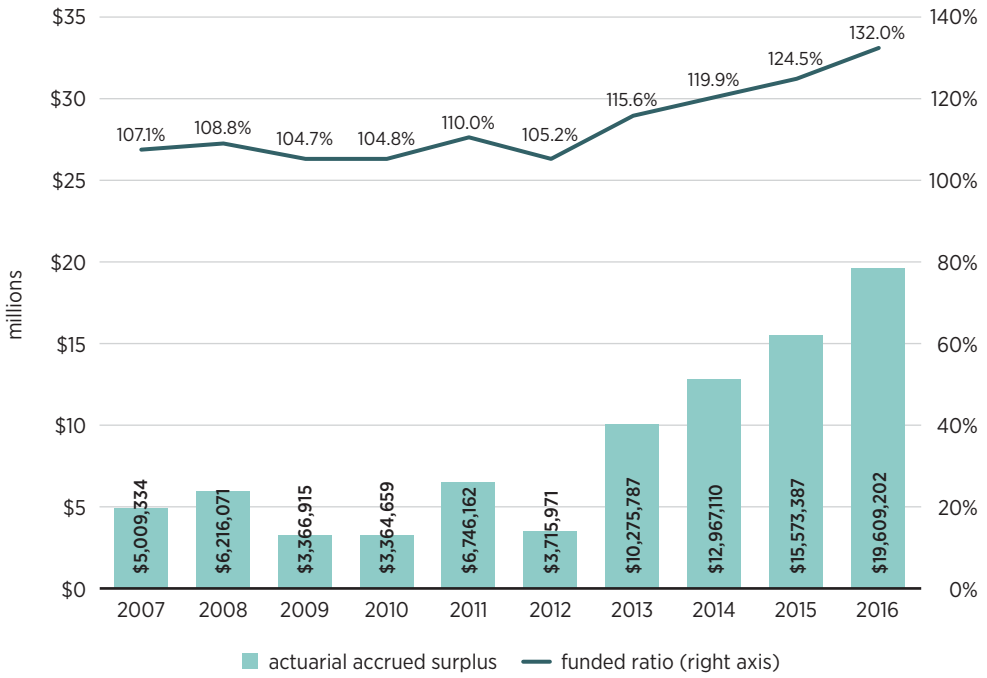


Source: *Retirement Plan for Employees of Job Service North Dakota: Actuarial Valuation Report as of July 1, 2016.* Prepared by Gabriel Roeder Smith & Company at the request of the state of North Dakota.

be concerned about its fiscal health. This plan is actually running a surplus with actuarial asset values outweighing actuarial accrued liability (see figure 57 and figure 58). The superior performance of this fund can be attributed to falling accrued liabilities. This fund was grandfathered in, meaning only those who participated in the fund before October 1, 1980, are eligible for the benefits of the fund. Without the addition of new employees, accrued liabilities should continue to fall until this fund is terminated.

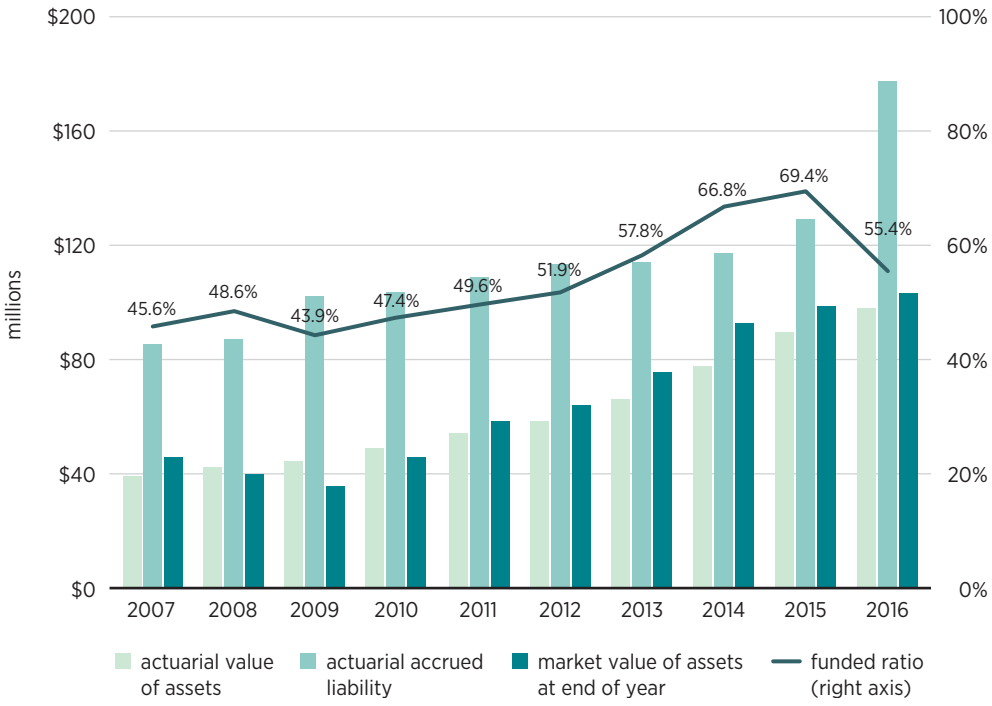
North Dakota Retiree Health Insurance Fund. The Retiree Health Insurance Fund is administered by the PERS Board with the goal of ensuring that public employees can maintain quality, affordable healthcare after retirement. This fund has the worst performance and is therefore the largest concern for fiscal health. The accrued liabilities outgrew accrued assets, suppressing the funded ratio to 43.9 percent in 2009. The fund peaked at 69.4 percent in 2015 and is currently at 55.4 percent (see figure 59). Using the funded ratio as a measure of fiscal health,

FIGURE 58. NORTH DAKOTA RETIREMENT FUND FOR JOB SERVICE EMPLOYEES, UNFUNDED ACTUARIAL ACCRUED LIABILITY



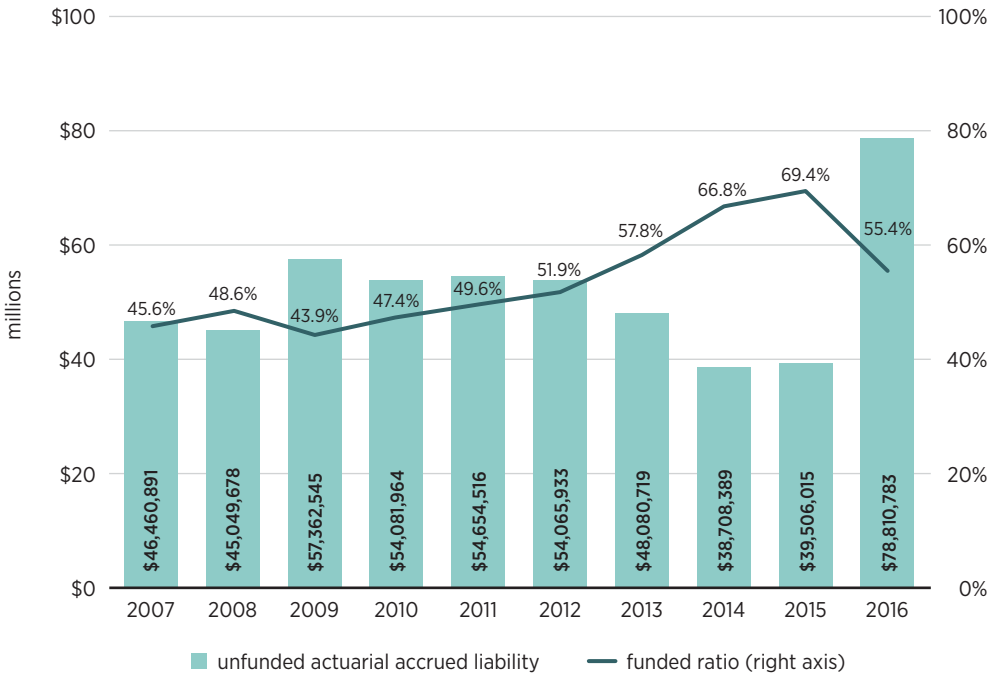
Source: *Retirement Plan for Employees of Job Service North Dakota: Actuarial Valuation Report as of July 1, 2016.* Prepared by Gabriel Roeder Smith & Company at the request of the state of North Dakota.

FIGURE 59. NORTH DAKOTA RETIREE HEALTH INSURANCE FUND ASSETS AND LIABILITIES



Source: North Dakota Retiree Health Insurance Credit Fund, *Actuarial Valuation Report as of July 1, 2016.* Prepared by Gabriel Roeder Smith & Company at the request of the state of North Dakota.

FIGURE 60. NORTH DAKOTA RETIREE HEALTH INSURANCE FUND, UNFUNDED ACTUARIAL ACCRUED LIABILITY



Source: North Dakota Retiree Health Insurance Credit Fund, *Actuarial Valuation Report as of July 1, 2016*. Prepared by Gabriel Roeder Smith & Company at the request of the state of North Dakota.

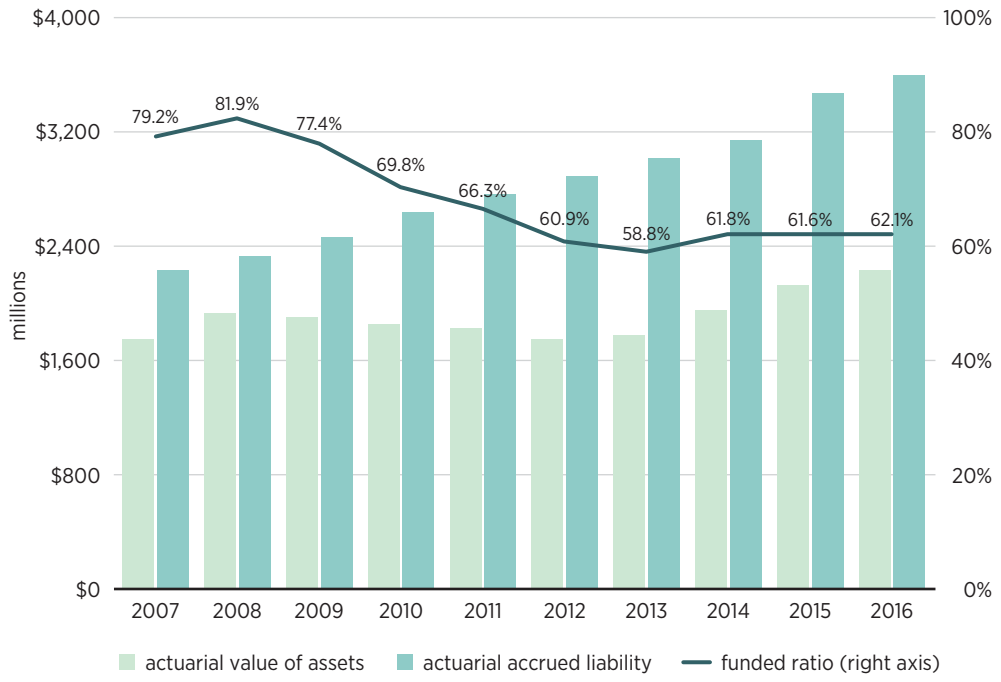
this fund has an average funded ratio of 53.6 percent, which is less than half of the 100 percent ratio needed to meet fiscal obligations.

Figure 60 shows the relationship between the unfunded ratio and the actuarial accrued liability. As the funded ratio increased from 2009 to 2015, the spread between the actuarial value of assets and actuarial accrued liability shrank in response.

North Dakota Teachers' Retirement Fund. The TFFR was established in 1913, making it one of the oldest pension funds in the country. This fund is the only one managed by the TFFR Board instead of the PERS Board. In recent years, the fund's accrued liabilities have outpaced the value of its assets. The funding ratio has consistently decreased, starting at 79.2 percent in 2007 and falling to a low of 58.8 percent in 2013 before recovering to 62.1 percent in 2016 (see figure 61).

The TFFR is one of the state's largest funds, and as a result, it has manifested the most unfunded liabilities. This fund has the ability to add billions in

FIGURE 61. NORTH DAKOTA TEACHERS' RETIREMENT FUND ASSETS AND LIABILITIES



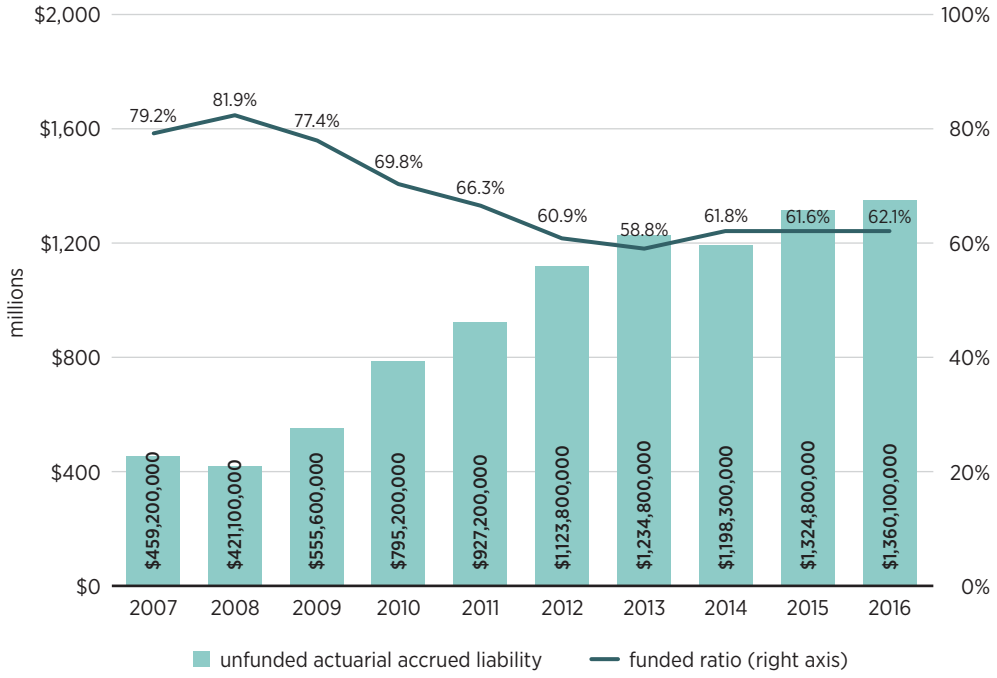
Source: North Dakota Retirement and Investment Office, Comprehensive Annual Financial Report (CAFR), June 30, 2016.

unfunded pension liabilities in the future; in fact, the TFFR has already amassed $1.36 billion in actuarial accrued liability (see figure 62). Although the funded ratio has stabilized, it remains too low to meet future obligations.

Fund Totals. Figure 63 displays the aggregate of all five funds. The North Dakota pension system is significantly underfunded and remains below the desirable funded ratio of 100 percent. Actuarial accrued liabilities as a whole have outpaced the actuarial value of assets throughout most of the past decade. This is a trend that is unsustainable and risks the future fiscal health of the system. Overall, unfunded actuarial accrued pension liabilities grew by 422 percent from 2007 to 2016, rising from $610 million to over $2.5 billion. Figure 64 shows the pension system's potential to become a runaway train if left unchecked.

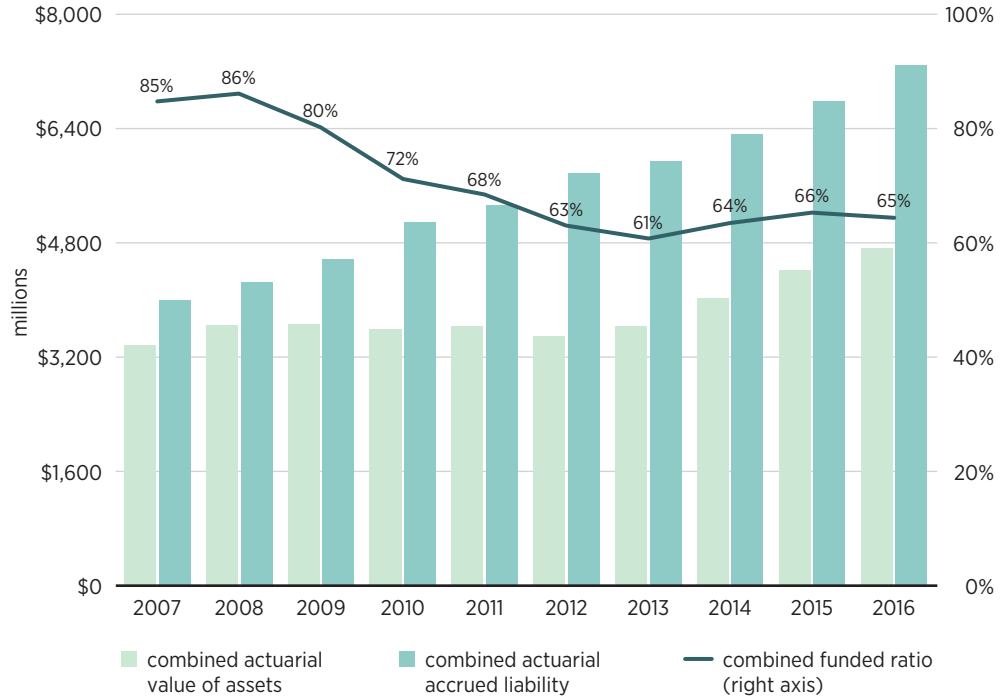
Table 10 shows that North Dakota has consistently failed to make the ARCs for its largest funds. The table shows the percentage of the ARC made for the corresponding year. For example, North Dakota paid 74 percent of the actuarially estimated ARC in 2004. Over the past 15 years, the state has funded an

FIGURE 62. NORTH DAKOTA TEACHERS' RETIREMENT FUND, UNFUNDED ACTUARIAL ACCRUED LIABILITY



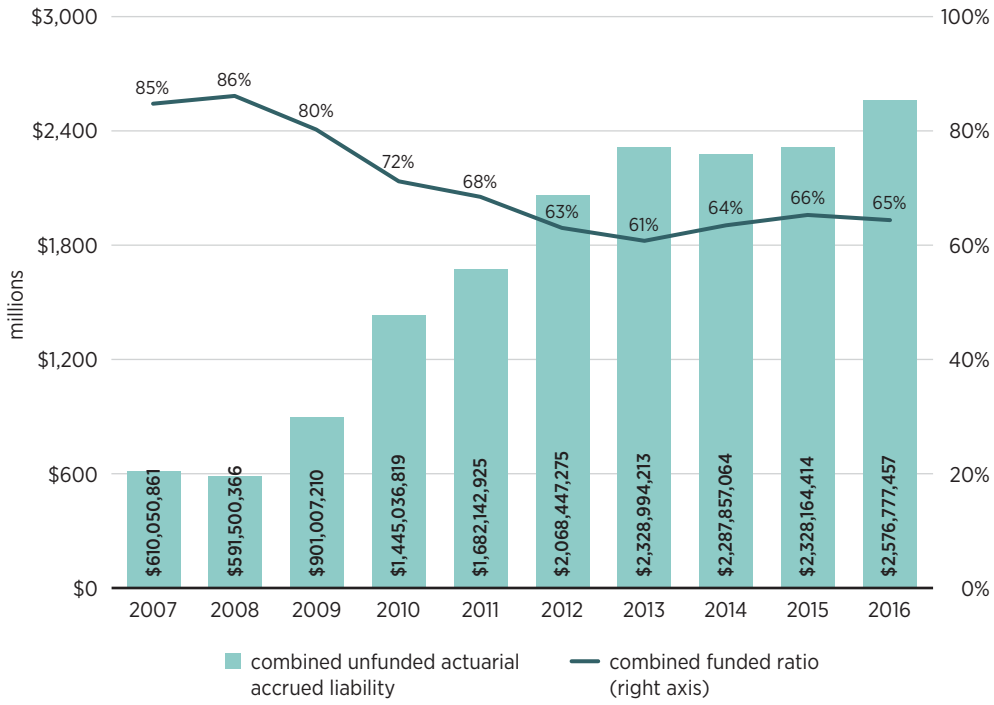
Source: North Dakota Retirement and Investment Office, Comprehensive Annual Financial Report (CAFR), June 30, 2016.

FIGURE 63. COMBINED STATE-ADMINISTERED RETIREMENT FUNDS, ASSETS AND LIABILITIES



Sources: Chart calculated using the aggregate data from North Dakota Public Employees Retirement System, *Actuarial Valuation Report as of July 1, 2016; Retirement Plan for Employees of Job Service North Dakota: Actuarial Valuation Report as of July 1, 2016;* North Dakota Retiree Health Insurance Credit Fund, *Actuarial Valuation Report as of July 1, 2016;* and North Dakota Retirement and Investment Office, Comprehensive Annual Financial Report, June 30, 2016.

FIGURE 64. COMBINED STATE-ADMINISTERED RETIREMENT FUNDS, UNFUNDED ACTUARIAL ACCRUED LIABILITY



Sources: Chart calculated using the aggregate data from North Dakota Public Employees Retirement System, *Actuarial Valuation Report as of July 1, 2016; Retirement Plan for Employees of Job Service North Dakota: Actuarial Valuation Report as of July 1, 2016;* North Dakota Retiree Health Insurance Credit Fund, *Actuarial Valuation Report as of July 1, 2016;* and North Dakota Retirement and Investment Office, Comprehensive Annual Financial Report, June 30, 2016.

average of 65 percent of the ARC for the PERS. In addition, the state's contributions to the TFFR have also fallen short, averaging 86 percent from 2002 to 2016. By failing to make the required contributions to meet future obligations, North Dakota is driving down the funded ratio and the future stability of the system. Additionally, budget surpluses during the oil boom had no visible impact on the state's contributions, which indicates a general unwillingness by lawmakers to meet the ARC.

Currently, pension expenditures make up less than 1 percent of state spending. However, the growth in unfunded pension liabilities warrants attention because of its potential to become a future budgetary restraint. Because of the state's dependence on commodity pricing, lawmakers should exercise fiscal responsibility today to better serve future citizens of the state. This would diminish the risk of having to allocate additional funds to the pension system during

TABLE 10. SCHEDULE OF EMPLOYER CONTRIBUTIONS (PERCENTAGE OF ARC FUNDED) FOR NORTH DAKOTA'S LARGEST FUNDS ($1 BILLION+)

Year	Public Employees Retirement System	North Dakota Teachers Retirement
2002	100%	100%
2003	93%	100%
2004	74%	87%
2005	65%	68%
2006	69%	64%
2007	61%	63%
2008	70%	76%
2009	69%	89%
2010	56%	77%
2011	39%	68%
2012	42%	66%
2013	50%	113%
2014	57%	105%
2015	66%	110%
2016	62%	98%
Avg.	65%	86%

Sources: Table calculated using data from the North Dakota Public Employees Retirement System Comprehensive Annual Financial Reports 2002–2016; North Dakota Public Employees Retirement System, *Actuarial Valuation Report as of July 1, 2016*; North Dakota Retirement and Investment Office, Comprehensive Annual Financial Report (CAFR), June 30, 2002–2016.

years of unexpected revenue shortfalls. Although the pension system makes up a relatively small portion of current state expenditures, as the absolute value of the unfunded liabilities grows, lawmakers will be forced to reallocate tax dollars to stabilize the funded ratio. This could mean a loss of state funding for other critical areas in the budget. To avoid making future cuts to other programs or raising taxes, the state should address this issue before it becomes more difficult to control. A simple way to avoid the liabilities associated with pension systems is to move to a defined contribution plan.

Unallocated Funds

North Dakota has tried to address its dependence on commodities through a system of unallocated funds. The state manages over 41 funds with purposes ranging from small, temporary funds for maintenance and facility upgrades to employee pensions, environmental remediation for oil and coal operations, and

funds for education and infrastructure. Only six funds are constitutionally protected. The other funds and their values can be altered by the state legislature (North Dakota State Treasurer 2017). The two funds with the greatest impact on North Dakota's fiscal future are the Budget Stabilization Fund (a rainy day fund) and the Legacy Fund (a sovereign wealth fund).

Budget Stabilization Fund. The primary fund tasked with ensuring state fiscal stability is the Budget Stabilization Fund. In 1987, Chapter 54-27.2 of the *North Dakota Century Code* established the Budget Stabilization Fund to address unexpected revenue shortfalls in the state's budget (North Dakota State Treasurer 2017). The law gives the North Dakota SIB management authority over the fund.

North Dakota is not the only state to use this type of fund for fiscal stability. States have been increasingly employing these stabilization funds to smooth revenue volatility since the 1980s (Gold 1981, 1984). There is evidence that such funds are effective at mitigating the revenue volatility that comes with economic fluctuations (Levinson 1998).

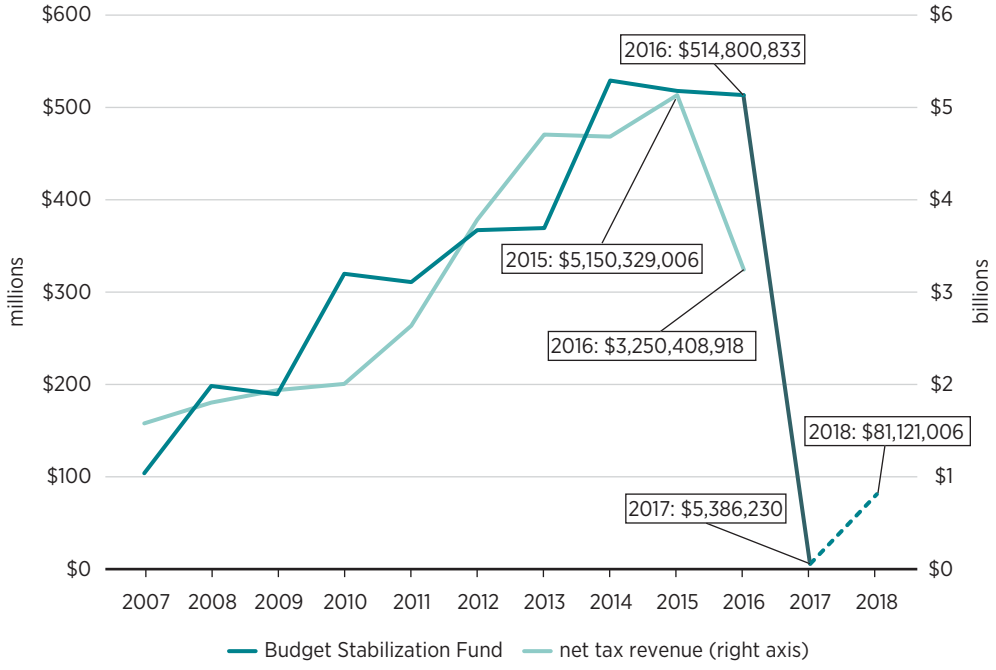
North Dakota's Budget Stabilization Fund acts like a savings account for the General Fund. Chapter 57-27.2-02 of the *North Dakota Century Code* states, "Any amount in the state general fund in excess of 65 million dollars at the end of any biennium, after deducting any amounts that would otherwise be transferred to the general fund . . . must be transferred by the state treasurer to the budget stabilization fund." This ensures that excess funds are reinvested and saved for future budget shortfalls.

The Budget Stabilization Fund caps investment earnings and fund deposits. In the event that the Budget Stabilization Fund exceeds the cap, excess funds must be deposited into the General Fund. Initially, the cap restricted the fund's growth to 15 percent of the biennial General Fund budget. This was later reduced to 5 percent in 1991, then raised to 10 percent in 2009. During the most recent legislative session, the cap was restored to 15 percent (North Dakota State Treasurer 2017). These changes demonstrate how lawmakers can adjust the fund over time.

The law also limits emergency transfers from the Budget Stabilization Fund. The governor can transfer funds only if revenues are projected to be at least 3 percent less than the budgeted allotment of the General Fund.[5] Additionally, the law requires the governor to receive legislative permission before making transfers of more than 3 percent. In other words, the governor is allowed to use Budget Stabilization Fund dollars only to plug small, unexpected revenue shortfalls.

5. *North Dakota Century Code* § 54-27.2-03

FIGURE 65. BUDGET STABILIZATION FUND (IN 2009$)



Sources: North Dakota's Comprehensive Annual Financial Report (CAFR), 2007–2016; North Dakota State Investment Board, *Investment Performance Summary,* March 31, 2017.

Figure 65 shows the inflation-adjusted performance of the Budget Stabilization Fund from 2007 to 2017. The fund experienced substantial growth from 2007 to 2014 as the oil boom created a favorable financial climate. However, the dramatic fall in state revenues after 2015 led to a projected shortfall. This unexpected collapse in revenues triggered the use of the Budget Stabilization Fund, which was reduced from $514.8 million in 2016 to $5.4 million in 2017; 99 percent of the fund was withdrawn to weather the crisis (Sharp 2016a, 2016b).

The collapse in oil revenue caused a budget shortfall of $1.07 billion (Sharp 2016a). To fulfill the constitutional requirement for a balanced budget, the governor was forced to deplete the Budget Stabilization Fund (Thompson 2017). Lawmakers have made contingent plans to replenish the Budget Stabilization Fund with a $75 million transfer from forecasted oil and gas tax revenues (North Dakota Office of Management and Budget 2017a).

Unfortunately, the Budget Stabilization Fund was unable to make up the entire revenue shortfall. Even after depleting the emergency fund, the state needed $224,731,606 (Sharp 2016b). The state was forced to make deep spending cuts and reallocate funds. The recent budget crisis has brought into question the ability of the Budget Stabilization Fund to fulfill its stated purpose.

Research has shown that having a budget stabilization fund is not enough to offset volatile revenue swings. The effectiveness of these funds is contingent on the rules that govern them and the actions of those who manage them (Hou 2004; Wagner 2004; Wagner and Elder 2005). State legislators often use statutorily created budget stabilization funds to circumvent tax and expenditure limits. The changes made to North Dakota's Budget Stabilization Fund since its establishment may suggest such political wrangling. In contrast, constitutionally imposed budget stabilization funds tend to represent an earnest desire by lawmakers to counter cyclical dependence in the budget (Hou 2004; Wagner and Sobel 2006). Putting the terms of use for the Budget Stabilization Fund into the state constitution would make it difficult for lawmakers to weaken the fund in the future.

A recent study calculated the appropriate cap for a rainy day fund in each state based on historical data through 2012. This study found that North Dakota would need a cap of 9.2 percent to survive most predictable revenue shortfalls (Zhao 2014). However, the state's most recent economic downturn and the diminishing of the Budget Stabilization Fund suggest that a higher cap is likely needed. Other studies support the implementation of a high cap (Government Finance Officers Association 2015; McNichol, Palacios, and Johnson 2014; Wagner and Elder 2007). Researchers Wagner and Elder found "that the typical state can expect a revenue shortfall equal to 13 to 16 percent of revenue during a normal downturn" (2007, 27). The Center on Budget and Policy Priorities suggests a cap of 15 percent (McNichol and Boadi 2011), which is supported by experts at the Tax Foundation (Henchman 2013).

North Dakota should consider adding the Budget Stabilization Fund to the state constitution. This would eliminate the possibility of future manipulations of the fund for short-term political gain. Additionally, the fund's cap should be permanently set at 15 percent of General Fund appropriations. This would help secure a larger balance for dealing with future shortfalls.

Several studies have found the implementation of a Tax and Expenditure Limit (TEL) to be an effective tool in preventing state expenditures from soaring out of control (Mitchell 2010). Research shows that TELs are most effective when they are codified in the constitution and limit expenditure growth using a formula such as the population growth rate plus inflation (Fatás and Mihov 2006; Mitchell and Tuszynski 2012). Other studies further demonstrated the effectiveness of these limits when used in conjunction with a budget stabilizing fund (Merrifield and Monson 2011; Merrifield and Poulson 2014; Schunk and Woodward 2005).

During the boom, expenses increased alongside revenue. This created an expectation and reliance on oil funds that failed to materialize (Hageman 2017a; Nowatzki 2016; Perez 2017; Tate 2017). By establishing a TEL, lawmakers can avoid painful cuts in the future, ensure that state institutions and citizens are protected from a loss of services, strengthen the Budget Stabilization Fund, and limit the boom-and-bust effect of commodity pricing (Davis et al. 2001).

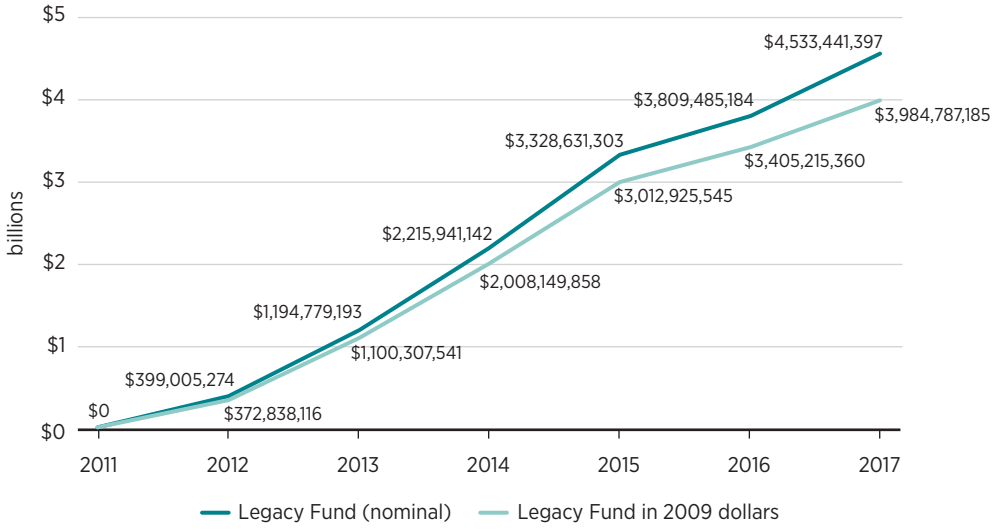
Legacy Fund. North Dakota recognized the limitations of deriving long-term revenue from finite resources such as oil. In 2009, the legislative assembly passed H.R. 3054. This constitutional amendment used proceeds from oil and natural gas taxes to fund a perpetual source of revenue. In 2010, North Dakota voters approved the measure on the statewide general election ballot. North Dakota became the eighth state to adopt a sovereign wealth fund, known as the Legacy Fund (Alhashel 2015; North Dakota State Treasurer 2017).

Sovereign wealth funds can best be described as "state-owned investment vehicles that invest globally in various types of assets ranging from financial to real to alternative assets" (Alhashel 2015, 2). According to Article X, Section 26 of the state constitution, 30 percent of the total revenue derived from oil and gas production must be transferred into the Legacy Fund. The amendment also states that there can be no expenditures from the fund before June 30, 2017, any expenditure of principal requires a two-thirds vote in each legislative chamber, and any principal expenditure is limited to 15 percent (North Dakota State Treasurer 2017).

Similar to North Dakota's public pension system, the Legacy Fund is managed by the SIB. The fund's investment policy is set by an advisory board and then delegated to professional money managers to achieve investment objectives. Oil and gas tax revenues began flowing into the Legacy Fund shortly after June 30, 2011 (North Dakota Secretary of State 2010). Since then, the fund has grown substantially. During the height of the oil boom (2012–2013), the fund grew from an inflation-adjusted value of $372.8 million to $1.1 billion, charting an astonishing growth rate of 195 percent. However, fund growth has tapered with the collapse in oil prices, as shown in figure 66.

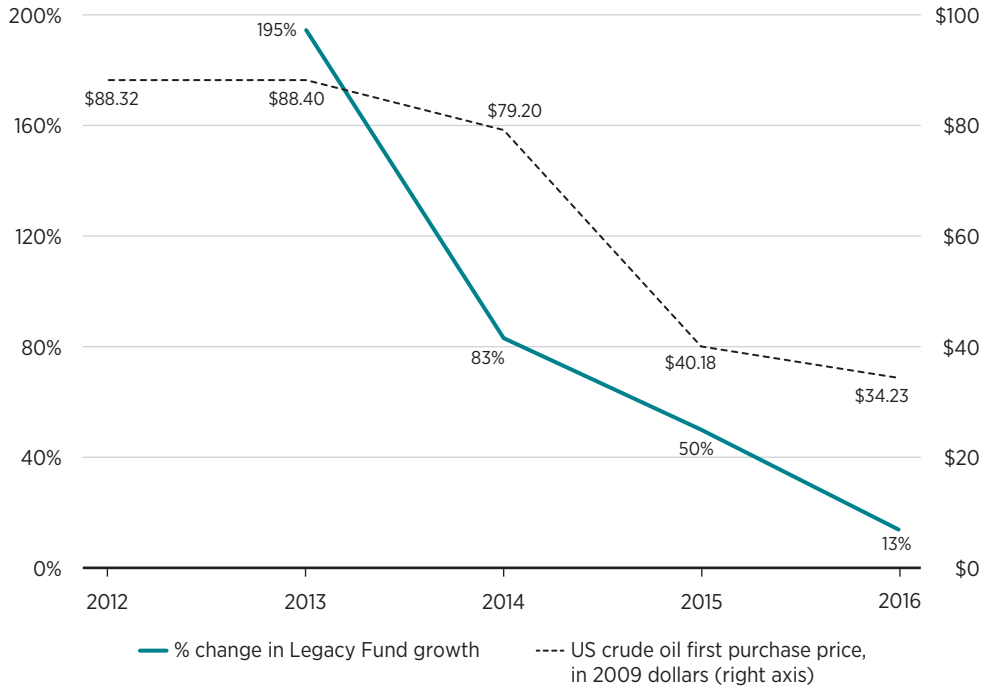
Figure 67 shows the inflation-adjusted US first purchase price of oil in relation to the percentage change in the growth of the Legacy Fund. Although the fund is invested across a range of diverse vehicles, its growth is primarily derived from oil and gas taxes. High oil prices in 2012 and 2013 helped push the fund to its 195 percent growth rate; however, as prices fell, growth declined to 13 percent by 2016.

FIGURE 66. LEGACY FUND



Sources: North Dakota's Comprehensive Annual Financial Report (CAFR), 2012–2016; North Dakota State Investment Board, *Investment Performance Summary,* March 31, 2017.

FIGURE 67. FUND GROWTH AND OIL PRICES



Sources: North Dakota's Comprehensive Annual Financial Report (CAFR), 2012–2016; North Dakota State Investment Board, *Investment Performance Summary,* March 31, 2017; US Energy Information Administration, "U.S. Crude Oil First Purchase Price: Annual," inflation-adjusted dollars per barrel.

The Legacy Fund has the potential to expand North Dakota's budgetary flexibility. Currently, there is no official use for Legacy Fund investment earnings, and state law allows investment earnings to be transferred from the Legacy Fund into the General Fund. How the money will be spent is at the discretion of the state legislature (North Dakota State Treasurer 2017).

Possible uses for the Legacy Fund's earnings have become an attractive topic of conversation throughout the state. In 2013, the Great Plains Institute assembled community stakeholders to form the Legacy Fund Initiative. The group released a set of recommendations on how best to spend the fund's earnings (Crabtree and Lahlum 2013).

The Legacy Fund Initiative set three primary goals for the fund. The first goal advocates using the fund as a "resource of last resort in times of exceptional need" (Crabtree and Lahlum 2013, 3). In this respect, the Legacy Fund would serve as a backup to the Budget Stabilization Fund. The second goal calls for the fund to "provide for a significant portion of the state's future needs by compensating for the reduction in revenues once oil and gas production begins to decline" (3). The third goal directs earnings to be spent on "bold, visionary, and transformative actions that build assets and enhance quality of life for North Dakota citizens today and in the future" (3).

Each of the stated goals is admirable. However, the ability of the Legacy Fund to meet the second and third goals will depend on the willingness of lawmakers to control expenditures. If the state fails to control spending, the second and third goals become much more difficult to achieve. With the state's historical revenue volatility, failing to control for spending would essentially turn the Legacy Fund into a second budget stabilization fund (Davis et al. 2001). Erratic state finances could easily create a situation in which the Legacy Fund earnings are used to plug budgetary shortfalls to try to maintain boom-level spending. This multipurpose use of the fund is contrary to research recommendations that stabilization funds should be limited to managing cyclical shortfalls in revenue (Hou 2004).

The state already has a budget stabilization fund and does not need a second one. The Legacy Fund offers great hope for lawmakers to lower the overall tax burden on citizens and businesses without sacrificing the quality of public services. The success of the Legacy Fund will be contingent on the state's ability to maintain reasonable expenditure expectations. The "bust" in the boom-and-bust cycles of commodity-driven economies can be curbed with prudent fiscal management and economic diversification (Putz, Finken, and Goreham 2011; Weinthal and Luong 2006). The purpose of the Legacy Fund needs to be clearly stated and codified; its use should not be targeted for budget stabilization.

CONCLUSION

Based on several key economic indicators, North Dakota is in good fiscal health. The state's real GDP, unemployment rate, and median household income are among the best in the region and the nation. Unemployment has not exceeded 6 percent in over 30 years and peaked at only 4.3 percent during the 2008 recession. While North Dakota struggles with a labor shortage that has the potential to slow growth, this problem is the result of the state's relative economic prosperity. Additionally, real median income has remained consistently above the national average since 2009. Overall, our analysis found many encouraging economic conditions in North Dakota.

However, the state's reliance on commodity prices makes it susceptible to volatile boom-and-bust cycles. This can be seen in both the direct and indirect effects oil prices have had on state revenue over the past decade. During the boom, growth abounded and spending increased. When prices fell, the bust led to deep spending cuts and depletion of the Budget Stabilization Fund. These cycles point to the need for greater economic diversification. Moreover, other spending issues have the potential to cause problems in the future if left unaddressed.

Policy Recommendations

We have outlined policy recommendations in three areas of fiscal health: revenues, expenditures, and state funds. Addressing these concerns will help improve and preserve state finances for the future.

Revenue

1. **Income Taxes:** North Dakota has one of the lowest top marginal income tax rates in the region. While eliminating the state income tax can remain a long-term goal for North Dakota, removing a steady stream of income at this time could damage the state's revenue stability. In order to attract and retain new businesses and workers, the state should maintain its commitment to low income taxes and resist the temptation to raise them to make up for revenue shortfalls.
2. **Property Taxes:** North Dakota should work to increase the salience of its property taxes. That is, it should make sure the property tax burden is visible and easily calculated and understood by the average citizen. Property taxes are disliked and distrusted by many, but economic theory shows they are one of the most stable forms of revenue collection. Moreover, the

state should avoid offering property tax relief programs that create fiscal illusions and increase local spending.

Expenditure

1. **Education Spending:** North Dakota's property tax relief programs have primarily been targeted at reducing the burden of financing local K–12 education. North Dakota currently spends more per pupil than its regional peers, but this increased spending does not show better student outcomes. This suggests there is room to increase the efficiency of education spending. Some policy proposals to improve efficiency include passing a constitutional provision to allow charter schools, implementing a school voucher program, and shifting property taxes back to local governments. Efficiency should be measured in terms of dollars spent and student outcomes to ensure taxpayers are receiving a return on the state's large investment in education.
2. **Infrastructure Spending:** North Dakota's large area coupled with its rural population and dominant industries creates unique infrastructure needs. The state has to balance the needs of the oil and agricultural industries without overspending in areas with limited growth. This is best accomplished through the use of strategic, targeted funding.
3. **Pension Funds**: North Dakota has consistently underfunded its pension system. The state has failed to make the ARCs for over a decade. While the state has enough money to meet its short-term obligations, chronic underfunding threatens the long-term stability of the funds. North Dakota should work toward meeting 100 percent of the ARCs to raise the funded ratio.

State Funds

4. **Budget Stabilization Fund:** North Dakota's Budget Stabilization Fund was depleted during the recent budget crisis, yet deep spending cuts remained unavoidable. North Dakota should pass a constitutional provision to set the fund's cap at the recommended 15 percent. This would prevent legislators from being able to manipulate the value of the fund. In addition, North Dakota should codify a TEL and restrain expenditure growth using a formula such as the population growth rate plus inflation. This would strengthen the effectiveness of the Budget Stabilization Fund and reduce the possibility for painful spending cuts or loss of services in the future.
5. **Legacy Fund**: The Legacy Fund is a sovereign wealth fund created using oil and natural gas tax revenues. As of 2017, the fund contained $4.5 billion.

The Legacy Fund's ability to provide for the state's future and support bold initiatives will depend on lawmakers' willingness to control spending. While the fund has the potential to expand North Dakota's budgetary flexibility, its purpose needs to be clearly stated and targeted at specific goals; it should not be used as a second stabilization fund.

Final Thoughts

Overall, North Dakota's fiscal issues are few and manageable. By taking proactive steps to monitor educational efficiency, improve pension funding, and bolster its unallocated funds, the state can better ensure future economic stability. However, until the state diversifies its economy, North Dakota's finances will be susceptible to volatile boom-and-bust cycles. The state has taken some steps to mitigate these effects, but they are not easily addressed through public policy. Instead, the state should continue to support the private sector's efforts to attract and grow new industries while also practicing prudent fiscal management for all taxpayers.

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