



Caesar Rodney Institute

Moving Delaware Out of the Economic Doldrums

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Executive Summary

Why do we care about a growing economy? The basic answer is faster growing economies lead to higher incomes making everyone a little richer, especially reducing poverty rates and unemployment rates. The Delaware economy actually fell a half percent a year between 2007 and 2015, and ranks 43rd in growth. Real Median Household Income is down an astounding \$12,000 a year from 2000 to 2016, leaving Delaware dead last among the fifty states for that time period when energy and regulatory policies began to shift in the state. Delaware placed 49th in employment growth in 2017. States' with faster growing economies also recovered from the recession faster, in fact five of the ten fastest growing states did not experience a recession.

Economic growth is measured most accurately as the sum total of all economic activity divided by the population and adjusted for inflation, or Per Capita Real Chained Gross Domestic Product (GDP). This study compares economic growth in the fifty states to a wide range of variables including trends seen in the Mercatus Center publication, "Freedom in the Fifty States", and CNBC annual publication, "Best States for Business" to tweak out ideas to increase economic growth in Delaware. In most cases comparisons are between the pre-recession year 2007, and 2015, the most recently available detailed economic data from the U.S Bureau of Economic Analysis. In some cases more recent data is available for comparison.

We don't need growth for growth's sake. A bigger economy, or a faster growing population doesn't necessarily lead to higher incomes. The fastest growing states do offer examples of paths to higher economic growth coupled with income grow. Those states reconfirm a direct economic impact from, say manufacturing increases, will lead to a quadrupling effect from indirect, and induced responses to that direct growth. The fastest growing states also had the best rankings in the Mercatus and CNBC ratings.

There are apparent trends from some factors, such as higher labor participation rates that occur as more potential employees enter the work force, lower violent crime rates, lower energy prices, and higher education ranking. States that have recently given employees the freedom to not join a union or to pay union dues, also known as Right to Work, have seen a jump in economic growth.

Delaware is primed for an industrial renaissance, but has barriers that can be addressed by the legislature. Delaware has the highest corporate income tax rates in the country when combined with our Gross Receipts Tax that must be paid even when a company loses money. The Tax Foundation ranks Delaware 50th for corporate income tax rates. We lack Right to Work (RTW) which sends a signal to companies Delaware is not a business friendly state.

The state government has limited capital for infrastructure investment, such as roads and schools. High industrial electric and natural gas rates have contributed to the loss of half the energy intense manufacturing in the state that has led directly to our lowered Median Household Income. Industrial electric rates have averaged 26 percent above the national average from 2003

to 2015. Industrial natural gas prices are extraordinarily high given our proximity to low cost gas produced in neighboring Pennsylvania where prices are half of Delaware's. We can do better:

- The Gross Receipts Tax can be repealed with the lost revenue made up by higher tax revenue generated by economic growth.
- Right to work can be implemented and has led to job growth including union job growth in other states. The primary down side is unions will have to work harder to convince employees joining the union has benefits. No state in the northeast has adopted RTW potentially providing Delaware with a distinct competitive advantage.
- Changing the Prevailing Wage law to use the more robust federal labor cost survey rather than the state labor cost survey will lower school and highway construction costs by up to 30 percent thus extending the amount of infrastructure that can be built.
- Ending Delaware's participation in the Regional Greenhouse Gas Initiative carbon dioxide tax program, and ending meddling in the electric generation mix by freezing the requirement for more expensive, unreliable wind and solar power will lower electric cost directly, and indirectly by encouraging more in-state electric generation.
- The Delaware Public Service Commission can be petitioned to open a docket to determine how to reduce natural gas cost in the state.

Improving education in Delaware is a big need, and a driver of economic development. Frankly, we know how to improve education in Delaware. For over two decades we have experimented with charter schools, and some of these have had amazing results. The formula that seems to work is hiring and training a good principal with hiring and firing authority and minimal interference from the school board. The principal is responsible for establishing a culture of success which permeates every facet of a school's operation including selection of curriculum, demeanor of students, professionalism of teachers, participation of parents, and expectations of everyone.

In addition, Delaware also has the potential to eventually participate in our national oil and gas renaissance that lifted the economy of six of the eleven fastest growing states including our neighbor, Pennsylvania. Delaware bans drilling in the Delaware River basin, and fights offshore drilling even 50 miles out to sea. The natural gas revolution is almost entirely responsible for almost doubling the total US CO₂ emissions reductions of the rest of the developed world, and in meeting an Obama era electric grid reduction target of 28% by 2025 in 2017.

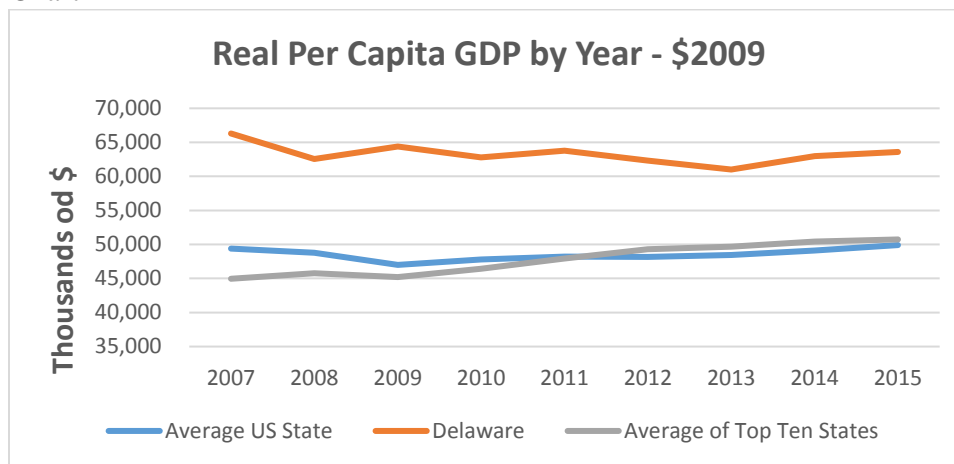
The U.S. Department of Interior offered a record offshore drilling leasing opportunity in the Gulf of Mexico in early 2018. Only 2 percent of the leases had a bid, and the winning leases were adjacent to existing infrastructure. The high cost of offshore drilling favors onshore drilling at this time. However, exploration is needed to determine the potential for future production, and Delaware should encourage that effort. Meanwhile, we anticipate no drilling off the coast of Delaware in the foreseeable future. However, the U.S. Department of Interior is considering allowing coastal states to participate in leasing and production royalties. Delaware's

state government should be encouraging this change to provide new tax revenue should the federal government approve offshore drilling.

State of the Delaware Economy

Delaware is experiencing a decline in per capita Real GDP growth falling an average one half percent a year between 2007 and 2015. Nationally, growth is essentially flat at 0.1 percent a year. The top ten states in the 2007 to 2015 time period are growing by 1.5% a year (Chart 1). Delaware ranked in 43rd place in per capita Real GDP growth.

Chart 1



Source: U.S. Bureau of Economic Analysis

The period covered starts in pre-recession 2007. Each slower growing quintile took longer to recover from the recession with the faster growing states never seeing a decline in Real GDP, and the slowest growing states still not fully recovered by 2015 (Table 1). It took Delaware until 2014 to recover.

Table 1: Real Per Capita GDP growth rate quintiles 2007 to 2015

Quintile	Average Growth Rate	Year Recovered to 2007 GDP
1 st	1.5%	No Decline
2 nd	0.5%	2011
3 rd	0.2%	2014
4 th	-0.2%	Not Recovered by 2015
5 th	-1.0%	Not Recovered by 2015
DE	-0.5%	Not Recovered by 2015
US	0.1%	2015

Source: author calculation

There is a very high correlation (0.8), with 1 being perfect correlation, between per capita real GDP growth and real Personal Income growth rates. Delaware Personal Income only grew at a 2.5 percent rate compared to 3.3 percent nationally (Table 2), and ranked 45th in the nation. Of greater concern is the impact on Median Household Income where Delaware ranked 46th, and

income dropped by over \$5,000 a year, while nationally household incomes grew by almost \$1000 a year. The news gets worse. Delaware ranked 50th in Median Household Income between 2000 and 2016, with incomes dropping over \$12,000 a year, or \$1000 a month with the next worse state falling \$700 a month.

Nationally, Median Household Income was basically flat, but the top performing state saw income growth of \$950 a month, as reported by the U.S. Census Bureau from its Annual Current Population Survey, Social and Economic Supplements. From the same survey, Delaware ranked 19th in percent of people living below the poverty level at 11.3 percent compared to the national average of 13.1 percent. Delaware ranked 13th on the GINI Coefficient which measures how evenly income is spread between rich and poor with a lower index number suggesting more equality.

Table 2 Real Personal Income Growth by state by quintile 2007 to 2016

Quintile	Average Growth Rate
1 st	4.6%
2 nd	3.7%
3 rd	3.1%
4 th	2.8%
5 th	2.5%
DE	2.5%
US	3.3%

Source: U.S. Bureau of Labor Statistics

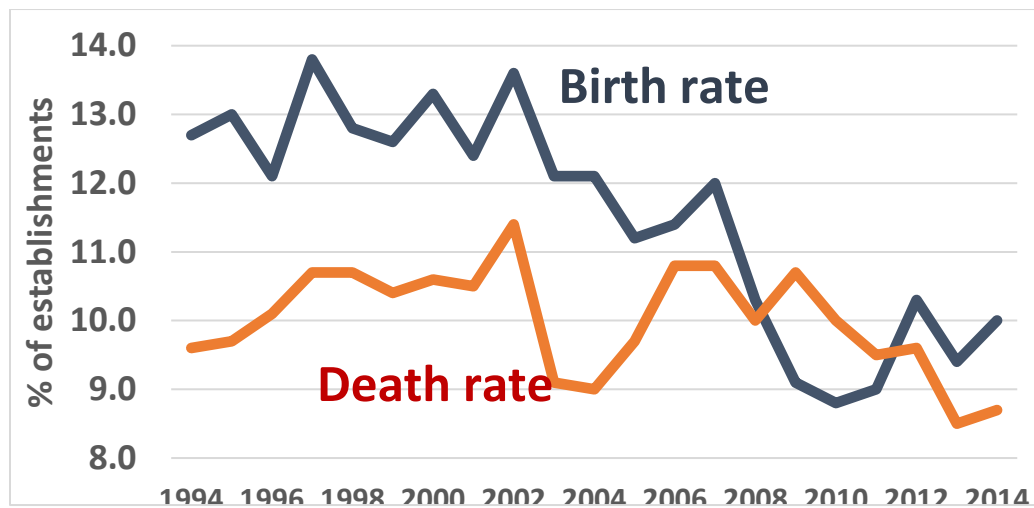
Delaware employment growth ranked 18th in the nation from 2007 to 2015, but fell 0.1 percent from December, 2016, to December, 2017, ranking 49th in the country. However, we rank 34th in our unemployment rate, and are one of only two states where the unemployment rate rose in the last few months from 4.1 percent to 4.5 percent.

Economists label the birth and death of business establishments in a geographic area “creative destruction.” The birth of new establishments allows new technologies to be introduced to the economy and for the economy to adapt to changing tastes and preferences. The death of establishments permits the economy to shed itself of businesses which are no longer productive or whose goods and services are no longer in demand.

Chart 2 below shows annual establishment births and deaths in Delaware as a percent of total business establishments. Two things jump out from the chart. First, following the 2007 recession the death rate of establishments in Delaware exceeded the birth rate for four years. The net effect was that the total number of business establishments in Delaware fell.

Second, over time the birth rate of establishments in Delaware has dropped substantially. New establishments on an annual basis have gone from almost 14% of all establishments down to 10%. By retarding the process of “creative destruction”, this drop in the formation of new business establishments causes a drag on Delaware economic growth.

Chart 2: Business Birth Rate vs. Business Death Rate



Source: U.S. Bureau of Census

Labor Practices

Personal Income grew slightly faster in states where employees are not forced to join a union or to pay union dues, or right to work states (RTW), at 31 percent versus 29 percent. Income grew slightly slower in states with no prevailing wage law at 28 percent versus 30 percent in states requiring workers be paid a higher calculated wage for government projects. CRI has estimated the cost of highway and school construction is 30 percent higher using state labor cost surveys as opposed to federal labor cost surveys, and may be adding \$100 million a year to state expenditures. Delaware does not have RTW, and relocation specialists direct potential new manufacturing facilities away from states without RTW.

There was little added continuing income advantage between 2007 and 2015 in RTW states from the first wave of adoptions that occurred in the nineteen forties. However contrary to union claims, having RTW certainly didn't hurt those states. There is evidence a recent wave of RTW adoption has paid off. Table 3 below shows a state by state impact on Median Household Income in four states that have adopted RTW since 2012, compared to Delaware, and the country as a whole. The average increase in Median Household Income for the four states was 7.2% while Delaware household income dropped 0.8% from 2015 to 2016. Had Delaware performed as well as these four states, household income would have increased \$4,211 in one just year. Note there is a pattern in the data showing greater income growth the longer ago the state adopted RTW, and private sector union membership is higher than Delaware. No state in the northeast has adopted RTW.

Table 3: Median Household Income, 2016\$

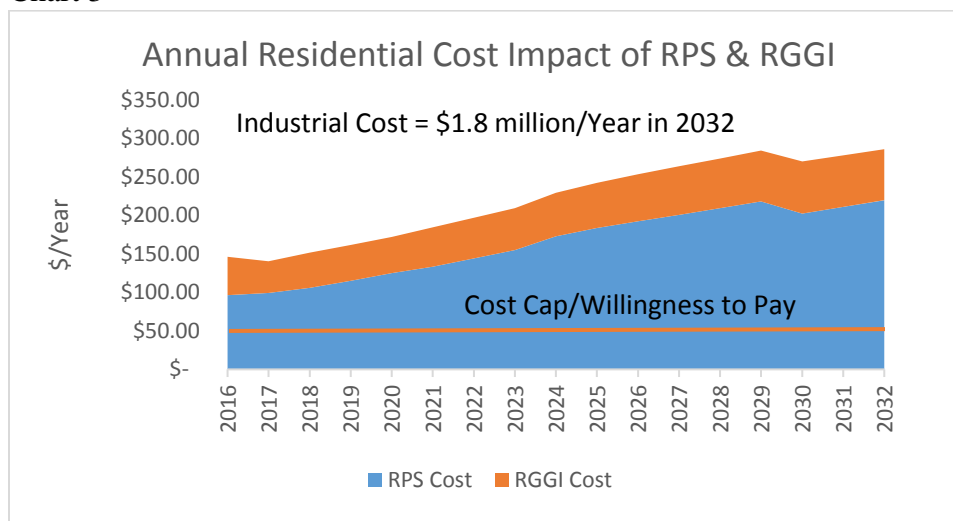
State	2016	2015	% Increase	RTW Start Date	% Private Sector Union
Indiana	\$56,094	\$52,640	7.6 %	2/2012	6.5 %
Michigan	\$57,091	\$54,888	9.0 %	12/2012	11.3 %
Kentucky	\$45,369	\$42,923	5.7 %	1/2015	8.0 %
Wisconsin	\$59,817	\$56,125	6.6 %	2/2015	6.7 %
Average	\$52,545	\$49,988	7.2 %		
Delaware	\$58,046	\$58,486	-0.8 %		6.1 %
United States	\$59,039	\$57,230	3.2 %		6.5%

Source: U. S. Census Annual Household Survey, Unionstats.com 2017 (Barry T. Hirsch and David A. Macpherson, "[Union Membership and Coverage Database from the Current Population Survey: Note](#)," *Industrial and Labor Relations Review*, Vol. 56, No. 2, January 2003, pp. 349-54. (in pdf)) Note: West Virginia and Kansas have adopted RTW so recently there has not been enough time to determine the impact on GDP growth, nationally 28 states have adopted RTW.

Energy Issues

Delaware has laid a heavy hand on the state's electric generation industry with mandatory rules for wind and solar power, carbon dioxide (CO₂) emission caps that require electric generators to buy costly emission allowances, and energy efficiency measures. While well intentioned, the rules have simply not worked to lower CO₂ emissions. However, the rules have raised electric rates, and will likely continue to raise them according to my analysis (see Chart 3 below). Chart 3 shows energy regulations are already adding about \$150 a year to residential bills, three times what customers say they are willing to pay. Mid-size industrial customers are paying about \$1 million a year. These costs could double by 2032.

Chart 3



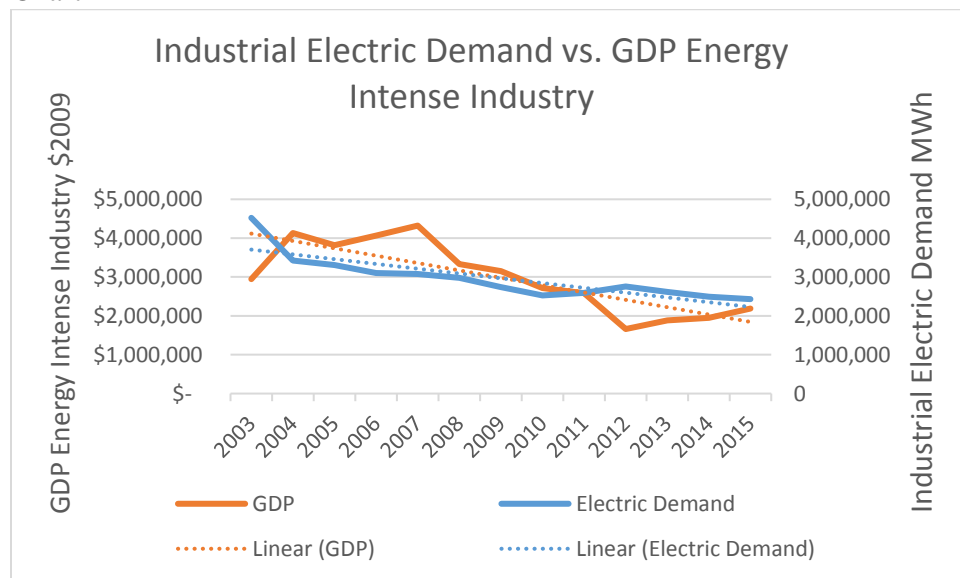
Sources: U.S. Energy Information Agency², RGGI, Inc⁹. University of Michigan Willingness to Pay Survey¹⁰

The U.S. Census reports in its annual Household Survey¹, Delaware inflation adjusted median household income has dropped from \$70,000 a year in 2000 to \$58,000 in 2016. Higher

industrial electric costs (26% average) contributed to cutting production, and industrial electric demand, in half from 2003 and 2015 from energy intensive manufacturing businesses such as chemicals, paper products, steel, autos, food processing, and oil refining (Chart 4). By comparison, national production in the same industries saw a 7 percent increase, while industrial electric demand fell only 3 percent most likely reflecting improved efficiency. Companies are simply relocating to states with more competitive electric rates. Manufacturing losses in these industries led to fewer high paying blue collar jobs, jobs that often paid up to \$75,000 a year. With 30 percent of Delawareans spending more than 10 percent of their income on energy, the definition of energy poverty, and lost high paying jobs in energy intense businesses, these policies are causing real hardship.

Anecdotal evidence supports the relationship between rising electric prices and lost industrial jobs. A CRI 2013 analysis determined Delaware's high electric rates contributed to the closure of the EVRAZ steel mill in Claymont. The closure put 375 union employees out of work. Press reports stated the average wage at EVRAZ was \$75,000 a year. Production was moved to Portland, OR, with an estimated \$8 million a year in lower industrial electric cost. Occidental Chemicals moved their bleach operation to another state because of high electric costs to run their hydrolysis separation process. Data storage companies have made it clear they cannot locate in Delaware without their own in house generation facilities, and one data company left the state because of high electric rates.

Chart 4



Sources: Electric demand from U.S. Energy Information Agency², and GDP data is from the US Bureau of Economic Analysis³

As poorly as these regulations have worked, there are plans to make them even more stringent. Delaware belongs to a nine state Regional Greenhouse Gas Initiative (RGGI) that targeted about a 50% reduction in CO₂ emissions by 2020 by requiring electric generators to buy emission allowances in quarterly auctions. The costs are passed onto electric customers. A new

rule has been announced to require another 30% reduction by 2030, and the cost to consumers could increase 50% as allowance prices rise.

Also, legislation is being proposed doubling the requirement for renewable energy, such as wind and solar power, in the Renewable Portfolio Standard (RPS) from 25 percent of electric demand by 2025 to 50% by 2032. This will likely harm electricity reliability as wind and solar supply power intermittently. Consumer costs for the program may double, in part because state subsidies will have to make up for falling federal subsidies.

I recently published the only independent, peer reviewed study of the RGGI program, “A Review of the Regional Greenhouse Gas Initiative”, in the winter issue of the Cato Journal⁴. I found RGGI states had the same emission reductions as non-RGGI states, lost more manufacturing jobs, had higher electric rates, and fared worse in adding wind, solar, and improving energy efficiency.

In another study I compared Maryland and Delaware with rigid regulations to Virginia with no RGGI program, and voluntary wind, solar, and energy efficiency programs⁵. All three states are in the same regional electric grid. Virginia reduced CO₂ emissions faster on a per capita basis, added twice as much renewable power, and did a better job of improving energy efficiency.

A recent study done for the Maryland offshore wind project by the Maryland Public Service Commission staff consultant⁶ shows adding more wind power doesn't lower emissions either as the need for cycling conventional power plants up and down to back-up intermittent wind erases any emissions gains from the wind project. Delaware's RPS required 16.5% of electric demand be filled with renewable power with 2 percent of that coming from solar in 2017. The U.S. Energy Information Agency provides generating and emissions data in its Electric Power Monthly⁷. The goal was met for the solar portion with in-state systems. Another 2% of generation came from the Bloom fuel cell program that is actually fueled with conventional natural gas. To pass the project approval process the Bloom generation is actually allowed to count double to make it seem less costly. Most of the remaining 10 percent renewable energy requirement is coming from out-of-state wind farms that add cost for Delaware electric customers, but provide no jobs here.

The desire of proponents to extend and expand the RGGI and RPS have been driven by Trump Administration plans to abandon the Paris Accord, and to repeal the treaty supporting the EPA proposed Clean Power Plan regulation. However, America has reduced greenhouse gas emissions 20 percent more than the entire developed world combined from 2005 to 2015⁸. Our emissions are down 14 percent compared to 6.5 percent for other developed countries according to the Organization for Economic Cooperation and Development.

The failed Clean Power Plan target of 28 percent reduction in CO₂ emissions from power plants by 2025 has been met eight years early without the regulation, and Delaware has already met the 2030 goal! Using 2017 information from RGGI, Delaware has already reduced emissions from power plants 58 percent compared to a 2020 goal of 53 percent⁹. Meanwhile, high emission allowance prices have made Delaware's lone coal-fired power plant uncompetitive

most of the time. This has forced the generator to cycle the power plant up and down reducing operating efficiency 16 percent resulting in higher emissions. The RGGI extension is simply not needed, and won't work anyway.

As reported in my recently published study⁴, lower priced natural gas from the shale revolution encouraged fuel switching from coal that has twice the emission rate for each megawatt-hour of power, and accounted for 70 percent of national emission reductions. National regulations from the EPA accounted for the other 30 percent nudging older, smaller coal-fired power plants to retire rather than investing in new pollution control equipment. RGGI had no impact. Ironically, Delaware has opposed extracting natural gas from shale, the primary successful strategy in reducing emissions.

Not only do Delaware energy policies not work, the cost greatly exceeds the willingness of electric customers to pay the added cost. A recent study by the University of Michigan¹⁰ concluded 34 percent of the U. S. population is not willing to pay anything extra for CO₂ reduction, with another 28 percent only willing to pay \$50 a year. Coincidentally, \$50 a year is about the same amount the Delaware Legislature set as a cumulative cost cap of 3% on electric bills. The cost cap was exceeded in 2012, and cost of the RPS was over triple the cost cap in 2017. Proposed legislation would change the cost cap from a cumulative 3% to allow cost increases of up to 3% a year!

A better policy would be to withdraw from RGGI, and freeze the requirement for more renewable power. Over the last year nearly two thirds of all new electric generation in the United States was wind and solar power⁷. These technologies are ready to compete with new conventional power plants without state subsidies. In Delaware, a large solar farm is being built in Sussex County with no state subsidies, and solar capacity may more than double with other planned non-subsidized additions. The Solar Energy Industry Association reports new utility scale projects are delivering power for \$28 to \$45/MWh¹¹. Last year Delmarva Power paid \$58/MWh for wholesale power from conventional sources. The last thing we need is to tighten costly state regulations when the free market can do the job without subsidies.

Delaware also has the potential to eventually participate in our national oil and gas renaissance. The U.S. Department of Interior offered a record offshore drilling leasing opportunity in the Gulf of Mexico in early 2018. Only 2 percent of the leases had a bid for leases adjacent to existing infrastructure. The high cost of offshore drilling and high liability of spills favors onshore drilling at this time. However, exploration is needed to determine the potential for future production, and Delaware should encourage that effort. Meanwhile, we anticipate no drilling off the coast of Delaware in the foreseeable future. However, The U.S. Department of Interior is considering allowing coastal states to participate in leasing and production royalties. Delaware's state government should be encouraging this change to provide new tax revenue should the federal government approve offshore drilling.

Critics point to possible negative impacts of seismic testing during exploration, and oil spills. Physicist John Droz answers these claims¹².

- “The National Marine Fisheries Service (NMFS), the agency charged with, among other things, protecting marine species, has concluded seismic surveying poses no significant threat to marine life. In 2014, during the Obama administration, NMFS stated, “To date, there is no evidence that serious injury, death, or stranding by marine mammals can occur from exposure to air-gun pulses, even in the case of large air-gun arrays.” ”
- “In 2017, The Lamont-Doherty Earth Observatory actually conducted a seismic survey off the coast of North Carolina to map plate tectonics, using the same type of ships and equipment oil and gas mapping would require. Environmentalists did not protest this seismic survey, even though it covered a larger area than any testing for oil and gas off the coast of North Carolina would and it sent signals deeper into the ocean bed. A study by the National Science Foundation concluded the survey caused no consequential harm to the ocean’s wildlife or the ecosystem.”
- “There are hundreds of producing OCS lease areas containing thousands of operating wells, many of which have been operating safely for decades. As Droz writes, “The number of oil spills from all sources and the volumes of oil involved have fallen considerably decade by decade in the past 30 years, in spite of the 40 million barrels per day increase in world oil output and consumption that occurred over the same time.” “
- “Oil spills are exceedingly rare, and most OCS platforms are well beyond the sight of shore, making OCS production no threat to tourism industries. With most drilling taking place more than 40 miles from the coast, distance and prevailing ocean currents would prevent oil from almost any spill from reaching shore. In addition, on those rare occasions when spills have occurred in the past and oil reached beaches, none of the resulting harms were permanent. Tourism and local fishing industries recovered quickly after such spills, and the jobs created and revenues generated in the long term from oil and gas production far exceed the temporary loss in revenue from tourism and fishing from the rare spill.”
- From Dr. Considine’s study, actual industry experience with oil spills predicts only about 170 barrels of oil spilled a year from production 50 miles off the Delaware coast in even the highest production estimate for 2035.

Clearly, the risks of seismic testing are manageable compared to the potential large economic benefits. The National Marine Fisheries Service approved seismic testing under President Obama.

Notes for Energy Issues:

- 1) U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, “*Median Household Income by State: 1984 to 2016*”. Table H-8. Available at <https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-income-households.html>
- 2) U.S. Energy Information Agency “*Annual State Energy Data*” available at <https://www.eia.gov/electricity/data/state/>

- 3) U.S. Bureau of Economic Analysis “*Interactive Data*” available at <https://bea.gov/itable/iTable.cfm?ReqID=70&step=1#reqid=70&step=4&isuri=1&7003=900&7001=1900&7002=1&7090=70>
- 4) Stevenson, D. T. (2017) “A Review of the Regional Greenhouse Gas Initiative”, “Winter 2018” Volume 38, Cato Journal. Available at <https://www.cato.org/cato-journal/winter-2018/review-regional-greenhouse-gas-initiative>
- 5) Adjusting for changes in out-of-state imports of power, Virginia carbon dioxide emissions from electric generation fell 38.6 percent/capita from 2005 to 2016 while Delaware and Maryland combined fell only 37.1 percent
- 6) Levitan and Associates Inc. for the Maryland Public Service Commission Docket 9431 item 85, “Evaluation and Comparison of US Wind and Skipjack Proposed Offshore Wind Project Applications” pages 92 and 160, revised public version, March 17, 2017, <http://www.psc.state.md.us/search-results/?keyword=9431&search=all&search=case&x.x=15&x.y=13>
- 7) U.S. Energy Information Agency (EIA), *Electric Power Monthly* (December 2017): “Table 1.14.B Wind by State by Sector, Year-to-Date”; “Table 1.17.B Solar Photovoltaic by State by Sector, Year-to-Date”. Available at <https://www.eia.gov/electricity/monthly/>
- 8) Organization for Economic Cooperation and Development Greenhouse Gas Data Set, available at https://stats.oecd.org/Index.aspx?DataSetCode=AIR_GHG
- 9) RGGI COATS interactive table for 2017, available at <https://rggi-coats.org/eats/rggi/index.cfm?hc=ISkgICAK>
- 10) University of Michigan Center for Local, State, and Urban Policy, “National Surveys on Energy & Environment”, willingness to pay Q31, <http://closup.umich.edu/national-surveys-on-energy-and-environment/nsee-data-tables/nsee-2017-spring/#Q31>
- 11) Solar Energy Industry Association, “*Industry Data Report*”, available at <https://www.seia.org/solar-industry-data>
- 12) “DISPELLING MYTHS ABOUT OFFSHORE ENERGY”, MARCH 23, 2018, By H. Sterling Burnett, Heartland Institute, <https://www.heartland.org/news-opinion/news/dispelling-myths-about-offshore-energy>

Tax Policies

The Tax Foundation ranks Delaware 50th on corporate income tax rates. Delaware’s maximum state corporate income tax rate is 8.7 percent on in-state earnings compared to an average of 6.7 percent nationally, and a range of 0 to 12 percent. However, Delaware is only one of six states that also have a version of the Gross Receipts Tax that is paid on sales volume. The tax is paid whether earnings are made or not. Usually sales up to a certain amount are exempted, meaning the tax puts larger companies in a given market at a disadvantage to smaller competitors. The Delaware Gross Receipts tax adds up to the equivalent of about an additional 4 percent to the income tax leaving Delaware with the highest corporate income tax rate in the country.

The CRI 2013 analysis mentioned earlier determined Delaware’s high corporate tax rate contributed to the closure of the EVRAZ steel mill in Claymont. Production was moved to Portland, OR, with an estimated \$850,000 a year lower tax bill.

The Gross Receipts Tax was to be phased out starting in 2009, but was extended as tax revenue fell during the recession. This tax needs to be repealed, or phased out, to make Delaware more competitive. The lost tax revenue can be made up with higher economic growth which will generate higher personal and corporate income tax revenue.

Prevailing Wage

Delaware also has a Prevailing Wage law whereby state funded projects must pay above market prices for labor. Delaware bases its prevailing wage rate on a survey conducted by the state Department of Labor at a cost of about \$1 million a year. Meanwhile the federal government pays the state to conduct another study that has five times the response rate. Using the federal study instead of the state study could save up to 30 percent a year on state highway and school projects thus leveraging more infrastructure completion.

Educational Policies

Education remains an important factor for individuals. Unfortunately, we find no correlation between high school graduation rates, or the percent of the population with bachelor, or advanced degrees with GDP, but, in keeping with the research literature, do find a statistically significant relationship between economic performance and the quality of education. There is a slight correlation (0.35) between GDP and the Education ranking system used in the CNBC “Best States for Business”, 2017 edition. CNBC uses a combination of the number of higher education institutions and their funding, k-12 test scores, class size, funding, and spending, and life-long learning opportunities. We note CNBC only weights education 200 points in its overall rankings of 2500 points. We note Delaware ranks 40th overall in the CNBC study, but of particular concern, ranks 36th in education, and 8th in spending per student. Delaware ranks 27th in high school graduation rates, 19th in college degrees, and 12th in advanced degrees. Delaware needs reform to get more for the dollars being spent.

Frankly, we know how to improve education in Delaware. For over two decades we have experimented with charter schools, and some of these have had amazing results. The formula that seems to work is hiring and training a good principal with hiring and firing authority and minimal interference from the school board. The principal is responsible for establishing a culture of success which permeates every facet of a school’s operation including selection of curriculum, demeanor of students, professionalism of teachers, participation of parents, and expectations of everyone.

Delaware spent 25% more per student than the average state in 2016 according to the U.S. Census Bureau (<http://www.governing.com/gov-data/education-data/state-education-spending-per-pupil-data.html>), and was the eleventh highest spending state in the country. A study by Caesar Rodney Institute’s Dr. John Stapleford showed significant economic impacts of Delaware’s mediocre education performance which placed 30th on the 2013 National Assessment of Education Performance (NAEP) 8th grade math test. Professionals employed in Delaware often live in southeastern Pennsylvania to avoid New Castle County public schools. Dr. Stapleford estimates this is driving \$3 billion dollars a year in wages out-of-state with

devastating consequences for Delaware businesses. Further, he did a regression analysis comparing ten years Gross State Product growth and employment by state against 2013 NAEP math test percent proficiency for public school 8th graders. Had proficiency in Delaware equaled the average of the surrounding states of Pennsylvania, New Jersey, and Maryland, the Delaware economy may have increased by \$4.5 to \$7.8 billion resulting in 12,300 to 20,850 more jobs.

Learning from More Successful States

A review of the fastest growing states offers some useful guidance in Table 4 below that shows how those states varied from the national average. Six of the eleven states highlighted in Table 4 benefitted from the expansion of oil and natural gas production using innovative drilling practices. Those states tended to see above average expansion in utilities, construction, and transportation to support the drilling effort. Three states saw economic expansion from higher grain prices and production to support increased ethanol use in gasoline. Four states saw above average manufacturing expansion, two in finance, two in information services, two in wholesale trade, and one in mining.

Table 4: Exceptions Report of How the Fastest Growing States Varied from the National Average Growth Rate 2007 to 2015

Sub Group	US	ND	NE	OK	MN	TX	SD	WV	AK	OR	NY	PA
Agriculture	1%		9%		3%		10%					
Oil, Gas, Mines	0%	21%		11%	2%	3%		15%	3%			7%
Utilities	1%	2%	4%	3%		3%		3%	3%			
Construction	1%	11%		5%		5%		8%				4%
Manufacturing	9%		12%		19%	11%				24%		
Wholesale	7%					10%	12%					
Transport	4%	8%	9%	12%					9%			
Info. Ser.	4%										10%	8%
Finance	9%		15%								23%	
Real GDP Growth %	1.1	50.1	11.8	10.5	10.3	9.8	8.5	7.9	7.0	6.8	6.4	5.7

Source: U.S. Bureau of Economic Analysis, highlighted items relate to energy production

Growth in the states with the fastest growing GDP had growth ranging from 5.7 percent to 50.1 percent while Delaware's economy dropped 4.1 percent. Economic growth tends to be driven by the indirect impact of Goods Production, such as agriculture, drilling and mining, utilities, construction, and manufacturing. Delaware had essentially no economic growth in those areas in total, and experienced a 5 percent drop in manufacturing. Growth in the service sectors tend to follow as indirect or induced impacts. In the fastest growing states each \$1 of increased Goods Production tended to result in \$4 of per capita GDP growth.

Delaware did see a 35 percent increase in Real GDP in its Finance sector as the Financial Development Act of the 1980's continues to pay dividends, and a 23 percent increase in the Real Estate sector as retirees move to the state for low taxes and low home prices. It is unlikely

Delaware can learn any lessons on the Finance sector from Nebraska (15 percent growth), or New York (23 percent growth).

Gone are the days Delaware economic growth was led by the DuPont Company built on its 1803 founding in Delaware for the water power available on the Brandywine River. As recently as the mid 1980's DuPont was the states' largest employer with about 35,000 well paid employees. It has shrunk to about 5,000. The states' largest employer is now the state government with the bloated bureaucracy an impediment to growth, and leaving Delaware with one of the second highest state spending per capita in the country.

Some states in our top performing list have DuPont equivalents. New York has the legacy of being the country's financial center. According to industry specific Real GDP data between 2007 and 2015 from the U.S. Bureau of Economic Analysis, over 80 percent of Oregon's manufacturing growth came from computers and electronics, and this was a direct legacy from Intel sourcing much of its production to Hillsboro. Arkansas likely sees some lasting impact from Sam Walton, Walmart founder.

Three states had wide ranging industrial manufacturing growth higher than the 9 percent national average; Minnesota with 19 percent, Nebraska with 12 percent, and Texas with 11 percent, compared to Delaware's 5 percent drop. The CNBC "Best States for Business", shows essentially no correlation for overall state GDP rankings, but we note the three high growth states did have good rankings between 2008 and 2017; Minnesota 1st to 11th, Texas 1st to 4th, and Nebraska 6th to 13th. Delaware ranked 38th to 43rd over the same time period. Texas and Nebraska are RTW states, and Minnesota is not. Several comparisons in Table 5 below do show apparent trends, such as higher labor participation rates, lower violent crime rates, lower energy prices, and higher education ranking.

Table 5: Selected High Industrial Growth State Comparisons

	MN	NE	TX	DE
% Real GDP Manufacturing Growth	19%	12%	11%	-5%
% Unionization	14%	7%	4%	11%
% Labor Participation Rate	70.2%	68.5%	63.6%	62.1%
CNBC Education Best Rank 2008-17	1	6	1	38
CNBC Best States for Business Rank	3	13	4	40
Mercatus Freedom in the Fifty States	4	2	5	43
Workers Compensation Insurance Rate	1.91%	1.67 %	1.45%	1.28%
Corporate Tax Rate	9.8%	7.81%	3.75%	12.7%
Unemployment Tax Rate	1.44%	1.25%	2.70%	1.70%
Property Crime Rate/100,000	2133	2263	2760	2766
Violent Crime Rate/ 100,000	243	275	412	499
Industrial Electric Rates Cents/KWh	7.49	6.95	5.70	8.56
Industrial Natural Gas Rates \$/MMBTU	4.19	4.04	2.65	9.02
Personal Income Growth Rate 2007-15	3.3%	4.2%	5.0%	2.5%
Median Household Income Growth 2007-16	4.5%	4.3%	9.1%	-8.1%

Nebraska was the second fastest growing state. Manufacturing grew from both expansion of existing business and from new businesses, such as, a new Monsanto seed facility, a pet medicine facility, and an electrical equipment facility. Nebraska is rated 2nd overall in the nation in the Mercatus Center published “Freedom in the Fifty States”, 2013 edition, and among other policies offers RTW, and a high labor force participation rate at 68.5 percent. The state is rated 13th overall in the CNBC “Best States for Business, 2017 edition. Nebraska also has a low crime rate, and low energy costs. The corporate tax rate is 7.8 percent which is roughly equal to the Delaware rate, but there is no Gross Receipts Tax.

Minnesota is the 4th fastest growing state, and has a wide ranging manufacturing sector that grew 19 percent between 2007 and 2015. The state ranks 4th overall in the Mercatus freedom rating, and 3rd in the CNBC business climate rating. It has a very high labor participation rate at 70.2 percent, low crime rate, and low energy costs. The Minnesota Department of Employment and Economic Development has a superb webpage highlighting a myriad of reasons to locate a business in the state (<https://mn.gov/deed/business/locating-minnesota/climate/performance.jsp>).

Texas is the 5th fastest growing state, and also has a wide ranging manufacturing base. Manufacturing growth has been driven by very low energy prices particularly for chemicals, plastics, machinery, and fabricated metals that tend to be energy intensive and to use natural gas as a feedstock. Texas is a RTW state with very low corporate income taxes that has attracted automobile and electronics companies to the state. The state ranks 5th in the Mercatus freedom rating, and 4th in the CNBC business climate rating.

In contrast, Delaware has a labor participation rate at 62.1 percent ranking 33rd and has been running about two percentage points lower than faster growing states reflecting a two percentage point higher rate of the population over the age of 65. Delaware doesn't offer RTW. The state ranks 43th in the Mercatus freedom rating, 40th in the CNBC business climate rating, and 50th in the Tax Foundation corporate income tax rating. Between 2016 and 2017 total employment in Delaware 0.1 percent, the 49th poorest performance in the country. The direct impacts of higher Goods Production actually fell 1 percent between 2007 and 2015. Delaware has 8th highest violent crime rate (FBI), and opioid overdose rate (CDC), the 16th highest incarceration rate (according to the Sentencing Project), the highest corporate tax rate in the country when the Gross Receipt Tax is included, and very high energy costs. Consequently, Delaware is dead last in Median Household Income actually losing an incredible \$12,000 a year between 2000 and 2016.

Lessons for Delaware

Last year the Delaware legislature opened up the potential for new industrial development in its formerly unavailable Coastal Zone, especially in brown fields. This provides space, port, rail, and truck access for new manufacturing sites. Delaware has a very positive policy for brown field re-development. Over the years manufacturing ceased at three of the

largest users of natural gas; the Claymont steel mill, Edgemore titanium dioxide facility, and the Seaford nylon facility opening lots of capacity of natural gas.

Delaware is primed for an industrial renaissance, but has barriers that can be addressed by the legislature. High corporate income tax rates, lack of RTW, high industrial electric and natural gas rates, mediocre education achievement, and limited capital for infrastructure investment. This report has shown the Gross Receipts Tax can be repealed with the lost revenue made up from higher tax revenue generated by economic growth. RTW can be implemented with no down side impacts other than unions having to work harder to win new members. Unions will actually see membership growth from jobs growth. Indiana adopted RTW in 2012 and by 2014 added 120,000 jobs, of which 50,000 were union jobs.

Ending Delaware's participation in the RGGI carbon dioxide tax program, and ending meddling in the electric generation mix by freezing the requirement for more expensive, unreliable wind and solar power will lower electric cost directly and indirectly by encouraging more in-state generation. Industrial natural gas prices are extraordinarily high given our proximity to low cost gas produced in neighboring Pennsylvania where prices are half of Delaware's. We recommend the Delaware Public Service Commission be petitioned to open a docket to determine how to reduce natural gas cost in the state. Delaware should also work with other coastal states to encourage the U.S. Department of Interior to offer a share of leasing and royalties from offshore oil and gas drilling, as is done with states for onshore drilling on federally owned lands.

Appendix: List of factors and their correlation to Per Capita Real Chained GDP growth. Note a correlation of 0.8 to, or -0.8 to -1 is generally considered a very high correlation, and a correlation of 0.2 to -0.2 is considered a very low correlation. We show even the low correlations for future guidance. Highlighted factors may be significant.

Personal Income Growth	0.80
Size of state GDP	0.27
Population size comparison	0.01
Population Growth	-0.34
Employment size comparison	0.26
Employment Growth	-0.43
Unemployment comparison	-0.15
Unemployment Growth	-0.25
Higher Labor Participation Rates	0.31
Higher Violent Crime Rates	0.21
Higher Poverty	-0.11
GINI Coefficient	-0.17
Higher Electric Prices	-0.07
Higher Natural Gas Prices	-0.22
Corporate Tax Rate	0.18
% High School Graduates	-0.09
% Bachelor degree	-0.01
% Advanced degrees	-0.06
CNBC Business Climate overall	0.09
Workforce	-0.17
Infrastructure	0
Cost of doing business	0.12
Economy	-0.12
Quality of Life	0.08
Technology & innovation	0.08
Education	0.35
Business Friendliness	-0.07
Access to Capital	-0.03
Cost of Living	0.06
Mercatus Freedom overall	0.09
Economic Freedom	-0.12
Fiscal Policy	-0.15
Regulatory Policy	-0.08
Personal Freedom	-0.03
Fiscal Decentralization	0.31
State Government Spending/Capita	0.25