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# The Effect of the Affordable Care Act's Medicaid Eligibility Expansion on Labor Supply

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HARTFORD CONNECTICUT

The Effect of the Affordable Care Act's Medicaid Eligibility Expansion on Labor  
Supply

By

Shannon K. Hebert

A Thesis Submitted to the Department of Economics  
of Trinity College in Partial Fulfillment of the  
Requirements for the Bachelor of Science Degree

Economics 498-99

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## ABSTRACT

Medicaid is a program that uses funds from the states and federal government to provide healthcare coverage to millions of Americans. A key goal of the 2010 Affordable Care Act (ACA) was to expand Medicaid eligibility to include all adults with income below 138 percent of the federal poverty level. Unintended labor supply consequences may arise due to this eligibility expansion. This paper seeks to determine what the effect of the ACA's Medicaid eligibility expansion on labor supply is.

In 2012, the Supreme Court ruled to make the expansion optional for states. As a result, many states chose not to expand Medicaid. This analysis uses a treatment group comprised of the swing states that adopted the ACA's Medicaid eligibility expansion on January 1, 2014, and a control group of the swing states that have not adopted it. Applying a difference-in-differences research design, I evaluate labor supply (typical hours worked per week) using data from the American Community Survey. My results suggest that the ACA's Medicaid eligibility expansion did not have a significant effect on labor supply for the overall sample population. However, the expansion significantly increased the typical hours worked per week for women by 0.531 hours. Men also experienced a statistically significant change to their labor supply. It reduced their typical hours worked per week by 0.364 hours. The opposing results for men and women appear to balance each other out in the results for the overall sample population. The behavioral differences between men and women explain the discrepancy in their results.

## **DEDICATIONS**

I would like to dedicate this thesis to my parents, Leah and Dan Hebert, and to my grandfather, Paul “Poppa” Kelley. Thank you to my parents for supporting me unconditionally, and for giving me the opportunity to attend Trinity. A special thank you to my Dad whose lifelong dedication to research inspired me to take on this challenge, and perform research of my own. Additionally, I would like to thank my grandfather for always encouraging me to learn and explore.

## **ACKNOWLEDGEMENTS**

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## TABLE OF CONTENTS

Abstract.....	1
Dedications.....	2
Acknowledgements.....	2
Table of Contents.....	3
List of Figures.....	5
List of Tables.....	6
List of Abbreviations.....	7
<b>Chapter 1: Introduction.....</b>	<b>8</b>
Background.....	8
Medicaid Eligibility Expansion and Labor Supply.....	12
Purpose and Outline.....	13
<b>Chapter 2: Literature Review.....</b>	<b>15</b>
Pre-ACA Studies.....	15
ACA Studies.....	19
<b>Chapter 3: Empirical Approach.....</b>	<b>22</b>
Data.....	22
Difference-In-Differences Research Design.....	24
<b>Chapter 4: Empirical Results.....</b>	<b>27</b>
Medicaid Coverage.....	27
Crowding-Out.....	27
Take-Up Rate.....	28
Labor Supply.....	29

Gender Discrepancy in Labor Supply Results.....	30
Sensitivity Analysis.....	31
Falsification Test.....	33
<b>Chapter 5: Conclusion</b> .....	<b>35</b>
Limitations and Future Research.....	35
Appendix.....	39
References.....	48

## **LIST OF FIGURES**

**Figure 1:** The Status of State Medicaid Expansion Decisions

**Figure 2:** Health Insurance Trends, Expansion vs. Non-Expansion States

- A. Medicaid Coverage
- B. Private Coverage
- C. Uninsurance Rate

**Figure 3:** Labor Supply, Expansion vs. Non-Expansion States

**Figure 4:** Labor Supply Trends among Different Genders, Expansion vs. Non-Expansion States

- A. Women
- B. Men

## **LIST OF TABLES**

**Table 1:** Descriptive Statistics of the Sample Population

**Table 2:** DiD Estimates for the Effect of the ACA's Medicaid Expansion on the Sample Population

**Table 3:** Sensitivity Analysis for the Sample Population

**Table 4:** DiD Estimates for the Falsification Tests



## **LIST OF ABBREVIATIONS**

**ACA**-The Affordable Care Act

**ACS**-The American Community Survey

**AFDC**-Aid to Families with Dependent Children

**CBO**-The Congressional Budget Office

**CPS**-The Current Population Survey

**(D)**-Member of the Democratic Party

**DiD**-Difference-in-Differences

**FPL**-Federal Poverty Level

**HS**-High School

**i**-Individual

**LPM**-Linear Probability Model

**(R)**-Member of the Republican Party

**s**-State

**t**-Year

**U.S.**-The United States of America

## CHAPTER 1: INTRODUCTION

### Background

The Patient Protection and Affordable Care Act (ACA) has been the largest healthcare regulatory revamp in the United States (U.S.) since the establishment of Medicaid and Medicare.<sup>1</sup> President Barack Obama (D) signed the ACA into law on March 23, 2010.<sup>2</sup> This ratification marked the start of a new chapter in American healthcare policy, and was a great legislative win for Democratic leadership. At the time, millions of Americans had no healthcare coverage.<sup>3</sup> The costs of healthcare were quickly rising.<sup>4</sup> Democrats hoped to resolve these problems through the ACA.<sup>5</sup> According to President Obama, the ACA is, “about filling in the gaps in employer-based care so that when we lose a job, or go back to school, or start that new business we’ll all have coverage.”<sup>6</sup> The ACA had three principal goals, which included making affordable health insurance available to more people, supporting new medical care delivery methods made to lower the cost of healthcare, and expanding Medicaid to cover all adults with income below 138 percent of the federal poverty level (FPL).<sup>7</sup>

Medicaid has become a fundamental part of the American healthcare system. Today, it is the largest single source of healthcare coverage in the United States, providing coverage to

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<sup>1</sup>“CMS' Program History Medicare & Medicaid.” *U.S. Centers for Medicare & Medicaid Services*, U.S. Centers for Medicare & Medicaid Services, 20 June 2018, [www.cms.gov/About-CMS/Agency-information/History/](http://www.cms.gov/About-CMS/Agency-information/History/).

<sup>2</sup>“Affordable Care Act (ACA).” *HealthCare.gov*, U.S. Centers for Medicare & Medicaid Services, [www.healthcare.gov/glossary/affordable-care-act/](http://www.healthcare.gov/glossary/affordable-care-act/).

<sup>3</sup>Rachel Garfield, et al. “The Uninsured and the ACA: A Primer – Key Facts about Health Insurance and the Uninsured Amidst Changes to the Affordable Care Act.” *Kaiser Family Foundation*, Kaiser Family Foundation, 25 Jan. 2019, [www.kff.org/uninsured/report/the-uninsured-and-the-aca-a-primer-key-facts-about-health-insurance-and-the-uninsured-amidst-changes-to-the-affordable-care-act/](http://www.kff.org/uninsured/report/the-uninsured-and-the-aca-a-primer-key-facts-about-health-insurance-and-the-uninsured-amidst-changes-to-the-affordable-care-act/).

<sup>4</sup>“Why Do We Need the Affordable Care Act?” *American Public Health Association*, American Public Health Association, [www.apha.org/~media/files/pdf/topics/aca/why\\_need\\_aca\\_2017.ashx](http://www.apha.org/~media/files/pdf/topics/aca/why_need_aca_2017.ashx).

<sup>5</sup>Jonathan Oberlander, “Long Time Coming: Why Health Reform Finally Passed.” *Health Affairs*, Project Hope, June 2010, [www.healthaffairs.org/doi/full/10.1377/hlthaff.2010.0447](http://www.healthaffairs.org/doi/full/10.1377/hlthaff.2010.0447).

<sup>6</sup>Andrew Malcolm, “Obama: Not My Fault That Working Families Are Feeling Anxious.” *Investor's Business Daily*, Investor's Business Daily, Inc., 19 Jan. 2016, [www.investors.com/politics/columnists/obama-wants-more-free-stuff-for-unemployed/](http://www.investors.com/politics/columnists/obama-wants-more-free-stuff-for-unemployed/).

<sup>7</sup>“Affordable Care Act (ACA).”

approximately seventy-six million Americans.<sup>8</sup> Medicaid uses funds from the states and federal government to provide healthcare coverage to certain vulnerable low-income groups.<sup>9</sup> President Lyndon B. Johnson (D) established the program in 1965 as an amendment to the Social Security Act.<sup>10</sup> In the beginning, Medicaid covered all Welfare recipients.<sup>11</sup> It has since developed its own application process, and offers eligibility to various low-income groups including pregnant women, the disabled, and parents with dependent children.<sup>12</sup> The ACA further expanded eligibility to include low-income childless adults.<sup>13</sup> This is one of the first instances that the U.S. government has given low-income childless adults access to Medicaid. As a result, the economic effects of the ACA's Medicaid eligibility expansion remain unknown.

Since its inception, the ACA has been a highly polarizing subject. Louisiana Representative John Fleming (R) called it, "the most dangerous piece of legislation ever passed."<sup>14</sup> Many states did not want to enforce its changes.<sup>15</sup> The country's distressed economic climate magnified the statute's political controversy. In 2010, the U.S. was coming out of the Great Recession, and its unemployment rate was at a thirty-year high.<sup>16</sup> Consequently, Americans were uneasy about the possible work deterrents and cost of the ACA. The state of Florida brought

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<sup>8</sup> "Five Things You May Not Know about Medicaid." *Peter G. Peterson Foundation*, Peter G. Peterson Foundation, 26 July 2017, [www.pgpf.org/blog/2017/07/five-things-you-probably-dont-know-about-medicaid](http://www.pgpf.org/blog/2017/07/five-things-you-probably-dont-know-about-medicaid).

<sup>9</sup> "Program History." *Medicaid.gov*, U.S. Centers for Medicare & Medicaid Services, [www.medicaid.gov/about-us/program-history/index.html](http://www.medicaid.gov/about-us/program-history/index.html).

<sup>10</sup> "CMS' Program History Medicare & Medicaid."

<sup>11</sup> "Medicaid Program (Circ. 1980)." *Virginia Commonwealth University*, Virginia Commonwealth University, 2 Aug. 2012, [socialwelfare.library.vcu.edu/public-welfare/medicaid-program/](http://socialwelfare.library.vcu.edu/public-welfare/medicaid-program/).

<sup>12</sup> "Who Is Eligible for Medicaid?" *HHS.gov*, U.S. Department of Health & Human Services, 4 Aug. 2017, [www.hhs.gov/answers/medicare-and-medicaid/who-is-eligible-for-medicaid/index.html](http://www.hhs.gov/answers/medicare-and-medicaid/who-is-eligible-for-medicaid/index.html).

<sup>13</sup> Robin Rudowitz, et al. "10 Things to Know about Medicaid: Setting the Facts Straight." *Kaiser Family Foundation*, Kaiser Family Foundation, 6 Mar. 2019, [www.kff.org/medicaid/issue-brief/10-things-to-know-about-medicaid-setting-the-facts-straight/](http://www.kff.org/medicaid/issue-brief/10-things-to-know-about-medicaid-setting-the-facts-straight/).

<sup>14</sup> M.J. "Why Republicans Hate Obamacare." *The Economist*, The Economist Newspaper, 11 Dec. 2016, [www.economist.com/the-economist-explains/2016/12/11/why-republicans-hate-obamacare](http://www.economist.com/the-economist-explains/2016/12/11/why-republicans-hate-obamacare).

<sup>15</sup> "14 States Sue to Block Health Care Law." *CNN*, CNN, 23 Mar. 2010, [www.cnn.com/2010/CRIME/03/23/health.care.lawsuit/index.html](http://www.cnn.com/2010/CRIME/03/23/health.care.lawsuit/index.html).

<sup>16</sup> Robert Kaestner, et al. "Effects of ACA Medicaid Expansions on Health Insurance Coverage and Labor Supply." *Journal of Policy Analysis and Management*, vol. 36, no. 3, 2017, pp. 608–642., doi:10.1002/pam.21993.

action to the U.S. District Court for the Northern District of Florida claiming that the ACA was unconstitutional on several grounds. Twenty-five other states joined Florida in their challenging of the ACA.<sup>17</sup> They argued that the ACA's Medicaid eligibility expansion was unconstitutionally coercive. The federal government appealed the district court's ruling, and the case made its way to the Eleventh Circuit Court of Appeals, and then eventually went to the Supreme Court. The Supreme Court unanimously ruled to make the Medicaid eligibility expansion optional for states on June 28, 2012.<sup>18</sup> The Supreme Court Justices felt that Congress did not have the authority to penalize states with loss of Medicaid federal funding if they did not comply with the ACA's expansion.<sup>19</sup> This ruling left the ACA's Medicaid eligibility expansion decisions up to the states.<sup>20</sup> Consequently, many states have chosen not to expand Medicaid.

This U.S. Supreme Court ruling gave states more liberty concerning the Medicaid that they provide. The federal government sets certain parameters that states must follow regarding Medicaid. The government has mandatory benefits that states must offer, which include physician services, inpatient hospital services, transportation to medical care and outpatient hospital services.<sup>21</sup> States however, have the freedom to determine some aspects of the Medicaid that they make available to their residents. Each state establishes certain eligibility standards, determines the type and amount of services, sets payment rate for services, and administers its

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<sup>17</sup> "Focus on Health Reform A Guide to the Supreme Court's Decision on the ACA's Medicaid Expansion." *Kaiser Family Foundation*, Kaiser Family Foundation, Aug. 2012, [kaiserfamilyfoundation.files.wordpress.com/2013/01/8347.pdf](http://kaiserfamilyfoundation.files.wordpress.com/2013/01/8347.pdf).

<sup>18</sup> "A Guide to the Supreme Court's Decision on the ACA's Medicaid Expansion." *Kaiser Family Foundation*, Kaiser Family Foundation, 1 Aug. 2012, [www.kff.org/health-reform/issue-brief/a-guide-to-the-supreme-courts-decision/](http://www.kff.org/health-reform/issue-brief/a-guide-to-the-supreme-courts-decision/).

<sup>19</sup> Sara Rosenbaum and Timothy Westmoreland, "The Supreme Court's Surprising Decision On The Medicaid Expansion: How Will The Federal Government And States Proceed?" *Health Affairs*, Project Hope, Aug. 2012, [www.healthaffairs.org/doi/full/10.1377/hlthaff.2012.0766](http://www.healthaffairs.org/doi/full/10.1377/hlthaff.2012.0766).

<sup>20</sup> "A Guide to the Supreme Court's Decision on the ACA's Medicaid Expansion."

<sup>21</sup> "Mandatory & Optional Medicaid Benefits." *Medicaid.gov*, Centers for Medicare & Medicaid Services, [www.medicaid.gov/medicaid/benefits/list-of-benefits/index.html](http://www.medicaid.gov/medicaid/benefits/list-of-benefits/index.html).

own program.<sup>22</sup> There are also optional benefits that states can provide, which include physical therapy, hospice, dental services, prescription drugs, and eyeglasses.<sup>23</sup> The 2012 Supreme Court ruling allows states to tailor Medicaid to align with their constituents' preferences even more. Numerous states have taken advantage of the Supreme Court ruling, and have chosen not to adopt the ACA's Medicaid expansion.

As of today, thirty-six states and the District of Columbia have implemented the ACA's Medicaid eligibility expansion.<sup>24</sup> *Figure 1* illustrates the expansion decisions of the states as of January 2019. The states that have chosen not to adopt the expansion are largely located in conservative regions of the country, such as the South and the Midwest.<sup>25</sup> Many red states are choosing to forgo expanding for political reasons. These states do not want to support the ACA because of its link to liberal President Barack Obama (D). Conservatives are ideologically against the ACA, and typically do not like entitlement programs.<sup>26</sup> In general, conservatives believe that the government should not intervene because entitlement programs create a pattern of dependence by removing incentive for low-income individuals to improve their situation. Some upper-class taxpayers do not believe that they should have to fund the lives of the lower class.<sup>27</sup> Conservatives also worry that the ACA limits individual freedom. New Hampshire State Representative Bill O'Brien (R) said that the ACA is, "as destructive to personal and individual

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<sup>22</sup> "State Overviews." *Medicaid.gov*, U.S. Centers for Medicare & Medicaid Services, [www.medicaid.gov/state-overviews/index.html](http://www.medicaid.gov/state-overviews/index.html).

<sup>23</sup> "Mandatory & Optional Medicaid Benefits."

<sup>24</sup> "Status of State Medicaid Expansion Decisions: Interactive Map." *Kaiser Family Foundation*, Kaiser Family Foundation, 13 Feb. 2019, [www.kff.org/medicaid/issue-brief/status-of-state-medicaid-expansion-decisions-interactive-map/](http://www.kff.org/medicaid/issue-brief/status-of-state-medicaid-expansion-decisions-interactive-map/).

<sup>25</sup> Lydia Saad, "Conservative-Leaning States Drop From 44 to 39." *Gallup*, Gallup, Inc., 6 Feb. 2018, [news.gallup.com/poll/226730/conservative-leaning-states-drop.aspx](http://news.gallup.com/poll/226730/conservative-leaning-states-drop.aspx).

<sup>26</sup> Tami Luhby, "Why so Many People Hate Obamacare." *CNN*, CNN, 6 Jan. 2017, [money.cnn.com/2017/01/05/news/economy/why-people-hate-obamacare/index.html](http://money.cnn.com/2017/01/05/news/economy/why-people-hate-obamacare/index.html).

<sup>27</sup> M.J.

liberty as the Fugitive Slave Act of 1850.”<sup>28</sup> Lastly, numerous opponents of the ACA do not trust that the federal government will honor its commitment to support the Medicaid expansion financially in the long term. The federal government claimed that it would perpetually pay at least ninety-percent of the ACA’s Medicaid eligibility expansion costs.<sup>29</sup> If the federal government went back on its promise, it would create a large financial burden for the expanded states.

### **Medicaid Eligibility Expansion and Labor Supply**

While the goals and benefits of the ACA are clear, unintended economic problems may arise. Economic theory postulates that the Medicaid expansion will influence U.S. labor markets in a few ways.<sup>30</sup> Individuals around the qualification threshold may work less in order to lower their income to qualify for Medicaid. People may work fewer hours because Medicaid eliminates most out-of-pocket medical expenses.<sup>31</sup> Medicaid recipients can maintain their same level of consumption while working less hours. This phenomenon is the income effect. Distinguished Economist John Cochrane said, “When the government subsidizes health insurance for people who do not have full-time jobs, that subsidy discourages work and job creation, just as much as a tax of thousands of dollars on employment would do.”<sup>32</sup> Hence, the ACA’s Medicaid expansion may discourage work and job creation. Those who worked solely for acquiring coverage might

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<sup>28</sup> Ashley Alman, “Bill O’Brien Compares Obamacare to Fugitive Slave Act.” *HuffPost*, Verizon Media, 26 Sept. 2013, [www.huffpost.com/entry/bill-obrien-obamacare\\_n\\_3692332](http://www.huffpost.com/entry/bill-obrien-obamacare_n_3692332).

<sup>29</sup> Laura Snyder and Robin Rudowitz, “Medicaid Financing: How Does It Work and What Are the Implications?” *Kaiser Family Foundation*, Kaiser Family Foundation, 21 Dec. 2016, [www.kff.org/medicaid/issue-brief/medicaid-financing-how-does-it-work-and-what-are-the-implications/](http://www.kff.org/medicaid/issue-brief/medicaid-financing-how-does-it-work-and-what-are-the-implications/).

<sup>30</sup> Kaestner, et al.

<sup>31</sup> Kaestner, et al.

<sup>32</sup> Casey B. Mulligan, *Side Effects and Complications: the Economic Consequences of Health-Care Reform*. University of Chicago Press, 2015.

stop working altogether since they no longer need to work to obtain health insurance.<sup>33</sup>

Economists are concerned with these possible reductions in labor supply, however these declines are not the only labor supply effects that may occur.

The ACA's Medicaid eligibility expansion may actually increase the labor supply of certain individuals. Some people may work additional hours because they can now earn more money and remain eligible for Medicaid.<sup>34</sup> The ACA's eligibility expansion might also have a positive effect on economic activity that could increase labor supply.<sup>35</sup> The health benefits from receiving health insurance coverage from Medicaid could contribute to small increases in labor supply as well. Individuals may now be healthier, which allows them to work more hours in a typical week and be more productive. The possible labor supply effects of the expansion of the Medicaid income eligibility threshold vary. Since the ACA's Medicaid eligibility expansion has the potential to both increase and decrease labor supply it is unclear what the aggregate effects are. The Congressional Budget Office (CBO) estimated that the ACA would lower labor supply, and reduce total hours worked by nearly two percent. This is the equivalent of two million less full time workers in the United States.<sup>36</sup> However, other Economists dispute the CBO's figure, and the overall labor supply effects remain to be a highly debated topic.<sup>37</sup> This thesis looks to determine how the ACA's Medicaid eligibility expansion has affected labor supply in the United States, and if there are any labor market consequences. Did the ACA's Medicaid eligibility expansion reduce U.S. labor supply?

## **Purpose and Outline**

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<sup>33</sup> Kaestner, et al.

<sup>34</sup> Craig Garthwaite, et al. "Public Health Insurance, Labor Supply, and Employment Lock." *NBER*, National Bureau of Economic Research, 11 July 2013, [www.nber.org/papers/w19220](http://www.nber.org/papers/w19220).

<sup>35</sup> Kaestner, et al.

<sup>36</sup> "Labor Market Effects of the Affordable Care Act: Updated Estimates." *Congressional Budget Office*, Congressional Budget Office, [www.cbo.gov/sites/default/files/cbofiles/attachments/45010-breakout-AppendixC.pdf](http://www.cbo.gov/sites/default/files/cbofiles/attachments/45010-breakout-AppendixC.pdf).

<sup>37</sup> Kaestner, et al.

The related literature on this topic has little consensus, which is why it is imperative that this subject is further explored. Medicaid is a key part of U.S. policy. Millions of Americans rely on Medicaid for healthcare coverage. It is important to understand the labor supply effects of the ACA's Medicaid eligibility expansion for formulating future U.S. healthcare policy, and for reforming Medicaid.

This opening chapter introduced the research question, gave background information, as well as explained the possible effects that economic theory proposes. In the next chapter, I will discuss literature on the effect of Medicaid expansions on labor supply. The literature discussed focuses on the ACA's Medicaid eligibility expansion, as well as earlier expansions in the 1980s, 1990s, 2000s, and 2010s. The effects of previous Medicaid eligibility expansions on labor supply can help us predict what the effects of the ACA's expansion will be. For this reason, it is important to consider literature on Pre-ACA expansions in addition to literature on the ACA's expansion. Chapter 3 describes the development of the empirical model, as well as an account of the variables and data used. Chapter 4 discusses the results through an econometric analysis. The final chapter of this thesis concludes with a discussion on the findings, limitations of the model, and suggestions for potential future research.



## CHAPTER 2: LITERATURE REVIEW

Previous literature indicates that the ACA's Medicaid eligibility expansion decreased uninsurance rates, and increased Medicaid coverage. However, the expansion's impact on labor supply remains unclear. The literature has yet to reach a conclusion with consensus on the relationship between Medicaid eligibility expansions and labor supply.<sup>38</sup> Some Economists believe that Medicaid expansions decrease labor supply in the U.S., whereas some think they actually increase labor supply. Others believe that Medicaid expansions have little effect on U.S. labor supply or that the increases and decreases in labor supply balance each other out.<sup>39 40 41</sup>

### Pre-ACA Studies

Before the ACA, Medicaid expansions generally targeted pregnant women, children and parents. Only six states had expanded Medicaid coverage to childless adults prior to the ACA.<sup>42</sup> Oregon's 2008 expansion opened up Medicaid eligibility to include childless adults. It instated a lottery system that allowed winners to apply for the state's Medicaid program. The lottery permitted childless adults to enter for a chance to win Medicaid coverage.<sup>43</sup> Baicker et al. explored the Oregon expansion to see if it had an effect on employment. They used a randomized controlled design, and 2009 data from the Social Security Administration and State administrative records. The study examined one post-treatment year. They found that the lottery

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<sup>38</sup> Pauline Leung and Alexandre Mas, "Employment Effects of the ACA Medicaid Expansions." *Cornell University*, Cornell University, July 2016, [www.princeton.edu/~amas/papers/aca\\_060116.pdf](http://www.princeton.edu/~amas/papers/aca_060116.pdf).

<sup>39</sup> Kaestner, et al.

<sup>40</sup> Katherine Baicker, et al. "The Impact of Medicaid on Labor Market Activity and Program Participation: Evidence from the Oregon Health Insurance Experiment." *The American Economic Review*, U.S. National Library of Medicine, May 2014, [www.ncbi.nlm.nih.gov/pmc/articles/PMC4145849/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4145849/).

<sup>41</sup> Craig Garthwaite, et al. "Public Health Insurance, Labor Supply, and Employment Lock." *The Quarterly Journal of Economics*, vol. 129, no. 2, 7 Mar. 2014, pp. 653–696., doi:10.3386/w19220.

<sup>42</sup> Genevieve Kenney, et al. "A Look at Early ACA Implementation: State and National Medicaid Patterns for Adults in 2014." *Urban Institute*, Urban Institute, 8 Sept. 2016, [www.urban.org/research/publication/look-early-aca-implementation-state-and-national-medicaid-patterns-adults-2014](http://www.urban.org/research/publication/look-early-aca-implementation-state-and-national-medicaid-patterns-adults-2014).

<sup>43</sup> Baicker, et al.

system resulted in no significant changes to employment rates. Baicker et al.'s results show that the Medicaid expansion increased the use of healthcare services, reduced financial burden, decreased rates of depression, and raised rates of diabetes detection and treatment. Increasing Medicaid coverage led to a variety of added benefits in Oregon, and did not create any apparent labor market problems.<sup>44</sup> This experiment was specific to the state of Oregon. Since my study includes ten states, as opposed to just one, it is more representative of the entire nation. Additionally, this study only included one post-treatment year. My study includes a longer post-treatment period of three years, which should give stronger results.

Garthwaite et al.'s study was also concerned with the effect of Medicaid expansions on employment rates. It aimed to determine if employment lock exists in the United States. Employment lock refers to a situation where individuals work for the sole purpose of gaining health insurance.<sup>45</sup> Knowing whether employment lock exists is important for understanding the possible labor effects that the ACA's Medicaid expansion will have. Garthwaite et al. looked at Tennessee's public health insurance disenrollment. Tennessee was the treated state and other Southern states were control states. The study used data from the Current Population Survey (CPS), which surveys 50,000 households on a monthly basis.<sup>46</sup> The CPS has a substantially smaller sample size than the ACS, which is the data source for this thesis. Garthwaite et al. used a difference-in-differences regression model for the analysis, which is the research design that I am also using. In 2005, 170,000 people in Tennessee lost Medicaid coverage.<sup>47</sup> Garthwaite et al. found that immediately after this disenrollment there was a surge in job searching, and employment especially among low-educated childless adults. The expansion led to a statistically

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<sup>44</sup> Baicker, et al.

<sup>45</sup> Garthwaite, et al.

<sup>46</sup> Garthwaite, et al.

<sup>47</sup> Garthwaite, et al.

significant 2.5 percentage point increase in employment for low-educated childless adults. This pre-ACA study is important because its findings suggest that there is significant employment lock in at least some parts of the United States. Based off this analysis, Garthwaite et al. predicted that the ACA's increased coverage would lead to an employment decline of almost a million childless adults.<sup>48</sup> They expected that the ACA's Medicaid expansion would have the opposite effects of Tennessee's disenrollment since the ACA's expansion should lead to an increase in enrollment. However, it is uncertain whether the opposite effect will actually occur when enrollment increases. Tennessee is the only state included in the treatment group, and the control group includes other Southern states. Southern states tend to be more conservative than the rest of the country, and therefore may respond differently to changes in healthcare policy. The findings of this study are not necessarily an accurate representation of the U.S. as a whole.

Dague et al. explored a different pre-ACA Medicaid expansion to childless adults. They looked at the impact of expanding Medicaid to childless adults in Wisconsin on employment. In 2010, Wisconsin launched BadgerCare Plus Core Plan, which provides health insurance to adults with no dependent children who have incomes 200 percent below the FPL. While Wisconsin has given certain low-income childless adults access to Medicaid through their BadgerCare Plus Core Plan, they have yet to adopt the ACA's Medicaid expansion. Dague et al.'s study used data from administrative records and applied a regression discontinuity design, as well as a difference-in-differences research design.<sup>49</sup> They found that this coverage expansion led to a significant five-percentage point drop in employment rates. This is a twelve percent reduction in employment. However, these results may relate to the high unemployment rates throughout the

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<sup>48</sup> Garthwaite, et al.

<sup>49</sup> Laura Dague, et al. "The Effect of Public Insurance Coverage for Childless Adults on Labor Supply." *American Economic Journal: Economic Policy*, vol. 9, no. 2, May 2017, pp. 124–154., doi:10.3386/w20111.

country during this time. The expansion occurred in 2010, which was just two years after the worldwide financial crisis of 2008, so the unemployment rates across the country were abnormally high.<sup>50</sup> The drop in employment that Dague et al. found might not entirely be from the Medicaid expansion. My study includes 2014, 2015, and 2016 as post-treatment years. The treatment in my study occurs six years after the Great Recession so the 2008 financial crisis should not alter my findings.

Yelowitz looked at the labor market effects of Medicaid reform in women. Very few other pieces of literature on this topic analyzed gender. The study focused on legislation passed by Congress from 1986 to 1991. This legislation increased the income threshold, as well as the age limit that allows dependent children to qualify for Medicaid.<sup>51</sup> This separated Aid to Families with Dependent Children (AFDC) and Medicaid eligibility. AFDC provided financial assistance to low-income children. Prior to this Medicaid expansion for children, a family would lose Medicaid if their income was higher than the welfare qualification threshold. Yelowitz hoped to see if this prevented individuals from seeking employment or working more hours. He described the ‘Medicaid Notch’ where individual budget lines are discontinuous at the income level in which they no longer qualify for Medicaid.<sup>52</sup> This suggests that Medicaid recipients will work fewer hours than non-Medicaid recipients will in order to remain eligible. Yelowitz’s study used ten years of data from the CPS and a difference-in-differences research design. He found that the Medicaid expansion resulted in a decrease in AFDC participation, and that after the expansion women were more likely to seek employment. The results show that there was a significant 0.9 percentage point increase in labor force participation among single mothers after

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<sup>50</sup> Dague, et al.

<sup>51</sup> Aaron Yelowitz, “The Medicaid Notch, Labor Supply, and Welfare Participation: Evidence from Eligibility Expansions.” *The Quarterly Journal of Economics*, vol. 110, no. 4, 1995, pp. 909–939., doi:10.2307/2946644.

<sup>52</sup> Yelowitz

the expansion. He also found that the effects of the Medicaid reform were stronger among divorced and separated women, but not strong for women who had never been married. My study only looks at childless adults so mothers are not included in the population of interest. The behavior of women that Yelowitz examined, however, is important for understanding the behavior of women after the ACA's expansion. This 'Medicaid notch' introduced by Yelowitz may occur in states who took on the ACA's expansion. Nevertheless, the way individuals react to Medicaid expansions may have changed since the 20<sup>th</sup> century.

Montgomery et al. also focused on women in the late 1980s and early 1990s in their study. They used a two-step empirical model, as well as data in the CPS March Supplements from 1988 through 1993. Montgomery et al. looked to see if different levels of benefits affect labor supply. Their results indicated that a ten percent increase in monthly Medicaid expenditures significantly reduced labor force participation by 0.36 percentage points among women.<sup>53</sup> Very few previous studies looked at specific demographic groups such as women. Individuals with dissimilar backgrounds and characteristics may respond differently to Medicaid expansions. My study looks at the results for men and women independently, and I suggest that future researchers do the same.

### **ACA Studies**

Leung and Mas looked at the ACA's Medicaid eligibility expansion. Their study aimed to see if the ACA's expansion lessened employment lock in childless adults who were not previously eligible for Medicaid. As discussed earlier in this paper, Garthwaite, et al. also explored the phenomenon known as employment lock. Leung and Mas used ACS data from

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<sup>53</sup> Edward Montgomery and John Navin, "Cross-State Variation in Medicaid Programs and Female Labor Supply." *Economic Inquiry*, vol. 38, no. 3, 26 July 2000, pp. 402–418., doi:10.3386/w5492.

2010 to 2014, and Current Population Survey (CPS) data from 2010 to 2015. They used a difference-in-differences research design to perform this analysis. Leung and Mas found that while the expansion increased Medicaid coverage for childless adults by three percentage points, it had no statistically significant effect on labor supply. Leung and Mas' results contradict the employment lock effects found by Gathwaite et al.<sup>54</sup> Due to these opposing results, it is unclear if employment lock exists. Future research should study if employment lock exists at all or if it only exists in some regions of the country or in certain demographic groups.

Kaestner et al. examined the effect of the ACA's Medicaid eligibility expansion on the labor supply of certain low-income individuals. This study is perhaps the most similar to mine out of all of the literature discussed. Their population of interest included non-disabled adults between the ages of twenty-two and sixty-four who have a high school education or less. Kaestner et al. and I both chose to determine our populations of interest by using education in place of income. The data used in this analysis comes from the ACS from 2010 to 2014, the March CPS from 2010 to 2015, and the monthly CPS data from January 2010 to March 2016. The study used a difference-in-differences research design, as well as a synthetic control model. Their results showed that Medicaid expansions had little impact on work effort. Kaestner et al. found that while not statistically significant, the expansions actually increased work effort for childless adults in their sample population. Kaestner et al. found that the ACA's Medicaid expansions resulted in statistically significant increases in Medicaid coverage between 54 percent and 70 percent for childless adults. Their results show that it decreased the proportion uninsured by between 9 percent and 15 percent.<sup>55</sup> Kaestner et al. reported their outcomes as

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<sup>54</sup> Garthwaite, et al.

<sup>55</sup> Kaestner, et al.

ranges because they used more than one empirical model, and therefore had multiple results.<sup>56</sup> Their findings go along with literature by Leung and Mas, as well as Baicker et al., which also found no significant effect on labor supply.<sup>57 58</sup>

Duggan et al. also looked to see what the ACA's effects on labor market outcomes are. The study uses data from the ACS. They found that the average effects of the ACA's Medicaid expansion on labor supply were almost zero. According to Duggan et al., the countervailing effects balance each other out. Increases in Medicaid coverage accounted for the majority of coverage increases that Duggan et al. found in the states that adopted the ACA's expansion.<sup>59</sup> The findings show that Medicaid expansion has greatly increased Medicaid coverage and reduced the rate of the uninsured without having any labor market consequences. They refute the findings of previous literature on Medicaid expansions that suggest Medicaid expansions significantly decrease labor supply<sup>60</sup>. Other Economists must complete research on this topic in order to understand the true labor market effects of the ACA's Medicaid expansion. My thesis aims to help clarify what the actual labor supply effects of the ACA's Medicaid eligibility expansion are.

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<sup>56</sup> Kaestner, et al.

<sup>57</sup> Leung and Mas

<sup>58</sup> Baicker, et al.

<sup>59</sup> Mark Duggan, et al. "The Effects of the Affordable Care Act on Health Insurance Coverage and Labor Market Outcomes." *Stanford Institute for Economic Policy Research*, Stanford University, July 2017, [siepr.stanford.edu/sites/default/files/publications/17-022.pdf](http://siepr.stanford.edu/sites/default/files/publications/17-022.pdf).

<sup>60</sup> Duggan, et al.

## CHAPTER 3: EMPIRICAL APPROACH

### Data

The data used in this analysis comes from the American Community Survey (ACS), and is both individual-level and cross-sectional.<sup>61</sup> The pretreatment years included are 2010, 2011, 2012, and 2013. The post-treatment years are 2014, 2015, and 2016. The ACS samples one percent of the U.S. each year (approximately three million people), and is the largest household survey in the United States. It aims to collect annual estimates of various social, economic, and housing characteristics of the U.S. population for different subgroups and geographic areas.<sup>62</sup> The survey is conducted each month, and merged together to create an annual file at the end of the year. It collects information on health insurance coverage status at the time of interview. Since participants are legally required to respond, it has a high response level.<sup>63</sup> The law requires individuals answer honestly so the ACS provides accurate responses. To form my data set I merged the annual files for the post-treatment and pre-treatment years for every state included in the study. I then removed the responses of individuals who failed to provide their typical hours worked per week or education level from the data set. My population of interest for this study consists of non-disabled, non-pregnant adults between the ages of eighteen and sixty-five who have a high school education or less, and are not parents of minors.

The ACA's Medicaid eligibility expansion targets low-income individuals so income would have been the ideal variable to determine my population of interest. However, a variety of issues would arise if I used income. Medicaid may influence labor supply and income, which

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<sup>61</sup> "PUMS Data." *United States Census Bureau*, U.S. Department of Commerce, 14 Feb. 2019, [www.census.gov/programs-surveys/acs/data/pums.html](http://www.census.gov/programs-surveys/acs/data/pums.html).

<sup>62</sup> "Fact Sheet: Differences Between ACS & CPS." *United States Census Bureau*, U.S. Department of Commerce, 16 May 2016, [www.census.gov/topics/income-poverty/poverty/guidance/data-sources/acs-vs-cps.html](http://www.census.gov/topics/income-poverty/poverty/guidance/data-sources/acs-vs-cps.html).

<sup>63</sup> "About the American Community Survey." *United States Census Bureau*, U.S. Department of Commerce, 17 June 2018, [www.census.gov/programs-surveys/acs/about.html](http://www.census.gov/programs-surveys/acs/about.html).



could result in biased estimates.<sup>64</sup> Despite the fact that the law requires individuals to answer the ACS honestly, individuals may still provide dishonest answers. People are more likely to lie about their income than their education level.<sup>65</sup> The income variable in my data set also had large amounts of missing information, which would have lowered my number of observations. Due to these problems, I use education to help determine my population of interest because education level has a strong and positive relationship with income.<sup>66</sup> Individuals with a high school education or less are more likely to face poverty than those with a college education. Americans with a college education are paid seventy-four percent more than those who only attended high school. Hence, lower educated individuals are more likely to have low incomes, and therefore are more likely to be impacted by the ACA's Medicaid expansion.<sup>67</sup>

My population of interest only includes people between the ages of eighteen and sixty-five since individuals become eligible for Medicare when they turn sixty-five, and individuals under the age of eighteen are minors.<sup>68</sup> Minors typically receive health insurance coverage through their parents, and do not usually have full time jobs. They also have had prior access to Medicaid. Similarly, I only include individuals who are not pregnant, not disabled, and not a parent of minors since these groups have not previously been able to receive Medicaid. The

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<sup>64</sup> Kaestner, et al.

<sup>65</sup> Benedict Carey, "I'm Not Lying, I'm Telling a Future Truth. Really." *The New York Times*, The New York Times, 6 May 2008, [www.nytimes.com/2008/05/06/health/06mind.html](http://www.nytimes.com/2008/05/06/health/06mind.html).

<sup>66</sup> Scott Wolla, and Jessica Sullivan, "Education, Income, and Wealth." *Economic Research Federal Reserve Bank of St. Louis*, Federal Reserve Bank of St. Louis, Jan. 2017, [research.stlouisfed.org/publications/page1-econ/2017/01/03/education-income-and-wealth/](http://research.stlouisfed.org/publications/page1-econ/2017/01/03/education-income-and-wealth/).

<sup>67</sup> Eduardo Porter, "A Simple Equation: More Education = More Income." *The New York Times*, The New York Times, 10 Sept. 2014, [www.nytimes.com/2014/09/11/business/economy/a-simple-equation-more-education-more-income.html](http://www.nytimes.com/2014/09/11/business/economy/a-simple-equation-more-education-more-income.html).

<sup>68</sup> Patricia Barry, "Medicare Eligibility, Age, Qualifications And Requirements." *AARP*, AARP, Mar. 2016, [www.aarp.org/health/medicare-insurance/info-04-2011/medicare-eligibility.html](http://www.aarp.org/health/medicare-insurance/info-04-2011/medicare-eligibility.html).

expansion is more likely to affect them since they have not had the opportunity to get Medicaid in the past.<sup>69</sup>

### **Difference-In-Differences Research Design**

This thesis uses a difference-in-differences (DiD) research design. It studies the differential effect of a treatment on a treatment group versus a control group. What set this study apart from previous studies is that it only observes swing states. The treatment group consists of swing states that expanded Medicaid eligibility to comply with the ACA on January 1, 2014 (Minnesota, Iowa, Nevada, Colorado, Ohio, and New Mexico), and the control group is made up of swing states that have not adopted the ACA's eligibility expansion (Wisconsin, North Carolina, Georgia, and Florida). The DiD research design only works if the pretreatment trends are the same for the treatment and control group. Red states (states with Republican leadership) and blue states (states with Democratic leadership) have different pretreatment trends. A handful of Democratic states including Oregon expanded before the ACA.<sup>70</sup> Additionally, Democratic states have policies that are more helpful for single people, the disabled, and individuals with incomes below the threshold.<sup>71</sup> Meanwhile, Republican states have no prior expansions, and uphold policies that are more conservative.<sup>72</sup> Hence, I expect red and blue states to have different pretreatment trends. Swing states' pretreatment trends should be closer together because they are less polarized.

Swing states are U.S. states where the Democratic and Republican Parties have similar levels of support among constituents. I identified swing states in this study by looking at the

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<sup>69</sup> "Eligibility." *Medicaid.gov*, U.S. Centers for Medicare & Medicaid Services, [www.medicaid.gov/medicaid/eligibility/index.html](http://www.medicaid.gov/medicaid/eligibility/index.html).

<sup>70</sup> "State Overviews"

<sup>71</sup> "Party Platform." *Democrats*, Democratic National Committee, 2018, [democrats.org/about/party-platform/](http://democrats.org/about/party-platform/).

<sup>72</sup> "Republican Platform." *GOP*, Republican National Committee, 2019, [gop.com/platform/](http://gop.com/platform/).

2012 and 2016 Presidential election results provided by *CNN*.<sup>73 74</sup> If the winning candidate received fifty-four percent of the vote or less for both the 2012 and 2016 elections then I considered them a swing state. This left me with ten swing states that either have not adopted the expansion or that expanded Medicaid on January 1, 2014. The treatment group for this study includes states that expanded on the same day so that I can follow the effects simultaneously.

As shown in *Table 1*, the pretreatment trends of the treatment and control group are very similar. *Table 1* provides the descriptive statistics of non-disabled, non-elderly, non-pregnant, childless adults with a high school education or less. Before the expansion, the average age of each group was around forty-four, thirty-five percent of the population was female, and about half of the population was married. The demographic characteristics for both the expansion states and non-expansion states prior to 2014 are alike. From 2010 to 2013, approximately six percent of both groups were Medicaid recipients. The treatment and control groups, however, differ slightly for other health insurance types. Yet, the differences are not sizable. Overall, the swing states in the control and treatment group have similar pretreatment trends so the difference-in-differences research design should be able to work well using this set of data.

The following regression model can provide DiD estimates:

$$\text{Labor Supply}_{ist} = \alpha_0 + \beta_s + \delta_t + \lambda(\text{TREAT}_s * Y2014_t) + X_{ist} \Gamma + e_{ist}$$

Equation (1) denotes that labor supply of individual “i” in state “s” and year “t” depends on state fixed effects ( $\beta_s$ ), year fixed effects ( $\delta_t$ ), and a vector of control variables ( $X_{ist}$ ). The control variables included in this model are race, marital status, gender, and citizenship status. It also denotes an error term ( $e_{ist}$ ) and an indicator of whether or not the state is in the treatment group and in the post-treatment period ( $\lambda(\text{TREAT}_s * Y2014_t)$ ).  $\text{TREAT}_s$  is a binary variable equal to one

<sup>73</sup> “Election 2012: Results.” *CNN*, CNN, 10 Dec. 2012, [www.cnn.com/election/2012/results/main/](http://www.cnn.com/election/2012/results/main/).

<sup>74</sup> “Presidential Results.” *CNN*, CNN, [www.cnn.com/election/2016/results/president](http://www.cnn.com/election/2016/results/president).

for the treatment states that expanded Medicaid on January 1, 2014, and equal to zero for the control states that have yet to expand.  $Y_{2014_t}$  is a binary variable equal to one for post-treatment years, which includes 2014, 2015, and 2016.  $Y_{2014_t}$  is equal to zero for all pretreatment years, which includes 2010, 2011, 2012, and 2013. This regression model accounts for state fixed effects so I expect that the results I will receive are from the ACA's Medicaid expansion, and not from other policies occurring in the states during this period. The model also includes year fixed effects, which controls for all policies in that year that could impact the dependent variable.

## CHAPTER 4: EMPIRICAL RESULTS

### Medicaid Coverage

I begin the discussion of the results by examining the effect of the ACA's Medicaid eligibility expansion on health insurance coverage. Health insurance coverage is partitioned into a few different groups: Medicaid coverage, private insurance coverage, and uninsured. *Figure 2a* shows the trends in Medicaid coverage for the treatment and control group. Before the 2014 Medicaid eligibility expansion, the treatment and control group experienced parallel trends in Medicaid coverage. After the ACA's expansion, the treatment group experienced a large jump in Medicaid coverage. This rise in Medicaid coverage continues into 2016. Meanwhile, the control group's increase in Medicaid coverage is more subtle. *Table 2* presents the DiD estimates, which are found using data from the ACS. The results shows that the ACA's Medicaid eligibility expansion increased Medicaid coverage by 4.3 percentage points in non-disabled, non-elderly, non-pregnant, childless adults with a high school education or less. As I expected, this increase in Medicaid coverage is statistically significant. Medicaid coverage increased sizably by 71.6 percent. There was not much of a difference in the increase in Medicaid coverage between men and women. Both men and women experienced statistically significant increases in Medicaid coverage. According to these results, the ACA accomplished its goal to increase Medicaid coverage among low-income Americans.

### Crowding-Out

The crowding-out effect is an economic theory that suggests that increasing public sector spending reduces private sector spending.<sup>75</sup> In this case, it suggests that expanding Medicaid eligibility will cause some people to change their insurance coverage from private coverage to Medicaid, which is public. *Figure 2b* shows the trends in private insurance coverage among low-income, non-pregnant, non-elderly, non-disabled, childless adults. In 2013, both the treatment and control group began to increase their level of private coverage. However, the control group increases by more than the treatment group, and the treatment group appears to level off around 2014. *Table 2* shows that there was a reduction in private insurance, and increase in Medicaid coverage, which suggests that the expansion resulted in some level of private insurance crowd-out for public insurance. The expansion decreased private insurance coverage by 3.7 percentage points. This a 5.7 percent reduction, and is statistically significant. As discussed above, Medicaid coverage increased by 4.3 percentage points and this rise in coverage is also statistically significant. These statistically significant changes in both private insurance coverage and Medicaid coverage suggest that there was a significant amount of private insurance crowd-out for public insurance because of the ACA's Medicaid eligibility expansion. It is not surprising that the U.S. government's attempt to provide more Medicaid coverage led to some level of private insurance crowd-out.

### **Take-Up Rate**

Take-up rate refers to the proportion of the population that is eligible for a program that participates in the program. In this case, the take-up rate is the amount of the population of interest that were previously uninsured that become insured after the ACA's Medicaid eligibility

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<sup>75</sup> John Holahan, "Crowding Out: How Big A Problem?" *Health Affairs*, Project Hope, 1997, [www.healthaffairs.org/doi/full/10.1377/hlthaff.16.1.204](http://www.healthaffairs.org/doi/full/10.1377/hlthaff.16.1.204).

expansion. To examine the take-up rate it is important to look at the uninsurance rate. When the uninsurance rate decreases the take-up rate increases. The expansion decreased the uninsurance rate by 0.7 percentage points. This is a 2.7 percent reduction in the uninsurance rate; however, the decline is not statistically significant. These results indicate that there is some increase in the take-up rate; however, it is not statistically significant. *Figure 2c* shows the trends in uninsurance rates among the treatment and control groups in this study. Before the expansion, the treatment and control group experience parallel trends. The uninsurance rate for both the treatment and control group started to decrease around 2013. The treatment group's uninsurance rate declined at a slightly faster rate following the expansion. There, however, is not a huge difference in the trends in uninsurance rates among the treatment and control group. This makes sense because my regression results show that the decrease in the uninsurance rate was not significant. The change in the uninsurance rate because of the ACA's expansion was not as large as I anticipated.

### **Labor Supply**

Labor supply in this study refers to typical hours worked per week in a given year. As seen in *Table 2*, the expansion decreased labor supply by 0.082 hours worked per week. This is a 0.2 percent reduction in labor supply and is not statistically significant. So the decline in labor supply is small. These results correspond with those of Duggan et al. and Kaestner et al. who also found that the labor effects of the ACA's Medicaid eligibility expansion were not significant in their studies. A combination of positive and negative labor supply effects might balance each other out, which leads to this insignificant result. *Figure 3* illustrates the pre-treatment and post-treatment labor supply trends of the control and treatment group. The treatment group's labor supply rises until around 2015 when it begins to decrease. Meanwhile, the control group's labor

supply continues to increase even after 2015. It is unclear what is causing the reduction in labor supply for the treatment group around 2015. My model accounted for state fixed effects, as well as year fixed effects. However, I do not think that every change illustrated in *Figure 3* is from the ACA's Medicaid eligibility expansion. It may be the result of measurement error in the dependent variable, which is labor supply (typical hours worked per week). The ACS does not fact check individuals' survey responses, and it may be hard for people to remember how many hours they actually worked per week in the past year. Resultantly, there may be some measurement error, which is causing the graph to have some unexpected fluctuations.

### **Gender Discrepancy in Labor Supply Results**

The results for the effect of the ACA's Medicaid expansion on labor supply are different for men and women. The ACA's Medicaid eligibility expansion significantly increased Medicaid coverage for both genders. It also significantly decreased private insurance coverage, and directly purchased coverage for both men and women. However, men experienced a significant decrease in labor supply, whereas women experienced a significant increase in labor supply. Their labor supplies had opposite responses to the ACA's Medicaid eligibility expansion. The expansion decreased the number of hours men work each week by 0.364 hours. This is a 0.92 percent decrease in labor supply. Meanwhile, it increased the number of hours that women work each week by 0.531 hours, which is a 1.6 percent increase in labor supply. These opposing results may explain why the results for the entire population of interest were statistically insignificant. The results for men and women balance each other out resulting in statistically insignificant findings for the total sample population.



The behavioral differences between men and women explains the dissimilarity in their empirical results for labor supply. Men may be more likely to take advantage of the system and decrease their hours worked per week to lower their income to qualify for Medicaid. They may have been working to obtain health insurance through their employer and choose to stop working altogether when given Medicaid coverage. On the other hand, I expect women experience health benefits since they now have health insurance coverage. Being healthier may allow them to work additional hours per week, which can explain their increase in labor supply. Prior to the expansion the average typical hours, that men worked per week was 39.94. Whereas the average hours that women usually worked per week was 34.17. On average, men worked more hours than women did. Since men worked more hours, they may be more likely to cut back on their hours worked per week than women may. Additionally, since women worked fewer hours it may be easier for them to increase their labor supply and be more productive when given health insurance. *Figure 4a* shows the labor supply trends for women, and *Figure 4b* shows the labor supply trends for men. In 2014, directly after the expansion, women in the treatment group experienced a sharp jump in labor supply. Both men and women in the treatment groups experienced a reduction in labor supply around 2015. It is unclear what is causing this reduction in 2015, but it may be the result of measurement error in hours worked per week as previously discussed. It may also be a delayed reaction to the 2014 expansion.

### **Sensitivity Analysis**

A sensitivity analysis examines how fluctuations in the assumptions of an empirical model affect its findings<sup>76</sup>. Through a sensitivity analysis I modified the sample and model

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<sup>76</sup> Stuart Gurrea, "Sensitivity Analysis in Economic Modeling." *Economists Incorporated*, Economists Incorporated, 2010, [ei.com/economists-ink/winter-2010/sensitivity-analysis-in-economic-modeling-by-stuart-d-gurrea-jonathan-a-neuberger/](http://ei.com/economists-ink/winter-2010/sensitivity-analysis-in-economic-modeling-by-stuart-d-gurrea-jonathan-a-neuberger/).

specifications to analyze the sensitivity of the findings of my baseline model. I estimated a logit model for binary outcomes instead of a linear probability model (LPM). I also changed the sample population to unemployed adults who are not married. *Table 3* includes the regression results for the sensitivity analysis.

I chose to include a logit model in my sensitivity analysis because one of the disadvantages of the LPM is that when you have a binary variable you can get probabilities that are outside the range of zero to one, which does not make sense. I include the logit model to see if I get the same results as when I use the baseline LPM. Logit only works for binary variables so it is irrelevant for my main dependent variable labor supply. When I used the logit model instead of the baseline LPM the same signs and effects for each outcome variable were found. The marginal effects from the logit model show that the expansion led to a significant increase in Medicaid coverage by 3.2 percentage points, and a significant decrease in private coverage by 3.2 percentage points. It correspondingly found that the expansion led to a statistically significant decrease of 3.3 percentage points in directly purchased insurance coverage. The DiD coefficients, as well as significance levels were alike for all of the outcome variables. This suggests that my results were not entirely dependent on my model specification, and therefore are robust to model selection.

The regression results using a sample population of individuals that are unemployed and not married also found similar results to those found when using my baseline model. I selected not married and unemployed individuals because this population is similar to my baseline population of interest. I expect that the ACA's Medicaid eligibility expansion affect this new sample population because they likely are low-income. As seen in *Table 3* I found that the ACA's Medicaid expansion significantly increased Medicaid coverage by 12.7 percentage

points. This is a 75.6 percent increase in Medicaid coverage. Additionally, I found that the expansion significantly decreased private insurance coverage by 4.9 percentage points, and decreased directly purchased insurance coverage by 4.8 percentage points. Once again, the DiD coefficients are similar and have similar significance levels to the results found using my baseline model. This shows that my results are robust to choosing a similar population of interest and that the population I selected does not drive my results. The results of my sensitivity analysis support the use of my empirical model and sample population.

### **Falsification Test**

Economists use falsification tests to help evaluate the validity of assumptions made in the baseline empirical model.<sup>77</sup> I conducted a falsification test on two different populations who the ACA's Medicaid eligibility expansion should not affect. The first population was non-disabled, pregnant women with a high school education or less. This population should have already been eligible for Medicaid coverage prior to the ACA's expansion in 2014. The second population I examined was non-disabled, non-pregnant childless minors with high school or less. Children previously had access to Medicaid so I do not expect the expansion to affect them significantly.

*Table 4* shows the regression results for these falsification tests. Non-disabled pregnant women with a high school education or less showed no significant results for any of the dependent variables, which is what I projected. They did not experience a significant change in Medicaid coverage, uninsurance, or private coverage. These insignificant results makes sense because non-disabled pregnant women with a high school education or less were not a target of the ACA's Medicaid eligibility expansion. The results of this falsification test support my data, and suggest that the data set I am using is logical.

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<sup>77</sup> Steven D. Pizer, "Falsification Testing of Instrumental Variables Methods for Comparative Effectiveness Research." *Health Services Research*, vol. 51, no. 2, 2015, pp. 790–811., doi:10.1111/1475-6773.12355.

The sample of non-disabled, non-pregnant, childless minors with a high school education or less also did not have significant change in Medicaid coverage, private coverage or uninsurance. *Table 4* also displays the results for this falsification test. This population experienced a significant increase in labor supply. They increased their typical hours worked per week by 4.99 hours. There is no clear way that their labor supply should react so I am not concerned with this significant finding. Non-disabled, non-pregnant, childless minors with a high school education or less are not a part of the ACA's population of interest so it follows that they did not experience a significant change in Medicaid coverage. These falsification tests support my choice to use data from the ACS, as they did not find any major problems.

## CHAPTER 5: CONCLUSION

In this study, I examine whether the ACA's Medicaid eligibility expansion led to changes in the labor supply of non-disabled, non-pregnant, childless adults between the ages of eighteen and sixty-five. The individuals in this sample population are likely to benefit from the ACA's Medicaid eligibility expansion. I used a difference-in-differences research design that compares the labor supply of the swing states that chose to expand on January 1, 2014, and the swing states that have not expanded, before and after the implementation. I found that although Medicaid coverage increased significantly by 4.3 percentage points there was no significant impact on the labor supply for adults in my overall population of interest. However, there was a discrepancy in the results when I separated men from women. For all men, the Medicaid expansion had a significantly negative effect on labor supply. The expansion resulted in a decline in hours worked per week by 0.364 hours for men. Meanwhile, for all women, the Medicaid expansion had a significantly positive effect on labor supply. They increased their typical hours worked per week by 0.531 hours. Previously literature did not describe such dissimilarities between the two genders. The behavioral differences between men and women explain these results. Perhaps, men are more likely to stop working when they become eligible for Medicaid. On the other hand, men may reduce their hours worked per week to lower their income to qualify for Medicaid. Meanwhile, women may experience a variety of health benefits when given coverage. Since they now are healthier, they can work more hours and actually increase their labor supply.

### **Limitations and Future Research**

One limitation of this study is that I used education to determine the population of interest when income determines Medicaid eligibility. The ACA expanded Medicaid eligibility

to all Americans with incomes 138 percent below the FPL.<sup>78</sup> Ideally, the sample population would only include individuals with incomes 138 percent below the FPL. This is difficult to do because the income threshold varies depending on what the FPL is, and how many people are in the household. Additionally, all of the data sets I encountered included many blanks in the income variable, which would result in fewer observations if used. Despite the fact that it would be difficult and provide fewer observations, selecting a population of those with income 138 percent below the FPL would give a more accurate representation of the population of interest. The government should find better ways to gather income data in order to help improve research on this topic. The ACS and CPS should add a question to their surveys asking if individuals are below or above the ACA's Medicaid income threshold. This would allow future researchers to identify a more accurate population of interest, and therefore provide results that are more accurate.

Another limitation of the data set used is that the typical hours worked per week are not fact-checked.<sup>79</sup> Thus, the survey relies on the memories and honesty of individuals answering the survey. It can be difficult for individuals to think back to the past year and estimate how many hours per week they typically worked. This human error brings about measurement error in the study. State fixed effects and year fixed effects are unable to control for this measurement error. I was unable to find a solution for this measurement error in my study. Perhaps the ACS could fact check individual's responses in the future to lessen the level of measurement error. This however, is unlikely as it would be incredibly difficult, and would lower their number of

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<sup>78</sup> "Affordable Care Act (ACA)."

<sup>79</sup> "Methodology." *United States Census Bureau*, U.S. Department of Commerce, 18 June 2018, [www.census.gov/programs-surveys/acs/methodology.html](http://www.census.gov/programs-surveys/acs/methodology.html).

observations substantially. Therefore, this measurement error will likely continue to exist in future studies.

Typically, in this type of study we would like to see more post-treatment years included to strengthen the regression results. In this particular case, I suggest that future researchers only include post-treatment years up until 2016. Economists should be cautious about including years after 2016 because the U.S. elected President Donald Trump in that year.<sup>80</sup> This brought about the creation of ‘Trumpcare’, which made some changes to U.S. healthcare policy.<sup>81</sup> Therefore, if years after 2016 were included in the post-treatment period it would be hard to determine what the actual effect of the ACA’s Medicaid eligibility expansion is versus what is the result of ‘Trumpcare’. My study only included post-treatment years up until 2016, and I advise that for these reasons future researchers should do the same.

Additionally more Economists should analyze the differences between men and women concerning the effect of the ACA’s Medicaid eligibility expansion on labor supply. For years, studies have shown that men and women’s brains differ, which results in behavioral differences between the two genders.<sup>82</sup> My results indicate that men and women responded to the ACA’s Medicaid eligibility expansion in very different ways. It is not shocking that men and women react differently to the ACA’s Medicaid expansion because of their well-known behavioral dissimilarities. Additionally, before the expansion men worked more hours per week than women. This may have also contributed to the different reactions between the genders.

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<sup>80</sup> Tessa Berenson, “Election: Donald Trump Wins the 2016 Election.” *Time*, Time, 9 Nov. 2016, [time.com/4563685/donald-trump-wins/](http://time.com/4563685/donald-trump-wins/).

<sup>81</sup> “Trumpcare and Medicaid.” *Trumpcare.com*, Health Network Group, 23 June 2017, [trumpcare.com/trumpcare-and-medicaid/](http://trumpcare.com/trumpcare-and-medicaid/).

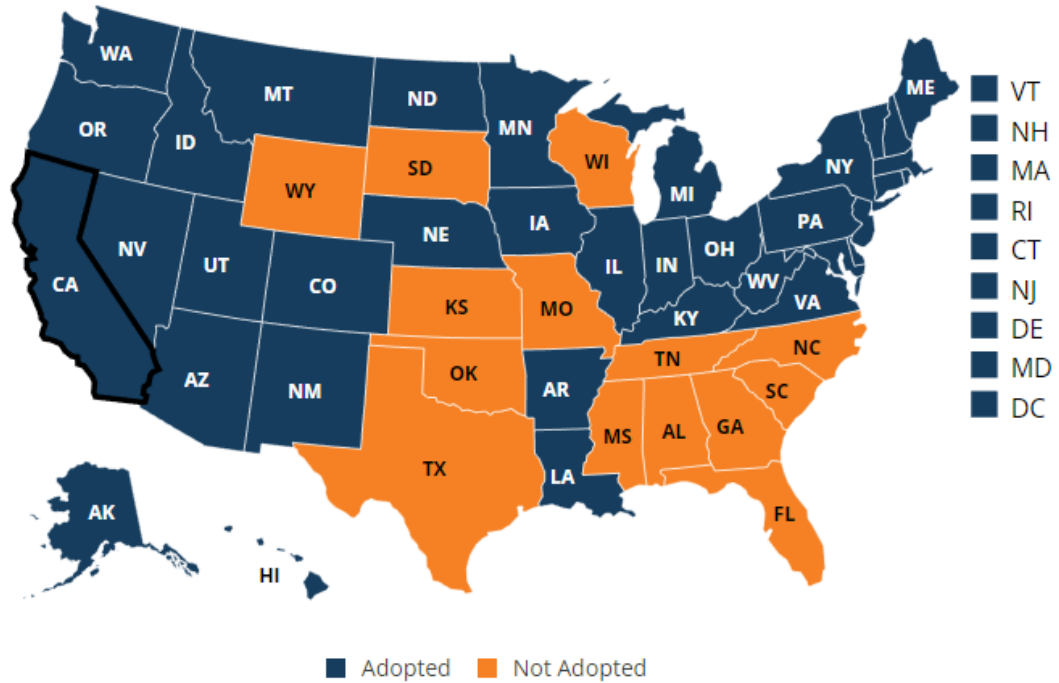
<sup>82</sup> Bruce Goldman and Gérard DuBois, “How Men's and Women's Brains Are Different.” *Stanford Medicine*, Stanford University, [stanmed.stanford.edu/2017spring/how-mens-and-womens-brains-are-different.html](http://stanmed.stanford.edu/2017spring/how-mens-and-womens-brains-are-different.html).

Economists should analyze this discrepancy in future research, as it may be important to take into consideration for the establishment of future healthcare policy.



## APPENDIX

**FIGURE 1:** The Status of State Medicaid Expansion Decisions<sup>83</sup>

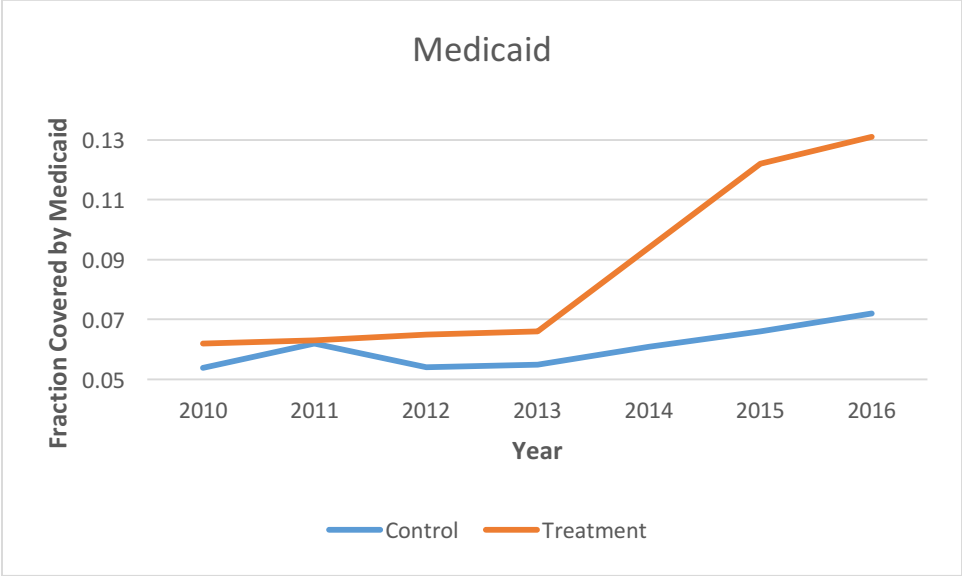


Notes: This figure shows the states that chose to adopt the ACA’s Medicaid eligibility expansion on any date prior to January 2019 in navy. The states that have still not adopted the expansion are in orange. States continue to change their Medicaid programs.

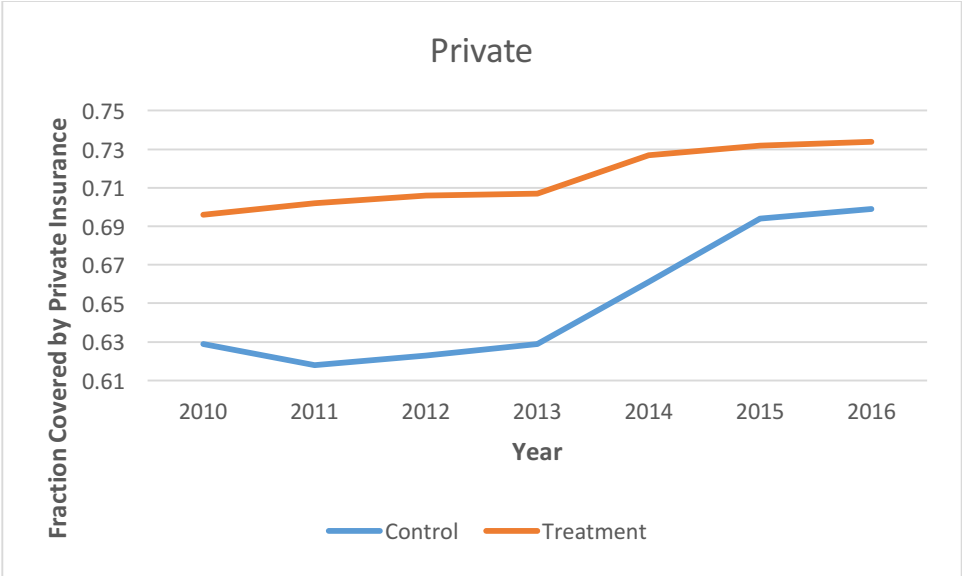
<sup>83</sup> “Status of State Medicaid Expansion Decisions: Interactive Map.”

**FIGURE 2:** Health Insurance Trends, Expansion vs. Non-expansion States

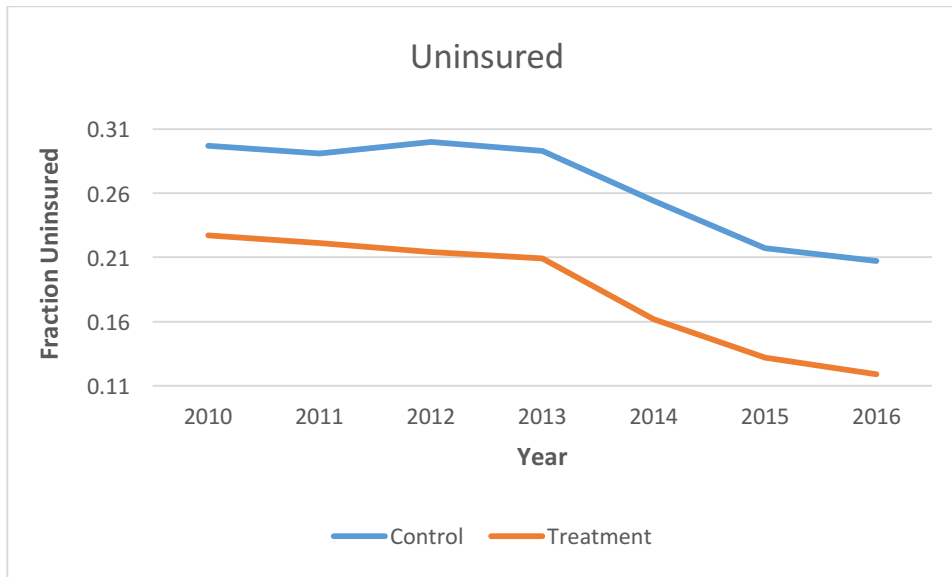
A.



B.

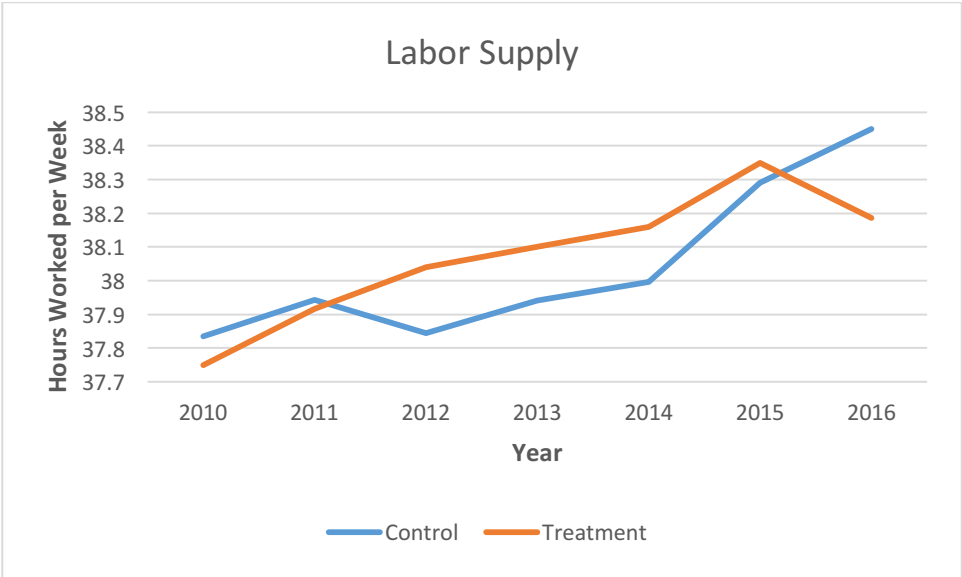


C.



Notes: This sample includes childless, non-disabled, non-pregnant, non-elderly adults with a high school education or less, and that either expanded on January 1, 2014 (Minnesota, Iowa, Nevada, Colorado, Ohio, and New Mexico) or did not expand (Wisconsin, North Carolina, Georgia and Florida). Data is from the ACS. Private refers to private health insurance coverage. Private health insurance coverage can include both directly and employer.

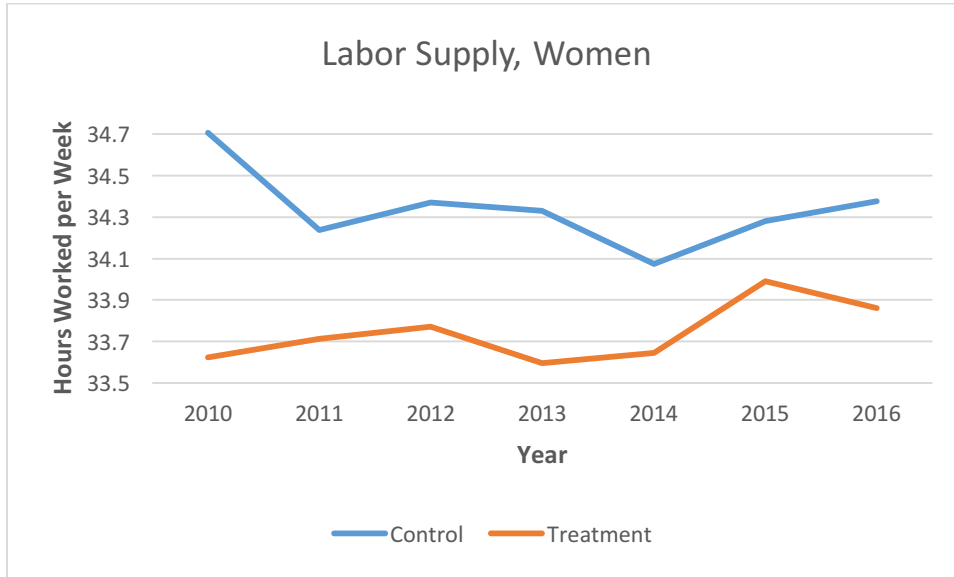
**FIGURE 3:** Labor Supply Trends, Expansion vs. Non-Expansion States



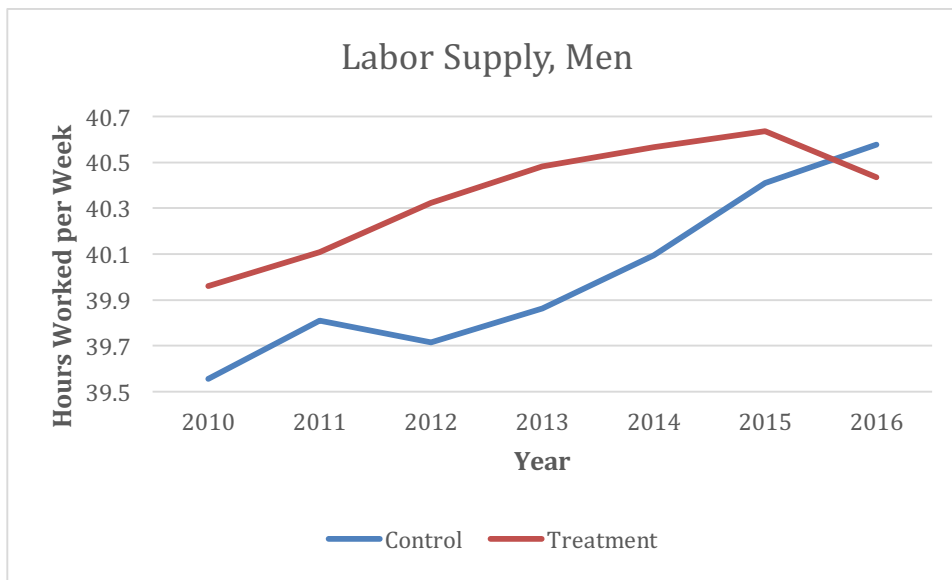
Notes: The sample includes childless, non-disabled, non-pregnant, non-elderly adults with a high school education or less, and that either expanded on January 1, 2014 (Minnesota, Iowa, Nevada, Colorado, Ohio and New Mexico) or did not expand (Wisconsin, North Carolina, Georgia, and Florida). Data is from the ACS.

**FIGURE 4: Labor Supply Trends among Different Genders, Expansion vs. Non-Expansion States**

A.



B.



Notes: The sample includes childless, non-disabled, non-pregnant, non-elderly adults with a high school education or less, and that either expanded on January 1, 2014 (Minnesota, Iowa, Nevada, Colorado, Ohio, and New Mexico) or did not expand (Wisconsin, North Carolina, Georgia and Florida). Data is from the ACS. For *Figure 4A* the sample is limited to only women, whereas for *Figure 4B* the sample is restricted to only include men.

<b>Table 1. Descriptive Statistics of the Sample Population</b>					
	<b>Expansion States</b>		<b>Non-Expansion States</b>		<b>Pre-2014 Diff.</b>
	2010-2013	2014-2016	2010-2013	2014-2016	
	[1]	[2]	[3]	[4]	[5]=[1]-[3]
<b>1. Demographics</b>					
Age	44.646 (15.563)	44.529 (15.928)	44.55 (15.519)	44.312 (15.614)	0.096
Female	0.345 (0.476)	0.345 (0.475)	0.355 (0.355)	0.346 (0.476)	-0.01
Married	0.537 (0.499)	0.51 (0.500)	0.517 (0.500)	0.498 (0.500)	0.02
Unemployed	0.057 (0.232)	0.039 (0.194)	0.062 (0.241)	0.037 (0.189)	-0.005
No High School	0.155 (0.362)	0.147 (0.354)	0.195 (0.396)	0.183 (0.387)	-0.04
High School	0.845 (0.362)	0.853 (0.354)	0.805 (0.396)	0.817 (0.387)	-0.04
White	0.861	0.851	0.758	0.7	0.103
Black	0.051	0.055	0.17	0.227	-0.119
Asian	0.017	0.02	0.019	0.019	-0.002
Native	0.019	0.019	0.007	0.007	0.012
Hawaiian	0.001	0.001	0.001	0.001	0
Other race	0.036	0.037	0.032	0.032	0.004
Mixed	0.015	0.017	0.013	0.014	0.002
Citizen	0.943 (0.232)	0.942 (0.233)	0.896 (0.305)	0.894 (0.308)	0.047
<b>2. Insurance Coverage</b>					
Medicaid Recipient	0.064 (0.245)	0.116 (0.320)	0.056 (0.230)	0.067 (0.249)	0.008
Uninsurance	0.218 (0.413)	0.138 (0.345)	0.295 (0.456)	0.226 (0.418)	-0.077
Employer	0.604 (0.489)	0.618 (0.459)	0.524 (0.499)	0.538 (0.499)	0.08
Directly	0.12 (0.325)	0.128 (0.335)	0.109 (0.311)	0.15 (0.357)	0.011
Private	0.703 (0.457)	0.731 (0.443)	0.625 (0.484)	0.684 (0.465)	0.078
<b>Observations</b>	172,753	126,803	226,602	176,188	-53,849

Notes: the sample population includes childless, non-disabled, non-pregnant, non-elderly adults with a high school education or less. The expansion states include swing states that expanded on January 1, 2014 (Minnesota, Iowa, Nevada, Colorado, Ohio and New Mexico) and the non-expansion states include swing states that have not expanded Medicaid eligibility (Wisconsin, North Carolina, Georgia and Florida). The data used is from the ACS. Employer refers to insurance coverage through a current or former employer or union. Directly refers to insurance purchased directly from an insurance company. Private refers to private health insurance coverage. Private health insurance coverage can include both directly and employer. The standard errors are presented in round brackets.

<b>Table 2. DiD Estimates for the Effect of the ACA's Medicaid Expansion on the Sample Population</b>						
	<b>All Adults</b>		<b>All Men</b>		<b>All Women</b>	
	Pre-2014 Mean	DiD Estimate	Pre-2014 Mean	DiD Estimate	Pre-2014 Mean	DiD Estimate
	[1]	[2]	[3]	[4]	[5]	[6]
Hours Worked Per Week	37.917 (12.932)	-0.082 (0.064)	39.944 (12.837)	-0.364 * (0.114)	34.171 (12.254)	0.531 * (0.175)
Uninsurance Rate	0.262 (0.440)	-0.007 (0.012)	0.291 (0.454)	-0.007 (0.013)	0.207 (0.405)	-0.004 (0.011)
Medicaid Recipient	0.06 (0.237)	0.043 *** (0.006)	0.061 (0.234)	0.042 *** (0.006)	0.058 (0.233)	0.045 *** (0.009)
Private	0.659 (0.474)	-0.037 ** (0.010)	0.633 (0.482)	-0.035 ** (0.010)	0.706 (0.456)	-0.041 ** (0.009)
Directly	0.114 (0.318)	-0.035 ** (0.009)	0.104 (0.305)	-0.033 ** (0.009)	0.132 (0.339)	-0.038 ** (0.009)
Employer	0.559 (0.497)	-0.004 (0.007)	0.54 (0.498)	-0.005 (0.006)	0.593 (0.491)	-0.003 (0.010)
<b>Observations</b>	702,346		457,121		245,225	

Notes: the sample population includes childless, non-disabled, non-pregnant, non-elderly adults with a high school education or less. The treatment group consists of swing states that expanded Medicaid on January 1, 2014 and the control group consists of swing states that have not expanded. The data used is from the ACS. Employer refers to insurance coverage through a current or former employer or union. Directly refers to insurance purchased directly from an insurance company. Private refers to private health insurance coverage. Private health insurance coverage can include both directly and employer. The pre-2014 mean is the mean for the pre-treatment years. The standard errors are presented in round brackets.

\*\*\*=extremely significant (P-value less than 0.001)

\*\*=very significant (P-value less than 0.01)

\*=significant (P-value less than 0.05)

**Table 3. Sensitivity Analysis for the Sample Population**

	All Adults Baseline Model		Logit Model		Unemployed and Not Married	
	Pre-2014 Mean	DiD Estimate	DiD Estimate	Pre-2014 Mean	DiD Estimate	
	[1]	[2]	[3]	[4]	[5]	
Medicaid Recipient	0.06 (0.237)	0.043 *** (0.006)	0.032 *** (0.006)	0.168 (0.374)	0.127 *** (0.017)	
Private	0.659 (0.474)	-0.037 ** (0.010)	-0.032 *** (0.007)	0.328 (0.469)	-0.049 *** (0.009)	
Directly	0.114 (0.318)	-0.035 ** (0.009)	-0.033 *** (0.009)	0.092 (0.288)	-0.048 *** (0.007)	
Employer	0.559 (0.497)	-0.004 (0.007)	-0.003 (0.007)	0.236 (0.425)	-0.003 (0.011)	
<b>Observations</b>	702,346			65,640		

Notes: the sample population includes childless, non-disabled, non-pregnant, non-elderly adults with a high school education or less. The treatment group consists of swing states that expanded Medicaid on January 1, 2014 and the control group consists of swing states that have not expanded. The data used is from the ACS. Employer refers to insurance coverage through a current or former employer or union. Directly refers to insurance purchased directly from an insurance company. Private refers to private health insurance coverage. Private health insurance coverage can include both directly and employer. The pre-2014 mean is the mean for pre-treatment years. The standard errors are presented in round brackets.

\*\*\*=extremely significant (P-value less than 0.001)

\*\*=very significant (P-value less than 0.01)

\*=significant (P-value less than 0.05)



**Table 4. DiD Estimates for the Falsification Tests**

	All Adults Baseline Model		Non-Disabled Pregnant Women with HS or Less		Non-Disabled Non-Pregnant Childless Minors with HS or Less	
	Pre-2014 Mean	DiD Estimate	Pre-2014 Mean	DiD Estimate	Pre-2014 Mean	DiD Estimate
	[1]	[2]	[3]	[4]	[7]	[8]
Hours Worked Per Week	37.917 (12.932)	-0.082 (0.064)	33.028 (11.878)	0.841 (0.420)	23.312 (14.569)	4.995 * (2.193)
Uninsurance Rate	0.262 (0.440)	-0.007 (0.012)	0.279 (0.449)	-0.022 (0.029)	0.102 (0.303)	-0.014 (0.008)
Medicaid Recipient	0.06 (0.237)	0.043 *** (0.006)	0.353 (0.478)	0.019 (0.032)	0.224 (0.417)	0.061 (0.030)
Private	0.659 (0.474)	-0.037 ** (0.010)	0.398 (0.490)	-0.015 (0.009)	0.702 (0.457)	-0.047 (0.030)
Directly	0.114 (0.318)	-0.035 ** (0.009)	0.048 (0.214)	-0.026 (0.015)	0.107 (0.309)	-0.026 * (0.009)
Employer	0.559 (0.497)	-0.004 (0.007)	0.346 (0.476)	0.0123 (0.021)	0.596 (0.491)	-0.023 (0.023)
<b>Observations</b>	702,346		10,359		75,988	

Notes: the sample population includes childless, non-disabled, non-pregnant, non-elderly adults with a high school education or less. The treatment group consists of swing states that expanded Medicaid on January 1, 2014 and the control group consists of swing states that have not expanded. The data used is from the ACS. Employer refers to insurance coverage through a current or former employer or union. Directly refers to insurance purchased directly from an insurance company. Private refers to private health insurance coverage. Private health insurance coverage can include both directly and employer. The pre-2014 mean is the mean for pre-treatment years. The standard errors are presented in round brackets.

- \*\*\*=extremely significant (P-value less than 0.001)
- \*\*=very significant (P-value less than 0.01)
- \*=significant (P-value less than 0.05)

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