Undergraduate Economic Review

Volume 17 | Issue 1 Article 5

2020

The Affordable Care Act and Entrepreneurship Lock: An Updated Examination of Employer-Based Healthcare's Effect on Self-employment by Demographic Group

Sean Ruddy
George Washington University, ruddyml@gwmail.gwu.edu

The Affordable Care Act and Entrepreneurship Lock: An Updated Examination of Employer-Based Healthcare's Effect on Self-employment by Demographic Group

Abstract

This paper capitalizes on a natural experiment created by differences in Medicaid expansion under *The Patient Protection and Affordable Care Act* (ACA). A difference and difference model comparing states that did and did not expand Medicaid is conducted to investigate if providing an alternative and low-cost source of health insurance affects self-employment rates overall and across different demographic groups. The results suggest that living in a state that expanded Medicaid was associated with a 1.4 percent increase in the likelihood that an individual will be self-employed and that this effect is heterogeneous across different demographics, being largest among African Americans.

Keywords

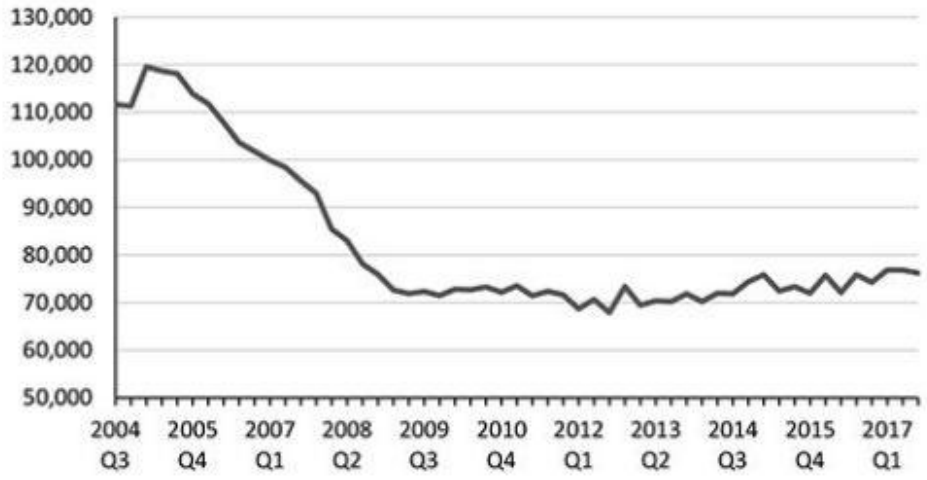
Affordable Care Act, ACA, Entrepreneurship Lock, Health Policy, Job Lock, small business, small business formulation, business formulation

Introduction

Newly formed businesses are the engine of the American economy. Firms less than a year old are wholly responsible for yearly net job growth in the United States and without firm creation, net employment would likely fall by about 1 percent a year (Kane 2010; Haltiwanger, et al. 2008). Firms that survive past their first year experience a higher average growth rate of 16 percent and make disproportionately large contributions to output and productivity growth (Haltiwanger, et al. 2008; Haltiwanger, et al. 2016). In fact, new businesses are so critical to economic growth that some economist have argued that "to the extent that policy interventions aimed at small businesses ignore the important role of firm age, we should not expect much of an impact on the pace of job creation." (Haltiwanger, et al. 2013 pg 360)

Despite the important economic impact newly formed firms have on output, the rate of business formulation has been declining since the mid-2000s. As shown in Graph 1, this decline began before the Great Recession and has not improved in the years thereafter, suggesting that the decline is not solely due to fluctuations in the business cycles. To spur additional economic growth and reverse this trend, existing barriers to entrepreneurship and self-employment should be removed.

Graph 1. Business Formations within 4 Quarters (BF4Q) - Actual and Projected, Seasonally Adjusted



Note: Business formulation within 4 quarters (BF4Q) is a forward-looking measure of business applications that turned into businesses with payroll within four quarters of their application. The above graph shows actual BF4Q through Q4 of 2014 and is estimates thereafter. This graph is from US Census Bureau (2018).

One such barrier to entrepreneurship in the United States may be both the availability and prohibitive cost of healthcare. Before the 2008 financial crisis, small business owners consistently cited health insurance costs as one of their greatest concerns (SBA 2009). In 2010,

45 percent of people who purchased their own health insurance did so because they were self-employed (KFF 2010).

The Patient Protection and Affordable Care Act (ACA) tried to alleviate this problem. Passed in 2010, the ACA's main goal was to reduce the number of uninsured people in the United States, but some supporters claimed that it would also spur business creation. When talking about ACA before its passage, Speaker of the House Nancy Pelosi (2010) said:

> "Imagine an economy where people could follow their aspirations,...Where they could be self-employed or start a business, not be job-locked in a job because they have health care there, and if they went out on their own it would be unaffordable to them." (para. 27)

While the Act was successful at reducing the number of uninsured people in the United States by about 20 million people (Antonisse & Rudowitz 2019), questions remain if the ACA created gains in self-employment and if those gains were uniform across different demographic groups.

This paper attempts to answer this question by using data from the Current Population Survey (CPS) to construct a difference in difference model comparing self-employment rates overall and by demographic group in states that expanded Medicaid under ACA to states that did not. This paper will also be the first to account for state political factors in examining Medicaid's impact on entrepreneurship, thereby supplementing previous research in the area.

Is employer-based healthcare a barrier to self-employment?

Economists have theorized that employer-based health insurance may decrease job mobility as workers fear separating from their current job and losing their employer-provided group health insurance only to be forced into the more expensive individual health insurance market (Holtz-Eakin 1993). This idea, called "Job Lock," has been widely studied by economists over the last 30 years. A paper by Grueber and Madrian (2002) that reviewed 50 studies on job lock concluded that there is "on net strong evidence of job lock" (pg. 35). A systematic review of literature examining the existence of job lock by the Government Accountability Office (GAO 2011) found that 29 of 31 examined studies provided supporting evidence (pg. 6). With a relatively strong empirical backing that job lock between salaried positions exist, some economists have begun to ask if employer-based health insurance creates similar barriers to entrepreneurship and self-employment.

The prevalence of the employer-based healthcare system and a lack of affordable insurance alternatives may create specific barriers to self-employment and "entrepreneurship lock" via two main channels. First, employer-based non-portable health insurance increases the already high risk of starting a new business by forcing would be entrepreneurs to forgo existing employer-based insurance to pursue self-employment (risk channel). Second, the high cost of individual health insurance coverage may diminish the amount of capital an entrepreneur has to

launch their business or use as collateral to secure outside financing (credit channel) (Olds 2016a).

The first paper to empirically examine the existence of entrepreneurship lock was by Holtz-Enkin, Penrod and Rosen (1996). The trio used data from the Survey of Program Participation (SIPP) and the Panel Study of Income Dynamics (PSID) to investigate if a lack of health insurance portability affects the likelihood that an individual will become self-employed. Using a difference in difference model, they examined individuals with existing employer-based health insurance. They compared variations in the probability that an individual will become self-employed between those whose spouse had employer-based insurance (portable insurance) and those whose spouse did not (non-portable insurance). This within group comparison attempts to avoids erroneous conclusions from the "good job" problem, where having employer based health insurance may indicate that an individual has a good job and would be less likely to leave this job to become self-employed than someone with a bad job without health insurance. Additionally, the trio uses a respondent's self-reported health status to produce a second difference in difference estimator that proxies the value an individual put on their insurance, with worse health indicating that an individual values their healthcare more. They predict that poorer health and non-portable health insurance creates a lower propensity to become an entrepreneur. Contrary to their prediction, Holtz-Enkin, Penrod, and Rosen do not find evidence that a lack of health insurance portability affects self-employment. However, their results suffer from large standard errors. The trio explained their results by arguing that starting a business is a risky endeavor, and those who choose to undertake it are unswayed by the additional risks of losing health insurance coverage.

Yet, other researchers have found robust evidence of entrepreneurship lock. Fairle, Kapur and Gates supplement Holz-Enkin, Penrod, and Rosen's model by taking advantage of the continuous surveying methods of the Current Population Survey (CPS) and created matched panel data. With this methodology, they found a large negative effect of poor health status and non-portable insurance in predicting self-employment, suggesting that employer-based health care does create entrepreneurship lock. Their findings are similar to those by Madrian (1998), who found that a lack of health insurance portability accounts for a 25 percent reduction in the business creation, and results from Wellington (2001), who estimated that a guaranteed alternative source of healthcare would increase business formulation by somewhere between 2.3 to 4.4 percent for husbands and 1.2 to 4.6 percent for wives.

Fairle, Kapur and Gates (2010) also pioneered a new methodology to examine entrepreneurship lock in their paper. They performed a regression discontinuity analysis examining the probability that elderly full-time male workers are self-employed just before and just after they turn 65, when they become eligible for Medicare. They find that business ownership rates increase between the ages 64 to 65 but do not increase similarly over other age gains between 55 and 75 years old, providing additional evidence of entrepreneurship lock. Table 1 below summarizes this previous research on entrepreneurship lock.

Table 1. Empirical Evidence on Entrepreneurship Lock

Study	Data Set/Years Studied	Population Studied	Finding Consistent with entrepreneur-ship lock?	Relevant Findings
"Health Insurance and the Supply of Entrepreneurs" by Holtz-Eakin, Penrod, and Rosen (1994)	Survey of Program Participation (SIPP);1984-1986 Panel Study of Income Dynamics (PSID); 1984	Workers with Employer-Based Health Insurance Before Separating	No	The coefficient on the interaction term between having employer-based health insurance and spousal family-based health insurance was statistically insignificant.
"Is Employer-Based Health Insurance a Barrier to Entrepreneurship?" by Fairle, Kapur, and Gates (2010)	Matched Current Population Survey (CPS); 1996-2003	Workers with Employer-Based Health Insurance Before Separating	Yes	The coefficient on the interaction term between spouse's healthcare coverage and health is large, negative, and statistically significant.
"Health Insurance Coverage and Entrepreneurship" by Wellington (2001)	Current Population Survey (CPS); 1993	Non-disabled Employed Married White Husbands and Wives between the ages of 25 and 62	Yes	A guaranteed alternative source of healthcare would increase business formulation by somewhere in between 2.3 to 4.4 percent for husbands and 1.2 to percent for 4.6 for wives.
"The Effect of Health Insurance on Transitions to Self-Employment" by Madrian (1998)	Survey of Program Participation (SIPP);1984-1993	Workers with Employer-Based Health Insurance Before Separating	Yes	Health insurance coverage status has a statistically significant effect on self-employment and that a lack of portable health insurance seems to reduce business creation by 25 percent.

The Impact of an Alternative Healthcare Source on "Entrepreneurship Lock"

In addition to establishing the existence and prevalence of entrepreneurship lock, researchers have examined if alternative sources of healthcare, mainly those provided by the public sector, can promote business formulation. Public health insurance may diminish entrepreneurship lock by providing a portable low-cost alternative to employer-based insurance thus alleviating both the risk and credit barriers to self-employment.

Olds (2016a) examined how the implementation of the national State Child Health Insurance Program (SCHIP) affected self-employment rates. Using a difference in regression discontinuity model, where families just above the income cutoff for SCHIP and just below the income cutoff for SCHIP are compared before and after the program's implementation, Olds found that SCHIP expanded self-employment among covered parents by 15 percent. Olds also examined if SCHIP promoted business formulation via the risk or credit channel. He found that the increase in self-employment occurs almost entirely from a reduction in risk while only minimally impacting credit. Olds thereby extends previous research by Bansak and Raphael (2008), who found that SCHIP improved job mobility for males in families with non-portable health insurance, to the field of business formulation.

Other economists have found evidence that government policy that provided new alternatives for healthcare promoted business formulation. DeCicca (2010) examined if New Jersey's Individual Health Coverage Plan (IHCP) spurred additional self-employment. IHCP helped create an individual healthcare market with coverage and renewal guarantees in the state. He found that IHCP increased self-employment rates in the state by 1.1 to 1.6 percent, a 14 to 20 percent increase from previous self-employment rates. Becker and Tulzman (2015) studied the impact of Massachusetts's 2006 Health Care reform, much of which served as a precursor to the Affordable Care Act, on entrepreneurship in the state using a traditional difference in difference model and an Instrumental Variable (IV) specification. They found that the reform caused self-employment rates in the state to rise by 1.2 to 1.5 percent and that the likelihood of becoming self-employed at the individual level rose by 6.3 percent. They also found this effect differed greatly by gender, as women were 15 percent more likely to become self-employed after the reform compared to a 3.2 percent increase in the probability for men.

Despite the myriad of natural experiments created by the passage and implementation of the Affordable Care Act and a body, albeit it a relatively small one, of existing literature on the subject, there seems to only be two studies that examined changes in self-employment due to the ACA. Lee (2019) leveraged differences in the state by state implementation of the Medicaid expansion under the Affordable Care Act to create a natural experiment that provides evidence of how this expansion affects the probability of self-employment. Using this difference in difference approach, Lee found that the Medicaid expansion caused a 0.8 to 1.6 percent increase in self-employment rates among low-income childless adults. Additionally, he found that newly covered childless adults became 8 to 11 percent more likely to be self-employed due to a lack in the risk of not being uninsured. Callison and Sicilian (2018) also examined the Medicaid expansion under the ACA but looked broadly at its effects on labor market outcomes. While they did find evidence that the expansion increased labor market freedom, they find no evidence that the expansion increased self-employment rates overall. They did, however, find evidence that self-employment rose for specific demographic groups, such as white women. Table 2 below summarizes this previous research on how access to alternative healthcare impacts entrepreneurship.

Table 2. Empirical Evidence of Alternative Healthcare on Entrepreneurship

Study	Data Set/Years Studied	Population Studied	Relevant Findings
"Entrepreneurship and Public Health Insurance" by Olds (2016a)	Current Population Survey (CPS) and the Survey of Program Participation (SIPP); 1992-2013	Non-farmer households with at least one child under 18	The creation of the State Child Health Insurance Program (SCHIP) expanded self-employment among covered parents by 15 percent.
"Health Insurance Availability and Entrepreneurship" by DeCicca (2010)	Behavioral Risk Factor Surveillance System (BRFSS); 1991-1996	Individuals between the ages of 25 and 59	New Jersey's Individual Health Coverage Plan (IHCP) increased self-employment rates in the state by 1.1 to 1.6 percent, a 14 to 20 percent increase from previous self-employment rates.
"Self-Employment and Health Care Reform: Evidence from Massachusetts" by Becker and Tulzman (2015)	Current Population Survey (CPS); 1995-2012	Individuals between the ages of 16 and 64 that are not employed in agricultural industries or the military	The Massachusetts Healthcare reform caused self-employment rates in the state to rise by 1.2 to 1.5 percent and caused the likelihood of becoming self-employed at the individual level to rise by 6.3 percent.
"Health Insurance and the Supply of Entrepreneurs: Evidence from the ACA Medicaid Expansion" by Lee (2019)	Current Population Survey (CPS); 2003-2017	Non-disabled childless adults between the ages of 26 and 64 in low-income households	ACA's Medicaid expansion caused a 0.8 to 1.6 percent increase in self-employment rates among low-income childless adults and that newly covered childless adults were 8 to 11 percent more likely to be self-employed.
"Economic freedom and the affordable care act: Medicaid expansions and labor mobility by race and ethnicity" by Callison and Sicilian (2018)	Current Population Survey (CPS); 2008-2018	Individuals between the ages of 18 and 65 in low-income households	No evidence that the ACA's Medicaid expansion increased self-employment overall but they did find evidence that the expansion promoted self-employment among some demographic groups.

The Patient Protection and Affordable Care Act

The Patient Protection and Affordable Care Act (ACA) represented the most significant changes to the healthcare system in the United States since the passage of Medicare and Medicaid in 1965. ACA made many large-scale policy changes, including (Altman & Schatman 2011 pg 253):

- Ending the practice wherein insurance companies could deny coverage to an individual because of a pre-existing condition
- Creating state-run insurance exchanges for individuals and small businesses
- Creating tax credits for low-income individuals and small businesses to buy private coverage

- Expanding Medicaid to individuals at 138 percent of the federal poverty line (FPL)

These changes could spur entrepreneurship by both increasing the availability and decreasing the cost of nonemployer-based health insurance. While three of these components were implemented as planned, the Medicaid expansion was not. In June of 2012, the Supreme Court ruled in *National Federation of Independent Business (NFIB) v. Sebelius* that it was unconstitutional to force states to expand Medicaid eligibility. States were therefore given the choice to expanded Medicaid creating a natural experiment. States could choose to expand coverage through legislation, an executive order, or a ballot initiative. To date 35 states and DC have expanded Medicaid, leaving only 15 states yet to expand the program (KFF 2020).

While other papers have utilized this natural experiment to examine the effect of the Medicaid expansions on self-employment, this paper will supplement previous research in several ways. First, it will build upon the existing literature on entrepreneurship lock and social insurance by providing additional evidence of how Medicaid expansion impacts firm creation. Second, this paper supplements Lee's existing research by adding an additional year, and supplements Callison and Sicilian research by adding an additional five years of previously unexplored data. Third, this paper will be one of only a few papers to examine the expansions effect on entrepreneurship by demographic group. Finally, this will be the first paper to include state political factors in the analysis, thereby accounting for a previously ignored possible omitted variable.

Data

The data comes from the Annual Social and Economic Supplement (ASEC) of the Current Population Survey (CPS) conducted by the US Census Bureau. CPS is a monthly nationally representative survey of households that collects information on labor force participation and workforce statistics. ASEC is a yearly supplement to the basic monthly CPS survey and is conducted in March with over 75,000 households. ASEC asks respondents a wide variety of questions about their households and their activities over the previous year including demographic information, employment status, income, health status, and health coverage. ASEC provides information about the respondents from the year prior to the survey year. The data used ranges from the 2004 to 2019 ASEC surveys, therefore allowing analysis from 2003 to 2018.

The sample is restricted to childless adults between the ages of 26 and 64 to avoid biases that may arise from alternative health insurance. As previously mentioned, ACA allowed young adults under the age of 26 to be covered by their parent's employer-based health insurance and individuals above 65 years old are eligible for Medicare. The sample is restricted to childless adults specifically to avoid additional basis from programs like SCHIP and because childless adults saw the largest expansion of Medicaid eligibility under the ACA reforms. This sample is also further restricted into two samples based on income.

The first restricted sample (Sample A) only includes those below 300 percent of the federal poverty line (FPL). While ACA only expanded Medicaid to individuals with below 138 percent of FPL, Medicaid eligibility is based off modified adjusted gross income (MAGI), which includes certain deductions that likely would not be reported by respondents in the survey. The self-employed may also underreport their income in tax filings to be below 138 percent of the FPL to be eligible for Medicaid but may report a higher income in the survey.[1] Finally, since the survey asks about income from the previous year there could be recall bis. The 300 percent sample is used to adjust for these factors. This 300 percent sample could be biased by individuals who use subsidies available to those below 400 percent of the FPL under ACA. To account for these problems the analysis is also conducted with a sample restricted to those below 138 percent of the FPL (Sample B).

State that expanded Medicaid after the initial expansion in 2014 are excluded from the analysis. States that are operating their Medicaid program with a Section 1115 waiver, which allows the state to implement an alternative expansion plan than the one stipulated under federal law, are also excluded from the analysis. Massachusetts and Vermont are excluded as they almost fully expanded Medicaid before 2014. Wisconsin is excluded because the state refused to take part in the Medicaid expansion under ACA but did expand Medicaid up to 100 percent of the FPL. With these exceptions, the analysis includes 31 states, 16 that expanded Medicaid and 15 that did not. Table 3 below outlines whether a state is excluded from the analysis, in the control group, or in the treatment group and why. The Appendix also has a map (graph A) that shows which states are in the treatment group (blue), control group (brown), and are excluded from the analysis (purple).

Table 3. States Included in Analysis

No Medicaid Expansion	Medicaid Expansion	
Included in Analysis: Alabama, Florida, Georgia, Kansas, Mississippi, Missouri, Nebraska, South Carolina, South Dakota, Tennessee, Texas, Wyoming, Oklahoma, North Carolina	**Included in Analysis**: Washington, California, Nevada, Colorado, Minnesota, North Dakota, Illinois, West Virginia, Maryland, Delaware, New Jersey, New York, Connecticut, Rhode Island, Kentucky, Oregon	**Excluded from Analysis**:[2] Arizona$^{\perp}$, Massachusetts$^{\infty}$, New Mexico$^{\perp}$, Ohio$^{\perp}$, Maine‡ Louisiana‡, Montana$^{\ddagger\perp}$, Virginia$^{\ddagger\perp,}$ Utah$^{\perp}$, Iowa$^{\perp}$, Michigan$^{\ddagger\perp}$, New Hampshire$^{\ddagger\perp}$, Alaska‡, Pennsylvania‡, Arkansas$^{\perp}$, Utah$^{\ddagger\perp,}$ Hawaii, Vermont$^{¥}$, Wisconsin$^{\epsilon}$, Idaho‡ Indiana$^{\ddagger\perp,}$

All the information on ACA Medicaid expansion is from Kaiser Family Foundation (KFF): https://www.kff.org/health-reform/state-indicator/state-activity-around-expanding-medicaid-under-the-affordable-care-act/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D#note-4

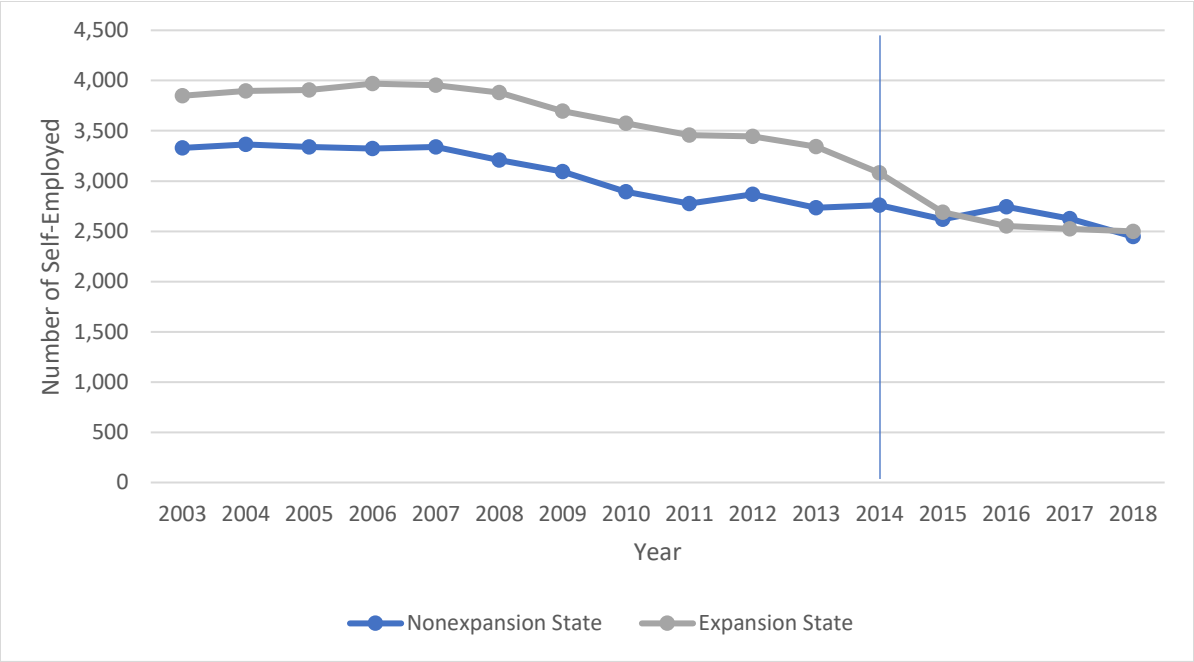
[1] Empirical evidence has shown that the self-employed at much more likely to report income near some arbitrary change in income that effects eligibility or marginal tax rates (called "bunching"). For greater discussion of bunching see Kleven (2016).

[2] $^{\perp}$ indicates a state approved Section 1115 waivers to operate their Medicaid expansion programs in ways not otherwise allowed under federal law. ‡ indicates that a state expanded Medicare after 2014. $^{\infty}$ indicates that a state implemented reforms similar to the Affordable Care Act before 2014. Under MassHealth Medicaid Waivers, adults were covered up to 133% of the FPL in Massachusetts. $^{\epsilon}$Wisconsin expanded Medicare up to 100% of the FPL but did not join the expansion under ACA. $^{¥}$Vermont Fully expanded Medicaid before 2014.

Parallel Trends Assumption and A Preliminary Look at Self-Employment levels

The key assumption for a difference in difference model is parallel trends. This assumption means that without a treatment, the difference between the treatment and the control group would be constant. For the assumption to hold in this context, it must be true that without the Medicaid expansion trends in self-employment in expansion and non-expansion states would be the same. Below is a trend graph of self-employment rates in both groups across the time period studied (graph 2). The graph clearly shows that the two groups operated under similar trends before the expansion, providing some evidence that the parallel trend assumption holds.

Graph 2. Number of Self-Employed Individuals Overtime by Expansion Status



Note: This graph was composed using the whole data set, not one of the income restricted samples. This was done to better capture the general trend in self-employment between the two groups. Medicaid expansion for all included states was 2014, making the pre-period 2003 to 2013 and the post-period 2014-2018.

Previous research examining the Medicaid expansion under ACA has also performed additional statistical tests on this assumption and found it to hold.[3] While this all suggests that the assumption holds, if it was violated the results would be biased and invalid.

Baseline Difference in Difference Models

The first model will be a baseline difference in difference approach comparing states that did not expand Medicaid (control) to states that did expand Medicaid (treatment group). The analysis includes 31 states, 15 in the control group and 16 in the treatment group. The pre-period for this

[3] Lee (2019) performs an event study of Medicaid expansion and finds the estimated differences between expansion and non-expansion states to be statistically insignificant and close to zero.

analysis will be 2003 to 2013 and the post-period will be from 2014 to 2018. The baseline regression has the following specification:

$$Self\text{-}Employment_{ist} = \alpha_o + \beta_1 (Exp_S * Post_t) + X_{ist} + \delta_s + \tau_t + \varepsilon_{ist}$$

Where $Self\text{-}Employment_{ist}$ represents a binary outcome variable for individual *i* in state *s* during time *t*. Exp_S is an indicator variable for if a state expanded Medicaid and is interacted with $Post_t$, an indicator variable for if the state is in the expansion period. X_{ist} is a set of demographic variables including age, sex, race, education, marital status, and if the individual was born in a foreign country.[4] δ_s and τ_t represents fixed state and time effects respectively and are included to remove specific time invariant state characteristics and time variant exogenous shocks. Standard errors are clustered at the state level and basic linear probability model (LPM) regressions are used. This model is based on a similar methodological framework used by Lee (2019).

To examine if the expansion had homogenous effects on different demographics groups, the baseline model is run with gender and racially specific regressions.[5] Demographic specific regressions are run for men, women, whites, African Americans, Asians, and Native Americans. Gender specific regressions are also run for each racial group.

Self-employment is the main outcome variable of this regression, but self-employment is not identical to entrepreneurship. While a direct measure of entrepreneurship would be preferable, this is not possible due to data availability. Self-employment serves as a strong proxy for entrepreneurship, capturing risk-tasking and other characteristics traditionally linked with entrepreneurship (Parker 2009). Using self-employment also allows for the comparison of these results to previous research on entrepreneurship lock, which almost exclusively uses self-employment.

Difference in Difference Model with Gubernatorial Regressor

As with any regression model, if there is some omitted variable that is correlated with both the treatment variable (Medicaid expansion) and the outcome variable (self-employment) the coefficient estimates will be biased. Partisan control of a state's executive branch and a state's general political climate overtime may be such a factor. Medicaid expansion is not random but instead a consequence of political, usually partisan, action by a state's government. Additionally, the political climate of a state likely influences the business landscape, as the two major political parties have differing policy approaches regarding how to support businesses and development.

[4] Foreign birth status is included as a control variable because foreign born workers are more likely to be self-employed than native born workers (Hipple & Hammond 2016). Foreign birth status is also included to allow for comparison of the results to previous work (Lee 2019).

[5] For example, the racial regression for African Americans only uses observations from African American respondents. Therefore, $Exp_S * Post_t$ represents the difference between the probability that an African American individual will be self-employed with the Medicaid expansion to the likelihood they would be self-employed without the Medicaid expansion.

While state fixed effects are included in the baseline model, partisan control of state governmental offices changes over the course of the study period and is therefore not time-invariant. To control for this possible omitted variable, I include a specification of the baseline model with additional regressors to account for political variation in the states between 2003 and 2018. This model has the following specification:

$$Self\text{-}Employment_{ist} = \alpha_o + \beta_1 (Exp_S * Post_t) + \beta_2 RepGov_{st} + \beta_3 RepLeg_{st} +$$

$$\beta_4 MixedLeg_{st} + X_{ist} + \delta_s + \tau_t + \varepsilon_{ist}$$

Where all previous variables are the same as the baseline and $RepGov_{st}$ is a dummy variable for if state had a Republican governor during a given year, $RepLeg_{st}$ is a dummy variable for if the Republican party was in control of both chambers of a state's legislature, and $MixedLeg_{st}$ is a dummy variable for if both chambers of a state legislature was not controlled by the same party for a given year.[6] The model accounts for variation within the executive and legislative branches in a state as Medicaid could be expanded via the legislative process or via a simple executive order. Democratic variables are excluded from this regression to prevent multicollinearity.

Descriptive Statistics

Table 4 below provides descriptive statistics from the 300 percent FPL sample (Sample B) for the treatment and control group in both the pre and post period. It contains information demographics, education, economic factors, and variables related to healthcare. The table shows that the mean for every variable moves in the same direction between treatment and control group in the pre and post time periods for both groups (except for self-employment). The treatment group appears to have fewer males, native born citizens, and married people. The treatment group appears to be slightly more educated and have higher incomes with fewer incorporated business. The difference in the sizes of business between the two groups flips, with the treatment group originally having more small firms, less than 25 people, in the pre-expansion period but fewer smaller firms in the post period. There are less self-employed people in the treatment group before expansion, but more following expansion compared to the control group. This could either suggest that the Medicaid expansion did increase self-employment or that there are different trends between the two groups, thereby violating the parallel trends assumptions. Finally, the treatment group seems to have poorer health in both periods and less employer-based healthcare. Not surprisingly, the treatment group seems to have a larger gain in Medicaid than the control group in the post period.

[6] These variables are independently coded for each year. Rhode Island is the only state in the analysis to have a Governor who was not part of either the Republican or Democratic Party, as Lincoln Chafee began his Governorship as an independent. However, Chafee began identifying as a democrat halfway through his term.

Table 4. Summary Statistics of Important Variables for Sample of 300 percent of FPL

Variable	Non-expansion State (Pre)	Expansion State (Pre)	Non-expansion State (Post)	Expansion State (Post)
Demographic				
Age	46.82	45.37	47.31	45.80
Male	.5166	.5238	.5042	.5160
Born in US	.8250	.7103	.8256	.7217
Married	.3480	.3009	.3215	.2835
Education				
Less than HS	.2304	.2182	.1836	.1839
HS	.3848	.3539	.3915	.3636
Bachelors	.0998	.1284	.1155	.1331
Masters	.0260	.0335	.0318	.0394
Professional	.0079	.0109	.0084	.0112
Economic				
Family Income	21,751	22,258	24,404	25,221
Self-Employment	.0674	.0643	.0568	.0623
Incorporated Business	.0100	.0089	.0102	.0096
Small Firm	.9898	.9883	.9861	.9787
Health				
Poor Health	.2889	.2466	.2734	.2456
Employer Based Healthcare	.3410	.3386	.2646	.2602
Medicaid	.1417	.1761	.1754	.3099
Observations (n)	**55,949**	**69,735**	**26,876**	**26,876**

The Effect of Medicaid Expansion on Self-Employments Rates

Table 5 shows the output from the baseline regression on self-employment for both samples. There are several interesting findings in this output. First, both samples find that self-employment in expansion states was statistically significantly higher by about 1.5 percent compared to non-expansion states. However, this increase is only significant at 10 percent significance level in the 138 percent sample (likely due to the smaller number of observations in this sample). These results are slightly larger than those found by Lee (2019).

Second, it seems that the Medicaid expansion did not have equal effects for all subgroups. The larger 300 percent sample finds significant increases for both genders, whites, and African Americans, with black men having the largest gains. The smaller 138 percent sample finds similar results for African Americans but at a large magnitude, as their self-employment rates are found to be 3.49 percent higher in expansion states than in non-expansion states when using this sample. While other ethnic groups also experience higher levels of self-employment across the board (the only exception being Native American women), these effects are smaller, sometimes less than 1 percent, and are not statistically significant (once again likely due to smaller sample sizes). These results seem to suggest that while Medicaid expansion increased the

self-employment rate across the board, these gains were concentrated within the African American community.

Table 5. Results from Baseline Difference in Difference Regressions by Demographic Group

VARIABLES	Baseline	Males Only	Females Only	White Only	Black Only	Asian Only	Nav. Amer. Only
Sample A: FPL<300%							
*Exp*Post*	0.0154***	0.0163**	0.0143***	0.0133**	0.0263**	-0.000131	0.0375
	(0.00419)	(0.00708)	(0.00506)	(0.00599)	(0.0104)	(0.0223)	(0.0346)
Observations (A)	179,201	92,732	86,469	126,451	36,129	8,755	3,463
R-squared (A)	0.018	0.016	0.013	0.019	0.012	0.028	0.045
Sample B: FPL<138%							
*Exp*Post*	0.0146*	0.0224*	0.00655	0.0125	0.0349***	0.000699	0.0795
	(0.00752)	(0.0132)	(0.00685)	(0.0112)	(0.0121)	(0.0356)	(0.0699)
Observations (B)	74,830	36,971	37,859	50,267	17,230	3,633	1,822
R-squared (B)	0.018	0.014	0.014	0.019	0.015	0.039	0.085
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

VARIABLES	White Female	Black Female	Asian Female	Nav. Amer. Female	White Male	Black Male	Asian Male	Nav. Amer Male
Sample A: FPL<300%								
*Exp*Post*	0.0109*	0.0253**	0.0171	-0.0430	0.0151	0.0272**	-0.0172	0.102**
	(0.00541)	(0.0122)	(0.0262)	(0.0432)	(0.0102)	(0.0129)	(0.0341)	(0.0468)
Observations (A)	60,063	18,199	4,468	1,596	66,388	17,930	4,287	1,867
R-squared (A)	0.014	0.008	0.034	0.052	0.016	0.012	0.031	0.066
Sample B: FPL<138%								
*Exp*Post*	0.00331	0.0251***	0.00741	-0.0109	0.0176	0.0440**	0.00990	0.139
	(0.00912)	(0.00746)	(0.0612)	(0.0271)	(0.0197)	(0.0210)	(0.0232)	(0.120)
Observations (B)	25,129	8,946	1,936	860	25,138	8,284	1,697	962
R-squared (B)	0.015	0.012	0.053	0.083	0.012	0.018	0.045	0.140
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust Standard Errors clustered at state level in parentheses. *** p<0.01, ** p<0.05, *p<0.1. Sample is restricted to childless adults between the ages of 26 and 64. Individual characters are controlled for (i.e. age, gender, race, education, marital and foreign birth status).

The Effect of Medicaid Expansion on Self-Employment Under Differing Partisan Control of the State Governmental Offices

Table 6 includes the output from the baseline regression with the additional gubernatorial regressor. While the 300 percent sample still shows expansion states to have a statistically significant higher self-employment rate, albeit it at a diminished magnitude, the addition of the gubernational regressors reduces the magnitude of the expansion effect in the 138 percent sample so that it is statistically insignificant. While the overall increase is diminished, there are similar effects of expansion on African Americans, men, and all the other demographic groups as in the baseline, providing some additional reassurance of the subgroup baseline results.

While the gubernatorial regressor coefficients may reflect interesting trends, these variables are designed as controls within this model and their coefficients should not be viewed as causal. It is likely inappropriate to interpret these results as evidence that Republican or Democratic state control is better or worse at spurring entrepreneurship across different demographic subgroups. There are many other factors that partisan control maybe capturing including a state's general political and business policy climate or some other unobserved factor. Instead, a different model with the explicit goal of capturing the causal effect of a party's control of state political offices on entrepreneurship would have be constructed. The above results are, however, helpful in showing that any effects of Medicaid expansion are not solely due to political factors.

Table 6. Results from Difference in Difference Regressions with Partisan Regressors by Demographic Group

VARIABLES	Baseline	Males Only	Females Only	White Only	Black Only	Asian Only	Nav. Amer. Only
Sample A: FPL<300%							
*Exp*Post*	0.0141***	0.0146*	0.0134**	0.0114*	0.0268***	-0.00672	0.0292
	(0.00436)	(0.00763)	(0.00518)	(0.00624)	(0.00962)	(0.0225)	(0.0374)
Republican Governor	-0.00429**	-0.00570	-0.00276**	-0.00505**	-0.00145	-0.00885	-0.0191*
	(0.00206)	(0.00345)	(0.00133)	(0.00239)	(0.00390)	(0.00810)	(0.0106)
Republican Legislature	0.00798**	0.0145**	0.000528	0.00618	0.00655	-0.0341	-0.0629
	(0.00386)	(0.00619)	(0.00369)	(0.00463)	(0.00677)	(0.0347)	(0.0428)
Mixed Legislature	0.00377	0.00693	-0.000371	0.00435	-0.00240	0.00860	-0.0584
	(0.00301)	(0.00418)	(0.00265)	(0.00331)	(0.00692)	(0.00707)	(0.0353)
Observations (A)	179,201	92,732	86,469	126,451	36,129	8,755	3,463
R-squared (A)	0.018	0.016	0.013	0.019	0.012	0.028	0.049
Sample B: FPL<138%							
*Exp*Post*	0.0121	0.0198	0.00404	0.00685	0.0371***	-0.0122	0.0701
	(0.00808)	(0.0143)	(0.00729)	(0.0127)	(0.0123)	(0.0399)	(0.0762)
Republican Governor	-0.00750***	-0.0104*	-0.00470*	-0.00928**	0.00105	-0.0223**	-0.0213
	(0.00249)	(0.00524)	(0.00274)	(0.00361)	(0.00371)	(0.00941)	(0.0191)
Republican Legislature	0.0177***	0.0259**	0.00957	0.0147*	0.0180*	-0.0245	-0.0593
	(0.00605)	(0.00984)	(0.00638)	(0.00780)	(0.00900)	(0.0249)	(0.0444)
Mixed Legislature	0.0109*	0.00833	0.0133**	0.0130*	0.00103	0.0223	-0.0385
	(0.00619)	(0.00846)	(0.00496)	(0.00675)	(0.00817)	(0.0136)	(0.0399)
Observations (B)	74,830	36,971	37,859	50,267	17,230	3,633	1,822
R-squared (B)	0.018	0.014	0.014	0.018	0.015	0.040	0.087
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

VARIABLES	White Female	Black Female	Asian Female	Nav. Amer. Female	White Male	Black Male	Asian Male	Nav. Amer Male
Sample A: FPL<300%								
*Exp*Post*	0.00937*	0.0269**	0.0159	-0.0666	0.0130	0.0267**	-0.0293	0.102*
	(0.00550)	(0.0123)	(0.0286)	(0.0491)	(0.0108)	(0.0114)	(0.0310)	(0.0513)
Republican Governor	-0.00358**	0.00280	-0.00253	-0.0404**	-0.00629	-0.00554	-0.0126	-0.00428
	(0.00133)	(0.00422)	(0.0128)	(0.0171)	(0.00456)	(0.00562)	(0.00862)	(0.0155)
Republican Legislature	-0.00232	0.0104*	-0.00491	-0.0550	0.0136	0.00350	-0.0638	-0.0788
	(0.00418)	(0.00509)	(0.0268)	(0.0469)	(0.00825)	(0.0111)	(0.0551)	(0.0473)
Mixed Legislature	-0.000358	0.00332	0.000160	-0.0286	0.00790	-0.00725	0.0135	-0.0874*
	(0.00299)	(0.00341)	(0.00802)	(0.0268)	(0.00516)	(0.0113)	(0.00987)	(0.0470)
Observations (A)	60,063	18,199	4,468	1,596	66,388	17,930	4,287	1,867
R-squared (A)	0.014	0.008	0.034	0.060	0.016	0.013	0.032	0.070
Sample B: FPL<138%								
*Exp*Post*	-0.000303	0.0271***	0.00356	-0.0434	0.0139	0.0461**	-0.00928	0.141
	(0.00960)	(0.00753)	(0.0623)	(0.0272)	(0.0217)	(0.0207)	(0.0237)	(0.131)
Republican Governor	-0.00562*	0.00288	-0.0172	-0.0491***	-0.0123	-0.00139	-0.0205	-0.00479
	(0.00319)	(0.00348)	(0.0134)	(0.0153)	(0.00764)	(0.00634)	(0.0122)	(0.0331)
Republican Legislature	0.00460	0.0178**	0.0581	-0.0554*	0.0254*	0.0181	-0.101*	-0.0905
	(0.00737)	(0.00827)	(0.0384)	(0.0274)	(0.0137)	(0.0121)	(0.0588)	(0.0640)
Mixed Legislature	0.0164***	0.00656	0.00931	-0.00950	0.00904	-0.00390	0.0322	-0.0824
	(0.00467)	(0.00578)	(0.0135)	(0.0221)	(0.0102)	(0.0117)	(0.0342)	(0.0644)
Observations (B)	25,129	8,946	1,936	860	25,138	8,284	1,697	962
R-squared (B)	0.015	0.012	0.054	0.095	0.013	0.019	0.050	0.143
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust Standard Errors clustered at state level in parentheses. *** p<0.01, ** p<0.05, *p<0.1. Sample is restricted to married childless adults between the ages of 26 and 64. Individual characters are controlled for (i.e. age, gender, race, education, marital and foreign birth status).

Implications of Providing an Alternative Source of Healthcare

The above results suggest that Medicaid expansion and access to alternative and cheaper healthcare options has a positive effect on firm creation and entrepreneurship. If the increases observed above hold true across income ranges, this suggests that providing alternative cheaper healthcare would increase the self-employment rate to about 11.5 percent, about a 14 percent increase from the 10.1 percent self-employment rate in 2015, and would create 210,000 new

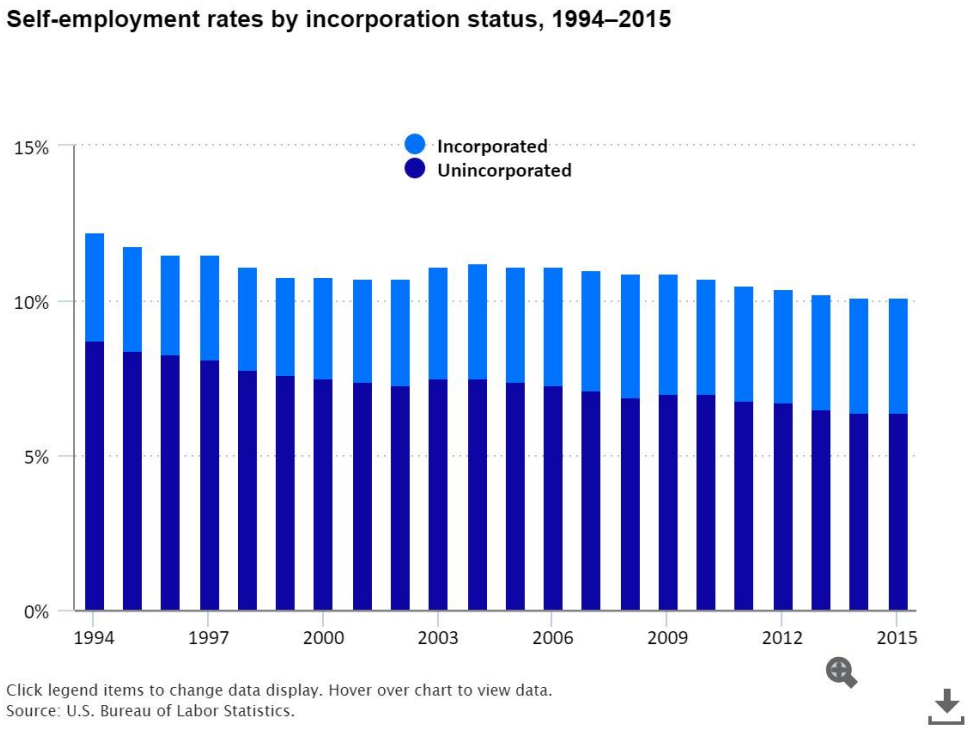
businesses (Hipple & Hammond 2016).[7] Assuming all these new firms have employees, then the addition of these firms would create 1.281 million new jobs.[8] This is likely a large overestimate, as younger firms are more likely to be unincorporated and not have employees. If a slightly more realistic assumption that only a fourth of new firms are employer is used, then 320,250 new jobs would be created.[9]

Significant increases in self-employment and the formulation of new young small firms could lead to substantial increases in innovations within the United States. In industries with the greatest number of innovations, small firms have a 6.64 times greater innovation-per-employee rate than larger firms (Acs& Audretsch 1988). Additionally, research by Allison, Lemley, Moore, and Trunkey (2003) found that individual inventors, small businesses, and small non-profit entities have a higher proportion of litigated patents than larger firms. 39.2 percent of ligated patents in their sample were initially issued to small entities whereas only 13.6 percent of litigated patents in the sample were initially issued to larger firms. This difference in patent ligation suggests that small and younger firms not only produce more innovation-per-employee, but that these patent innovations are also of higher value.[10] New small firms that arise from the provision of an alternative source of health insurance could therefore spur a greater volume of valuable innovations.

Increases to the self-employment rate are particularly importance today given the declining level of self-employment over the last few decades. The self-employment rate has fallen from 12.1 percent in 1994 to 10.1 percent in 2015. The unincorporated self-employment rate specifically, fell from 8.7 percent to 6.4 percent over the same time period (Hipple & Hammond 2016). Graph 3 below shows the declining trend in the overall and unincorporated self-employment rate between 1994 and 2015. One analysis found that the firm creation rate has fallen by 27 percent and that this lower rate led to a loss of 1.7 million jobs between 2006 and 2011 (Gourio & Siemer 2014). If, as this paper's analysis suggests, alternative healthcare spurs business formulation, then providing these alternatives could be a strong tool in reversing this current downward trend.

[7] The estimate of 210,000 new firms come from a 1.4 percent increase in the 15 million people who identified as self-employed in 2015. This is likely a large overestimate as becoming self-employed is not the same as starting a business or new firm.
[8] These projections are based of the estimates that new firms had 6.1 employees on average in 2011 (Hathaway, Bell-Masterson & Stangler 2013). These projections are a large overestimate considering that not all increases in self-employment lead to business with employees.
[9] 75 percent of small businesses were not employers (SBA 2012). The job creation estimate is based of the assumption that alternative health care would create 52,500 new employer firms and that they would have an average of 6.1 employees. This is still likely a large overestimate of the effects of new firms.
[10] Litigation is used as a proxy for the value of patents in the study as litigated patents have a higher number of claims, cite more prior art and are cited by other patents more often than issued patents. For a greater explanation of why litigation us used as an indicator of patent value see Allison, Lemley, Moore, and Trunkey (2003).

Graph 3. Self-employment rates by Incorporation Status, 1994-2015

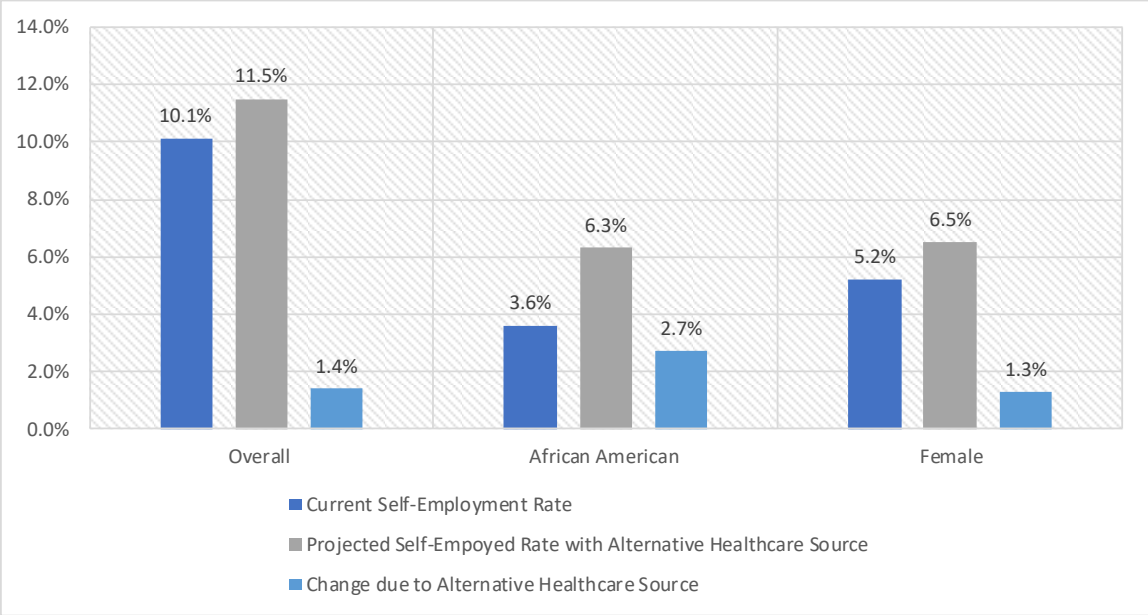


Source: Page 3 of Hipple & Hammond 2016

These finding also have considerable significance given the current healthcare debate in the United States. During the 2020 presidential elections and primary cycle, Democratic candidates have proposed a variety of different plans to expanded alternative access to healthcare. The most contentious and ambiguous of these plans has been a Medicare for All system, under which the entire US population would be eligible for Medicare. While this paper does not shed insight into the feasibility or cost of such a plan, it does provide some evidence that a Medicare for All type system could increase self-employment.

These findings also suggest that providing alternative healthcare could be especially powerful in promoting minority businesses. If these findings hold across all income groups and all new firms were unincorporated, then an alternative source of insurance would increase the unincorporated self-employment rate for African Americans from 3.6 percent to about 6.3 percent, almost doubling it (Hipple & Hammond 2016). Under the same assumptions, the female unincorporated self-employment rate would rise from 5.2 percent to about 6.5 percent (Hipple & Hammond 2016). Graph 4 below shows these projected changes in self-employment overall and by demographic group. These increases could be important to federal agencies charged with promoting small business development, such as the Small Business Administration (SBA), and agencies trying to promote minority business development, such as the Minority Business Development Agency (MBDA).

Graph 4. Current and Projected Change in Self-Employment Rate by Demographic Group



Limitations of the Model

There are several limitations to the results presented above and the general model used for this analysis. Notably, self-employment is only a proxy for entrepreneurship and not a direct measure of it. Further, these results would be invalid if the parallel trends assumption is violated. There are also a variety of other limitations to the model that threaten the validity of the results.

The first limitation of the analysis is that Medicaid expansion in a state does not mean an increase in coverage. Eligible individuals may not enroll in the program. Expansion does not capture the size of scope enrollment increases. Additionally, income is often not static over the course of a year and someone may be eligible to enroll in Medicaid one month but not the next or may re-enroll over the course of a year. However, increased access to alternative insurance options may reduce risk and lower entrepreneurship lock even if an individual does not actually enroll in Medicaid.

The second limitation of the analysis is a lack of statistical weights. There are several differences between the treatment and control group that could skew results or even invalidate them if these differences are correlated with self-employment. Other researchers have compensated for these differences by creating propensity weight scores and further research on this topic could supplement this analysis by including such scoring. Additionally, the data used for this paper comes from CPS which is a repeated cross-sectional dataset that may experiences changes in the consumption of its random sample overtime. While ASEC weights provided with the CPS survey are used to account for some of this variation, unaccounted changes may still exist and affect results.

The third limitation of this analysis is that is does not account for a possible demand shock. Medicaid recipients may have additional income from not paying for healthcare or health-related costs. If new recipients consume more goods locally as a result of these funds, it could create a demand shock that has producers increase output and make self-employment more attractive. In an attempt to account for this limitation and determine if a demand shock occurred, a difference in difference model is presented in the Appendix that has the same specification as the baseline model but with wage-earners as the output variable instead of self-employment (Table A and B). If a demand shock occurred, we would expect the coefficient on $Exp_S * Post_t$ to be positive, statistically significant, and similar to the coefficient found in the baseline self-employment model. Results are also presented for wage-earners in the model with partisan regressors. The coefficient on these regressors are statistically insignificant and negligible in magnitude, suggesting that the increase in self-employment is not due solely to a demand shock.

The fourth limitation of the modeling is the small number of observations and R-squared values for some of the regressions. Some of the demographic specific analyses have a rather low level of observations, with the gender-specific Native American regressions having less than 1,000 observations. Given the large amount of noise in self-employments rates, a small number of observations likely makes these results rather imprecise. The regressions also have rather low R-squared value, below .02 in most cases. This R-squared value cannot be compared to other papers on this subject as most do not provide these values.[11] While this value is rather low, R-squared values do not represent the validity of a model.

The fifth and final limitation of the modeling is that it only applies to low-income individuals. Since the samples are limited to 300 percent and 138 percent of the FPL, the results are not representative of the entire income spectrum, as assumed in the implication section. Since Medicaid was only expanded to these lower-income groups, the expansion would likely have little to no effect on other higher income populations. Therefore, the results may not be externally valid for higher income populations. Future research into this natural experiment and other issues relating to entrepreneurship lock should attempt to supplement the modeling used in this analysis and account for these limitations.

Other Areas for Future Research

Besides improvements to the above model, there are several other areas future researchers could explore. First, future researchers could use an Instrumental Variable (IV) model to measure the effect of self-employment outcomes by demographic groups for those who actually enrolled in Medicaid (compliers), instead of those who simply lived in an expansion state.[12] This research would provide greater insight into the outcomes for those who actually enrolled in Medicaid instead of the net effect. If possible, it would also be useful to compare eligible individuals who

[11] While most papers on predicting entrepreneurship did not include R-squared values, those that do vary widely from 0.1 (Luo & Chong) to 0.8 (Becker & Tuzman 2015).
[12] For previous work using IV modeling and ACA Medicaid expansion see Lee (2019).

enrolled in Medicaid to eligible individuals who did not enroll and measure differences in self-employment outcomes between the two groups.

Another area future researcher should examine is if different demographic groups experienced reduced entrepreneurship lock through a different mechanism. These results could find, for example, if African Americans respond more to a reduction in risk (the risk channel) or additional capital (the credit channel). These results would be useful for policymakers, as they could target a channel specifically to spur entrepreneurship among certain target populations. In the Appendix, a preliminary analysis of the mechanisms through which the Medicaid expansion reduced entrepreneurship lock is presented (Table C and D), but a more robust model is likely needed.

Finally, future researchers should examine the quality (e.g. if a firm is incorporated, has employees, etc.) of new businesses produced by the Medicaid expansion. In the implications section, it was assumed that the newly self-employed mirrored the general proportion of small and new businesses. However, this may not be true as low-income households have different characteristics than the general population. Research by Balkin (1989) found that low-income households tend to start business that are smaller and less sophisticated than higher income groups. While this sort of analysis is currently hampered by a lack of strong information about firm characteristics, especially information that includes demographic information about the owner, if new data sources become available researchers maybe better able to answer this question.[13]

Conclusion

This paper examined the effect expanding Medicaid under the Affordable Care Act (ACA) had on reducing entrepreneurship lock and increasing self-employment levels of different demographic groups. This project built off previous research on the Medicaid expansion by including partisan control variables within regressions and by including previously unused years of new data. The results found that Medicaid expansion improved self-employment rates by about 1.4 percent when accounting for political factors within a state, and that the increase in self-employment was greatest among the African American community. If valid and applicable to the entire income spectrum, the results suggest that providing an alternative source of healthcare could create up to 210,000 new businesses and create 1.281 million new jobs. Future research should expand upon these findings by addressing some of the limitation of this study and by exploring alternative and differently targeted specifications to the modeling.

References

Acs, Z. J., & Audretsch, D. B. (1988). Innovation in large and small firms: an empirical analysis. *The American economic review*, 678-690.

[13] One such new data maybe collected under Section 1071 of the Dodd-Frank Act. This section requires the Consumer Financial Protection Bureau (CFPB) to collect information on small business loan applications, including sex, race, and ethnicity.

Allison, J. R., Lemley, M. A., Moore, K. A., & Trunkey, R. D. (2003). Valuable patents. *Geo. Lj*, 92, 435.

Antonisse, L., & Rudowitz, R. (2019, February 28). An Overview of State Approaches to Adopting the Medicaid Expansion. Retrieved March 8, 2020, from https://www.kff.org/medicaid/issue-brief/an-overview-of-state-approaches-to-adopting-the-medicaid-expansion/

Balkin, S. (1989). *Self-employment for low-income people*. Greenwood Publishing Group.

Bansak, C., & Raphael, S. (2008). The State Children's Health Insurance program and job mobility: identifying job lock among working parents in near-poor households. *ILR review*, *61*(4), 564-579.

Becker, T., & Tuzemen, D. (2014). Self-employment and health care reform: evidence from Massachusetts. *Federal Reserve Bank of Kansas City Working Paper*, (14-16).

Callison, K., & Sicilian, P. (2018). Economic freedom and the affordable care act: Medicaid expansions and labor mobility by race and ethnicity. *Public Finance Review*, 46(2), 301-324.

DeCicca, P. (2010). Health insurance availability and entrepreneurship. *Upjohn Institute Working Paper*, (10-167). https://research.upjohn.org/up_workingpapers/167/

Fairlie, R. W., Kapur, K., & Gates, S. (2011). Is employer-based health insurance a barrier to entrepreneurship?. *Journal of Health Economics*, *30*(1), 146-162.

Flood, S., King, M., Rodgers, R., Ruggles, S., & Warren, J. R. (2018). Current Population Survey: Version 6.0 [dataset]. *Integrated Public Use Microdata Series*. Minneapolis, MN: IPMUS, 2018. https://doi.org/10.18128/D030.V6.0

Gourio, F., Messer, T., & Siemer, M. (2014). What Is the Economic Impact of the Slowdown in New Business Formation?. *Chicago Fed Letter*, (326), 1.

Government Accountability Office. (2011). Health care coverage: Job lock and the potential impact of the Patient Protection and Affordable Care Act. https://www.gao.gov/assets/590/586973.pdf

Gruber, J., & Madrian, B. C. (2002). *Health insurance, labor supply, and job mobility: A critical review of the literature* (No. w8817). National Bureau of Economic Research.

Haltiwanger, J., Jarmin, R., & Miranda, J. (2008). Business formation and dynamics by business age: Results from the new business dynamics statistics. *CES preliminary paper. http://webserver03.ces.census.gov/docs/bds/bds_paper_CAED_may2008_dec2.pdf Downloaded May, 18,* 2010.

Haltiwanger, J., Jarmin, R. S., & Miranda, J. (2013). Who creates jobs? Small versus large versus young. *Review of Economics and Statistics*, 95(2), 347-361.

Haltiwanger, J., Jarmin, R. S., Kulick, R., & Miranda, J. (2016). High growth young firms: contribution to job, output, and productivity growth. In *Measuring entrepreneurial businesses: current knowledge and challenges* (pp. 11-62). University of Chicago Press.

Hathaway, I., Bell-Masterson, J., & Stangler, D. (2013). The return of business creation. *Available at SSRN 2307926*.

Hipple, S. F., & Hammond, L. A. (2016). Self-Employment In The United States. *US Bureau of Labor Statistics*. Retrieved from https://www.bls.gov/spotlight/2016/self-employment-in-the-united-states/pdf/self-employment-in-the-united-states.pdf

Holtz-Eakin, D. (1993). *Job-lock: an impediment to labor mobility? Is health insurance crippling the labor market?* (No. 10). Public Policy Brief.

Holtz-Eakin, D., Penrod, J. R., & Rosen, H. S. (1996). Health insurance and the supply of entrepreneurs. *Journal of Public Economics*, *62*(1-2), 209-235.

Kaiser Family Foundation. (2010). Survey of People Who Purchase Their Own Insurance. https://www.kff.org/wp-content/uploads/2013/01/8077-r.pdf

Kaiser Family Foundation. (2020, February 19). Status of State Action on the Medicaid Expansion Decision. Retrieved from https://www.kff.org/health-reform/state-indicator/state-activity-around-expanding-medicaid-under-the-affordable-care-act/?currentTimeframe=0&sortModel={"colId":"Location","sort":"asc"}#note-4

Kane, T. (2010). The Importance of Startups in Job Creation and Job Destruction, Kauffman Foundation Research Series: Firm Formation and Economic Growth. *http://www. kauffman. org/uploadedFiles/firm_formation_importance_of_startups. pdf.*

Kleven, H. J. (2016). Bunching. *Annual Review of Economics*, *8*(1), 435–464. doi: 10.1146/annurev-economics-080315-015234

Lee, K. M. (2019). Health Insurance and the Supply of Entrepreneurs: Evidence from the ACA Medicaid Expansion. *Available at* SSRN 3462896.

Luo, B., & Chong, T. T. L. (2019). Regional differences in self-employment in China. *Small Business Economics, 53*(3), 813-837.

Madrian, B. (1998). *The effect of health insurance on transitions to self-employment* (No. 98-5). Chicago-Population Research Center.

Olds, G. (2016a). *Entrepreneurship and public health insurance*. Harvard Business School.

Olds, G. (2016b). *Food stamp entrepreneurs*. Harvard Business School.

Parker, S., & Parker, S. (2009). *The economics of entrepreneurship* . Cambridge, UK ;: Cambridge University Press.

Pelosi, N. (2010, March). *2010 Legislative Conference for National Association of Counties.* Washington D.C.

Small Business Administration. (2009). The Small Business Economy: A Report to the President. Retrieved February 6, 2020, from https://www.sba.gov/sites/default/files/files/sb_econ2009.pdf

Small Business Administration Office of Advocacy. "Frequently Asked Questions." Small Business Administration, September 2012. https://www.sba.gov/sites/default/files/FAQ_Sept_2012.pdf.

Tozzi, J. (2010, March 26). Health Reform Expected to Untether Job-Locked Entrepreneurs. Retrieved February 6, 2020, from https://www.bloomberg.com/news/articles/2010-03-25/health-reform-expected-to-untether-job-locked-entrepreneurs

US Census Bureau. (2018, February 8). Business Formation Statistics: A New Census Bureau Product that Takes the Pulse of Early-Stage U.S. Business Activity. Retrieved April 21, 2020, from https://www.census.gov/newsroom/blogs/research-matters/2018/02/bfs.html

Wellington, A. J. (2001). Health insurance coverage and entrepreneurship. *Contemporary Economic Policy*, *19*(4), 465-478.

Appendix

Graph A. Map of States Included in Analysis

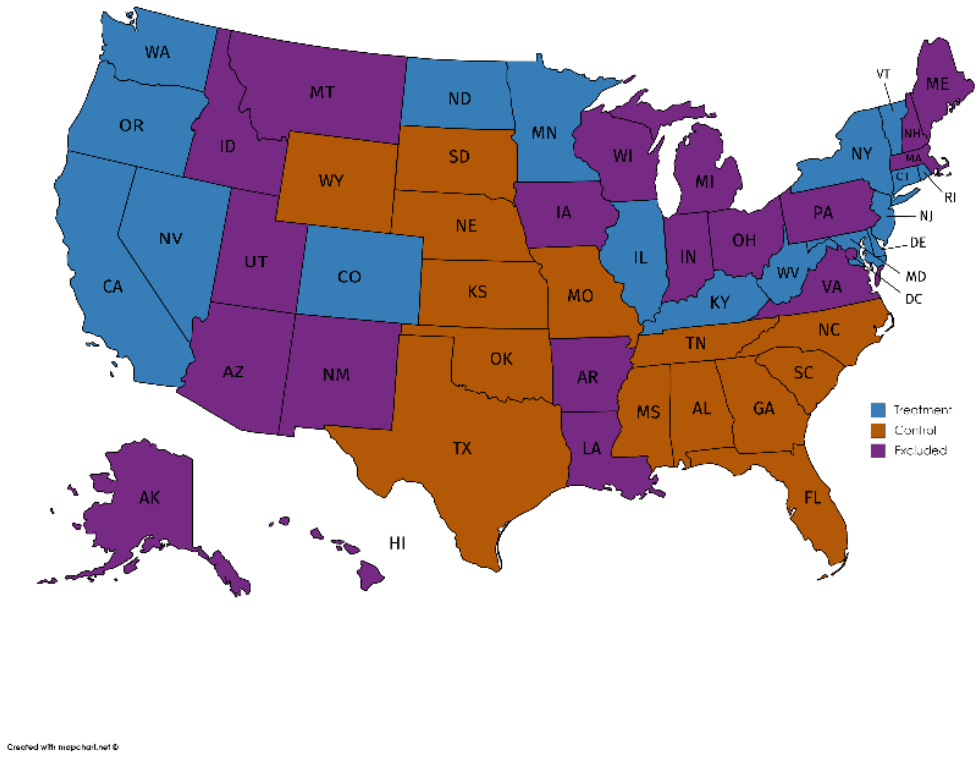


Table A. Results from Wage Earner Baseline Difference in Difference Regressions

VARIABLES	Baseline	Males Only	Females Only	White Only	Black Only	Asian Only	Nav. Amer. Only
Sample A: FPL<300%							
*Exp*Post*	-0.00907	-0.0147	-0.00432	-0.0104	-0.0107	-0.0409	0.0637
	(0.0118)	(0.0207)	(0.00882)	(0.0120)	(0.0202)	(0.0467)	(0.103)
Observations (A)	179,201	92,732	86,469	126,451	36,129	8,755	3,463
R-squared (A)	0.088	0.104	0.075	0.099	0.078	0.047	0.134
Sample B: FPL<138%							
*Exp*Post*	-0.00292	-0.00373	-0.00482	0.00255	-0.0165	-0.0288	-0.203
	(0.0165)	(0.0290)	(0.0132)	(0.0193)	(0.0240)	(0.0772)	(0.131)
Observations (B)	74,830	36,971	37,859	50,267	17,230	3,633	1,822
R-squared (B)	0.077	0.107	0.054	0.090	0.066	0.038	0.173
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

VARIABLES	White Female	Black Female	Asian Female	Nav. Amer. Female	White Male	Black Male	Asian Male	Nav. Amer Male
Sample A: FPL<300%								
*Exp*Post*	-0.00763	0.00249	-0.0247	0.0694	-0.0135	-0.0233	-0.0376	0.0617
	(0.0133)	(0.0221)	(0.0630)	(0.119)	(0.0211)	(0.0281)	(0.0672)	(0.126)
Observations (A)	60,063	18,199	4,468	1,596	66,388	17,930	4,287	1,867
R-squared (A)	0.084	0.072	0.058	0.113	0.117	0.091	0.050	0.184
Sample B: FPL<138%								
*Exp*Post*	0.00349	-0.0380	-0.0626	-0.0600	0.000903	0.00635	0.0251	-0.340**
	(0.0140)	(0.0257)	(0.111)	(0.180)	(0.0345)	(0.0348)	(0.107)	(0.135)
Observations (B)	25,129	8,946	1,936	860	25,138	8,284	1,697	962
R-squared (B)	0.062	0.058	0.044	0.193	0.124	0.085	0.067	0.261
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust Standard Errors clustered at state level in parentheses. *** p<0.01, ** p<0.05, *p<0.1. Sample is restricted to childless adults between the ages of 26 and 64. Individual characters are controlled for (i.e. age, gender, race, education, marital and foreign birth status).

Table B. Results from Wage Earners Difference in Difference Regressions with Partisan Regressors

VARIABLES	Baseline	Males Only	Females Only	White Only	Black Only	Asian Only	Nav. Amer. Only
Sample A: FPL<300%							
*Exp*Post*	-0.00905	-0.0148	-0.00451	-0.00851	-0.0141	-0.0401	0.0538
	(0.0123)	(0.0219)	(0.00802)	(0.0128)	(0.0208)	(0.0487)	(0.106)
Republican Governor	0.000591	0.000380	-0.000315	0.00688*	-0.0177**	-0.00148	-0.0294
	(0.00376)	(0.00594)	(0.00485)	(0.00362)	(0.00651)	(0.0176)	(0.0267)
Republican Legislature	-0.00610	-0.0120	0.00240	-0.00608	-0.0131	-0.0559	0.0545
	(0.0128)	(0.0219)	(0.0137)	(0.0149)	(0.0187)	(0.0389)	(0.0419)
Mixed Legislature	-0.00295	-0.00760	0.00250	0.00269	-0.0274*	-0.0721***	0.0375
	(0.0124)	(0.0164)	(0.00960)	(0.0141)	(0.0148)	(0.0229)	(0.0372)
Observations (A)	179,201	92,732	86,469	126,451	36,129	8,755	3,463
R-squared (A)	0.088	0.104	0.075	0.100	0.078	0.047	0.134
Sample B: FPL<138%							
*Exp*Post*	-0.00312	-0.00488	-0.00431	0.00501	-0.0212	-0.0292	-0.216
	(0.0175)	(0.0308)	(0.0121)	(0.0203)	(0.0252)	(0.0813)	(0.136)
Republican Governor	0.00175	0.00167	0.000244	0.00959	-0.0165	-0.00596	-0.0375
	(0.00545)	(0.00878)	(0.00587)	(0.00632)	(0.0134)	(0.0243)	(0.0235)
Republican Legislature	0.00923	-0.00417	0.0277	0.0159	-0.0132	-0.112	0.109*
	(0.0145)	(0.0295)	(0.0167)	(0.0123)	(0.0269)	(0.0805)	(0.0599)
Mixed Legislature	0.0141	0.0119	0.0174	0.0229*	-0.0154	-0.109*	0.0614
	(0.0127)	(0.0209)	(0.0108)	(0.0117)	(0.0233)	(0.0552)	(0.0518)
Observations (B)	74,830	36,971	37,859	50,267	17,230	3,633	1,822
R-squared (B)	0.077	0.107	0.054	0.090	0.066	0.039	0.175
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

VARIABLES	White Female	Black Female	Asian Female	Nav. Amer. Female	White Male	Black Male	Asian Male	Nav. Amer Male
Sample A: FPL<300%								
*Exp*Post*	-0.00557	-0.00286	-0.0217	0.0876	-0.0121	-0.0249	-0.0392	0.0382
	(0.0138)	(0.0235)	(0.0612)	(0.124)	(0.0225)	(0.0289)	(0.0691)	(0.126)
Republican Governor	0.00710	-0.0224**	0.000818	-0.00625	0.00569	-0.0142*	-0.00269	-0.0348
	(0.00632)	(0.00884)	(0.0166)	(0.0239)	(0.00604)	(0.00748)	(0.0221)	(0.0406)
Republican Legislature	0.00552	-0.0145	-0.0578	0.146**	-0.0131	-0.00711	-0.0517	-0.0249
	(0.0154)	(0.0204)	(0.115)	(0.0581)	(0.0254)	(0.0245)	(0.138)	(0.0713)
Mixed Legislature	0.0104	-0.0262**	-0.0873**	0.0305	-0.00197	-0.0271	-0.0508	0.0269
	(0.0130)	(0.0110)	(0.0323)	(0.0508)	(0.0180)	(0.0206)	(0.0488)	(0.0492)
Observations (A)	60,063	18,199	4,468	1,596	66,388	17,930	4,287	1,867
R-squared (A)	0.084	0.072	0.059	0.115	0.117	0.091	0.051	0.185
Sample B: FPL<138%								
*Exp*Post*	0.00779	-0.0448*	-0.0617	-0.0124	0.00111	0.00464	0.0272	-0.370**
	(0.0127)	(0.0260)	(0.112)	(0.182)	(0.0356)	(0.0367)	(0.100)	(0.142)
Republican Governor	0.0132	-0.0309**	-0.00255	0.00681	0.00468	-0.000991	-0.00544	-0.0461
	(0.00858)	(0.0113)	(0.0223)	(0.0337)	(0.00933)	(0.0220)	(0.0397)	(0.0327)
Republican Legislature	0.0295	0.0190	-0.165	0.270***	0.00703	-0.0404	-0.0229	0.0104
	(0.0236)	(0.0309)	(0.102)	(0.0918)	(0.0323)	(0.0360)	(0.154)	(0.112)
Mixed Legislature	0.0279**	-0.00970	-0.124*	0.0439	0.0202	-0.0210	-0.0733	0.0574
	(0.0111)	(0.0238)	(0.0642)	(0.0585)	(0.0203)	(0.0315)	(0.0975)	(0.0796)
Observations (B)	25,129	8,946	1,936	860	25,138	8,284	1,697	962
R-squared (B)	0.062	0.059	0.045	0.202	0.124	0.085	0.068	0.263
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust Standard Errors clustered at state level in parentheses. *** p<0.01, ** p<0.05, *p<0.1. Sample is restricted to married childless adults between the ages of 26 and 64. Individual characters are controlled for (i.e. age, gender, race, education, marital and foreign birth status).

Difference in Difference Models with Healthcare Demand

As previously discussed, when examining entrepreneurship lock arising from healthcare it is critical that healthcare demand is considered to avoid the good job problem.[14] Thus, in order to correctly test if the Medicaid expansion relieved entrepreneurship lock, I use a model that proxies healthcare demand. The healthcare demand model has the following specification:

$$Self\text{-}Employment_{ist} = \alpha_o + \beta_1(Exp_S * Post_t) + \beta_2(Exp_S * Post_t * Dem_{ist}) + X_{ist} + \delta_s + \tau_t + \varepsilon_{ist}$$

Where everything is the same as the baseline regression but there is the additional interaction term $Exp_S * Post_t * Dem_{ist}$ where Dem_{ist} is the demand proxy variable. I use two different variables in Dem_{ist}. The first is if one's partner has employer-based health insurance and serves as a measure for the availability of alternative healthcare. The second is if anyone in the respondent's household is reported to have poor health and is a measure of increased expected healthcare costs.[15] The sample used for this specification is further restricted to married childless adults. This demand model is also based on a similar methodological framework used by Lee (2019).

Using these two different variables to proxy healthcare demand has the additional benefit providing insight into through which mechanism the Medicaid expansion may have alleviated entrepreneurship lock. Not having access to partner's employer-based health insurance measures the risk channel and poor health status measures the credit constraint channel. If the β_2 on either of these variables is positive and statistically significant, this would suggest that the Medicaid expansion improved entrepreneurship by reducing this mechanism of entrepreneurship lock.

[14] See the discussion of Holtz-Eakin, Penrod, Rosen (1994) in the Literature Review.
[15] Since the Affordable Care Act forbid private insurance companies from denying coverage to an applicant because of pre-existing condition, poor health would not affect one access to alternative healthcare plans. However, since this person would be in the individual instead of group-based market, they would likely face higher premiums and total healthcare coverage costs.

Table C. Spousal Coverage

VARIABLES	Baseline	Males Only	Females Only	White Only	Black Only	Asian Only	Nav. Amer. Only
Sample A: FPL<300%							
*Exp*Post*	-0.0112	-0.0112	-0.0123	-0.00805	-0.0160	-0.0527	-0.00600
	(0.0100)	(0.0164)	(0.0113)	(0.0124)	(0.0146)	(0.0369)	(0.0948)
*Exp*Post*Spouse*	0.0504***	0.0695***	0.0320***	0.0529***	0.0236*	0.0543***	0.0619**
	(0.00646)	(0.0105)	(0.00501)	(0.00778)	(0.0119)	(0.0164)	(0.0264)
Observations (A)	56,642	27,383	29,259	42,932	7,886	3,723	906
R-squared (A)	0.023	0.017	0.011	0.025	0.019	0.039	0.109
Sample B: FPL<138%							
*Exp*Post*	-0.00182	0.000471	-0.00512	-0.000287	0.00822	-0.0659	0.0443
	(0.0184)	(0.0347)	(0.0189)	(0.0252)	(0.0495)	(0.0411)	(0.0757)
*Exp*Post*Spouse*	0.0415***	0.0583***	0.0247**	0.0475***	0.0152	0.0436***	-0.00201
	(0.00922)	(0.0148)	(0.0102)	(0.0118)	(0.0211)	(0.0133)	(0.0865)
Observations (B)	19,147	9,205	9,942	14,127	2,724	1,505	380
R-squared (B)	0.028	0.022	0.014	0.029	0.044	0.051	0.202
State FE (A&B)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

VARIABLES	White Female	Black Female	Asian Female	Nav. Amer. Female	White Male	Black Male	Asian Male	Nav. Amer Male
Sample A: FPL<300%								
*Exp*Post*	-0.00913	-0.0384*	-0.0333	-0.125	-0.00761	0.00232	-0.0859	0.163
	(0.0128)	(0.0189)	(0.0475)	(0.0905)	(0.0196)	(0.0314)	(0.0708)	(0.158)
*Exp*Post*Spouse*	0.0318***	0.0244	0.0361**	0.0464***	0.0749***	0.0221	0.0748***	0.112**
	(0.00603)	(0.0144)	(0.0133)	(0.0161)	(0.0124)	(0.0172)	(0.0248)	(0.0542)
Observations (A)	22,088	4,056	2,029	457	20,844	3,830	1,694	449
R-squared (A)	0.012	0.019	0.043	0.195	0.020	0.023	0.038	0.160
Sample B: FPL<138%								
*Exp*Post*	-0.00231	-0.0153	-0.0282	-0.151**	-0.000409	0.0277	-0.0676*	0.216
	(0.0254)	(0.0325)	(0.0632)	(0.0588)	(0.0418)	(0.0971)	(0.0373)	(0.134)
*Exp*Post*Spouse*	0.0262**	0.0174*	0.0305**	0.0994	0.0706***	0.00694	0.0468**	-0.0883
	(0.0127)	(0.00913)	(0.0117)	(0.0735)	(0.0180)	(0.0389)	(0.0174)	(0.256)
Observations (B)	7,278	1,422	825	191	6,849	1,302	680	189
R-squared (B)	0.015	0.041	0.053	0.392	0.024	0.065	0.070	0.381
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust Standard Errors clustered at state level in parentheses. *** p<0.01, ** p<0.05, *p<0.1. Sample is restricted to married childless adults between the ages of 26 and 64. Individual characters are controlled for (i.e. age, gender, race, education, marital and foreign birth status).

Table D. Poor Health

VARIABLES	Baseline	Males Only	Females Only	White Only	Black Only	Asian Only	Nav. Amer. Only
Sample A: FPL<300%							
*Exp*Post*	0.0333***	0.0514***	0.0154	0.0397***	0.00363	-0.0143	0.0399
	(0.00949)	(0.0168)	(0.0103)	(0.0109)	(0.0109)	(0.0356)	(0.107)
*Exp*Post*Health*	-0.0455***	-0.0658***	-0.0278***	-0.0524***	-0.0154	0.00596	-0.0266
	(0.00361)	(0.00709)	(0.00516)	(0.00327)	(0.0158)	(0.0139)	(0.0178)
Observations (A)	56,642	27,383	29,259	42,932	7,886	3,723	906
R-squared (A)	0.023	0.017	0.011	0.026	0.018	0.037	0.107
Sample B: FPL<138%							
*Exp*Post*	0.0400**	0.0600	0.0195	0.0489**	0.0223	-0.0362	0.0479
	(0.0177)	(0.0358)	(0.0147)	(0.0237)	(0.0306)	(0.0419)	(0.0680)
*Exp*Post*Health*	-0.0278***	-0.0410***	-0.0159*	-0.0337***	-0.00451	0.00841	-0.0165
	(0.00711)	(0.0123)	(0.00874)	(0.00812)	(0.0215)	(0.0107)	(0.0722)
Observations (B)	19,147	9,205	9,942	14,127	2,724	1,505	380
R-squared (B)	0.028	0.022	0.014	0.029	0.044	0.050	0.202
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

VARIABLES	White Female	Black Female	Asian Female	Nav. Amer. Female	White Male	Black Male	Asian Male	Nav. Amer Male
Sample A: FPL<300%								
*Exp*Post*	0.0198*	-0.0239	-0.00352	-0.116	0.0602***	0.0290	-0.0395	0.257
	(0.0109)	(0.0149)	(0.0414)	(0.0903)	(0.0184)	(0.0255)	(0.0675)	(0.180)
*Exp*Post*Health*	-0.0330***	0.00113	-0.0191	0.0342	-0.0738***	-0.0341	0.0344	-0.0902
	(0.00639)	(0.0141)	(0.0124)	(0.0283)	(0.00648)	(0.0238)	(0.0227)	(0.0597)
Observations (A)	22,088	4,056	2,029	457	20,844	3,830	1,694	449
R-squared (A)	0.012	0.017	0.042	0.194	0.020	0.024	0.035	0.159
Sample B: FPL<138%								
*Exp*Post*	0.0247	0.00527	-0.00480	-0.101	0.0731	0.0307	-0.0395	0.181
	(0.0190)	(0.0347)	(0.0648)	(0.0716)	(0.0437)	(0.0693)	(0.0317)	(0.132)
*Exp*Post*Health*	-0.0182	-0.0195**	0.0158	0.0263	-0.0500***	0.00648	-0.000621	-0.0219
	(0.0124)	(0.00784)	(0.0201)	(0.0668)	(0.0118)	(0.0384)	(0.0342)	(0.123)
Observations (B)	7,278	1,422	825	191	6,849	1,302	680	189
R-squared (B)	0.015	0.042	0.052	0.385	0.024	0.065	0.069	0.380
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust Standard Errors clustered at state level in parentheses. *** p<0.01, ** p<0.05, *p<0.1. Sample is restricted to married childless adults between the ages of 26 and 64. Individual characters are controlled for (i.e. age, gender, race, education, marital and foreign birth status.