

# The Impact of the Affordable Care Act on Self-Employment: Early Evidence

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**Abstract.** This paper provides early evidence on the impact of the implementation of the Affordable Care Act (ACA) in 2014 on the decision to be self-employed. Using data from the Current Population Survey, we utilize pre-reform variation in state individual market health insurance regulations, and find that the ACA did not have a differential impact on self-employment rates in states for which the ACA was a larger change in policy. Similarly, we find no significant impact of the ACA in specifications that utilize variation across individuals in characteristics that could make it harder for them to purchase insurance if they left their current employer.

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## **1. Introduction**

It is well known that the cost and availability (or lack thereof) of health insurance has the potential to impact self-employment decisions, since leaving a wage and salary job often entails the loss of employer sponsored health insurance. Further, surveys performed by the National Federation of Independent Business find that the rising cost of health insurance is perennially a top concern among small business owners. As a result, laws that reform the health insurance market, particularly for those who are self-employed, may impact the level and composition of entrepreneurship in the United States. In this paper, we use data from the Current Population Survey to provide early evidence on whether the most recent of such reforms, the Affordable Care Act (ACA), has impacted the level of self-employment in the United States.

The ACA makes several federal-level changes to regulations in the private non-group health insurance market. First, it implements modified community rating and guaranteed issue regulations, which limit the extent to which insurance companies may charge different premiums based on health status and prevent insurance companies from excluding anyone based on pre-existing conditions. Second, it contains subsidies for low-income taxpayers to purchase health insurance and for small firms to provide health insurance for their employees. Third, it contains a mandate for individuals to purchase health insurance and for large firms to provide health insurance (though this mandate has been delayed). Finally it gives states the option of merging their non-group and small group markets.

Before the passage of the ACA, a number of studies estimated its potential impact on premiums. The Congressional Budget Office (2009) estimated that the ACA would

result in a 10-13% increase in non-group premiums overall, though the price of a given amount of insurance coverage for a given group of enrollees was estimated to decrease by 7-10%. Studies done by Grau and Giesa (2009) and PriceWaterhouseCoopers (2009), however, predicted much higher increases of 53% and 49%, respectively.<sup>1</sup> Since the establishment of the health insurance exchanges and offering of policies beginning in October 2013, U.S. Department of Health and Human Services (2013) argued that premiums offered on the exchanges were 16% lower than expected, while Roy (2013) estimated a 41% average increase in premiums, with higher increases for young adults. However, using premiums reported by the self-employed on tax returns, Heim et al. (2014) found that gross premiums increased by 4.2% on average among the self-employed, but decreased by 42.3% on average after taxes and subsidies are taken into account.

Some recent papers have attempted to examine whether changes in non-group health insurance markets affect the level of self-employment, but have come to mixed results. Fairlie et al. (2011) found that having access to spousal health insurance increases the likelihood of self-employment, which would suggest that regulations that make it easier for entrepreneurs to be covered would lead to increases in self-employment. Consistent with this, DeCicca (2010) found that the implementation of community rating and guaranteed issue regulations in New Jersey increased self-employment levels by 15% to 25%. However, Heim and Lurie (2014a) examined the passage of these regulations throughout the country, and found no significant effect on the level of self-employment, though they did find that the composition of the self-

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<sup>1</sup> In addition to these studies, numerous analyses were done examining the impact of the ACA on premiums at the state level. See America's Health Insurance Plans (2012).

employed changed from younger to older taxpayers. Finally, Heim and Lurie (2014b) found that the 2006 Massachusetts health reform law led to a decline in the rate of taxpayers earning a majority of income from self-employment, though Niu (2011) found no statistically significant long-run impact of the Massachusetts reform.

In a widely remarked-upon report, the Congressional Budget Office<sup>2</sup> recently predicted the impact of the Affordable Care Act on a number of labor market outcomes, including labor supply, labor demand, and retirement, but did not examine the impact on self-employment or entrepreneurship. Blumberg, Corlette, and Lucia (2013), however, extrapolated the DeCicca (2010) and Fairlie et al. (2011) findings assuming that there will be a differential impact of the ACA on self-employment in states that lacked ACA-like provisions in their individual health insurance markets, and predicted that the number of self-employed will increase by approximately 1.5 million due to the Affordable Care Act. Since the DeCicca and Fairlie et al. findings are at the upper end of estimated effects of health insurance reforms on self-employment, it is an open question whether this predicted impact of the ACA will come to pass.

In this study, we analyze data from the 2010-2014 Current Population Survey (CPS) to provide early and timely evidence on the impact of the Affordable Care Act on the level and composition of self-employment. The Current Population Survey is a nationally representative survey of U.S. households and is administered every month. Its timeliness and inclusion of labor participation information make CPS an appropriate data source for analyzing changes in self-employment upon the implementation of the ACA's health insurance exchanges and subsidies starting January 2014.

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<sup>2</sup> See Congressional Budget Office (2014).

We pursue two identification strategies. In the first, we utilize the fact that the pre-ACA individual health insurance environment differed across states regarding community rating and guaranteed issue regulations. To identify the impact of the ACA on self-employment, we compare the change in self-employment rates pre- and post-ACA implementation in states that had no such regulations (or had a subset of these regulations) and for which the ACA is a substantial change in policy, to states that had regulations similar to the ACA regulations and for which the ACA is a smaller change in policy. The former group constitutes the treatment states, while the latter the comparison states.

In the second identification strategy, we utilize differences across individuals in whether they had employer-sponsored health insurance (ESI) prior to 2014, and examine, among those who had such insurance, whether having a characteristic (spousal coverage, poor health, being older, or a large family) that would make them more (less) likely to be insurable if they left their job is associated with higher (lower) levels of transitions to self-employment. Such a relationship has previously been interpreted as evidence of entrepreneurship lock.<sup>3</sup> We test this difference-in-differences analysis in the pre-ACA period (from November 2010 to December 2013) and the results confirm our expectations. We then adopt a triple-differences strategy with pre- and post-ACA implementation as the third level of difference to investigate whether the prevalence of entrepreneurship lock has declined following the implementation of the ACA.

Our results suggest that the ACA has not had a differential impact on self-employment in states for which the ACA was a larger change in policy, nor has it led to

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<sup>3</sup> See, for example, Holtz-Eakin et al. (1996), Madrian and Lefgren (1998), Wellington (2001), and Gumus and Regan (2014).

an increase in the propensity to become self-employed among individuals with employer sponsored insurance who do not have spousal coverage, have poor health, are older, or have large families.

The paper proceeds as follows. Section 2 describes our data, and Section 3 describes the estimation strategy in detail. Section 4 presents the estimation results, and Section 5 concludes.

## **2. Data**

We use monthly Current Population Survey (CPS) data from November 2010 to July 2014 as well as the Annual Social and Economic (ASEC) supplement of the CPS (commonly known as the March CPS) from years 2012, 2013 and 2014. The CPS is a nationally representative survey of households administered on a monthly basis. Households are interviewed for four consecutive months, are out of the sample for the next eight months, and then interviewed for a final four months. For example, an individual who was interviewed for the first time from January 2013 to April 2013 could respond to the survey again from January 2014 to April 2014. In addition to information on whether the individual is self-employed and in the labor force as of the month of interview, the CPS also contains information on age, race, marital status, education, state of residence, and income. The March CPS additionally includes information on health insurance coverage and household member health condition for the year *prior to* the interview.<sup>4,5</sup>

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<sup>4</sup> The 2014 ASEC questions on health insurance status underwent some revisions from previous years' questionnaires. Preliminary datasets released by the Census Bureau, which are used for this paper, provide

To conduct the analysis by type of state regulation, we append CPS monthly data from January 2012 to July 2014. This pooled cross section dataset contains a representative sample of US households for each month, and some individuals who repeatedly responded to the survey have multiple observations.

Because health insurance information is only available in the March CPS, to conduct the analysis by the presence of employer-sponsored insurance, we merge March CPS from years 2012 to 2014 with monthly CPS data from November 2011 to July 2014, forming a panel dataset. Because an individual could be interviewed for two consecutive March CPS supplements and the March CPS survey asks about health insurance from the *prior* year, we assign information from the March CPS to monthly observations from the prior year. That is, monthly observations from 2011 are assigned matched health information from the March 2012 supplement, monthly observations from 2012 are matched to the March 2013 supplement, and monthly observations from 2013 and 2014 are matched to the March 2014 supplement.

Based on the CPS monthly survey questionnaire, we denote an individual to be self-employed if they report their primary job as being self-employed in an incorporated or unincorporated business.

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variables that are similar to those from previous years' ASEC data. However, they may not be directly comparable due to the changes in the underlying questions.

<sup>5</sup> Despite being popularly known as the March CPS, the ASEC supplement data are collected over a three-month period in February, March, and April, with most of the data collection occurring in the month of March. As a result, using household and individual identifiers, we can (for example) match information from 2013 ASEC data to four months of monthly CPS data during the November 2012 to July 2013 period. Additionally, for those whose 2013 ASEC interview fell within their first four monthly interviews, we can match the 2013 ASEC information to their second four interviews during the November 2013 to July 2014 period, while those whose 2013 ASEC interviews fell in their last four months of interviews, we can match the 2013 ASEC information to their first four interviews during the November 2011 to July 2012 period. Similar matches can be done for other years of ASEC data.

We define ESI-only individuals as those with health insurance from an employer at any time in the year and never from other sources, including privately purchased insurance, public health insurance, or dependent coverage from a family member's plan. Spousal coverage indicates an individual's spouse has ESI that provides the *possibility* of insurance coverage to the individual, as opposed to any dependent coverage already in effect. Respondents to the March CPS categorized their health status to be excellent, very good, good, fair, and poor; we define "poor health" individuals as those with at least one family member in a poor health condition.

Throughout, we only include individuals who are in the labor force and age 27 through 60. We chose the lower age limit because the ACA also requires<sup>6</sup> insurers to allow dependents to remain on their parents' health insurance policies up to the age of 26, and thus including this group would confound the impact of young adult expansion with the impact of general provisions of the ACA. We chose an upper limit of age 60 to focus on individuals in their prime working years.

Table 1 presents the summary statistics for the two empirical models. Note that the mean self-employment rate from the by-state analysis is higher than that for the by-ESI analysis because (as is noted below) the latter model confines the sample to only those who were consistently wage and salary workers in the first four months of interviews. The mean and standard deviation for demographic and other covariates are generally consistent between the two samples.

### **3. Empirical Strategy**

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<sup>6</sup> For plan years beginning on or after September 23, 2010.



We pursue two identification strategies. In the first, we utilize the fact that the pre-ACA individual health insurance environment differed across states. Prior to January 2014, 13 states had community rating regulations either without guaranteed issue or with guaranteed issue applying to only a subset of plans (denoted Moderate Regulation), 8 states had guaranteed issue and (except for one state) rating regulations for insurance plans for “business groups of one” (which we will denote as Group of One Regulation), 6 states had community rating and guaranteed issue regulations applying to all plans (denoted Heavy Regulation), and Massachusetts and Vermont combined community rating and guaranteed issue regulations with a number of additional provisions that were similar to provisions in the ACA (denoted the base group). All other states are denoted as Light Regulation states. Table 2 shows the grouping of states by their prior level of regulation.

To identify the impact of the ACA on self-employment, we compare changes in self-employment rates pre- and post-ACA implementation in states that had lighter regulations and for which the ACA is a substantial change in policy, to states that had regulations similar to the ACA and for which the ACA is a comparatively minor change in policy. Figure 1 demonstrates trends in self-employment rate among different groups of states from the Current Population Survey prior to January 2014, while Table 3 presents results from statistical tests in which the sample is cut to pre-reform years, and self-employment is regressed on either regulation group-specific yearly linear trends or regulation group-specific monthly linear trends. The results suggest that pre-

implementation trends in the base group and all other groups did not differ significantly,<sup>7</sup> which lends credibility to our identification strategy.

In our most basic specification, we estimate a linear probability model by regressing an indicator for self-employment against dummy variables representing state groups by levels of pre-ACA regulation, an indicator for the post-ACA implementation period, and the interaction between the two. We then modify this standard difference-in-differences model by replacing the post-ACA implementation indicator with monthly indicator variables. Finally, we also include covariates on individual demographics that may help explain self-employment choices. The estimation equation is

(1)

$$\text{SelfEmployed}_{it} = \alpha_0 + \alpha_1 \text{Heavy}_{it} + \alpha_2 \text{GroupOfOne}_{it} + \alpha_3 \text{Moderate}_{it} + \alpha_4 \text{Light}_{it} + \alpha_5 \text{Heavy} * \text{Post}_{it} \\ + \alpha_6 \text{GroupOfOne} * \text{Post}_{it} + \alpha_7 \text{Moderate} * \text{Post}_{it} + \alpha_8 \text{Light} * \text{Post}_{it} + \beta X_{it} + \delta_t + \varepsilon_{it}$$

where *SelfEmployed<sub>it</sub>* equals one if the individual is self-employed in the survey month and zero otherwise, *Heavy<sub>it</sub>*, *GroupOfOne<sub>it</sub>*, *Moderate<sub>it</sub>* and *Light<sub>it</sub>* denote respectively residence in states with different levels of prior regulations as outlined in Table 2, *Heavy \* Post*, *GroupOfOne \* Post*, *Moderate \* Post*, and *Light \* Post* denote residence in different groups of states during the post-ACA implementation period, and  $\delta_t$  denotes monthly fixed effects.<sup>8</sup> The  $X_{it}$  vector includes the following information gathered from CPS monthly data: age, age squared, gender, education level, marital status, race and ethnicity, the number of own children under the age of 18, and occupation categories. We define the post period as being January 2014 and after, the

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<sup>7</sup> We also used monthly dummy variables instead of a linear time trend and test whether coefficients for all the interaction terms for a specific state group are jointly insignificant at zero. Unfortunately, we fail to confirm the parallel trend assumption under this more flexible specification.

<sup>8</sup> A post-period indicator variable is collinear with the set of time dummy variables, and thus is omitted from the regression.

time period in which individuals could be covered by insurance purchased on the exchanges. Because identification of the coefficients of interest comes from state to state variation in whether regulations were passed prior to the ACA, we cluster standard errors at the state level.<sup>9</sup>

In our second method, we utilize a triple-difference model to examine whether entrepreneurship lock, as estimated using standard techniques in the literature, has significantly lessened following the implementation of the ACA. Following Holtz-Eakin et al. (1996) and Madrian and Lefgren (1998), among others,<sup>10</sup> we first examine, among those who have employer-sponsored health insurance, whether having a characteristic that would make them more (less) insurable if they left their jobs is associated with higher (lower) levels of transitions to self-employment prior to the implementation of the ACA, since such a relationship has previously been interpreted as evidence of entrepreneurship lock. We then introduce a third difference, to examine whether the impact of having ESI and the additional characteristic on transitions to self-employment declines following the implementation of the ACA.

For these specifications, we first cut the sample to include only individuals who were consistently wage and salary workers in the first four months of interviews. We then examine whether they were self-employed during the second four months of interviews. This process generates a pseudo panel dataset where each individual have up to four observations of whether they were self-employed or a wage and salary worker in

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<sup>9</sup> We also have calculated standard errors at the type of regulation level, but the standard errors were smaller than those clustered at the state level. So, to be conservative, we choose the larger of the two.

<sup>10</sup> See Wellington (2001) and Gumus and Regan (2014).

each month in the second set of interviews.<sup>11</sup> We estimate a linear probability model of the form

$$\text{SelfEmployed}_{it} = \gamma_0 + \gamma_1 \text{ESI}_{it} + \gamma_2 \text{VOI}_{it} + \gamma_3 \text{ESI}_{it} * \text{VOI}_{it} + \gamma_4 \text{ESI}_{it} * \text{Post}_{it} + \gamma_5 \text{VOI}_{it} * \text{Post}_{it} \\ + \gamma_6 \text{ESI}_{it} * \text{VOI}_{it} * \text{Post}_{it} + \theta X_{it} + \delta_t + \epsilon_{it}$$

where  $\text{ESI}_{it}$  equals one if an individual has employer-sponsored insurance but no other sources of health insurance (either public or private insurance), and  $\text{VOI}_{it}$  denotes an additional variable of interest (VOI) that makes the individual more or less likely to be insurable, and  $\text{Post}_{it}$  denotes that the observation comes from January 2014 or after. Because we may have multiple observations for a given individual, we cluster standard errors at the individual level.

We explore four types of VOIs in this paper: (1) having a spouse who has employer-sponsored health insurance, (2) having family member with poor health (using an indicator for self-reported health being poor), (3) being older (using either a continuous age variable, or an indicator variable for being over 45), and (4) the number of dependents on an individual's ESI plan (using a continuous variable for family size).<sup>12</sup> While having a spouse who has employer-sponsored insurance is likely to ensure a source of coverage if an individual leaves their employer, having poor health, being older, and having more dependents are likely to make it harder for an individual to find coverage for themselves or their families if they quit a wage and salary job.

Since the ACA provides premium subsidies for families with income up to 400% of the federal poverty level (FPL), and an individual's income may affect the availability of

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<sup>11</sup> Some individuals may have refused to answer the survey during the second four months period or dropped out of the labor force, thus leading to less than four observations per individual.

<sup>12</sup> In this specification,  $\text{ESI}_{it}$  equals one if an individual has ESI that covers at least one dependent, regardless of whether the ESI plan is the person's only source of health insurance.

health insurance and thus self-employment choices, controlling for income seems necessary. However, self-employment status affects income prospects, and this simultaneous relationship indicates that simply adding the family income variable into the regression will cause biased estimates. To estimate differential impacts of the ACA by income level while avoiding reverse causality, we use 2010 monthly CPS data to estimate a probit model by regressing an indicator for family income lower than 400% FPL on the  $X_{it}$  vector employed in the previous models, and use the regression parameter estimates to predict income levels after 2010. Because the predicted income variable is based on 2010 data, it should not be affected by post-2010 self-employment choices. We choose a probability cutoff that divides all 2011-2014 observations into below and above 400% FPL groups at the same ratio of these group sizes as in 2010. This creates an indicator variable of whether an individual is predicted to have family income below 400% FPL as an instrument variable for real income. To avoid making functional assumptions regarding income and self-employment choices, we implement both identification strategies for each income subgroup separately.

## **4. Results**

### **4.1 Results from by-State Analysis**

Table 4 presents the estimation results from the by state analysis. Column 1 presents results from a basic difference-in-differences specification comparing changes in self-employment rates in states that had regulation with ACA-like provisions (Massachusetts

and Vermont) to changes in self-employment rates in states with other pre-ACA regulations. The indicator variables for heavy, group of one, moderate, and light regulation suggest that self-employment levels in states with different regulatory regimes did not differ statistically significantly prior to January 2014. Further, all of the interaction terms between regulation levels and the post-January 2014 period are statistically insignificant and small. Similar results are found in Column 2, which includes monthly dummy variables in place of a post-January 2014 dummy variable, and in Column 3, which additionally includes individual covariates. These results, then, suggest that the implementation of the ACA individual market reforms has not had an impact on the level of self-employment in states that lacked these provisions before.

The last two columns of Table 4 show results from the specification in Column 3 when the sample is cut to whether family income is predicted to be above or below 400% FPL, which determines eligibility for subsidies.<sup>13</sup> In both of these columns all coefficient estimates are statistically insignificant.

Overall, we find little evidence that the implementation of the ACA in January 2014 led to an increase in self-employment in states that lacked similar provisions in their individual health insurance markets.

## **4.2 Results from Triple-Difference Analysis**

Table 5 presents the estimation results from an analysis based on the availability of employer-sponsored health insurance. We estimate six models using different variables of interest that affect an individual's likelihood to obtain health insurance if they were to leave their employer.

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<sup>13</sup> About 53.3 percent of the full sample has predicted income below 400% FPL.

Looking across all columns, the interactions of having ESI and the variables of interest (with the exception of family poor health) have statistically significant coefficients, suggesting the presence of entrepreneurship lock in the pre-January 2014 period. This is largely consistent with prior research findings and lends credibility to the triple-difference identification strategy; the lack of significance for the interaction between ESI and poor health could be due to the fact that health status is self-reported and thus a rough measure. In Columns 1 and 2, individuals with ESI who also have spousal ESI are estimated to be 2.48 percentage points more likely to become self-employed in a sample of married individuals and 1.81 percentage points more likely in the full sample. In Column 3-5, individuals with ESI who report having at least one family member in poor health are estimated to be 0.12 percentage points less likely to become self-employed (despite an insignificant estimate), while those over 45 are estimated to be 0.51 percentage points less likely, and becoming a year older is associated with a 0.03 percentage point decline in the probability of self-employment. Finally, in Column 6, among individuals with ESI, each additional family member is associated with a 0.47 percentage point decrease in the probability of becoming self-employed.

The triple interaction between having ESI, the variable of interest, and the post-period indicates whether the degree of entrepreneurship lock declined after the ACA's implementation, while the sum of the triple interaction and the double interaction noted above indicates the level of entrepreneurship lock in the post period (the total effect). Overall, all triple-interaction terms have insignificant coefficient estimates, confirming the findings from the by-state analysis. In the first two columns, the level of entrepreneurship lock is still positive and highly significant, suggesting that among

people with ESI, those who also have spousal insurance are still more likely to become self-employed after the ACA's implementation. In Column 3, although the triple-interaction term has a positive coefficient, none of the interaction terms are significant. In Columns 4-5, the triple interaction terms have a negative sign, suggesting older individuals with ESI face even stronger entrepreneurship lock; however, these terms are imprecisely estimated. Finally, in Column 6, although the triple interaction coefficient is statistically insignificant, its sign is suggestive of a reduction in entrepreneurship lock post-ACA implementation. The sum of the double and triple interaction coefficients is still marginally statistically significantly different from zero in the post-period.

Table 6 splits the sample according to whether predicted income is above or below 400% FPL.<sup>14</sup> Possibly due to the reduction in sample size, now the ESI\*VOI interaction terms for model 4-5 are no longer significant, despite having consistent signs.

In the top panel, among individuals with predicted income above 400% FPL, the results are similar to those found for the entire sample, with two differences. The triple interaction term with poor health is now marginally statistically significant and of a much larger magnitude than the two-way interaction, leading to a positive and marginally statistically significant total effect estimate. Second, when family size is the variable of interest, the triple interaction is positive but insignificant, but the amount of entrepreneurship lock post-ACA implementation is reduced and is insignificantly different from zero. Similarly, in the bottom panel, which includes individuals with predicted income below 400% FPL, the triple interaction in the family size specification is again positive (but insignificant), and the entrepreneurship lock post-ACA implementation is again insignificantly different from zero. Overall, although the

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<sup>14</sup> About 58.2 percent of the full sample has predicted income below 400% FPL.



observations from by-income group analysis imply a reduction in entrepreneurship lock for subgroups with certain characteristics, the estimates are imprecise.

Taken together, the results suggest that the ACA has not led to an increase in the propensity to become self-employed in states without prior regulations similar to those in the ACA, or for individuals facing entrepreneurship lock due to employer-provided health insurance prior to the ACA.

## **5. Conclusion**

In this paper, we used data from the Current Population Survey to provide early evidence on the impact of the implementation of the Affordable Care Act (ACA) in 2014 on self-employment in the United States.

In specifications that utilize pre-reform variation in state individual market health insurance regulations, we find that the ACA did not have a differential impact on self-employment in states for which the ACA was a larger change in policy. Similarly, we did not find an impact of the ACA on self-employment in specifications that utilize variation across individuals in characteristics that could make it harder for them to purchase insurance if they left their current employer.

Thus, these results challenge the expectation of some practitioners and researchers that the ACA would reduce entrepreneurship lock, and it appears that the projections in Blumberg, Corlette, and Lucia (2013) are likely to be substantial overestimates. Their estimates are driven by the assumption that self-employment would differentially increase in states that did not have pre-existing health insurance markets and regulations that are similar to those in the ACA, but our study finds no such impact overall. The no-

effect findings are further supported by identification strategies that utilize individual differences regarding availability of employer-sponsored insurance.

One caveat, however, is that this study estimates self-employment rates and transitions during a period in which the ACA is being newly implemented. Although health insurance exchanges were established, their roll-outs were problematic. In addition, the employer mandate has been delayed, several exemptions have been added to the individual mandate, and a number of insurance plans that do not satisfy some of the ACA's requirements have been grandfathered in.<sup>15</sup> Such uncertainty may have dissuaded individuals from relying on insurance purchased through the exchanges, leading them to delay an entry into self-employment. As such, the longer-run impacts of this law on self-employment remain to be seen.

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<sup>15</sup> We modified the triple-difference models to estimate a month-specific effect of the ACA on self-employment. Most estimates are insignificant, but we do observe during the most recent months (July 2014), the triple interaction term for the by-family size model is significant and shows reduction in entrepreneurship lock. However, it is unclear to what extent this provides evidence of an evolving effect of the ACA on self-employment as opposed to a statistical artifact.

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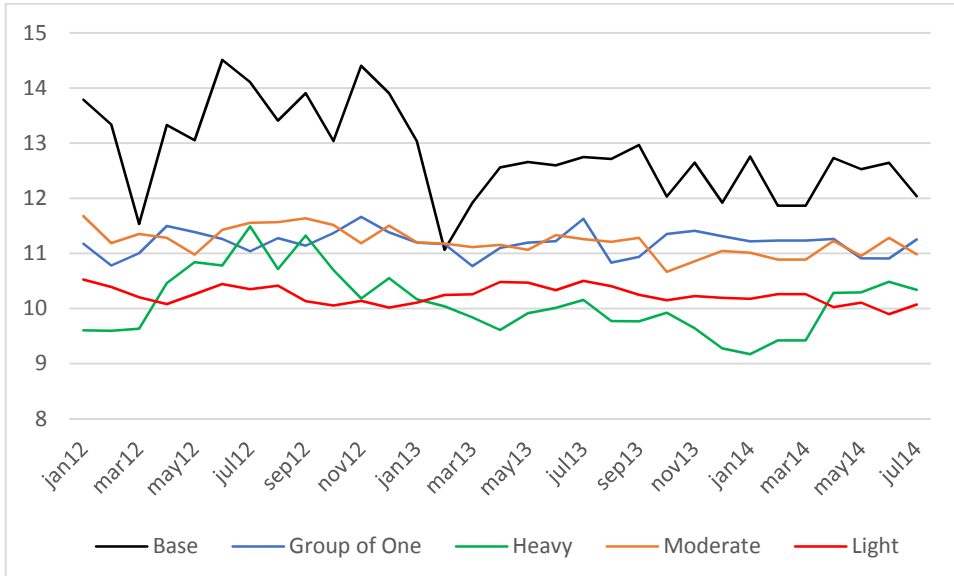
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## Figures

Figure 1: Trend in Self-Employment Rate, by State Regulatory Regime



Note: Data from the 2012-2014 Monthly CPS.

## Tables

Table 1: Summary Statistics

	By-State Analysis		By-ESI Analysis	
	Mean	Standard Deviation	Mean	Standard Deviation
Self-Employed	0.11	0.31	0.02	0.15
Heavy Regulation	0.10	0.30		
Group of One Regulation	0.16	0.37		
Moderate Regulation	0.21	0.41		
Light Regulation	0.51	0.50		
Employer Sponsored Insurance (ESI) Only			0.55	0.50
Spouse has ESI			0.31	0.46
At Least One Family Member with Poor Health			0.04	0.18
Over 45 Year Old			0.48	0.50
Number of People in Family			3.06	1.47
Has ESI that Covers Dependents			0.33	0.47
Age	43.61	9.66	44.45	9.02
Age Squared	1995	842	2057	799
Married	0.65	0.48	0.72	0.45
Race: White or Partially White	0.84	0.37	0.84	0.37
Race: Black or Partially Black, Nonwhite	0.10	0.30	0.09	0.29
Race: Other	0.07	0.25	0.07	0.26
Hispanic	0.13	0.33	0.12	0.33
Education: Less than High School	0.07	0.26	0.06	0.24
Education: High School Graduate	0.27	0.45	0.26	0.44
Education: Some College	0.17	0.37	0.16	0.37
Education: Associate's Degree	0.12	0.32	0.13	0.33
Education: Bachelor's Degree	0.24	0.42	0.25	0.43
Education: Some Graduate Studies	0.14	0.34	0.15	0.36
Occupation: Management, Professional, and Related	0.41	0.49	0.43	0.50
Occupation: Service	0.16	0.36	0.14	0.34
Occupation: Sales and Office	0.21	0.41	0.22	0.41
Occupation: Farming, Fishing, and Forestry	0.01	0.08	0.01	0.08
Occupation: Construction and Maintenance	0.09	0.29	0.09	0.28
Occupation: Production, Transportation, and Material Moving	0.12	0.32	0.12	0.33
Occupation: Armed Forces	0.00	0.01	0.00	0.00
Number of Own Children	0.79	1.10	0.93	1.12
Male	0.52	0.50	0.51	0.50
N	1,492,698		256,841	

Note: Data from 2012 to 2014 Current Population Survey monthly data and Annual Social and Economic Supplement.



Table 2: Pre-ACA State Implementation of Rating Restrictions and Guaranteed Issue Regulations

State	Description
<b>Base Group</b>	
Massachusetts	<p>In 1996, Massachusetts implemented modified community rating and guaranteed issue in the non-group market. Rating was allowed to vary by age, geographic region, and family composition, but not health status. Rating variation for age was not allowed to vary by more than +/- 33% of the base premium. Only eligible individuals who do not have access to a group policy are able to participate in this market. Insurers are obligated to offer at least one of three standardized plans in the non-group market that vary by the degree of managed care (Kirk 2000). The 2006 Massachusetts reform established the “Connector,” a clearing house for insurance plans and payments, and implemented a sliding scale subsidy for those with income up to 300% of the federal poverty line (FPL). An individual mandate required all individuals 18 and older to obtain “credible health insurance,” and an employer mandate required firms with eleven or more full-time equivalents to offer health insurance. Medicaid was expanded for children from families with income up to 300% of FPL and for adults with income up to 150% of FPL. Finally, the non-group and small-group health insurance markets were merged, which was expected to reduce non-group premiums and somewhat increase small group premiums. (McDonough et al. 2008)</p>
Vermont	<p>Vermont implemented modified community rating. The premiums for commercial indemnity plans could vary by +/- 20% for demographic factors, but not health status. HMOs and Blue Cross plans were not allowed to use any rating differentials (Hall 2000b). In 2006, Vermont passed a law that created a subsidized insurance product (Catamount Health) and included an employer mandate, among other provisions. (Community Catalyst, 2006) In 2011, Vermont passed a law that is scheduled to lead to the implementation of Green Mountain Care, a state funded and managed single-payer insurance system.</p>
<b>Heavy Regulation</b>	
Maine	<p>Maine implemented modified community rating and guaranteed issue in 1993. Premiums could vary by +/- 50% of the community rate for age, smoking status, occupation, industry, and geographic areas health (Lo Sasso and Lurie 2009).</p>
New Jersey	<p>New Jersey implemented pure community rating and guaranteed issue in 1993 for 6 standardized plans: 5 indemnity plans and one HMO plan (Swartz and Garnick 2000).</p>
New York	<p>New York implemented pure community rating and guaranteed issue in 1993, only allowing rating differentials for geographical region (Hall 2000a).</p>
Washington	<p>Washington implemented modified community rating and guaranteed issue</p>

	in 1996. Age-related rating was allowed and carriers could give up to 10% premium differences for health and “wellness” related characteristics (Kirk 2000). In 2000, was scaled back to allow some risk-based underwriting and pre-existing condition limits. (LoSasso 2008)
<b>Moderate Regulation</b>	
Idaho	Idaho implemented a rating restriction with guaranteed issue for two plans in 1995. Premiums may not vary more than 25% an applicable index for age and gender.
Iowa	Iowa implemented rating restrictions with guaranteed issue for 2 plans in 1996. Premium rates may not vary by more than 100 percent from the applicable index rate for demographic characteristics approved by the Commissioner of Insurance. The legislation does not specify these characteristics, but they include age, gender, and geographic location.
Kentucky	Kentucky implemented modified community rating and guaranteed issue in 1996. Rating was originally allowed to vary by a ratio of 3:1 based on age, geography, and family composition, but not by health status or claims experience (Kirk 2000). Later, premium variation was allowed to vary by a ratio of 5:1 and differential rating for gender was allowed, but the premiums could not vary for gender by greater than 50%. Community rating and guaranteed issue were repealed in 2000, but Kentucky maintains rating restrictions. (Lo Sasso 2008)
Louisiana	Louisiana implemented modified community rating with no guaranteed issue in 1994. Premiums can vary +/- 10% based on health status and unlimited variation based on specific demographic characteristics (GAO 1996).
Michigan	BCBS of Michigan must guarantee issue and community rate products in individual market. (U.S. HHS 2008)
Minnesota	Minnesota implemented a rating restriction without guaranteed issue in 1993. Premium rates may vary from the index rate +/-25 percent for health status, claims experience, and occupation, and +/-50 percent of the index rate for age. Premium rates may also vary by up to 20 percent for three geographic areas.
Nevada	Nevada implemented +/- 50% rating bands but no guaranteed issue. (U.S. HHS 2008)
New Hampshire	New Hampshire implemented modified community rating and guaranteed issue in 1995. Premiums could vary by age by a 3:1 ratio (GAO 1996, Feldvebel and Sky 2000). Community rating and guaranteed issue was repealed in 2003, but adjusted community rating was reinstated in small-group market in 2005. (Lo Sasso 2008)
North Dakota	North Dakota implemented rating restrictions without guaranteed issue in 1995. Premium rates charged to individuals within a class for the same or similar coverage may not vary by a ratio of more than 5:1 for differences in age, industry, gender, duration of coverage, geography, family composition, healthy lifestyles, and benefit variations. Gender and duration of coverage may not be used after January 1, 1997.
Oregon	Oregon implemented modified community rating without guaranteed issue

	in 1996. Premium rates shall not vary from the individual geographic average rate, except for benefit design, family composition, and age. Legislation does not limit this variation but indicates that age adjustments must be applied uniformly.
South Dakota	South Dakota implemented +/- 30% rating bands but no guaranteed issue. (U.S. HHS 2008)
Utah	Utah implemented rating restrictions with one plan that is guaranteed issue in 1996. Premiums may vary by +/-25 percent for health status or duration of coverage. Carriers may also vary premiums because of differences in age, gender, family composition, and geographic area by actuarially reasonable rates, as defined in NAIC guidelines. Premiums may also be rated-up 15 percent for industry. The index rates carriers use for their individual business may be lower than or equal to, but not any higher than, the index rates they use for their small-employer business.
West Virginia	West Virginia implemented +/- 30% rating bands but no guaranteed issue. (U.S. HHS 2008)
<b>Business Group of One Regulation</b>	
Colorado	Colorado implemented guaranteed issue and modified community rating for business groups of 1. (U.S. HHS 2008)
Connecticut	Connecticut implemented guaranteed issue and modified community rating for business groups of 1. (U.S. HHS 2008)
Delaware	Delaware implemented guaranteed issue and a +/- 35% rating band for group sizes of 1. (U.S. HHS 2008)
Florida	Florida implemented guaranteed issue and a +/- 15% rating band for business groups of 1. (U.S. HHS 2008)
Hawaii	Delaware implemented guaranteed issue for business groups of 1, but without rating restrictions. (U.S. HHS 2008)
Mississippi	Mississippi implemented guaranteed issue and a +/- 25% rating band to business groups of 1. (U.S. HHS 2008)
North Carolina	North Carolina implemented guarantee issue and a +/- 20% rating band to business groups of 1. (U.S. HHS 2008)
Rhode Island	Mississippi implemented guaranteed issue and a +/- 10% rating band to business groups of 1. (U.S. HHS 2008)

Note: Descriptions of regulations in Heavy Regulation states come from Table 1 in LoSasso and Lurie (2009). Descriptions of regulations in Moderate Regulation states were compiled from Table 5.2 and Appendix III in GAO (1996) and Lo Sasso (2008). Descriptions of regulations in Business Group of One states were compiled from U.S. HHS (2008).

Table 3: Test Result for Pre-Policy Parallel Trends in Self-Employment Rates

	Yearly Linear Trend	Monthly Linear Trend
	(1)	(2)
Linear Trend X Heavy Regulation	0.0046 (0.0087)	0.0002 (0.0005)
Linear Trend X Group of One Regulation	0.0104 (0.0081)	0.0006 (0.0004)
Linear Trend X Moderate Regulation	0.0082 (0.0074)	0.0004 (0.0004)
Linear Trend X Light Regulation	0.0116 (0.0074)	0.0006 (0.0004)

Note: Data from the 2012-2014 Monthly CPS. The basic test for parallel trend assumption is setup as:

$SE_{it} = \alpha_1 + \alpha_2 HeavyReg_{it} + \alpha_3 SmallGroup_{it} + \alpha_4 ModerateReg_{it} + \alpha_5 NoReg_{it} + \alpha_6 LinearTrend_t + \beta_1 Heavy * LT + \beta_2 SmallGroup * LT + \beta_3 Moderate * LT + \beta_4 No * LT + \epsilon_{it}$ . We tested for both a yearly time trend and a monthly time trend; we show here only results of interest, coefficients and their standard errors for the interaction terms. Standard errors are clustered at the state level.

Table 4: Difference-in-Differences Regression Results for the Probability of Being Self-Employed, By-State Analysis

	Post-2014 Dummy without Covariates	Month Dummies without Covariates	Month Dummies with Covariates	Month Dummies with Covariates - Above 400% FPL	Month Dummies with Covariates - Below 400% FPL
	(1)	(2)	(3)	(4)	(5)
Heavy Regulation	-0.0281 (0.0199)	-0.0270 (0.0197)	-0.0197 (0.0173)	-0.0098 (0.0156)	-0.0303 (0.0184)
Post X Heavy Regulation	0.0029 (0.0030)	-0.0023 (0.0035)	-0.0011 (0.0034)	-0.0005 (0.0046)	-0.0020 (0.0034)
Group of One Regulation	-0.0177 (0.0188)	-0.0166 (0.0186)	-0.0079 (0.0170)	0.0044 (0.0159)	-0.0210 (0.0175)
Post X Group of One Regulation	0.0038 (0.0023)	-0.0014 (0.0025)	-0.0005 (0.0023)	-0.0038 (0.0043)	0.0022 (0.0038)
Moderate Regulation	-0.0173 (0.0191)	-0.0161 (0.0189)	-0.0114 (0.0172)	0.0003 (0.0160)	-0.0247 (0.0177)
Post X Moderate Regulation	0.0025 (0.0025)	-0.0027 (0.0025)	-0.0019 (0.0025)	0.0009 (0.0039)	-0.0038 (0.0030)
Light Regulation	-0.0271 (0.0185)	-0.0260 (0.0183)	-0.0147 (0.0169)	-0.0036 (0.0158)	-0.0271 (0.0173)
Post X Light Regulation	0.0023 (0.0021)	-0.0028 (0.0025)	-0.0026 (0.0024)	-0.0051 (0.0031)	-0.0003 (0.0028)
Post-2014 Dummy	Yes	No	No	No	No
Month Dummies	No	Yes	Yes	Yes	Yes
Individual Covariates	No	No	Yes	Yes	Yes
Number of Observations	1,492,698	1,492,698	1,492,698	647,261	845,437

Note: Data from the 2012-2014 monthly Current Population Survey. Table presents coefficients from a linear probability model. Standard errors are clustered at the state level, and are in parentheses.

\* implies significant at 10%; \*\* implies significant at 5%; \*\*\* implies significant at 1%

Table 5: Triple Differences Regression Results for the Probability of Being Self-Employed

Variation of Interest (VOI)	Spousal ESI Available - Married	Spousal ESI Available - Full Sample	Family Poor Health	Age over 45 Year Old	Age	Family Size
	(1)	(2)	(3)	(4)	(5)	(6)
ESI Only	-0.0484*** (0.0036)	-0.0421*** (0.0024)	-0.0326*** (0.0016)	-0.0303*** (0.0018)	-0.0196*** (0.0073)	
ESI with Dependent						-0.0084** (0.0033)
VOI	-0.0257*** (0.0039)	-0.0203*** (0.0031)	0.0028 (0.0072)		0.0009 (0.0008)	0.0023*** (0.0008)
ESI X VOI	0.0248*** (0.0043)	0.0181*** (0.0033)	-0.0012 (0.0081)	-0.0051** (0.0021)	-0.0003* (0.0002)	-0.0047*** (0.0010)
VOI X Post	0.0040 (0.0077)	-0.0008 (0.0060)	-0.0096 (0.0138)	0.0062 (0.0057)	0.0005 (0.0003)	-0.0007 (0.0013)
ESI X Post	0.0017 (0.0069)	-0.0022 (0.0047)	-0.0016 (0.0033)	0.0014 (0.0040)	0.0227 (0.0149)	-0.0048 (0.0063)
ESI X VOI X Post	0.0017 (0.0085)	0.0055 (0.0068)	0.0082 (0.0149)	-0.0056 (0.0062)	-0.0005 (0.0003)	0.0017 (0.0019)
Month Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Individual Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Age (Continuous Variable)	Yes	Yes	Yes	Yes	Yes	Yes
(ESI X VOI) + (ESI X VOI X Post)	0.0265*** (0.0077)	0.0235*** (0.0062)	0.0071 (0.0131)	-0.0107* (0.0059)	-0.0008** (0.0003)	-0.0029* (0.0017)
Number of Observations	125,863	181,502	181,502	181,502	181,502	181,502

Note: Data from the 2012-2014 Current Population Survey. Table presents coefficients from a linear probability model. Standard errors are clustered at the individual level, and are in parentheses. \* implies significant at 10%; \*\* implies significant at 5%; \*\*\* implies significant at 1%

Table 6: Difference-in-Differences Regression Results for the Probability of Being Self-Employed, By-ESI Analysis Split by Income

Variation of Interest (VOI)	Spousal ESI Available - Married	Spousal ESI Available - Full Sample	Family Poor Health	Age over 45 Year Old	Age	Family Size
	(1)	(2)	(3)	(4)	(5)	(5)
Above 400% Federal Poverty Line						
ESI Only	-0.0547*** (0.0069)	-0.0543*** (0.0052)	-0.0356*** (0.0028)	-0.0337*** (0.0032)	-0.0242* (0.0132)	
ESI with Dependent						-0.0027 (0.0019)
VOI	-0.0321*** (0.0072)	-0.0313*** (0.0058)	0.0160 (0.0182)		0.0000 (0.0013)	0.0024 (0.0017)
ESI X VOI	0.0284*** (0.0075)	0.0273*** (0.0060)	-0.0108 (0.0203)	-0.0041 (0.0034)	-0.0003 (0.0003)	-0.0070*** (0.0019)
VOI X Post	0.0107 (0.0149)	0.0156 (0.0118)	-0.0497** (0.0251)	0.0107 (0.0100)	0.00101* (0.0006)	0.0001 (0.0027)
ESI X Post	0.0000 (0.0137)	0.0065 (0.0101)	-0.0044 (0.0059)	0.0039 (0.0077)	0.0500* (0.0275)	-0.0112 (0.0117)
ESI X VOI X Post	-0.0029 (0.0157)	-0.0095 (0.0127)	0.0505* (0.0287)	-0.0117 (0.0106)	-0.00115* (0.0006)	0.0030 (0.0039)
(ESI X VOI) + (ESI X VOI X Post)	.0255* (0.0141)	0.0178 (0.0114)	0.0398* (0.0212)	-0.0158 (0.0102)	-.0014** (0.0006)	-0.0039 (0.0036)
Number of Observations	59,897	78,327	78,327	78,327	78,327	78,327
Below 400% Federal Poverty Line						
ESI Only	-0.0445*** (0.0041)	-0.0366*** (0.0026)	-0.0301*** (0.0020)	-0.0278*** (0.0022)	-0.0168* (0.0088)	
ESI with Dependent						-0.0110*** (0.0041)
VOI	-0.0220*** (0.0047)	-0.0160*** (0.0037)	-0.0004 (0.0076)		0.0016 (0.0010)	0.0023** (0.0010)
ESI X VOI	0.0252*** (0.0054)	0.0172*** (0.0043)	-0.0001 (0.0084)	-0.0054** (0.0027)	-0.0003 (0.0002)	-0.0035*** (0.0012)
VOI X Post	-0.0028 (0.0087)	-0.0112* (0.0067)	0.0069 (0.0171)	0.0028 (0.0069)	0.0002 (0.0004)	-0.0008 (0.0015)
ESI X Post	0.0027 (0.0078)	-0.0052 (0.0052)	0.0000 (0.0039)	-0.0003 (0.0046)	0.0039 (0.0173)	0.0007 (0.0070)
ESI X VOI X Post	0.0061 (0.0100)	0.0138* (0.0081)	-0.0107 (0.0175)	-0.0006 (0.0074)	-0.0001 (0.0004)	0.0005 (0.0020)
(ESI X VOI) + (ESI X VOI X Post)	0.0313*** (0.0090)	0.0310*** (0.0073)	-0.0107 (0.0160)	-0.0060 (0.0070)	-0.0004 (0.0004)	-0.0030 (0.0018)
Number of Observations	65,966	103,175	103,175	103,175	103,175	103,175

Note: Data from the 2012-2014 Current Population Survey. Table presents coefficients from a linear probability model. Standard errors are clustered at the individual level, and are in parentheses. \* implies significant at 10%; \*\* implies significant at 5%; \*\*\* implies significant at 1%