Do Health Care Insurance Expenditures and State Policies Affect State Self-Employment Rates?

Mary Ellen Benedict and Lizi Wu*

ABSTRACT. Previous research on self-employment has focused on employers as insurance-providers or how individuals make job choices under health insurance constraints. We add to the literature by examining whether certain health insurance factors determine the self-employment rate at the state level. One explored variable is the per capita health insurance expenditure for states. Using panel data for the years 1999-2004, a random effects model indicates that per capita private health expenditures reduce the state self-employment rate. We also analyze the impact of state health insurance regulations that support small businesses and self-employment. The results indicate that those states with relatively strict limits on health insurance premiums charged to small businesses or the self-employed have higher average self-employment rates. The mandate may be reducing the cost difference between paid and self-employed workers, making the decision between paid and self-employment less about health insurance costs. And, if health insurance costs distort the choice between the two labor market paths, state regulation on carriers, at least as they relate to premiums, may be leading to economic decisions that are more socially efficient. (J48, I13)

I. Introduction

Self-employment has become an increasingly large focus of academic research from a variety of disciplines. Because society views self-employment as the driver of economic growth, federal and state governments provide incentive policies, such as tax incentive programs for those who develop new businesses in certain industries, to increase self-employment and entrepreneurship.[1]

This paper examines whether health insurance expenditures and related state policies provide incentives or disincentives for

*Mary Ellen Benedict, Bowling Green State University; e-mail: mbenedi@bgsu.edu, and Lizi Wu, Wayne State University; e-mail: lizi.wu@wayne.edu. Send correspondence to Mary Ellen Benedict. The authors thank Irina Hakobyan for her earlier work on the dataset, the discussant and session participants from the 2009 MVEA meeting and the 2010 Midwest Economics Association session participants, Steven Malenchak for editorial assistance, and anonymous reviewers for their helpful comments. The paper arises from earlier work by author Wu.

self-employment. In particular, we examine whether per capita spending on health insurance and state policies related to health insurance have an effect on state self-employment rates. Economists analyze the decision to become self-employed as a utility-maximization problem, whereby the individual considers job choices based on financial and other constraints. In the United States, one such constraint is the cost of private health insurance, because the health insurance market is to a large degree employer-based. Nearly 59 percent of those who have health insurance do so with their employer (Turner, et al., 2009)[2] and many self-employed do not have health insurance because of the cost (CAHC, 2009). Thus, health insurance costs enter into the decision of whether to jump from the relative safety of paid work to a risky self-employment position.

Federal and state policymakers, aware that health care costs enter into the decision, have developed laws and policies that are believed to ease the transition into self-employment. However, it is not clear whether such policies have their intended effect. Using individual data, a few researchers have found limited evidence that some policies, such as the continuation of health insurance coverage when one leaves an employer, do indeed have a positive effect on job mobility (Gruber and Madrian, 1994). We extend this literature with a state-level examination of health insurance costs and policy as it relates to the state's self-employment rate.

This paper first investigates the relationship between state-level private health care expenditures to self-employment rates. The objective is to determine the extent to which per capita private health care insurance spending affects a state's self-employment rate. We view this variable as a "pull" factor because lower spending makes it easier for movement into self-employment, thus increasing the state's self-employment rate. We also provide a description of the various state policies and test whether incentives related to state health insurance policy affect the self-employment rate.

At least one study indicates that the individual decision of being self-employed is not significantly shifted by one being insured or not (Holtz-Eakin, et al., 1996). However, other studies have demonstrated that the self-employed are less likely to have health insurance than do paid workers (CAHC, 2009) and recent work by Fairlie and Kapur (2009) suggests that entrepreneurial activity is stymied by our employer-based health insurance system. Given this information, it is expected that the higher per capita private health care insurance expenditure is, the lower the state self-employment rate will be. We also expect that states with

health care policies targeting the small employer with access to affordable group plans and tax credits will have a higher average self-employment rate than those states with limited policies relating to health insurance.

Previous research on health insurance and self-employment focuses on individual decision-making. However, health insurance, requirements relating to health coverage, mandates, and tax credits, are primarily a state decision. Further, economic development and encouragement of self-employment is often a state-level initiative. Macro studies on self-employment have often investigated self-employment rates by some sort of within-country unit, such as states. Our paper appropriately employs state-level data to investigate the relationship of self-employment to health insurance costs and state policy.

II. Past Research on Health Insurance and Self-Employment

A. HEALTH INSURANCE AND THE STATE SELF-EMPLOYMENT RATES

The Coalition for Affordable Health Coverage (CAHC) states that more than 25% of all self-employed persons are uninsured (compared with 13% of workers in firms with more than 1,000 workers). The organization indicates that self-employed workers and small businesses comprise about 30% of all workers, but represent nearly half of all uninsured workers (CAHC, 2009). Kim and Baeck (2002) point out that the self-employed, especially small business owners, have been a persistent public policy concern as they are more likely to be among the uninsured.

Madrian and Lefgren (1998) attribute the difference in health care coverage between the self- employed and paid workers to three factors. First, economies of scale enable large employers to spread out the risk associated with health care and therefore they face lower premiums from health insurance companies. Small employers and self-employed individuals generally face larger premiums, have fewer benefits, and the variability around mean premiums is typically larger for small employers (Williams and Lee, 2002). Second, the price of health insurance is related to state mandates regarding employer-based health insurance, and

small firms are less likely to be able to afford the added increase in the cost of health insurance due to these mandates. Bunce and Wieske (2008) report that state mandates, which can number as high as 50 for an individual state, can drive up the cost of basic health care coverage by 20 to 50 percent. Finally, Madrian and Lefgren (1998) note that differential tax treatments can create disparity in health care costs for paid work and self-employment. For paid workers, health insurance costs are part of pre-tax income and health costs exceeding 7.5 percent of adjusted gross income are tax deductible. For the self-employed, tax treatment is more complicated and depends on the organizational form of the business and ultimately, many self-employed are prevented from taking the tax advantage as it relates to health insurance because they cannot meet requirements (Madrian and Lefgren, 1998).

To our knowledge, little work on health insurance and self-employment has been done at the state level. Only one study has attempted to investigate state policies in this manner. Xirasagar et al. (2005) examined the relationship between state uninsured rates and demographic data for the years 1998-2000, including a variable that controls for the percentage of the workforce in small businesses. The authors find that a percentage point increase in the workforce in small businesses (defined as 1-4 employees in the study) increases the percentage of uninsured by almost 0.8 percentage points, ceteris paribus. As the authors note, since 4.9 percent of the working population were in this category at the time, the result indicated that approximately 25 percent of the total uninsured load is accounted for by this sector.

B. STATE HEALTH POLICIES AND SELF-EMPLOYMENT RATES

Health insurance policy in the United States is generally a patchwork of state-level initiatives, with some encouragement from the federal government. Every state regulates the terms and conditions of how health insurance is sold. Each state has its own rules regarding access, portability, and pricing (GAO, 1995). Both federal and state lawmakers have indicated a growing concern with the number of uninsured, hence a number of policies have been instituted since the 1990s to make it easier for individuals and small businesses to obtain affordable insurance. The policies can be divided into several categories: cost containment for small businesses and individuals, portability, and small group coverage via tax incentives and small group definition.

Several different changes at the national level led to changes in state health insurance regulation over the time period of our data and today. We will focus on the regulations that relate to small businesses and the self-employed. Appendix 1 provides details of these regulations for each state, along with the average self-employment rate over the time period for the data.

State regulators used the National Association of Insurance Commissioners (NAIC) model in an attempt to reduce the variability in health insurance costs for small businesses across states. Between 1990 and 1994, 45 states made changes to the health insurance rules to move toward the NAIC model, but states are not required to follow NAIC precisely and therefore large variability among states still existed by 1994 (GAO, 1995). The model provided state regulators with a list of recommendations that would create uniformity in health insurance provision across states:

- Carriers were limited in how they set premium rates. The NAIC focused on the personal factors that could be used in setting rates, the type and number of business classes employed in premium calculations, and limitations on the variability in rates among business classes (GAO, 1995).
- Regarding guarantee issue, all insurance carriers were to offer at least two health plans (a basic and standard plan), which would be regulated by an external commission. The basic plan was to provide coverage at a lower cost by excluding some state-mandated benefits and/or by requiring high deductibles, while standard plans would represent the typical plan in the state. All policies were also required to be renewed with limited exceptions, such as fraud or failure to pay premiums.
- Small employers were defined as businesses with 25 or less individuals. States could decide whether to include a "group of one" within the category to allow the self-employed an avenue for relatively low-priced health insurance.
- Carriers could deny coverage for preexisting conditions for no more than 12 months after coverage was effective. Further, carriers were required to include those who were covered under a previous plan.

By 1994, even though the NAIC attempted to make adherence to the recommendations easier, states still varied in health regulations that

affected small employers and the self-employed. One state, Hawaii, developed a universal health insurance model in 1975 and was exempt from many of the mandates handed down over the time period in question. Of the remaining states, 34 states permitted variation in how premiums were determined via the NAIC model, which was already quite generous to the carriers at the time, and 4 states (Michigan, Nevada, Pennsylvania, and Washington) had no regulation of how insurance premiums were determined. By 2002, Michigan and Pennsylvania still did not regulate premium rates, Nevada and Washington placed some limits on insurance companies in regard to premiums, and the other states conformed to NAIC rules or set higher limits on what information could be used to set premiums (GAO, 2006). The states with limits or no regulation on premium rates were all below the average state self-employment rate of 6.34 percent.

Likewise, the NAIC recommendations regarding guarantee issue were not always followed by the states. Twelve states did not regulate the number of plans required to be offered by carriers and four states required carriers to offer only one plan, rather than the NAIC model of two. In our data, only three states (South Dakota, Washington and New Mexico) did not regulate the required number of plans and had an above-average self-employment rate; one other state was above the average self-employment rate and offered only one plan (Oregon), while the other high self-employment states offered at least two plans.

The NAIC also attempted to provide additional health insurance opportunities for small employers by designating a "group of one" so that individual self-employed workers could find affordable health insurance rates with state group plans. The self-employed often had to provide evidence that they were indeed self-employed in order to take advantage of the insurance programs for small group employers (GAO, 1995). There were eleven states with "group of one" plans offered by private health insurers; this group included the state with the lowest self-employment rate over the time period of our study, Delaware, as well as the state with one of the highest rates, Maine.

In addition to the NAIC mandates, several federal laws changed how states regulated heath insurance carriers. The Health Insurance Portability and Accountability Act of 1996 (HIPAA) required that states develop regulations to allow individuals the ability to move more easily between jobs and to protect individuals and small businesses from health insurance carriers that charged high premiums or that denied coverage

easily. Four years later, twenty states still did not conform to HIPPA.

The Consolidated Omnibus Budget Reconciliation Act (COBRA) of 1985 was enacted to help with health care coverage when individuals required insurance outside of an employer. Under this act, those with employer-sponsored insurance (at businesses with 20 or more employees) are entitled to temporarily continue, generally for 18 months, their coverage in the event that employment or dependent status changes for a reason other than termination due to gross misconduct. States are permitted to expand the coverage to small businesses and to extend the time that individuals are covered under the law. During the time frame of our sample, states with lower self-employment rates tended to impose limits on the length of COBRA coverage due to preexisting conditions.

Health Savings Accounts (HSAs) were established in federal law in December 2003, when President George W. Bush signed the Medicare Prescription Drug Improvement and Modernization (aka the MMA) Act. HSAs are tax-free financial accounts that are designed to help individuals save for future health care expenses. The tax-free accounts would help small business owners to use a relatively low-cost method of health insurance since the HSA-plans have lower premiums than traditional health insurance plans (GAO, 2006). Several states immediately conformed to the law. Another large group had been initiated into HSAs through a pilot program developed in the 1990s. By the end of 2004, only twelve states did not conform to the federal rules regarding HSAs; most of these states were within the standard deviation of the average self-employment rate of our sample and one state (Maine) had a relatively high level of self-employment.

Additionally, the MMA law allows states to offer tax breaks to small employers who desire to offer their employees health insurance. Tax breaks have been available to small employers for many years, but the 2003 law provided further impetus to states. Today, most states offer a tax incentive to small employers who provide health insurance to their employees, but in the time of our sample, there were few offered. Only Kentucky, Colorado, Kansas and Maine provided tax incentives to employers with employee health insurance, and all of these laws were in place prior to the MMA.

We next examine the relationship between health insurance expenditure and self-employment rates, and whether state policies help to improve self-employment rates.

III. Methodology and Data Issues

The determinants of self-employment include two categories of factors: at the individual level, there are personal characteristics and family circumstances, and in the broader macroeconomic level, employment and government policies are influential (Parker, 2004). If the aggregate situation is the focus, macro-factors are employed to discover their relationship with the self-employment rate. The influential macroeconomic variables mainly include economic development, changes in industrial structure, unemployment, regional effects and government policies (Parker, 2004). Push factors are those that force individuals into self-employment, while pull factors are those that provide incentives for individuals to become self-employed (or pull individuals away from self-employment). In other words, the self-employment decision is opportunistic, where the economic environment at a particular time drives the self-employment choice (Aaronson, 1991).

The basic strategy of this study is to see how differences in a list of macroeconomic factors, particularly health expenditures, translate into variances in state self-employment rates. We expect that lower per capita health care insurance expenditures and health policies that make it easier for small businesses and the self-employed to be covered and pay for health insurance will pull workers into self-employment. We employ a panel dataset of the 50 states in the United States covering the years of 1999-2004. The data are mainly collected from eight sources: the Bureau of Economic Analysis (BEA), the Bureau of Labor Statistics (BLS), the Centers for Medicare & Medicaid Services (CMS), the Department of Health & Human Services, the National Bureau of Economic Research (NBER), the U.S. Census Bureau, the Government Accounting Office (GAO), and the National Conference for State Legislatures (NCSL).

Because the data series is both cross-sectional and time-series, the error term can include state and time-varying effects. The employed model is a random effects (RE) model. The hypothesis is that the state self-employment situation is affected by the miscellaneous macro-factors in the following manner:

$$Self\text{–}Employment_{it} = \beta_1 + \beta_k X_{it} + \omega_{it} \quad (1)$$

where X_{it} represents the macro-variables. The error term ω_{it} is assumed

to be normally distributed with mean zero and variance σ^2. ω_{it} is comprised of two components: the individual state-specific error, ξ_{it}, and a combined time series and cross-section error, u_{it}. ξ_{it}, is the deviation around the intercept term in (1) and is unobservable. The usual assumptions regarding normality, zero mean, constant variance, and zero covariance between the two error terms are assumed. We use generalized least squares to alleviate the problem; tests indicate that the random effects model works best with the data at hand and that the GLS procedure makes the appropriate corrections.[3]

The dependent variable is the self-employment rate, defined as the self-employed population over the civilian labor force in each state (Lin, Yates, & Picot, 1999).[4] Only the nonfarm self-employment rate is considered because farm businesses face a unique economic environment and decision-making process (Parker, 2004). Based on the findings by Benedict and Hakobyan (2008), the base model includes the unemployment rate, the labor force participation rate, and average tax rate. We also include a control for state economic freedom.

The per capita private health care insurance expenditure (*HCIE*) is the per capita dollar amount (in 2004 constant dollars) individuals pay for their own health insurance. The CMS lists the Medicare and Medicaid personal health care expenditures and the overall health care expenditures up to the year 2004. Because Medicare is operated by the federal government single-payer system to cover health care of people aged 65 and over and Medicaid is used to help low-income individuals with the efforts of both federal and state, the expenditures on these two programs are deducted from the overall health care insurance expenditure to calculate the variable for each state. *HCIE* is computed by dividing the private health insurance spending by the population aged less than 65, which was collected from U.S. Census Bureau. As stated earlier, it is expected that *HCI*E will have a negative effect on the state self-employment rate.[5]

The unemployment rate (*UERATE*), collected from the BLS, is defined as the annual percentage of the unemployed population over the labor force in each state. As both a push and pull factor (Parker, 2004), it is unknown whether it will be positively or negatively related to the state self-employment rate. A second independent variable is the labor force participation rate (*LFP*), which is the percentage of the employed in the labor force and collected from the U.S. Census Bureau database (Statistical Abstract of United States). The coefficient on *LFP* is expected

to be positive as more people are likely to be self-employed when the economy is strong (the prosperity pull hypothesis).

Average tax rates (*TAXRATE*) are included to control for the tax avoidance theory of self-employment (Blau, 1987). The rates are estimated as the sum of the federal, state and local tax revenues divided by the state's total personal income. The relevant data are collected from the BEA. In the study conducted by Benedict and Hakobyan (2008) using similar data, marginal tax variables were statistically insignificant and average tax rates were not. Hence, this paper only examines the effects of average tax rates on self-employment.

We also add one additional variable to control for the level of economic freedom associated with the state.[6] States vary widely in the level of economic and personal freedom provided to its businesses and citizens. The Fraser Institute has tracked economic freedom in North America for many years. It uses a variety of economic and personal freedom estimates to rank regions of Canada, Mexico, and the United States (Karabegović and McMahon, 2008). For the United States, the estimates are provided for each state. The size of government (spending-related items), government revenues, taxation, and labor market freedom comprise the elements used by the Institute in the development of economic freedom scores and rankings. The U.S. states and Canada provinces are combined. Delaware has been ranked first in economic freedom (score of 1) for all years of the data. The other states have had varying scores over the time period, but Maine, West Virginia, Hawaii, Montana, New Mexico, North Dakota, and Rhode Island typically have high scores (meaning relatively low economic freedom).

We are unsure about the sign of the relationship between economic freedom and self-employment rates. Basic economic theory would lead one to expect that states with economic freedom would also have high rates of self-employment, since low barriers to entry should increase entrepreneurial activity. The Fraser Institute demonstrates that their measure of economic freedom is positively associated with venture capital investment and new start-ups in 2008 (Karabegovic and McMahon, 2008). This would imply a negative coefficient on our economic freedom variable. However, self-employment is much more broadly defined in the data analysis and includes individuals who have very small operations, such as house painters, house cleaners, and music teachers. It may be that these types of the self-employed are either supported by regulation (e.g., the states have rules to help small

businesses of less than five employees receive loans) or they begin their activity without consideration to the rules and regulations (e.g., the house painter just starts painting houses for friends and neighbors). Under the former scenario, the coefficient on economic freedom will be positive (low freedom implies higher self-employment rates) and under the latter scenario, the coefficient will not be statistically significant.

Table 1 shows the statistical characteristics of the main variables. The average state self-employment rate is 6.34 percent, the average per capita health insurance expenditure is $3,485.12, and the overall expenditure is an average of 13.13 percent of the Gross State Product. The mean state freedom score is 25.34. Table 2 provides the nonfarm self-employment rates of all states over the time period of the analysis. Montana and Delaware have the average minimum and maximum percentages, respectively.

TABLE 1–Descriptive Statistics of the Variables (n=300)

Variable	*Description*	*Mean*	*SD*
SE rate	Population of nonfarm self-employed/labor force	6.34	1.39
UE rate	Unemployed as a percentage of labor force	4.69	1.16
LFP	Percentage of employed in labor force	66.53	4.17
TAXRATE	Total average tax rate	11.66	2.42
HCIE	per capita private health care expenditure	3485.12	861.86
HC/GSP	Private health care expenditure as a percentage of Gross State Product	13.13	2.40
STATE FREEDOM	Economic Freedom Ranking	25.34	14.35

Data compiled from several sources by the authors as described in the text.

TABLE 2–Self-Employment Rates by State 1999-2004

State	*Average*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*
Alabama	5.58	6.01	6.04	4.89	5.04	5.73	5.78
Alaska	8.70	10.16	9.01	8.07	8.36	8.14	8.47
Arizona	6.21	6.35	6.18	6.69	5.84	5.84	6.34
Arkansas	6.30	5.73	5.41	6.85	6.07	6.40	7.33
California	8.27	8.34	8.14	8.01	7.65	8.62	8.86
Colorado	7.19	6.80	7.38	6.93	6.61	7.80	7.61
Connecticut	6.57	7.15	7.04	6.58	6.66	6.32	5.69
Delaware	min4.49	5.40	4.65	4.06	min3.55	4.79	min4.46
Florida	5.37	5.25	5.15	5.11	5.20	6.09	5.43
Georgia	5.87	6.41	5.44	4.99	5.27	6.87	6.25
Hawaii	6.55	6.39	6.39	6.93	7.04	6.31	6.21
Idaho	8.06	7.94	7.60	7.62	7.60	8.66	8.92
Illinois	4.75	5.00	min4.53	4.60	4.61	4.73	5.01
Indiana	5.27	5.43	5.48	4.89	5.23	5.62	4.97
Iowa	6.30	6.54	6.33	6.42	6.24	6.33	5.93
Kansas	5.75	6.62	5.39	5.07	5.66	5.85	5.88
Kentucky	5.58	6.19	5.50	5.54	5.75	5.11	5.36
Louisiana	6.15	5.90	6.06	5.66	5.63	6.78	6.86
Maine	9.52	10.27	max10.60	9.36	8.75	9.23	8.91
Maryland	5.37	5.86	5.03	5.01	5.18	5.78	5.37
Massachusetts	6.45	6.62	6.24	6.46	5.91	6.36	7.09
Michigan	5.08	5.20	5.02	5.02	4.96	5.18	5.08
Minnesota	6.12	6.00	5.73	6.72	6.34	6.02	5.91
Mississippi	6.31	5.83	6.79	6.33	6.63	6.02	6.28
Missouri	5.45	4.85	5.09	5.59	5.38	5.96	5.83
Montana	max10.12	10.34	10.23	max9.46	max9.70	max10.11	max10.90

State	*Average*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*
Nebraska	5.91	6.15	5.74	6.03	6.05	5.84	5.66
Nevada	5.04	5.73	4.56	4.79	4.72	5.00	5.45
New Hampshire	7.58	8.41	8.45	6.82	7.37	7.38	7.04
New Jersey	4.72	4.87	4.63	4.95	4.42	4.71	4.74
New Mexico	7.64	7.78	7.80	7.04	7.52	8.25	7.46
New York	5.78	5.74	5.60	5.50	5.53	5.94	6.39
North Carolina	6.06	6.87	6.72	6.13	5.54	5.34	5.78
North Dakota	6.24	6.23	6.49	6.19	6.07	6.63	5.84
Ohio	5.11	5.13	5.41	5.38	4.79	4.91	5.04
Oklahoma	7.11	6.98	6.67	7.63	6.79	7.73	6.88
Oregon	8.26	8.58	9.26	7.75	7.63	7.74	8.59
Pennsylvania	5.72	5.63	5.73	5.94	5.48	5.57	5.94
Rhode Island	5.04	4.96	4.55	4.76	4.86	5.58	5.51
South Carolina	5.26	4.99	5.44	5.54	5.03	5.50	5.05
South Dakota	6.45	6.75	6.23	7.16	6.41	5.87	6.25
Tennessee	7.07	7.31	6.54	6.85	7.04	7.43	7.22
Texas	6.85	6.80	6.74	6.61	6.27	7.29	7.41
Utah	6.07	5.90	6.25	6.19	5.25	6.33	6.47
Vermont	9.39	max10.42	9.34	8.66	9.46	9.68	8.77
Virginia	4.74	min4.74	4.93	min3.92	4.31	5.17	5.34
Washington	6.83	7.25	6.57	6.64	6.26	7.03	7.20
West Virginia	5.10	5.75	4.97	4.68	4.85	5.72	4.65
Wisconsin	5.63	5.77	6.27	5.65	5.42	5.43	5.23
Wyoming	7.98	7.63	8.99	8.49	7.04	7.54	8.17

Source: Bureau of Labor Statistics. Min= Minimum and Max = maximum

Table 3 reports the results from the two-way GLS random effects (RE) models. All models have statistically significant χ^2-statistics, indicating the models explain the data well. As noted earlier, Bruesch-Pagan and Hausman χ^2 tests (last two rows in Table 2) indicate that the RE model is preferred over OLS and the FE model at the 1% level of significance.

TABLE 3–GLS Random Effects Regression (n=300)
Dependent Variable: Self Employment Rate

	Model 1 HCIE	*Model 2 Macro Vars. Inc.*	*Model 3 Health Policy Vars. Inc.*
Constant	7.76*** (12.94)	2.116 (1.03)	2.897 (1.35)
HCIE Health Care Insurance Expend./Cap.	-0.00031*** (-2.36)	-0.00045*** (-2.57)	-0.00049*** (-2.81)
UE rate Unemployment Rate		-0.090 (-1.57)	-0.104 (-1.75)
LFPR Labor Force Part. Rate		0.099*** (3.61)	0.097*** (3.61)
Tax rate Average Tax Rate		-0.045 (-0.84)	-0.080 (-1.43)
State Freedom Ranking (1 is "free")		0.026*** (3.48)	0.026*** (3.68)
Premium 1 if state reg. Prem. Above NAIC recom.			0.775** (2.04)
χ^2	48.16***	69.06***	74.45***
Breush-Pagan χ^2 comparing RE to OLS	615.48***	527.98***	507.46***
Hausman test χ^2	0.25	8.58	

All models control for state and time-related error components. T-statistics are in parentheses. *** $\rightarrow \alpha = 0.01$; ** $\rightarrow \alpha = 0.05$; * $\rightarrow \alpha = 0.10$; χ^2 is the statistic to test the overall fit of the model for the random effects models. The χ^2 statistic related to the Hausman test indicates a random effects model is superior because we fail to reject the null that the coefficients in the two models are equal.

The coefficients on the control variables are consistent across

models, and the coefficients on the labor force participation rate and the state freedom index are statistically significant in both Models (2) and (3). The coefficient on the labor force participation rate is in the direction expected, supporting the prosperity pull hypothesis (Parker, 2004). The state freedom coefficient is positive, indicating that ceteris paribus, as the index increases (freedom from government decreases), the self-employment rate increases, suggesting that state regulation may help to promote self-employment rates. The unemployment rate coefficient is negative and statistically significant in Model (3), while the coefficient on average taxes is not statistically different from zero in all models. The results on these control variables indicate support for the "pull" hypothesis in the literature.

Model (1) tests whether per capita health care insurance expenditure singly has an effect on self-employment rates and finds that it has a negative and statistically significant relationship with the self-employment rate. When we include the macro variables with the health insurance expenditure variable in Model (2), the HCIE coefficient remains negative and statistically significant. The result indicates that a $1 increase in per capita expenditures leads to a .00045 percentage point decrease in the self-employment rate.[7]

This result, while seemingly small, has some importance economically, at least for those states with relatively large populations and high self-employment rates. For example, as noted earlier, Bunce and Wieske (2008) indicate that state mandates can increase the cost of basic health care coverage by 20 to 50 percent. Our model indicates that a 20 percent increase in health care insurance expenditures would lead to a 2.2 percent decrease in the self-employment rate, while a 50 percent increase would reduce the self-employment rate by 5.5 percent.[8] For a state like California, a 50 percent increase in per capita health care insurance expenditures would reduce the number of self-employed by an estimated 131,164 individuals.[9]

Do state health insurance policies have any statistical relationship to the state's self-employment rate, once we control for other factors that are typically associated with the rate? Tests for multicollinearity demonstrate that the policy variables are highly collinear. Further testing and the statistical significance the health policy variables in various regression models indicate that we should include only the control related to premiums in the final regression (Table 3, Model (3)).[10] The result suggests that those states that imposed strict limits on how carriers

calculated premium rates, thereby reducing costs for small businesses, had an average self-employment rate that was 0.775 percentage points greater than those states that did not do more than what the NAIC recommended. Since the average state self-employment rate is only 6.34 percent, the average increase due to the premium requirement is not insubstantial.

IV. Conclusion

This paper examines whether state health insurance expenditures or state regulations on insurance companies affect the state's self-employment rate. Using state-level data over the years 1999-2004, we employ a random effects model to control for errors arising from state-specific and time-varying components. Our results indicate that higher per capita health care insurance expenditures are associated with lower self-employment rates, ceteris paribus. Although the estimated effect is not large, dramatic health care expenditures changes can substantially reduce the self-employment rate. Further, the health care insurance expenditure result indicates that factors pulling individuals to (or away from) self-employment dominate over possible push factors. When we investigate state health insurance policy, it appears that only state rules as they pertain to health insurance premiums have an individual impact on the state self-employment rate, and the effect is separate from the general economic freedom of the state or state-specific effects associated with self-employment, because we control for those effects.

What do the health policy results imply for states? If the health insurance regulation is cost-reducing, as it is with regulation on health insurance premiums, it may have the effect of pulling individuals into self-employment. So, although state mandates can raise health insurance costs (Bunce and Wieske, 2008) it may be that the difference in costs between paid and self-employed workers is smaller, making the decision between paid and self-employment less about health insurance costs. And, if health insurance costs distort the choice between the two labor market paths, state regulation on carriers may be leading to economic decisions that are more socially efficient.

Appendix 1. State Health Policies 1999-2004

State	*Average Self-Employ-ment Rate*	*Premium requirements 1994*	*Premium requirements 2002*	*Guarantee issue 1994 per NAIC rules*	*Special rule for group of 1 by 1999*	*Did not conform to Hippa in 2000*	*Limit of COBRA coverage for preexisting condition 2002*	*Tax incentives 1999-2004*	*Con-formed to HSA law when it was enacted*
Alabama	5.58	Variation	Variation	No Rule	No	Did not conform	**	**	***
Alaska	8.70	Variation	Variation	2+ plans	No	Did not conform			N/A
Arizona	6.21	Variation	Variation	1 plan	No	*			Yes
Arkansas	6.30	Variation	Variation	No Rule	No				
California	8.27	Variation	Variation	2+ plans	No		limited		
Colorado	7.19	Some limits	Some limits	2+ plans	Yes	Did not conform	limited	enacted 2000	Yes
Connecticut	6.57	Some limits	Some limits	2+ plans	No		limited		Yes
Delaware	4.46	Variation	Variation	2+ plans	Yes	Did not conform			Yes
Florida	5.37	Some limits	Variation	2+ plans	Yes				N/A
Georgia	5.87	Variation	Variation	No Rule	Yes	Did not conform	limited		Yes
Hawaii	6.55	None	None	No Rule	Yes	Did not conform			Yes
Idaho	8.06	Variation	Variation	2+ plans	No	Did not conform			Yes
Illinois	4.75	Variation	Variation	2+ plans	No		limited		Yes
Indiana	5.27	Variation	Variation	2+ plans	No		limited		Yes

State	*Average Self-Employ-ment Rate*	*Premium requirements 1994*	*Premium requirements 2002*	*Guarantee issue 1994 per NAIC rules*	*Special rule for group of 1 by 1999*	*Did not conform to Hippa in 2000*	*Limit of COBRA coverage for preexisting condition 2002*	*Tax incentives 1999-2004*	*Con-formed to HSA law when it was enacted*
Iowa	6.30	Variation	Variation	2+ plans	No	Did not conform			Yes
Kansas	5.75	Variation	Variation	2+ plans	Yes		limited	implemented 1999	Yes
Kentucky	5.58	Some limits	Variation	1 plan	No			enacted 1998	
Louisiana	6.15	Variation	Variation	No Rule	No				Yes
Maine	9.52	Some limits	Some limits	2+ plans	Yes		limited	implemented 2001	
Maryland	5.37	Some limits	Some limits	2+ plans	No		limited		Yes
Massachusetts	6.45	Some limits	Some limits	2+ plans	No	Did not conform			
Michigan	5.08	None	None	No Rule	No	Did not conform			Yes
Minnesota	6.12	Variation	Variation	2+ plans	No				
Mississippi	6.31	Variation	Variation	2+ plans	Yes	Did not conform			
Missouri	5.45	Variation	Variation	2+ plans	No				Yes
Montana	10.12	Variation	Variation	2+ plans	No				Yes
Nebraska	5.91	Variation	Variation	2+ plans	No	Did not conform			Yes
Nevada	5.04	NONE	Variation	No Rule	No				N/A
New Hampshire	7.58	Some limits	Some limits	2+ plans	Yes		limited		N/A

State	*Average Self-Employ-ment Rate*	*Premium requirements 1994*	*Premium requirements 2002*	*Guarantee issue 1994 per NAIC rules*	*Special rule for group of 1 by 1999*	*Did not conform to Hippa in 2000*	*Limit of COBRA coverage for preexisting condition 2002*	*Tax incentives 1999-2004*	*Con-formed to HSA law when it was enacted*
New Jersey	4.72	Some limits	Some limits	2+ plans	No		limited		No
New Mexico	7.64	Variation	Variation	No Rule	No	Did not conform	limited	more	Yes
New York	5.78	Some limits	Geographic or Family limits only	2+ plans	No	Did not conform		more	Yes
North Carolina	6.06	Some limits	Some limits	2+ plans	Yes			more	Yes
North Dakota	6.24	Variation	Variation	2+ plans	No	Did not conform		more	Yes
Ohio	5.11	Variation	Variation	2+ plans	No	Did not conform			Yes
Oklahoma	7.11	Variation	Variation	2+ plans	No		limited		Yes
Oregon	8.26	Some limits	Some limits	1 plan	No			more	Yes
Pennsylvania	5.72	NONE	NONE	No Rule	No				
Rhode Island	5.04	Variation	Variation	2+ plans	No		limited	more	Yes 2004
South Carolina	5.26	Variation	Variation	2+ plans	No			more	Yes
South Dakota	6.45	Variation	Variation	No Rule	No	Did not conform		more	
Tennessee	7.07	Variation	Variation	2+ plans	No			more	
Texas	6.85	Variation	Variation	2+ plans	No			more	
Utah	6.07	Variation	Variation	No Rule	Yes	Did not conform		more	Yes
Vermont	9.39	Some limits	Geographic/Family limits only	2+ plans	Yes			more	Yes

State	*Average Self-Employ-ment Rate*	*Premium requirements 1994*	*Premium requirements 2002*	*Guarantee issue 1994 per NAIC rules*	*Special rule for group of 1 by 1999*	*Did not conform to Hippa in 2000*	*Limit of COBRA coverage for preexisting condition 2002*	*Tax incentives 1999-2004*	*Con-formed to HSA law when it was enacted*
Virginia	4.74	Variation	Variation	2+ plans	No			more	Yes
Washington	6.83	None	Some limits	No Rule	No		limited	more	
West Virginia	5.10	Variation	Variation	No Rule	No			more	Yes
Wisconsin	5.63	Variation	Variation	1 plan	No	Did not conform		more	
Wyoming	7.98	Variation	Variation	2+ plans	No	Did not conform		more	

Data Sources: GAO reports, various. National Conference for State Legislatures. Groom Law Group.
* - blank space indicates conformed to Hippa. ** - blank space indicates No; *** - blank space indicates No; **** - Universal health insurance model in 1975. N/A indicates states without income taxes and therefore HSA does not apply.

References

Aaronson, Robert L. 1991. *Self-Employment: A Labor Market Perspective.* ILR Press, Ithaca, NY.

Blau, D. M. 1987. "A Time-Series Analysis of Self-Employment in the United States". *Journal of Political Economy* 95(3): 445-467.

Benedict, Mary Ellen and Irina Hakobyan, 2008. "Regional Self-Employment: The Effect of State Push and Pull Factors." *Politics & Policy* 36(2): 268-286.

Bunce, Victoria Craig, and J.P. Wieske. 2009. "Health Insurance Mandates in the States 2008. "The Heartland Institute. http://heartland.org/sites/all/modules/custom/heartland_migration/files/pdfs/23616.pdf. Accessed June 23, 2012.

Bureau of Economic Analysis. (1999-2004). www.bea.gov (Accessed January 2009).

Bureau of Labor Statistics. (1999-2004). www.bls.gov. (Accessed January 2009).

Coalition of Affordable Health Coverage, 2009. www.cahc.net.

Centers for Medicare & Medicaid Services. (1999-2004). www.cms.hhs.gov. (Accessed January 2009).

Department of Health & Human Services. (1999-2004). www.hhs.gov. (Accessed January 2009).

Fairlie, Robert W., Kanika Kapur and Susan M. Gates. 2010. "Is Employer-Based Health Insurance a Barrier to Entrepreneurship?" Working paper WR-637-1-EMKF, Rand Corporation. http://www.rand.org/pubs/working_papers/2010/RAND_WR637-1.pdf. Accessed June 20, 2012.

Fraser Institute. (2004-2009) www.fraser.org/-Canada.

Government Accounting Office, "Health Insurance Regulation. Variations in Recent State Small Employer Health Reforms" GAO-HEHS-95-161, June, 1995.

Government Accounting Office, "Small Employers Continue to Face Challenges in Providing Coverage." GAO-02-8, October, 2001.

Government Accounting Office, "Health Savings Accounts: Early Enrollee Experiences with Accounts and Eligible Health Plans." GAO-06-1133T, September, 2006.

Gruber, Jonathan and Brigitte C. Madrian. 1994. "Health Insurance and Job Mobility: The Effects of Public Policy and Job-Lock." *Industrial and Labor Relations Review.* 48(1): 86-102.

Holtz-Eakin, Douglas, John R. Penrod, & Harvey S. Rosen. 1996, "Health Insurance and the Supply of the Entrepreneurs. " *Journal of Public Economics* 62: 209-235.

Hughes, Jonathan R.T. 1986. The Vital Few : the Entrepreneur and American Economic Progress. New York, Oxford University Press.

Karabegović, Amela & McMahon, F. 2008. *Economic Freedom of North America, 2008 Report (Canada Edition)*. Vancouver, British Columbia, The Fraser Institute. http://www.freetheworld.com/efna2008/EFNA_Complete_Publication.pdf. Accessed July 2011.

Kim, Haejeong & Sunmee Baeck. 2002. "Health Insurance and the Self-employed". *Consumer Interests Annual* Volume 48.

Madrian, Brigitte C. and Lars J. Lefgren. 1998. "The Effect of Health Insurance on Transitions to Self-Employment." Unpublished paper Number 98-5. Population Research Center, University of Chicago.

National Bureau of Economic Research. (1999-2004) 2009. www.nber.org. (Accessed

January 2009).

National Conference of State Legislatures. (1999-2004). www.ncsl.org. (Accessed January 2009).

Parker, Simon C. 2004. *The Economics of Self-Employment and Entrepreneurship*. Cambridge: Cambridge University Press.

Turner, Joanna, Michael Boudreux, and Victoria Lynch. 2009. "A Preliminary Evaluation of Health Insurance Coverage in the 2008 American Community Survey." U.S. Census. http://www.census.gov/hhes/www/hlthins/data/acs/2008/2008ACS_healthins.pdf. (Accessed March 2009).

U.S. Census Bureau. (1998-2004). www.census.gov. (Accessed January 2009).

Williams, Claudia and Jason Lee. 2002. "Are Health Insurance Premiums Higher for Small Firms?" Policy Brief No. 2, The Robert Wood Johnson Foundation, at http://www.rwjf.org/pr/synthesis/reports_and_briefs/pdf/no2_policybrief.pdf. (Accessed March 2009).

Xirasagar, Sudha, Carleen H. Stoskopf, Michael E. Samuels, and Herng-Ching Lin. 2005. "Reducing the Numbers of the Uninsured: Policy Implications From State-Level Data Analysis." *Journal of Public Health management Practice* 11(1): 72-78.

Endnotes

1. Researchers often apply the same definition to self-employment and entrepreneurship, but the two have distinct definitions. Some consider entrepreneurs as encapsulating self-employment, which simply means one who works for oneself. Entrepreneurs can also be innovators and in the grand sense, those whose innovations advance society (Hughes, 1986).
2. Another 9 percent of health insurance is due to direct purchase, while the remaining 32 percent of coverage is due to government and military-related coverage.
3. A Breusch and Pagan Lagrangian Multipler test indicates that the random effects model is appropriate over OLS ($\chi 2$ statistics are associated with p-values less than 0.01 for all models). A Hausman test indicates that the random effects model is superior to the fixed effects (within) estimator. Results are presented in Table 3.
4. The other optional dependent variable is the self-employment ratio, defined as the number of the self-employed over the state population. The rate series is utilized as the dependent variable for three reasons: both the rate and the ratio give similar regression results, the rate series has a better statistical fit to the data, and the interpretation by the self-employment rate is more informative.
5. One concern may be that the health care insurance expenditure variable is endogenous to the model. A Hausman specification test for endogeneity was performed, where in the first stage, a reduced form equation for HCIE against the other independent variables was estimated using a two-way random effects model. In the second stage, the self-employment rate was regressed against the predicted HCIE and the error term (also using random effects). A t-test on the coefficient related to the error term (t=-0.87) shows that there was no relationship between the first-stage error term and the self-employment rate, indicating that HCIE is not endogenous.
6. The authors thank an audience member in our MVEA 2009 session for this helpful

addition.

7. Per the suggestion of a reviewer, a test for multicollinearity was conducted (VIFs estimated) and indicated that multicollinearity is not a problem in Model 2 (Overall VIF=1.16).
8. Elasticity was calculated at the means of the HCIE and self-employment rate variables.
9. In 2004, California's population was 26,768,000, of which 2.372 million individuals were self-employed. A 5.5 percent decrease in the self-employment rate is about a 0.49 of a percentage point in the self-employment rate, which translates into a decrease of the self-employed by 131,164 individuals.
10. We performed several tests related to the multicollinearity of the health policy variables. A series of auxiliary regressions (where one variable is made a function of all others) indicate multicollinearity. For example, a regression of the variable *Premium* on the other health policy variables results in a statistically significant F-statistic of 16.66 at the 1% level of significance, an adjusted R-squared of 0.26, and a number of coefficients that were statistically different from 0 at the 1% level of significance. An ANOVA test was also performed and indicated that there was multicollinearity, with an F-statistic of 8.822, which is statistically significant at the 1% level. Due to the model's small degrees of freedom, we chose only one health policy variable that added to the regression model statistically. We do not generally advocate selecting variables, but in this case it made sense due to the data issues.