Understanding the Effects of the Macroeconomy on Employer Sponsored Insurance

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III. Introduction

Employer sponsored health insurance (ESI) is an important source of coverage for working individuals and families. In the United States, 57% of the non-elderly population received health insurance coverage through employers in 2009 (Kaiser Family Foundation, 2011), down from 63.3% in 2002 (Kaiser Family Foundation, 2004). Since employers can choose to offer health insurance to employees and their dependents, and employees can decide to accept or decline, it is unclear what mechanism may be driving changes in offers and take-up. The goal of this paper is to analyze the effects of macroeconomic and labor market conditions on employer sponsored coverage in the United States between 2005 and 2009. Did macroeconomic conditions like unemployment or tax rates affect employees' access through offers or take-up? Did changes to the number of people with employer sponsored insurance occur before the onset of the recession or after the severity of the recession became known? Did macroeconomic conditions disproportionately affect certain types of workers through offers and take-up?

Institutional Background

An understanding of the history of health insurance can help to explain the value of this study. In the latter half of the 19th century, private insurance was reserved for accidental, burial, and sickness policies (Austin and Hungerford, 2010). As workers moved from rural agriculture to industrialized centers, occupational accidents became more common, leading to possible poverty for workers who could not cover medical expenses. From that, a need for reform developed. In 1929, Baylor University Hospital in

Dallas started a prepaid hospitalization plan for school teachers. The Baylor Plan was extended to other parts of the country. Ultimately the Blue Cross, from the St. Paul plan, was used by other hospital plans adhering to American Hospital Association guidelines. Initially, the insurance market avoided competition by tying a plan to a single area or hospital. However, by the 1950's, commercial insurers started to compete with the Blue Cross plans. Commercial insurers were able to underbid the Blue Cross plans by setting premiums using an experience rating versus a community rating based on average claims in the geographic area.

Blumenthal (2006) describes employer sponsored health insurance as "a cornerstone of the U.S. health care system". The coverage arose out of a lack of a universal health care coverage program during President Franklin D. Roosevelt's administration. During World War II, in order to control inflation, Congress set wage and price controls stating that employers were not allowed to raise wages. However, fringe benefits were exempt and allowed to increase. Offering health insurance allowed employers to be attractive to workers. Other key legislation came in 1954 when the Internal Revenue Service deemed employer contributions toward health insurance premiums to be a business expense and therefore, exempt from federal taxation (Austin and Hungerford, 2010). Employer health coverage has been a mainstay in the U.S. and also providing access to coverage for dependents and families. While expanding for many years, employer sponsored health insurance has begun to erode (Vistnes, Zawacki, Simon, and Taylor, 2010).

Research Motivation and Significance

This is not the first study to analyze the relationship between broader macroeconomic conditions and employer sponsored health insurance. However, this study makes two important extensions to the literature. First, the effect of the most recent recession has not been fully examined. Results from this analysis can provide policymakers with current information about the role of recent economic conditions on employer sponsored health insurance. Second, the focus is distinct from prior work. In particular, we are interested in which type of workers and individuals were most likely to turn down coverage even when offered. The intent is to see what happens to employer sponsored insurance among those who retained their jobs.

In what follows, the paper discusses previous literature that has looked at employer sponsored health insurance. Then the conceptual framework is presented along with the empirical specification. Finally, results from the descriptive and multivariate analyses are presented. The final section provides key conclusions.

IV. Literature Review

Several studies have examined the institution of employer sponsored insurance, including workers' access and take-up of coverage. They examine the question: Are the employees choosing not to enroll in programs when they have access to an offer, or are businesses dropping coverage? Or are workers choosing jobs that do not offer coverage? Studies have shown that in weaker labor markets, those with jobs may still find it harder to afford coverage (Farber and Levy, 2000), while other studies have shown that firms drop coverage when the economy deteriorates (so it is the firm that is the reason for the

loss of coverage) (Cawley and Simon, 2005). We address these claims by interacting

macroeconomic conditions with certain worker characteristics, and we attempt to

understand whether the recession had different effects on firm and individual choices.

Our research is motivated by previous studies on employer health insurance

conducted by Fronstin (2011) as well as Cawley and Simon (2005). This paper extends

work in the area by examining employer based health insurance access and coverage in

the context of the recent macroeconomic conditions using a different data set. The 2007-

2009 financial crisis provides a window into how both employers and employees are

changing in their demand for employer sponsored health insurance. Other authors have

investigated similar questions during different time periods such as Glied and Jack (2003)

and Holahan and Garrett (2009).

Offers

Having an offer of insurance (by working or through a family member) is a

prerequisite to holding such coverage (or being covered by employer sponsored

insurance). We begin with establishment characteristics in the context of access.

Feldman, Dowd, Leitz, and Blewett (1997) looked at the impact of premiums on offers at

small firms. They used 1993 data on Minnesota establishments. The authors hypothesized

that firms offered wage and benefit levels that minimized cost. Similarly, it was

hypothesized that workers would sort into jobs to find their ideal fringe benefits and

wages. The key results showed establishments with older male workers had stronger

demand, but were less likely to be offered insurance through their employer.

Establishments with more married employees were less like to have offers as well. The

impact of premiums was also seen, whereby a $1 increase in premiums reduced the probability of an offer of single coverage by 1.7 percentage points.

Farber and Levy (2000) investigated whether the decline in employer coverage was specific to certain jobs. We follow this same idea as to see which workers were affected. The authors divided jobs into a "core" group for those that had been working more than 12 months and were full-time, while all others were classified as "peripheral". Farber and Levy (2000) found that offers for core and peripheral workers actually increased over the 1988-1997 time period, meaning it could not explain the decline in coverage. For full-time workers, offers did not play a role in explaining the coverage rate. There was less access for peripheral workers, since old part-time workers saw fewer offers than core workers.

Macroeconomic conditions have been shown to influence the benefits available to employees. Marquis and Long (2001) hypothesized there was variation in employer sponsored insurance offers and premiums across communities by demonstrating the significance of local market conditions between 1993 and 1997. They restricted their data set to only small firms, whereas we consider workers from a broader distribution of establishment sizes. They hypothesized that offers would be higher in areas with higher marginal tax rates because of the tax exempt nature of the premium. It was also thought that areas with a high proportion of large employers, unionized workers, and regulated industries would be more likely to have employer sponsored insurance. Their results showed that higher federal marginal tax rates significantly increased offers in 1993. State tax rates were not significant. Also, they found that offers were higher in areas with large

businesses and more unions. Offers were lower in areas with more regulated industries, which was counter to their hypothesis. For 1993 and 1997, an increase in the federal tax rate led to higher contributions by employers.

Abraham, DeLeire, and Royalty (2009) provided three reasons that there are fewer offers for health insurance at small establishments. They hypothesized that smaller establishments face higher administration costs, that workers demand a smaller share of compensation in the form of benefits, and that there may be insurance market failure in the form of adverse selection. Data from the Medical Expenditure Panel Survey-Household Component for the years 1997-2003 were used to model offers of health insurance and fringe benefits. They found that workers at establishments with 10 or fewer employees were 22 percentage points less likely to have an offer of coverage. Age, education, income, job tenure, and union membership were all positively correlated with the probability of a worker having an offer of employer sponsored insurance.

Vistnes, Zawacki, Simon, and Taylor (2010) looked at the 2000-2008 time period when employment rates were stable. Their goal was to see if there were changes in offers for primary holders and the availability of dependent coverage. Data for the study came from private sector establishments in the Medical Expenditure Panel Survey-Insurance Component. Offers of family coverage and health insurance decreased at small firms while offers remained stable for workers at large firms.

Cawley and Simon (2005) examined the relationship between the economy and employer sponsored health insurance. They used the National Longitudinal Survey of Youth (NLSY) from 1983-2000 to predict the impact of the 2001 recession. The loss of

coverage through an employer was examined because some people may turn to public

programs, may not receive as much care, may be more costly on the health care system,

or may experience financial losses as a result. The monthly state unemployment rate and

annual real per capita gross state product were the macroeconomic measures used by the

researchers. In regards to employer sponsored coverage, they hypothesized that high state

unemployment and low gross state product were associated with decreased offers,

reduced coverage, and more cost shifting to employees. Unemployment was also

hypothesized to affect those who were still employed. As the demand for labor decreases,

total compensation provided to workers (including health insurance) may also decline.

Cawley and Simon (2005) found that a 1 percentage point increase in the unemployment

rate led to a decrease in offers by .16 percentage points for men. For women, it led to a

decrease in offers of .11 percentage points. The results revealed that men were more

sensitive to changes in the unemployment rate than women.

Take-Up

A worker having an offer must also make the decision about whether or not to

take-up that coverage. Farber and Levy (2000) estimated an equation to decompose the

decline in employer sponsored insurance by type of worker (old full-time, new full-time,

old part-time, and new part-time) and coverage (offer, eligibility, and take-up). They

found for core (old, full-time) workers, the decline in coverage was due to the decline in

take-up. New full-time workers also had lower rates of take-up, while part-time workers

saw an increase in take-up. One explanation for a decline in take-up was that a worker

may have had coverage through a spouse. That element was added in and about half of

the decline in take-up was offset by the increase in spousal coverage for core workers from 1988-1997. The trend of decreased coverage because of take-up also had a higher share as education increased. Eligibility was responsible for the entire decline for part-time workers. Overall the peripheral workers were the hardest hit in terms of coverage.

Again the likelihood of taking-up coverage by establishments was also examined. Vistnes et al. (2010) revealed that there was decreased coverage for all firm sizes from 2000 to 2008 using establishment level data. The coverage rate fell from 57.1% in 2001 to 53.6% in 2008. Small firms saw declines in the number of employees covered due to declines in both offers and take-up. In contrast, the decline in coverage for large firms was strictly due to declines in take-up. An important finding was that there was increased take-up when there was no employee premium contribution required when compared to making a contribution. A possible conclusion was that the decreased take-up was from the premium contribution burden.

Abraham and Feldman (2010) looked at the households' decision to take-up or turn-down health insurance coverage through an employer. It was suggested that the out-of-pocket premium may be a reason for turning down coverage if the out-of-pocket premium was greater than the expected value of the offered coverage. The 1997-2001 linked Medical Expenditure Panel Survey provided data used in the study. The first model looked at the decision to take-up or turn-down coverage. It was found that the out-of-pocket premium had a statistically significant negative effect on the probability of a household to take-up coverage through an employer. Their study also estimated an instrumental variable (IV) model to deal with premium endogeneity. An inverse

relationship was found between out-of-pocket premiums and the household probability of take-up. For one-person households, a $100 increase in the premium was associated with a .027-.029 percentage point decrease in the probability of take-up. For multi-person households, the increase in premium led to a decrease of take-up by .005 percentage points. With the IV method, similar results were found but the magnitude of take-up was 5 times larger. Additionally, older workers and those in poor health were more likely to have coverage. The authors also found that for each additional child eligible for public coverage there was a 3 percentage point decrease in the probability a worker had coverage.

We also see the macroeconomic effects on take-up of coverage. Cawley and Simon (2005) also used the NLSY to examine the take-up of employees from 1983-2000. Nothing was significant with respect to the macroeconomic variables of state unemployment or gross state product. As a check, they ran the results first using state and then county variables, and had similar results.

This study is closest to Fronstin (2011), who looked at the impact of the most recent 2007-2009 recession, having used 2008 and 2009 Current Population Survey data. The unemployment rate went from 5.8% in 2008 to 9.3% in 2009. With fewer people working, there were fewer people with access to employer coverage. He found that those workers with less than a high school education experienced declines in coverage from 27.5 percent to 25.6 percent coverage. All races and both genders saw significant declines. The annual earnings of middle income workers also shifted lower. The decline in income made coverage less affordable. Also there was a decrease in the percentage of

workers who were full-time, while part-time workers increased. This meant fewer

workers with access to employer coverage. Fronstin (2011) found significant declines in

own coverage from 2008 to 2009 for firms with less than 10 workers up to 499 workers

in the private sector. Structural workforce changes were seen with people moving away

from areas with traditionally higher coverage. One change was that there were fewer

people employed in the private sector as the number of people employed in the public

sector increased. This was important as coverage was likely higher in the public sector.

Workers were also moving from the manufacturing to service industries where there were

likely fewer benefits. The study was descriptive in nature and did not include any type of

multivariate analysis. Moreover, we differentiate between offers and take-up, whereas

Fronstin only observes the latter and does not know whether a worker has an offer.

Coverage

Lastly, we see what role macroeconomic variables have on coverage. The term

coverage is used when studies lack specific offer and take-up information, discuss

household coverage, or refer to sources of coverage. Glied and Jack (2003) looked at

macroeconomic conditions and health care costs from 1981-2001 at the state level. They

pointed to four things that affect insurance coverage: local labor market conditions,

health care costs, the structure of the economy, and the availability of public coverage.

The people in the study were divided into groups by education. Union members were

more likely to have coverage. There was not much of an effect of Medicaid eligibility;

those with less than a high school education had slightly lower coverage meaning there

was some crowd-out. Glied and Jack (2003) found that the unemployment rate was

significant on all education groups for private coverage. The highest impact was on college graduates where a 1 percentage point increase in the unemployment rate corresponded to a .36 percentage point decrease in private coverage. Other key results revealed that a 10% increase in health care costs led to a .88% point decrease in health insurance coverage. The effect was greater on those with less education.

Holahan and Garrett (2009) also used the 1990-2003 Current Population Survey to report that a 1 percentage point increase in the unemployment rate led to a decrease in employer sponsored coverage for the non-elderly population by .92 percentage points. With increased unemployment, there is less state revenue generated as a result of people not working. They predicted that a 1 percentage point increase in unemployment was expected to decrease state revenue by 3.4 percentage points.

Finally, we look at how demographic characteristics are associated with employer sponsored insurance coverage. Vistnes et al. (2010) showed that with less people taking up coverage there will be fewer households with employer sponsored insurance. Enrollment in single coverage plans increased from 46.3% in 2001 to 50.2% in 2008. Results suggested that the decrease in household coverage was a result of decreased take-up of any coverage and increased enrollment in single coverage (relative to family coverage). While employee premium contributions increased, the authors found it hard to draw a correlation between enrollment rates and employee premium contributions.

Cawley and Simon (2005) used the Survey of Income and Program Participation data from 1990-2000 to look at coverage. For men, unemployment was significant for coverage through any source including through employers. A 1 percentage point increase

in the unemployment rate led to a 1.3 percentage point decrease in the probability of coverage through employers for men. Additionally for men, the gross state product variable was not significant. For women, a 1 percentage point increase in the unemployment rate corresponded to a .7 percentage point decrease in coverage from an employer. Medicaid coverage was significant for children, where a 1 percentage point increase in the unemployment rate led to a 1.04 percentage point increase in Medicaid coverage. The unemployment rate was useful in determining the number of people who lost health coverage. They used their regression results to predict that 984,000 (908,000 of those men) Americans lost coverage during 2001. A drawback of the Cawley and Simon (2005) study is that the state unemployment rate is not very informative about local conditions.

Most studies found that unemployment and the probability of coverage were negatively correlated. The results showed there was decreased coverage (Glied and Jack (2003) and Holahan and Garrett (2009)) or decreased offers (Cawley and Simon (2005)). Marquis and Long (2001) found that higher federal tax rates were positively correlated with higher offer probabilities. Other studies discussed the impact of establishments on offers and take-up and personal characteristics on coverage.

V. Conceptual Framework

According to the standard theory of demand for private health insurance, insurance will be purchased if the worker's expected utility with insurance is greater than it is without insurance (Santerre and Neun, 2010). An individual buys insurance as a way to avoid the risk associated with medical care expenses. Generally speaking, the demand

for health insurance is a function of the premium, the degree of risk aversion, the probability of illness, magnitude of loss, and current income.

Employer sponsored health insurance is the most common source of private insurance and is unique because its premium is exempt from federal and state income taxes. In this way, insurance through an employer acts like a subsidized good by the government. Consistent with economic theory, more insurance will be purchased because of the preferential tax treatment. The demand for medical care is usually positively associated with the demand for insurance. Similarly, the quantity demanded is a function of an individual's preferences, state of health, and the quality of care. The supply side of health insurance also plays a major role on coverage. Employers that offer plans can go through insurance companies or self-insure and pool the risk themselves (Austin and Hungerford, 2010). Along those same lines, larger firms are more likely to offer health benefits and provide more plan choices. A growing concern is the cost of the out-of-pocket premium (Abraham and Feldman, 2010). As employees face higher costs, some may turn-down coverage.

Three different outcomes are evaluated to see how coverage is affected by macroeconomic conditions and for whom. The first outcome is whether a worker receives an offer of health insurance through their employer. The next outcome is whether the worker with an offer takes-up coverage. Take-up is studied because not everyone will accept. Some may have coverage through a spouse, public coverage, or may not be able to afford it. The last outcome is if the individual members of a household have employer

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sponsored coverage. With each outcome we want to see what determines the probability of each of these happening.

VI. Data Sources

The primary data source is the Medical Expenditure Panel Survey (MEPS) Household Component (HC) for the time period of 2005-2009. It is a representative sample of the non-institutionalized, civilian population. This confidential sampling frame is from the National Health Interview Survey, which is sponsored by the Agency for Healthcare Research and Quality and the National Center for Health Statistics. Additionally, the MEPS provides detailed data relating to insurance coverage and other demographic and employment characteristics. Specifically, the survey has numerous health insurance variables and in our case, employer sponsored health insurance information.

In addition to the MEPS, three other data sources are used to provide supplemental information. The source of county-level unemployment data is the Bureau of Labor Statistics. Next, the minimum and maximum state income tax rates are collected from the Federation of Tax Administrators. Third, the Kaiser Family Foundation is the source for information on Medicaid eligibility limits for children.

Study Population

The focus is on the non-elderly population meaning those 64 years of age and younger. No full-time students are included, as they may have access through their school or their parents. Further, anyone who is self-employed is removed because their income status is separately characterized by the MEPS.

This study examines three outcomes related to employer sponsored insurance. Individual workers serve as the first unit of analysis. Workers are defined as those who report being employed, having a job, or having worked during the interview round. Employment is examined because it is the basis of employer sponsored health insurance. The worker population only looks at those who are between 19 and 64 years of age. Those under 19 may have Medicaid coverage or be in school while almost all individuals 65 and older are eligible for Medicare. Likewise, those at the extreme age groups are not as likely to be employed. The dependent variable is whether they receive an offer from their employer for health insurance coverage. The next population includes those who have an offer from the firm. The dependent variable is binary and equal to one if they take-up coverage, zero if they turn-down the offer. The full years from 2005-2009 are investigated.

The other unit of analysis is the household. A household in the survey is classified as the health insurance eligibility unit (HIEU) identifier. An HIEU consists of the adults and family members who would be eligible for coverage under family plans. The model carries similar restrictions as the individual unit (no self-employed, students, elderly, etc.), but includes every household with people under 65. It is not restricted to those who only have offers. While the personal characteristics of each individual are used, the employment characteristics of the highest earner of each household are used for all members of the household. This approach is similar to Abraham and Feldman (2010). The highest earner is used because they are the most likely to hold coverage within the family, given their labor force attachment. The dependent variable in this model is binary

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and coded as one if the household member has employer coverage, zero if not. The model only looks at 2005-2008 because income data to identify the highest earner is not yet available for 2009. The household model allows us to see what is happening to coverage by individual members within a household. The broader coverage variable is whether a person has employer coverage. In this case, the policy holder of the household must be employed and provide coverage to dependents.

The MEPS uses a complex survey design, where people are divided into primary sampling units based on their county or nearby counties. Weights are used to ensure that the results are nationally representative. Adjustments are made for non-response and population control by compiling survey weights from the March Current Population Survey that account for disproportionate sampling. In order to use the weights for the time period, they are divided by the number of years of the study. For the offer and take-up models, it is five years, while it is four years for the household model. Observations are removed if they did not have a positive weight. Specifications to the statistical programs are done to include stratification, clustering, and weighting. SAS and Stata are used for model estimation and interpretation.

The sample size for the worker model is 49,071 unique person-years, which when weighted, represents 105.2 million people. Of those, 32,296 workers received offers and are used to estimate the take-up model. This corresponds to 74.1 million people. There are 69,046 people in the household analysis, which represents 171.4 million people.

Measures

We test the heterogeneity of labor market conditions on access and coverage. The three outcomes offer, holding, and coverage are studied as functions of personal and employment characteristics as well as the macroeconomic conditions. A binary logit model is used in this study. It is selected because all the dependent variables considered are either zero or one.

Worker Models:

(1)   Prob(Offer of ESI) = f(Personal Characteristics, Employment

Characteristics, Macroeconomic conditions) + error

(2)   Prob(Hold|Offer) = f(Personal Characteristics, Employment

Characteristics, Macroeconomic conditions) + error

Household Model:

(3)   Prob(ESI Coverage) = f(Personal Characteristics, Main Earner

Employment Characteristics, Macroeconomic conditions) +error

Individuals in the survey are interviewed in five rounds over two years. We select the first round of the panel year on which to focus. We use information regarding the demand for insurance to inform our model development. Variables are selected that are likely associated with an individual's tastes and preferences for insurance, including measures of demographics, health status, employment risk aversion, and income. The following variables are selected from the study data: geographic census region, metropolitan statistical area (MSA), age, gender, race, ethnicity, health status, education, wage, industry employed, number of employees in establishment, more than one location

of establishment, union status, offer of employment coverage, held status of coverage, and status of employer coverage. They are used to form the variables in the models.

Several personal characteristics are used in model estimation. All variables selected are chosen as they are used to help explain the demand for coverage. Age is included because younger individuals are less likely to purchase health insurance regardless of availability because of cost and their health status, also as people grow older they are more likely to purchase coverage. A quadratic measure of age is also included because the demand increases with age but may diminish over time. There is a binary indicator of whether the individual is female. We expect more males to be the holders of coverage but more females to have coverage. Working-age females have a higher demand for coverage most likely because of childbirth (Santerre and Neun, 2010). A worker's race and ethnicity is captured using a set of binary indicators corresponding to whether the person is white, black, or Asian is included with the "other" group being the reference category. In addition there is an indicator for an individual being Hispanic. An individual's education is given by the number of years of education. Likewise, a quadratic measure of education is used as well to help explain variation while we expect demand to increase with education (Farber and Levy, 2000).

We also control for whether a worker is married, since employer sponsored insurance may provide benefits to a worker's spouse and dependents. We expect married individuals to be more likely to have coverage that covers dependents. Finally, the number of children under 18 in the household is used. We expect other family members in the household to affect the coverage decision (Abraham et al., 2010). Following

Blumberg et al. (2001) and Abraham and Feldman (2010), an indicator of a person who perceives themself in "poor" or "fair" health is included. They may be less likely to work full-time, but be more likely to take-up coverage because of their demand for medical care (Santerre and Neun, 2010). Regional indicator variables help control for geographic differences. The regions are the Northeast, Midwest, and South, with the West being the reference group. An indicator for residence in a MSA is included as well, as larger firms tend to be located in larger population areas and are more likely to offer insurance, etc. An indicator is also used for a household with two or more earners in the family. This is relevant in terms of coverage because both people will most likely not take-up policies through their respective employers.

We are able to determine which types of employees are most likely to have insurance coverage. Binary indicators are used to distinguish between four establishment sizes: less than 25 people; between 26-50 employees; between 51-200 employees; and finally establishments with more than 200 employees. The less than 25 group serves as the reference. Establishment size is important as larger ones will be more likely to have group plans since they have higher enrollment numbers (Abraham et al., 2009). Smaller firms face more difficulties gaining group coverage. While small firms may want to be as generous (Feldman et al., 1997), they may still face higher premiums (Abraham et al., 2009). An indicator of whether the establishment has more than one location indicates it could be a large firm but only have a small number of employees at each establishment. There is also an indicator if the worker is at a private company. Government workers are the reference group. Public sector workers are more likely to have coverage (Farber and

Levy, 2000). We have an indicator for whether a worker is a member of a union. We expect union members to have higher coverage levels as they have more bargaining power and stronger preferences for fringe benefits (Glied and Jack, 2003). Several indicators for the type of industry in which the worker is employed are included. These variables include manufacturing, retail and trade, professionals, entertainment and service, public administration and military, and construction (mining and natural resources is the reference category). Some industries may be more likely to not offer fringe benefits and different industries may be affected differently by the recession (i.e. construction is cyclical while the military is not). That may result in people losing their jobs in construction or losing benefits among those still employed (Fronstin, 2011).

Hourly wage is vital since those with higher wages tend to also be offered more benefits such as health insurance. Following Abraham et al. (2009), wages are also categorized as follows: earners are split into the bottom 10 percent, 20 percent, 30 percent, 40 percent, 50 percent, and those above the median wage. The focus is on the low earners and those in the bottom 10 percent are kept as the reference. Actual wage is not used as it may be endogenous. There are also three variables that are flagged, including if the worker was missing wage, the number of people at establishment, or if the company was private. We did not include the number of hours worked as it is endogenous, but part-time workers were still included.

Finally we control for time fixed effects. Year indicators are included for 2006-2009, while 2005 is the reference year. The county-level unemployment rate is used as a broad measure of local labor market conditions because it is the most precise geographic

measure available. We expect increases in unemployment to lower the probability of offers and coverage as suggested by Glied and Jack (2003), Cawley and Simon (2005), and Holahan and Garrett (2009). With higher unemployment, employers will not have to be as generous because employees cannot switch jobs as easily. The next two variables are the minimum and maximum income tax rates for each state. Higher taxes increase the incentive for employers to offer health benefits because of the tax exempt status of employer contributions (Marquis and Long, 2001). Lastly, we include Medicaid eligibility for each state. The value of employer sponsored insurance declines if workers or household members can qualify for public coverage, particularly when employee out-of-pocket contributions are required for coverage (Glied and Jack, 2003).

VII.   Results

Table 1 shows variable descriptions, means, and standard deviations for the three samples. Table 2 presents the average marginal effects and standard errors for the offer, take-up, and coverage binary logit models.

Offers

Two of the four macroeconomic variables are significant in the offer model. For every 1 percentage point increase in the county-level unemployment rate, the probability of a worker having an offer decreases by .4 percentage points. Cawley and Simon (2005) found a similar relationship. This small difference means that if the unemployment rate went up 1% in 2005 (beginning study year), a corresponding offer rate of 70.25% (2005 mean) would decrease .4 percentage points to 69.97%, ceteris paribus. Also, for each additional 1 percent increase in the maximum state income tax there is an associated

decrease in the offer probability by .2 percentage points. This shows that in states where the tax treatment is more favorable there will be decreased offers, which contradicts our hypothesis. Marquis and Long (2001) could not find a significant impact of state rates, but did find that higher marginal federal tax rates led to higher offers.

Next we look at offers and take-up of employer sponsored health insurance in the worker model. The marginal effects of the offer model are in the second column of Table 2. Females are 3 percentage points less likely than males to be offered coverage. We expect this in families because males are more likely to be working full-time and eligible for coverage if offered through employer. Cooper and Schone's (1997) results are consistent with this finding. Hispanics are 4.9 percentage points less likely to have offers through their employers than non-Hispanics. For every 1 year increase in education, the probability of having an offer increases by .5 percentage points. Again, Cooper and Schone (1997) found that younger individuals were less likely to have offers. Being married leads to a 1.5 percentage point decrease in having an offer compared to those not married. Feldman et al. (1997) also saw establishments with higher percentages of married workers receive less offers. Those with two earners or more in the household are 4.2 percentage points less likely to have an offer. A potential explanation for this is that one worker in the household may be the primary earner (with an offer) and the other may be the secondary earner who is more flexible with employment choices because of their spouse. For each additional child in the household, the probability of an offer goes down .8 percentage points. One possible reason is that they may have access to public coverage. Those living in the South are 1.8 percentage points more likely to have an offer

than those living in the West. A slightly interesting rural finding was that living in an MSA is associated with a 2 percentage point decrease in the probability of having an offer of coverage, relative to those living outside of metropolitan areas.

Many establishment characteristics are statistically related to the probability that a worker has an offer of coverage. The probability of an offer increases with size of establishment, whereby workers in establishments with over 200 employees are 15.1 percentage points more likely to have an offer than workers in establishments with 25 employees or less. The results concur with Cooper and Schone (1997), Abraham et al. (2009), and Vistnes et al. (2010). All wage groupings are significantly positive compared to wages in the bottom decile. The largest magnitude is with respect to workers who had wages above the median. They are 37.3 percentage points more likely to have offers than the lowest earners. The results are similar to that of Abraham et al. (2009) that lower wage workers had fewer offers. Working at an establishment with more than one location is also associated with an 11.4 percentage point increase in the probability of an offer compared to only one location. Union members are 12.2 percent more likely to have access to coverage versus non-union workers. This finding likely reflects worker preferences for non-wage benefits, which was what Marquis and Long (2001) found as well. A few differences are observed within industries. Workers in the manufacturing industry are 7.3 percentage points more likely to have offers than those in natural resources and mining. Construction workers are 5.5 percentage points less likely to have offers than those in natural resources and mining.

<u>Take-Up</u>

The next model estimates the probability that a worker will take-up coverage through an employer, given that he or she has an offer. Take-up model marginal effects are in the fourth column of Table 2. None of the macroeconomic variables are statistically significant for the take-up model. Among individuals who kept their job, there was no behavioral change in terms of take-up. However, the probability of take-up of coverage is 1.9 percentage points less likely in 2008 than it was in 2005.

We find a small, positive marginal effect of age on the probability of take-up. Females, who have a lower probability of offers, are also 3 percentage points less likely to take-up ESI coverage compared to males even when offered. Asian workers with offers are also 3.4 percentage points more likely to take-up coverage than someone of other races. Workers who are married are 3.6 percentage points less likely to take-up compared to those not married. For each additional child in the household there is a .9 percentage point decrease in take-up probability for coverage. This may be due to the availability of public coverage for children. Abraham and Feldman (2010) found similar findings in take-up of coverage for females, married workers, and public coverage eligibility. Likewise, Blumberg et al. (2001) found a worker was less likely to take-up coverage if their spouse had an offer or had a child eligible for Medicaid. Similar patterns of results with establishment characteristics are seen in the take-up model relative to the offer model. Workers in larger establishments are more likely to take-up coverage. Those belonging to unions are also more likely to take-up. These results were in agreement with what Glied and Jack (2005) found. Workers in private organizations are 4 percentage

points less likely to take-up coverage compared to those that are employed in a government agency possibly due to preferences for benefits. Worker take-up of coverage is also positively correlated with higher wage groups again, but not as strong of an effect of the offer model.

<u>Coverage</u>

The household model looks at employer coverage of individual members and reveals similar patterns of statistically significant variables along with some additional ones. Results are found in the sixth column of Table 2. A household member was 1.9 percentage points less likely to have coverage in 2007 than they were in 2005. For every 1 percent increase in unemployment the likelihood of coverage decreases by .9 percentage points which is consistent with Cawley and Simon (2005). Consider Lapeer County, Michigan as an example: The unemployment rate in Lapeer County went from 10.1% in 2008 to 17.2% in 2009. Our results suggest that the increase in unemployment was associated with a decrease in coverage of 6.39 percentage points, ceteris paribus.

An increase in age of an individual is positively associated with an increase in coverage. If an individual is white, they are 3.3 percentage points more likely to have coverage than someone of other races. Hispanic individuals are 10.9 percentage points less likely to have coverage than non-Hispanics. Fronstin (2011) found reduced coverage for Hispanics as well. When the individual is in poor health there is less coverage. Living in the Northeast or Midwest (compared to the West) is associated with a 2.8 and 3.5 percentage point increase in coverage respectively. Each additional child in the household

leads to a 1.5 percentage point decline in coverage. Members of households with two more earners are 14.3 percentage points more likely to be covered.

While the unit of analysis is a person in the household, all employment variables relate back to the main earner of the household who most likely provides coverage. Many characteristics of the primary earner's establishment are associated with coverage for its household members. Primary earners working in large establishments and unions are more likely to have coverage. A household with a worker in the entertainment, service, or construction industries are less likely to have coverage than those in the natural resources. There is also a strong, positive effect of wage on the likelihood of household coverage.

Encrypted state indicators were also used for specifying state fixed effects, which control for time-invariant unobservable differences at the state-level. We ran additional models with the state fixed effects included and found that there were significant state effects for the offer and take-up models. This could be due to differences in state regulation or differences in the preferences of residents. Most of the significant variables remained the same. After controlling for state differences, the unemployment rate and maximum tax were no longer significant in the offer model.

Robustness Checks

A second set of models was estimated for each of the three outcomes to evaluate the presence of heterogeneity with respect to the effects of local labor market conditions on different types of workers. To do this, we interacted the following variables with the county-level unemployment rate: gender, race, industries, and years. The interactions were done to see who most likely hit was by changing economic conditions. None of the

interactions in any of the models were statistically significant at conventional levels—a surprising finding. Thus, it appears that no specific types of workers, industries, or years were disproportionately affected by macroeconomic conditions.

To verify that our results were not dependent on dropping missing observations, we ran a binary logit model of ESI coverage for individuals in households excluding worker characteristics similar to the household coverage model. The model allowed more observations to be used because missing worker data was not excluded. Similar findings to the household model were seen. Females, compared to males, were 1.3 percentage points less likely to have coverage. Being Hispanic was associated with an 18.6 percentage point decrease in coverage compared to being non-Hispanic. Coverage was 2 percentage points less likely in the year 2007 than 2005. Every 1 percent increase in the unemployment rate led to a 1.1 percentage point decrease in coverage.

We also broke the offer and take-up models down by gender to see how the results changed. Overall most of the results remained the same. For the offer model, marriage had a positive impact for men, but a negative one for women. The unemployment rate was found to only be significant for women. One of the biggest changes for the take-up model was that holding coverage in the year 2008 was less likely than 2005 only for women. The small changes did not warrant separate models for males and females.

Limitations

There are a few limitations to this analysis worth noting. We take as given a worker's employment decision. Health insurance is known to be a factor for a worker

choosing between different job opportunities. If a spouse is already covered, a worker may be more willing to accept a position that does not offer health insurance (Abraham et al., 2009). This may lead to a potential endogeneity problem if workers sort into jobs based on their preferred choice of employment characteristics. Another limitation is that for workers, their employers might respond in other ways beyond offers. In particular, they might reduce the generosity of the coverage or make the worker pay a higher out-of-pocket premium.

Like many studies, we lack data on the premiums workers face. Not knowing the out-of-pocket premiums that workers must pay to get insurance, we are unable to determine fully the role of price on a worker's decision to take-up coverage. The premium may potentially be an omitted variable since it affects the dependent variable and is correlated with independent variables (firm size, industry, etc.) as well. Other data such as eligibility conditions are also not in our data set.

VIII.   Conclusion

Employer sponsored health insurance is an important source of coverage for working individuals and families and is thought to be affected by macroeconomic conditions. Using data from 2005 to 2009, we tested several hypotheses about the relationship between ESI and worker characteristics.

Overall, the effect of macroeconomic conditions on access and coverage among workers was modest. However, since there was not much variation over the 2005-2009 time period in take-up or offers our results our reasonable. Although other forces may have been at play such as job loss, or even rising premiums, we were able to find

significant effects within establishments. Future research is needed to be able to fully explore the relationship between worker characteristics, premiums, eligibility requirements, and macroeconomic conditions.

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X. Appendices

Figure 1: Literature Review

Type	Study	Question	Data	Results
Offer	Feldman, Dowd, Leitz, & Blewett (1997)	How do premiums affect offers?	Survey of Minneapolis Firms 1993	Increased out-of-pocket premiums were associated with decreased offers.
	Farber & Levy (2000)	Is the decline in coverage specific to certain jobs?	Current Population Survey 1988-1997	Offers actually increased over the time period.
	Marquis & Long (2001)	What is the influence of local labor market conditions on coverage?	National Employer Health Insurance Survey & Robert Wood Johnson Foundation Employer Health Insurance Survey 1993 & 1997	Higher federal tax rates led to increased offers.
	Cawley & Simon (2005)	What is the relationship between the macroeconomy and offers?	National Longitudinal Survey of Youth 1983-2001	Increases in unemployment were correlated with decreased offers.
	Abraham, DeLeire, & Royalty (2009)	How is access to health insurance at small firms similar to other benefits?	Medical Expenditure Panel Survey-Household Component 1997-2003	Offers were lower at smaller establishments.
	Vistnes, Zawacki, Simon, & Taylor (2010)	What are the changes in offer for primary holders and dependent coverage?	Medical Expenditure Panel Survey-Insurance Component 2000-2008	Decreased offers at small firms while they remained stable for large firms.

Type	Study	Question	Data	Results
Take-Up	Feldman, Finch, Dowd, & Cassou (1989)	What determines the demand for employer sponsored insurance?	Minneapolis Survey of Firms 1984	High out-of-pocket premiums were chosen less and there was a preference for preventative coverage.
	Cooper & Schone (1997)	What is causing a decrease in employer coverage?	1996 Medical Expenditure Panel Survey & 1987 National Medical Expenditure Survey	Decreased coverage because of decreased take-up, not offers.
	Blumberg, Nicholas, & Banthin (2001)	What influences worker take-up?	Medical Expenditure Panel Survey-Linked Component 1996	Out-of-pocket premium was negatively related to take-up.
	Farber & Levy (2000)	How can the decline in coverage be decomposed by type of worker?	Current Population Survey 1988-1997	Declined coverage for core workers due to decreased take-up.
	Vistnes, Zawacki, Simon, & Taylor (2010)	What were the changes in coverage by establishments?	Medical Expenditure Panel Survey-Insurance Component 2000-2008	Lowered coverage for large firms because of the decreased coverage.
	Abraham & Feldman (2010)	What is the demand for household coverage?	Medical Expenditure Panel Survey-Linked Component 1997-2001	The out-of-pocket premium had negative effects on take-up.
	Fronstin (2011)	Who experienced the impact of the recession?	Current Population Survey 2008 & 2009	Decreased coverage for the least educated, all races, and both genders. Workers moved from manufacturing to service industry.
Coverage	Glied & Jack (2003)	What is the role of the macroeconomy and health care costs on coverage?	Current Population Survey 1981-2001	Higher unemployment rates led to decreased coverage.
	Cawley & Simon (2005)	What is the relationship between the macroeconomy and coverage?	Survey of Income and Program Participation 1990-2000	Unemployment and probability of coverage negatively correlated.
	Holahan & Garrett (2009)	What has the impact of unemployment been on the uninsured?	Current Population Survey 1990-2003	Rising unemployment led to decreased coverage.

Table 1: Descriptive Statistics

		Workers (n=49,071)		Workers with Offers (n=32,296)		Household (n=69,046)	
Variable Name	**Definition**	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Offer	=1 if worker has ESI offer, 0 if not	0.70	0.00				
Take-Up	=1 if worker takes up ESI offer, 0 if not	0.62	0.00	0.88	0.00		
Coverage	=1 if individual has ESI coverage, 0 if not					0.70	0.00
Age	Age of individual in years	40.31	0.12	41.16	0.13	33.17	0.13
Female	=1 if individual is female, 0 if male	0.49	0.00	0.47	0.00	0.51	0.00
White	=1 if individual is white, 0 if not	0.82	0.01	0.81	0.01	0.81	0.01
Black	=1 if individual is black, 0 if not	0.11	0.00	0.12	0.00	0.12	0.00
Asian	=1 if individual is Asian, 0 if not	0.05	0.00	0.05	0.00	0.05	0.00
Hispanic	=1 if individual is Hispanic, 0 if not	0.14	0.01	0.10	0.00	0.16	0.01
Education	Education of individual in number of years	13.57	0.03	13.94	0.03	11.18	0.04
Married	=1 if individual is married, 0 if not	0.57	0.00	0.58	0.01	0.46	0.00
Number Of Children	Number of children under 18 years of age	0.69	0.01	0.66	0.01	1.14	0.01
Poor Health	=1 if individual reports being in poor health, 0 if not	0.08	0.00	0.08	0.00	0.08	0.00
Northeast	=1 if individual resides in Northeast, 0 if not	0.18	0.01	0.19	0.01	0.18	0.01
Midwest	=1 if individual resides in Midwest, 0 if not	0.23	0.01	0.24	0.01	0.22	0.01
South	=1 if individual resides in South, 0 if not	0.36	0.01	0.35	0.01	0.36	0.01
MSA	=1 if individual resides in a metropolitan statistical area, 0 if not	0.85	0.01	0.86	0.01	0.85	0.01
Two Earner	=1 if two or more earners in household, 0 if not	0.47	0.00	0.48	0.01	0.45	0.00
Establishment 26-50	=1 if worker's establishment has 26-50 employees, 0 if not	0.13	0.00	0.13	0.00	0.11	0.00
Establishment 51-200	=1 if worker's establishment has 51-200 employees, 0 if not	0.23	0.00	0.26	0.00	0.20	0.00
Establishment >200	=1 if worker's establishment has over 200 employees, 0 if not	0.29	0.00	0.35	0.00	0.27	0.00
More Locations	=1 if worker's employer has more than 1 location, 0 if not	0.68	0.00	0.75	0.00	0.63	0.00
Union	=1 if worker is a member of a union, 0 if not	0.13	0.00	0.17	0.00	0.13	0.00
Private Sector	=1 if worker's employer is a private organization, 0 if employer is a state or federal organization	0.82	0.00	0.78	0.00	0.76	0.00
Manufacturing	=1 if worker is employed in the manufacturing industry, 0 if not	0.18	0.00	0.21	0.00	0.20	0.00
Wholesale Retail Trade	=1 if worker is employed in the wholesale retail and trade industry, 0 if not	0.13	0.00	0.12	0.00	0.12	0.00
Professional	=1 if worker is employed in the professional industry, 0 if not	0.43	0.00	0.46	0.01	0.41	0.01
Entertainment & Service	=1 if worker is employed in the entertainment and service industry, 0 if not	0.11	0.00	0.07	0.00	0.10	0.00
Public Administration & Military	=1 if worker is employed in the public administration or military industry, 0 if not	0.06	0.00	0.08	0.00	0.07	0.00
Construction	=1 if worker is employed in the construction industry, 0 if not	0.06	0.00	0.05	0.00	0.08	0.00
Wage 20 percentile	=1 if worker's wage is in the 20th wage percentile, 0 if not	0.06	0.00	0.03	0.00	0.06	0.00
Wage 30 percentile	=1 if worker's wage is in the 30th wage percentile, 0 if not	0.07	0.00	0.05	0.00	0.06	0.00
Wage 40 percentile	=1 if worker's wage is in the 40th wage percentile, 0 if not	0.09	0.00	0.08	0.00	0.08	0.00
Wage 50 percentile	=1 if worker's wage is in the 50th wage percentile, 0 if not	0.10	0.00	0.10	0.00	0.09	0.00
Wage 51-100 percentile	=1 if worker's wage is above the 50th wage percentile, 0 if not	0.61	0.00	0.72	0.00	0.60	0.01
Year 2006	=1 if year is 2006, 0 if not	0.20	0.00	0.20	0.00	0.25	0.00
Year 2007	=1 if year is 2007, 0 if not	0.20	0.00	0.20	0.00	0.25	0.00
Year 2008	=1 if year is 2008, 0 if not	0.20	0.00	0.20	0.00	0.25	0.01
Year 2009	=1 if year is 2009, 0 if not	0.20	0.00	0.19	0.00		
Unemployment Rate	County-level unemployment rate by year	5.83	0.05	5.79	0.05	5.06	0.04
Minimum Tax	Minimum state income tax rate by year	2.23	0.06	2.26	0.07	2.23	0.07
Maximum Tax	Maximum state income tax rate by year	5.31	0.09	5.30	0.09	5.27	0.09
Medicaid Eligibility	State Medicaid eligibility limits as a % of federal poverty level by year for children	136.60	1.53	138.04	1.59	135.03	1.57

Table 2: Binary Logit Models

Variable Name	Offers Workers (n=49,071) Marginal Effect		Standard Error	Take-Up Workers (n=32,296) Marginal Effect		Standard Error	Coverage Household (n=69,046) Marginal Effect		Standard Error
Age	0.000		0.000	0.001	**	0.000	0.002	**	0.000
Female	-0.030	**	0.006	-0.030	**	0.005	-0.002		0.004
White	0.020		0.014	0.022		0.012	0.033	*	0.013
Black	0.020		0.015	0.007		0.011	-0.024		0.015
Asian	-0.003		0.017	0.034	**	0.011	-0.004		0.018
Hispanic	-0.049	**	0.008	-0.015	*	0.006	-0.109	**	0.008
Education	0.005	**	0.001	0.002		0.001	0.008	**	0.001
Married	-0.015	*	0.007	-0.036	**	0.006	-0.001		0.006
Number Of Children	-0.008	**	0.002	-0.009	**	0.002	-0.015	**	0.003
Poor Health	-0.007		0.007	-0.008		0.007	-0.055	**	0.007
Northeast	-0.010		0.009	-0.035	**	0.010	0.028	**	0.010
Midwest	0.002		0.009	-0.022	**	0.009	0.035	**	0.009
South	0.018	*	0.008	-0.001		0.007	0.003		0.008
MSA	-0.020	**	0.007	-0.011		0.006	0.006		0.008
Two Earner	-0.042	**	0.006	-0.057	**	0.006	0.143	**	0.007
Establishment 26-50	0.087	**	0.007	0.015	*	0.006	0.065	**	0.007
Establishment 51-200	0.124	**	0.006	0.031	**	0.005	0.089	**	0.007
Establishment >200	0.151	**	0.006	0.056	**	0.005	0.124	**	0.007
More Locations	0.114	**	0.005	0.006		0.005	0.084	**	0.006
Union	0.122	**	0.008	0.059	**	0.005	0.118	**	0.010
Private Sector	-0.003		0.009	-0.040	**	0.006	-0.018		0.009
Manufacturing	0.073	**	0.019	0.013		0.020	0.035		0.019
Wholesale Retail Trade	0.035		0.019	-0.045		0.025	0.000		0.020
Professional	0.031		0.020	-0.028		0.021	0.005		0.018
Entertainment and Service	-0.043		0.022	-0.079	**	0.030	-0.063	**	0.023
Public Admin & Military	0.096	**	0.021	-0.012		0.024	-0.013		0.024
Construction	-0.055	*	0.023	-0.034		0.027	-0.097	**	0.022
Wage 20 percentile	0.037	**	0.010	0.003		0.012	0.020		0.012
Wage 30 percentile	0.111	**	0.008	0.036	**	0.008	0.069	**	0.010
Wage 40 percentile	0.154	**	0.007	0.065	**	0.007	0.119	**	0.009
Wage 50 percentile	0.194	**	0.007	0.085	**	0.006	0.164	**	0.008
Wage 51-100 percentile	0.373	**	0.012	0.201	**	0.015	0.339	**	0.012
Year 2006	0.002		0.006	-0.008		0.006	-0.010		0.006
Year 2007	-0.009		0.007	0.002		0.006	-0.019	*	0.008
Year 2008	0.010		0.007	-0.019	**	0.007	-0.007		0.007
Year 2009	0.016		0.009	-0.008		0.009			
Unemployment Rate	-0.004	*	0.002	0.001		0.001	-0.009	**	0.002
Minimum Tax	0.001		0.002	0.002		0.001	0.000		0.002
Maximum Tax	-0.002	*	0.001	0.000		0.001	0.001		0.001
Medicaid Eligibility	0.000		0.000	0.000		0.000	0.000		0.000

*p<.05 **p<.01