Do Work Decisions among Young Adults Respond to Extended Parental Coverage in the U.S.?

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Abstract

Young adults aged 19-24 are significantly less likely to have health insurance in the U.S. since most family insurance policies cut off dependents when they turn 19 or finish college. In recent years, several states in the United States have expanded eligibility to allow young adults to remain covered under their parents' employer-provided health insurance. For those who qualify for these benefits, the expansion of parental coverage partially reduces the value of being employed by a firm that provides health insurance or working full-time, as adult children can now obtain health insurance through another channel. In this study, we employ quasi-experimental variation in the timing and generosity of states' eligibility rules to identify the effect of the policy change on young adults' labor market choices. Our results suggest that the expansion of parental coverage increases the group dependent coverage rate and reduces labor supply among young adults, particularly in full-time employment.

JEL classification: H75; I18; J21

Keywords: Young adults; Health insurance; Group dependent coverage; Labor force participation; Full-time employment

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1. Introduction

A strong linkage between health insurance and labor supply is often observed in the United States, as almost 88 percent of private insurance coverage comes through employment.[1] Given the high costs of obtaining coverage for young adults entering the labor market, health insurance could be a critical factor in labor supply decisions, and changes in health insurance policy could affect their labor market choices. This paper studies how recent state-level expansions of parental health insurance could affect young adults' work decisions. Although numerous empirical studies on health insurance and labor market outcomes have been conducted, evidence on young adults is sparse if not absent.[2]

Young adults are least likely to have health insurance compared to other age cohorts; for example, only 66 percent of 22-year-olds in the U.S. have health insurance, the lowest rate of coverage among the entire population.[3] There are several reasons why young adults lack health insurance coverage. First, until recently, young adults lost dependent coverage status under a parent's private plan upon turning 19 or finishing college (up to age 24). Also, most young adults after age 19 have limited access to public health insurance, with eligibility for public health insurance such as Medicaid generally restricted to very low income families or disabled adults.[4] In addition, they often do not have an affordable employer-sponsored insurance option due to their limited work experience. They may also feel 'young and invincible', making them even less likely to obtain health insurance. Thus, combined with high premiums for individual health insurance plans, this lack of access to or disinterest in taking up other types of coverage has made young adults the most likely to be uninsured compared to any other age group.

As a result, several states have recently expanded eligibility to include young adults being covered under their parents' employer-provided health insurance. These states have taken measures to expand dependent coverage to young adults with qualifications based on age, marital status, student status, or financial dependence, which vary from state to state. This expansion provides a safety net for young adults who might not otherwise find affordable coverage in the individual insurance market, and reduces risks that are commonly experienced at key transitions such as graduation. Since the relevant state laws have only recently been implemented, very few studies have investigated the potential effects of these laws on economic outcomes. For instance, Levine et al. (2011) examine the impact of expanded eligibility

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[1] Income, Poverty, and Health Insurance Coverage in the United States: 2007, U.S. Census Bureau, 2008
[2] Gruber and Madrian (2002) provide a more complete review of this broader literature. Many previous studies have investigated the link between health insurance and labor market outcomes of other cohorts such as the elderly or lower income single mothers. More recently, Bansak and Raphael (2008) and Hamersma and Kim (2009) examined the effect of expanding public health insurance on job mobility among working parents.
[3] Annual Social and Economic (ASEC) Supplement, U.S. Census Bureau, 2008
[4] The State Children's Health Insurance (SCHIP), of which eligibility income limit is higher than Medicaid, is available up to 19 years old.

on insurance coverage and find that the extended parental coverage laws increases health insurance coverage among young adults.

While these laws may help some young adults stay insured, there might be some side effects that undermine the overall effectiveness of the program in terms of reducing the uninsured rate. In the absence of the intervention, obtaining coverage for young adults would have been difficult unless they had jobs that offered group private insurance. Thus, those who value health insurance but do not have access to it other than through employment might have a greater incentive to work. As this implicit value of employment that provides health insurance decreases with the expansion laws, those who become eligible for extended parental coverage may be more inclined to withdraw from the workforce or less likely to work full-time.

In this paper, we examine the labor market effects of allowing young adults to remain covered under their parent's health insurance plan. To date, there has been little research into how access to health insurance affects young adults' labor supply and labor market choices. Our objective, then, is to describe the association between outside health insurance availability and labor market outcomes among young adults. In particular, we investigate whether the recent intervention in the private health insurance market discourages young adults from participating in the labor market. We employ quasi-experimental variation in the timing and generosity of states' eligibility rules to identify the effect of the policy change on young adults' labor supply. Our results suggest that the expansion of parental coverage increases the group dependent coverage rate and reduces labor supply among young adults who become newly eligible for the expansion, particularly in full-time employment. In most cases a decrease in full-time employment is observed with a decline in young adults' own private insurance, without reducing the uninsured rate.

This study is particularly important, as an analysis of state experiences with the extended parental coverage informs the question of the effectiveness of federal health care reforms. The enactment of the Affordable Care Act of 2010 by the federal government promises to cover approximately 32 million uninsured people over the next ten years, including the majority of uninsured young adults. The provision includes the ability for a young adult to remain on a parent's health plan up to age 26.[5] The reform applies to all adult children regardless of living arrangement, degree of financial independence, or marital or student status. Given this, it is worth asking whether this reform would have the intended effect of reducing the uninsured rate among young adults and, more broadly, how it would affect their labor market outcomes.

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[5] Most Affordable Care Act proposals go into effect in 2014. The dependent coverage provision is an exception since it was already in effect as of September 2010. The current study uses data to 2010 and does not directly investigate the effect of the Affordable Care Act.

2. Background

2.1 Expansion of parental health insurance

Young adults between the ages of 19 and 29 constitute the largest segment of the uninsured; they represented nearly one in three uninsured people in 2008, totaling approximately 13.7 million (Collins et al., 2010). To help those young adults stay insured, several states have expanded eligibility and allowed them to remain covered under their parent's employer-provided health insurance. As of 2009, 27 states had passed laws that increased the age of dependency for insurance purposes. Table 1 shows how the laws vary across states in the requirements for coverage. It can be seen that the age limit varies considerably, ranging from age 24 in Delaware, Indiana, Louisiana and Tennessee to age 30 in New Jersey and New York. The laws also vary across states in terms of how they define dependent young adults. In some states, the eligibility is restricted to full-time students, financially dependent young adults, young adults residing in the same state as their parents, unmarried young adults, or young adults without their own dependents. In six states, young adults are required to be full-time students in order to be covered under their parent's plan.

The expansion, however, does not apply to employers that provide health benefits directly to their employees (i.e., self-insured firms). Under the Employee Retirement Income Security Acts of 1974 (ERISA), the state-level regulations apply only to employers that purchase insurance through a carrier (i.e., fully-insured plans), and these employers are likely to be small firms.[6] The implication for our study is that we expect the effect of the expansion to be larger for young adults when their parents work at small firms and have private group health insurance.

For young adults, the extension of dependent coverage provides an attractive alternative to purchasing insurance through their own employers, student plans, or remaining uninsured. Before the expansion of parental coverage, the insurance protection afforded through a parent's employer policy or a student health plan was lost upon graduation. Thus, young adults who were not full-time students were more likely to be uninsured following graduation from high school or college. Even though young adults enter the labor market after school, they may experience difficulties in finding jobs with health benefits. Indeed, nearly half of employed young adults have jobs that do not provide health insurance coverage.[7] As they are at the beginning of a career, the jobs available to them—jobs at small firms, with low wages,

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[6] Kaiser/HRET Survey of Employer-Sponsored Health Benefits, 1999–2007. In firms with 5,000 or more employees, 86 percent of workers were covered by self-insured arrangements, while in firms with fewer than 200 employees only 12 percent were covered by self-insured plans in 2007.

[7] Current Population Survey, March 2008

or part-time or temporary—often do not offer health benefits.[8] Therefore, the state reforms are aimed at having young adults covered by their parents' health insurance, even if they work instead of undertaking full-time study.

2.2 Health insurance and Labor Supply

Individuals who value health insurance but had access to it only through their own employment may have worked longer hours than they would otherwise, even though their marginal value of leisure exceeds that of their marginal product of labor. It is also possible that some young adults starting their career might choose a full-time job more precipitously than they otherwise would, because health insurance premiums for individual plans are very high compared to group plans and group coverage is typically offered with full-time employment. The fact that employers tend to restrict health insurance benefits to full-time workers results in a non-convex budget constraint in a choice set between leisure (x-axis) and consumption (y-axis); once they work enough hours to be classified as full-time, workers receive health insurance and the portion of their budget constraint jumps up vertically by the consumption value of the insurance (Buchmueller and Valletta, 1998).

For young adults who work full-time even though they would prefer to work fewer hours in the absence of the kink in the budget constraint, the expansion would effectively smooth out this kink in the budget set. In fact, the availability of parental health insurance acts like an increase in unearned income, with the pure income effect predicting that young adults would decrease total work hours. In addition, the likelihood of working at a large firm, as opposed to working at a small firm, may decrease when young adults become eligible for extended parental coverage.

The relevant past literature examines the effects of spousal health insurance on own labor supply (see Gruber and Madrian 2002; Currie and Madrian 1999 for a more complete literature review). These studies indicate a strong negative effect of spouse's health insurance on own probability of working full time, either assuming that availability of spousal health insurance is exogenous to own labor supply or by using instrumental variables approaches.[9] Our estimation strategy uses variation in the availability of

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[8] The likelihood of offering health insurance coverage among small firms (those with fewer than ten employees) is low and has decreased substantially from 57 percent in 2000 to 49 percent in 2008 (Employer Health Benefits Survey by Kaiser Family Foundation).

[9] Royalty and Abraham (2006) argue that even those studies that use instrumental variables (which typically predict the likelihood of having spouse's health insurance using observable characteristics of the spouse such as human capital) are potentially biased if there is positive assortative mating on the observables. They mitigate this concern by using the degree of association between spouse's health insurance and own sick leave, which should not have any causal relationship, as a proxy for the extent of bias resulting from the assortative mating. After differencing out this bias, they find that spouse's health insurance still has negative effects on the probability of working full-time at a firm that provides health insurance.

alternative insurance as a result of a clear policy intervention. Thus, it is less subject to the problem of assuming exogeneity of an alternative source of health insurance.

3. Empirical Strategy

We use a difference-in-differences approach where we compare the pre- and post-law changes in insurance coverage and labor market outcomes of those who are and are not affected by the policy intervention.

$$Y_{ist} = \alpha + \beta_0 Treated_{is} + \beta_1 (Treated_{is} \cdot Post_{st}) + \beta_2 Post_{st} + \beta_3 X_{ist}$$

$$+ \beta_4 Unemp_{st} + State_s + Year_t + Age_i + \varepsilon_{ist}, \qquad (1)$$

where Y refers to an outcome variable for individual i in state s in year t. We look at outcomes of health insurance coverage as well as labor market such as overall labor supply and full-time work. *Treated* is an imputed measure that defines who will be *newly eligible* after the policy change is implemented based on the state laws described in Section 2. Even before the coverage extensions, dependent status (and therefore eligibility) was not lost until age 24 as long as young adults continued schooling. In our analysis, we focus on *newly eligible* (= *Treated*), rather than *always eligible* (students who are age 24 or younger) because this group is most likely to benefit from the expansion. That is, students up to 24 years old are not newly eligible, and *Treated* is imputed to be 0. *Post* is a binary variable indicating whether the state and year are affected by the laws. The interaction term, *Treated×Post*, is an indicator that the observation comes from the treated group after the expansion has occurred. We call this interaction term *newly affected* group, who will be most likely to respond to policy changes. *X* is a vector of demographic characteristics that include student and marital status, female, having any children, whether residing with parents, and race dummies. *State, Year* and *Age* are state, year and age fixed effects, respectively. To the extent that *Post* is determined by some time-invariant state level conditions (i.e., states that typically have had high uninsured rate among young adults tend to adopt the laws earlier), state fixed effects will absorb such state differences. We also control for *Unemp*, the unemployment rate at the state and year level, in order to capture overall time-varying economic conditions for each state. If state unemployment influences outcome variables and policy itself, omitting it from incidence studies would bias the estimated effect of the policy.[10]

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[10] We also used a one year lag of unemployment rate to avoid concern that young adult's labor supply may be determined simultaneously with unemployment rate when the dependent variable concerns labor market outcomes. We found very little change in the coefficient estimates.

As discussed in Section 2.2, if the expansion allows young adults to be covered by parental health insurance and lowers the incentive to work among the newly eligible, we expect β_1 to have a negative sign, especially when the dependent variable is working full-time. However, whether young adults' labor market outcomes are indeed affected by the expansion is an empirical question.

We also look at differential effects across gender on both health insurance coverage and labor supply using equation (1). The effects of extended parental coverage on insurance status and labor market outcomes are expected to be stronger among those who value insurance highly. Loosely speaking, health insurance coverage is likely to be more valuable for females than males. Gruber (1994) found that women of child-bearing age tend to receive lower wages when several state and federal mandates made insurance cover childbirth costs. This finding implies that women of child-bearing age could face higher premiums for health insurance and lower wage jobs if they were to acquire their own health insurance. Therefore, we expect to see greater effects of the policy change for women compared to men.

Our estimation strategy employs variation where the availability of alternative insurance is driven by a policy intervention. One concern with this strategy is that *Treated* may be endogenously determined if there is a behavioral response at the eligibility margin, that is, some young adults may find it advantageous to become eligible as the intervention phases in. Table 1 shows that eligibility is different across states in terms of whether they allow young adults to be non-students, married, and to have dependents. We test the possibility of the behavioral response to the policy change by estimating the following regression equation:

$$\Pr(Z_{ist} = 1) = \sigma + \delta_0 Post_{st} + \delta_1 X_{ist} + State_s + Year_t + Age_i + \upsilon_{ist} \tag{2}$$

Equation (2) tests whether the young adults in the affected states changed their behavior in response to the state's eligibility rules. We are interested in the behavioral outcome *Z* that is affected by the eligibility rules. The dependent variable *Z* is a binary variable indicating whether a young adult is a student, single or has children. In all variants of regression (2), the coefficient on *Post* is close to zero and not statistically significant at the 10 percent level. We also run regressions where the dependent variable is *Treated*, and where it is an indicator of having a parent who has private coverage and works at a small firm (so that the young adults are affected even under ERISA). Again, the coefficient on *Post* is not statistically significant at the 10 percent level, indicating that there is less concern for endogenous behavioral change at the eligibility margin.[11]

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[11] The March CPS reports information on only family members residing within the same household. Thus, having parental information necessarily indicates that the young adults reside with their parents. We also estimate the

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Another concern is policy endogeneity. In order to protect the analysis from potential bias caused by policy endogeneity, we have to assure that either time-varying state level variables did not change between the pre- and post-treatment period, or that they changed in an identical manner in the treatment and control states (Besley and Case, 2000). The problem not resolved by controlling for state fixed effects is that the timing of the implementation may depend on pre-law changes in uninsured rate among young adults. To confirm, we plotted uninsured rate across time for each state to examine this issue but did not find any noticeable pattern or trend before the expansion.[12] In addition, all regressions include state's unemployment rate each year, and we add state's mortgage foreclosure rates (both for overall and subprime mortgages) for each year to mitigate the concern.

We provide results based on equation (1) in section 5.1. We also estimate the variants of equation (1) for robustness checks to help strengthen the case for identification, with the results reported in section 5.2. In section 5.3, we offer an additional check by constructing an alternative sampling distribution using placebo laws, which is used to test whether the observed effect is driven by the policy change rather than some mechanical bias. Finally, we look at dynamic response of the extended parental coverage in section 5.4.

4. Data

We use the 2001-2010 March Current Population Survey (CPS) data. The March CPS offers a variety of information on individual circumstances including health insurance status and labor market choices. In addition, it has a large sample size and allows for nationally representative estimates when using sampling weights. Most states that extended dependent insurance coverage adopted the laws between 1999 and 2009. In order to focus on a period when the majority of state actions occurred, our analysis ranges from 2000 to 2009, which is covered in the 2001-2010 CPS as insurance and employment information is dated back one year. We exclude Massachusetts in our analysis since broader health insurance reform was implemented in this state at the same time as the extended parental coverage law, as in Levine et al. (2011).

In our analysis we use the sample of young adults aged 19 to 24. In some states, the age limit increases to 25 or older, but the March CPS does not have information on student status when a respondent is older than 24. Several other sample restrictions are made in the analysis. For example, we

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regression equation (2) using a binary dependent variable of living with one's parents. The resulting coefficient of *Post* is 0.009 and statistically significant at 10 percent, indicating that the law had a small impact on living arrangements.

[12] Graphs are available upon request.

exclude disabled individuals and those in the armed forces because they are eligible for other sources of health insurance, and their work patterns are likely to be different from others.

Table 2 reports summary statistics for the sample of young adults. The first five outcomes relate to health insurance coverage.[13] About a third of young adults in the sample are uninsured, which is very high compared to the overall uninsured rate of 15 percent among the U.S. population. What follows next are the mean values for three types of private insurance. Private insurance can be categorized by six types in total, and we collapse them to the three most relevant ones: group dependent, own private, and other private health insurance.[14] Group dependent coverage means a respondent is covered as a dependent on employment-based (group) health insurance. Own private insurance indicates that a young adult is covered by any private insurance (either group or non-group) as a policyholder for the health insurance. Other private health insurance pools remaining types of private insurance, consisting of non-group dependent and spousal coverage (either group or non-group). Most young adults on private health insurance are covered by either group dependent coverage or own private plan; 22 percent are covered by group dependent coverage, 31 percent have own private insurance plans, while only 8 percent are covered by other private insurance. Nine percent of young adults aged 19 to 24 are covered by public health insurance.

72 percent of the young adults in the sample are employed, with a large portion of them working full-time (71 percent of those employed) and working at a big firm (63 percent of those employed). The remaining variables are the control variables in the main regressions. Those who are newly eligible constitute 26 percent of the sample (those newly affected, *Treated×Post*, are about 8 percent of the sample). On average, 25 percent are enrolled as full-time students; the majority of these young adults are single and do not have children (78 percent and 81 percent, respectively).

5. Results
5.1 Main Results

Table 3 presents results from the difference-in-differences approach in regression equation (1). All models are estimated by OLS. We begin by discussing the effect of extended parental coverage laws on health insurance coverage. As health insurance is a channel through which labor market outcomes are

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[13] The insurance coverage variables are not mutually exclusive since young adults can report being covered under, for example, group dependent and own private insurance (less than 2 percent in the sample). We have estimated regression by making them have only one type of health insurance. The results did not change meaningfully by the chosen type of the insurance.

[14] The six types constitute whether it is group (employment based) or non-group (individually purchased) and, for each group and non-group, one can be covered under own name, as a dependent, or as a spouse of the insurance holder.

affected, it is important to establish evidence that the law affects health insurance status. Column (1) shows that those who are newly affected by the law (*Treated×Post*) are 4.3 percentage points more likely to be covered by group dependent health insurance than the control group. More than 50 percent of the effect appears to come from a decrease in the likelihood of having own private health insurance, as shown in column (2). The probability of being covered by public insurance is not affected by the law; we find little evidence of 'reverse crowd-out', which can happen if the availability of group private insurance results in a switch from public to private insurance. Lastly, we find no evidence that those newly affected by the law are less likely to be uninsured (column (5)).[15]

This finding suggests that there is no improvement on the extensive margin of increasing coverage for targeted young adults; rather, we see evidence of shifting between the types of insurance they get. One possible reason for the switch is that the marginal cost to parents of adding an additional dependent could be lower than the young adult's own coverage premium, and young adults may face incentives to receive coverage as a dependent rather than own employer-provided insurance coverage.[16] Other than the monetary incentives, the parental or dependent coverage also enables young adults to exercise greater flexibility in changing jobs and to delay working until they find the job with high match quality. They would additionally enjoy greater job choice sets, encompassing the jobs that do not necessarily provide health insurance.

The next columns of Table 3 present the results in labor market choices. The dependent variable in column (6) is whether a young adult works or not. The law in general reduces overall labor supply by 2.1 percentage points on average, which is a relatively small distortion given that average labor market participation is 72 percent. To observe the sources of this change, in columns (7) and (8) we examine whether the law affects likelihood of working full-time or working at a large (>100 employees) firm. The results show that the decrease in the probability of working full-time is the main driver of the change; the

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[15] Levine et al. (2011) find that extended parental coverage was effective at increasing health insurance coverage in some subgroups of young adults. We also found a decrease in the uninsured rate among the subgroup of young adults who live with parents, but this is the case only when general eligibility is used rather than focusing on the newly eligible young adults. However, direct comparison would not be meaningful as several aspects of methodology are different other than the group of interest. For instance, for states that have not passed extended parental coverage laws, Levine et al. (2011) assume the eligibility criterion that the young adult must be unmarried. In our case, these young adults are considered as ineligible. We also use more updated laws and include more recent samples in our analysis.

[16] In 2010, annual premiums for family coverage are $13,623 and the employee share is $3,637 (26.7 percent of the premiums) on average, whereas premiums for single coverage are $4,951 and the employee share is $1,005 (20.3 percent) on average (Medical Expenditure Survey 2010). According to the Health and Human Services Department, additional cost for each dependent is $3,380 per annum. If we apply for the same employee share of family coverage, the employee's marginal cost per dependent is then $902. Thus, on average terms, the cost of covering an additional child through family coverage is 10 percent less than single coverage. In addition, some family coverage does not incur additional cost of adding dependent, where the potential beneficiary would face the greater monetary incentive to take up dependent coverage.

likelihood of having a full-time job decreases (2.6 percentage points) more than that of working at all (2.1 percentage points), where the difference of 0.5 percentage points indicates that some people who previously had a full-time job may switch to a part-time job (but the difference is not statistically significant given the standard error). Lastly, as shown in column (8), young adults' propensity to work at a large size firm (thus more likely to be offered employer-provided health insurance) appears unaffected.

Table 4 examines how female and male young adults differentially respond to the extended parental coverage. Generally, women are charged higher premiums because as a group they tend to consume more medical services than men. Especially, women of childbearing age need more health care than men because of the combined demands of pregnancy and family planning. Partly as a result of this, young women typically pay more than young men for individual health insurance,[17] unless they live in one of ten states where gender rating is illegal.[18] Therefore, women may have greater incentives than men to be covered by parental coverage instead of their own coverage.

Our results indicate that women are indeed more likely to take advantage of the increased access to parent's health insurance. As shown in column (1), the likelihood of being covered by group dependent coverage increases by 6 percentage points for women, compared to 2.6 percentage points for men. This increase in the group dependent coverage for women appears to largely come from a decrease in own private health insurance (3.9 percentage points), whereas for men it comes from other private insurance (1.5 percentage points).

The results on labor market choices in Table 4 shed light somewhat on the cause of this differential pattern in insurance coverage across gender. A salient 2.8 percentage point decrease in the likelihood of working full-time emerges among young, female adults, whereas for men a decline in the likelihood of working at all is more prominent. The point estimates where the dependent variable is working full-time are very similar across gender; however, they are statistically significant only among females, and females experience a larger percentage change compared to males. A decrease in full-time work among women without its having any effect on overall labor supply suggests that women are likely to substitute away from full-time to a part-time job. This is perhaps why we observe a corresponding decrease (although not one-to-one) in the probability of holding private insurance under own name, with full-time workers more likely to be offered private insurance than part-time workers. We again find no evidence that the expansion of parental coverage affects the probability of working at a large size firm for either women or men.

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[17] National Women's Law Center, 2008

[18] Maine, Massachusetts, Montana, Minnesota, New Hampshire, New Jersey, New York, North Dakota, Oregon and Washington prohibit the use of gender rating. We examine whether females are more responsive to the expansion law in the states that do not prohibit gender rating. Although we found a greater responsiveness among women in these states, the difference in the coefficient estimate was not statistically significant at 10 percent.

Table 5 shows the effects of parental coverage laws using two restricted samples. The first part is estimated using only non-students since the newly affected group is composed of non-students and they are the more relevant population for examining labor market outcomes. In addition, the restriction allows the comparison group to be more homogenous with the treated group.[19] The results show that the newly eligible young adults, upon changes in the law, are more likely to be covered by group dependent health insurance relative to their counterparts who are non-students and unaffected by the law. When this different comparison group is used in the analysis, we do not observe any significant decline in the probability of having own coverage. The next columns show the labor market outcomes for non-students. We find a pattern similar to the full sample; labor supply and full-time work decrease 1.7 and 2.2 percentage points, respectively. That is, those non-students newly affected by the law are less likely to work full-time compared to the non-students unaffected by the law, decreasing overall labor supply among this group.

In the second part of Table 5, we restrict the sample to young adults whose parents, either mother or father, hold group private health insurance and work at small firms with fewer than 100 employees. This restriction follows from ERISA, which exempts the self-insured firms (likely to be large firms) from the state-level regulations. As expected, we generally find that the law has a larger effect on young adults whose parents work at small firms. This cohort are 5.2 percentage points more likely to have group dependent health insurance, and this change comes mostly from a decrease in own private coverage. Also, we found a decrease in full-time work by 6 percentage points among this group, while overall labor supply seems to be unaffected by the policy change.

5.2 Robustness Checks

We experiment with a few specifications that might lead to a more convincing case for identification in Table 6. First, we include state-specific linear time trend and state-specific quadratic time trend. In general, this specification provides a more convincing estimate by identifying the effect independently from any existing trends in the outcome variable. It is possible, however, that including state-specific trends may actually exacerbate the bias depending on the dynamic response. Wolfers (2006) argues that the resulting counterfactuals when they include state-specific trends would be misleading when the effects differ drastically across time, as the trends in this case will absorb the actual effects of the policy, not just capture the existing trends. Our coefficient estimates in Panel A are not sensitive to the

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[19] As discussed, we do not find any behavioral change in the likelihood of being a student in response to law changes, so sample selection bias is less of a concern.

inclusion of these trends, indicating that there is less concern for confounded counterfactuals that consist of not only the existing trends but also the response to the policy shock itself.

Next in Panel B, we exclude Hawaii and examine the sensitivity of our results. In 1974, Hawaii passed the Prepaid Health Care Act, which mandated private sector employers to provide health insurance to employees who work at least 20 hours per week. This broad health care reform in employer health insurance increased insurance coverage over time especially for workers with low predicted probability of having insurance coverage (Buchmueller et al., 2011). Thus, young adults in Hawaii might not be a good comparison group, and we therefore have estimated the regressions without Hawaii. However, excluding the data from Hawaii does not significantly impact the main findings.

It is possible that the late-2000s Great Recession might have differentially affected a state's capacity to expand the private insurance, resulting in a non-random timing of the policy implementation. We therefore use the years before the Great Recession, and establish results that are similar to the baseline specifications (Panel C). We also include mortgage foreclosure rates (both for overall and subprime mortgages) as additional time-varying state control variables (the results not shown). However, different years and the additional variables do not affect the results.

Lastly, we confine the sample to those states that passed the expansion of parental coverage, not having the non-passed states as controls. This specification can prevent potential bias that policy endogeneity might cause by excluding states that did not introduce the law. The results are again insensitive to this different specification.

5.3 Additional Check using Placebo Laws

The fact that once *Post* variable takes value one it remains one in later years may result in a systematic bias towards finding the effect for certain outcome variables even without the true policy effect. In other words, the true null that is used to test whether there is an effect may not be zero due to the nature of the variable, *Post*. As a result, even if we find an effect that is statistically different from zero, it might not be significantly different from what would be expected when *Post* is constructed by a randomly-implemented year of policy changes. To address this issue, we use variants of Fisher's exact p-value test, generating sampling distribution of the coefficient estimates of *Treated×Post* using randomized placebo laws. It allows us to obtain (given our sample) the probability that the estimated placebo effects are at least as large as the reported effects.

We consider a hypothetical setting when constructing sampling distribution of the placebo estimates. The setting concerns a case where all states, rather than selected states that have already passed the law, are going to implement this law at some point in time before 2014. It relaxes what is implicitly assumed so far, that those states that have not implemented the law will never implement the law. We

then obtain sampling distribution of the coefficient estimates using the randomly generated year of the law implementation and use the 5th and 95th percentiles of the distribution for statistical inference.

For each state, a placebo year of implementation is randomly chosen from the years between 2000 and 2014, using a uniform distribution with replacement. If the random year exceeds the last year of the sample period, which is 2009, these states now become the control states that have not yet implemented the law.[20] We estimate equation (1) 1000 times using this sample (each time with the randomly drawn year of implementation for each state) and collect these 1000 placebo estimates of coefficient of *Treated×Post*. The resulting set of coefficients serve as the randomization distribution of the effect of law (sampling distribution under the new null), which can be used to calculate the p-value for hypothesis testing to determine whether the reported effect in Table 3 is large enough to reject the null. Since there is no eligibility rule established in non-passing states, we impose the most common eligibility criteria observed in Table 1—being unmarried—to the young adults in non-passing states. Hence, *Treated* (who will be newly eligible upon passage of the law) in this case will be the single young adults who are not students.[21]

The 5th and 95th percentile intervals for each case are reported in Table 7. We indicate by ([+]) if the estimates lie outside the interval, implying that the effect is significant at 10 percent level. It allows for more conservative testing as the mean value of the randomization distribution (the new null) tends to shift towards the same direction as the finding in Table 3. The results are generally supportive and consistent with Table 3 in terms of significance level. The effects of the law on group dependent health insurance, work and full-time work are either outside the interval of 5th and 95th or at the margin.[22] Overall, the results suggest that the estimated effect on group dependent coverage, work and full-time work are found to be robust, indicating that the effects do not merely reflect a mechanical bias that may result from a design of the policy variable.[23]

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[20] Although the expansion of dependent coverage was already in effect in September 2010 as an earlier implementation of the Affordable Care Act of 2014, we chose 2014 rather than 2010 in order to reflect that a large portion of states still had not implemented the expansion of coverage as of 2009.

[21] As an alternative way of creating eligibility which incorporates the conditions of both passing and non-passing states, we follow the eligibility rule based on Affordable Care Act, which basically has no particular requirements. It allows young adults to be dependent for coverage purpose regardless of marital or student status. When we use this alternative eligibility, the main estimated effect of law for the outcome variable of group dependent, other private, work, full-time work lie outside of the interval of 5th and 95th percentiles of the distribution.

[22] For instance, although we cannot strictly say that the coefficient estimate of *Treated×Post* lie outside the interval when the dependent variable is *Work* (column 6), estimated effect of -0.021 lies very closely with the 5 percentile value of -0.022.

[23] We have conducted corresponding exercises for tables 4 and 5 as well. The resulting p-values are generally consistent with what is observed in the regression results.

5.4 Dynamic Response of the Extended Parental Coverage

It is our interest to know whether the state law has a differential effect across time. To see this, we introduce three binary variables that indicate first, second and third and later year of the implementation, and interact those variables with the *Treated* variable. Table 8 reports the coefficients of the differential timing effects.

Compared to the period before the implementation, those targeted by the law had 2.8 percentage points greater probability of obtaining group dependent coverage in the first year. The law gains momentum, and the increase in coverage is 4.4 percentage points in the second year and 6.5 percentage points in the later years, compared to pre-reform period.

The effect on labor supply and full-time work shows a similarly-sized large decline in the first and second years, and a modest decline in the third year and after (although *Work* has big standard errors in second and later years while *Full-time* does not). As an increase in job mobility can be accompanied by an expansion of parental coverage, young adults may delay their labor supply or voluntarily withdraw from the labor market until finding a job with high match quality, particularly during the earlier period of the policy expansion. But as the time spent in job search and the quality of job match increases, this tendency disappears over time. The increasing pattern shown in the group dependent coverage implies that the new job chosen after the job search tends not to offer private health insurance, or that young adults prefer to stay in dependent coverage even with the option of taking employer-provided health insurance. The apparent increase in the rate of a switch over time from own private to group dependent coverage also delivers a consistent story.

6. Policy Implications and Conclusion

This paper investigates the effects of recently expanded state-level dependent coverage laws on various health insurance and labor market choices. Young adults aged 19 to 29 are significantly less likely to have health insurance since most family insurance policies cut off dependents when they turn 19 or finish college. In order to improve continuity of coverage for young adults, about half of the U.S. states have recently intervened in the private insurance market by expanding dependent eligibility to young adults aged 24 to 30.

The expected responsiveness of this intervention is different from earlier governmental efforts to reduce the uninsured rate, which mainly targeted poor households by expanding public insurance such as Medicaid and SCHIP. As the eligible income threshold increased, the earlier reforms would have had to worry about crowd-out of private insurance to public insurance (Cutler and Gruber, 1996). Current intervention in the private insurance market, however, affects families who are not necessarily poor and

who are presumably more active in the labor market. Therefore, states are now faced with a potential crowd-out of other types of private insurance to the dependent private insurance. In addition, due to a tight linkage between private health insurance and employment observed in the U.S., unintended behavioral response can exist not just in health insurance but also in the labor market.

In the absence of the expansion of parental health insurance, young adults have had difficulty in obtaining coverage unless they had a full-time job with employer-provided health insurance. For those who qualify for expanded parental coverage, having continued access to health insurance through their parent's plan partially reduces the value of being employed full-time. By employing the quasi-experimental variation in the timing and generosity of states' eligibility rules, we identify the effect of the policy change on young adults' health insurance status and labor market outcomes. Our baseline results suggest that the state-level expansions of parental coverage have increased group dependent coverage among young adults by 4.3 percentage points. However, we find no evidence that the expansions have increased overall coverage. One possible explanation suggested in this paper is that newly eligible young adults endogenously respond to the law changes by reducing their labor supply, decreasing the likelihood of obtaining private health insurance through their own employment. This behavioral change partially undermines the states' effort to increase health insurance coverage, as much of the increase in dependent private coverage was initiated by those who were previously covered. Thus, the laws have been largely ineffective in attracting those who were previously uninsured, at least among the targeted group in our study. Our results are robust to a variety of empirical specifications and sample selection.

When fully-fledged, federal-level reform comes into effect in 2014, we will see a broader population affected. Recently-passed federal health care reform allows young adults, regardless of their residing states, to stay on their parents' plans longer by expanding dependent eligibility until age 26. Our results show that the feedback effect of health insurance on the labor market may mitigate the effectiveness of increasing overall health insurance as the policy intended. Our study suggests that such side effects should be considered in policy-making decisions.

While we focused on the partial equilibrium effects of reforms on beneficiaries, the state or federal level reforms are expected to bring other changes in the economy as well, such as behavioral changes among employers in coverage offerings and premium contribution. Sheppard et al. (2000) investigated whether employers were less likely to provide health insurance to employees with Medicaid-eligible family members after the expansion of Medicaid eligibility. Their findings suggest that firms do respond to policy changes, with firms less likely to offer family coverage as the proportion of Medicaid-eligible employees increases. Depending on the extent of premium change and wage-shifting, the welfare

implications will be very different. There are many important, unanswered questions in health insurance reforms; we expect to see further fruitful discussions along the way.

Table 1: Variations of state dependent coverage laws

State	Year of passage	Age limit	Non-student	Married	Dependents
			Expansion		
Colorado	2006	25	●		●
Connecticut	2009	26	●		●
Delaware	2006	24	●		
Florida	2007	25	●		●
Idaho	2007	25			●
Illinois	2008	26	●		●
Indiana	2007	24	●	●	●
Iowa	2008	25			●
Kentucky	2008	25	●		●
Louisiana	2009	24			●
Maine	2007	25	●		
Maryland	2007	25	●		●
Minnesota	2008	25	●		●
Montana	2008	25	●		●
New Hampshire	2007	26	●		
New Jersey	2006	30	●		
New Mexico	2005	25	●		●
New York	2009	30	●		●
Rhode Island	2006	25			●
South Dakota	2005	29		●	●
Tennessee	2008	24	●		●
Texas	2003	25	●		●
Utah	1994	26	●		●
Virginia	2007	25		●	●
Washington	2007	25	●		●
West Virginia	2007	25	●	●	●

Notes: The mark (●) indicates whether a state extends parental coverage to young adults satisfying each eligibility rule (being a student, single or having children).

Source: Levine et al. (2011) ; Nicholson et al. (2009); Kronstadt et al. (2007); National Conference of State Legislatures (2008)

Table 2: Summary statistics for young adults aged 19-24

	Mean	Standard deviation
Uninsured	0.339	0.473
Group dep. health insurance	0.216	0.412
Own private insurance	0.311	0.463
Other private health insurance	0.079	0.269
Public health insurance	0.089	0.285
Work	0.723	0.447
Working full-time	0.515	0.500
Working at a big firm (>100)	0.455	0.498
Fraction of the newly eligible (*Treated)*	0.256	0.436
Fraction whose parent works at small firms with coverage	0.133	0.340
Full-time student	0.254	0.435
Single	0.781	0.413
Female	0.499	0.500
No child	0.813	0.390
Not living with parents	0.578	0.494
White	0.784	0.411
Black	0.140	0.347

Notes: Other private health insurance includes non-group (privately-purchased) dependent coverage or spousal coverage (i.e., covered as a spouse of the policyholder).Total observation is 140,629. Data are from 2001-2010 March CPS.

Table 3: The effects of extended parental coverage laws on health insurance coverage and labor market choices

Dependent Variable:	Health insurance coverage						Labor market choices		
	Group dependent HI	Own private HI	Other private HI	Public HI	Uninsured		Work	Full-time	Big firm
	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)
Treated	0.043***	-0.023*	-0.012	-0.010	-0.002		-0.021**	-0.026***	0.007
×*Post*	(0.008)	(0.012)	(0.007)	(0.009)	(0.010)		(0.009)	(0.008)	(0.010)
Mean	0.216	0.311	0.078	0.109	0.339		0.723	0.515	0.455
Obs.	140,629	140,629	140,629	140,629	140,629		140,629	140,629	140,629
R^2	0.282	0.151	0.101	0.064	0.109		0.144	0.254	0.037

Notes: Other private health insurance includes non-group (privately-purchased) dependent coverage or spousal coverage (i.e. covered as a spouse of the policyholder). Working full-time is not conditional on working. Big firms hire more than 100 employees. Standard errors are clustered by state and shown in parentheses, * $p<0.10$, ** $p<0.05$, *** $p<0.01$. All specifications include state and year fixed effects.

Table 4: The effects of extended parental coverage laws by gender

A: Female

Dependent Variable:	Health insurance coverage					Labor market choices		
	Group dependent HI	Own private HI	Other private HI	Public HI	Uninsured	Work	Full-time	Big firm
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated	0.060***	-0.039***	-0.007	-0.019	-0.001	-0.013	-0.028***	0.002
$\times Post$	(0.012)	(0.014)	(0.008)	(0.011)	(0.013)	(0.014)	(0.010)	(0.018)
Mean	0.237	0.294	0.084	0.144	0.297	0.684	0.442	0.459
Obs.	73,354	73,354	73,354	73,354	73,354	73,354	73,354	73,354
R^2	0.267	0.157	0.107	0.080	0.086	0.123	0.207	0.048

B: Male

Dependent Variable:	Health insurance coverage					Labor market choices		
	Group dependent HI	Own private HI	Other private HI	Public HI	Uninsured	Work	Full-time	Big firm
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated	0.026**	-0.010	-0.015*	-0.001	-0.001	-0.034**	-0.026	0.008
$\times Post$	(0.011)	(0.013)	(0.009)	(0.010)	(0.011)	(0.013)	(0.017)	(0.015)
Mean	0.194	0.327	0.072	0 .073	0.380	0.762	0.588	0.450
Obs.	67,275	67,275	67,275	67,275	67,275	67,275	67,275	67,275
R^2	0.311	0.158	0.097	0.033	0.126	0.198	0.303	0.033

Notes: Other private health insurance includes non-group (privately-purchased) dependent coverage or spousal coverage (i.e., covered as a spouse of the policyholder).Working full-time is not conditional on working. Big firms hire more than 100 employees. Standard errors are clustered by state and shown in parentheses, * $p<0.10$, ** $p<0.05$, *** $p<0.01$. All specifications include state and year fixed effects.

Table 5: The effects of extended parental coverage laws with restricted sample

A: Non-Students

Dependent Variable:	Health insurance coverage						Labor market choices		
	Group dependent HI	Own private HI	Other private HI	Public HI	Uninsured		Work	Full-time	Big firm
	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)
Treated	0.037***	-0.010	-0.002	-0.010	-0.017		-0.017**	-0.022*	-0.003
×*Post*	(0.010)	(0.015)	(0.006)	(0.014)	(0.020)		(0.007)	(0.012)	(0.011)
Mean	0.143	0.371	0.043	0.117	0.381		0.782	0.630	0.470
Obs.	105,972	105,972	105,972	105,972	105,972		105,972	105,972	105,972
R^2	0.131	0.135	0.015	0.071	0.097		0.132	0.148	0.039

B: Young adults whose parent works at a small firm and has private health insurance

Dependent Variable:	Health insurance coverage						Labor market choices		
	Group dependent HI	Own private HI	Other private HI	Public HI	Uninsured		Work	Full-time	Big firm
	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)
Treated	0.052**	-0.055***	-0.010	-0.002	0.016		0.015	-0.060***	0.036
×*Post*	(0.023)	(0.020)	(0.009)	(0.010)	(0.018)		(0.029)	(0.018)	(0.036)
Mean	0.549	0.240	0.022	0.068	0.197		0.677	0.392	0.401
Obs.	18,710	18,710	18,710	18,710	18,710		18,710	18,710	18,710
R^2	0.343	0.165	0.008	0.031	0.124		0.131	0.256	0.018

Notes: Other private health insurance includes non-group (privately-purchased) dependent coverage or spousal coverage (i.e., covered as a spouse of the policyholder).Working full-time is not conditional on working. Big firms hire more than 100 employees. Standard errors are clustered by state and shown in parentheses, * $p<0.10$, ** $p<0.05$, *** $p<0.01$. All specifications include state and year fixed effects.

Table 6: The effects of extended parental coverage laws with other specifications

Dependent Variable:	Health insurance coverage					Labor market choices		
	Group dependent HI	Own private HI	Other private HI	Public HI	Uninsured	Work	Full-time	Big firm
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. With trend								
Treated	0.049***	-0.028**	-0.007	-0.013	-0.004	-0.024**	-0.036***	0.008
$\times Post$	(0.011)	(0.013)	(0.007)	(0.010)	(0.013)	(0.010)	(0.010)	(0.011)
Obs.	140,629	140,629	140,629	140,629	140,629	140,629	140,629	140,629
R^2	0.259	0.139	0.070	0.064	0.100	0.123	0.190	0.037
B. Without Hawaii								
Treated	0.043***	-0.023*	-0.012	-0.009	-0.002	-0.021**	-0.026***	0.007
$\times Post$	(0.008)	(0.012)	(0.007)	(0.009)	(0.010)	(0.009)	(0.008)	(0.010)
Obs.	138291	138291	138291	138291	138291	138291	138291	138291
R^2	0.283	0.151	0.101	0.064	0.109	0.145	0.255	0.037
C. Before 2008 (without Great Recession years)								
Treated	0.056***	-0.032*	-0.011	0.005	-0.015	-0.017	-0.029***	0.008
$\times Post$	(0.010)	(0.018)	(0.012)	(0.007)	(0.014)	(0.015)	(0.010)	(0.016)
Obs.	112,663	112,663	112,663	112,663	112,663	112,663	112,663	112,663
R^2	0.283	0.149	0.103	0.060	0.108	0.143	0.253	0.036
D. Sample with states which passed the laws								
Treated	0.043***	-0.023*	-0.011	-0.010	-0.001	-0.020**	-0.026***	0.007
$\times Post$	(0.008)	(0.012)	(0.007)	(0.009)	(0.010)	(0.009)	(0.007)	(0.011)
Obs.	73,825	73,825	73,825	73,825	73,825	73,825	73,825	73,825
R^2	0.282	0.149	0.086	0.066	0.111	0.151	0.255	0.040

Notes: Other private health insurance includes non-group (privately-purchased) dependent coverage or spousal coverage (i.e., covered as a spouse of the policyholder).Working full-time is not conditional on working. Big firms hire more than 100 employees. Standard errors are clustered by state and shown in parentheses, * $p<0.10$, ** $p<0.05$, *** $p<0.01$. All specifications include state and year fixed effects.

Table 7: Additional Checks using Placebo Laws

Dependent Variable:	Health insurance coverage					Labor market choices		
	Group dependent HI	Own private HI	Other private HI	Public HI	Uninsured	Work	Full-time	Big firm
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
5th percentile	-0.013	-0.030	-0.013	-0.015	-0.011	-0.022	-0.025	-0.018
95th percentile	0.033	0.007	0.015	0.006	0.019	0.017	0.000	0.016
The coef. of Treated×Post	0.043[+]	-0.023	-0.012	-0.01	-0.002	-0.021	-0.026[+]	0.007
The mean of the sampling dist.	0.009	-0.011	0.001	-0.005	0.004	-0.003	-0.013	-0.001

Notes: The sample size is 140, 629. The coefficient of *Treated×Post* is repeated values from Table 3. [+] means the effect lies outside the interval of 5th and 95th percentile of the sampling distribution that is generated by the placebo laws 1000 times.

Table 8: The effects of extended parental coverage laws by time

Dependent Variable:	Health insurance coverage					Labor market choices		
	Group dependent HI	Own private HI	Other private HI	Public HI	Uninsured	Work	Full-time	Big firm
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated *×1st year*	0.028**	-0.008	-0.012	0.004	-0.014	-0.034**	-0.029*	-0.010
	(0.011)	(0.019)	(0.010)	(0.017)	(0.027)	(0.014)	(0.017)	(0.023)
Treated *×2nd year*	0.044***	-0.031***	-0.014	-0.002	0.006	-0.033	-0.029**	0.000
	(0.010)	(0.009)	(0.011)	(0.012)	(0.017)	(0.028)	(0.014)	(0.020)
Treated *×3rd year*	0.065***	-0.065*	-0.017	0.009	0.010	-0.023	-0.020**	-0.011
	(0.012)	(0.033)	(0.012)	(0.007)	(0.017)	(0.030)	(0.009)	(0.023)
Obs.	140,629	140,629	140,629	140,629	140,629	140,629	140,629	140,629
R^2	0.282	0.151	0.101	0.064	0.109	0.145	0.254	0.037

Notes: (*Treated×1st year*), (*Treated×2nd year*) and (*Treated×3rd year*) are equal to one if they are newly eligible and live in the effective states after the first year, second year and third year of implementation or beyond, respectively. Other private health insurance includes non-group (privately-purchased) dependent coverage or spousal coverage (i.e., covered as a spouse of the policyholder).Working full-time is not conditional on working. Big firms hire more than 100 employees. Standard errors are clustered by state and shown in parentheses, * $p<0.10$, ** $p<0.05$, *** $p<0.01$. All specifications include state and year fixed effects.

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