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The Incidence Of Mandated Health Insurance:
Evidence From The Affordable Care Act Dependent Care Mandate

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ABSTRACT

The dependent care mandate is one of the most popular provisions of the 2010 Affordable Care Act
(ACA). This provision requires that employer-based insurance plans cover health care expenditures
for workers with children 26 years old or younger. While there has been considerable scholarly and
policy interest in the effects of this mandate on health insurance coverage among young adults, there
has been little scholarly work measuring the costs and incidence of this mandate and who pays the
costs of it. In our empirical work, we exploit the fact that some states had dependent care mandates
in years prior to the passage of the ACA. Using data from the Survey of Income and Program Participation
(SIPP), we find that workers at firms with employer-based coverage – whether or not they have dependent
children – experience an annual reduction in wages of approximately $1,200. Our results imply that
the marginal costs of mandated employer-based coverage expansions are not entirely borne only by
the people whose coverage is expanded by the mandate.

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I.   Introduction

Tax-financed public expenditures and mandated benefits are alternative ways to finance expanded health insurance coverage. While tax-financed benefits require raising revenue and have an associated deadweight loss, mandating employers to provide benefits can potentially be more efficient if employees value the benefit they are receiving. In fact, if employees value the benefit at its full cost, wages will offset the cost of the benefit and there will be no deadweight loss associated with the benefit.

The passage of the Affordable Care Act (ACA), signed into law by President Obama on March 23, 2010, imposes mandates on employers with 50 or more full-time equivalent workers to offer health insurance to their employees. Because of delays in aspects of the law's implementation, these mandates had been postponed to take effect no sooner than late 2015 or 2016. However, one provision of the ACA that took effect almost immediately is the dependent care mandate, which stipulated that dependents up to age 26 would be covered on their parents' health insurance policies. The dependent care mandate was effective on plan renewal dates following September 23, 2010 and increased the costs of providing health insurance coverage to families with dependents between the ages of 19 and 25, as most family insurance plans previously limited coverage of dependents to age 19.

In this paper, we simulate the potential effect this type of mandate would have on wages, which varies depending on the extent to which the costs of the mandate are targeted on populations most likely to benefit from the mandate and the increase in dependent coverage due to crowd-out and other factors. We show that the range of possibilities are large, from less than $50 per year if little crowd-out occurs and the effects are spread across the entire working

population, to more than $1,500 per year if crowd-out is high and small groups of workers are targeted.

We then explore whether workers bear the cost of the increased cost of health insurance coverage for these young adults in the form of reduced wages. We exploit variation in state mandates to cover young adults that existed prior to the passage of the ACA to produce a difference-in-difference estimate of the amount that wages decreased for workers in states and firms most affected by the mandate. Our estimates suggest that the effect is approximately $1,200 per year. Finally, we examine heterogeneity in the effect among different subsets of the population, including populations likely to benefit from the mandate. We find evidence that those currently employed at firms that offer health insurance seem to bear the cost more than those at firms that do not offer insurance; however, our results do not suggest the cost of the mandate is solely borne by parents of eligible children or parents more generally.

The dependent care mandate's early implementation has spurred several studies examining the effect it had on coverage (Antwi, Moriya and Simon 2013; Cantor et al 2012b; Sommers and Kronick 2012; Sommers et al. 2013), labor market impacts (Antwi, Moriya and Simon 2013; Heim, Lurie and Simon 2015), and health care utilization/outcomes (Mulcahy et al 2013; Chua and Sommers 2014; Golberstein et al. 2014; Fronstin 2013; Antwi, Moriya and Simon 2015; Barbaresco, Courtemanche and Qi 2015). In general, the literature has found that the dependent care mandate has had a substantial effect on uninsurance rates among young adults, and resulted in higher health care utilization, but mixed effects on overall health. The measured impact on labor market outcomes has not been large.

Despite the large number of papers examining the effects of the dependent care mandate, literature on the incidence of this mandate is scarce. Recent work by Bailey and Depew (2014)

examine the effect that the dependent care mandate had on premiums for family coverage relative to single coverage. Their estimates suggest that total annual family premiums increased by approximately $400 per year but the authors find no evidence that employee contributions increased. These results suggest that extra health care costs of the mandate were not put on workers via increasing the amount that employees pay for their health insurance, leaving open the possibility that employees bear the extra costs in the form of reduced wages.

Another strand of relevant literature relates to the incidence of employee benefits and mandates and compensating differentials. Early work by McGuire and Montgomery (1982) and Summers (1989) provide a theoretical examination of the efficiency tradeoffs for employer mandates relative to public provision. Likely because there is selection among employers in the provision of health insurance, there has been limited evidence showing that employees bear the cost of health insurance premiums in reduced wages; the bulk of evidence shows either no evidence of wage offsets or evidence of positive wage offsets (Gruber 2000).

Recent empirical work has found evidence that these groups bear the increased cost through lower wages (Pauly and Herring 1999). This empirical literature has focused on the extent to which groups that have higher health care costs due to demographics, observable characteristics, or mandates have lower wages. For instance, Sheiner (1999) shows that older workers tend to have flatter wage profiles in locations where health care costs are higher. Bhattacharya and Bundorf (2009) find evidence that wages are lower for obese workers in firms with employer-sponsored health insurance while there is no evidence that wages differ in firms without employer-sponsored health insurance, suggesting that obese workers pay for the incremental health care costs associated with obesity in the form of lower wages. Other relevant

studies include Baicker and Chandra (2006) who find that a 10 percent increase in health insurance premiums is associated with a 2.3 percent decrease in wages.

Much of the literature on the incidence of health insurance coverage mandates has focused on mandates to cover services. For instance, Gruber (1994) finds that mandates requiring childbirth coverage by health insurance reduced wages for the women of childbearing age. This study spurred many articles seeking to determine the effects of mandated benefits on premiums and labor market outcomes, providing mixed results (for a review see Monheit and Rizzo 2007). Lahey (2012) reconciles these previous results and shows that the additional cost of infertility mandates is not reflected in wage cuts for targeted groups but that total labor input decreases; workers do not value the these mandates at cost and are therefore not willing to accept pay reductions in exchange for the increased coverage provided by the mandate. If mandates are not fully valued and employers can distinguish between targeted and non-targeted employees, the employment of the targeted group will decline.

The remainder of the paper proceeds as follows. In Section 2 we describe the state and federal mandates to cover dependent children that we use as a source of identification and also provide benchmarks of the extra costs associated with the mandate. Section 3 presents a simulation exercise to understand the expected level of wage offsets given the range of crowd-out and the set of workers across which the extra costs are pooled. Section 4 describes our data and empirical strategy. In Section 5, we report the results of our empirical specification. Section 6 concludes.

II.   Background Information

A. *State Extended Parental Coverage Mandates*

During the past few decades, insurance coverage rates among young adults have been lower than other age groups. In 2010, 19-29 year olds represented almost 30% of the uninsured in the United States or 13 million of 47 million uninsured Americans (Claxton 2002, NCSL 2010, Kronstadt, Mojerie and Schwartz 2007). Few options existed to cover young adults over 19 years of age. Public program coverage targeting low-income populations, such as Medicaid and CHIP, generally terminated at the beneficiary's 19th birthday. Private insurance sources exacerbated this insurance discontinuity; young adults covered under their parent's employer sponsored insurance typically lost coverage at the age of 19, unless they were full time students. Moreover, the tax code defined coverage of dependents older than 19 years of age as a taxable benefit, effectively deterring employers in providing this extended coverage. Federal laws like COBRA allowed dependents to temporarily extend their coverage past the termination date but their scope was limited. Studies such as Levine et al (2011), examine insurance trends by age group over time and document a sharp discontinuity in coverage rates at age 19, and also note that, while coverage rates for children under 19 increased by 15 percentage points between 1982 and 2007, rates among young adults remained at least as low as they were twenty five years ago.

In the absence of federal laws and state funds to expand public programs, many states sought to address this insurance gap by passing extended parental coverage laws of their own, mandating that firms that offer dependent coverage increase their age threshold, generally up to 24 to 26 years. As of 2009, 37 states had passed some form of extended parental coverage laws.

Several studies have analyzed the impact of these state-level mandates. Levine et al. (2011) find that extended parental coverage laws were effective in decreasing uninsurance rates in the targeted population; producing a three percentage point reduction in uninsurance. However, Blum et al. (2012) and Monheit et al. (2011) find no overall gain in coverage. While

these mandates may have increased coverage they often had requirements for student status and exclusions for married young adults or those who did not reside with their parents. Moreover, the laws were limited in the extent to which they could reach age-eligible dependents: more than half of the employees covered by employer-sponsored insurance (ESI) work for large self-insured firms which are exempt from state health insurance regulation under the Employee Retirement Income Security Act of 1974 (ERISA). In addition, most states did not regulate the premiums that could be levied for coverage of older dependents, potentially allowing firms to price out young adults. Finally, information regarding state mandates was not widely disseminated; parents with eligible children may not have been aware of this benefit. Nevertheless, Depew (2015) examines the effects of state coverage mandates on labor supply of young adults and finds a reduction in labor supply on the intensive margin in states with mandates relative to states without mandates.

B. *Dependent Coverage Expansion under the 2010 Affordable Care Act*

The dependent coverage mandate was signed into law on March 23, 2010 as part of the Affordable Care Act and requires issuers that offer coverage to children on their parents' plan to extend the coverage up to the age of 26 years. The federal mandate differs from the state-level mandates in several respects. First, it applies to all young adults in the targeted age group regardless of place of residence, financial dependency, residency with parents and other factors (NCSL 2010). Second, it stipulates that insurance plans could not charge more for dependent coverage for older children relative to younger ones. Third, it applies to all firms whether or not they self-insured and hence was able to reach a much larger population. Finally, the law also

revises the IRS rules so that the benefit offered to the newly eligible young adults would be tax exempt.

The dependent coverage expansion was one of the first features of the ACA to be implemented. Beginning on September 23, 2010, insurers offering dependent-coverage policies that included children were required to cover dependents until their 26th birthday starting with the next renewal date of the plan. Several insurers chose to comply with the mandate sooner than September 2010, and since most employer plans start in January or July, full implementation was likely to have occurred shortly thereafter.[1] Antwi, Moriya and Simon (2013) document a 3.2 percentage point increase in health insurance coverage of those affected by the mandate relative to a pre-treatment mean of 66.5 percent.

III.   Simulated Effects of the ACA Dependent Care Mandate on Worker Wages

We first conduct a simulation exercise where we use estimates of annual health expenditures for 19-25 year-old young adults together with pre-existing rates of insurance coverage and numbers of workers in different categories to construct a range of potential wage offsets stemming from the dependent coverage mandate. The results of this exercise illustrate the range of wage offsets that are likely given the health care costs of the additional insureds and the populations these costs are spread over.

Our estimates of the annual wage offsets come from dividing the amount of health care costs shifted by the mandate divided by the population among whom these additional costs are spread. There are several choices for both the numerator and denominator that depend on

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[1] Until 2014, employer plans in existence as of March 23, 2010 were still allowed to refuse coverage to otherwise eligible dependent children if their employers offered health insurance. However, it is unknown the extent to which this provision is enforced.

economic responses to the mandate. Specifically, the numerator depends on the additional number of dependents between the ages of 19 and 25 that will be covered by their parents' health insurance policies and who were *not* on their parents' policies prior to the mandate. This number includes both dependents who were previously uninsured and gained insurance due to the mandate as well as those who had other sources of coverage which were crowded out by the mandate (for instance, dependents who previously qualified for public programs who switched to coverage from their parents' employers, as per Levine et al. (2011)).

The denominator depends on the set of workers who bear the cost of the mandate. As parents may be reasonably straightforward for employers to identify, it is plausible that employers respond to the extra costs of providing dependent coverage by reducing the wages of parents. However, since many non-parents are potential future users of the policy, and it may be difficult for firms to implement wage offsets when workers become parents, it is also plausible that all workers bear the cost of the mandate. In addition, since some employers do not offer health insurance to their employees, it is possible that workers at these firms do not bear the increased cost of providing health insurance to dependent young adults.

As an extreme example, suppose *all* health care costs by 19-25 year olds shifted to private insurers and that these extra costs were borne by *all* workers age 26 and older. According to 2010 data from the Medical Expenditure Panel Survey, total health care costs in 2010 for 19-25 year olds were approximately $48.8 billion. The total number of workers age 26 and older from the March 2011 CPS (reflecting labor market activity in 2010) is 132.9 million. Assuming no change in health care utilization, if the total costs of 19-25 year olds were distributed evenly across all workers, the average wage offset would be $367.49 per year. These wage offsets could increase if the denominator shrank, for instance because total health care

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costs were spread among a subset of workers, or they could decrease if the numerator shrank due to crowd-out of less than 100 percent.

We refer to the denominator as the degree of pooling, as higher values of the denominator indicate a greater population over which costs are spread. Similarly, the numerator indicates the degree of crowd-out as it reflects the proportion of young adults who would shift onto their parents' health insurance. In performing this analysis, we assume that average health care costs for those covered as a result of the mandate are equal to the average costs for the 19-25 age group, regardless of the degree of crowd-out. In other words, there is no selection into coverage based on health status. If those who move onto their parents' health insurance are more or less healthy than average, these numbers would be adjusted accordingly.

In Figure 1, we show simulated annual wage offsets for different levels of pooling and crowd-out. The *x*-axis denotes the proportion of workers who bear the additional cost of providing health insurance to those newly covered as a result of the mandate.[2] At one extreme, if all workers bear the additional costs, the expected wage offset is lower because the additional costs are borne by a larger number of people. At the other extreme, if only targeted groups bear the costs, the wage offset would be much higher. The *y*-axis denotes the proportion of 19-25 year olds who gain coverage as a result of the dependent care mandate. If a large proportion of 19-25 year olds drop their existing coverage and move to their parents' insurance, the mandate would result in a higher wage offset, while the wage offset would be lower if very few 19-25 year olds were newly covered by their parents' insurance.

The amount of crowd-out determines the total amount of health care costs that are shifted to workers age 26 and older as a result of the mandate. Estimates from the literature suggest that

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[2] We limit our sample of workers to those age 26 and older in order to remove those who may themselves benefit from the mandate.

approximately 9 percent of 19-25 year olds gained insurance as a result of the mandate (Antwi et al. 2013). If all previously uninsured 19-25 year olds with parents who have employer-sponsored health insurance suddenly gained insurance, approximately 6 percent of 19-25 year old health insurance costs would shift. If 19-25 year olds with parents who have employer-sponsored health insurance switched to their parents' insurance regardless of their prior insurance status, an even higher percentage (33 percent) of costs would be shifted to parents' insurance policies. This last scenario is possible if the dependent mandate crowds out a large degree of insurance coverage from other sources (e.g., the dependent's own health insurance, Medicaid, etc.).

With regards to the amount of pooling, it may be reasonable to expect that less than 100 percent of workers age 26 and older bear the additional health insurance costs. Since workers without employer-sponsored health insurance cannot put dependents on their insurance, it is quite plausible that only workers with health insurance from their employer would bear the cost (70 percent of workers). A potentially-identifiable group that stands to benefit most from the mandate is parents of 19-25 year old children with employer-sponsored insurance (8 percent of workers). Given that parents of younger children may benefit from the mandate in the future, it is possible that employers offset wages of workers who are parents of children up to age 25 (34 percent).

The analysis shows that a wide range of wage offsets are possible. The annual wage offset would be approximately $34 per year if additional health insurance costs of only those who gained coverage as a result of the mandate (9 percent) shifted to all workers. On the other hand, if crowd-out is high (33 percent) and the effects are spread across only parents with health

insurance whose children are aged 19-25 (8 percent), wage offsets could be as much as $1,556 per year.

Note that for several given wage offsets, there are multiple combinations of the numerator and denominator that could generate that particular wage offset. In our empirical analysis, we investigate both the level of wage offset and the degree of pooling to pin down the level of crowd-out implied by our analysis.

IV.   Data and Empirical Strategy

The Survey of Income and Program Participation (SIPP) is a longitudinal survey spanning approximately four years which collects data on the distribution of income and participation in government assistance programs among other topics. It surveys a nationally representative sample of the population and collects monthly household and individual specific information by splitting the population into four rotations, each of which is interviewed every four months. During the interview, people are asked questions regarding their income, health insurance status and welfare program participation during the previous four months. In our analysis, we used the 2008 SIPP Panel which began in 2008.[3]

We first classify states by whether they had a dependent care mandate in place prior to the federal mandate, and if so, the date the mandate took effect. After reviewing several sources of information regarding the date the mandate took effect, we rely on a combination of Cantor et al. (2012a) and a review of primary sources cited in order to designate each person-month observation as being subject to a state mandate that provides dependent coverage to adult children over age 19. The list of states we code as having a state mandate and its assumed date of implementation is provided in Table 1. There are five states that we believe have a state

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[3] Interviewees in August 2008 provided responses for May 2008 to August 2008. In order to minimize recall bias we only use data from the most recent reference month.

mandate, but have incomplete information as to their effective dates from some sources. In these cases, we choose an effective date based on the information available. However, we also show that our results are robust to omitting these states from the analysis.

Our data are organized at the person-month level and contains information from August 2008 through March 2013. This represents 19 months of pre-ACA enactment and 37 months of post-enactment data. The SIPP offers several advantages to other nationally representative samples such as the Current Population Survey (CPS). First, it provides monthly and point-in-time wage and employment information, which is essential since the passage of the federal mandate occurred in the first third of 2010. Second, it provides indicators for the size of the employee's firm that serve as a proxy to determine those workers who would not be subject to ERISA laws and thus to refine our identification strategy. Third, it provides more detailed job and industry classification codes than the CPS, allowing us to control for job/industry specific variation when examining the impacts on earnings. Finally, the SIPP data also allows for the partial identification of the parents and the newly eligible children, using the Core wave files in combination with Topical Module files.

The period from March to December 2010 when the dependent care mandate was being rolled out was characterized by several large changes in the health insurance market as various legislative measures of the ACA went into effect. Apart from the extended dependent coverage mandate, the ACA contains a provision that firms cannot deny coverage to children based on pre-existing conditions. Hence, to study the wage and labor market impacts of the dependent coverage, we must isolate the effects of mandate from other changes that might result from concurrent changes underway during this period. To this end, we use a difference-in-difference approach, using as a control group those states with prior dependent coverage mandates already

in place. The control group will allow us to difference out unobserved time-varying factors that are unrelated to the passage of ACA mandate. Inherent in this strategy is the assumption that 'mandate' states and 'no mandate' states trend similarly in terms of wages and labor market outcomes. We formally test this assumption in Section VI.

Our difference-in-difference model is as follows:

$$y_{ist} = \alpha + \beta Post_{it} + \gamma NoMandate_{st} + \delta Post_{it} \times NoMandate_{st} + \pi X_{ist} + \varepsilon_{ist} \qquad (1)$$

where y_{ist} is our outcome variable (e.g., monthly earnings) for individual i residing in state s at time t, $Post_{it}$ is a binary variable equal to 1 if the individual is observed in March 2010 or later and 0 otherwise, $NoMandate_{st}$ is a binary variable equal to 1 if the state has no mandated dependent coverage law in place in state s at time t, and X_{ist} is a vector of controls that includes binary variables for married, female, race, ethnicity, a full set of age dummies, job and industry fixed effects, month and year fixed effects, and state-specific linear time trends.

Due to ERISA, state mandates do not apply to age-eligible dependents of workers at self-insured firms. While we do not observe whether a worker is employed at a firm that self-insures, we observe firm size and use this as a proxy. Specifically, we look separately at those in mandate states who work for companies with fewer than and more than one hundred employees. Since ERISA applies only to self-insured firms, and companies with fewer than one hundred employees are much less likely to self-insure, our prediction is that the ACA dependent care mandate will have a larger effect on workers at smaller firms in non-mandate states relative to mandate states. In other words, workers at small firms in mandate states provide a cleaner counterfactual for workers at small firms in non-mandate states, since the mandates were not applicable to a significant portion of workers at large firms in mandate states.

After identifying the effect of the ACA dependent care mandate on earnings, we analyze whether earnings reductions are concentrated among groups that are more likely to gain from the mandate. Specifically, we run the analysis separately for parents and non-parents, and for those working at firms that offer employer-sponsored health insurance and those that do not. This allows us to understand the degree to which employers are distributing the additional costs of covering dependent young adults across all workers or specific subsets.

Our sample is restricted to those greater than or equal to 26 years of age to exclude people who would themselves be able to qualify for dependent coverage. For our primary analysis where we study the impacts of the federal mandate on earnings, we restrict our sample to those who are currently employed. Earnings are inflation-adjusted using the monthly CPI-U indices and March 2013 as the base month. Our main sample consists of 404,982 person-month observations. We also study the impacts on hours worked, and the likelihood of being employed at all or full time using an expanded sample of 693,863 person-month observations that includes those not currently employed.

Summary statistics of our demographic control variables and outcome measures are shown for both the main sample and the expanded sample in Table 2. Approximately 64 percent of the main sample is married, and 50 percent is female. The average age is 45 and approximately 71 percent is white. Average monthly earnings is approximately $4,100 conditional on working, and $2,170 for the expanded sample, approximately half of which is not currently employed. While the majority of the main sample is a parent, a much smaller percentage is identified as having a child in the age ranges that make them eligible for the dependent care mandate. Approximately 61 percent of those currently employed work at firms that offer health insurance, and 52 percent work at firms with 100+ employees.

V. Results

A. *Estimating the effect of the federal dependent care mandate on earnings*

We display the results of estimating Equation (1) on earnings in Table 3. Column (1) reports the results using all individuals currently employed and age 26 or older, while Columns (2) and (3) split the sample by the size of the firm at which the employee works. All three columns include controls for marital status, gender, age, race, ethnicity, year and month fixed effects, job and industry fixed effects and state-specific time trends.

The results in Column (1) indicate that earnings for individuals in states without a prior dependent care mandate decreased by $103 per month after the ACA dependent care mandate was signed into law in March 2010. This effect is weakly statistically significant at the 10 percent level. For employees at firms with fewer than 100 employees, the effect is larger in magnitude and statistically significant at the 5 percent level (Column (2)). In particular, the results indicate that employees at these firms saw a $134 reduction in monthly earnings as a result of the ACA dependent care mandate. By contrast, workers at larger firms saw no statistically significant difference in earnings following the ACA in mandate states relative to states without a mandate (Column (3)). The results suggest that workers at small firms saw a more pronounced reduction in earnings as a result of the federal mandate in states without a prior mandate relative to states with a prior mandate. This pattern of results is what we would expect to see given that state mandates did not apply to self-insured firms due to ERISA, and larger firms are more likely to be self-insured. As a result, looking at differences between states with and without mandates around the passage of ACA is uninformative for larger employers because we would assume both groups to be affected by the federal mandate, which applied to all firms.

Relative to the mean earnings level in states without a dependent care mandate prior to the ACA, the effects in Column (2) are economically large, representing a drop in earnings of 3.5 percent. Comparing to our benchmark analysis in Section III, this drop could represent an increase in coverage of approximately 99 percent of young adults aged 19 to 25 borne across 31 percent of workers or an increase in coverage of approximately 16 percent of young adults borne across 5 percent of workers. Our results suggest that the increased costs are borne differentially by workers with health insurance, but not differentially by those who are parents. These findings, together with the level of wage offset we estimate, suggest that employers may have reduced wages assuming either a larger percentage of 19-25 year olds would be on their parents' insurance policies or that those who would switch are sicker than average.

B. *The effect of the federal dependent care mandate on other employment outcomes*

We next examine the effect of the dependent care mandate on outcomes such as wages, hours, and binary indicators of full-time employment and any current employment. The results use the same estimating equation and simply replace the outcome variable for wages and hours, and we run an analogous logit specification for the binary outcomes and report odds ratios.

Table 4 reports the results. None of our estimated coefficients of the interaction term are statistically significant, showing no evidence that the dependent care mandate affected either intensive or extensive measures of labor supply. Together with the results from Table 3, the findings suggest that the costs imposed on workers due to the mandate were not high enough to lead to a drop in labor supply.

C. *Effects of the federal dependent care mandate across subsamples*

We next assess the extent to which earnings reductions were concentrated among select groups among the population who are likely to benefit from the dependent care mandate. We

limit our sample to employees at small firms, and divide the sample by health insurance status, an indicator of whether the individual is a parent, and an indicator of whether the individual is a parent of an eligible child age 19-25.[4] The results of estimating Equation (1) on monthly earnings for these different groups are shown in Table 5.

Given that the dependent care mandate applies to parents in firms that offer health insurance, it is not surprising that the effect is concentrated among workers with employer-sponsored health insurance, as shown in Column (2). However, when examining either parents with a co-resident child (Column (4)) or parents with children aged 19-25 (Column (6)), we do not find evidence that earnings declined as a result of the federal dependent care mandate. By contrast, the effects are large in magnitude and statistically significant among non-parents. One reason behind this finding could be that parents are taking the hit by paying higher contributions towards their health plans, and that the wage reduction among non-parents reflects the option value of having this benefit at some point in the future. At the very least, these results suggest pooling of premiums between parents and non-parents at firms that offer health insurance.

VI.   Robustness and Sensitivity Testing

A. *Eliminating states with uncertain state mandate implementation dates*

As mentioned previously, a small set of states had dependent care mandates in place but we were unable to verify their implementation dates from more than one source. We therefore repeat the analysis omitting these five states (Georgia, Nevada, Pennsylvania, South Carolina and Wyoming) and report the results in Table 6. Dropping these five states results in a reduction

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[4] The identification of whether the individual has an eligible child is done through the topical modules, and may understate the number of parents of eligible children due to lack of information on the ages of dependent children not living in the household.

in sample size of approximately 24,000 person month observations; however, the main pattern of results is very similar to those reported in Table 3. In particular, while the coefficient on the interaction term is negative for all employees, it is larger in magnitude and statistically significant when focusing on the sample of individuals who work at firms with fewer than 100 employees.

B. *Pairwise state results*

Our analysis thus far pools all mandate and non-mandate states together and examines how wages among employees in these states differ before and after the ACA dependent care mandate took place. We also run regressions where we pair each mandate state with each non-mandate state and examine the coefficients on the interaction term in Equation (1). While we clearly lose a lot of power in each individual regression, the distribution of results provide a way to determine whether a few mandate or non-mandate states are driving the results or whether the effects are stable across different state pairings.

A histogram of the coefficients from this analysis is shown in Figure 2. Out of 336 regressions, 99 yield coefficients that are between -$200 and 0. Some combinations have negative and positive coefficients that are large in magnitude, but a significant portion of the distribution of coefficients is within the range that we estimate for the whole sample.

C. *Placebo tests*

We conduct a series of placebo tests using data prior to March 2010. We use each month between September 2008 and February 2010 as placebo ACA implementation dates to determine whether there were any differences between mandate and non-mandate states prior to the actual date of implementation, using our main specification as described by Equation (1). We repeat

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this analysis for both the sample of all employees as well as all employees working at firms with less than 100 employees.

The results of our placebo analysis are shown in Table 7. None of the coefficients for either sample are statistically significant across all of the possible placebo implementation dates. The lack of significant coefficients for alternative placebo implementation dates among both those currently employed and those currently employed at small firms provides more evidence that the effects we report in Table 3 are due to the implementation of the ACA dependent care mandate rather than differential trends among states with and without dependent care mandates.

D. *Common trends assumption*

Our main identifying assumption is that there are no differential trends between mandate and no mandate states in wages aside from those occurring as a result of the ACA dependent care mandate. We formally test for equality of trends by regressing monthly earnings on a set of time trend variables, interactions between these time trends and a "No Mandate" dummy, and the same control variables as our main model using data prior to the implementation of the ACA dependent care mandate. In Table 8, we report the *p*-values from tests of whether the interaction terms are jointly significantly different from zero where time trends are represented by linear, quadratic, cubic or quartic specifications, and also a specification where time trends are non-parametrically estimated using year dummies. These *p*-values are reported for both the main sample as well as the sample containing those in firms with less than 100 employees.

In all of the specifications, we fail to reject the null hypothesis that time trends before the ACA were the same mandate vs. no mandate states. We conclude that, conditional on control variables included in the model, there are no statistically detectable differences in trends across our treatment and control groups in earnings levels that would be driving our results.

VII.   Conclusion

We examine the incidence of mandated health insurance by exploring the extent of wage offset from a provision in the Affordable Care Act that requires employer-provided health insurance to cover dependent children through age 25. Our analysis exploits the fact that prior to the implementation of the ACA, certain states had pre-existing mandates in place that mainly applied to workers in small firms. We find evidence that employees who were most affected by the mandate, namely employees at large firms, saw wage reductions of approximately $1,200 per year. These reductions appear to be concentrated among workers whose employers offer employer-sponsored health insurance; however, they do not seem to be only borne by parents of eligible children or parents more generally. We perform several placebo tests and find no evidence that trends in wages differed across mandate and no-mandate states prior to the implementation of the ACA.

The amount of the wage offset appears to be high in light of our simulations of wage offsets that would be expected given the shift in insurance coverage expected from the mandate and the share of workers who bear the additional cost. In particular, in comparing our $1,200 estimate against Figure 1 from our simulation, we find that our econometric estimate is consistent with the light-blue isoquant, which ranges from 30% crowd out (with no pooling) to 100% crowd out (with ~30% pooling). Since some of our estimates suggest at least some pooling between parents and non-parents at firms that provide health insurance, our estimates imply at least moderate crowd-out (i.e., the mandate led a substantial number of children between 19 and 25 to switch from other sources of insurance to their parents' insurance). It is also possible that employers over-charged their employees for the extension of coverage, at least in the year after

passage of the ACA, or that the set of children who shifted over to their parents' plan are more expensive to insure than the average 19-25 year old.

Despite the incidence of the dependent care mandate on workers at small firms, we do not find any evidence that suggests workers reduced their labor supply in response to the lowered wages, perhaps because the mandate arrived in the poor labor market of 2010-2011, or because workers valued the extended health insurance coverage for their children (or their co-workers' children). The dependent care mandate remains the most popular provision of the ACA, so perhaps it is not surprising that workers might be willing to pay for it, though perhaps they are not aware of the size of the bill (Hamel, Firth, and Brodie 2014).

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Figure 1

Contour Plot of Expected Effects on Annual Earnings
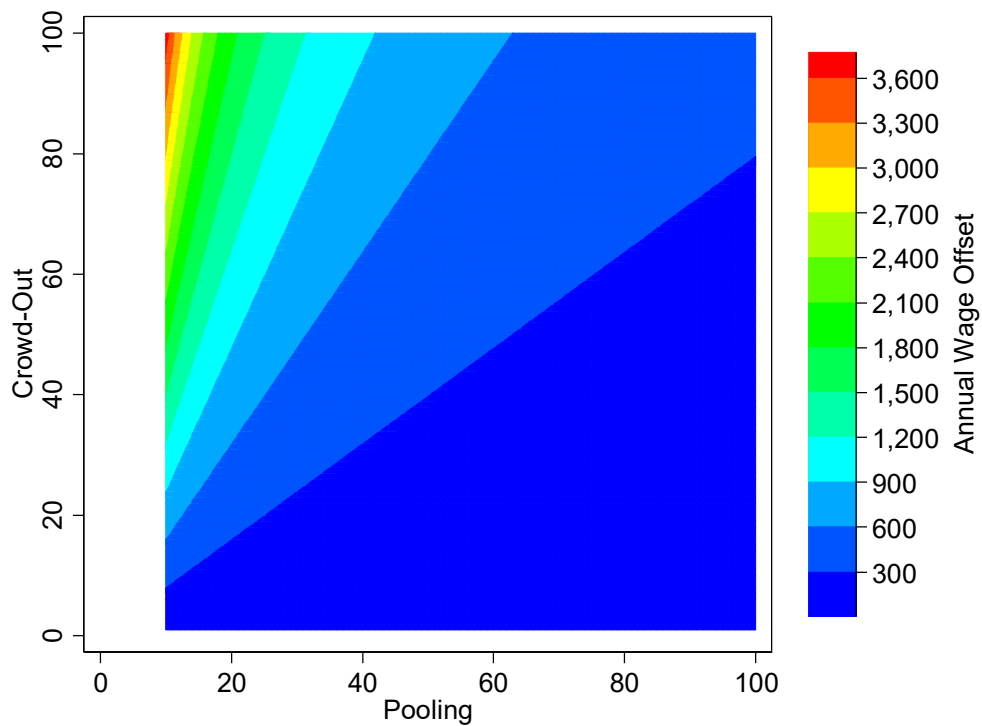
Note: 100 on *y*-axis represents total health care costs of 19-25 year olds in 2010 from MEPS ($48,873,381,193). 100 on *x*-axis represents total number of workers age 26 and over in 2010 from CPS (129,557,590).

Figure 2

Frequency of Coefficients on Post X No Mandate State from State Pairwise Regressions
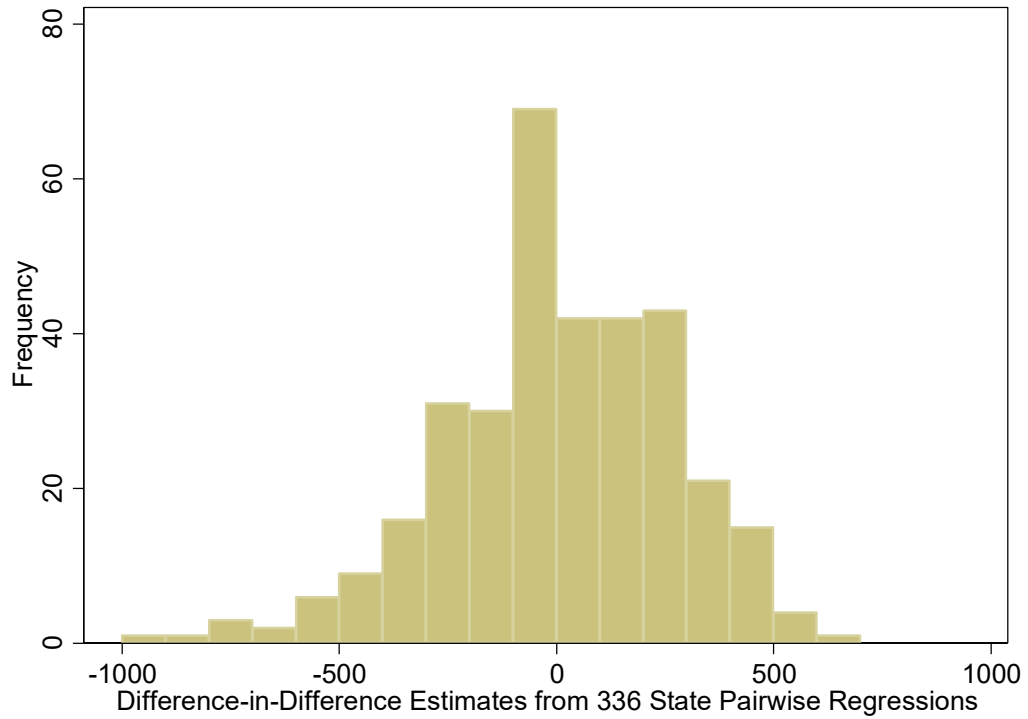
Note: Histogram shows frequency of coefficients on Post X No Mandate State interaction term from 336 pairwise regressions of states with and without mandates. Height of bar indicates frequency of coefficients.

Table 1

States with Dependent Coverage Mandates Prior to ACA and Assumed Effective Date

State	Assumed Effective Date	State	Assumed Effective Date
Colorado	1/1/2006	New Hampshire	9/15/2007
Connecticut	1/1/2009	New Jersey	1/1/2006
Delaware	6/1/2007	New Mexico	7/1/2003
Florida	7/1/2007	New York	9/1/2009
Georgia*	1/1/2006	North Dakota	7/1/1995
Idaho	7/1/2007	Ohio	7/1/2010
Illinois	6/1/2009	Oregon	1/1/2009
Indiana	7/1/2007	Pennsylvania *	9/1/2009
Iowa	7/1/2008	Rhode Island	1/1/2007
Kentucky	7/15/2008	South Carolina*	1/1/2008
Louisiana	1/1/2009	South Dakota	1/1/2005
Maine	9/20/2007	Tennessee	1/1/2008
Maryland	1/1/2008	Texas	1/1/2004
Massachusetts	1/1/2007	Utah	1/1/1995
Minnesota	1/1/2008	Virginia	7/1/2007
Missouri	1/1/2008	Washington	1/1/2009
Montana	1/1/2008	West Virginia	7/1/2007
Nevada*	1/1/2006	Wisconsin	1/2/2010
		Wyoming*	1/1/2009

Notes: Sources include Collins et al. (2011), Cantor et al. (2012a), Levine et al. (2011), NCLS (2010), Dillender (2014). States with asterisks have uncertain implementation dates and are dropped in robustness checks.

Table 2

Summary Statistics

Variable	Main Sample		Expanded Sample	
	Mean	Std Dev	Mean	Std Dev
Married	0.638	0.481	0.606	0.489
Female	0.499	0.500	0.551	0.497
Age	45.36	11.68	52.33	16.12
Hispanic	0.111	0.315	0.104	0.306
White	0.707	0.455	0.711	0.453
Asian	0.0458	0.209	0.0412	0.199
Other Race	0.0272	0.163	0.0285	0.166
No Mandate	0.301	0.459	0.309	0.462
Earnings (monthly)	4,131	4,089	2,170	3,600
Hours	40.60	12.17	22.06	22.12
Full-Time	0.735	0.441	0.391	0.488
Currently Employed	1	0	0.517	0.500
Parent	0.603	0.489	0.499	0.500
Parent of Eligible Child	0.181	0.385	0.140	0.347
Firm offers ESHI	0.614	0.487	0.397	0.489
100+ Employees	0.520	0.500	0.284	0.451

Notes: Main sample includes 404,982 person-month observations where the individual is currently employed. Expanded sample includes those not currently employed and represents 693,863 person-month observations. Hours outcome reported conditional on being employed. Both samples are restricted to individuals age 26 or older.

Table 3

Effect of ACA Dependent Care Mandate on Monthly Earnings

Variables	(1) All	(2) <100 Employees	(3) 100+ Employees
Post	92.76***	34.77	143.7***
	(33.58)	(42.43)	(44.15)
No State Mandate	-0.989	-4.228	-3.105
	(141.70)	(147.80)	(146.80)
Post X No State Mandate	-103.5*	-133.9**	-58.13
	(58.86)	(56.53)	(80.95)
Observations	404,982	194,391	210,591
R-squared	0.34	0.322	0.368
Mean pre-March 2010 Mandate States	4,224	3,756	4,657
Mean pre-March 2010 Non-Mandate States	4,249	3,827	4,622
Mean post-March 2010 Mandate States	4,062	3,612	4,517
Mean post-March 2010 Non-Mandate States	4,127	3,671	4,541

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Notes: Dependent variable is inflation-adjusted monthly earnings. Column (1) includes all individuals currently employed aged 26 or older. Column (2) restricts to individuals from Column (1) employed at firms with less than 100 employees, and Column (3) restricts to individuals from Column (1) with 100 or more employees. All specifications include controls for marital status, gender, age, race, ethnicity, year and month fixed effects, job and industry fixed effects, and state-specific time trends.

Table 4

Effect of ACA Dependent Care Mandate on Wages, Hours, and Employment

Variables	(1) Wages	(2) Hours	(3) Full-Time Employment	(4) Currently Employed
Post	1.857**	0.0639	1.010	0.998
	(0.778)	(0.0513)	(0.0155)	(0.0122)
No State Mandate	0.922	-0.233*	0.899**	0.939
	(2.038)	(0.125)	(0.0447)	(0.0476)
Post X No State Mandate	-1.525	-0.0366	1.015	1.014
	(1.423)	(0.0666)	(0.0234)	(0.0199)
Observations	693,863	693,863	693,863	693,863
R-squared	0.159	0.840		
Mean pre-March 2010 Mandate States	58.59	23.31	0.40	0.54
Mean pre-March 2010 Non-Mandate States	59.68	23.99	0.42	0.56
Mean post-March 2010 Mandate States	55.1	22.13	0.40	0.52
Mean post-March 2010 Non-Mandate States	57.57	23.09	0.42	0.54

Notes: Dependent variable is as indicated in table. All columns include all individuals aged 26 or older. Columns (1) and (2) report the results from OLS regressions and Columns (3) and (4) report odds ratios from logit regressions. All specifications include controls for marital status, gender, age, race, ethnicity, year and month fixed effects, and state-specific time trends. Columns (1) and (2) also include job and industry fixed effects.

Table 5

Effect of ACA Dependent Care Mandate on Parent and ESHI SubSamples

Variables	(1) No ESHI	(2) ESHI	(3) Non-parents	(4) Parents	(5) Non-parents of eligible child	(6) Parents of eligible child
Post	31.57	55.01	66.35	14.32	26.48	117.2
	(49.84)	(51.61)	(70.77)	(51.58)	(43.33)	(79.56)
No State Mandate	-54.65	1.896	26.92	-34.29	-6.235	-19.06
	(92.59)	(187.6)	(141.3)	(154.8)	(137.7)	(193.1)
Post X No State Mandate	-77.59	-162.9**	-211.8*	-74.82	-179.3**	-15.77
	(69.35)	(67.97)	(109.8)	(55.90)	(74.70)	(156.7)
Observations	89,054	105,337	77,518	116,873	158,923	35,468
R-squared	0.276	0.309	0.305	0.361	0.313	0.430
Mean pre-March 2010 Mandate States	2596.79	4692.62	3791.22	3731.06	3723.05	3908.47
Mean pre-March 2010 Non-Mandate States	2687.61	4788.03	3776.12	3863.24	3779.53	4050.73
Mean post-March 2010 Mandate States	2517.39	4569.22	3706.52	3549.81	3578.7	3763.4
Mean post-March 2010 Non-Mandate States	2597.09	4579.11	3700.06	3650.34	3647.98	3783.73

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: Dependent variable is inflation-adjusted monthly earnings. All columns includes individuals currently employed at firms with less than 100 employees aged 26 or older. Columns (1) and (2) split the sample based on whether individual currently employed at firms that offer health insurance. Columns (3) and (4) split the sample based on whether individual has own child living in their residence. Columns (5) and (6) split the sample based on whether individual has an eligible child between the ages of 19 and 25. All specifications include controls for marital status, gender, age, race, ethnicity, year and month fixed effects, job and industry fixed effects, and state-specific time trends.

Table 6

Effect of ACA Dependent Care Mandate on Earnings
(Dropped States Sample)

Variables	(1) All	(2) <100 Employees	(3) 100+ Employees
Post	95.38**	47.42	136.8***
	(37.03)	(43.42)	(48.14)
No State Mandate	-12.74	-25.46	-11.51
	(146.50)	(151.90)	(152.60)
Post X No State Mandate	-106.7	-139.1**	-58.51
	(63.78)	(61.27)	(83.26)
Observations	380,283	182,467	197,816
R-squared	0.34	0.322	0.369
Mean pre-March 2010 Mandate States	4,224	3,756	4,657
Mean pre-March 2010 Non-Mandate States	4,249	3,827	4,622
Mean post-March 2010 Mandate States	4,062	3,612	4,517
Mean post-March 2010 Non-Mandate States	4,127	3,671	4,541

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Notes: Dependent variable is inflation-adjusted monthly earnings. All columns drop individuals living in Georgia, Nevada, Pennsylvania, South Carolina, and Wyoming where state mandate implementation dates are less certain. Column (1) includes all individuals currently employed aged 26 or older. Column (2) restricts to individuals from Column (1) employed at firms with less than 100 employees, and Column (3) restricts to individuals from Column (1) with 100 or more employees. All specifications include controls for marital status, gender, age, race, ethnicity, year and month fixed effects, job and industry fixed effects, and state-specific time trends.

Table 7

Effect of Placebo ACA Dependent Care Mandate on Earnings

Sample	(1) Sep-08	(2) Oct-08	(3) Nov-08	(4) Sep-08	(5) Oct-08	(6) Nov-08
All currently employed	36.32	-13.16	-27.27	18.21	33.47	-6.073
	(75.79)	(54.05)	(52.58)	(64.00)	(80.21)	(76.20)
All currently employed at firms with <100 emp	155	-11.89	-36.04	-8.171	74.06	-41.42
	(103.30)	(83.21)	(70.65)	(68.42)	(86.93)	(89.80)
	(7) Dec-08	(8) Jan-09	(9) Feb-09	(10) Mar-09	(11) Apr-09	(12) May-09
All currently employed	-20.45	-10.39	67.95	83.38	91.23	75.01
	(89.37)	(114.00)	(111.10)	(117.10)	(141.30)	(158.40)
All currently employed at firms with <100 emp	-97.17	-105.6	-21.44	-0.754	-31	-20.65
	(109.90)	(114.30)	(111.70)	(131.40)	(160.00)	(150.70)
	(13) Jun-09	(14) Jul-09	(15) Aug-09	(16) Sep-09	(17) Oct-09	(18) Nov-09
All currently employed	74.42	6.728	4.044	-36.03	-21.68	-92.66
	(159.80)	(134.10)	(131.90)	(158.10)	(124.40)	(125.50)
All currently employed at firms with <100 emp	2.039	-47.1	-61.36	-94.46	-68.37	-55.04
	(175.50)	(160.20)	(127.10)	(101.40)	(88.34)	(120.80)

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: Dependent variable is inflation-adjusted monthly earnings. Sample includes either all currently employed individuals prior to March 2010 (156,002 observations) or all currently employed individuals working at firms with < 100 employees prior to March 2010 (73,888 observations) as indicated. Column heading represents placebo ACA implementation date. All specifications include controls for marital status, gender, age, race, ethnicity, year and month fixed effects, job and industry fixed effects, and state-specific time trends.

Table 8

Test for Common Trends in Mandate vs. No Mandate States

Sample	(1) Linear	(2) Quadratic	(3) Cubic	(4) Quartic	(5) Year Dummies
All currently employed	0.8038	0.9749	0.5154	0.1431	0.7403
All currently employed at firms with <100 emp	0.8118	0.8351	0.9331	0.4020	0.3335

Notes: Dependent variable is inflation-adjusted monthly earnings. Reported p-value represents p-value that emerges from testing whether trends differ in states with and without mandates. Sample includes either all currently employed individuals prior to March 2010 (156,002 observations) or all currently employed individuals working at firms with < 100 employees prior to March 2010 (73,888 observations) as indicated. Column heading represents representation of time trend. All specifications include controls for marital status, gender, age, race, ethnicity, job and industry fixed effects, and state-specific time trends.