How do Firms Design Their Health Insurance Benefits Packages? Evidence from Interstate Spillover Effects of the Affordable Care Act Medicaid Expansions

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Abstract

Businesses operating establishments across multiple states face a trade-off between offering standardized pay and benefits packages and tailoring their pay and benefits to the economic and policy circumstances of each state. To better understand how businesses navigate this trade-off, I study how large firms adjusted their benefits in response to the Affordable Care Act Medicaid expansions by comparing changes in health insurance offer rates and related outcomes before and after the Medicaid expansions between businesses varying in their degree of company-wide exposure to the Medicaid expansions. Using this approach, I find evidence that more heavily exposed businesses responded to the expansions by reducing their health insurance offer rate in a national, company-wide fashion, apparently favoring standardization of benefits over tailoring. In turn, companies' standardized responses to the Medicaid expansions caused the expansions to have interstate spillover effects, reducing the availability of employer-sponsored health insurance in non-expansion states and making such treatment effects difficult to detect using a traditional state difference-in-differences research design. Beyond effects on the health insurance offer rate, I also find that more exposed businesses responded to the expansions by exhibiting reduced health insurance costs, increased employee turnover rates, and increased employment of part-time workers, with these responses also occurring largely in a standardized fashion. Overall, my results offer evidence that large firms standardize the design of their health insurance benefits packages and highlight that in settings where standardizing behavior by firms is likely prevalent, researchers and policy makers both may wish to consider the degree to which policies under consideration are likely to trigger responses by large firms and to generate inter-jurisdictional spillover effects.

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1 Introduction

Large multi-state firms, when designing their employee health insurance benefits packages, must navigate a considerable amount of heterogeneity across states in healthcare policies and health insurance market conditions. On the one hand, such firms are incentivized to tailor their health insurance benefits to local conditions. Otherwise identical health insurance plans can vary significantly in terms of both cost of provision and value to workers across states, due to various factors.[1] Failing to account for this heterogeneity when calibrating their benefits packages could cause firms to lose workers to competitors and miss out on the opportunity to profitably exchange wages for benefits within their compensation packages (Gruber, 2000; Buchmueller et al., 2013). On the other hand, firms might prefer to offer a standardized, company-wide set of benefits if benefit tailoring is expensive and difficult, if offering standardized benefits allows them to achieve certain economies of scale, or if intra-firm egalitarian norms otherwise constrain firms from varying health benefits across otherwise similar types of workers. These competing incentives raise the question of whether in practice large firms lean toward tailoring or toward standardizing their benefits packages. This question is of considerable importance to our understanding of how labor markets function, as health insurance is a significant component of worker compensation and large national firms play a substantial and increasingly important role in U.S. and global labor markets (Autor et al., 2020; Kwon et al., 2024; Ma et al., 2024). Moreover, whether firms engage in standardizing behavior is of significant methodological importance to researchers studying outcomes substantially determined by businesses using state difference-in-differences research designs and other methods that exploit geographic variation in policy adoption for identification. This is because standardization can cause large firms to respond on a national, company-wide basis to policy changes occurring in just some jurisdictions, generating spillover effects that violate the Stable Unit Treatment Value Assumption (SUTVA) of most research designs and threatening the internal validity of their estimated treatment effects.

To help shed light on this issue, I study how large multi-location firms adjusted their health insurance benefits in response to the Affordable Care Act (ACA) Medicaid expansions. In ACA Medicaid expansion states, access to Medicaid increased for lower income workers, reducing the value of employer-sponsored health insurance by comparison and thereby generating incentives for firms to shift workers from employer-sponsored health insurance to Medicaid (Cutler and Gruber, 1996; Gruber and Simon, 2008; Buchmueller et al., 2013). If firms tailor their benefits on a state-by-state basis, one should expect to see Medicaid crowd out employer-sponsored health insurance at their locations (i.e., establishments) in ACA expansion states, but not elsewhere. If firms instead standardize their benefits, firms with significant operations in ACA states might respond by offering health insurance to fewer workers at all of their establishments, even outside of expansion states.

[1] For example: differences in healthcare costs (Cooper et al., 2019, 2022), benefit coverage mandates (Robinson, 2025), regulations affecting the price of healthcare services (Cooper et al., 2020; Murray and Gudiksen, 2024; Kleiner et al., 2016; Dillender et al., 2022), the value of the health insurance tax deduction (Robinson and Tazhitdinova, 2025; Gruber and Lettau, 2004), and various policies that affect the value of workers' next best alternative to employer-sponsored health insurance (Fox et al., 2020).

Under tailoring, what matters is an establishment's location; under standardization, what matters is the overall situation at the firm of which a given establishment is a part.

In this study, I present results from several related research designs. The first is a traditional state difference-in-differences research design, comparing changes in outcomes between establishments located in ACA expansion states versus those in non-expansion states. This research design should be able to capture treatment effects under benefit tailoring, but not necessarily under benefit standardization, as standardization would imply treatment effects can occur in non-ACA states. My preferred research design is a continuous treatment difference-in-differences specification that compares changes in outcomes between establishments that are part of firms with greater versus lesser degrees of firm-wide exposure to the ACA Medicaid expansions. While this approach might struggle to capture treatment effects under geographic benefit tailoring, it should capture treatment effects under standardization, as it compares establishments on the basis of the degree to which the Medicaid expansions generate incentives to adjust benefits for the firms of which they are a part (i.e., their parent firms). Beyond this primary research design, I implement a variant of it that allows for the effect of Medicaid expansion exposure to vary between ACA and non-ACA states, allowing me to test whether firms geographically tailor their response to firm-wide Medicaid exposure. I also implement a dichotomized version of the continuous treatment design, where I use a traditional difference-in-differences specification that compares changes in outcomes between establishments in high-exposure firms (exposure levels exceeding 25%; approximately the top fifth of firms by exposure) and those in low-exposure firms. The benefit to this research design is that it yields results more directly methodologically comparable to those from the state difference-in-differences design, while also potentially presenting some opportunity to detect nonlinearities in the effect of Medicaid expansion exposure.

To implement these research designs, I use 2008-2019 data from the Medical Expenditure Panel Survey – Insurance Component with Administrative Records (MEPS-ICAR) on private sector business establishments that are a part of large ($\geq$ 100 employees) multi-establishment firms (Hegland et al., 2022). This is a class of firm that employed, as of 2023, 56.9% of U.S. private sectors workers.[2] The MEPS-ICAR includes business establishment survey data, which details various aspects of the health benefits offered by a given establishment, as well as tax and Decennial Census records, which allow me to characterize both a given establishment's workforce and the entire workforce of their parent firm. I use these latter data to construct my firm-level measure of exposure to the ACA Medicaid expansions, which I define as the percentage share of a firm's workforce that lives in an ACA expansion state and whose household income and size qualifies them for ACA-expanded Medicaid. The MEPS-ICAR also furnishes me with my key outcome variables, the percentage share of workers in each establishment to which insurance is offered (the establishment's offer rate) and the similar such share that enroll in health insurance (the enrollment rate). Other available outcomes include the prevalence of part-time employment within establishments, establishment employment

[2]Per author's calculations using data from 2023 MEPS-IC Table I.B.1 (Agency for Healthcare Research and Quality, 2023).

levels, establishment employee turnover rates, the average age of workers in a given establishment, establishment total payroll, establishment average levels of pay, average insurance premiums, and average insurance deductibles.

I find results that demonstrate a substantial contrast between the location-based state difference-in-differences approach and the firm characteristics-based Medicaid exposure research design. My state difference-in-differences specification finds a small null effect, -0.53 percentage points (p.p.; SE=1.1 p.p.), of the ACA Medicaid expansions on the health insurance offer rate and on nearly all other outcomes that predominantly reflect firms' decisions. In contrast, my exposure-based research designs tend to find substantial, statistically significant effects. The result most directly comparable to the state difference-in-differences research design is from my dichotomized exposure-based difference-in-differences model, which finds that establishments in high-exposure firms exhibited a statistically significant 9.3 p.p. (SE=3.0 p.p.) reduction in the health insurance offer rate relative to establishments in lower exposure firms. More generally, my continuous treatment design finds that the average marginal effect (AME) of an additional percentage point of exposure to Medicaid expansion is a statistically significant 0.17 p.p. (SE= 0.05 p.p.) reduction in the insurance offer rate. This translates into an overall average treatment effect (ATE), averaged across the entire population of in-sample firms regardless of degree of exposure, of -2.2 p.p (SE=0.65 p.p.). This result is robust to the inclusion (or exclusion) of a variety of controls and to the use of employment weights. It also survives a placebo randomization test where my results are compared to those obtained when the main analysis is reproduced after treating randomly drawn sets of states as though they were ACA expansion states. Additionally, I find that the AME of an additional unit of exposure on the health insurance offer rate does not vary substantively between establishments located in ACA expansion states (AME=-0.18 p.p.) and non-expansion states (AME=-0.14 p.p.), with the difference between these two effects being statistically insignificant (p=0.78). Notably, this is not true of the enrollment rate, upon which the effect per unit exposure was negative and statistically significant in ACA expansion states (AME=-0.12 p.p.) but positive and statistically insignificant in non-ACA states (AME=0.15 p.p.), with the null hypothesis that these two AMEs are equal being rejected (p=0.01). The difference between the enrollment rate and the offer rate in this regard may be due to the fact that while the offer rate is determined solely by the employer, the enrollment rate is jointly determined by the employer's offer decision and by workers' enrollment decisions, with workers presumably being sensitive to the policy environment in the state where they live.

Beyond these core findings, I also find evidence that more Medicaid exposed establishments appear to respond to the Medicaid expansions by increasing the share of their workers employed on a part-time basis and by exhibiting higher employee turnover rates. These results could be indicative of increased difficulty attracting and retaining full-time employees after reducing benefit availability. They also could be reflective of a strategy for reducing benefit availability while complying with insurance non-discrimination legislation: firms are not required by Employee Retirement Income Security Act (ERISA) to offer part-time workers and workers with job tenures less than one year in-

length the same health insurance benefits as their other workers (U.S. Department of Labor, 2025; U.S. Code of Federal Regulations, 2010).[3] In a related vein, I find evidence that the average age of workers at more exposed establishments falls in response to the Medicaid expansions, consistent with the composition of employed workers shifting towards persons with lesser need for a health insurance offer. Finally, I also show that average levels of annual pay in more exposed establishments tend to fall, that there is a negative-signed but statistically insignificant effect on total payroll, and that employers' health insurance premium contributions fell. Taken together with the effects on enrollment, these findings indicate that employers' total and unit health insurance expenditures fell in response to the Medicaid expansions, with this potentially having occurred as part of a reduction in total labor costs. These findings are less clear with respect to unit labor costs: while there is no evidence that workers received substantial pay increases in compensation for reduced access to employer-sponsored health insurance, it is also difficult to rule out that this occurred, as observed reductions in average annual rates of pay may have been driven by compositional change in the workforce toward increased employment of part-time and low job-tenure workers.

Overall, my results indicate that firms engage in a considerable amount of company-wide geographic standardization of benefits. They also suggest that the ACA Medicaid expansions reduced the availability of employer-sponsored health insurance and employers' insurance costs, at least among large multi-location firms, with negative interstate spillover effects causing the health insurance availability to fall even in states not adopting Medicaid expansion. Notably, this ACA Medicaid expansion effect was veiled in the portion of my analysis relying on a state difference-in-differences research design, as firms' apparent standardizing behavior generated treatment effects in non-ACA states that biased my difference-in-differences estimates toward zero. My results thus highlight that firms engaged in standardizing behavior can pose methodological challenges to researchers seeking to use state difference-in-differences, neighbor-pair, and other similar research designs for evaluating the effect of policy changes occurring in large states or large collections of states. In a related vein, standardizing behavior also raises concerns for researchers employing case studies, synthetic control designs, and other analyses of policies adopted in small collections of states or sub-state areas, as policy changes applying only to a limited jurisdiction might not be sufficient to trigger a response on the part of large, multi-state firms. While one could estimate an internally valid null effect of such policies on various outcomes, its external validity to broader adoption of the same policies would be questionable given that broader adoption might cause large firms to begin responding. In a similar vein, these results also carry implications for policy makers, whose ability to elicit (or avoid) a given reaction from firms may depend not just on the policies adopted in their state or locality, but also on those adopted elsewhere.

My findings relate to a growing literature that examines the prevalence of standardizing behavior by multi-location firms. Evidence indicates that retail chain stores do not tailor prices to the local conditions around each store, but instead adopt standardized firm-wide prices for products

[3]ERISA also permits firms to vary insurance benefits on the basis of geographic location and occupation (U.S. Department of Labor, 2025; U.S. Code of Federal Regulations, 2010).

(DellaVigna and Gentzkow, 2019; Cavallo et al., 2014; Hitsch et al., 2021). This standardizing behavior is driven by a mix of factors including administrative difficulty implementing geographic heterogeneity in prices and normative-related brand image concerns (DellaVigna and Gentzkow, 2019; Hitsch et al., 2021). Hazell et al. (2022) use job board data on jobs with publicly posted wages to provide evidence that large national firms principally set wages on a national basis, rather than in response to local labor market conditions. They further offer evidence that this standardization is driven by a range of factors, including intra-firm pay equity norms, practical administrative difficulty associated with implementing geographic variation in pay, and, in some cases, either the presence of a national labor market for the workers in question or the absence of relevant geographic heterogeneity to motivate deviation from standardization. This broader literature on standardization also relates to a long literature examining the role of various types of intra-firm egalitarian norms in driving firms' pay and benefit setting behavior (Rudanko, 2023; Carpenter et al., 2024; Dube et al., 2019; Bewley, 2002; Card et al., 2012; Breza et al., 2017; Bracha et al., 2015; Lazear and Shaw, 2007), as well as to research on the role of administrative difficulty in influencing firms' pay and benefit setting decisions (Dube et al., 2018; Cullen et al., 2022).

This study's chief contributions to the literature on standardization are as follows. First, to my knowledge, this is the first study to offer evidence on the subject of standardization in the context of employee health insurance benefits. Health benefits are an important and uniquely policy-affected portion of employee compensation, with employer premium contributions representing about 7.7% of average pay (U.S. Bureau of Labor Statistics, 2023). Moreover, health insurance benefits are an area where egalitarian norms and concerns regarding administrative complexity may be particularly potent, making it a valuable test of firms' standardizing behavior. Second, to my knowledge, this is the first study to offer evidence on firms' standardizing behavior in the context of responding to a policy shock, highlighting the importance of addressing firms' standardizing behaviors in the context of policy analysis. Moreover, distinguishing between tailoring and standardization using firms' responses to geographically-varying policy-linked changes in incentives to offer insurance has some virtue relative to strictly observational approaches. Firms commonly vary benefit availability by worker characteristics and commonly employ different types of workers at different locations, depending on if the location is a corporate headquarters, retail sales location, production facility, etc. This can make differentiating between geographically-tailored benefits and benefits that vary by worker characteristics according to a firm-wide standardized rule difficult using observational data, but does not necessarily create difficulty when studying the issue in the context of a policy shock. Finally, this study offers evidence on standardizing behavior in a more general context than in many prior studies, with the sample being nationally representative of all establishments that are a part of large, multi-location private sector firms in the United States, regardless of industry, propensity to post wages on job boards, or other factors.

Beyond the literature on standardizing behavior, my study also contributes to prior research about the effect of the ACA Medicaid expansions on employer-sponsored health insurance-related outcomes. Most prior such research used worker-level data and examined effects on the prevalence

of employer-sponsored health insurance enrollment, often employing state difference-in-differences research designs or other research designs that at least partly rely on geographic variation in policy environment for identification. Most such papers find small, statistically insignificant effects of the Medicaid expansions on the prevalence of employer-sponsored health insurance coverage (Frean et al., 2017; Courtemanche et al., 2019; Duggan et al., 2019; Courtemanche et al., 2017; Frisvold and Jung, 2018; Kaestner et al., 2017; Blavin et al., 2015), though some find larger statistically significant effects (Lennon, 2025), with statistically significant effects being more likely in analyses of employee subgroups likely to be gaining Medicaid eligibility after the expansions. Less research is focused on the question of how businesses themselves responded to the Medicaid expansions. Currently, the most closely related research to my own is that by Abraham et al. (2019), who use establishment-level data from the Medical Expenditure Panel Survey - Insurance Component and a state difference-in-differences research design to find largely statistically insignificant effects on employer-sponsored health insurance-related outcomes. However, they do find a statistically significant reduction in the share of workers offered health insurance at the average business establishment, including small businesses, contrasting with null effects on the offer rate estimated for pre-ACA Medicaid expansions in older work (Shore-Sheppard et al., 2000; Buchmueller et al., 2005). My study's chief contribution to this literature is the finding that the ACA Medicaid expansions had negative interstate spillover effects, intermediated by large multi-state firms adopting company-wide responses to the expansions, that caused reductions in access to employer-sponsored health insurance in non-expansion states and which caused much prior work to underestimate the effect of the ACA Medicaid expansions on employer-sponsored health insurance-related outcomes due to the adverse impact of these spillovers on prior research designs' SUTVAs. I also provide to this literature new evidence that the Medicaid expansions reduced employers' total and unit insurance costs.

The remainder of this paper proceeds as follows. In section 2, I introduce the data and my approach to measuring firm-level exposure to Medicaid expansion and introduce the key outcome and control variables used in this study. In this section, I also present summary statistics characterizing these variables and present a set of binned scatter plots showing how the insurance offer rate varied over time with respect to Medicaid expansion exposure. In section 3, I introduce my research designs and discuss my approach to robustness testing. Finally, in section 4, I present and discuss my results, while in section 5, I conclude.

2 Data and Measurement

My data consists of business establishment-level data drawn from the Medical Expenditure Panel Survey- Insurance Component with Administrative Records (MEPS-ICAR) (Hegland et al., 2022). This dataset consists of annual responses to a nationally representative survey of U.S. private sector business establishments, excluding railroads, linked with Internal Revenue Service tax records and Decennial Census data. The dataset consists of repeated cross-sections of establishments and does not contain a longitudinal component. The tax records include data on job-specific levels of annual

pay, household income, and other characteristics for all workers employed by a given establishment's parent firm as well as for just those workers employed by the establishment responding to the survey. The survey component of the data captures information on responding establishments' health insurance benefits and other characteristics. Information on the health insurance benefits at the level of the parent firm, as opposed to at the establishment level, are not available.

My estimation sample is restricted to MEPS-ICAR data for establishments that are part of large multi-establishment firms from the years 2008-2019, defining large to mean firms with a typical employee count exceeding 100.[4] The sample includes approximately 94,000 establishment-year observations drawn from across 23,000 firms, observed across all 50 states, with approximately 64% of observations being drawn from states that expanded Medicaid through the ACA at some point within the sample period.[5] I restrict the sample to establishments that are part of multi-establishment firms because these are the only ones for which it is possible that their parent firms have exposure to multiple states' insurance and health policy environments. The restriction to establishments that are a part of large firms, meanwhile, is principally to exclude businesses affected by the ACA's establishment of a single risk pool for the small group health insurance market in each state, which might otherwise affect the incentives firms face (Corlette, 2015). This restriction likely also helps suppress measurement error in variables measured in per employee terms.[6] In practice, this additional firm size restriction does not bind very strongly: firms that operate multiple locations also tend to have many employees. Finally, as for the sample's time span, the range from 2008-2019 features six years of data from before and after the initial 2014 ACA Medicaid expansions, and was chosen to capture the maximum extent of data available without including data from two major events affecting data collection: the coronavirus pandemic in 2020 and a substantial survey re-design which caused MEPS-ICAR data to be unavailable in 2007.

My main treatment measure is each establishment's parent firm's level of exposure to the Affordable Care Act Medicaid expansions. I define exposure in any given year as the percentage share of the parent firm's total workforce, as observed in the universe of tax records, that lives in an ACA expansion state and that qualifies for Medicaid on the basis of household income and family size under the post-expansion eligibility rules.[7] In my actual analyses, I use an average exposure measure, where each establishment in any given year is assigned the average exposure level that the establishment's parent firm would have faced over the years 2014-2019, given its contemporaneously observed workforce and states' years of Medicaid expansion (KFF, 2024). This ensures that my

[4]Multi-establishment firm status and employee counts are measured based on a combination of the survey data and administrative records available in the MEPS-ICAR. Typical employee count refers to the number of employees employed by a firm at an average point in time, rather than the total number of persons employed by the firm over the course of a year; this latter figure tends to be larger due to employee turnover.

[5]Sample size counts and related figures are rounded for compliance with Census Bureau disclosure requirements.

[6]The restriction to large firms also ensures that there is no cross-sectional variation in the sample in terms of whether establishments are a part of firms affected by the ACA's employer mandate.

[7]When measuring exposure, I assess Medicaid eligibility based on household income information derived from IRS form 1040 data and determine workers' location based on a blend of administrative data sources. When calculating exposure shares, the MEPS-ICAR's point-in-time weights are used, so as to obtain the firm's exposure level at an average period of time within the year.

treatment exposure measure is reasonably consistent over time and, critically for implementing difference-in-differences and event study style analyses, available as a potential exposure measure in the pre-treatment period. Finally, note that exposure depends only on the characteristics of the parent firm of which an establishment is a part: it is not determined by the characteristics of the establishment, except in as much as the establishment is a part of its parent firm.

When thinking about firms' ability to control their degree of exposure to Medicaid expansion, it is worth noting that exposure likely is difficult for firms to adjust in the short run. Shifting workers across states is difficult to do for firms in non-tradable industries, and even in tradable industries may require costly investments in new facilities and facility expansion that would only achieve a shift over the long run. Raising exposure by reducing worker incomes, meanwhile, also faces challenges related to correctly targeting wage cuts. Medicaid eligibility depends on household income and household size, both of which are margins that firms may struggle to observe and to use, given a mix of legal and competitive constraints, as inputs for targeting wage cuts. Even given targeted wage cuts or reductions in hours, firms cannot control how household labor supply responds to their actions. As such, it seems likely that firms might regard their level of Medicaid expansion exposure as something over which they have only limited control conditional on existing investments in business locations and the general type of workers they employ. While firms' exposure levels might vary over time because of changes in labor market conditions that affect household income and because of households' labor supply decisions, in any case, the average exposure level is largely stable over time, declining only slightly over the sample period from an average of 13.94% in the pre-expansion period to 12.75% over the period of 2014-2019.

The key outcome variable I focus on in this study is the health insurance offer rate, measured as the percentage share of employees an establishment reports making health insurance available to. The offer rate is notable because it is an important dimension of an employer's degree of health insurance generosity toward lower income workers, whose employers are generally less likely to offer them health insurance (Vistnes and Monheit, 2011; Zawacki et al., 2025), and since offers may carry considerable option value for workers even when they do not enroll. The offer rate also has the virtue, relative to the enrollment rate, of being solely determined by choices made by the offering employer, allowing us to rule out that changes in this outcome are occurring due to workers' evolving evaluation of the quality of a given insurance offer, except in as much as workers' reactions are anticipated by their employers.

My main set of outcome variables consists of this offer rate measure coupled with a set of closely related variables: the establishment's health insurance enrollment rate (i.e., the share of the establishment's workers that were both offered health insurance and which chose to enroll in that insurance), its part-time employment rate, its number of employees, its employee turnover rate,[8] and the average age of its employees. Of these, the enrollment rate in particular pairs with

[8]The turnover rate in this context is defined as one-half times hires plus separations, all divided by employment, in keeping with the definition used in the Census Bureau's Quarterly Workforce Indicators (Abowd et al., 2005; Hegland et al., 2022). Note that this variable is only available for the years 2009-2019; data availability constraints prevent its use in 2008.

the offer rate and serves as a useful point of comparison, since the offer rate is fully determined by the employer, whereas the enrollment rate is jointly determined by the employer's insurance offer and employees' willingness to pay premiums to enroll in the offered insurance relative to other options. The other variables, meanwhile, serve to monitor for other more general changes in establishments' scale and workforce composition, though the part-time employment rate and the employee turnover rate are also useful to consider due to their importance in insurance benefits nondiscrimination legislation. All variables mentioned here except for the turnover rate and the average age are derived from establishments' survey responses; the excepted two are derived from tax records and Decennial Census records respectively.

Beyond these main outcome variables, I also examine a number of supplementary outcomes that reflect other possible margins of response to the Medicaid expansions by establishments and workers. In one set of supplementary outcomes, I decompose the insurance offer rate variable into offers to part-time workers and offers to full-time workers, defining the part-time and full-time worker offer rates so that they sum to the overall offer rate, giving me outcomes which provide additional resolution into the types of workers that may be gaining or losing health insurance offers. A second set of supplementary outcomes characterizes workers' levels of real compensation, and includes the mean, 25th percentile, median, and 75th percentile amounts of annual real total compensation paid to workers by each establishment. This outcome set also includes the establishment's annual level of real total payroll across all employees. For all of these pay-related outcomes, total compensation is defined to include workers' wage and salary income, as derived from IRS W2 records, summed with employer health insurance premium contributions, as derived from establishments' survey responses.[9] Estimates using just wage and salary income, unadjusted for changes in premium contributions, are also available in the appendix. My final set of supplementary outcomes characterize each establishments' insurance offerings, and include the real annual total premium, employer's premium contribution, worker's out of pocket premium, and deductible of the average plan enrolled in by the establishment's workers. All variables measured in dollar terms are inflation adjusted into 2017 dollars using the Personal Consumption Expenditures price index.

Finally, in my main analyses, I use a variety of control variables that characterize other dimensions of the size, geographic extent, and employment composition of establishments' parent firms. These include the percentage share of the parent firm's workforce that lives in an ACA expansion state but that does not qualify for expanded Medicaid, the share of the parent firm's workforce that does not live in an ACA expansion state but that would qualify for Medicaid under the expanded eligibility rules, the establishment's report of its parent firm's typical level of total employment, and a parent firm-level state employment concentration index, computed as the sum across all states of the squared percentage share of the firm's employees that live in a given state (i.e., a Herfindahl Hirschman Index for state shares of firm employment).

[9]For the quantile estimates, wage and salary income from the establishment is adjusted for premium contributions under the assumption that the Xth percentile person by pay receives the average premium contribution if at least (100-X)% of workers in the establishment are enrolled in one of its health insurance plans, and that the Xth percentile person receives no premium contributions otherwise.

Table 1 presents summary statistics characterizing the variables discussed above, presenting means and standard deviations in the overall sample, among establishments located in states that expand Medicaid within the sample ('ACA States'), and among establishments located in non-expansion states ('Non-ACA States'). All estimates shown are computed using the MEPS-ICAR's establishment weights and so are representative of the nationally average establishment at a large, multi-establishment firm. Similar estimates that are representative for the average worker employed by such establishments, computed using employment weights, are available in Appendix Table A1. Within these tables, it is worth highlighting that the average treatment exposure rate is about 13.3%, with a standard deviation of 14.5%, and that while average exposure was higher in ACA states (16.0% vs 8.5%) than in non-ACA states, non-ACA state exposure was still substantial.

To provide a visual impression of how the relationship between the insurance offer rate and exposure to ACA Medicaid expansion evolves over time, I present in Figure 1 a binned scatter plot of these two variables that simultaneously shows estimates for the pre-ACA period (2008-2009), the period after the ACA was passed but before Medicaid expansions occurred (2010-2013), and the post-expansion period (2014-2019). All points on the plot are establishment-weighted averages within one of fifteen bins formed to partition the distribution of establishments by Medicaid expansion exposure, as judged using establishment-weights in the sample as a whole. Among establishments with exposure to Medicaid expansion less than 10%, there is no clear pattern of changes in the offer rate over time. However, as exposure to Medicaid expansion increases, so also does the gap between the pre-ACA and post-expansion estimates. The gap between the 2008-2009 and 2010-2013 estimates, meanwhile, does not show a similar pattern of growth associated with Medicaid exposure. Note that in Figure 2, a similar binned scatter plot is presented, but after controlling for the percentage share of an establishment's parent firm's workforce that lives in an ACA expansion state but that does not qualify for expanded Medicaid as well as for the percentage share of an establishment's parent firm's workforce that does not live in an ACA expansion state but that would qualify for Medicaid under the expanded eligibility rules. I implement these controls following Cattaneo et al. (2024). The binned scatterplot with controls exhibits qualitatively similar patterns of data as to in the plot without them, except that with the controls, it appears that the offer rate was somewhat more likely to increase from 2008-2009 to 2010-2013 among higher exposure establishments.

3 Methods

This study features two main empirical approaches: a state difference-in-differences research design and a continuous treatment variant of a difference-in-differences approach where the key treatment variable is a measure of each establishment's parent firm's degree of exposure to the ACA Medicaid expansions. I supplement this second approach with two variants on its design, one which extends the design by permitting variation in the effect of exposure to Medicaid expansion by whether a given establishment is located in an ACA expansion state and a second which consists of a dichotomized difference-in-differences variant of the continuous treatment design. Additional details

on these models are provided under their respective headings below.

All of the methods I employ feature certain common elements. All regressions are estimated using ordinary least squares (Correia, 2016), with the exception of the worker pay-related outcomes. Due to the extremely right-skewed nature of these income variables and for ease of interpretation, I estimate those using Poisson regression, so as to allow treatment effects on these outcomes to carry an interpretation as though they were logged, but without the considerable drawbacks associated with actual log-levels specifications (Chen and Roth, 2023). Unless otherwise noted, all regressions are weighted to be representative of the average private sector establishment that is part of a multi-establishment firm with more than 100 employees; use of sampling weights are required for estimate representativity given the complex survey design of the MEPS-ICAR's underlying survey data (Davis, 2018). For key estimates, I also produce supplementary results where regressions are weighted to be representative of the average employee at establishments meeting the sample's inclusion criteria, with these estimates helping to provide insight into the effective impact on workers of changes in employers' benefits decisions and helping to rule out the possibility of results being disproportionately driven by relatively small establishments where variables defined in per worker terms may be less well measured.

3.1 The State Difference-in-Differences Model

To estimate the effect of Medicaid expansion under the assumption that firms tailor their insurance offerings by state, I use a traditional state difference-in-differences research design that compares establishments in ACA states to those in non-ACA states. To avoid issues related to the staggered adoption of ACA Medicaid expansions across states, I follow Wooldridge (2021) and implement my difference-in-differences design using a two-way fixed effects regression that permits estimated treatment effects to vary by year and by a state's year of Medicaid expansion. After estimation, I then re-aggregate these year by treatment onset date-specific effects in order to report figures in line with traditional difference-in-differences and event study estimands (i.e., the average treatment effect on the treated group and year-relative-to-treatment-onset specific effects). My regression specification is below:

$$Y_{i,t} = \sum_{g \in G} \sum_{t \in T} \beta_{g,t} * I_t * I_g + \mu_t + \delta_s \tag{1}$$

In this equation, i indexes individual establishments, t indexes years, g indexes groups of states by Medicaid expansion year, G is the set of in-sample years in which states expanded Medicaid (2014, 2015, 2016, and 2019), T is the set of years ranging from 2008-2019 excluding years where $t = g - 1$, $\beta_{g,t}$ is the treatment effect observed in year t for Medicaid expansion year group g, I_t is an indicator variable that is 1 if the year is equal to year t and 0 otherwise, I_g is an indicator variable for membership in Medicaid expansion year group g, μ_t contains year fixed effects, and δ_s contains state fixed effects. This specification estimates treatment effects specific to each Medicaid expansion year group for each available year, except for the year immediately prior to Medicaid

expansion in each group, whose treatment effect is normalized to zero. Standard errors are clustered at the level of assignment into year of Medicaid expansion, in keeping with the recommendation of Abadie et al. (2022), which here means clustering at the state level.

This regression specification estimates a large number of group-year specific treatment effects. To summarize the treatment effects obtained, I calculate the overall average treatment effect on the treated group (ATT) as the weighted-average of the estimated $\beta_{g,t}$ coefficients in equation (1) that correspond with post-expansion years, weighting by the amount of sample weight falling in each coefficient's corresponding group-year. This gives the ATT in the post-treatment period as a whole, computed relative to each Medicaid expansion year-group's year immediately prior to Medicaid expansion. I also compute the pre-treatment ATT, which is the sample weight weighted-average of the $\beta_{g,t}$ coefficients corresponding to years prior to Medicaid expansion, excluding the year immediately prior to expansion. Finally, to produce event study style coefficients, I produce relative year-specific ATTs, where the ATT for the n^{th} year before (or after) Medicaid expansion is computed by taking the sample weight weighted-average of the $\beta_{g,t}$ coefficients where t equals the Medicaid expansion year g minus (or plus) n.[10] The event study coefficients are available to help judge whether treated and control units appear to be on the same trend prior to treatment; the pre-treatment ATT, meanwhile, serves as a higher power test of pre-treatment differences between the treatment and control group, with the aggregation used making it methodologically symmetric to the post-treatment ATT in construction. Standard errors for all ATT-type estimates are produced using the delta method. Cumulatively, these various ATT estimates yield results conceptually comparable to those one would wish to obtain from a traditional two-way fixed effects difference-in-differences or event study specification.

3.2 The Continuous Treatment Exposure Model

My preferred empirical approach is a continuous treatment difference-in-differences design where I regress outcomes on a continuous measure of exposure to Medicaid expansion by year, thereby achieving a Wooldridge (2021)-inspired continuous treatment specification. As in the state difference-in-differences case, I normalize the effect of exposure in the year prior to when the Medicaid expansions began (i.e., 2013) to zero; the estimated exposure coefficients thus represent the change from 2013 to the coefficient's given year in the marginal effect of Medicaid exposure. Similarly to the state difference-in-differences case, I also provide aggregations of the year-specific treatment effects that correspond with average pre- and post- treatment effect estimates, including the (change in the) average marginal effect of treatment exposure and the overall average treatment effect given the observed distribution of exposures. This specification includes assorted controls, discussed below, and state-year fixed effects, with the fixed effects being included to eliminate the direct effect

[10] Note that I do not present relative-year specific estimates for all years for which it is conceptually possible to do so. Rather, I limit myself to presenting 6 relative year-specific estimates before and after treatment (including the effect normalized to zero for the year immediately prior to Medicaid expansion), doing so in order to avoid presenting relative-year estimates based on small underlying samples of establishments and for symmetry with the results from my other specifications.

of Medicaid expansion and other state policy changes on establishments operating in any given state in any given year. As such, treatment effects in this model are entirely identified on the basis of comparisons between establishments located within the same state, but which differ in terms of their parent firm's relative level of employment of Medicaid eligible workers in ACA states. This specification thus should be well adapted to detecting standardization behavior by firms, but should struggle to detect treatment effects given tailoring. The exact specification I use is below:

$$Y_{i,t} = \sum_{t \in T} \beta_t * ex_{i,t} + \sum_{t=2008}^{2019} I_t * X_{i,t} + \mu_{s,t} + \gamma * ex_{i,t} \tag{2}$$

In equation 2, i indexes individual business establishments, t indexes years, T is the set of years from 2008-2019 excluding 2013, s indexes states (as measured based on an establishment's location), $Y_{i,t}$ is an outcome variable, $ex_{i,t}$ is the level of exposure to ACA Medicaid expansion of establishment i's parent firm in year t, β_t is the year-specific average marginal effect (AME) of a 1 p.p. increase in treatment exposure on the outcome variable relative to the comparable effect in 2013, I_t is a year indicator variable, $X_{i,t}$ is a vector of controls, and $\mu_{s,t}$ is a state-year fixed effect. The effect of the exposure control in this equation, which is listed with the coefficient γ, is included to control for the effect of exposure as observed in the reference year 2013, and has its coefficient normalized to zero. Standard errors are clustered at the firm level, as this is the level at which exposure to Medicaid expansion occurs.

With respect to the controls included in $X_{i,t}$, I produce results using three different, nested sets of controls. The first set is the null set. The second includes my parent firm workforce composition controls, which include controls for the share of the parent firm's workforce living in an ACA state but not qualifying for expanded Medicaid as well as the similar workforce share qualifying for expanded Medicaid but not living in an ACA state. For my third and complete set of controls, I add to the second set a control for parent firm employment and the parent firm's state employment concentration index. The main results I present will include all controls, but results using the other two sets of controls are available in the appendix. These controls, being interacted with year indicator variables, help eliminate variation in health insurance offers and other outcomes due to secular changes, or other policy driven changes, in the relationship between outcomes and firm size, firm scale, exposure to higher income workers in expansion states, and exposure to lower income workers in non-expansion states.

In order to usefully summarize treatment effect estimates derived from this model, I calculate and present a set of average treatment effects (ATEs) and average marginal effects of treatment exposure, producing standard errors for these estimates using the delta method. First, I present an overall AME, which is calculated as the weighted average of the post-treatment year-specific AME coefficients (β_t), weighting each coefficient by the amount of sample weight present in each year. The overall ATE, meanwhile, is computed by multiplying each post-treatment establishment-year observation's level of treatment exposure ($ex_{i,t}$) by the appropriate year-specific AME, and then taking the weighted average, weighting by each observation's sample weight. The virtue of the

AME is it captures the effect of an additional unit of treatment exposure and thus is comparable across subsamples of the data where the level of treatment exposure may vary. The virtue of the ATE, meanwhile, is that it captures the overall net effect of treatment, accounting for heterogeneity in both the level and impact of treatment exposure. Using a comparable method, I produce pre-treatment ATEs and AMEs, comparing estimates for the years 2008-2012 to the effect in 2013. I also present year-specific AMEs and ATEs, with the year-specific AMEs simply being the β_t coefficients and with the year-specific ATEs similarly being the AME integrated over the observed distribution of exposure levels in the appropriate year.

A concern one may have with this approach, despite the controls, is that its treatment effect estimates may be driven solely by establishments' parent firm's employment of low-income employees, without a specific component of exposure to those located in Medicaid expansion states specifically. In that case, treatment effects would just reflect changes in outcomes among employers of low-income workers more generally, without necessarily being due to the ACA Medicaid expansions and their effect on empployers of low-income workers in ACA expansion states specifically. To help allay this concern, I present results from a placebo randomization test where I compare my genuine AME estimates to those obtained using the same methodological approach but after randomizing which states are considered ACA expansion states for the purpose of calculating treatment exposure, holding constant the formula used to determine workers' eligibility for ACA expanded Medicaid. More specifically, I re-compute my treatment exposure and related control variables after randomizing the set of states considered to be Affordable Care Act expansion states, holding constant the number of ACA expansion states by year of Medicaid expansion, and use these to produce a placebo AME estimate using the methodology describe above. I then report the share of 1000 such placebo AMEs that are larger in magnitude and which have the same sign as my genuine AME estimate. For an outcome variable where I find a treatment effect, if it is true that the effect is driven principally by firm-level exposure to employment of individuals eligible for expanded Medicaid in Medicaid expansion states, then my genuine AME estimate should tend to be larger in magnitude than those obtained from the placebo regressions. This is because the randomization of ACA expansion state status should add measurement error to the placebo treatment exposure variables and thus should bias treatment effect estimates using these placebo exposure measures toward zero. The genuine AME estimates should not be distinguished relative to the placebo estimates, however, if the ACA expansion state component of my exposure measure is unimportant.

3.3 The Interacted Model

The continuous treatment model above imposes a homogenous effect of treatment exposure, regardless of the state in which an establishment is located. In this variant on the exposure model, I allow the effect of treatment exposure, as well as of any included controls, to vary based on whether or not an establishment is located in a state that ever expands Medicaid through the ACA between 2014 and 2019. This allows me to obtain AMEs and ATEs specific to establishments located in ACA

or in non-ACA states, allowing me to statistically test whether the effect of exposure to Medicaid expansion varies across these different types of state. A test of this sort is useful, as it can help determine whether states are responding to Medicaid exposure in a state-tailored fashion, as would be evidenced if we observe larger responses to Medicaid exposure in ACA states than in non-ACA states. The equation I use to implement this interacted variant of the exposure model is below:

$$Y_{i,t} = \sum_{t \in T} (\beta_t^{ACA} * ACA_{i,t} + \beta_t^{\neg ACA} * \neg ACA_{i,t}) * ex_{i,t} + \sum_{t=2008}^{2019} I_t * (ACA_{i,t} + \neg ACA_{i,t}) * X_{i,t} + \gamma_1 * ACA_{i,t} * ex_{i,t} + \gamma_2 * \neg ACA_{i,t} * ex_{i,t} + \mu_{s,t} \quad (3)$$

Everything in the above equation is defined as in equation (2), except that the variables $ACA_{i,t}$ and $\neg ACA_{i,t}$ have been added, where $ACA_{i,t}$ is 1 when an establishment is located in a state that expanded Medicaid between 2014 and 2019 and is 0 otherwise, and where $\neg ACA_{i,t}$ is the same but reversed. Additionally, the equation differs in that the estimated year-specific coefficients are either specific to ACA states (β_t^{ACA}) or non-ACA states ($\beta_t^{\neg ACA}$), as also are the baseline exposure controls whose coefficients are normalized to zero. Given these estimates, and following the general approach used for the main continuous treatment model, I produce ACA state and non-ACA state specific AMEs, ATEs, pre-treatment AMEs, and pre-treatment ATEs. For each post-treatment AME or ATE, I also present a p-value from the F-test of the hypothesis that establishments in ACA and non-ACA states have the same treatment effect.

3.4 The High-Exposure Difference-in-Differences Model

While the continuous treatment exposure model is my preferred specification, it has the disadvantage of yielding results which are conceptually less comparable to those from the state difference-in-differences research design, since the latter produces an ATT using dichotomous treatment variables while the other produces an ATE using continuous treatment variables. To produce potentially more directly comparable results that still take advantage of my treatment exposure measure, I implement a traditional difference-in-differences research design where establishments are taken to be treated starting in 2014 if their parent firm's level of exposure to 2014 Medicaid expansion states exceeds 25% (approximately the top fifth of establishments by exposure) and are taken to be untreated otherwise. While this approach faces drawbacks in that there is non-zero exposure to treatment within the control group and in that the effect of later Medicaid expansions on exposure is ignored, this approach does have the virtue of being more methodologically similar to the state difference-in-differences model. It also has some potential to help detect exposure effects in the presence of non-linearities, such as may occur if firms only respond to Medicaid exposure after it passes some high threshold level. I estimate this high-exposure difference-in-differences design using the equation below, implementing it following (Wooldridge, 2021) to further maintain similarity in design to the state difference-in-differences model:

$$Y_{i,t} = \sum_{t \in T} \beta_t * I_t * Treat_i + Treat_i + \mu_t + \delta_s \quad (4)$$

In this equation, i indexes establishments, t indexes years, T is the set of years from 2008-2019 excluding 2013, s indexes states, $Y_{i,t}$ is the outcome variable, β_t is the treatment effect for high-exposure establishments in year t, I_t is an indicator variable that is 1 in year t and 0 otherwise, $Treat_i$ is an indicator variable that is 1 if an establishment is in a high-exposure firm and 0 otherwise, μ_t is a year fixed effect, and δ_s is a state fixed effect. All year-specific treatment effects are estimated relative to a reference period of 2013, the year prior to that in which ACA Medicaid expansions began occurring, with the effect in 2013 being normalized to 0. Standard errors are clustered at the level of assignment into treatment and control status, so here at the firm-level. As in the case of the state model, treatment effects are aggregated prior to presentation such that an overall ATT, a pre-treatment ATT, and relative-year specific ATTs are all presented, though in this specification the relative-year specific ATTs are simply equal to the β_t coefficients.

4 Results and Discussion

4.1 Main Outcomes: The State Difference-in-Differences Model

Table 2 presents results from the state difference-in-differences model for my core set of outcomes. Using this approach, I estimate that the ACA Medicaid expansions had no statistically significant effect on the health insurance offer rate, the enrollment rate, the part-time employment rate, establishment employment levels, worker turnover, and the average age of establishment employees. All pre-treatment ATT estimates and nearly all relative-year specific event study style treatment effect estimates are statistically insignificant as well. These results do not support the presence of either substantive effects of the ACA Medicaid expansions on my main outcomes under the assumptions of the state difference-in-differences model, or of there being a violation of the model's parallel trends assumption. As such, these results are suggestive that either firms genuinely do not respond to Medicaid expansion along these margins or, alternatively, that if they do respond, the response is not tailored by state and so cannot be easily detected using a state difference-in-differences model.

For readers interested in seeing visualizations of the event study style estimates obtained for this model, or for those models discussed below, Figure 3 presents a panel of event study-style plots of the effect of Medicaid expansion on the offer rate by model. Specifically, the results show the event study relative-year specific ATTs and ATEs from the state difference-in-differences model, the high-exposure difference-in-differences model, the continuous treatment exposure model, and the continuous treatment exposure model estimated using employment-weights. A similar such figure for the enrollment rate is also available in Figure 4.

4.2 Main Outcomes: The Continuous Treatment Model

Results for my main outcomes estimated using the continuous treatment exposure model are in Table 3. In contrast to the state difference-in-differences results, the continuous treatment model estimates a statistically significant effect of the ACA Medicaid expansions on the health insurance offer rate. The estimated ATE (-2.2 p.p.) is markedly larger than the state model's ATT (-0.53 p.p.), despite that the ATE is an average across all establishments in the sample, including those in firms with little or no Medicaid expansion exposure, while the ATT pertains to a subpopulation of establishments that has a higher than average level of exposure. This ATE represents about a 3% reduction relative to the pre-expansion average offer-rate among in-sample establishments. The average marginal effect of treatment exposure, meanwhile, indicates that each additional percentage point of exposure to Medicaid expansion is associated with an additional 0.17 p.p. reduction in the offer rate, with the implied effect of a 1 standard deviation increase in treatment exposure being about a 2.5 p.p. reduction in the offer rate. The ATE on the enrollment rate is a statistically insignificant -0.59 p.p. reduction; the effect on establishment employment levels is statistically insignificant as well. Meanwhile, I observe a statistically significant increase in the part-time employment rate, increase in the employee turnover rate, and reduction in the average age of workers. All three statistically significant effects share a sign with their counterpart estimates from the state difference-in-differences results, but yield results that are larger in magnitude. The part-time employment and turnover rate are particularly large in terms of relative magnitude: the part-time employment rate ATE is a 5.4% increase relative to the pre-expansion average part-time employment rate, while the turnover rate ATE is a 9.6% increase relative to the pre-expansion average turnover rate. Note that all pre-treatment ATE and AME estimates are statistically insignificant, while the event study estimates do not appear to exhibit a clear upward or downward pre-expansion trend in the relative-year specific treatment effect estimates.

The continuous treatment model's results point to higher exposure firms responding to the ACA Medicaid expansions by reducing their health insurance offer rate. The accompanying increases in the part-time rate and turnover rate suggest that the reduced availability of employer-sponsored health insurance may have been associated with difficulty retaining and attracting workers into stable, full-time employment. Alternatively, these accompanying changes could have been intended by employers as part of a strategy for reducing insurance availability while complying with ERISA, which does not require firms that offer health insurance to established full-time employees to also do so to part-time employees or employees with job tenures less than 1 year. Toward this point, Appendix Table A2 shows results where changes in the offer rate are decomposed between offers made to part-time workers and to full-time workers. These results show that similar magnitude reductions in health insurance offers occurred for both part-time and full-time employees which, given the markedly lower baseline offer rate for part-time workers, indicates that reductions in health insurance offers are disproportionately driven by reductions for part-time employees. Relatedly, the reduction in the average age shown in Table 3 also suggests a shift toward greater employment of workers with less demand for health insurance. Finally, the absence of a statistically significant

enrollment rate effect bears several possible explanations. One is that the enrollment rate may be expected to exhibit more geographically-linked variation due to workers' sensitivity to the policy environment where they leave, making it relatively difficult to detect effects on enrollment in this model, especially given the model's use of state-year fixed effects. Another explanation is that if firms reducing their offer rate do so by withdrawing offers first among workers with the lowest likelihood of enrolling, then enrollment rate effects may be detectable only among employers that markedly reduced their offer rate. In turn, this would suggest that a continuous, linear model of the effect of exposure may have difficulty detecting the effect of enrollment relative to the high-exposure difference-in-differences model.

The strength of these results are bolstered by findings from a number of robustness exercises. In Appendix Table A3, I show that these results are not sensitive to the set of included controls. In Appendix Table A4, I show that results obtained when weighting the sample to be representative of the average employee of an in-sample establishment are mostly similar to those obtained when weighting to be representative of the average establishment itself, with two exceptions. The first is that the employee-weighted average age effect (ATE=-0.11 p.p.) is statistically insignificant and markedly smaller in magnitude than the establishment-weighted effect, which may not be surprising given that the age structure of large workplaces is likely more difficult to change than that of small workplaces. The second is that the employee-weighted enrollment effect is statistically significant and markedly large in magnitude (ATE=-1.57 p.p.) than the establishment-weighted enrollment effect. More generally, these re-weighted estimates suggest that my core results are not disproportionately driven by particularly small or large establishments, though the employee-weighted enrollment result does suggest that the aggregate impact of businesses' responses to the Medicaid expansions on workers may have been considerable.

Beyond these discussed treatment effects, Table 3 also contains results from my placebo randomization tests, where the genuine AME estimates are compared to those obtained after randomizing which states are considered to be ACA expansion states. My offer rate AME is larger than all but 2.8% of placebo AMEs. Other outcomes where I obtain statistically significant results also tend to yield relatively small placebo randomization test scores. These placebo randomization test results indicate that the specific component of exposure to Medicaid eligible workers *in ACA expansion states* is critical to generating the observed effects and that the AMEs are not merely driven by firms having exposure to low-income workers generally. The one exception where the placebo randomization test score does not broadly comport with the main estimate's statistical significance level is the placebo test result for the enrollment rate. While the enrollment rate effect is statistically insignificant, it nevertheless yields a very small placebo randomization test score of 0.2%. This finding, taken together with the employment-weighted results, suggests that there may have been a genuine, if small, enrollment rate reduction.

Overall, the results from the continuous treatment model, and particularly their contrast with the state difference-in-difference results, are consistent with firms that have many employees affected by the Medicaid expansions responding to the expansions by reducing their health insurance

offer rate, but doing so on a firm-wide standardized basis rather than by tailoring their benefits changes to feature offer rate reductions only in ACA states. This is especially the case since the continuous treatment model includes state-year fixed effects, which would eliminate any response to the Medicaid expansions shared in common among establishments in ACA states, regardless of their Medicaid exposure level.

4.3 Main Outcomes: The Interacted Model

In Table 4, I present results for my main outcomes from the interacted model, where I allow the effect of Medicaid exposure to vary between establishments in ACA expansion states and non-expansion states. Using this approach, I find that the AME of treatment exposure on the offer rate is -0.14 p.p. per unit of exposure in non-ACA states, versus -0.18 p.p. in ACA states. These two estimates are qualitatively similar and the null hypothesis that the two estimates are the same cannot be rejected (p=0.78). Similar is true for the part-time employment rate, average employment, turnover rate, and average age variables. Finally, the ATEs for all variables exhibit more substantive variation between ACA and non-ACA states than do the AMEs. This is because the average level of ACA exposure in ACA states is about twice as high as the level of exposure in non-ACA states, causing even very similar AMEs to translate into different ATEs. While the ATEs are useful to note from the perspective of understanding the impact of the ACA Medicaid expansions on different types of states, the AMEs are more useful for assessing whether firms in different states respond differently or similarly to an equivalent change in exposure.

These results from the interacted model are consistent with firms exhibiting a standardized, company-wide response to their exposure to Medicaid expansions, rather than tailoring their response to that exposure by state. The one exception to this pattern is for the enrollment rate outcome, where the AME on enrollment is a statistically significant -0.12 p.p. in ACA states and a statistically insignificant 0.15 p.p. in non-ACA states, with the two AMEs being statistically significantly different from one-another (p=0.01). This finding highlights that standardization appears to be a feature of outcomes over which firms exert strong direct influence, such as the health insurance offer rate, but not so much for outcomes over which employees have a greater degree of direct influence. The sign of the enrollment effects, meanwhile, are consistent with workers in ACA states being more comfortable forgoing employer-sponsored health insurance offers when ACA expanded Medicaid is available, facilitating larger reductions in enrollment at exposed establishments in ACA states than in non-ACA states.

4.4 Main Outcomes: The High-Exposure Difference-in-Differences Model

Estimates from the high-exposure difference-in-differences model are in Table 5. Using this model, I estimate that the ATT on the offer rate is a statistically significant 9.3 p.p reduction, a considerably larger estimate than the -0.59 p.p. effect observed in the state model. The estimate for the enrollment rate is -5.3 p.p. and is statistically significant as well. While the estimated effect on establishment employment remains statistically insignificant in this model, statistically significant

effects are observed on the other three outcomes: the part-time employment rate increased by 5.5 p.p., the employee turnover rate increased by 0.16, and the average age of employed workers fell by 1.6 years. The overall average pre-treatment ATT estimates, meanwhile, are all statistically insignificant and the relative-year specific ATT estimates, meanwhile, do not appear to suggest a parallel trends violation.

As with the continuous treatment model's results, the high-exposure difference-in-differences model yields larger, statistically significant treatment effect estimates where the state difference-in-differences model yields smaller, statistically insignificant results. These findings thus buttress those from the continuous treatment model by offering a qualitatively similar contrast to the state model's results, while being produced using a traditional difference-in-differences approach that is similar in implementation to that of the state model. Relative to the continuous treatment model, the high-exposure model's results differ in that its ATTs are markedly larger than the continuous exposure model's ATEs. To a large extent, this is because the ATEs represent averages across all establishments, including minimally exposed establishments, while the ATT is for a subset of establishments with a very high level of exposure to Medicaid expansion. However, the contrast between these results could also indicate that there may be some non-linearities in how firms respond to Medicaid exposure. Such behavior would be at least partially consistent with the descriptive evidence in Figures 1 and 2, where differences in the relationship between the offer rate and Medicaid exposure appear to emerge mainly for establishments with exposure levels exceeding 10%. In a similar vein, the contrast between the high-exposure model's substantial effect on the enrollment rate and the continuous treatment model's small effect could be reflective of firms preferring to withdraw health insurance offers from workers with lower propensities to enroll, a phenomenon which could cause the effect of exposure on enrollment to be nonlinear. These results are thus suggestive that even if there is no statistically significant average reduction in enrollment, there do appear to be reductions at least at establishments that are a part of very highly Medicaid exposed firms.

4.5 Pay and Payroll Outcomes

Table 6 presents Poisson regression estimates from the main continuous treatment exposure research design on measures of annual employee total compensation. The average marginal effect of an additional percentage point of treatment exposure on the mean level of compensation paid to workers in an establishment is a statistically significant 0.7% reduction. This AME translates into an average treatment effect where compensation falls by 8.7%. This rather considerable effect contrasts with the estimated effects on the total level of compensation paid to all workers in the establishment, which are markedly smaller in magnitude and which are statistically insignificant. Estimated treatment effects for the 25th percentile, median, and 75th percentile level of compensation paid within each establishment further indicate that reductions in pay occurred disproportionately at the bottom of each establishment's income distribution. All estimated pre-treatment AMEs and ATEs are statistically insignificant; the relative-year specific AMEs are not suggestive of the estimated

treatment effects being a result of a straightforward extension of pre-expansion trends.

This pattern of treatment effects where average unit labor costs fell might be surprising, given that one might expect reduced access to health insurance benefits to be associated with an increase in pay, given the logic of compensating differentials (Buchmueller et al., 2013). One explanation for these findings is that firms may give lower income workers pay cuts calibrated to enable them to qualify for Medicaid, with the net impact on total payroll being less than that on mean compensation due to lower pay workers being a smaller share of total payroll relative to their contribution to the mean level of pay. However, in light of the increased part-time employment rate and increased worker turnover results, these results more likely reflect a compositional change in the workforce, with average annual compensation falling due to the workforce increasingly consisting of workers with lower hours of work per year, but not necessarily with lower hourly wages. Whatever the effect on unit labor costs, however, the statistically insignificant and negative signed effect on total payroll is suggestive that firms may have reduced, or at least did not substantively increase, their total labor costs in response to the Medicaid expansions.

In addition to the main worker pay results above, a number of tables presenting complementary results are available in the appendix. Appendix Table A5 present estimates for these outcomes from the interacted model, with the AMEs for ACA and non-ACA states being statistically indistinguishable for most outcomes. The exception is for the effect on 75th percentile compensation, which is more negative in ACA states than in non-ACA states. Appendix Table A6 shows that the main compensation results are not sensitive to the choice of included controls. Appendix Table A7 shows these results are largely similar when employment weights are used, with the exception that the effect on 75th percentile income becomes statistically significant and negative, while the total payroll results adopt a positive sign and remain statistically insignificant. Appendix Table A8 indicates that the main results presented are not sensitive to excluding employer premium contributions from the measure of employee compensation. Finally, Appendix Tables A9 and A10 present results for these outcomes using the state and high-exposure difference-in-differences research designs. Findings are similar to those observed for the main outcome set: the state difference in differences estimates are all statistically insignificant, and interestingly are all of opposite sign as to those obtained from the exposure methods, while the high-exposure difference-in-differences estimates match the continuous treatment model with respect to sign and statistical significance.

4.6 Insurance Outcomes

Table 7 presents estimates from the main continuous treatment exposure research design of the effect of Medicaid expansion on the characteristics of establishments' enrollment-weighted average health insurance plan. The estimated AME and ATE on insurance deductibles are both statistically insignificant and qualitatively small in magnitude. The AME of exposure on total annual insurance premiums indicates that each additional percentage point of exposure is associated with a $20 reduction in premiums, with the ATE being a $249 reduction in premiums. This ATE is equivalent to a 2.9% reduction in premiums relative to the pre-expansion average level of premi-

ums. Additional such percentage calculations indicate that proportionally similar reductions in employer (i.e., firm) premium contributions and on workers' premiums may have occurred, though only the reduction in employer premiums is statistically significant. All estimated pre-treatment AMEs and ATEs are statistically insignificant; the relative-year specific AMEs are not suggestive of the estimated treatment effects being a result of a straightforward extension of pre-expansion trends. The premium results are indicative that the ACA expansions reduced insurance costs per covered-worker for employers. Whether this indicates reduced healthcare costs for workers is less clear: even if workers' premiums fell, their overall healthcare costs may have risen if insurance plans became less generous along dimensions not observable within this study.

As with the compensation results, additional supplementary tables produced for the insurance results are available in the appendix. Estimates of insurance effects split between ACA and non-ACA states are available in Appendix Table A11. As with the other outcomes, AMEs for the insurance outcomes in ACA and non-ACA states are statistically indistinguishable. Appendix Table A12 indicates that the insurance results are not sensitive to choice of included controls. Appendix Table A13 indicates that the premium effects estimated with employment weights are qualitatively similar to the main estimates, with sign and statistical significance level all remaining the same. These results do differ, however, in that the positive effects on deductibles become statistically significant, suggesting the average worker at in-sample establishments was at an establishment that increased its deductibles by a statistically significant $58 in response to the Medicaid expansions. With respect to the state difference-in-differences estimates, Appendix Table A14 indicates that the state approach finds mostly statistically insignificant results of opposite sign to that observed in the continuous treatment exposure model, with the exception of finding a statistically significant reduction in the average deductible of about $90. Finally, the results in Appendix Table A15 indicate that the high-exposure difference-in-differences design differs somewhat from that observed in the continuous treatment model: while the signs of treatment effects remain the same, all estimates are statistically insignificant.

5 Conclusion

In this study, I find evidence that large, multi-establishment firms tend to standardize their health insurance benefits packages at the firm-level, rather than tailoring their benefits packages by state in response to local conditions. The key evidence for this is that establishments that are a part of firms with larger shares of their workforce located in an Affordable Care Act expansion state and eligible for ACA expanded Medicaid exhibit greater reductions in the share of their workforce to which they offer health insurance. Moreover, this response does not vary based on whether a given establishment is located in an ACA state and a similar effect could not be detected using my traditional state difference-in-differences research design. At the same time, for outcomes that employees have relatively more control over than firms, such as the health insurance enrollment rate, estimated treatment effects are weaker and more likely to be larger in ACA expansion states than in non-ACA states, as might be expected given that workers have natural reasons to be

sensitive to the policy conditions in their state of residence. Beyond these key results, I observe increases in employee turnover and the part-time employment rate, and reductions in the average age of establishments' workers, in average insurance premiums, and average rates of pay. This set of additional results suggests that reductions in the health insurance offer rate are accompanied by a compositional change in affected establishments' workforce to include a larger share of part-time workers, short job tenure workers, and workers that may attach less value to a health insurance offer. They further indicate that the Medicaid expansions allowed employers to achieve reductions in their insurance costs, and possibly also in their total labor costs.

The phenomenon of firms engaging in firm-wide standardizing behaviors has important economic, methodological, and policy implications. Economically, standardization is a subject of recent research interest (DellaVigna and Gentzkow, 2019; Hitsch et al., 2021; Hazell et al., 2022; Cavallo et al., 2014), and has considerable implications for our understanding of how firms operate and structure themselves. Frictions limiting firms' abilities to tailor their activities to local conditions could be an important constraint on firm scale and may help determine the boundary of the firm. For example, difficulty tailoring benefits might encourage firms to substitute direct employment of workers particularly sensitive to local conditions, as opposed to workers operating in a national labor markets, with contract workers provided by an external company, potentially helping drive the 'fissured firm' phenomenon (Weil, 2014). The ease or difficulty associated with tailoring could also have substantial effects on firms' decisions about where to locate new establishments. Further research on the circumstances in which standardization or tailoring should be expected from large firms would be valuable and potentially informative for a range of topic areas. For example, if firms standardize when making decisions about capital investments, policies that encourage capital-labor substitution may only trigger capital investments once a sufficient number of jurisdictions adopt such policies.

Methodologically, standardizing behavior by firms poses challenges for researchers, since multi-state firms making company-wide standardized responses to policies can cause state policies to have interstate spillover effects. These spillover effects would tend to contaminate the control groups used in state difference-in-differences designs, biasing their treatment effect estimates toward zero due to violation of their Stable Unit Treatment Value Assumptions. Bias of this sort may be particularly severe in geographic neighbor pair style research designs if subnational multi-state chains tend to concentrate in contiguous sets of states, or in synthetic control research designs if the synthetic control for treated units tends to disproportionately consist of places where employment is driven by the same set of underlying firms as in the treated unit. Biases of this sort could call into question evidence from such research designs in any setting where the outcome variable under consideration is strongly determined by firms that engage in standardizing behavior. To avoid such bias, researchers might adopt research designs that account for the spillover effects, possibly by adopting research designs that classify units into treatment and control groups on the basis of firm-level exposure to policy changes. An additional challenging implication of standardizing behavior is that it implies that results from case studies of policy changes occurring in singular states, cities,

or other sub-states localities may have limited external validity. This is because while the policy activity in the case study might not rise to the level of attention of large, multi-location firms, it presumably would if the policy were to become more widely adopted.

These same features of standardizing behavior that generate challenges for researchers also do so for policy makers. Policy makers seeking to obtain certain reactions from firms must consider whether their policy change will affect a large enough share of firms' operations to trigger a response from large, multi-location firms. Certain policy outcomes might only be achievable when policies are adopted collectively by coalitions of states, or by certain influential large states. Still other policy outcomes might be achievable only if the policies in question do not become prevalent enough to rise to large firms' attention. Relatedly, avoiding certain outcomes may not be possible even when a given jurisdiction does not adopt a policy, if enough other places have done so. It is therefore important for policy makers to consider not just how firms will respond to their policies if they respond, but also to consider what policy prevails in other jurisdictions and whether their jurisdiction is likely to be significant enough to trigger a response. Since a given jurisdiction might be of great significance to certain firms or certain industries, but not necessarily to all, this implies that a careful evaluation of policies and the firms they affect must be undertaken to understand likely outcomes.

Beyond these implications related to the finding that firms engage in standardizing behavior, this study also has implications for our understanding of the Affordable Care Act itself. In particular, I find evidence that the ACA reduced the prevalence of employer-sponsored health insurance offers, in keeping with the theoretical expectation that Medicaid expansion reduces the value of employer-sponsored health insurance relative to workers' outside option and thus that it should reduce the health insurance offer rate. Importantly, I find that the employer-sponsored health insurance offer rate fell not just in ACA expansion states, but also that expansion had negative interstate spillover effects that caused insurance availability to fall in non-expansion states as well. Beyond these results pertaining to the offer rate, I find suggestive evidence that the ACA Medicaid expansions reduced the employer-sponsored health insurance enrollment rate, especially in ACA expansion states and in highly exposed firms, and that this, coupled with a reduction in average employer premium contributions, led to a reduction into employers' total health insurance expenditures. These results tend to contrast with prior literature which usually, though not uniformly, finds little effect of the ACA Medicaid expansions on employer-sponsored health insurance related outcomes (Frean et al., 2017; Courtemanche et al., 2019; Duggan et al., 2019; Courtemanche et al., 2017; Frisvold and Jung, 2018; Kaestner et al., 2017; Blavin et al., 2015; Lennon, 2025; Abraham et al., 2019). One important limitation of this study relating to this topic is that information about the overall health insurance situation of workers losing health insurance offers, as well for workers disenrolling from their employers' health insurance plans, is not available to me. As such, it is unclear whether such workers tend to become uninsured, enroll in Medicaid, enroll in a spouse's or parent's health insurance plan, or respond to changes in the availability of employer-sponsored health insurance in some other way. As such, it is difficult to draw implications for worker welfare based solely on this

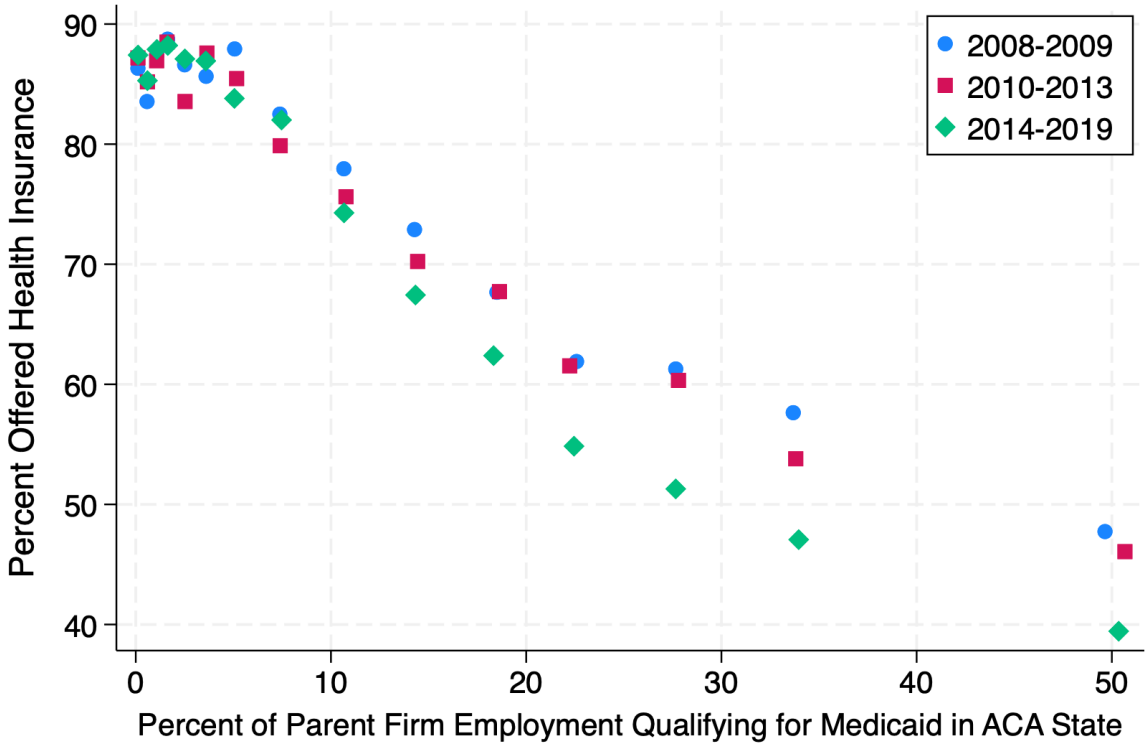
research.

One important limitation of this study is that my research design does not offer an opportunity to ascertain why firms engage in standardizing behavior. Possible explanations include intra-firm egalitarian norms causing firms to prefer to offer standardized policies lest workers or customers object, managerial inertia and general aversion to the complexity associated with tailoring benefits on a state-by-state basis, and other assorted costs of implementing a benefit tailoring regime. Suggestive evidence has been found favoring these mechanisms as an explanation for standardizing behavior in other settings (DellaVigna and Gentzkow, 2019; Hitsch et al., 2021; Hazell et al., 2022). Determining which mechanisms are most impactful is important since it may have implications for our understanding of the circumstances in which firms are likely to exhibit standardizing behavior. For example, if intra-firm egalitarian norms are key drivers of standardizing behavior, standardization will be most likely to occur with respect to decisions affecting their workforce and decisions that are very salient to customers (e.g., price setting). However, decisions that are less public-facing and with less direct implications for workers' health and pay may be more tailored, such as decisions pertaining to capital investments in stores and production facilities. On the other hand, if inertia and complexity aversion are key drivers of standardizing behavior, standardization will still be important for decisions related to determining capital investments and other decisions related to structuring production and business processes. Additional research on this subject would thus be valuable for determining the circumstances in which standardization behavior should be expected.

Ultimately, this research presents evidence that firms engage in standardizing behavior when making health insurance benefits decisions and highlights that this behavior can cause state policy regimes to interact with each other in important ways. These interstate policy spillovers can have important implications for policy and research and warrant further research and consideration both in the healthcare policy environment and in other settings.

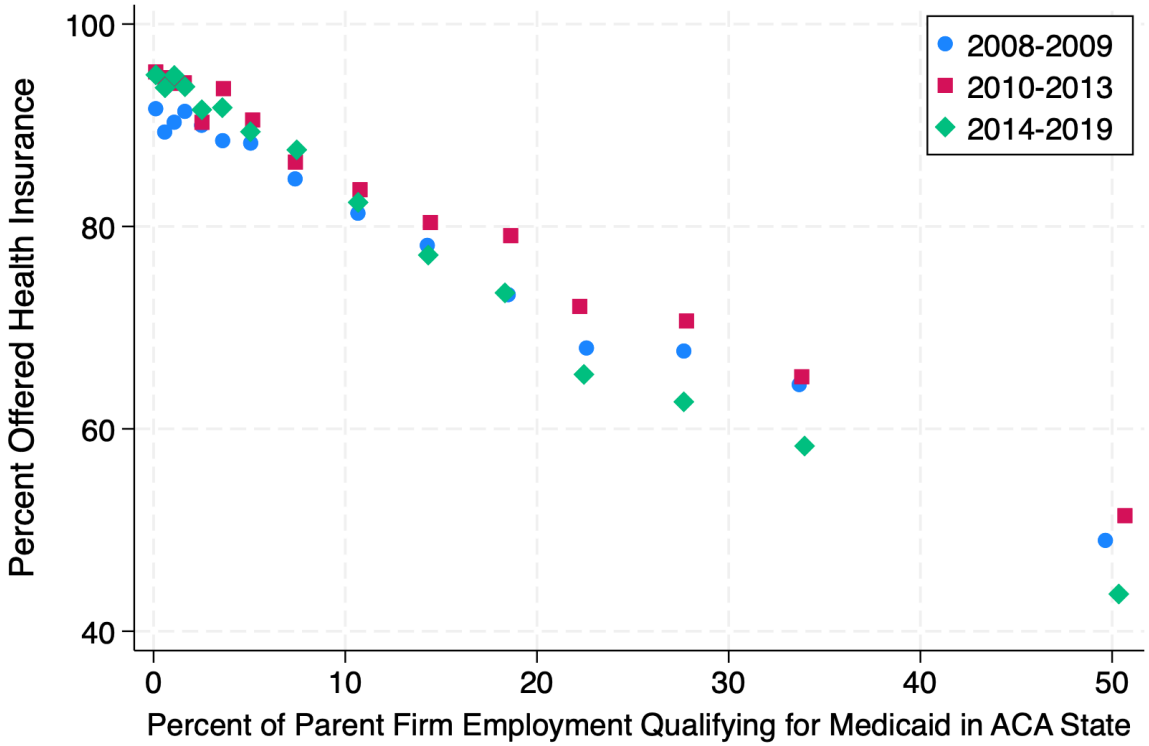
6 Figures

Figure 1. Health Insurance Offer Rate vs ACA Medicaid Exposure by Time Period



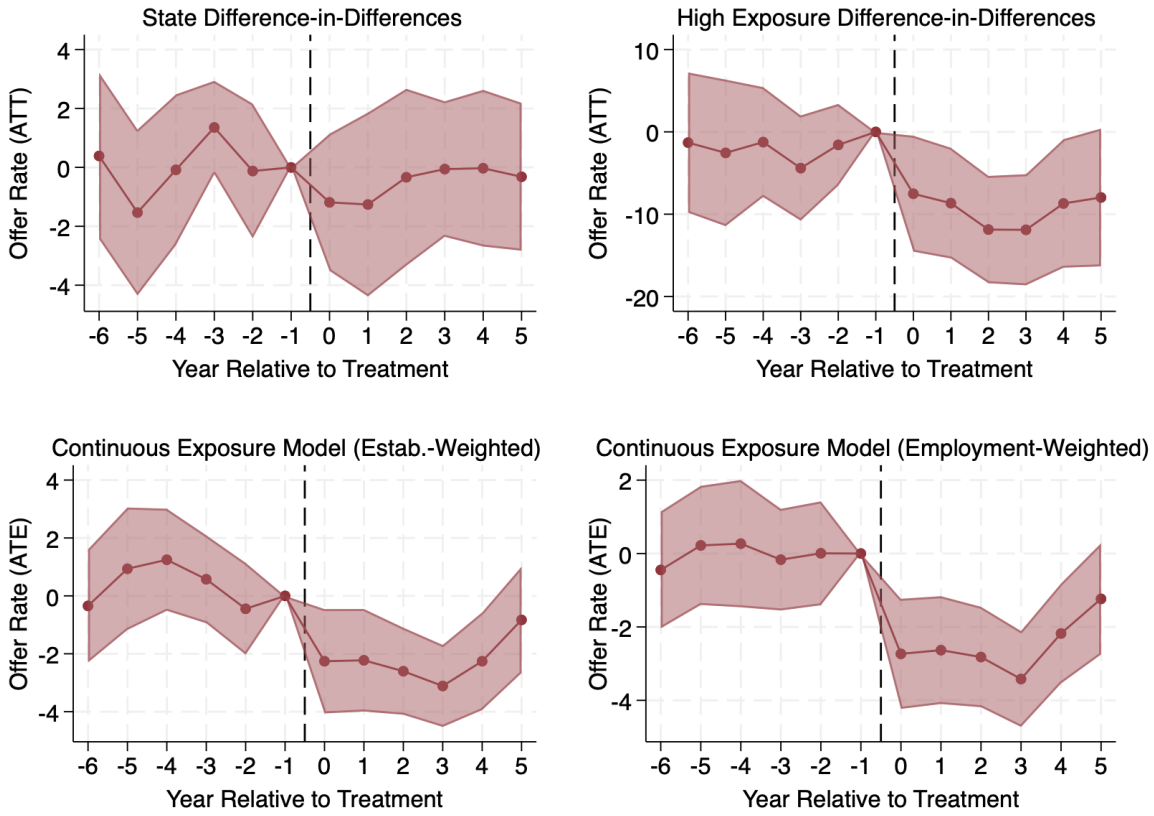
Notes: This figure is a binned scatter plot of establishments' employer-sponsored health insurance offer rate against their parent firm's level of exposure to Affordable Care Act (ACA) Medicaid expansion, defined as the percentage share of persons working for their parent firm that live in an ACA expansion state and whose household income and composition makes them eligible for Medicaid under the ACA's expanded eligibility rules. Each point on the plot specifies the establishment-weighted mean of the given variables within one of 15 bins for a given time period, with the bins being formed to partition observations by Medicaid exposure within the full sample of data into 15 bins containing approximately equal amounts of sample weight. The time periods include 2008-2009 (pre-ACA), 2010-2013 (post-ACA, but pre-ACA Medicaid expansions), and 2014-2019 (post-ACA Medicaid expansions). All data shown is derived from the Medical Expenditure Panel Survey- Insurance Component with Administrative Records (MEPS-ICAR), within a sample of establishments that are a part of multi-establishment firms with at least 100 employees.

Figure 2. Health Insurance Offer Rate vs ACA Medicaid Exposure by Time Period, with Controls



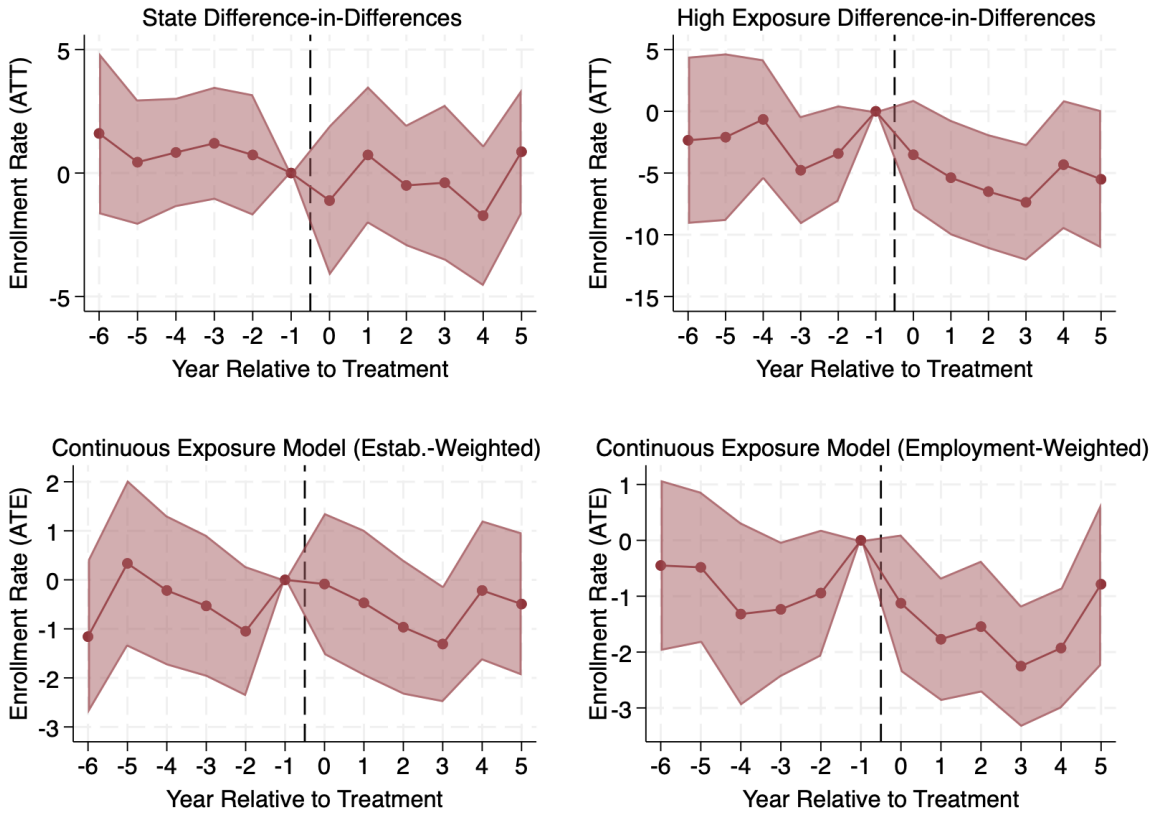
Notes: This figure is a binned scatter plot of establishments' employer-sponsored health insurance offer rate against their parent firm's level of exposure to Affordable Care Act (ACA) Medicaid expansion, defined as the percentage share of persons working for their parent firm that live in an ACA expansion state and whose household income and composition makes them eligible for Medicaid under the ACA's expanded eligibility rules. Each point on the plot specifies the establishment-weighted mean of the given variables within one of 15 bins for a given time period, with the bins being formed to partition observations by Medicaid exposure within the full sample of data into 15 bins containing approximately equal amounts of sample weight. The time periods include 2008-2009 (pre-ACA), 2010-2013 (post-ACA, but pre-ACA Medicaid expansions), and 2014-2019 (post-ACA Medicaid expansions). The estimates shown are adjusted to control for the percentage share of each establishment's parent firm's workforce that lives in an ACA expansion state but that does not qualify for expanded Medicaid as well as the percentage share of each establishment's parent firm's workforce that does not live in an ACA expansion state but that would qualify for Medicaid under the expanded eligibility rules. These controls are implemented following Cattaneo et al. (2024). All data shown is derived from the Medical Expenditure Panel Survey- Insurance Component with Administrative Records (MEPS-ICAR), within a sample of establishments that are a part of multi-establishment firms with at least 100 employees.

Figure 3. Health Insurance Offer Rate Event Study Plots



Notes: This figure presents event study-style plots of relative year-specific treatment effects of ACA Medicaid expansion on the health insurance offer rate from across four different specifications. The first row presents ATT estimates from the state difference-in-differences model on the left and from the high-exposure difference-in-differences model on the right. The second row presents ATE estimates from the continuous treatment exposure model, with the estimates on the left being weighted to be representative of the average establishment ('Estab.-Weighted'), and the estimates on the right being weighted to be representative of the average worker employed by an establishment within the sample. All plots shown are derived from the event study estimates shown in the tables: from left to right and then down, these tables are 2, 5, 3, and A4. For more on how these estimates are produced, please refer to the tables from which these estimates are sourced. All data shown is derived from the Medical Expenditure Panel Survey- Insurance Component with Administrative Records (MEPS-ICAR), within a sample of establishments that are a part of multi-establishment firms with at least 100 employees.

Figure 4. Health Insurance Enrollment Rate Event Study Plots



Notes: This figure presents event study-style plots of relative year-specific treatment effects of ACA Medicaid expansion on the health insurance enrollment rate from across four different specifications. The first row presents ATT estimates from the state difference-in-differences model on the left and from the high-exposure difference-in-differences model on the right. The second row presents ATE estimates from the continuous treatment exposure model, with the estimates on the left being weighted to be representative of the average establishment ('Estab.-Weighted'), and the estimates on the right being weighted to be representative of the average worker employed by an establishment within the sample. All plots shown are derived from the event study estimates shown in the tables: from left to right and then down, these tables are 2, 5, 3, and A4. For more on how these estimates are produced, please refer to the tables from which these estimates are sourced. All data shown is derived from the Medical Expenditure Panel Survey- Insurance Component with Administrative Records (MEPS-ICAR), within a sample of establishments that are a part of multi-establishment firms with at least 100 employees.

7 Tables

Table 1. Summary Statistics

	All States		ACA States		Non-ACA States	
	Mean	SD	Mean	SD	Mean	SD
Share of Full Sample (%)	100		64.00		36.00	
Treatment Exposure Rate (%)	13.33	14.53	16.04	15.69	8.503	10.59
SFW in Non-ACA State and ACA Medicaid Eligible (%)	10.97	14.22	7.042	9.255	17.94	18.26
SFW in ACA State and Not ACA Medicaid Eligible (%)	45.51	26.7	55.48	23.03	27.79	23.39
SFW in ACA State (%)	58.84	29.51	71.51	22.32	36.29	27.19
SFW Eligible for ACA Medicaid (%)	24.29	20.88	23.08	20.1	26.45	22.02
Firm Employment	31200	88470	31310	89400	30990	86800
State Concentration Index	35.21	34.32	35.99	34.76	33.82	33.48
Offer Rate (%)	73.74	31.43	73.57	31.45	74.05	31.38
Enrollment Rate (%)	52.87	32.98	52.8	32.88	53	33.14
Part-time Rate (%)	23.2	29.34	23.35	29.4	22.93	29.24
Establishment Employment	44.38	220	45.37	223.2	42.61	214.2
Turnover Rate	.6041	.6341	.5735	.6081	.6583	.6746
Average Age	37.02	8.779	37.12	8.839	36.85	8.669
Mean Total Compensation (TC)	34580	46630	35490	44960	32950	49410
25th Percentile TC	37330	78510	38130	63150	35910	100100
50th Percentile TC	39870	71010	40630	64950	38510	80640
75th Percentile TC	42370	68510	43380	66310	40590	72240
Total Payroll TC (1000s)	2783	24270	3019	27840	2363	16050
Part-time Offer Rate (%)	5.452	15.33	5.593	15.34	5.2	15.29
Full-time Offer Rate (%)	68.29	32.89	67.98	32.95	68.85	32.79
Mean Pay	30760	45480	31600	43730	29270	48390
25th Percentile Pay	34700	77750	35470	62180	33340	99590
50th Percentile Pay	35730	69940	36390	63760	34560	79750
75th Percentile Pay	37160	67610	38050	65340	35580	71430
Total Payroll (1000s)	2578	23090	2803	26580	2179	15010
Average Deductible	1321	1238	1255	1212	1437	1275
Average Total Premium	9223	4057	9361	4120	8976	3930
Average Firm Premium	6517	3434	6665	3498	6253	3301
Average Worker Premium	2706	1901	2696	1904	2723	1896

Notes: All statistics are from a sample of establishments that are a part of multi-establishment firms with at least 100 employees, drawn from the Medical Expenditure Panel Survey- Insurance Component with Administrative Records (MEPS-ICAR) for the years 2008-2019. Estimates are weighted to be nationally representative of US private sector business establishments, excluding railroads, meeting the sample inclusion requirement. The three panels provide results for all such establishments, just those in states that expanded Medicaid through the Affordable Care Act (ACA) in or before 2019, and those in states that did not. Among the variables shown, the Treatment Exposure Rate is the share of an establishment's parent firm's overall workforce that resides in an ACA state and that has a household income and composition making them eligible for ACA expanded Medicaid. SFW refers to the Share of parent Firm's Workforce. Offer Rate refers to the share of workers offered health insurance by a given establishment. TC refers to Total Compensation, and consists of workers' W2-derived annual pay for their job at the establishment summed with their employer's health insurance premium contributions. All other variables are as shown.

Table 2. State Diff-in-Diff: Main Results

	% Offer	% Enrollment	% Part-time	Employment	Turnover	Avg. Age
Average Treatment Effects on the Treatment Group (ATT)						
Overall ATT	-0.533	-0.376	0.194	-1.750	0.0380	-0.00677
	(1.074)	(1.127)	(0.867)	(1.214)	(0.0277)	(0.430)
Pre-Treatment ATT	-0.0483	1.006	0.527	-0.393	0.0360	-0.309
	(0.949)	(0.986)	(0.864)	(1.146)	(0.0249)	(0.342)
Relative Year-Specific ATTs						
Year-6	0.389	1.604	-0.108	-3.768	0.00751	-0.0290
	(1.442)	(1.669)	(1.647)	(2.012)	(0.0431)	(0.460)
Year-5	-1.533	0.440	1.372	-1.018	0.0396	-0.399
	(1.438)	(1.294)	(0.838)	(1.595)	(0.0306)	(0.406)
Year-4	-0.0829	0.834	1.484	1.004	0.0693**	-0.837
	(1.307)	(1.129)	(1.240)	(1.478)	(0.0258)	(0.447)
Year-3	1.355	1.204	-0.422	-0.986	0.0346	0.0526
	(0.807)	(1.167)	(1.183)	(1.293)	(0.0333)	(0.393)
Year-2	-0.123	0.732	0.461	0.341	0.0108	-0.512
	(1.168)	(1.253)	(1.289)	(1.316)	(0.0295)	(0.447)
Year-1	0	0	0	0	0	0
	.	.	.	.	.	.
Year+0	-1.187	-1.114	0.209	0.136	0.0404	-0.110
	(1.188)	(1.555)	(0.951)	(1.534)	(0.0304)	(0.390)
Year+1	-1.261	0.733	0.620	-1.536	0.0867*	-0.107
	(1.593)	(1.420)	(1.064)	(1.885)	(0.0358)	(0.505)
Year+2	-0.336	-0.501	0.510	-0.608	0.0538	0.108
	(1.533)	(1.256)	(1.342)	(1.893)	(0.0350)	(0.600)
Year+3	-0.0573	-0.392	-1.268	-2.866	0.0168	0.105
	(1.174)	(1.610)	(1.166)	(2.269)	(0.0359)	(0.459)
Year+4	-0.0287	-1.727	1.134	-2.550	0.0372	-0.473
	(1.357)	(1.459)	(1.326)	(1.572)	(0.0345)	(0.517)
Year+5	-0.319	0.864	0.00744	-3.198	-0.0116	0.482
	(1.281)	(1.295)	(1.119)	(1.669)	(0.0389)	(0.470)

Notes: Statistics shown are derived from establishment-level MEPS-ICAR data for the years 2008-2019, weighted and using a sample of establishments as described in Table 1. All estimates are derived from a state difference-in-differences specification estimated following Wooldridge (2021), implemented via Hegland (2023). The overall Average Treatment effect on the Treated group (ATT) gives the average effect of the ACA Medicaid expansions, obtained by comparing changes in outcomes between ACA state and and non-ACA state establishments from the year immediately prior to Medicaid expansion to the post-treatment period as a whole. The pre-treatment ATT is computed similarly to the overall ATT, but comparing the pre-treatment period to the year immediately prior to Medicaid expansion. Relative-year specific ATTs are computed as well. All specifications include state and year fixed effects. Standard errors are clustered at the state level and are computed for quantities like the ATT using the delta method. Statistical significance indicators for ATTs are as follows: * $p < .05$, ** $p < .01$, and *** $p < .001$. The outcomes are as shown, with the Offer Rate referring to the percentage share of workers offered health insurance by the given establishment, not the share of establishments offering insurance to at least one worker. For more details on the variables and on how the ATTs are computed, please refer to sections 2 and 3 respectively.

Table 3. Main Results

	% Offer	% Enrollment	% Part-time	Employment	Turnover	Avg. Age
Overall Treatment Effects						
Avg. Marginal Effect (AME)	-0.174***	-0.0479	0.101*	0.0343	0.00460***	-0.0379***
	(0.0515)	(0.0402)	(0.0451)	(0.0709)	(0.000932)	(0.0102)
Avg. Treatment Effect (ATE)	-2.206***	-0.593	1.250*	0.394	0.0559***	-0.469***
	(0.651)	(0.510)	(0.567)	(0.896)	(0.0118)	(0.129)
ATE as % of Avg. Pre-Treat. Y	-2.96%	-1.11%	5.40%	0.90%	9.64%	-1.28%
Pre-Treatment Effects						
AME	0.0283	-0.0383	-0.0180	-0.0802	0.00149	-0.0116
	(0.0497)	(0.0414)	(0.0445)	(0.0658)	(0.000934)	(0.00957)
ATE	0.398	-0.519	-0.230	-1.070	0.0214	-0.151
	(0.688)	(0.573)	(0.616)	(0.907)	(0.0132)	(0.133)
Relative Year-Specific AMEs						
Year-6	-0.0274	-0.0915	-0.0550	-0.247*	.	-0.0410**
	(0.0788)	(0.0633)	(0.0638)	(0.108)	.	(0.0130)
Year-5	0.0650	0.0233	-0.0772	-0.0558	0.00192	-0.00117
	(0.0749)	(0.0602)	(0.0606)	(0.0902)	(0.00110)	(0.0124)
Year-4	0.0909	-0.0158	-0.0937	-0.0138	0.000876	-0.00601
	(0.0655)	(0.0568)	(0.0561)	(0.0870)	(0.00113)	(0.0119)
Year-3	0.0416	-0.0385	0.0610	-0.0299	0.000722	-0.0101
	(0.0562)	(0.0536)	(0.0527)	(0.0830)	(0.00112)	(0.0115)
Year-2	-0.0302	-0.0711	0.0737	-0.0609	0.00243*	-0.000783
	(0.0549)	(0.0460)	(0.0516)	(0.0744)	(0.00112)	(0.0119)
Year-1	0	0	0	0	0	0
	.	.	.	.	.	.
Year+0	-0.155*	-0.00577	0.0759	0.0159	0.00143	-0.0187
	(0.0631)	(0.0507)	(0.0548)	(0.0975)	(0.00107)	(0.0132)
Year+1	-0.155*	-0.0328	0.0417	-0.0825	0.00251*	-0.0344*
	(0.0630)	(0.0531)	(0.0587)	(0.0908)	(0.00107)	(0.0141)
Year+2	-0.204***	-0.0756	0.108	0.0986	0.00323*	-0.0226
	(0.0601)	(0.0550)	(0.0566)	(0.0983)	(0.00127)	(0.0129)
Year+3	-0.261***	-0.110*	0.0768	0.112	0.00525***	-0.0365**
	(0.0605)	(0.0507)	(0.0615)	(0.0963)	(0.00114)	(0.0136)
Year+4	-0.196**	-0.0188	0.167*	-0.0312	0.00832***	-0.0700***
	(0.0749)	(0.0634)	(0.0665)	(0.103)	(0.00208)	(0.0147)
Year+5	-0.0713	-0.0423	0.133	0.0885	0.00646***	-0.0428**
	(0.0806)	(0.0639)	(0.0726)	(0.120)	(0.00121)	(0.0143)
Statistics						
Placebo Randomization Test	0.0280	0.00200	0.0240	0.450	0.0670	0.0360
Avg. Pre-Treatment Y	74.44	53.62	23.16	43.69	.5796	36.64
Mean Treatment Exposure	13.33	13.33	13.33	13.33	13.33	13.33

Notes: See next page.

Notes for Table 3: Statistics shown are derived from establishment-level MEPS-ICAR data for the years 2008-2019, weighted and using a sample of establishments as described in Table 1. All estimates are derived from the continuous treatment exposure model, a continuous treatment extensions of the difference-in-differences approach inspired by Wooldridge (2021), implemented via Hegland (2023). The overall Average Marginal Effect (AME) gives the effect a 1 percentage point increase in exposure to Medicaid expansion in the post-treatment period relative to in the year immediately prior to Medicaid expansion (2013), and is obtained as the sample-weight weighted-average of year-specific AMEs. Medicaid expansion (i.e., treatment) exposure is defined as the percentage share of an establishment's parent firm's workforce that is located in an Affordable Care Act (ACA) Medicaid expansion state and is part of a household with an income-level qualifying for ACA-expanded Medicaid. The overall Average Treatment Effect (ATE) is obtained by integrating the post-treatment year-specific AMEs over the distribution of observed exposure levels, given the sample weights. Avg. Pre-Treat. Y refers to the sample weighted average of the given outcome variable in the pre-treatment period. The pre-treatment variants of the AME and ATE are calculated similarly to their overall post-treatment counterparts, but compare the pre-treatment period to 2013 instead of the post-treatment period. Relative-year specific AMEs is presented as well. All specifications include state-year fixed effects and a set of controls interacted with year indicator variables. The year-interacted controls include firm size, a state concentration index measuring the degree to which firm employment is concentrated in particular states, the share of a firm's workforce located in an ACA expansion state but not qualifying for ACA expanded Medicaid, and the share of a firm's workforce qualifying for ACA expanded Medicaid but not located in an ACA expansion state. Standard errors are clustered at the firm-level and are computed for quantities like the AME and the ATE using the delta method. Statistical significance indicators for are as follows: * $p < .05$, ** $p < .01$, and *** $p < .001$. The outcomes are as shown, with the Offer Rate referring to the percentage share of workers offered health insurance by the given establishment, not the share of establishments offering insurance to at least one worker. An ATT for Year-6 is now shown for the turnover variable because it is not observed in 2008 in the MEPS-ICAR. The Placebo Randomization Test statistic reports the share of placebo estimates, produced after re-randomizing the set of states labelled as ACA expansion states, that are as large or larger than, and sharing the same sign as, the genuine estimated AME. For more details on the variables and on how the ATTs are computed, please refer to sections 2 and 3 respectively.

Table 4. Main Results by ACA vs Non-ACA States

	% Offer	% Enrollment	% Part-time	Employment	Turnover	Avg Age
Avg. Marginal Effect (AME)						
Non-ACA State	-0.140	0.147	0.0332	0.0255	0.00369	-0.0344
	(0.131)	(0.109)	(0.114)	(0.195)	(0.00242)	(0.0294)
ACA State	-0.176**	-0.119*	0.108	0.115	0.00474***	-0.0258
	(0.0609)	(0.0495)	(0.0572)	(0.104)	(0.00109)	(0.0139)
p-val: ACA = Non-ACA	0.780	0.0136	0.520	0.682	0.686	0.798
Avg. Treatment Effect (ATE)						
Non-ACA State	-1.117	1.206	0.261	0.124	0.0258	-0.262
	(1.027)	(0.858)	(0.893)	(1.532)	(0.0189)	(0.235)
ACA State	-2.722**	-1.829*	1.630	1.759	0.0703***	-0.385
	(0.935)	(0.763)	(0.874)	(1.600)	(0.0168)	(0.215)
P-val: ACA = Non-ACA	0.181	0.00227	0.219	0.455	0.0706	0.713
Pre-Treatment AME						
Non-ACA State	0.0474	0.0955	-0.00122	-0.102	-0.000907	-0.0319
	(0.137)	(0.112)	(0.119)	(0.160)	(0.00237)	(0.0286)
ACA State	0.0229	-0.0537	-0.0408	-0.0148	0.00178	0.0144
	(0.0597)	(0.0499)	(0.0544)	(0.0990)	(0.00106)	(0.0131)
Pre-Treatment ATE						
Non-ACA State	0.443	0.893	0.0374	-0.878	-0.00841	-0.269
	(1.232)	(1.017)	(1.077)	(1.442)	(0.0218)	(0.259)
ACA State	0.368	-0.897	-0.661	-0.201	0.0306	0.245
	(0.987)	(0.823)	(0.900)	(1.632)	(0.0180)	(0.217)
Mean Treatment Exposure						
Non-ACA State	8.503	8.503	8.503	8.503	8.503	8.503
ACA State	16.04	16.04	16.04	16.04	16.04	16.04
Pre-Treatment Mean Y						
Non-ACA State	74.59	53.35	22.76	41.67	.6329	36.58
ACA State	74.36	53.77	23.38	44.82	.5495	36.68

Notes: All estimates shown in this table are computed similarly as to in Table 3, but are derived from models where the average marginal effect (AME) of treatment exposure is permitted to vary between establishments located in Affordable Care Act (ACA) expansion states and non-expansion states. Control variables are similarly interacted. All AME and average treatment effect (ATE) estimates are shown separately for ACA and non-ACA expansion states in this table. For the main treatment effect estimates, p-values are shown for F-tests of the hypothesis that the treatment effect observed among establishments located in ACA expansion states is the same as that observed among establishments located in non-expansion states. For more information on how these estimates are produced, please refer to the notes to Table 3.

Table 5. High Exposure Diff-in-Diff: Main Results

	% Offer	% Enrollment	% Part-time	Employment	Turnover	Avg. Age
Average Treatment Effects on the Treatment Group (ATT)						
Overall ATT	-9.314**	-5.329**	5.471*	-2.482	0.162***	-1.641***
	(2.966)	(1.864)	(2.306)	(2.797)	(0.0385)	(0.491)
Pre-Treatment ATT	-2.231	-2.676	1.075	-3.440	0.0384	-0.770
	(2.739)	(2.008)	(2.185)	(2.558)	(0.0327)	(0.445)
Relative Year-Specific ATTs						
Year-6	-1.300	-2.346	-4.605	-10.11*		-0.798
	(4.348)	(3.454)	(3.186)	(4.110)		(0.612)
Year-5	-2.553	-2.097	0.711	-4.910	0.0307	-0.749
	(4.543)	(3.463)	(3.417)	(3.643)	(0.0426)	(0.547)
Year-4	-1.242	-0.653	-0.394	1.673	0.0424	-0.990
	(3.407)	(2.479)	(2.659)	(3.408)	(0.0426)	(0.527)
Year-3	-4.403	-4.771*	3.544	-5.529	0.0567	-0.794
	(3.263)	(2.237)	(2.709)	(3.270)	(0.0425)	(0.581)
Year-2	-1.578	-3.420	4.697*	0.196	0.0264	-0.560
	(2.535)	(1.987)	(2.395)	(2.690)	(0.0410)	(0.515)
Year-1	0	0	0	0	0	0
	.	.	.	.	.	.
Year+0	-7.516*	-3.519	4.079	0.390	0.0733	-1.446*
	(3.592)	(2.267)	(2.846)	(3.790)	(0.0424)	(0.638)
Year+1	-8.661*	-5.377*	4.381	-2.883	0.111**	-1.426*
	(3.432)	(2.384)	(2.769)	(3.658)	(0.0428)	(0.617)
Year+2	-11.87***	-6.506**	7.225*	-1.681	0.187***	-1.333*
	(3.326)	(2.370)	(3.164)	(3.832)	(0.0515)	(0.597)
Year+3	-11.90***	-7.375**	6.287	-1.208	0.135**	-1.718**
	(3.444)	(2.410)	(3.251)	(3.914)	(0.0472)	(0.647)
Year+4	-8.699*	-4.323	6.256	-8.997*	0.332*	-2.853***
	(3.984)	(2.665)	(3.403)	(4.061)	(0.140)	(0.689)
Year+5	-7.968	-5.509	5.461	-1.654	0.188***	-1.268
	(4.270)	(2.854)	(3.637)	(4.474)	(0.0513)	(0.769)

Notes: Statistics shown are derived from establishment-level MEPS-ICAR data for the years 2008-2019, weighted and using a sample of establishments as described in Table 1. All estimates are derived from the high exposure difference-in-differences specification estimated following Wooldridge (2021), implemented via Hegland (2023). The overall Average Treatment effect on the Treated group (ATT) gives the average effect of the ACA Medicaid expansions, obtained by comparing changes in outcomes between treated (Medicaid exposure $\geq$ 25%) and untreated establishments from the year immediately prior to Medicaid expansion (2013) to the post-treatment period as a whole. The pre-treatment ATT is computed similarly to the overall ATT, but comparing the pre-treatment period to 2013. Relative-year specific ATTs are computed as well. All specifications include state, year, and treatment status fixed effects. Standard errors are clustered at the state level and are computed for quantities like the ATT using the delta method. Statistical significance indicators for ATTs are as follows: * $p < .05$, ** $p < .01$, and *** $p < .001$. The outcomes are as shown, with the Offer Rate referring to the percentage share of workers offered health insurance by the given establishment, not the share of establishments offering insurance to at least one worker. An ATT for Year-6 is now shown for the turnover variable because it is not observed in 2008 in the MEPS-ICAR. For more details on the variables and on how the ATTs are computed, please refer to sections 2 and 3 respectively.

Table 6. Pay and Payroll Results

	Mean TC	25th Pctile TC	50th Pctile TC	75th Pctile TC	Total Payroll TC
Overall Treatment Effects (Poisson)					
Avg. Marginal Effect (AME)	-0.00702***	-0.00830***	-0.00596**	-0.00347	-0.00349
	(0.00165)	(0.00247)	(0.00228)	(0.00187)	(0.00368)
Avg. Treatment Effect (ATE)	-0.0869***	-0.100**	-0.0722*	-0.0433	-0.0409
	(0.0210)	(0.0314)	(0.0290)	(0.0239)	(0.0464)
Pre-Treatment Effects (Poisson)					
AME	-0.000297	0.00107	0.00356	0.00156	-0.00186
	(0.00168)	(0.00242)	(0.00368)	(0.00179)	(0.00345)
ATE	-0.00352	0.0155	0.0491	0.0218	-0.0226
	(0.0232)	(0.0336)	(0.0508)	(0.0249)	(0.0477)
Relative Year-Specific AMEs (Poisson)					
Year-6	-0.00319	-0.00153	-0.000223	0.000502	-0.0124*
	(0.00206)	(0.00315)	(0.00292)	(0.00233)	(0.00490)
Year-5	0.000582	0.00212	0.00213	-0.000285	0.00172
	(0.00197)	(0.00303)	(0.00286)	(0.00330)	(0.00503)
Year-4	0.00357	0.00265	0.0172	0.00434*	0.00120
	(0.00295)	(0.00334)	(0.0141)	(0.00203)	(0.00450)
Year-3	-0.00178	0.000870	-0.00162	0.000974	-0.000634
	(0.00188)	(0.00291)	(0.00283)	(0.00226)	(0.00465)
Year-2	-0.000799	0.00111	0.000122	0.00224	0.000357
	(0.00180)	(0.00271)	(0.00263)	(0.00230)	(0.00396)
Year-1	0	0	0	0	0
	.	.	.	.	.
Year+0	-0.00548*	-0.00440	-0.00181	-0.00320	0.00217
	(0.00226)	(0.00310)	(0.00283)	(0.00309)	(0.00446)
Year+1	-0.00311	-0.00214	-0.00254	-0.00173	-0.00256
	(0.00186)	(0.00302)	(0.00280)	(0.00244)	(0.00455)
Year+2	-0.00704**	-0.00406	-0.00497	-0.00413	-0.000214
	(0.00227)	(0.00315)	(0.00290)	(0.00237)	(0.00492)
Year+3	-0.00567*	-0.00452	-0.00504	-0.00195	-0.00555
	(0.00284)	(0.00307)	(0.00294)	(0.00328)	(0.00601)
Year+4	-0.0110***	-0.00878*	-0.00946**	-0.00666*	-0.00636
	(0.00246)	(0.00394)	(0.00320)	(0.00261)	(0.00501)
Year+5	-0.00949***	-0.0250***	-0.0114***	-0.00310	-0.00778
	(0.00205)	(0.00313)	(0.00259)	(0.00197)	(0.00670)
Statistics					
Placebo Randomization Test	0.0500	0.133	0.123	0.0200	0.402
Avg. Pre-Treatment Y	32230	36040	38420	38900	2621000
Mean Treatment Exposure	13.33	13.33	13.33	13.33	13.33

Notes: All estimates in this table are computed as in Table 3, but with different outcomes. TC refers to Total Compensation, the sum of workers' W2-pay from a given establishment and their employer's health insurance premium contributions. Total Payroll TC is the sum of TC across all workers at an establishment. For more information on these estimates, please refer to the notes to Table 3.

Table 7. Insurance Results

	Deductible	Total Premium	Firm Premium	Worker Premium
Overall Treatment Effects				
Avg. Marginal Effect (AME)	1.955	-19.66**	-14.58**	-5.081
	(2.284)	(6.718)	(5.566)	(3.036)
Avg. Treatment Effect (ATE)	22.97	-249.1**	-183.9**	-65.22
	(29.21)	(85.94)	(71.07)	(38.62)
ATE as % of Avg. Pre-Treat. Y	2.39%	-2.88%	-3.01%	-2.58%
Pre-Treatment Effects				
AME	-0.729	-7.979	-7.594	-0.388
	(2.356)	(6.709)	(5.499)	(3.120)
ATE	-10.35	-111.7	-106.2	-5.607
	(32.61)	(93.06)	(76.24)	(43.21)
Relative Year-Specific AMEs				
Year-6	-1.353	-2.451	-2.509	0.0576
	(2.780)	(8.381)	(6.922)	(4.361)
Year-5	1.390	-12.62	-10.41	-2.227
	(2.656)	(7.878)	(6.812)	(3.613)
Year-4	0.892	-2.556	-1.287	-1.269
	(2.894)	(8.449)	(7.177)	(3.569)
Year-3	-0.641	-18.44*	-19.85**	1.402
	(2.725)	(8.266)	(6.839)	(3.894)
Year-2	-3.936	-3.709	-3.838	0.127
	(2.375)	(8.271)	(6.589)	(3.732)
Year-1	0	0	0	0
	.	.	.	.
Year+0	-2.131	-13.55	-9.655	-3.897
	(2.920)	(9.306)	(7.361)	(3.885)
Year+1	-0.555	-21.06*	-14.73	-6.325
	(3.260)	(9.701)	(7.664)	(4.098)
Year+2	6.086*	-24.77**	-16.36*	-8.418*
	(2.693)	(8.649)	(7.077)	(3.986)
Year+3	7.103*	-17.46*	-16.43*	-1.028
	(3.140)	(8.835)	(7.257)	(4.283)
Year+4	-0.0883	-24.98**	-21.44**	-3.533
	(3.051)	(8.838)	(7.220)	(4.172)
Year+5	1.145	-16.10	-8.712	-7.390
	(3.200)	(9.122)	(7.523)	(4.338)
Statistics				
Placebo Randomization Test	0.424	0.0200	0.0290	0.239
Avg. Pre-Treatment Y	960.5	8637	6110	2527
Mean Treatment Exposure	13.33	13.33	13.33	13.33

Notes: All estimates in this table are computed as in Table 3, but with different outcomes. Premiums and deducibles are those of the establishment's enrollment-weighted average plan. For more information on these estimates, please refer to the notes to Table 3.

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A Appendix Tables

Appendix Table A1. Summary Statistics (Employment-Weighted)

	All States		ACA States			
	Mean	SD	Mean	SD	Mean	SD
Share of Full Sample (%)	100		65.43		34.57	
Treatment Exposure Rate (%)	11.26	13.25	13.42	14.42	7.18	9.41
SFW in Non-ACA State and ACA Medicaid Eligible (%)	9.028	12.69	5.657	8.142	15.41	16.68
SFW in ACA State and Not ACA Medicaid Eligible (%)	49.48	27.37	60.51	22.75	28.6	22.83
SFW in ACA State (%)	60.74	29.34	73.93	21.15	35.79	26.3
SFW Eligible for ACA Medicaid (%)	20.29	19.27	19.08	18.58	22.59	20.3
Firm Employment	58800	168300	55170	155800	65680	189700
State Concentration Index	36.02	32.88	36.89	33.17	34.37	32.26
Offer Rate (%)	76.76	28.94	76.79	28.8	76.71	29.2
Enrollment Rate (%)	58.21	30.42	58.54	30.24	57.58	30.76
Part-time Rate (%)	19.55	26.38	19.56	26.2	19.52	26.73
Establishment Employment	1135	4227	1144	3473	1119	5371
Turnover Rate	.497	.5736	.4689	.5494	.5506	.6135
Average Age	38.42	6.785	38.59	6.805	38.12	6.736
Mean Total Compensation (TC)	45950	44350	48960	47550	40240	36880
25th Percentile TC	49950	192800	52620	110200	44880	290800
50th Percentile TC	52680	117500	56350	133200	45740	79360
75th Percentile TC	55530	98290	57640	91550	51530	109800
Total Payroll TC (1000s)	96730	417900	112400	492600	66990	211000
Part-time Offer Rate (%)	5.725	13.82	5.869	13.73	5.451	13.97
Full-time Offer Rate (%)	71.03	30.58	70.92	30.48	71.25	30.79
Mean Pay	41340	42640	44210	45860	35910	35130
25th Percentile Pay	46630	192400	49210	109300	41750	290600
50th Percentile Pay	47530	116600	51020	132300	40940	78300
75th Percentile Pay	49350	97390	51270	90550	45730	109100
Total Payroll (1000s)	90110	399000	105200	471700	61620	195100
Average Deductible	1220	1102	1152	1072	1348	1146
Average Total Premium	9986	3630	10150	3674	9667	3524
Average Firm Premium	7295	3342	7495	3413	6915	3171
Average Worker Premium	2691	1694	2659	1671	2753	1735

Notes: All statistics are from a sample of establishments that are a part of multi-establishment firms with at least 100 employees, drawn from the Medical Expenditure Panel Survey- Insurance Component with Administrative Records (MEPS-ICAR), from 2008-2019. Estimates are weighted to be nationally representative of workers employed at US private sector business establishments, excluding railroads, meeting the sample inclusion requirement. The three panels provide results for all such establishments, just those in states that expanded Medicaid through the Affordable Care Act (ACA) in or before 2019, and those in states that did not. Among the variables shown, the Treatment Exposure Rate is the share of an establishment's parent firm's overall workforce that resides in an ACA state with a household income and composition making them eligible for ACA expanded Medicaid. SFW refers to the Share of parent Firm's Workforce. ACA Medicaid Eligible refers to workers that would be eligible for Medicaid through an ACA expansion, regardless of whether these workers are in an ACA expansion state. Offer Rate refers to the share of workers offered health insurance by a given establishment. TC refers to Total Compensation, and consists of workers' W2-derived annual pay for their job at the establishment summed with their employer's health insurance premium contributions. All other variables are as shown.

Appendix Table A2. Offer and Enrollment Results by Part Time vs Full Time Status

	% Part-time	% Offer	% Part-time Offer	% Full-time Offer
Overall Treatment Effects				
Avg. Marginal Effect (AME)	0.101*	-0.174***	-0.0945*	-0.0792
	(0.0451)	(0.0515)	(0.0412)	(0.0437)
Avg. Treatment Effect (ATE)	1.250*	-2.206***	-1.242*	-0.964
	(0.567)	(0.651)	(0.513)	(0.553)
ATE as % of Avg. Pre-Treat. Y	5.40%	-2.96%	-17.36%	-1.43%
Pre-Treatment Effects				
AME	-0.0180	0.0283	0.0388	-0.0104
	(0.0445)	(0.0497)	(0.0370)	(0.0409)
ATE	-0.230	0.398	0.540	-0.142
	(0.616)	(0.688)	(0.512)	(0.566)
Relative Year-Specific AMEs				
Year-6	-0.0550	-0.0274	0.0101	-0.0374
	(0.0638)	(0.0788)	(0.0561)	(0.0642)
Year-5	-0.0772	0.0650	0.0217	0.0433
	(0.0606)	(0.0749)	(0.0496)	(0.0654)
Year-4	-0.0937	0.0909	0.0246	0.0663
	(0.0561)	(0.0655)	(0.0474)	(0.0548)
Year-3	0.0610	0.0416	0.110*	-0.0683
	(0.0527)	(0.0562)	(0.0453)	(0.0490)
Year-2	0.0737	-0.0302	0.0270	-0.0572
	(0.0516)	(0.0549)	(0.0373)	(0.0466)
Year-1	0	0	0	0
	.	.	.	.
Year+0	0.0759	-0.155*	-0.100**	-0.0547
	(0.0548)	(0.0631)	(0.0388)	(0.0598)
Year+1	0.0417	-0.155*	-0.150***	-0.00507
	(0.0587)	(0.0630)	(0.0391)	(0.0576)
Year+2	0.108	-0.204***	-0.136**	-0.0676
	(0.0566)	(0.0601)	(0.0449)	(0.0540)
Year+3	0.0768	-0.261***	-0.128**	-0.133*
	(0.0615)	(0.0605)	(0.0470)	(0.0532)
Year+4	0.167*	-0.196**	-0.0588	-0.138*
	(0.0665)	(0.0749)	(0.0620)	(0.0645)
Year+5	0.133	-0.0713	0.000510	-0.0718
	(0.0726)	(0.0806)	(0.0665)	(0.0707)
Statistics				
Placebo Randomization Test	0.0240	0.0280	0.419	0.0150
Avg. Pre-Treatment Y	23.16	74.44	7.156	67.28
Mean Treatment Exposure	13.33	13.33	13.33	13.33

Notes: All estimates in this table are computed as in Table 3, but with different outcomes. Note that the part and full time offer rates are constructed so that they sum to the overall offer rate. For more information on these estimates, please refer to the notes to Table 3.

Appendix Table A3. Main Results with Controls

	% Offer	% Enrollment	% Part-time	Employment	Turnover	Avg Age
Full Controls						
Avg. Marginal Effect (AME)	-0.174***	-0.0479	0.101*	0.0343	0.00460***	-0.0379***
	(0.0515)	(0.0402)	(0.0451)	(0.0709)	(0.000932)	(0.0102)
Avg. Treatment Effect (ATE)	-2.206***	-0.593	1.250*	0.394	0.0559***	-0.469***
	(0.651)	(0.510)	(0.567)	(0.896)	(0.0118)	(0.129)
Pre-Treatment AME	0.0283	-0.0383	-0.0180	-0.0802	0.00149	-0.0116
	(0.0497)	(0.0414)	(0.0445)	(0.0658)	(0.000934)	(0.00957)
Pre-Treatment ATE	0.398	-0.519	-0.230	-1.070	0.0214	-0.151
	(0.688)	(0.573)	(0.616)	(0.907)	(0.0132)	(0.133)
Limited Controls						
Avg. Marginal Effect (AME)	-0.170***	-0.0464	0.106*	0.0323	0.00464***	-0.0386***
	(0.0509)	(0.0402)	(0.0445)	(0.0708)	(0.000919)	(0.0103)
Avg. Treatment Effect (ATE)	-2.155***	-0.577	1.312*	0.390	0.0565***	-0.480***
	(0.643)	(0.510)	(0.559)	(0.895)	(0.0116)	(0.132)
Pre-Treatment AME	0.418	-0.517	-0.192	-0.920	0.0225	-0.172
	(0.683)	(0.577)	(0.612)	(0.901)	(0.0129)	(0.136)
Pre-Treatment ATE	0.0298	-0.0382	-0.0152	-0.0693	0.00156	-0.0131
	(0.0494)	(0.0416)	(0.0442)	(0.0652)	(0.000911)	(0.00982)
No Controls						
Avg. Marginal Effect (AME)	-0.187***	-0.0561	0.119*	0.0451	0.00492***	-0.0451***
	(0.0535)	(0.0447)	(0.0472)	(0.0761)	(0.000942)	(0.0113)
Avg. Treatment Effect (ATE)	-2.374***	-0.702	1.472*	0.532	0.0597***	-0.559***
	(0.675)	(0.565)	(0.593)	(0.963)	(0.0118)	(0.143)
Pre-Treatment AME	0.0547	-0.0342	-0.0313	-0.0502	0.000994	-0.0156
	(0.0513)	(0.0468)	(0.0458)	(0.0681)	(0.000896)	(0.0103)
Pre-Treatment ATE	0.768	-0.456	-0.419	-0.655	0.0144	-0.206
	(0.709)	(0.648)	(0.634)	(0.941)	(0.0127)	(0.143)
Statistics						
Avg. Pre-Treatment Y	74.44	53.62	23.16	43.69	.5796	36.64
Mean Treatment Exposure	13.33	13.33	13.33	13.33	13.33	13.33

Notes: All estimates shown in this table are computed as in Table 3, but with varying sets of included controls. The Full Controls case includes state-year fixed effects and year-interacted controls for firm size, a state concentration index measuring the degree to which firm employment is concentrated in particular states, the share of a firm's workforce located in an ACA expansion state but not qualifying for ACA expanded Medicaid, and the share of a firm's workforce qualifying for ACA expanded Medicaid but not located in an ACA expansion state. The Limited Controls case is the same, but removes the firm size and firm employment concentration index controls. Finally, the No Controls includes only the state-year fixed effects. For more information on how these estimates are produced, please refer to the notes to Table 3.

Appendix Table A4. Employment-Weighted Main Results

	% Offer	% Enrollment	% Part-time	Employment	Turnover	Avg Age
Overall Treatment Effects						
Avg. Marginal Effect (AME)	-0.227***	-0.145***	0.0878*	-2.250	0.00417***	-0.0108
	(0.0491)	(0.0395)	(0.0442)	(5.053)	(0.000832)	(0.00852)
Avg. Treatment Effect (ATE)	-2.486***	-1.568***	0.944*	-18.13	0.0447***	-0.109
	(0.534)	(0.430)	(0.482)	(54.88)	(0.00915)	(0.0927)
ATE as % of Avg. Pre-Treat. Y	-3.19%	-2.62%	4.89%	-1.61%	9.59%	-0.28%
Pre-Treatment Effects						
AME	-0.00400	-0.0756	-0.0156	-4.927	0.00102	-0.0108
	(0.0496)	(0.0435)	(0.0462)	(7.159)	(0.000913)	(0.00786)
ATE	-0.0291	-0.878	-0.201	-57.41	0.0123	-0.118
	(0.569)	(0.497)	(0.528)	(83.84)	(0.0109)	(0.0903)
Relative Year-Specific AMEs						
Year-6	-0.0441	-0.0444	0.0151	-2.856	.	-0.0286*
	(0.0800)	(0.0769)	(0.0782)	(9.244)	.	(0.0115)
Year-5	0.0182	-0.0397	-0.114	-15.31	0.00195	-0.00917
	(0.0681)	(0.0567)	(0.0623)	(23.65)	(0.00170)	(0.0114)
Year-4	0.0227	-0.112	-0.0716	-0.962	0.000999	-0.0109
	(0.0748)	(0.0707)	(0.0660)	(6.472)	(0.00131)	(0.0109)
Year-3	-0.0147	-0.109*	0.0661	-7.805	-0.000259	-0.00732
	(0.0621)	(0.0543)	(0.0542)	(8.140)	(0.000975)	(0.0102)
Year-2	0.000511	-0.0771	0.0253	2.330	0.00135	0.00278
	(0.0590)	(0.0472)	(0.0497)	(5.236)	(0.000939)	(0.00910)
Year-1	0	0	0	0	0	0
	.	.	.	.	.	.
Year+0	-0.217***	-0.0895	0.0290	8.529	0.00358*	0.00769
	(0.0608)	(0.0498)	(0.0635)	(5.484)	(0.00161)	(0.0106)
Year+1	-0.227***	-0.152**	0.0943	4.697	0.00264*	-0.0132
	(0.0645)	(0.0486)	(0.0619)	(5.815)	(0.00111)	(0.0107)
Year+2	-0.252***	-0.138*	0.124*	1.187	0.00221*	-0.00711
	(0.0623)	(0.0537)	(0.0588)	(6.781)	(0.00103)	(0.0107)
Year+3	-0.324***	-0.214***	0.0894	-6.797	0.00404***	-0.0178
	(0.0632)	(0.0526)	(0.0578)	(5.720)	(0.00109)	(0.0122)
Year+4	-0.225**	-0.200***	0.120	-9.847	0.00531***	-0.0366**
	(0.0719)	(0.0570)	(0.0672)	(7.046)	(0.00119)	(0.0119)
Year+5	-0.120	-0.0762	0.0671	-9.680	0.00695***	0.00398
	(0.0750)	(0.0721)	(0.0755)	(7.763)	(0.00127)	(0.0141)
Statistics						
Avg. Pre-Treatment Y	78.05	59.8	19.32	1128	.4661	38.25
Mean Treatment Exposure	13.33	13.33	13.33	13.33	13.33	13.33

Notes: All estimates shown in this table are computed as in Table 3, with the exception that estimates are employment-weighted rather than establishment-weighted. For more information on how these estimates are produced, please refer to the notes to Table 3. For more on the alternative weighting system, please refer to the notes to Table A1.

Appendix Table A5. Pay and Payroll Results by ACA vs Non-ACA States

	Mean TC	25th Pctile TC	50th Pctile TC	75th Pctile TC	Total Payroll TC
Avg. Marginal Effect (AME) (Poisson)					
Non-ACA State	-0.000717	-0.00931	0.00343	0.0118	-0.000806
	(0.00540)	(0.00764)	(0.00821)	(0.00604)	(0.00778)
ACA State	-0.00668***	-0.00823**	-0.00670**	-0.00471*	0.00200
	(0.00184)	(0.00280)	(0.00253)	(0.00212)	(0.00480)
P-val: ACA = Non-ACA	0.298	0.897	0.240	0.0111	0.757
Avg. Treatment Effect (ATE) (Poisson)					
Non-ACA State	-0.00126	-0.0626	0.0334	0.0977*	-0.00849
	(0.0424)	(0.0597)	(0.0650)	(0.0484)	(0.0612)
ACA State	-0.101***	-0.124**	-0.101**	-0.0723*	0.0339
	(0.0283)	(0.0433)	(0.0389)	(0.0328)	(0.0734)
P-val: ACA = Non-ACA	0.0522	0.417	0.0790	0.00438	0.655
Pre-Treatment AME (Poisson)					
Non-ACA State	0.00792	0.00607	0.0233*	0.0176**	0.0000245
	(0.00537)	(0.00644)	(0.0107)	(0.00661)	(0.00782)
ACA State	0.000120	0.00148	0.000354	-0.000681	0.00138
	(0.00175)	(0.00260)	(0.00256)	(0.00207)	(0.00439)
Pre-Treatment ATE (Poisson)					
Non-ACA State	0.0716	0.0550	0.204*	0.161**	0.00288
	(0.0480)	(0.0581)	(0.0934)	(0.0597)	(0.0708)
ACA State	0.00234	0.0240	0.00586	-0.0119	0.0256
	(0.0289)	(0.0429)	(0.0424)	(0.0344)	(0.0725)
Mean Treatment Exposure					
Non-ACA State	8.503	8.503	8.503	8.503	8.503
ACA State	16.04	16.04	16.04	16.04	16.04
Pre-Treatment Mean Y					
Non-ACA State	30820	34340	37290	37820	2220000
ACA State	33020	37000	39050	39510	2847000

Notes: All estimates shown in this table are computed similarly as to in Table 6, but are derived from models where the average marginal effect (AME) of treatment exposure is permitted to vary between establishments located in Affordable Care Act (ACA) expansion states and non-expansion states. Control variables are similarly interacted. All AME and average treatment effect (ATE) estimates are shown separately for ACA and non-ACA expansion states in this table. For the main treatment effect estimates, p-values are shown for F-tests of the hypothesis that the treatment effect observed among establishments located in ACA expansion states is the same as that observed among establishments located in non-expansion states. For more information on how these estimates are produced, please refer to the notes to Tables 6 and 3.

Appendix Table A6. Pay and Payroll Results with Controls

	Mean TC	25th Pctile TC	50th Pctile TC	75th Pctile TC	Total Payroll TC
Full Controls					
Avg. Marginal Effect (AME)	-0.00702***	-0.00830***	-0.00596**	-0.00347	-0.00349
	(0.00165)	(0.00247)	(0.00228)	(0.00187)	(0.00368)
Avg. Treatment Effect (ATE)	-0.0869***	-0.100**	-0.0722*	-0.0433	-0.0409
	(0.0210)	(0.0314)	(0.0290)	(0.0239)	(0.0464)
Pre-Treatment AME	-0.000297	0.00107	0.00356	0.00156	-0.00186
	(0.00168)	(0.00242)	(0.00368)	(0.00179)	(0.00345)
Pre-Treatment ATE	-0.00352	0.0155	0.0491	0.0218	-0.0226
	(0.0232)	(0.0336)	(0.0508)	(0.0249)	(0.0477)
Limited Controls					
Avg. Marginal Effect (AME)	-0.00688***	-0.00812***	-0.00599**	-0.00335	-0.00279
	(0.00161)	(0.00241)	(0.00226)	(0.00182)	(0.00364)
Avg. Treatment Effect (ATE)	-0.0849***	-0.0979**	-0.0723*	-0.0414	-0.0317
	(0.0205)	(0.0307)	(0.0287)	(0.0233)	(0.0459)
Pre-Treatment AME	-0.000733	0.0174	0.0470	0.0244	-0.0100
	(0.0230)	(0.0331)	(0.0497)	(0.0243)	(0.0484)
Pre-Treatment ATE	-0.0000958	0.00121	0.00340	0.00175	-0.000927
	(0.00166)	(0.00238)	(0.00361)	(0.00174)	(0.00350)
No Controls					
Avg. Marginal Effect (AME)	-0.00798***	-0.0102***	-0.00697**	-0.00307	-0.00278
	(0.00199)	(0.00264)	(0.00266)	(0.00209)	(0.00395)
Avg. Treatment Effect (ATE)	-0.0981***	-0.122***	-0.0839*	-0.0379	-0.0328
	(0.0253)	(0.0336)	(0.0338)	(0.0266)	(0.0499)
Pre-Treatment AME	0.00127	0.00227	0.00404	0.00336	-0.000552
	(0.00203)	(0.00255)	(0.00378)	(0.00211)	(0.00377)
Pre-Treatment ATE	0.0183	0.0322	0.0557	0.0466	-0.00509
	(0.0281)	(0.0353)	(0.0522)	(0.0293)	(0.0521)
Statistics					
Avg. Pre-Treatment Y	32230	36040	38420	38900	2621000
Mean Treatment Exposure	13.33	13.33	13.33	13.33	13.33

Notes: All estimates shown in this table are computed as in Table 6, but with varying sets of included controls. The Full Controls case includes state-year fixed effects and year-interacted controls for firm size, a state concentration index measuring the degree to which firm employment is concentrated in particular states, the share of a firm's workforce located in an ACA expansion state but not qualifying for ACA expanded Medicaid, and the share of a firm's workforce qualifying for ACA expanded Medicaid but not located in an ACA expansion state. The Limited Controls case is the same, but removes the firm size and firm employment concentration index controls. Finally, the No Controls includes only the state-year fixed effects. For more information on how these estimates are produced, please refer to the notes to Tables 6 and 3.

Appendix Table A7. Employment-Weighted Pay and Payroll Results

	Mean TC	25th Pctile TC	50th Pctile TC	75th Pctile TC	Total Payroll TC
Overall Treatment Effects (Poisson)					
Avg. Marginal Effect (AME)	-0.00980***	-0.00840*	-0.0141***	-0.00692**	0.0190
	(0.00162)	(0.00402)	(0.00321)	(0.00252)	(0.0177)
Avg. Treatment Effect (ATE)	-0.103***	-0.0859	-0.149***	-0.0719*	0.218
	(0.0176)	(0.0446)	(0.0342)	(0.0281)	(0.195)
Pre-Treatment Effects (Poisson)					
AME	-0.00173	0.00445	-0.000536	0.000355	0.0200
	(0.00172)	(0.00408)	(0.00312)	(0.00235)	(0.0247)
ATE	-0.0171	0.0542	-0.00443	0.00511	0.229
	(0.0201)	(0.0472)	(0.0365)	(0.0267)	(0.283)
Relative Year-Specific AMEs (Poisson)					
Year-6	-0.00842***	-0.00337	-0.00544	-0.00235	0.0318
	(0.00199)	(0.00482)	(0.00288)	(0.00520)	(0.0303)
Year-5	0.00114	0.00950	-0.00159	-0.000763	0.0249
	(0.00388)	(0.00657)	(0.00341)	(0.00395)	(0.0263)
Year-4	0.000733	0.00468	0.0106	0.00116	-0.0114
	(0.00222)	(0.00377)	(0.0108)	(0.00341)	(0.0224)
Year-3	-0.00231	0.00731	-0.00320	0.00110	0.0108
	(0.00237)	(0.00748)	(0.00300)	(0.00259)	(0.0346)
Year-2	0.000609	0.00453	-0.00245	0.00281	0.0421
	(0.00187)	(0.00442)	(0.00337)	(0.00325)	(0.0293)
Year-1	0	0	0	0	0
	.	.	.	.	.
Year+0	-0.00388	0.00117	-0.00316	0.00229	0.0396*
	(0.00202)	(0.00470)	(0.00264)	(0.00514)	(0.0201)
Year+1	-0.00390	0.00854	-0.00924**	-0.00533	0.0459
	(0.00202)	(0.00895)	(0.00352)	(0.00529)	(0.0300)
Year+2	-0.00738***	-0.0153	-0.00623	-0.00619*	0.0337
	(0.00207)	(0.00807)	(0.00344)	(0.00298)	(0.0311)
Year+3	-0.0138***	-0.00729	-0.0329*	-0.0128*	-0.0286
	(0.00355)	(0.00615)	(0.0134)	(0.00512)	(0.0209)
Year+4	-0.0125***	-0.00851*	-0.0146***	-0.0102**	0.0453
	(0.00239)	(0.00390)	(0.00349)	(0.00328)	(0.0243)
Year+5	-0.0164***	-0.0273***	-0.0172***	-0.00838**	-0.0193
	(0.00284)	(0.00461)	(0.00320)	(0.00287)	(0.0203)
Statistics					
Avg. Pre-Treatment Y	43670	48550	50080	50890	85070000
Mean Treatment Exposure	13.33	13.33	13.33	13.33	13.33

Notes: All estimates shown in this table are computed as in Table 6, with the exception that estimates are employment-weighted rather than establishment-weighted. For more information on how these estimates are produced, please refer to the notes to Tables 6 and 3. For more on the alternative weighting system, please refer to the notes to Table A1.

Appendix Table A8. Pay and Payroll Results Without Insurance Premium Adjustments

	Mean Pay	25th Pctile Pay	50th Pctile Pay	75th Pctile Pay	Total Payroll
Overall Treatment Effects (Poisson)					
Avg. Marginal Effect (AME)	-0.00756***	-0.00882***	-0.00609*	-0.00343	-0.00356
	(0.00185)	(0.00251)	(0.00249)	(0.00216)	(0.00376)
Avg. Treatment Effect (ATE)	-0.0935***	-0.107***	-0.0736*	-0.0428	-0.0416
	(0.0234)	(0.0319)	(0.0316)	(0.0276)	(0.0474)
Pre-Treatment Effects (Poisson)					
AME	-0.000179	0.000902	0.00379	0.00192	-0.00178
	(0.00186)	(0.00245)	(0.00395)	(0.00208)	(0.00350)
ATE	-0.00170	0.0134	0.0526	0.0268	-0.0214
	(0.0257)	(0.0340)	(0.0544)	(0.0289)	(0.0485)
Relative Year-Specific AMEs (Poisson)					
Year-6	-0.00371	-0.00206	-0.000555	0.000554	-0.0129**
	(0.00227)	(0.00321)	(0.00317)	(0.00272)	(0.00497)
Year-5	0.000679	0.00163	0.00192	-0.000221	0.00170
	(0.00217)	(0.00312)	(0.00312)	(0.00380)	(0.00516)
Year-4	0.00386	0.00229	0.0182	0.00497*	0.00166
	(0.00317)	(0.00333)	(0.0149)	(0.00234)	(0.00458)
Year-3	-0.00146	0.000994	-0.00149	0.00155	-0.000294
	(0.00208)	(0.00293)	(0.00308)	(0.00262)	(0.00474)
Year-2	-0.000427	0.00153	0.000702	0.00269	0.000486
	(0.00198)	(0.00273)	(0.00284)	(0.00268)	(0.00403)
Year-1	0	0	0	0	0
	.	.	.	.	.
Year+0	-0.00604*	-0.00468	-0.00196	-0.00341	0.00217
	(0.00252)	(0.00319)	(0.00306)	(0.00354)	(0.00458)
Year+1	-0.00316	-0.00251	-0.00216	-0.00176	-0.00232
	(0.00206)	(0.00307)	(0.00300)	(0.00285)	(0.00464)
Year+2	-0.00729**	-0.00413	-0.00472	-0.00394	-0.000272
	(0.00255)	(0.00325)	(0.00315)	(0.00272)	(0.00504)
Year+3	-0.00568	-0.00489	-0.00496	-0.00125	-0.00542
	(0.00317)	(0.00313)	(0.00318)	(0.00379)	(0.00621)
Year+4	-0.0122***	-0.00940*	-0.0101**	-0.00725*	-0.00615
	(0.00279)	(0.00406)	(0.00352)	(0.00304)	(0.00509)
Year+5	-0.0106***	-0.0263***	-0.0121***	-0.00291	-0.00868
	(0.00226)	(0.00315)	(0.00280)	(0.00224)	(0.00693)
Statistics					
Placebo Randomization Test	0.0500	0.133	0.123	0.0200	0.402
Avg. Pre-Treatment Y	28600	33510	34510	33940	2429000
Mean Treatment Exposure	13.33	13.33	13.33	13.33	13.33

Notes: All estimates in this table are computed as in Table 3, but with different outcomes. Pay refers to workers' W2-pay from a given establishment; Total Payroll to the sum of pay across all workers at an establishment. For more information on these estimates, please refer to the notes to Table 3.

Appendix Table A9. State Diff-in-Diff: Pay and Payroll Results

	Mean TC	25th Pctile TC	50th Pctile TC	75th Pctile TC	Total Payroll TC
Average Treatment Effects on the Treatment Group (ATT) (Poisson)					
Overall ATT	0.0820	0.0358	0.0601	0.104	0.0156
	(0.0593)	(0.0518)	(0.0584)	(0.0533)	(0.0492)
Pre-Treatment ATT	0.0801	0.0685	0.0488	0.0650	0.0457
	(0.0458)	(0.0390)	(0.0662)	(0.0502)	(0.0365)
Relative Year-Specific ATTs (Poisson)					
Year-6	0.0778	0.0828	0.0634	0.00716	-0.0287
	(0.0683)	(0.0615)	(0.0812)	(0.0854)	(0.0657)
Year-5	0.0486	0.0618	0.0598	0.0996	-0.00748
	(0.0645)	(0.0604)	(0.0824)	(0.0831)	(0.0457)
Year-4	0.0462	0.0171	-0.0126	0.0366	0.0717
	(0.0470)	(0.0484)	(0.119)	(0.0649)	(0.0529)
Year-3	0.142**	0.108*	0.0744	0.145**	0.0902
	(0.0511)	(0.0450)	(0.0640)	(0.0539)	(0.0546)
Year-2	0.0695	0.0262	0.0127	0.0458	0.0109
	(0.0450)	(0.0403)	(0.0746)	(0.0602)	(0.0363)
Year-1	0	0	0	0	0
	.	.	.	.	.
Year+0	0.109*	0.0976*	0.0413	0.121*	0.0313
	(0.0549)	(0.0484)	(0.0646)	(0.0478)	(0.0474)
Year+1	0.0962	0.0560	0.0355	0.0258	0.0158
	(0.0540)	(0.0558)	(0.0684)	(0.0755)	(0.0772)
Year+2	0.0914	0.0504	0.111	0.123	0.0258
	(0.0563)	(0.0672)	(0.0763)	(0.0754)	(0.0676)
Year+3	0.0279	-0.0933	0.0266	0.145*	0.0379
	(0.102)	(0.118)	(0.0535)	(0.0713)	(0.0980)
Year+4	0.0184	0.00375	0.0132	0.0467	-0.0214
	(0.104)	(0.100)	(0.106)	(0.0774)	(0.0637)
Year+5	0.160*	0.114*	0.143*	0.167**	0.00116
	(0.0622)	(0.0558)	(0.0594)	(0.0561)	(0.0542)

Notes: All estimates shown in this table are computed as in Table 2, but with different outcomes being considered. TC refers to Total Compensation, the sum of workers' W2-pay from a given establishment and their employer's health insurance premium contributions. Total Payroll TC is the sum of TC across all workers at an establishment. For more information on how these estimates are produced, please refer to the notes to Table 2.

Appendix Table A10. High Exposure Diff-in-Diff: Pay and Payroll Results

	Mean TC	25th Pctile TC	50th Pctile TC	75th Pctile TC	Total Payroll TC
Average Treatment Effects on the Treatment Group (ATT) (Poisson)					
Overall ATT	-0.177***	-0.250***	-0.172*	-0.0776	-0.173
	(0.0535)	(0.0718)	(0.0799)	(0.0628)	(0.0934)
Pre-Treatment ATT	0.0362	0.0571	0.128	0.0814	-0.0430
	(0.0555)	(0.0719)	(0.117)	(0.0590)	(0.0886)
Relative Year-Specific ATTs (Poisson)					
Year-6	0.0345	0.0548	0.0481	0.0372	-0.227
	(0.0683)	(0.102)	(0.0949)	(0.0849)	(0.129)
Year-5	0.0477	0.0881	0.104	0.0620	-0.0110
	(0.0706)	(0.0996)	(0.108)	(0.0881)	(0.148)
Year-4	0.123	0.0306	0.570	0.143*	0.123
	(0.104)	(0.112)	(0.422)	(0.0688)	(0.115)
Year-3	-0.0384	0.0851	-0.0744	0.0535	-0.187
	(0.0608)	(0.106)	(0.0908)	(0.0641)	(0.112)
Year-2	0.0157	0.0275	-0.00138	0.103	0.0402
	(0.0571)	(0.0833)	(0.0969)	(0.0871)	(0.111)
Year-1	0	0	0	0	0
	.	.	.	.	.
Year+0	-0.135	-0.155	-0.0801	-0.0821	0.0144
	(0.0740)	(0.0952)	(0.0937)	(0.102)	(0.141)
Year+1	-0.0840	-0.0823	-0.132	-0.0628	-0.214
	(0.0670)	(0.103)	(0.104)	(0.0901)	(0.148)
Year+2	-0.200**	-0.191*	-0.178	-0.141	-0.170
	(0.0688)	(0.0886)	(0.106)	(0.0756)	(0.123)
Year+3	-0.303***	-0.387***	-0.313**	-0.0468	-0.187
	(0.0786)	(0.102)	(0.105)	(0.0983)	(0.131)
Year+4	-0.183**	-0.152	-0.0904	-0.0857	-0.304
	(0.0659)	(0.0926)	(0.0961)	(0.0780)	(0.155)
Year+5	-0.212***	-0.659***	-0.300***	-0.0439	-0.242
	(0.0643)	(0.0922)	(0.0897)	(0.0704)	(0.137)

Notes: All estimates shown in this table are computed as in Table 5, but with different outcomes being considered. TC refers to Total Compensation, the sum of workers' W2-pay from a given establishment and their employer's health insurance premium contributions. Total Payroll TC is the sum of TC across all workers at an establishment. For more information on how these estimates are produced, please refer to the notes to Table 5.

Appendix Table A11. Insurance Results by ACA vs Non-ACA States

	Deductible	Total Premium	Firm Premium	Worker Premium
Avg. Marginal Effect (AME)				
Non-ACA State	-5.073	-12.46	0.296	-12.76
	(5.764)	(16.42)	(14.46)	(7.051)
ACA State	3.813	-28.67***	-21.58**	-7.096*
	(2.957)	(8.627)	(7.139)	(3.588)
P-val: ACA = Non-ACA	0.0908	0.356	0.150	0.440
Avg. Treatment Effect (ATE)				
Non-ACA State	-39.96	-97.16	4.517	-101.7
	(46.23)	(130.9)	(114.6)	(55.92)
ACA State	55.79	-436.4**	-326.1**	-110.3*
	(45.76)	(133.8)	(110.5)	(55.48)
P-val: ACA = Non-ACA	0.0513	0.0530	0.0253	0.905
Pre-Treatment AME				
Non-ACA State	-7.186	-1.296	7.539	-8.835
	(5.963)	(17.62)	(14.31)	(7.469)
ACA State	-0.0370	-14.27	-11.22	-3.057
	(3.004)	(7.955)	(6.763)	(3.567)
Pre-Treatment ATE				
Non-ACA State	-65.22	-16.57	62.94	-79.51
	(53.89)	(159.0)	(129.0)	(67.47)
ACA State	-1.047	-238.1	-187.0	-51.19
	(49.66)	(131.7)	(112.0)	(58.96)
Mean Treatment Exposure				
Non-ACA State	8.503	8.503	8.503	8.503
ACA State	16.04	16.04	16.04	16.04
Pre-Treatment Mean Y				
Non-ACA State	1052	8450	5902	2548
ACA State	909.3	8742	6226	2516

Notes: All estimates shown in this table are computed similarly as to in Table 7, but are derived from models where the average marginal effect (AME) of treatment exposure is permitted to vary between establishments located in Affordable Care Act (ACA) expansion states and non-expansion states. Control variables are similarly interacted. All AME and average treatment effect (ATE) estimates are shown separately for ACA and non-ACA expansion states in this table. For the main treatment effect estimates, p-values are shown for F-tests of the hypothesis that the treatment effect observed among establishments located in ACA expansion states is the same as that observed among establishments located in non-expansion states. For more information on how these estimates are produced, please refer to the notes to Tables 7 and 3.

Appendix Table A12. Insurance Results with Controls

	Deductible	Total Premium	Firm Premium	Worker Premium
Full Controls				
Avg. Marginal Effect (AME)	1.955	-19.66**	-14.58**	-5.081
	(2.284)	(6.718)	(5.566)	(3.036)
Avg. Treatment Effect (ATE)	22.97	-249.1**	-183.9**	-65.22
	(29.21)	(85.94)	(71.07)	(38.62)
Pre-Treatment AME	-0.729	-7.979	-7.594	-0.388
	(2.356)	(6.709)	(5.499)	(3.120)
Pre-Treatment ATE	-10.35	-111.7	-106.2	-5.607
	(32.61)	(93.06)	(76.24)	(43.21)
Limited Controls				
Avg. Marginal Effect (AME)	1.938	-19.58**	-14.31*	-5.273
	(2.311)	(6.728)	(5.583)	(3.007)
Avg. Treatment Effect (ATE)	22.71	-248.0**	-180.2*	-67.82
	(29.54)	(86.04)	(71.30)	(38.23)
Pre-Treatment AME	-12.20	-110.8	-99.88	-10.98
	(33.09)	(93.58)	(76.95)	(42.68)
Pre-Treatment ATE	-0.861	-7.909	-7.139	-0.773
	(2.390)	(6.747)	(5.548)	(3.082)
No Controls				
Avg. Marginal Effect (AME)	2.137	-20.43**	-14.54*	-5.892
	(2.393)	(6.922)	(5.838)	(3.085)
Avg. Treatment Effect (ATE)	25.47	-259.9**	-184.1*	-75.79
	(30.56)	(88.35)	(74.42)	(39.15)
Pre-Treatment AME	-1.267	-7.245	-5.174	-2.075
	(2.514)	(6.902)	(5.718)	(3.152)
Pre-Treatment ATE	-17.90	-102.6	-73.41	-29.24
	(34.78)	(95.76)	(79.32)	(43.64)
Statistics				
Avg. Pre-Treatment Y	960.5	8637	6110	2527
Mean Treatment Exposure	13.33	13.33	13.33	13.33

Notes: All estimates shown in this table are computed as in Table 7, but with varying sets of included controls. The Full Controls case includes state-year fixed effects and year-interacted controls for firm size, a state concentration index measuring the degree to which firm employment is concentrated in particular states, the share of a firm's workforce located in an ACA expansion state but not qualifying for ACA expanded Medicaid, and the share of a firm's workforce qualifying for ACA expanded Medicaid but not located in an ACA expansion state. The Limited Controls case is the same, but removes the firm size and firm employment concentration index controls. Finally, the No Controls includes only the state-year fixed effects. For more information on how these estimates are produced, please refer to the notes to Tables 7 and 3.

Appendix Table A13. Employment-Weighted Insurance Results

	Deductible	Total Premium	Firm Premium	Worker Premium
Overall Treatment Effects				
Avg. Marginal Effect (AME)	5.355**	-16.40**	-13.91*	-2.492
	(1.881)	(5.913)	(5.593)	(3.180)
Avg. Treatment Effect (ATE)	58.04**	-170.2**	-142.9*	-27.28
	(20.44)	(64.71)	(61.15)	(34.73)
ATE as % of Avg. Pre-Treat. Y	6.66%	-1.83%	-2.10%	-1.10%
Pre-Treatment Effects				
AME	0.854	-2.469	-3.102	0.629
	(1.820)	(6.004)	(5.502)	(3.228)
ATE	10.29	-28.98	-36.23	7.206
	(21.00)	(68.95)	(63.22)	(37.16)
Relative Year-Specific AMEs				
Year-6	-0.375	4.621	3.068	1.552
	(2.217)	(8.734)	(7.742)	(4.101)
Year-5	2.359	-3.289	-2.031	-1.276
	(2.771)	(7.714)	(7.245)	(4.120)
Year-4	1.510	-5.055	-5.664	0.609
	(2.246)	(8.113)	(7.482)	(3.885)
Year-3	1.016	-16.62*	-15.32*	-1.300
	(2.477)	(7.884)	(6.973)	(4.492)
Year-2	-0.161	7.343	3.851	3.491
	(1.988)	(6.931)	(6.212)	(3.713)
Year-1	0	0	0	0
	.	.	.	.
Year+0	1.473	-0.212	-1.683	1.471
	(2.236)	(9.084)	(7.863)	(4.209)
Year+1	7.190**	-8.860	-3.179	-5.681
	(2.515)	(7.682)	(6.858)	(3.985)
Year+2	6.870*	-10.20	-5.762	-4.440
	(2.790)	(7.501)	(7.202)	(4.139)
Year+3	4.634	-29.49***	-22.03**	-7.454
	(2.591)	(7.757)	(7.066)	(4.135)
Year+4	3.598	-30.41***	-29.99***	-0.413
	(2.619)	(8.238)	(7.605)	(4.330)
Year+5	8.129*	-17.26*	-18.70*	1.439
	(3.578)	(8.777)	(8.129)	(5.099)
Statistics				
Avg. Pre-Treatment Y	871.7	9296	6807	2489
Mean Treatment Exposure	13.33	13.33	13.33	13.33

Notes: All estimates shown in this table are computed as in Table 7, with the exception that estimates are employment-weighted rather than establishment-weighted. For more information on how these estimates are produced, please refer to the notes to Tables 7 and 3. For more on the alternative weighting system, please refer to the notes to Table A1.

Appendix Table A14. State Diff-in-Diff: Insurance Results

	Deductible	Total Premium	Firm Premium	Worker Premium
Average Treatment Effects on the Treatment Group (ATT)				
Overall ATT	-89.82*	185.0	183.1	1.856
	(39.67)	(181.7)	(153.6)	(55.05)
Pre-Treatment ATT	-17.54	-32.90	21.39	-54.36
	(37.49)	(114.0)	(111.1)	(33.67)
Relative Year-Specific ATTs				
Year-6	-5.261	-61.77	-22.25	-39.51
	(44.43)	(142.5)	(122.4)	(56.68)
Year-5	-16.80	-119.6	-75.17	-44.48
	(47.57)	(221.6)	(219.4)	(52.50)
Year-4	4.061	-109.5	-64.83	-44.70
	(46.13)	(161.4)	(150.9)	(40.36)
Year-3	-12.90	-30.94	-11.24	-19.71
	(48.63)	(147.0)	(148.5)	(54.61)
Year-2	-44.91	123.6	158.8	-35.48
	(57.66)	(144.4)	(125.9)	(53.38)
Year-1	0	0	0	0
	.	.	.	.
Year+0	-107.3*	214.6	191.6	22.92
	(48.10)	(202.1)	(170.1)	(69.54)
Year+1	-99.65	207.0	181.2	25.78
	(55.66)	(254.4)	(186.1)	(90.94)
Year+2	-45.81	116.2	63.37	52.86
	(69.55)	(211.7)	(190.1)	(76.30)
Year+3	-43.20	24.39	189.2	-164.8
	(57.38)	(248.9)	(191.3)	(87.20)
Year+4	-32.11	321.7	243.0	78.72
	(47.72)	(205.1)	(172.6)	(76.21)
Year+5	-228.0**	241.1	237.4	3.721
	(79.21)	(234.9)	(250.6)	(98.45)

Notes: All estimates shown in this table are computed as in Table 2, but with different outcomes being considered. Premiums and deducibles are those of the establishment's enrollment-weighted average plan. For more information on how these estimates are produced, please refer to the notes to Table 2.

Appendix Table A15. High Exposure Diff-in-Diff: Insurance Results

	Deductible	Total Premium	Firm Premium	Worker Premium
Average Treatment Effects on the Treatment Group (ATT)				
Overall ATT	53.56	-474.7	-383.4	-91.34
	(86.34)	(284.6)	(229.3)	(131.4)
Pre-Treatment ATT	30.37	-202.5	-172.9	-29.63
	(78.54)	(272.2)	(220.8)	(123.2)
Relative Year-Specific ATTs				
Year-6	53.72	203.5	84.75	118.8
	(92.38)	(342.1)	(273.8)	(181.9)
Year-5	146.3	-169.1	-139.9	-29.52
	(98.49)	(309.0)	(268.0)	(141.1)
Year-4	129.8	111.0	121.6	-10.59
	(101.6)	(352.2)	(295.3)	(140.5)
Year-3	-23.93	-743.9*	-744.0*	0.0506
	(88.47)	(344.0)	(289.3)	(150.6)
Year-2	-138.1	-333.7	-153.7	-179.9
	(82.95)	(369.2)	(297.5)	(145.0)
Year-1	0	0	0	0
	.	.	.	.
Year+0	-55.71	-470.3	-345.1	-125.2
	(106.9)	(363.5)	(291.3)	(157.8)
Year+1	20.33	-311.4	-210.1	-101.4
	(127.1)	(387.0)	(284.4)	(187.9)
Year+2	170.2	-795.6*	-603.8*	-191.8
	(110.0)	(344.0)	(281.4)	(156.7)
Year+3	86.03	-558.1	-479.3	-78.83
	(118.0)	(372.8)	(293.5)	(189.2)
Year+4	105.2	-558.2	-562.2	3.998
	(115.1)	(355.7)	(294.6)	(161.9)
Year+5	43.67	-181.1	-157.7	-23.35
	(130.5)	(401.0)	(342.2)	(176.6)

Notes: All estimates shown in this table are computed as in Table 5, but with different outcomes being considered. Premiums and deducibles are those of the establishment's enrollment-weighted average plan. For more information on how these estimates are produced, please refer to the notes to Table 5.