Do Firms Avoid Health Insurance Mandates? Evidence from the Self-Funding of Employer Plans

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Abstract

Fifty percent of the U.S. population gets health insurance through an employer, and roughly half of employers only offer one health plan. Therefore, the choices made by firms about what plan(s) to offer are critical to understanding the health insurance available to workers. This paper focuses on one dimension of the firm's decision: whether to self-fund plans (meaning the firm bears the financial risk of claims itself). I study whether firms use self-funding to avoid complying with mandates to cover specific procedures or providers. Using administrative data on the health plans offered by firms and a difference-in-differences design, I find that new mandates increase rates of self-funding among smaller firms (100-249 employees) by 3.2 percentage points, an increase of 14.5%. The mandates do not appear to affect larger firms (250+ employees), who are more likely to already be self-funded in the pre-period. These results imply that new mandates can lead to long-lasting reductions in the proportion of firms that are bound by any state health insurance regulations, including all previously mandated benefits as well as premium taxes.

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1 Introduction

Employers play a crucial role in shaping the health insurance options of workers and their families in the United States. Half of the population receives health insurance coverage from an employer (KFF, 2019). However, little is known about how employers decide what plans to offer. These decisions are important to understand because the offerings at a firm are a limited subset of all available plans: 43% of firms only offer one plan (AHRQ, 2021). Furthermore, the choices made by firms may not be optimal for workers – for example, if firms have imperfect information about worker preferences or satisfying these preferences is not profit-maximizing.

I focus on an important but understudied dimension of employer choice: whether to fully insure or to self-fund their health plan(s). Many employers offer self-funded health insurance plans, meaning the firm bears the financial risk of healthcare claims itself. In 2021, 64% of workers with employer-sponsored coverage were in self-funded plans, up from 44% in 1999 (Figure 1, KFF 2021). Self-funding is also more common among larger firms.[1] A potential explanation for why firms increasingly self-fund is that it allows firms to avoid state-level regulations. In particular, while plans at fully insured firms must comply with state requirements that health insurance covers specific procedures or providers ("mandated benefits"), plans at self-funded firms are exempt. However, self-funding is not particularly salient to workers, and the extent to which these high rates of self-funding reflect worker preferences is unclear. Because self-funding is consequential yet inconspicous, in 2019 New York began to require health insurance ID cards to clearly state whether the plan was fully insured or self-funded. The goal of this requirement was to ensure that all individuals "are armed with vital insurance information" and those "with state-regulated health plans receive consumer protections guaranteed by state law" (New York State DFS, 2019).

In this paper, I examine how self-funding among firms responds when states require

[1] In firms with 1,000 or more employees, 87% of covered workers are in self-funded plans, compared to only 21% of workers at firms with fewer than 200 workers (Figure A1).

insurance to cover new benefits. I use difference-in-differences and event study designs to estimate the causal effect of new mandated benefits. However, mandated benefits vary widely in their expected costs – while some mandates increase the cost of insurance by less than $1 per person per year (e.g., blood screening for lead), others cost more than $100 per person per year (e.g., mental healthcare). As a result, I focus on mandates that increase premiums by 1% or more and exclude mandates with negligible costs. I focus on the years 1999 to 2008 because this was a particularly active period for new mandates; the number of (costly) mandates nationwide grew from 528 to 676 (Figure 2).[2] In my baseline specification, I consider a binary treatment that compares states before and after the passage of the first *new* mandate during my time period. As a result, the mandates that existed prior to 1999 do not directly contribute to my estimates, which are identified from variation within states. Because some states pass multiple mandates in this period or even within the same year, I also consider specifications excluding these states or with a continuous measure of treatment.

I use an administrative dataset on the welfare benefits offered by firms, the Form 5500 Series. This dataset is ideal for my setting because whether or not a firm is self-funded is observed for all firms offering health benefits. The Form 5500 must be filed by all private-sector firms with 100 or more employees, providing extensive coverage of firms participating in the "large-group" health insurance market. Excluding firms in the "small-group" market is important because the regulatory environment for these plans quite different. In particular, during the time period of study, the majority of states allowed all firms in the small-group market to waive mandated benefits (Jensen and Morrisey, 1999).[3]

My main finding is that mandates increase self-funding rates among smaller firms (100-249 employees) by 3.2 percentage points, or 14.5%.[4] This indicates substantial avoidance of mandates among these firms, highlighting the importance of accounting for self-funding when

[2]Including mandates with negligible costs, the number of mandates grew from 1,187 to 1,647.

[3]States independently determine what size of firm is eligible for the large-group market, as high as 100 full-time equivalents but typically at 50.

[4]Controlling for firm size could bias my estimates if employment is changing as a result of the mandates. To avoid this concern, I categorize firms as small or large using their number of employees in the first year they are observed.

studying how mandated benefits affect workers. Because self-funded firms do not have to comply with *any* state regulations of health insurance, firms that avoid new mandates are also no longer required to offer benefits that were mandated previously or may be mandated in the future. Furthermore, self-funded firms do not pay taxes on their insurance premiums, which are levied on fully insured firms by nearly all states (at rates as high as 4%). These effects persist for at least four years after the mandate, suggesting that self-funding in untreated states does not catch up to that of treated states in the short-run.

In addition, I document heterogeneous treatment effects across industry groups, with larger effects in industries with higher baseline rates of self-funding and larger average deductibles. However, I do not detect an effect of mandates on self-funding among larger firms (250+ employees). This may be because larger firms were much more likely to be self-funded in the pre-period, and thus less exposed to new mandates. Large firms could also be less affected by mandates because they tend to offer more generous health insurance in general (making mandates less burdensome) and may be more likely to operate in multiple states (such that mandates in one state have only a small impact).[5]

Another way firms could avoid mandates is by ceasing to offer health coverage at all.[6] However, I do not detect a statistically significant effect of mandates on the rates of offering health coverage, and the 95% confidence interval excludes changes larger than 1-2% in either direction. Because self-funding is only defined conditional on offering health coverage, this result also reduces concern that mandates affected selection into my main analysis sample. In addition, I estimate null effects of mandates on employment at firms with health coverage. Finally, I show suggestive evidence that small firms were either less likely to offer any benefits or to operate at all, but the effects are imprecisely estimated and I am not able to distinguish between these two possibilites. Taken together, these results provide additional context for

[5] Larger firms offer lower deductibles and lower out-of-pocket maximums (KFF, 2021), and Gruber (1994*b*) shows evidence that they are more likely to offer the benefits covered by mandates, conditional on being self-funded.

[6] Firms were not required to offer insurance health insurance to workers during the time period of study (though offer rates did not noticeably change when the Affordable Care Act began to require this).

the finding in Sloan and Conover (1998) that mandated benefits reduce the probability that *individuals* are covered by insurance. In particular, these reductions may have occured because small firms ceased to offer any benefits or to operate entirely, rather than from firms dropping health coverage or reducing employment.

A potential concern with my research design is that mandated benefits may be endogenous to self-funding rates of firms – for example, policymakers could be reacting to their state's trends in self-funding when deciding whether or not to pass additional mandates. To address this concern, I provide evidence that treated and untreated states were trending similarly prior to the mandate, supporting a causal interpretation of my estimates. In addition, because I consider a staggered adoption design, my results could be biased if the treatment effect is heterogeneous across states or time (de Chaisemartin and D'Haultfœuille, 2020; Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021; Sun and Abraham, 2021). This issue is of particular concern in my setting, because "treatment" includes mandates with varying effects on costs (though mandates with negligible costs are excluded), as well as states that passed more than one mandate in the same year or soon after. Reassuringly, my results are qualitatively and quantitatively consistent when I use an alternative estimator that is robust to heterogeneous treatment effects and allows for a continous measure of treatment (the number of mandates passed).

Finally, another concern is that the external validity of my results could be limited to the extent that the time period I study, 1999–2008, is different from the landscape following the Affordable Care Act (ACA). The ACA included many reforms, especially to the individual market for insurance. However, the relationship between state-level regulations and self-funding for firms with 100 or more employees remains unchanged today – self-funded firms do not have to comply with state mandated benefits. The ACA may have had a chilling effect on the passage of *new* mandates, because it requires states to pay for the associated premium increase in the individual market for some types of new mandates (Office of Legislative Research, 2019).[7] However, because this rule does not apply to mandates passed prior to 2011, the mandates studied here may still be contributing to self-funding rates today. Furthermore, the rule did not completely deter the passage of new mandates, with the Centers for Medicare and Medicaid Services recently increased reporting requirements on mandates out of concern that states were not reimbursing appropriately (CMS, 2020).[8]

The welfare implications of firms avoiding mandated benefits are theoretically ambiguous, and depend on whether the mandates themselves are welfare-improving or not. On one hand, in the canonical model of Summers (1989), mandates reduce wages and employment. On the other hand, a growing body of empirical evidence suggests that the plans offered by firms may not (as predicted in the model) reflect worker preferences (e.g., Cebul et al., 2011; Fang and Gavazza, 2011; Liu and Sydnor, 2022). Thus, a richer model that takes choice frictions and labor market frictions into account could show that restricting the set of available plans – for example, by requiring plans to include specific benefits – may increase welfare. To the extent that firms avoid mandated benefits, welfare changes are attenuated in both directions: wage and employment losses will be mitigated, but any consumer protection gains (from removing "bad" options) would be diminished as well. In Section 2, I discuss a theoretical framework for mandated benefits, avoidance, and the associated welfare implications in more detail. Though quantifying these welfare effects is beyond the scope of this paper, in Section 7 I briefly discuss extensions in upcoming work.

My work contributes to several lines of literature. First, it relates to the overarching question of how firms make decisions about the health insurance plans they offer to workers. This paper is the first to study the impact of mandated benefits on the decision to self-fund at small firms – a group that is disproportionately fully insured and thus exposed to the mandates. When analyzing firms overall, Jensen, Cotter and Morrisey (1995) and Park

[7] This is because the federal government provides subsidies for the individual market that are based on actual premiums, so state mandates that increase premiums will also increase the size of the subisides.

[8] In addition, the ACA included a federal mandate that insurance cover preventative health services without cost-sharing, superceding state-level mandates in this category. But its broader Essential Health Benefits requirements do not apply to firms in the large-group market, whether they are fully insured or self-funded.

(2000) report null effects, though their estimates rely on a few hundred firms and cross-sectional variation respectively. Using administrative data on all firms with 100 or more employees and a quasi-experimental research design, my results for firms overall are similar. However, unlike these prior studies, my data and design allow me to estimate an effect specifically for small firms, showing that the overall estimates mask important heterogeneity across firm size. Though I do not identify a statistically significant effect among larger firms, Dalton and Holland (2019) show suggestive evidence that self-funding rates may have decreased among publicly-listed firms after controlling for a rich set of corporate finance characteristics, further emphasizing that the effects are heterogeneous across firm size.

Much of the remaining literature on firm decisions has focused on how rising healthcare costs jointly affect employee premium contributions and wages (Sommers, 2005; Baicker and Chandra, 2006; Clemens and Cutler, 2014; Lubotsky and Olson, 2015; Anand, 2017; Meiselbach et al., 2022). Liu and Sydnor (2022) show that many firms offer dominated plans, suggesting that firms may face choice frictions or incentives that are not aligned with workers'. Unlike these studies, my paper addresses how firms select the *design* of plans, not just how to share premium costs with workers. There are few other papers with this focus, though limited work in this area includes Moran, Chernew and Hirth (2001) and Bundorf (2002), who show that firm choices about the generosity and diversity of plans vary somewhat with worker age, gender, and income.

In addition, my work contributes to the literatures that study the effects of mandated benefits. Building on the work of Summers (1989), a wide range of studies have analyzed how mandated benefits are passed through to individuals via decreased wages, decreased job creation, decreased probability of health insurance coverage, and increased employee premium contributions (Gruber, 1994*a*; Mathur, 2010; Sloan and Conover, 1998; Bailey and Blascak, 2016). In this paper, I document an avoidance response by firms to mandates. My results show that these existing estimates of pass-through to workers are understated, as this literature is generally unable to control for the self-funding status of firms. If firms avoid mandates, the net effect on wages will be smaller than if avoidance were not available, and a portion of the impact on workers will be overlooked. With respect to the rates of firms offering health coverage, my results complement those of Jensen and Gabel (1992) and Gruber (1994*b*), who study even smaller firms with fewer than 50 or 100 employees respectively, and also do not detect any effect of mandates. This study also complements the work of Mulligan (2020) and Dillender, Heinrich and Houseman (2022), who study how employment and hours per worker responded to the ACA mandate that insurance be offered at all. I study a different context yet show a similar result, in that small firms are willing and able to reorganize aspects of their business in order to avoid costly health insurance regulations. Finally, the avoidance response documented here is an extension of that identified in other settings where firms decide whether to shift to a separate regulatory environment (e.g., shifting profits to tax havens or incorporating (Zucman, 2014; Tazhitdinova, 2020)).

2 Theoretical Framework

In this section, I examine the theoretical considerations for how firms may respond to mandated benefits. First, I consider the canonical model of mandated benefits from Summers (1989). Second, I expand this model to allow for avoidance. Third, I briefly discuss several factors not captured in this model, which empirical evidence suggests are quantitatively important and which have countervailing implications for welfare. Fourth, I describe how this framework applies to my empirical setting.

Consider labor demand D and labor supply S, which are both functions of the wage w, such that the equilibrium wage and employment satisfy:

$$D(w_0) = S(w_0) \tag{1}$$

Next consider a benefit that is valued by workers at v, but costs firms c to provide. If workers value the benefit more than it costs ($v > c$), it will be offered regardless of any mandate, leaving both firms and workers better off. However, if employees value the benefit less than it costs ($v < c$), the benefit will only be offered if mandated, in which case the new equilibrium will be given by:

$$D(w_1 + c) = S(w_1 + v) \tag{2}$$

As shown in Figure 3a, the labor demand curve shifts down by the amount that the firm must pay for the benefit, and the supply curve also shifts down to the extent that workers are willing to accept a lower wage in exchange. In the case where $v = c$ such that workers value the benefit at its cost, the mandate has no effect other than how total compensation (wages + value of benefits) is broken down between the two components: $w_1 + v = w_0$. However, as workers' value v decreases, compensation, employment, and welfare also decrease. In particular, the effects of the mandate are equivalent to those from a tax of $(c - v)$. Like a tax, the degree of pass-through to worker wages is determined by the relative wage elasticity of workers and firms.

I extend this model to allow firms to avoid the mandate, such that firms can pay a to not provide the benefit. If the firm does not avoid, then the situation remains as above in Figure 3a. However if the firm does avoid, the equilibrium would be given by:

$$D(w_2 + a) = S(w_2) \tag{3}$$

where the labor demand curve shifts down, but the labor supply curve is unchanged because the workers do not receive the benefit. Relative to no mandate, welfare is decreased, but the comparison between compliance (L_1, w_1) and avoidance (L_2, w_2) is ambiguous. In particular, it depends on the cost to provide the benefit (c), how much workers value it (v) as well as the cost to avoid (a). If the cost of avoiding is high such that $a > c - v$, then workers and firms will be better off if the firm complies. Otherwise, if $a < c - v$, as in Figure 3b, then the firm will choose to avoid, making itself and workers better off. Thus, in this model, the option to avoid mitigates welfare losses from the mandates themselves. Note that an econometrician who observes only wages and employment but not avoidance will underestimate the degree of pass-through to workers. In particular, she would observe workers receiving wage w_2, when wages would actually be lower, at w_1, if firms were not able to avoid. Furthermore, she may assume that workers are still receiving the value of the benefit such that compensation is $w_2 + v$, when in fact they do not and are only compensated by w_2.

In this simple model, the cost of providing the benefit (c) as well as the value of the benefit to workers (v) are observed and fixed. However, c may depend on time-variant characteristics of the market for the benefit, as well as firm preferences beyond the direct financial cost. In addition, firms may be able to lower wages by more or less than v in exchange for offering the benefit. While fully characterizing a model that incorporates these features is beyond the scope of this paper, I generalize the simple model to allow for them. Thus, I consider firms as avoiding the mandate if:

$$a \; < \; c(\theta, \eta) - \phi(v, \varepsilon) \tag{4}$$

As before, a is the cost of avoiding. I allow the cost of complying with the mandate $c(\cdot)$ to be a function that varies with θ, a measure of adverse selection into the benefit, as well as η, a measure of the firm's preferences. The firm weighs these costs against the amount that could be passed through to workers, $\phi(\cdot)$, which is a function of how much workers value the benefit v and some error ε rather than simply the value alone.

Furthermore, theoretical and empirical work suggest that these additional factors play a significant role. As a result, a richer model accounting for these factors would show that restricting the set of available plans (for example, by mandating plans to cover specific benefits) can increase welfare, in which case firm avoidance of the mandates would be welfare-diminishing. I briefly discuss these factors below. In particular, they each explain how workers could value the benefit more than it would cost to provide, yet the benefit would not exist absent a mandate (or in the presence of a mandate that can be avoided). Of course, if workers do not value the benefit, then mandates will only decrease welfare. On the other hand, it is not clear why policymakers would implement a mandate for a benefit that workers do not value more than its cost. Thus, these factors may also explain why policymakers consider mandated benefits to be worthwhile, at the same time as these benefits are not provided by the free market.

Adverse selection: The welfare losses from mandates described above may be offset by welfare gains if mandates reduce adverse selection. Prior to the mandate, workers may have selected into firms offering the benefit based on their likelihood of using it. The cost of providing the benefit (c) would reflect this selection, such that workers at other firms may not find it worthwhile even if it were efficient to insure them (Akerlof, 1970; Rothschild and Stiglitz, 1976). Thus, with adverse selection, reducing the choice of plans available could theoretically increase welfare by decreasing the cost of providing it (Einav and Finkelstein, 2011; Ericson and Sydnor, 2017; Marone and Sabety, 2022). In this case, if firms also select into avoiding mandates, avoidance would reduce welfare.

Individual choice frictions: In the simple model described above, firms know how much their workers value a given benefit, and in the absence of a mandate will provide benefits that are valued more than they cost. But if employees do not maximize their own preferences, it will be difficult for firms to gather the information needed to do so on their behalf.[9] Empirical work has documented that individuals frequently fail to make rationalizable choices with respect to health insurance and healthcare, and thus employers may misperceive workers' true preferences (v) with some error (ε). For example, employees frequently select dominated plans and generally seem not to understand how insurance works (Bhargava, Loewenstein and Sydnor, 2017; Brot-Goldberg et al., 2017). Individuals also experience frictions when using healthcare: they respond to small increases in out-of-pocket prices by reducing high-value care, which ultimately increases mortality (Chandra, Gruber and McKnight, 2010; Choudhry et al., 2011; Baicker, Mullainathan and Schwartzstein, 2015; Brot-Goldberg et al., 2017; Chandra, Flack and Obermeyer, 2021; Gross, Layton and Prinz, 2022).

Firm choice frictions: Even if firms do know the preferences of workers, it can be difficult to actually offer a health insurance plan that is best suited to these preferences.

[9] More specifically, the plan, employee premium contribution, and wage *bundle* may not the bundle that workers most prefer, among the options the firm is willing to provide.

Firms encounter substantial search frictions when making a selection from the wide range of potential plans (Cebul et al., 2011), similar to the frictions that individuals face when comparing many options (Kling et al., 2012).[10] As a result, the cost of providing a benefit (c) may depend on firm factors such as search costs that are beyond the direct financial cost.

Firm incentives: Finally, maximizing worker preferences may not be profit-maximizing. Liu and Sydnor (2022) show that a large fraction of firms offer a dominated plan – meaning a plan that is financially worse for every employee, regardless of how much healthcare they use, compared to another plan offered at the same firm. This finding, that firms offer plans that none of their workers should take, is difficult to reconcile with the standard frictionless model. Liu and Sydnor (2022) go on to provide suggestive evidence that firms may differentially favor high-deductible plans. Firm preferences of this type would be reflected in the cost to the firm of providing certain benefits (c). In addition, Fang and Gavazza (2011) show that employee turnover and frictions in the labor market lead firms to underinvest in employee health (raising expenditures in retirement). Thus, frictions in the labor market could be reflected in the degree to which firms have incentives to respond to worker preferences (v).

Altogether, these factors suggest that in a richer theoretical model, restricting plan options by mandating benefits may in fact increase (and thus avoidance would decrease) welfare. Finally, to apply this model to avoidance via self-funding, it is important to note that self-funding exempts firms from *all* mandated benefits, including previously enacted ones. In addition, the costs to a firm of self-funding are unlikely to vary substantially with the number of mandated benefits. As a result, it may be most appropriate to think of a new mandate as an increase in the cost of complying with mandated benefits (c), and potentially an increase in the value of mandated benefits to workers (v), without much change in the cost of avoiding (a). If so, firms with low avoidance cost may already be self-funded by the time I observe them, and not affected by new mandates at all. Thus, we may expect the

[10] These frictions compound the baseline difficulty that firms face in aggregating heterogeneous worker preferences into a small number of offered plans (Goldstein and Pauly, 1976; Moran, Chernew and Hirth, 2001; Bundorf, 2002).

firms avoiding new mandates (marginal firms) to have higher costs of avoidance, compared to the firms that are already self-funded (inframarginal firms). Additionally, to the extent that new mandates change the cost of complying with mandated benefits, we may expect that firms facing higher marginal compliance costs (firms for whom it is more costly to provide new benefits) to be the firms with an avoidance response.

3 Institutional Setting

Employer-sponsored health insurance is the primary way that working-age adults receive health coverage in the U.S. About two-thirds of all firms offer health coverage, including 99% of firms with 200 or more workers, and these figures have remained steady since 1999 (KFF, 2021). Health coverage plays an extremely important role in how workers are paid – it is typically the most expensive non-wage component, constituting 8% of total compensation (BLS, 2020). Firms offering health coverage can structure their plans to be fully insured or self-funded. The choice of whether or not to self-fund has substantial implications for a firm's obligations and finances. There are four main differences:

Payments: Under full insurance, the firm pays monthly premiums to an insurance carrier. Premiums are experience-rated, meaning that they are customized to the firm based on firm characteristics and its claims history.[11] However, premiums are negotiated and set for the length of the contract (a few years). Under self-funding, the firm pays a fixed fee to an insurer to administer the plan, but pays employee healthcare claims itself.

Financial risk: Under full insurance, the insurer bears risk – if healthcare claims are unusually high in a month or year, the firm continues to pay the same premium. On the other hand, a self-funded firm bears the financial risk of high claims. (Self-funded firms may also purchase stoploss coverage, which can limit the amount that the firm pays in claims.)

[11] I focus exclusively on firms with 100 or more employees. Firms with fewer employees (fewer than 50 or 100, depending on the state) participate in the small-group market. Those plans were a mix of medically underwritten, experience-rated, community-rated prior to the ACA, and community-rated after the ACA (Hall and McCue, 2021).

Plan design: Fully insured firms have less control over the design of health plans. Self-funded plans can customize the benefits covered, cost-sharing arrangements, and even the provider network to a greater degree.

Compliance: The plans that fully insured firms buy from insurers must comply with all federal and state regulations. However, self-funded plans are covered by the Employee Retirement Income Security Act of 1974 (ERISA), which pre-empts state regulations (McCuskey, 2022). As a result, self-funded plans do not have to comply with any state health insurance regulations. For example, at the onset of the COVID-19 pandemic, many states passed laws requiring coverage of telehealth services. But because these laws were at the state level, they only applied to fully insured firms, and self-funded firms were not required to comply.[12]

To employees, the experience of using their health coverage is approximately the same under the two types of plan – the appearance of insurance cards and the process of finding, using, and paying for care are almost identical. Insurance cards for self-funded plans typically include the name of the plan administrator and a statement that they provide administrative services only. Figure A2 includes an example health insurance card for a self-funded plan that is administered by Anthem Blue Cross. (Similarly, self-funding is also not particularly salient to healthcare providers.)

The primary drawback to firms of self-funding is the assumption of financial risk. Each individual's healthcare claims are uncertain, and the distribution of claims is highly skewed: among ages 18-64, the top 1% of individuals account for 23% of healthcare spending (Ortaliza et al., 2021). As a result, self-funded firms can face much higher costs (relative to if they were fully insured) if only a few of their employees experience large health shocks. Thus, the variance of these firms' potential claims is an important consideration in their financial planning. Large firms will face a smaller variance, and are correspondingly more likely to self-fund, because they can spread the risk across more employees. As shown by Dalton and

[12]Both fully insured and self-funded plans must comply with federal regulations.

Holland (2019), firms that have less difficulty accessing liquidity or lower opportunity cost of investments are also more likely to self-fund, because higher than anticipated claims are less burdensome to them.[13]

The primary appeal to firms of self-funding is the flexibilty in plan design. In particular, because self-funded firms can avoid state regulations, they are excluded from state laws that require health insurance to cover specific benefits or providers. Many factors may influence how appealing this option is to firms – for example, mandated benefits may be inconsistent with a firm's "values," or the firm may expect many more mandates to occur in the future. However, I focus on the most tangible factor in how appealing self-funding is to firms: the cost of adding the existing mandated benefits to their health coverage plan.

4 Data

4.1 Form 5500 Series

I use the Form 5500 Series, an administrative dataset on employee welfare benefit plans. This form is submitted on an annual basis to jointly satisfy reporting requirements with the Department of Labor and Internal Revenue Service; firms face penalties for non-filing and responses are subject to audit. I focus on the time period 1999 (first available) to 2008 (to avoid any anticipation of the 2010 Affordable Care Act).[14]

Firms are required to file the Form 5500 for each employee welfare benefit plan with 100 or more participants. An employee welfare benefit plan includes one or more of: health, dental, vision, life insurance/death benefits, disability (temporary or long-term), supplemental unemployment, severance, prepaid legal, scholarship, apprenticeship and training, or

[13]Note that the variance of claims can affect the choices of firms without any assumption about the firm's risk preferences – for example, a risk-neutral firm facing a non-linear budget constraint due to limited liquidity.

[14]As discussed in Section 1, the ACA made no changes to the relationship between mandated benefits and self-funding for firms with 100 or more employees.

housing.[15] The mapping of benefits to plans is at the firm's discretion: firms may choose to file information about a single plan that covers all of their benefits, or file separately for multiple plans (e.g., one health plan and one dental plan). In order to weight all firms equally regardless of what they choose, I aggregate the set of plans to the firm level.[16]

Each filing includes the number of plan participants, which are measured as of the end of the plan year, reflect individuals rather than full-time equivalents, and do not include family (e.g., spouse and dependents enrolled in an employee's health plan). Because I do not observe the number of employees directly, I define the firm's number of employees as the number of participants in its largest plan (across all welfare benefits).[17] As a result, this measure may exclude employees who are not eligible for any of the benefits listed above, such as part-time workers. A few firms report implausibly large numbers of participants, so I exclude the top 1% of firms by size.

The Form 5500 data do not directly specify whether a plan is fully insured or self-funded, but firms are required to provide details about insurance contracts and how benefits are paid for. Among firms that offer health benefits, I follow guidance from the Department of Labor to identify self-funded plans (DOL, 2021). The most important factor in identifying fully insured plans is the presence of any health insurance contract details, and the most important factor in identifying self-funded plans is indication that benefits are paid from general assets or a trust.

The main outcome of interest is whether or not the firm is self-funded, conditional on offering health coverage. For almost all observations (93%), this outcome is equal to either zero (if the firm is fully insured) or one (if the firm is self-funded). However, for the remaining observations, the outcome is a fraction between zero and one. This occurs when a firm divides their health plans across multiple Form 5500s filings, only some of which are self-funded. In

[15] I focus on welfare benefit plans, though the Form 5500 also separately collects information on pension benefits (defined benefit and defined contribution).

[16] I also exclude a small number of multi-employer plans, i.e., where one plan covers employees at more than one firm.

[17] For example, if a firm has 100 participants in one health plan, 200 participants in a second health plan, and 300 participants in a single life insurance plan, I will count them as having 300 employees.

this case, I identify self-funding at the plan level and then use the participant-weighted average of self-funding across the firm's plans. I also consider as outcomes the (log) number of employees at firms with health coverage; whether the firm offers any health coverage; and whether firms report any welfare benefits at all (e.g., life insurance or long-term disability) through the Form 5500, though I cannot distinguish firms that offer no benefits from firms that are not operating.

The Form 5500 data also includes limited information about the firm such as industry (6-digit NAICS code) and address. A limitation of this dataset is that only one address is observed per firm. As a result, I treat each firm as though all of its employees are in the same state as its headquarters, an assumption which is more plausible for smaller firms. While precise data on the prevalence of multi-state firms is not easily available, size is a strong determinant of the number of establishments at a firm. Firms with 100-299 employees have 3 establishments on average, while 300+ employee firms have 41 establishments on average (U.S. Census Bureau, 2019).

For the sample of firms offering health coverage, Figure 4 shows the distribution of firm size in 1999, the first year of the sample. Most firms are small; the median number of employees is 342. Furthermore, size is an important determinant of self-funding rates – as shown in Figure 5, larger firms are much more likely to be self-funded. As a result, my empirical approach allows the response of smaller firms to differ from the response of larger firms. I follow the U.S. Census Bureau's classification of firm sizes in selecting a cutoff of 250 employees, but my results are similar if I use higher or lower cutoffs.

Table 1 shows summary statistics for firms overall, for firms with 100-249 employees, and for firms with 250 or more employees. Because firm size could be endogenous to the passage of mandated benefits, when separating firms by size I use employment in the first year the firm is observed. Statistics are shown for the sample of firms offering health coverage as well as the broader sample of all firms in the dataset. 88% of firms offer health benefits.[18] Of these firms, 26% are self-funded overall, with self-funding rates of 22% among smaller firms and 29% among larger firms.

Over the course of 10 year period, firms are observed for 5.5 years on average, which reflects an improbable amount of entry and exit, and may be due to the fact that firms often change their Employee Identification Number (EIN). To better connect firms over time, I allow for changes in EIN if the firm name and address remain the same. Even so, the low tenure indicates that this methodology does not perfectly capture changes. As a result, I refrain from using firm fixed effects throughout my analysis.

4.2 State Benefit Mandates

Data on mandates comes from the Blue Cross Blue Shield Assocation (Laudicina, Gardner and Holland, 2013). This report identifies state-level mandates that specific procedures, providers, or persons be covered by insurance, as well as the year in which each mandate was passed.[19] All states have at least one mandate, ranging from 8 mandates in Idaho to 39 mandates in Maryland in 1998.

There is substantial heterogeneity in the cost of incorporating these mandates into a health plan. In particular, many mandates are expected to have negligible effects on insurance premiums, while a few mandates are expected to be quite costly. Mandated benefits with very low costs may be used by a small number of people, be associated with low spending per person, or both. Despite this, prior work in this area has mostly focused on effects from the *total number* of mandates, implicitly treating every mandate as equally costly.

To account for this heterogeneity, I use cost estimates from several sources (described

[18] The higher rate of offering health coverage among smaller firms in Table 1 is an artifact of categorizing firms by size in their first year. Around 7% of observations are from firms that were small initially but became large. When I instead split firms by contemporaneous size, 82.1% of smaller firms and 91.1% of larger firms offer health coverage.

[19] Mandates typically take effect within a year of passage, and firms switching to self-funding likely do so at the beginning of their benefit year.

below) to exclude mandates with negligible effects on premiums. These sources use claims data for fully insured plans, calculate the total spending related to the mandated benefits, and average the spending across all plan participants. Thus, the cost estimates are relative to zero spending on these benefits, and will overstate the marginal cost increase if firms offered the benefit prior to the mandate. On the other hand, the cost estimates are measured among fully insured plans, and may be understated if the firms that would experience high spending on the mandated benefits switch to being self-funded. The estimates do account for potential moral hazard in that they measure spending after the benefits have been mandated, rather than before.

The primary source of mandates costs comes from the Council of Affordable Health Insurance (CAHI), a research and advocacy association of insurance carriers, in 2009. CAHI provides cost estimates across all states, which is important because the exact coverage and language of each mandate can vary from state to state (e.g., for mandated infertility treatment benefits, the number of IVF cycles that are covered may vary from state to state.) As a result, CAHI estimates whether each mandate will increase costs by: less than 1%, 1-3%, 3-5%, and 5-10%. One limitation of this approach is that the "less than 1%" category continues to mask a significant amount of heterogeneity in costs. Therefore, I supplement using reports from three states who study the costs associated with their own mandates and provide numerical estimates: Connecticut in 2009, Massachussets in 2013, and Rhode Island in 2014. These states are representative in terms of the number of mandates in 1998 as well as the number of additional mandates passed. However, my results are similar if I only rely on the cost estimates from CAHI to identify costly mandates.

Figure 6 shows the methodology for identifying costly mandates. There are 60 mandates that are newly enacted in one or more states in my time period of study. Of these, I include the 19 mandates that are estimated by CAHI to cost at least 1% of premiums. For the remaining 41 mandates, I look for any estimate across the three state reports that the mandate will cost more than $50 per person per year, and I find an additional 2 (Diabetic

Supplies & Education and Home Health Care). Thus, I include in my analysis 21 mandates that at least one source has identified as costly, and I exclude the remaining 39 mandates that no source has identified as costly. The costly mandates have mean (median) estimated costs of \$63 (\$28), while the excluded mandates have estimated of costs of \$11 (\$2).

Figure 7 shows the distribution of mandates across states over time. From 1998 to 2008, the average number of mandates in a state increased from 10.3 to 13.2. This growth occurred throughout the distribution, as shown by the median and interquartile range. The distribution for all mandates, including thoes with negligible cost estimates, can be found in Figure A3. Finally, the list of mandates and how frequently they contribute to my causal estimates are show in Table A1.

5 Empirical Framework

I estimate the impact of mandated benefits using a difference-in-differences design with a two-way fixed effects specification. First, I discuss a specification considering all firms together:

$$Y_{it} = \beta Mandate_{st} + \gamma_s + \delta_t + \varepsilon_{it} \tag{5}$$

where Y_{it} represents the outcome for firm i in year t, such as whether the firm is self-funded. State fixed effects γ_s ensure that estimates are identified from variation within states, rather than cross-sectional comparisons. Year fixed effects δ_t control for idiosyncratic time effects. In all specifications, standard errors are clustered at the state level (level of treatment).

The treatment variable, $Mandate_{st}$, is an indicator equal to one in the years after state s passes any costly mandate. By considering a binary treatment, I am comparing states before and after their passage of the first new mandate during my time period. Because my results are identified from variation within states, mandates that existed prior to 1999 do not contribute to the estimated effects. While most states pass only one mandate at a time, some states pass multiple mandates within a year. Figure 8 shows variation by state in the intensity of treatment: 31 states pass a single mandate at the time of treatment; 16 states including D.C. added between two and four mandates; and 4 states do not pass any mandates in this time period (are never treated).[20] I include all states in my main specification, such that my estimates are the effect of "changing the number of mandates for the first time" rather than the effect of one additional mandate. However, my results are similar if I exclude the states that added more than one mandate. In addition, all but 18 states go on to pass more mandates in subsequent years, but my results are similar when excluding these states from the analysis.

In order to interpret β as the causal effect of mandates on firm outcomes, the standard difference-in-differences parallel trends assumption must hold. In my setting, this requires that mandates are uncorrelated with other unobserved time-varying determinants of firm outcomes related to the health insurance plans they offer to workers. In other words, in the absence of mandates, there would have been no change in firm outcomes among treated states relative to states that did not pass mandates. To test the plausibility of this assumption, I expand Equation 5 to an event study framework with leads and lags:

$$Y_{it} = \sum_{k \neq -1} \beta_k 1\{t - \tau = k\} + \gamma_s + \delta_t + \varepsilon_{it} \tag{6}$$

For $k < -1$, the β_k coefficients estimate anticipatory responses of firm outcomes k years before the state passes any costly mandate, relative to the year immediately prior. If these lead coefficients are very close to zero, then treated and control firms were trending similarly prior to the mandate, lending support to the assumption that they would have continued to do so in the absence of any mandates. Conversely, for $k > -1$, the β_k coefficients estimate the response k years after the mandate, and allow me to examine how the response of firms evolves over time.[21]

[20]The number of mandates passed is not strongly related to the number of mandates in existence as of 1998 (Figure A4), with a correlation of only -0.095.

[21]When estimating Equation 6, I consider event times -5 to 3, where 0 is the year of treatment. Event times of -6 and earlier are binned into one indicator, and event times of 4 and later are binned into another indicator (not shown). For comparison, when estimating Equation 5, I exclude event times of -6 and earlier, as well as 4 and later. My results are similar when considering narrower event windows.

Next, I consider a specification where the treatment effect can differ between small and large firms. Allowing this possibility is important because firm size is a strong determinant of self-funding rates (see Figure 5). Equation 7 describes the difference-in-differences specification:

$$Y_{it} = \beta_1 Mandate_{st} * Small_i + \beta_2 Mandate_{st} * Large_i + \theta Small_i + \gamma_s + \delta_t + \varepsilon_{it} \tag{7}$$

$Small_i$ is an indicator equal to one if the firm has fewer than 250 employees in the first year the firm is observed. $Large_i$ is an indicator equal to one if the firm has 250 or more employees in the first year of observation. I control for (initial) firm size, so the θ coefficient captures baseline differences in outcomes between small and large firms.[22] Then, I interact firm size with the treatment variable, $Mandate_{st}$. Thus, β_1 is the effect of mandates on firm outcomes for small firms only, and β_2 is the effect of mandate on firm outcomes for large firms only. I also expand this specification to an event study:

$$Y_{it} = \sum_{k \neq -1} \beta_{1k} 1\{t - \tau = k\} Small_i + \beta_{2k} 1\{t - \tau = k\} Large_i + \theta Small_i + \gamma_s + \delta_t + \varepsilon_{it} \tag{8}$$

For $k < -1$, the β_{1k} coefficients allow testing for pre-trends among small firms, and the β_{2k} coefficients allow separate testing for pre-trends among large firms. For $k > -1$, the β_{1k} coefficients estimate the treatment effect over time for small firms, and the β_{2k} coefficients estimate these dynamic effects separately for large firms.

To test whether my results are sensitve to alternative specifications, I consider models with additional fixed effects and time-varying covariates. In particular, I allow the idiosyncratic state and time effects to vary by the industry of the firm. I replace the state fixed effects with state-by-industry or state-by-sector fixed effects, where industry is the 6-digit NAICS code for the firm (in the first year of observation) and sector is the 3-digit NAICS code. Similarly, I replace the year fixed effects with year-by-industry or year-by-sector fixed effects. These are potentially important because health insurance outcomes vary across in-

[22]Because changes in firm size could be endogenous to new mandates, I do not include contemporaneous firm size in my baseline specification. However, my results are similar when I include it.

dustries (Figures 16-20), so a single set of state and time fixed effects may not be sufficient for capturing geographic variation or time shocks. I also consider models that control for the number of contemporaneous employees at the firm, as well as the number of non-costly (excluded) mandates in each state for a given year.

Recent work has shown that two-way fixed effect specifications, as those described above, can lead to biased estimates if the treatment effect is heterogeneous between groups or over time (de Chaisemartin and D'Haultfœuille, 2020; Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021; Sun and Abraham, 2021). Heterogeneous treatment effects are particularly likely in my setting, because "treatment" includes mandates with varying effects on costs (though mandates with negligible costs are excluded), as well as states that passed more than one mandate in the same year or soon after. Therefore, I also estimate effects using an alternative estimator that is robust to heterogeneous treatment effects. I use the estimator from de Chaisemartin and D'Haultfœuille (2022) for several reasons. First, this estimator allows for dyamic effects, akin to an event study, where the treatment effect may grow or shrink over time. Similarly, placebo effects can also be estimated to test the parallel trends assumption. Finally, unlike other robust estimators, the de Chaisemartin and D'Haultfœuille (2022) estimator also allows for continuous treatment, which is ideal for my setting because some states pass more than one mandate.

6 Results

In Section 6.1, I first show results on whether mandates have any effect on firm rates of offering health coverage. Then in Section 6.2, I study the effect of mandates on self-funding rates. Finally in Section 6.3, I analyze the effect of mandates on employment and whether the firm reports any welfare benefits at all.

6.1 Offering Health Coverage

One way that firms could avoid complying with mandated benefits is by ceasing to offer health coverage at all. Furthermore, if mandates do affect the rates of offering health coverage, estimates of the effect on self-funding may be biased due to selection (because self-funding is only observed for firms that offer coverage). Thus, I first estimate the effect of mandates on firm rates of offering health coverage. For this analysis, my sample is the set of all firms that report offering any welfare benefits through the Form 5500 in a given year.

Figure 9 shows estimates from the event study and difference-in-differences specifications where the treatment effect is not allowed to vary across firm size (Equations 5 and 6). In the pre-period, the coefficients are not statisically distinguishable from zero, but they are trending downward in a way that suggests treated and control states were evolving differently prior to the mandate. However, this tendency is reduced when the treatment effect is allowed to vary across small and large firms. Figure 10 shows estimates of Equations 7 and 8. In the pre-period, for both small and large firms, the estimates are statistically indistinguishable from zero and are not strongly trending up nor down.[23]

In the post-period, I am unable to detect an effect of mandates on rates of offering insurance among small or large firms. For both types of firms, the difference-in-differences coefficient is -0.2 percentage points and not statisically distinguishable from zero. For small firms, the 95% confidence interval excludes decreases larger than 1.9 percentage points and increases larger than 1.5 percentage points. For large firms, the 95% confidence interval excludes decreases larger than 1.3 percentage points and increases larger than 1.0 percentage point. Relative to the mean rate of offering health coverage, these confidence intervals exclude effects larger than 1-2% for both smaller and larger firms. (Table A2 shows the detailed difference-in-differences regression results for firms overall and split by size.)

These results suggest that new costly mandates did not have a significant effect on

[23] For small (large) firms, an F-test that all of the pre-period coefficients are equal to zero has a p-value of 0.07 (0.48).

the rates of firms offering health coverage to workers. In addition, the results reduces any potential concern that the sample of firms for which I observe self-funding status could be changing in response to mandates.

6.2 Self-Funding

Next, I restrict my sample to the set of firms offering any health coverage and study the effect of mandates on whether or not firms self-fund their health plans. Figure 11 shows estimates from the event study and difference-in-differences specifications for firms overall. While there does not appear to be evidence of pre-trends, and the coefficients in the post-period show an upward trend, the treatment effect is not statistically different from zero.

However, Figure 12 shows that the effect of mandates varies dramatically by firm size. For smaller firms with 100-249 employees, mandates increase self-funding rates by 3.2 percentage points, representing a 14.5% increase. Self-funding rates increase sharply in the year that the mandate is passed, and rise slightly again in the following year. The effects persist for at least four years following treatment. In contrast, I am unable to detect any response among larger firms, and the 95% confidence inverval excludes increases larger than 0.5 percentage points (1.7%) and decreases larger than 1.7 percentage points (5.9%). (Table A3 shows the detailed difference-in-differences regression results for firms overall and split by size.) For both small and large firms, coefficients in the pre-period are close to zero and neither trending up nor down.[24] I conduct a series of robustness checks to test whether my results are sensitive to alternative samples or specifications:

Additional fixed effects and controls: Figure 13 shows results where the state and year fixed effects are allowed to vary within sector (3-digit NAICS) or within industry (6-digit NAICS). Also shown are results from regressions that control for the number of (contem-

[24] For small (large) firms, an F-test that all four of the pre-period coefficients are equal to zero has a p-value of 0.02 (0.01). However, when I narrow the window of time around the treatment year, such that only three pre-period coefficients are estimated, the effect for small firms remains stable and the parallel trends test p-value rises to 0.54. For large firms, the p-value rises to 0.08 when I consider two pre-period coefficients (Table A4).

poraneous) employees at the firm, as well as the number of non-costly (excluded) mandates in each state for a given year. The estimates for both small and large firms are remarkably stable across all specifications.

Excluding states with additional mandates: I consider several restrictions on the set of states used. Results are similar if I exclude states that pass additional mandates after the treatment year (Figure A5); exclude states that pass two or more mandates in the treatment year (Figure A6, though only statistically significant for small firms at the 10% level); or exclude states that passed mandates in any of the four years prior to the treatment year (Figure A7). Because many states pass mandates in 1999 (Figure A8), I also show estimates excluding these states, and find quantitatively similar though imprecise results (Figure A9).

Excluding additional mandates: In Figure A10 I consider only the mandates identifies by CAHI as costly. The estimates are similar in magnitude, albeit imprecise.

Varying cutoff between small and large firms: Figure A11 shows that my results are similar when the cutoff between smaller and larger firms is higher or lower than 250. In particular, the effect for smaller firms is quite stable across cutoffs. For larger firms, all but one of the 95% confidence intervals include zero.

Robust to heterogeneous treatment effects: In order to address concerns that two-way fixed effects specifications may be biased when effects are heterogeneous across groups or time, I turn to the robust estimator from de Chaisemartin and D'Haultfœuille (2022). The results are shown in Figure 14. I do not detect evidence of pre-trends for small or large firms. For small firms, self-funding rates rise after the passage of new mandates. Note that the coefficients plotted in the figure are analagous to those from an event study design, in that they estimate the effect of "changing the number of mandates for the first time" k periods after the change. However, they are estimated by comparing the evolution of outcomes in states that add new mandates only to those that have not yet added mandates (rather than to all states, including already-treated states). In addition, this estimation strategy allows me to calculate the average effect of one additional mandate in a way that is robust to heterogeneous treatment effects. I show these average effects for small and large firms. For small firms, I estimate that an additional mandate increases self-funding by 2.0 percentage points and the 95% confidence interval does not include zero. This estimate is smaller in magnitude than the baseline difference-in-differences estimate, which makes intuitive sense because the baseline estimates average across states with one or more mandates at the time of treatment. For large firms, the post-period coefficients show a small upward trend, but are neither the individual coefficients nor the average effect for one mandate are statistically distinguishable from zero.

In Figure 15, I show that the effect of mandates on self-funding is heterogeneous across industry groups. For both small and large firms, I interact the treatment variable with indicators for nine industry groups. (Figure A12 shows how the sample of small firms that offer health is distributed across these industry groups). Small firms in agriculture, fishing, and forestry industries have the largest response, though it is also the least precisely estimated, followed by firms in other service industries and then firms in construction industries. I examine how these treatment effects are related to characteristics of small firms in these industries in 1999. These treatment effects are negatively correlated with rates of offering health coverage (Figure 16, -20% correlation) and positively correlated with rates of self-funding (Figure 17, 70% correlation). To study the relationship with additional characteristics of these industries, I use estimates of the total premium, employee premium contribution, and deductible in each industry group in 2002 from the Medical Expenditure Panel Survey – Insurance Component (AHRQ, 2021).[25] The effect of mandates on self-funding is negatively correlated with both the average total premium and the average employee premium contribution (Figures 18 and 19, correlations -44% and -18%), and positvely correlated with the average deductible (Figure 20, 69% correlation).

[25] Note that these characteristics are for all firms in the industry group, rather than only small firms.

6.3 Employment & Reporting Any Welfare Benefits

Finally, I study other two additional margins along which firms may respond to mandates. Figure 21 shows the estimated effects of mandates on (log) employment among firms that offer health coverage. The difference-in-differences coefficients are not statistically different from zero, though imprecisely estimated. For large firms, the 95% confidence intrvals exclude increases larger than 2.4% and decreases larger than 3.7%. For small firms, the 95% confidence intervals exclude increases larger than 3.2% and decreases larger than 5.4%, though the event study coefficient in the year immediately following the mandate shows a statistically significant decline.

Figure 22 shows the estimated effect of mandates on whether firms report any welfare benefits at all. For this outcome, the sample is firms that *ever* report any welfare benefits. Firms could not report benefits if they do not offer any of the welfare benefits associated with the Form 5500. Alternatively, firms would not report benefits if they are no longer in operation. A limitation of the data is that I am not able to distinguish between these two mechanisms. I do not find any evidence of a response for large firms. I find suggestive evidence that small firms cease to offer any benefits or operate, though the difference-in-differences coefficient is only statistically significant at the 10% level and the effect appears concentrated in the year immediately following the mandate.

7 Discussion & Conclusion

In this paper, I study the effect of state mandated benefits on self-funding for the health insurance offered by firms. I document that new mandates increase self-funding rates among smaller firms (100-249 employees) by 3.2 percentage points, representing a 14.5% increase. These findings indicate a substantial degree of avoidance among these firms, i.e., that they switch to self-funding so that they are not required to comply with the mandates. A limitation of the data is that I do not observe any details about the specific benefits covered by a plan – as a result, I cannot rule out the possibility that firms switch to self-funding but still begin to cover the benefit. However, treated and control firms trend very similarly prior to the mandate, and self-funding rates at treated firms rise right after the mandate is passed. These findings suggest that the mandates have a causal effect on the attractiveness of self-funding to firms. Because costly mandates make flexibility in plan design and exemption from state regulations more valuable, I consider my results to be suggestive evidence that firms are avoiding providing the mandated benefit.

A potential secondary mechanism worth discussing is one of reduced adverse selection. If the mandate succeeds in bringing coverage of the benefit to additional workers, this may reduce adverse selection in the market for that benefit. It is plausible that this reduced adverse selection would itself make self-funding more appealing to firms. For example, if coverage for infertility treatment is covered by more firms after the mandate, each individual firm may find that the use of this benefit is lower and more predictable, making self-funding less financially risky. Future work on how specific plan benefits evolve after a mandate is passed can provide futher insight into the role that these mechanisms play.

I am unable to detect an effect of mandates on larger firms (250+ employees). Size is a significant determinant of self-funding status, where larger firms are much more likely to be self-funded at baseline. As a result, larger firms are more likely to be inframarginal with respect to new mandates (cannot become more self-funded than they already are). There are a few additional potential explanations for why I do not find an effect among larger firms. First, conditional on being fully insured, larger firms may also be more likely to have seriously considered switching – as firms grow, their benefits administration becomes more sophisticated, and these firms may have already decided that self-funding is not advantageous for them. In contrast, smaller firms may be prompted to seriously consider self-funding by the mandates. Interestingly, the effects for small firms persist for at least four years after the mandate, suggesting that there is no "catch-up" by firms not exposed to new mandates in this period.

Second, larger firms offer more generous health insurance in general. Plans at larger firms have lower deductibles and lower out-of-pocket maximums (KFF, 2021), and Gruber (1994*b*) shows evidence that they are more likely to offer the benefits covered by mandates, conditional on being self-funded. If larger firms are already offering the benefit, they would not have any change in their incentive to switch to self-funding. Finally, a limitation of this data is that I only observe one address per firm (headquarters address). To the extent that larger firms are more likely to be present in multiple states, then mandates in one state will affect a smaller proportion of their total workforce, and thus treatment for these firms has a lower intensity. However, self-funding is particularly advantageous for multi-state firms (because they can design one plan without concern for differing state regulations), and so I expect that these firms are also more likely to be self-funded at baseline, and thus inframarginal with respect to new mandates.

I document heterogeneous effects on self-funding for small firms across industry groups. In particular, the treatment effect is larger for industries with higher rates of self-funding, suggesting that these industries find self-funding more appealing overall. Furthermore, the treatment effect is also larger for industries with higher average deductibles. This result would be consistent with the idea that industries with low deductibles can respond to the cost of mandated benefits by raising deductibles, but industries with high deductibles cannot and thus are more likely to use self-funding as a margin of adjustment.

I do not detect an effect of mandates on the rates at which firms offer health coverage, among small or large firms. My results are fairly precise, where the 95% confidence interval excludes increases or decreases of 1-2%. Because self-funding is only defined for the set of firms that offer health benefits, it is important to document that the selection into this sample is not changing as the result of the treatment. I also find no evidence that mandates affected employment among firms that offer health coverage. These findings provide additional context for understanding prior work on how health insurance coverage responds to mandates. In particular, Sloan and Conover (1998) find that a larger number of mandates reduces the probability that individuals are covered by insurance. This paper suggests that these reductions may not occur by firms dropping health coverage specifically, or by firms that offer coverage reducing employment. Rather, these effects may occur because small firms drop all kinds of welfare benefits or cease to operate.

Firms' avoidance of state mandates through self-funding presents a significant challenge for policy. When firms self-fund, they are no longer required to comply with *any* state regulations for health insurance. So, when considering whether or not to mandate a new benefit, policymakers must account for a variety of effects on compliance. A firm switching to self-funding may not offer the benefit currently being mandated; it can drop benefits associated with older mandates; and it will not be required to comply with any future mandates. Thus, policymakers need to consider a dynamic problem where stricter policies today may lead to reduced regulatory scope tomorrow. For example, when states mandated greater coverage of telehealth at the beginning of the COVID-19 pandemic, all firms that had decided to self-fund previously were exempted (even if no new firms becamse self-funded).

Furthermore, this firm avoidance response has implications for all of the other types of state-level regulations beyond mandated benefits. Nearly all states require fully insured firms to pay taxes on their insurance premiums, as high as 4%, but these do not apply to self-funded firms. States may also pass laws along other dimensions, such as California's 2017 law protecting consumers from surprise medical bills, which did not apply to self-funded firms (though they were impacted by a similar a federal law that came into effect in 2022). When firms switch to self-funding to avoid mandated benefits, they also become exempt from all these other regulations. In addition, my results raise the possibility that these other types of regulations could also affect firms' decision to self-fund.

A welfare analysis of firm avoidance of mandates would require, first, a comprehensive study of the ways that employees might be impacted by mandates. While such an exercise is beyond the scope of this paper, in upcoming work I will extend this analysis to study how firms use multiple margins of adjustment to respond to mandates and other increases in healthcare costs. In particular, I will study how self-funding, plan design, employee premium contributions, and wages are jointly adjusted by firms. As a result, I will be able to estimate the total pass-through of mandates to workers, how it is distributed across the various margins of adjustment, and the extent to which additional factors (such as the firm's labor market power) affect which channel the firm chooses.

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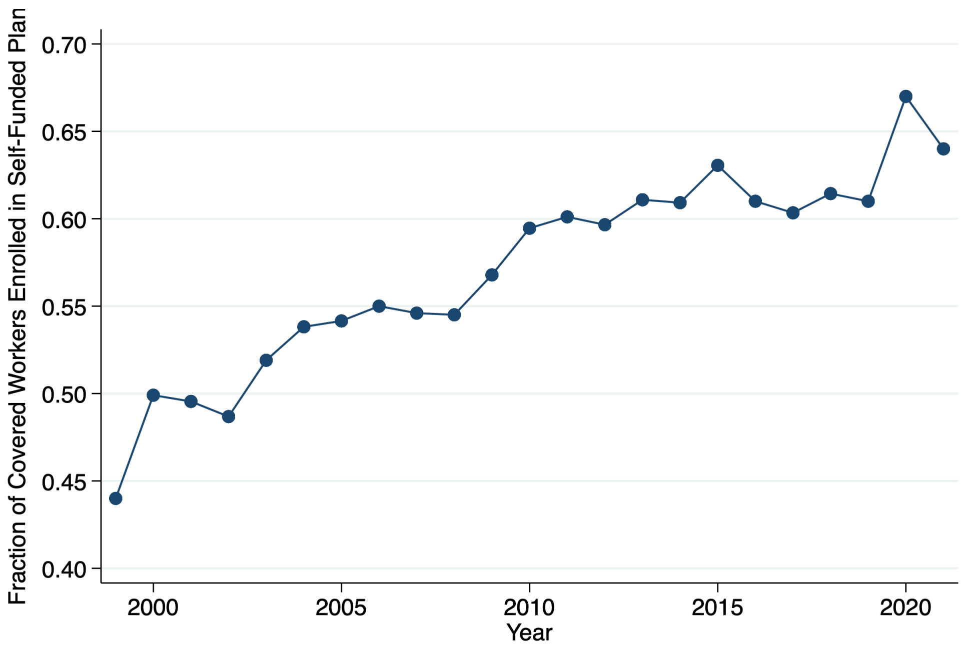
Table 1: Summary Statistics 1999-2008

	All Firms	100-249	250+
(a) All firms:			
Observations	354,510	143,468	211,042
Firms	64,025	29,095	34,930
Years in sample	5.54	4.93	6.04
	(3.32)	(3.10)	(3.41)
Employees (1^{st} year)	1,031.13	161.40	1,915.87
	(5,379.52)	(40.98)	(7,538.25)
Employees	1,536.62	239.78	2,418.22
	(6,833.25)	(1,514.93)	(8,657.66)
Offers health	0.88	0.92	0.85
	(0.33)	(0.27)	(0.36)
(b) Firms that offer health:			
Observations	309,977	131,344	178,633
Firms	57,513	28,966	28,547
Years in sample	5.39	4.53	6.26
	(3.21)	(2.99)	(3.19)
Employees (1^{st} year)	1,032.43	161.50	1,916.15
	(5,386.18)	(40.97)	(7,542.96)
Employees	1,618.47	234.24	2,636.26
	(7,045.16)	(1081.61)	(9,100.79)
Self-funded	0.26	0.22	0.29
	(0.42)	(0.41)	(0.43)

Notes: This table provides summary statistics for (a) all firms that report offering any welfare benefits through the Form 5500, and (b) firms that offer health coverage. Statistics are shown separately for firms that have +/− 250 employees in the first year they are observed. When categorizing by *contemporaneous* size, 82.1% of smaller firms and 91.1% of larger firms offer health coverage.

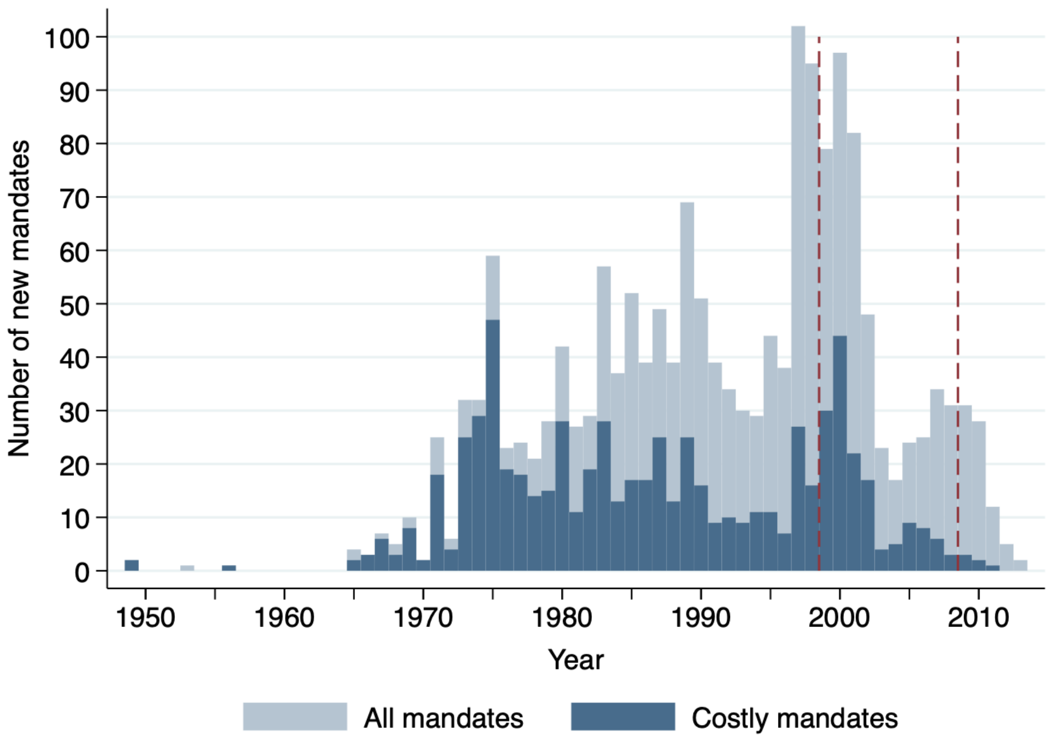
Figure 1: Prevalence of Self-Funding Over Time



Notes: This figure shows the percent of workers who are enrolled in self-funded plans, among all workers who are covered by an employer-sponsored health plan.

Source: Kaiser Family Foundation Employer Health Benefits Survey

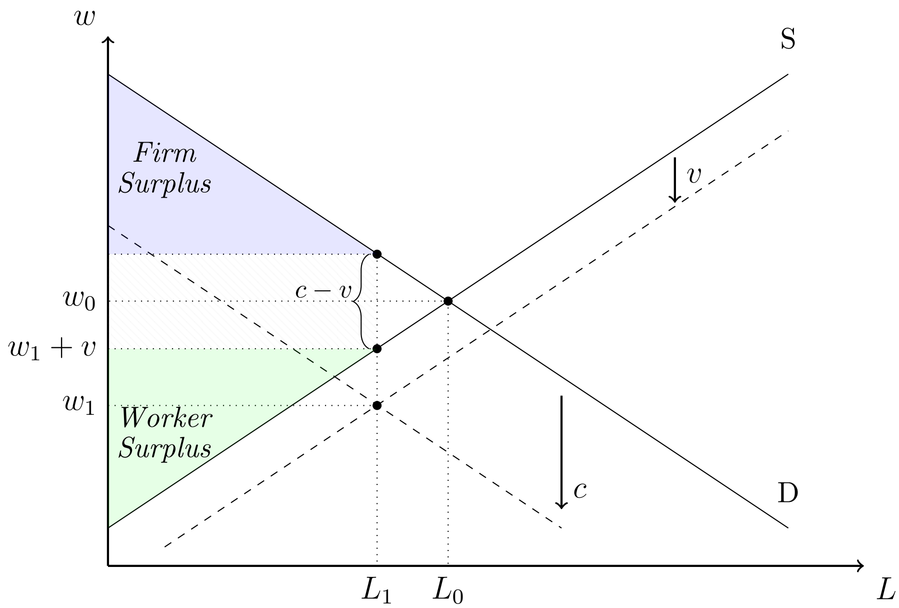
Figure 2: New Mandated Benefits Over Time



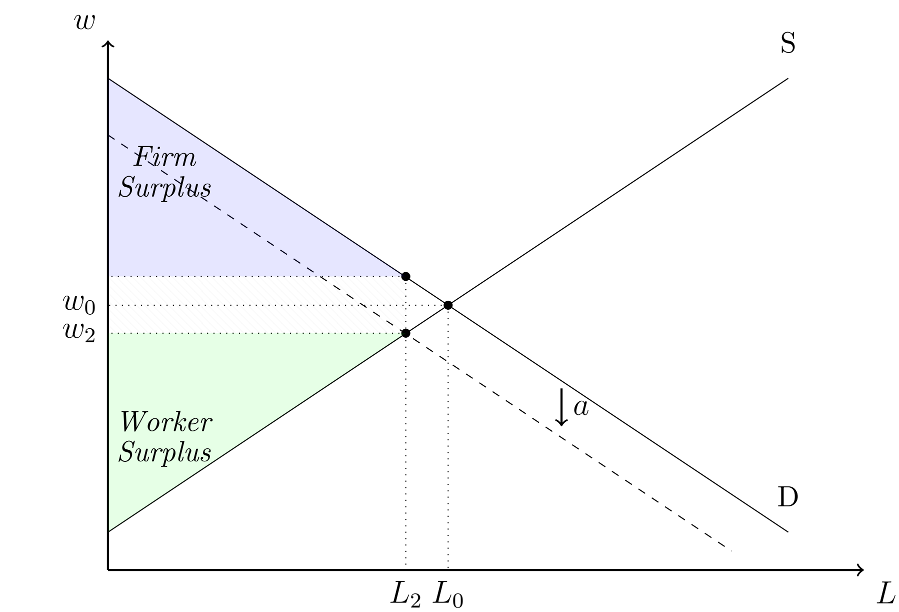
Notes: This figure shows the number of new mandated benefits in the U.S. in each year. The total number of new mandates is shown, as well as the number of new mandates that are expected to raise premiums by 1% or more. This paper focuses on costly mandates passed in years 1999-2008.

Figure 3: Simple Theoretical Framework

(a) No Avoidance

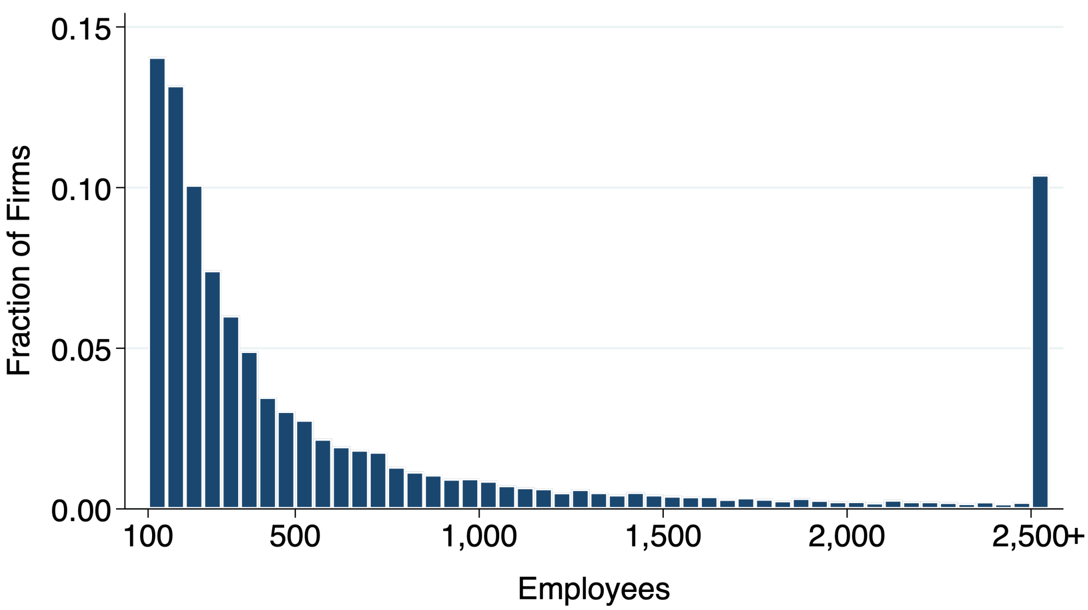


(b) Avoidance



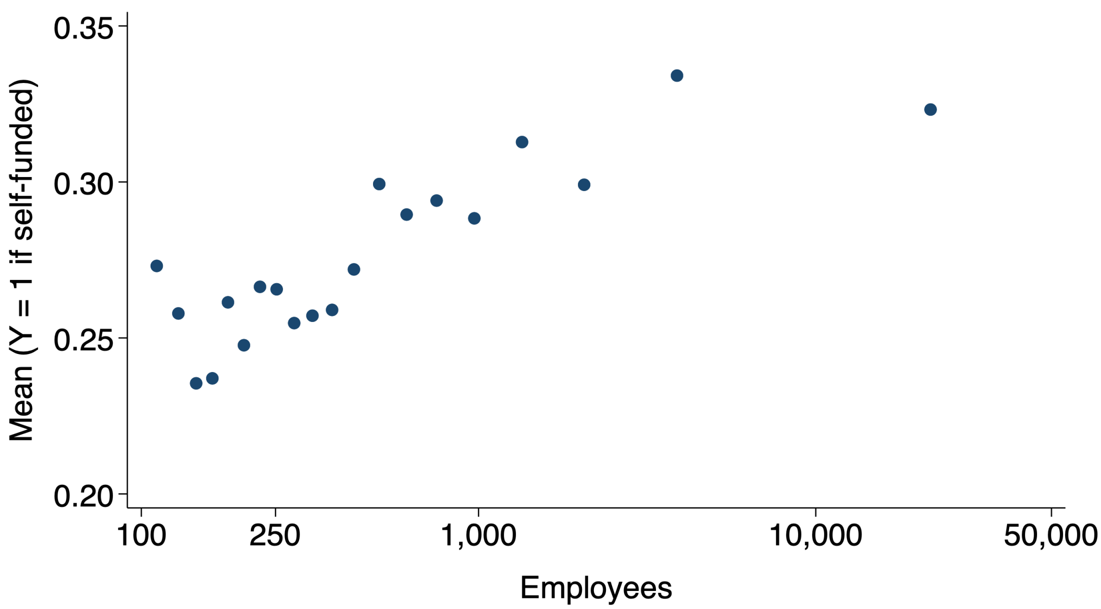
Notes: This figure shows (a) a simple model of mandated benefits as in Summers (1989), for a mandate that costs firms c to provide and is valued by workers at v. I extend this model in (b) to allow firms to avoid complying with the mandate by paying a.

Figure 4: Distribution of Firm Size



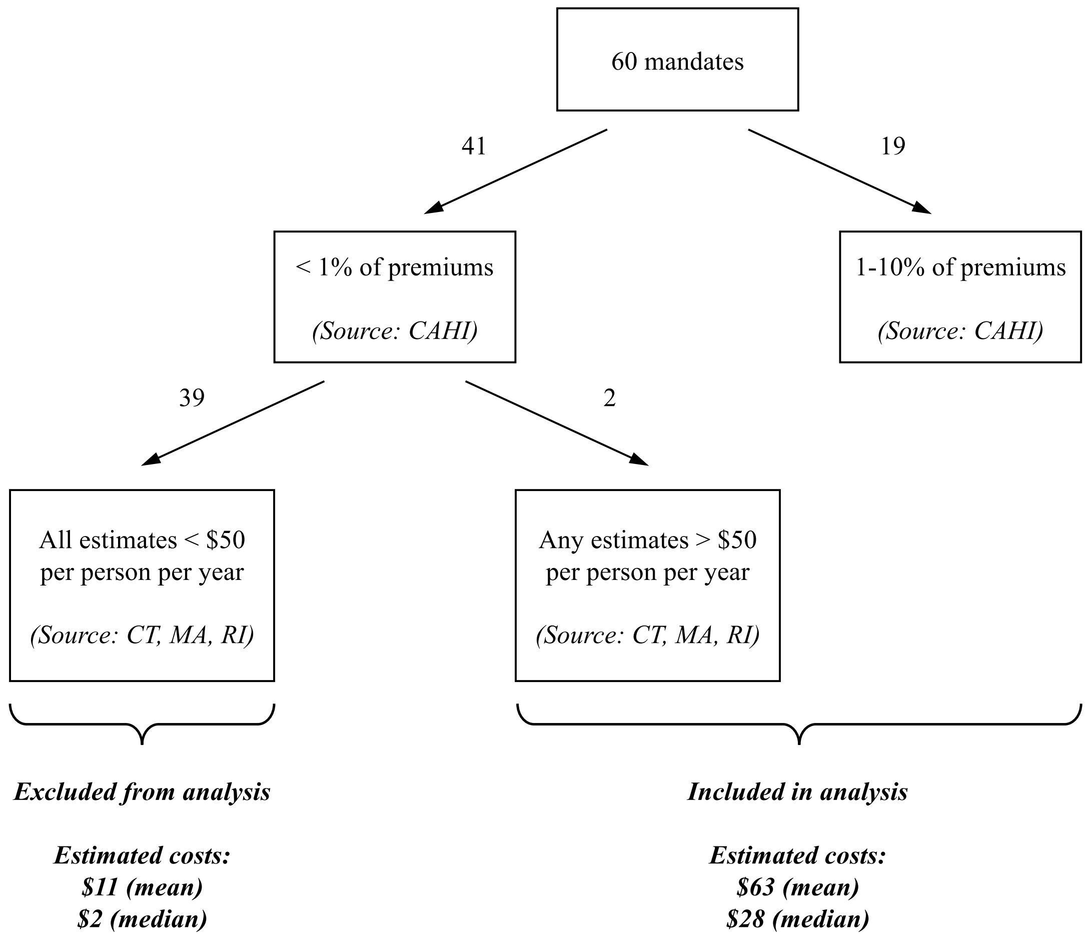
Notes: This figure shows a histogram of firm size in the year 1999 (first year of sample), conditional on offering health coverage. The last bin includes all firms with 2,500 or more employees.

Figure 5: Self-Funding Rates by Firm Size



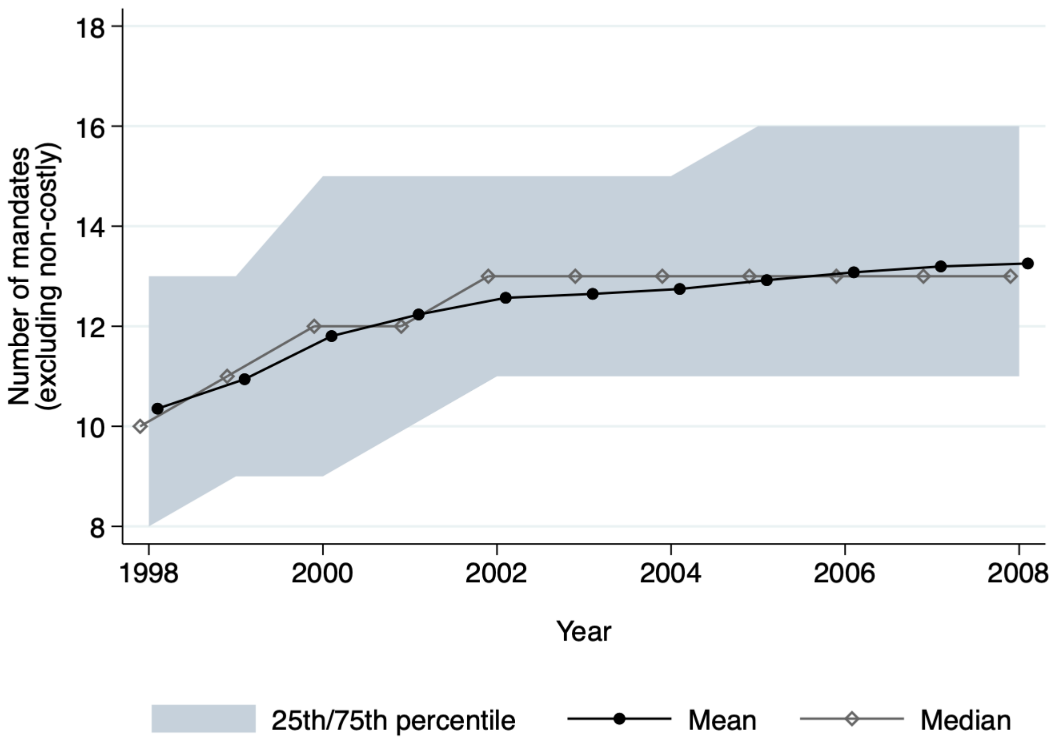
Notes: This figure shows a binscatter of firm size and self-funding rates in the year 1999 (first year of sample), conditional on offering health coverage.

Figure 6: Identifying Costly Mandates



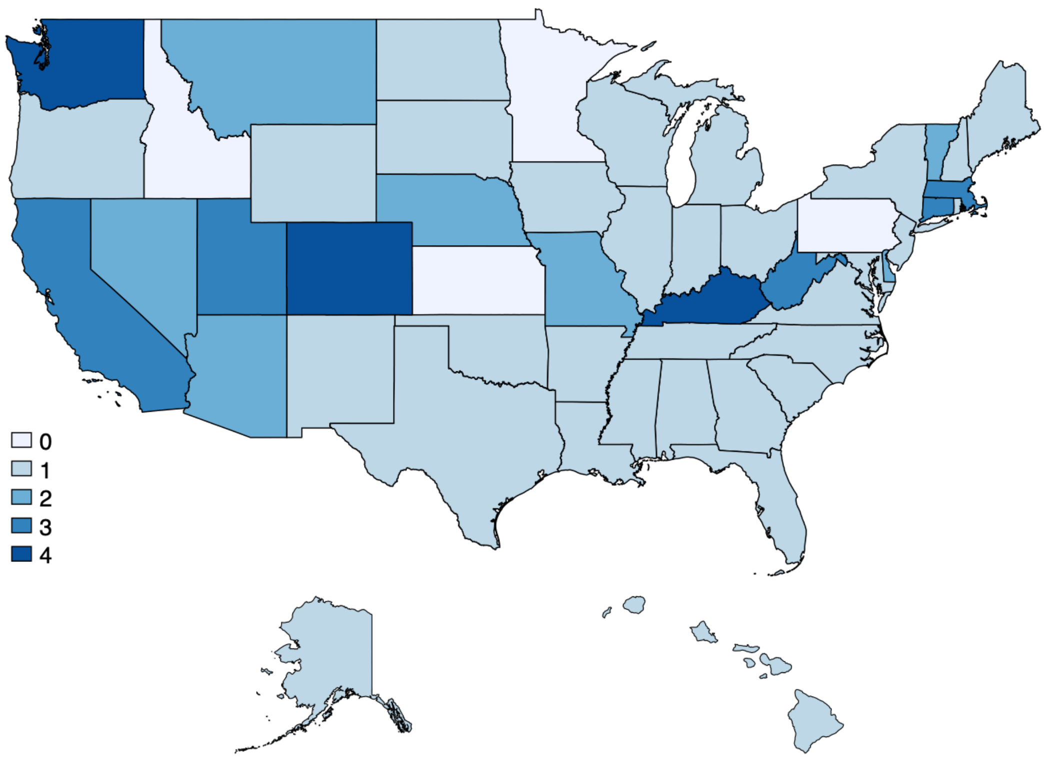
Notes: This figure shows the process for identifying costly mandates. I include all mandates that are estimated by the Council of Affordable Health Insurance (CAHI) to increase premiums by at least 1%. For the remaining mandates, I look for any estimate in three state reports (Connecticut in 2009, Massachussets in 2013, and Rhode Island in 2014) that the mandate will cost more than $50 per person per year.

Figure 7: Mandates Over Time



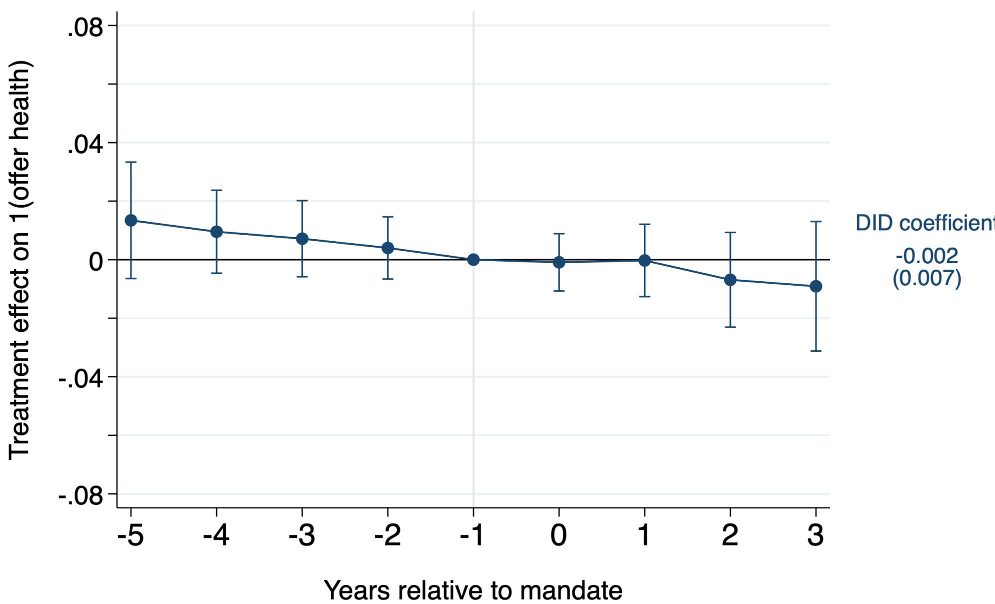
Notes: This figure shows the distribution of mandates across states over time. In each year, the mean number of mandates across states is shown. The median, 25th percentile, and 75th percentile are also shown. Only the costly mandates used in the analysis are included.

Figure 8: Variation in Number of Mandates Passed in Treatment Year



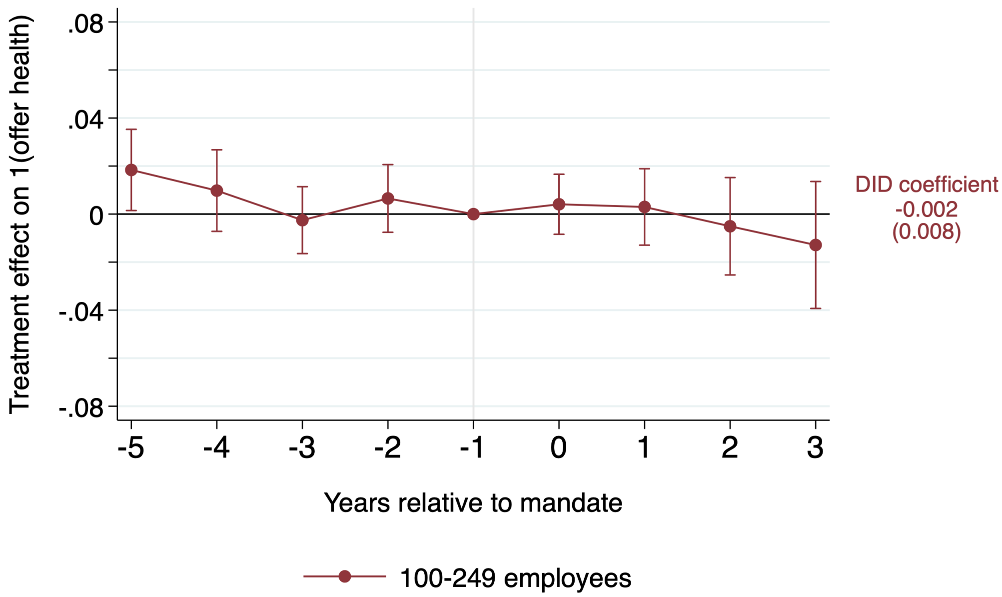
Notes: This figure shows the variation by state in the number of mandates passed in the treatment year. 31 states pass only one mandate in the treatment year; 8 states including DC pass two mandates in the same year; 5 states pass three mandates; and 3 states pass four mandates. There are 4 states that do not pass any mandates in the study period (never treated).

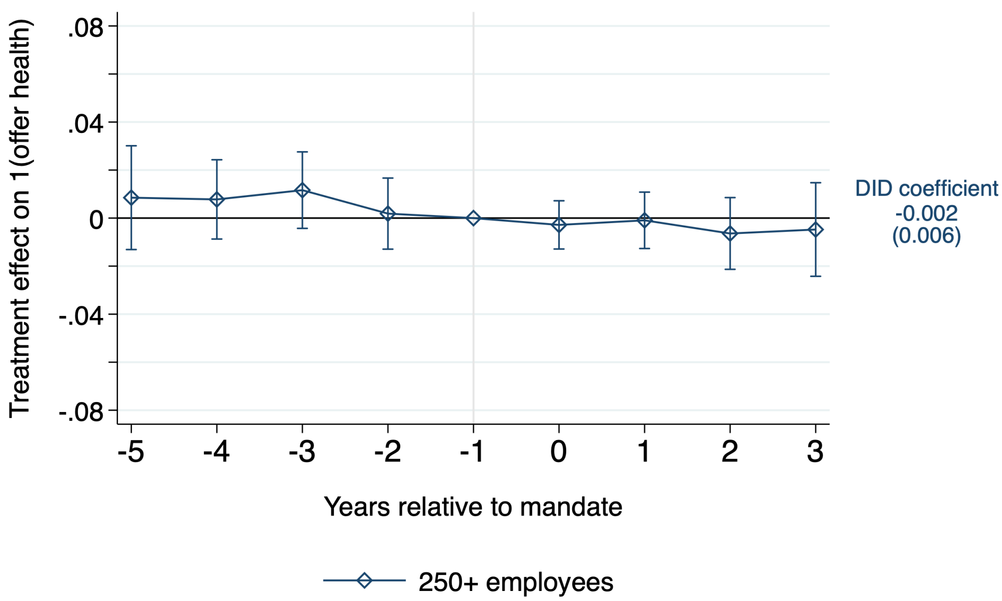
Figure 9: Effect of Mandates on Offering Health Coverage



Notes: This figure shows the estimated effect of mandated benefits on whether firms offer any health coverage. The sample includes all firms that report offering any welfare benefits through the Form 5500. Event study and difference-in-differences estimates are from a regression that includes state and year fixed effects, and standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

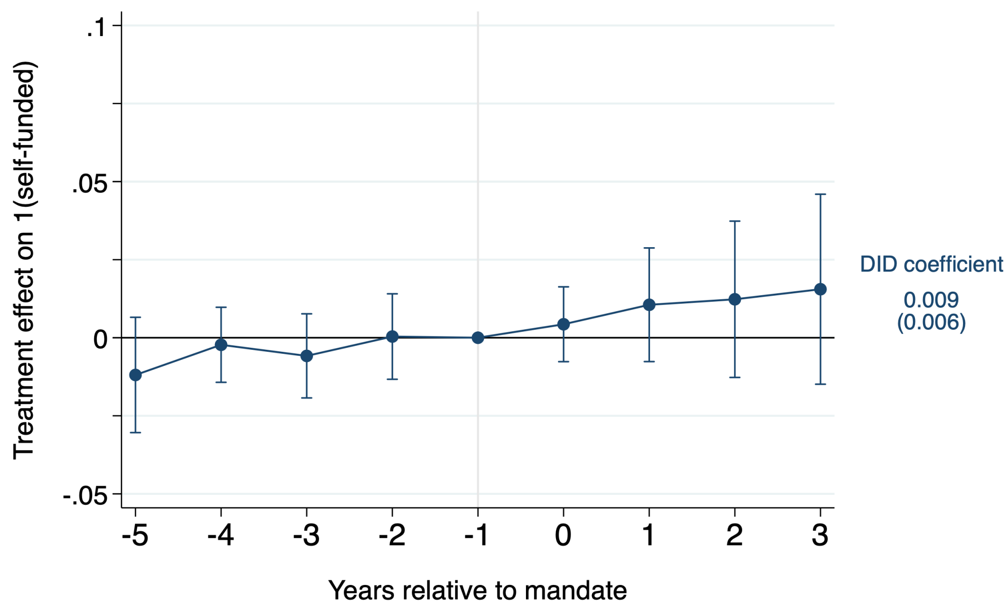
Figure 10: Effect of Mandates on Offering Health Coverage by Firm Size





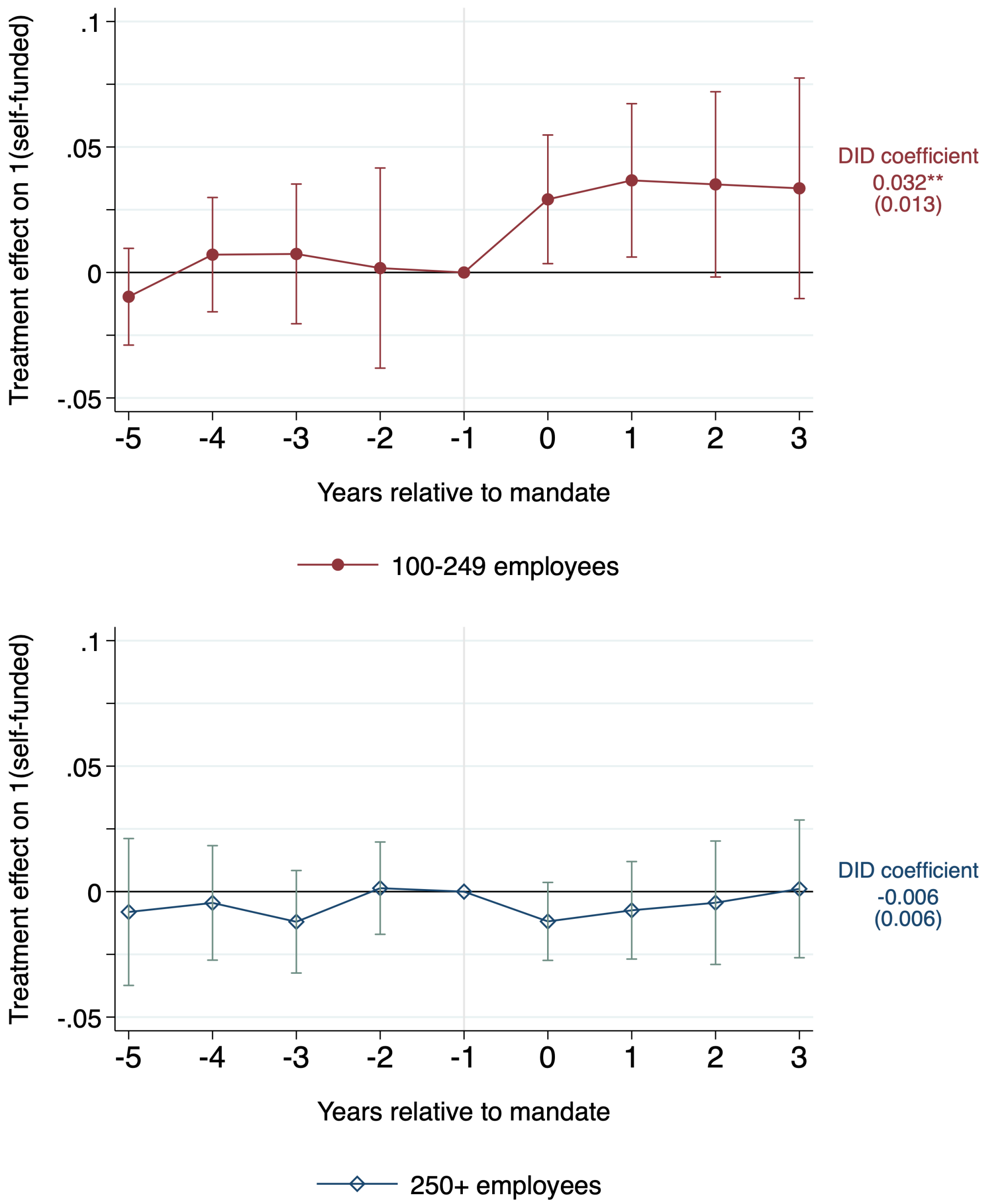
Notes: This figure shows the estimated effect of mandated benefits on whether firms offer any health coverage, separately for smaller and larger firms. The sample includes all firms that report offering any welfare benefits through the Form 5500. Event study and difference-in-differences estimates are from a regression that interacts treatment with firm size category, controls for size category, and includes state and year fixed effects. Standard errors are clustered at the state level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 11: Effect of Mandates on Self-Funding



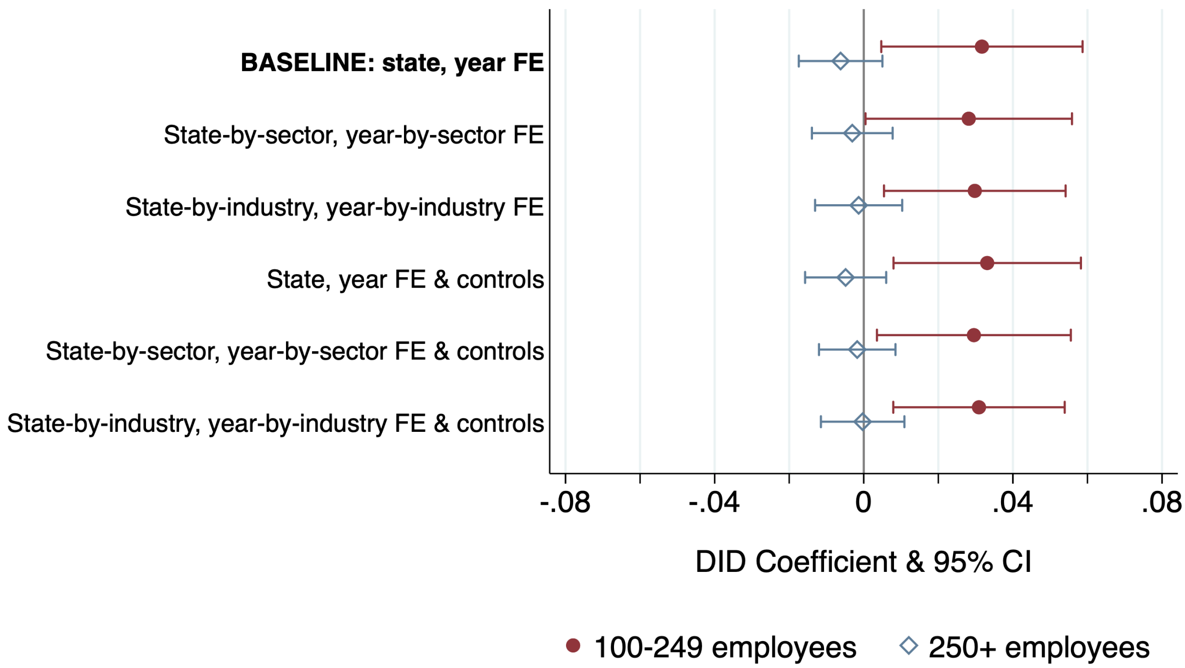
Notes: This figure shows the estimated effect of mandated benefits on whether firms self-fund their health coverage. The sample includes all firms that report offering health coverage through the Form 5500. Event study and difference-in-differences estimates are from a regression that includes state and year fixed effects, and standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 12: Effect of Mandates on Self-Funding by Firm Size



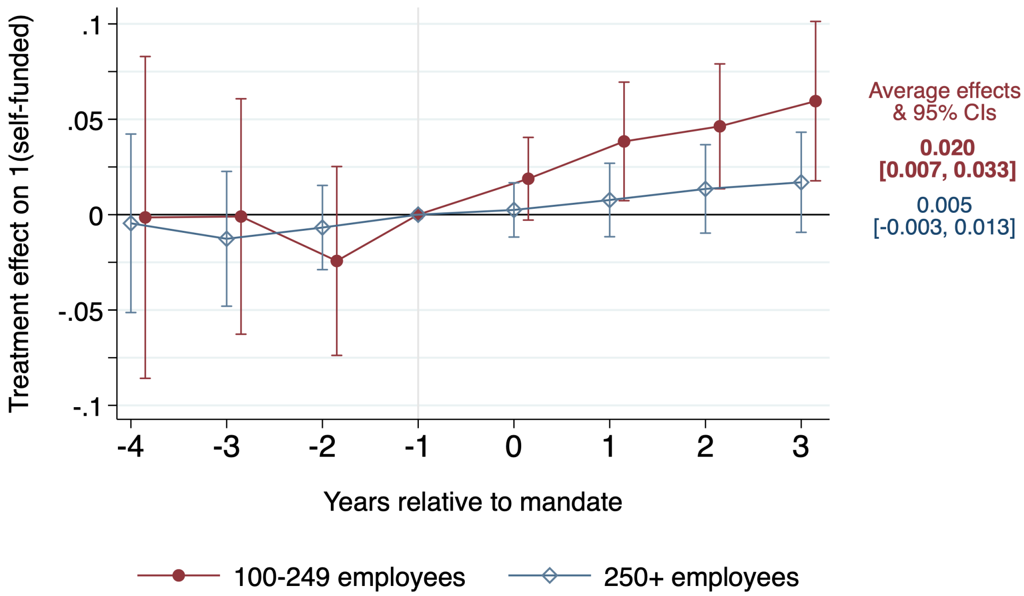
Notes: This figure shows the estimated effect of mandated benefits on whether firms self-fund their health coverage, separately for smaller and larger firms. The sample includes all firms that report offering health coverage through the Form 5500. Event study and difference-in-differences estimates are from a regression that interacts treatment with firm size category, controls for size category, and includes state and year fixed effects. Standard errors are clustered at the state level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 13: Effect of Mandates on Self-Funding
with Additional Fixed Effects and Controls



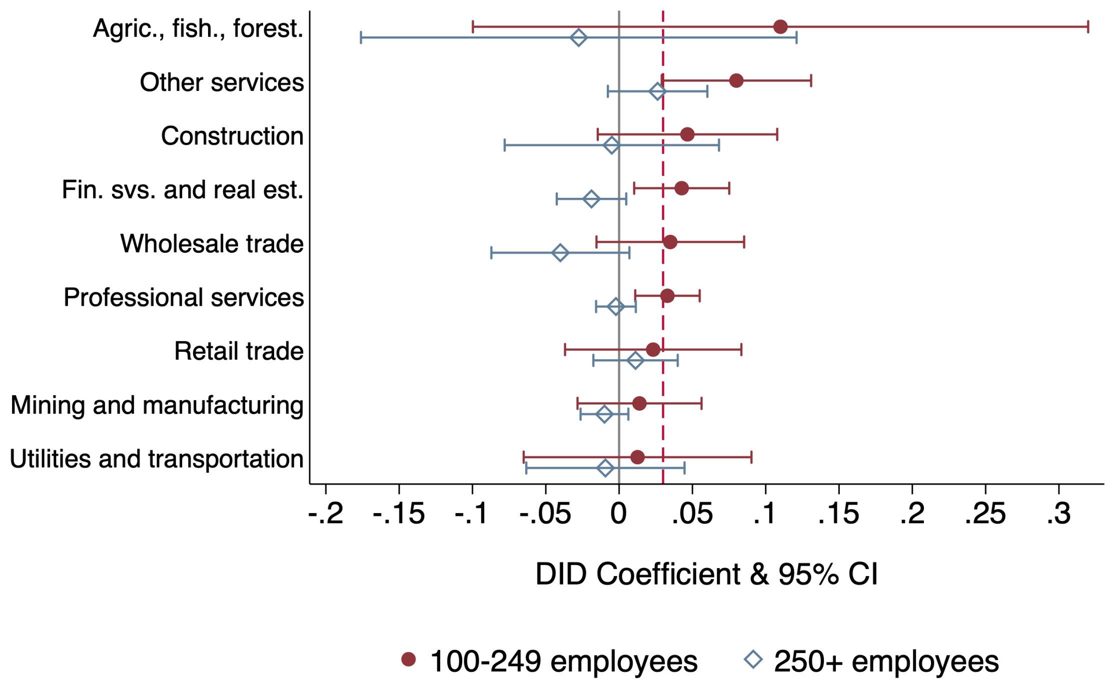
Notes: This figure shows the estimated effect of mandated benefits on whether firms self-fund their health coverage. For each specification, difference-in-differences estimates and 95% confidence intervals are shown for smaller and larger firms. All estimates are from a regression that interacts treatment with firm size category and controls for size category, and standard errors are clustered at the state level. Sector is defined by the 3-digit NAICS code, and industry is defined by the 6-digit NAICS code. Controls refer to the number of (contemporaneous) employees at the firm as well as the number of negligible cost (excluded) mandates in each state.

Figure 14: Robust DID Estimation



Notes: This figure shows the estimated effect of mandated benefits on whether firms self-fund their health coverage, using the robust estimator from de Chaisemartin and D'Haultfœuille (2022). Results are estimated separately for small firms and for large firms, among firms that report offering health coverage through the Form 5500. The treatment variable is the number of costly mandates in a year, beyond the number existing in 1998. Standard errors are clustered at the state level, and estimated using 300 bootstrap replications.

Figure 15: Effect of Mandates on Self-Funding by Industry

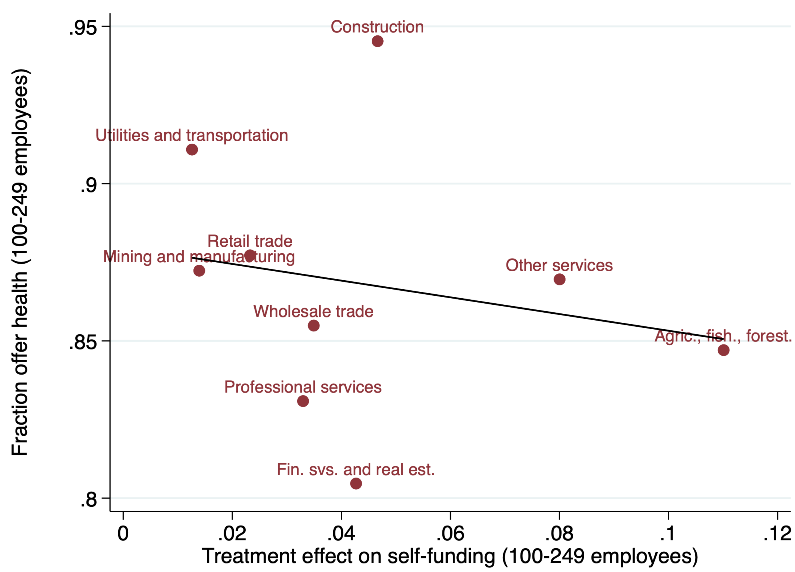


Notes: This figure shows the estimated effect of mandated benefits on whether firms self-fund their health coverage. For each specification, difference-in-differences estimates and 95% confidence intervals are shown for smaller and larger firms. All estimates are from a regression that interacts treatment with firm size category and industry, and controls for size category and industry. Standard errors are clustered at the state level. The red dotted line marks the difference-in-differences estimate for small firms overall.

Figure 16: Industry Heterogeneity in Offering Health

(a) Fraction of Firms Offering Health (100-249 Employees) in 1999

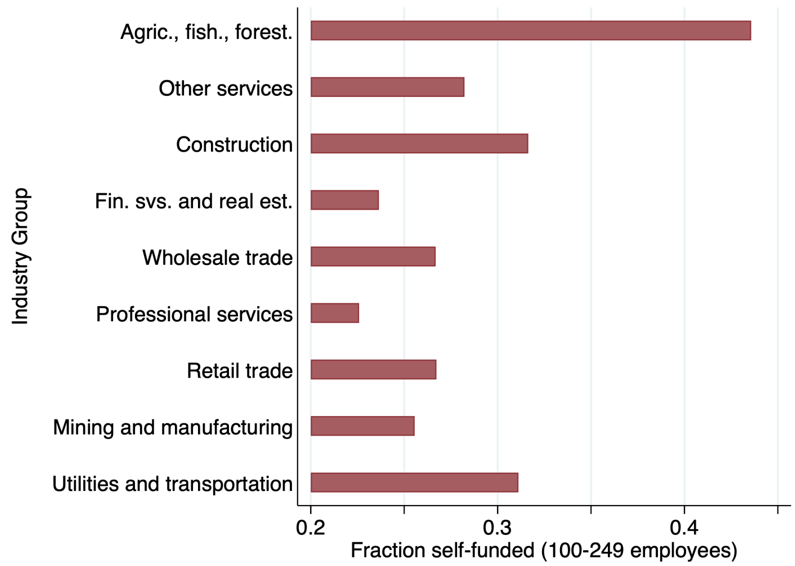
(b) Correlation with Effect of Mandates on Self-Funding



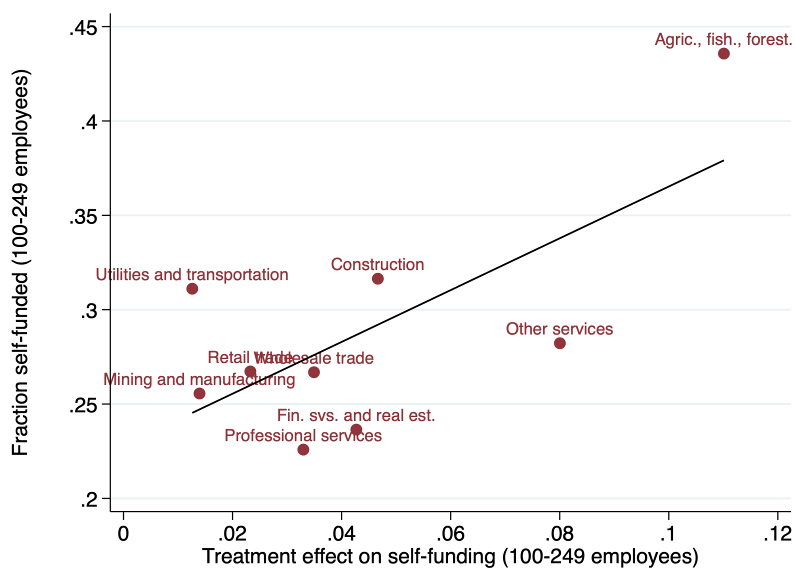
Notes: This figure shows (a) the fraction of firms (100-249 employees) that offer health by industry in 1999, and (b) the relationship with the estimated effect of mandates on self-funding for firms with 100-249 employees.

Figure 17: Industry Heterogeneity in Self-Funding

(a) Fraction Self-Funded (100-249 Employees) in 1999



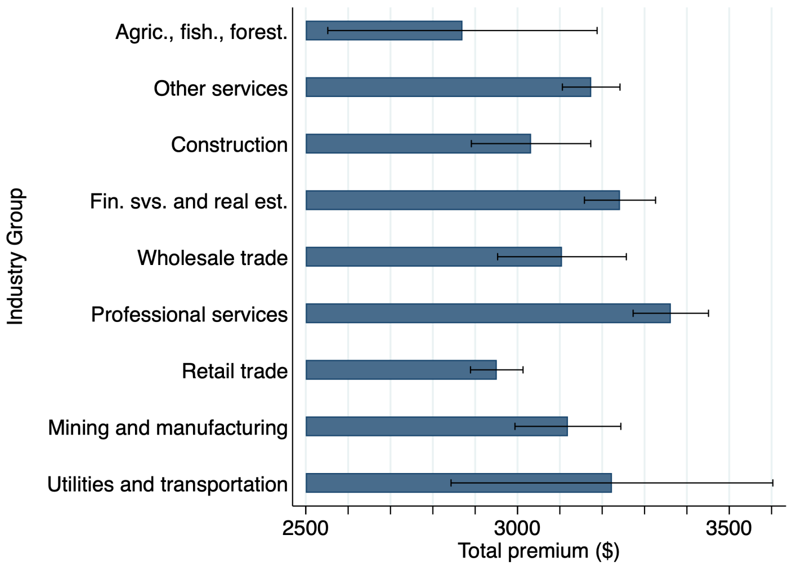
(b) Correlation with Effect of Mandates on Self-Funding



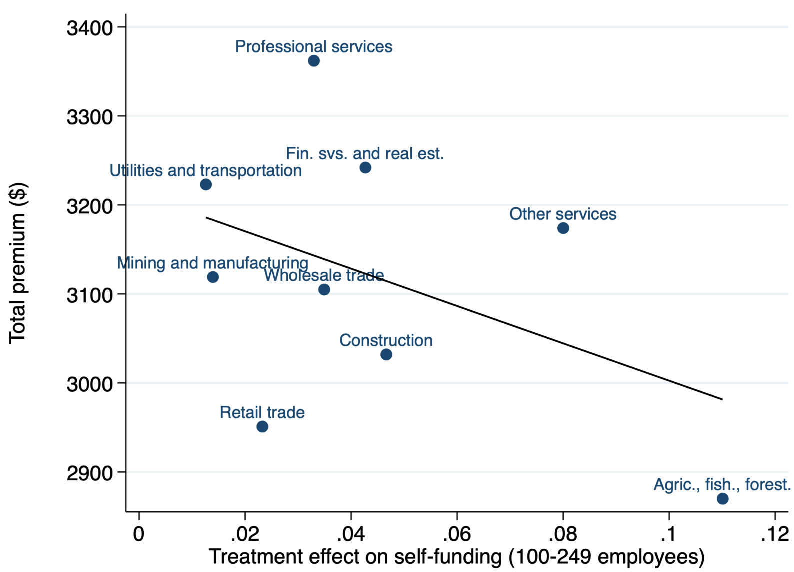
Notes: This figure shows (a) the fraction of firms (100-249 employees) that are self-funded by industry in 1999, and (b) the relationship with the estimated effect of mandates on self-funding for firms with 100-249 employees.

Figure 18: Industry Heterogeneity in Total Premiums

(a) Average Total Premium (All Firms) in 2002



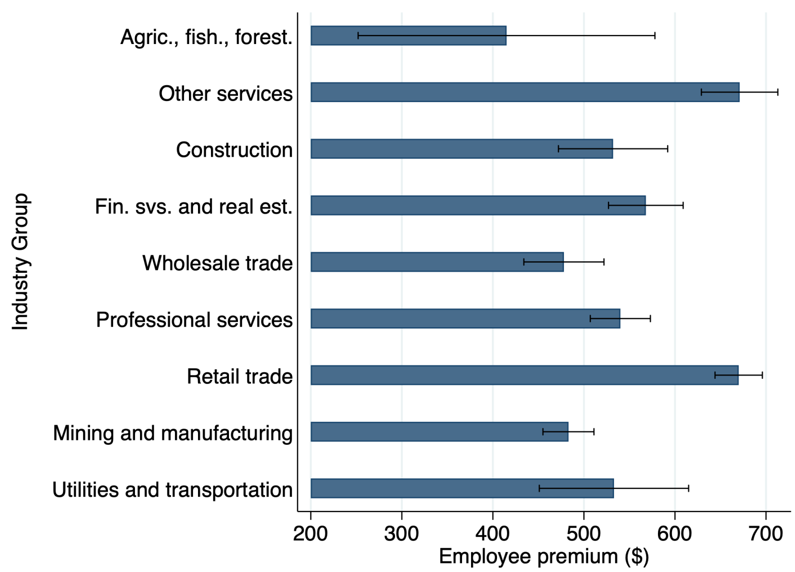
(b) Correlation with Effect of Mandates on Self-Funding



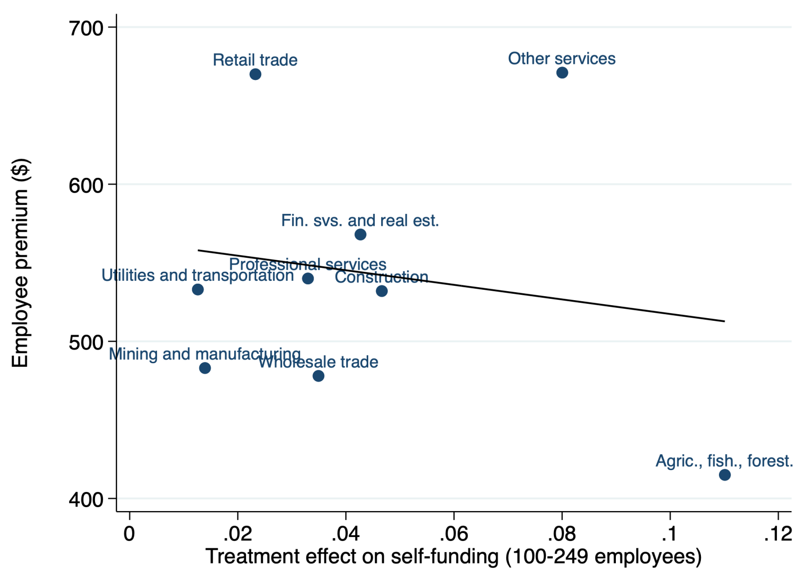
Notes: This figure shows (a) the average total premium for all firms by industry in 2002, and (b) the relationship with the estimated effect of mandates on self-funding for firms with 100-249 employees. Average total premiums and 95% confidence interval are from the Medical Expenditure Panel Survey – Insurance Component (AHRQ, 2021).

Figure 19: Industry Heterogeneity in Employee Premiums

(a) Average Employee Premium (All Firms) in 2002



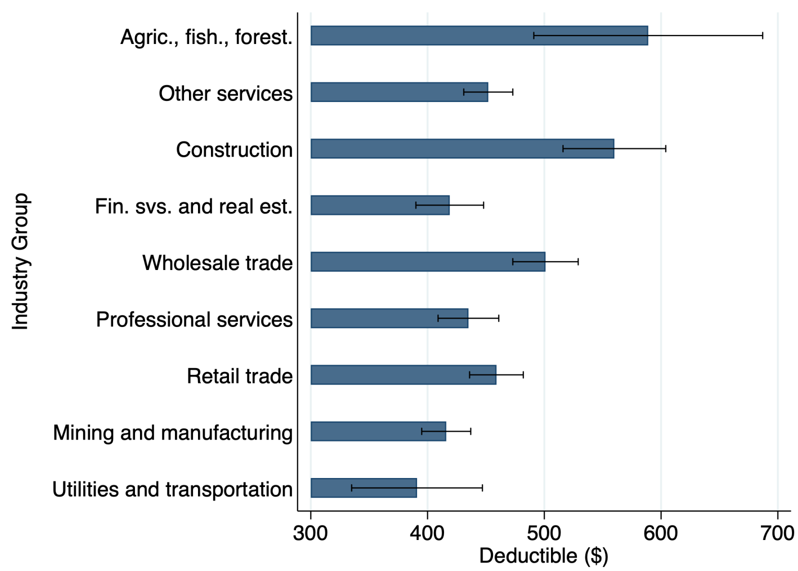
(b) Correlation with Effect of Mandates on Self-Funding



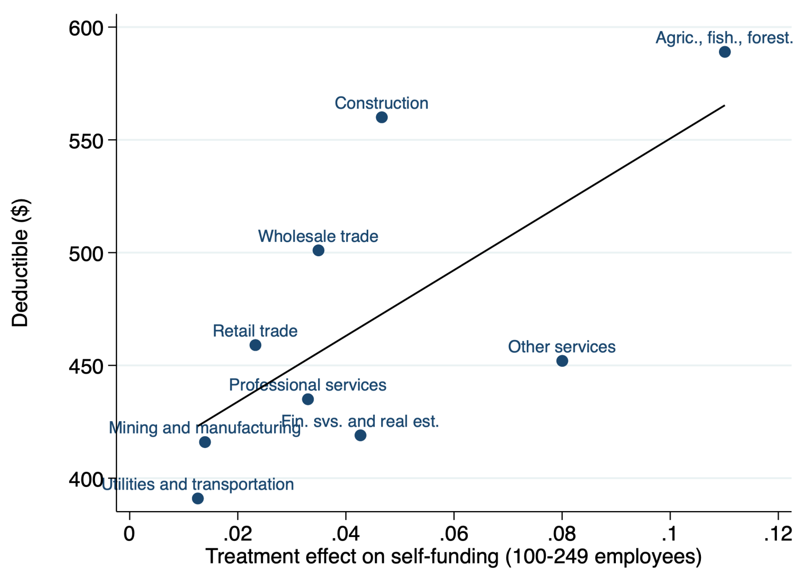
Notes: This figure shows (a) the average employee premium contribution for all firms by industry in 2002, and (b) the relationship with the estimated effect of mandates on self-funding for firms with 100-249 employees. Average employee premiums and 95% confidence interval are from the Medical Expenditure Panel Survey – Insurance Component (AHRQ, 2021).

Figure 20: Industry Heterogeneity in Employee Premiums

(a) Average Deductible (All Firms) in 2002

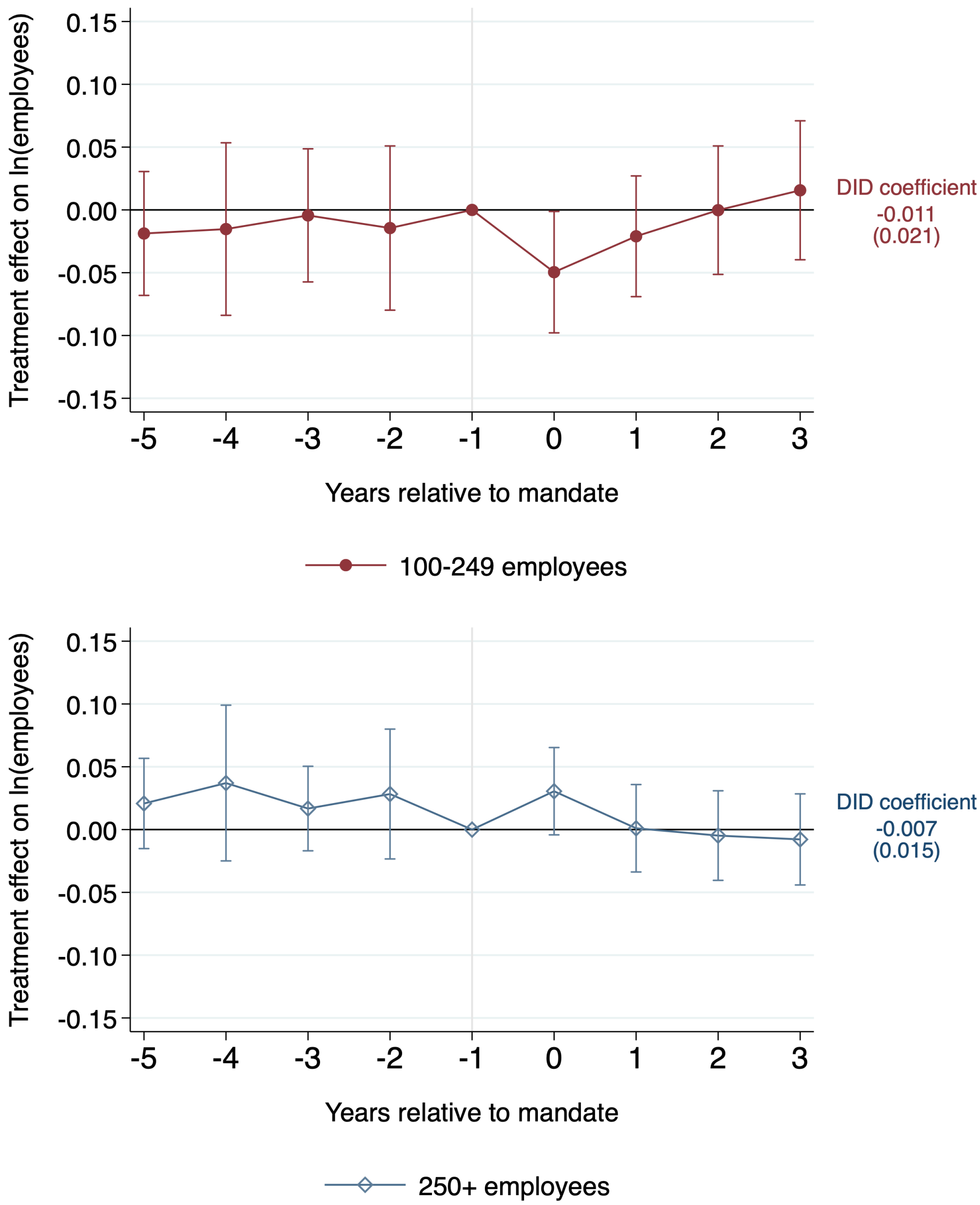


(b) Correlation with Effect of Mandates on Self-Funding



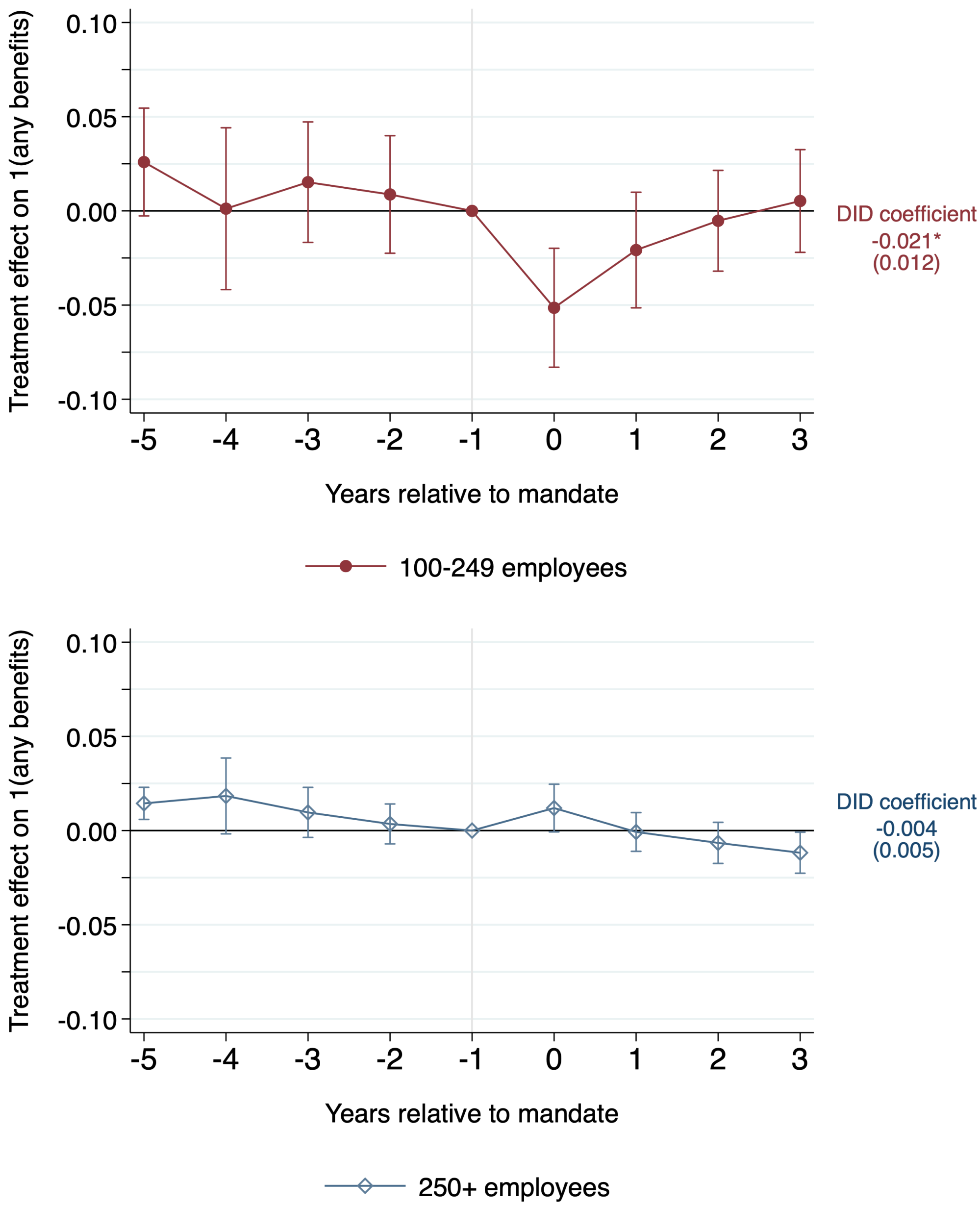
Notes: This figure shows (a) the average deductible for all firms by industry in 2002, and (b) the relationship with the estimated effect of mandates on self-funding for firms with 100-249 employees. Average deductible and 95% confidence interval are from the Medical Expenditure Panel Survey – Insurance Component (AHRQ, 2021).

Figure 21: Effect of Mandates on Employment by Firm Size



Notes: This figure shows the estimated effect of mandated benefits on (log) employment, separately for smaller and larger firms. The sample includes all firms that report offering health coverage through the Form 5500. Event study and difference-in-differences estimates are from a regression that interacts treatment with firm size category, controls for size category, and includes state and year fixed effects. Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 22: Effect of Mandates on Any Benefits by Firm Size



Notes: This figure shows the estimated effect of mandated benefits on whether firms offer any benefits, separately for smaller and larger firms. The sample includes all firms that ever report welfare benefits through the Form 5500. Firms not reporting benefits could either not offer benefits, or not exist. Event study and difference-in-differences estimates are from a regression that interacts treatment with firm size category, controls for size category, and includes state and year fixed effects. Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix

Table A1: Mandates Contributing to Treatment

Mandate	# Times Passed	# Times Passed in Treatment Year	# Times Passed Alone in Treatment Year
Acupuncturists	5	1	1
Alcoholism Treatment	2		
Ambulatory Surgery	1		
Chiropractors	3	3	
Contraceptives	26	13	7
Conversion to Non-Group	4	2	
Dentists	2	2	
Diabetic Supplies & Education	19	14	6
Handicapped Dependents	2	1	
Home Health Care	1		
Infertility Treatment	5		
Maternity	6	3	2
Mental Health (General)	9	5	2
Mental Health (Parity)	29	13	7
Optometrists	7	4	
Osteopaths	3	3	
Physical Therapists	3	1	
Psychologists	1	1	
Rehabilitation Services	3		
Social Workers	1	1	
Well Child Care	16	7	6

Notes: This table lists the (costly) mandates that occur during the time period of study. The first column details the number of times the mandate was passed overall. The second column details the number of times that the mandate was passed in the treatment year. The third column details the number of states where the mandate was the only mandate passed in the treatment year.

Table A2: Effect of Mandates on Offering Health Coverage

	(1)	(2)
Mandate	-0.002	
	(0.007)	
Mandate * Small		-0.002
		(0.008)
Mandate * Large		-0.002
		(0.006)
N	185,261	185,261
State FE	Yes	Yes
Year FE	Yes	Yes
Control for Small		Yes
Mean	0.865	
Mean (100-249)		0.905
Mean (250+)		0.840

Notes: This table shows the estimated effect of mandated benefits on whether firms offer any health coverage. The sample includes all firms that report offering any welfare benefits through the Form 5500, for event times -5 to 3 (where 0 is the year of treatment). Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3: Effect of Mandates on Self Funding

	(1)	(2)
Mandate	0.009	
	(0.006)	
Mandate * Small		0.032**
		(0.013)
Mandate * Large		-0.006
		(0.006)
N	159,714	159,714
State FE	Yes	Yes
Year FE	Yes	Yes
Control for Small		Yes
Mean	0.274	
Mean (100-249)		0.239
Mean (250+)		0.298

Notes: This table shows the estimated effect of mandated benefits on whether firms self-fund their health coverage. The sample includes all firms that report offering health coverage through the Form 5500, for event times -5 to 3 (where 0 is the year of treatment). Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A4: Varying Size of Event Window

	(1)	(2)	(3)
Mandate * Small	0.032**	0.031**	0.031**
	(0.013)	(0.013)	(0.013)
Parallel trends test p-value	0.016	0.541	0.643
Mandate * Large	-0.006	-0.008	-0.009
	(0.006)	(0.005)	(0.007)
Parallel trends test p-value	0.006	0.005	0.084
N	159,714	152,986	144,384
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Control for Small	Yes	Yes	Yes
Window	-5 to 3	-4 to 2	-3 to 1

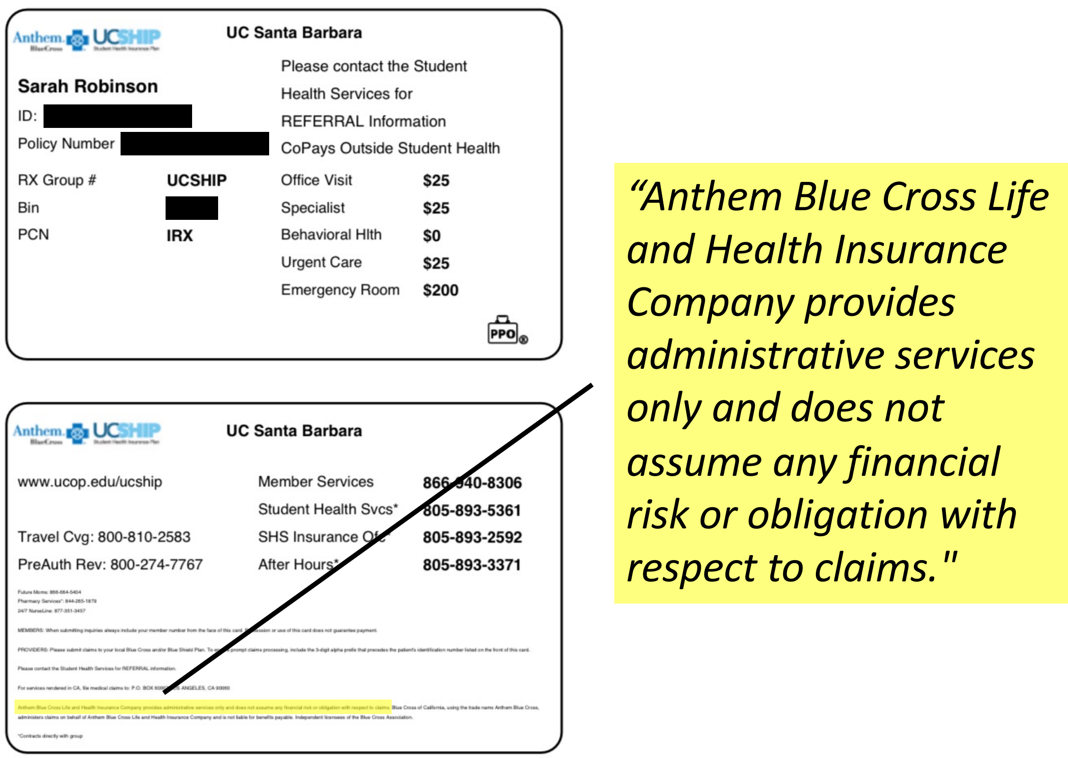
Notes: This table shows the estimated effect of mandated benefits on whether firms self-fund their health coverage. Each column considers a different event window, where 0 is the year of treatment. Results from the difference-in-differences specification are shown, as well as p-values from an F-test that all of the event study pre-period coefficients are equal to zero. The sample includes all firms that report offering health coverage through the Form 5500. Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure A1: Prevalence of Self-Funding Over Time by Firm Size

Notes: This figure shows the percent of workers who are enrolled in self-funded plans, among all workers who are covered by an employer-sponsored health plan, by the size of firm.

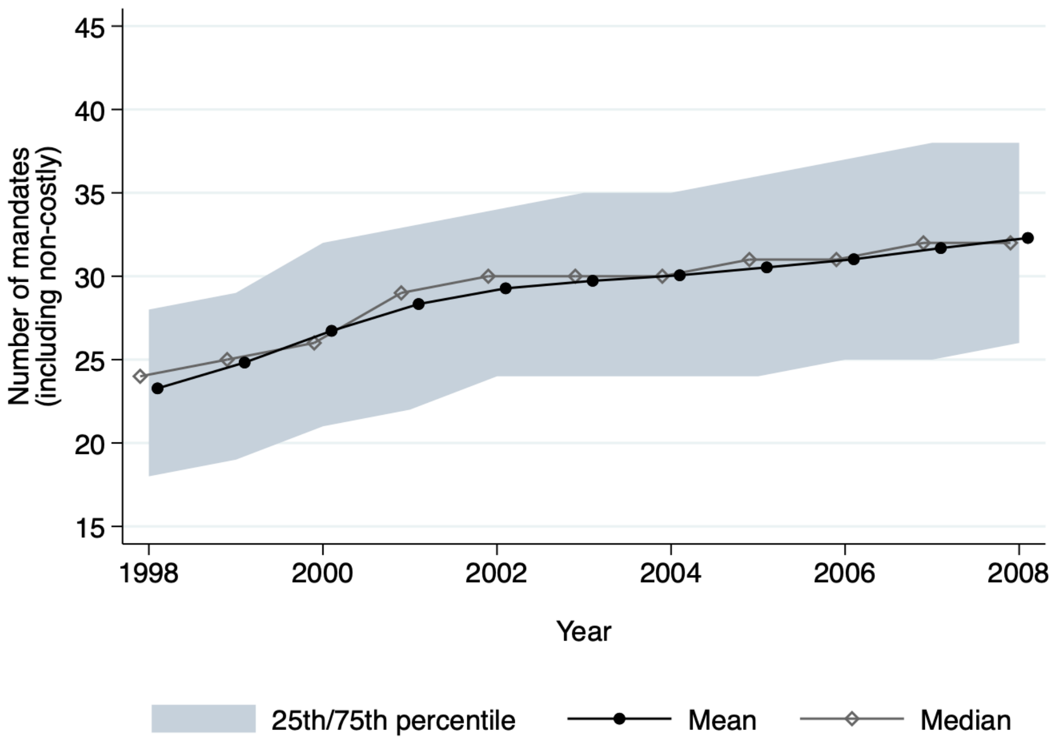
Source: Kaiser Family Foundation Employer Health Benefits Survey

Figure A2: Sample Health Insurance Card



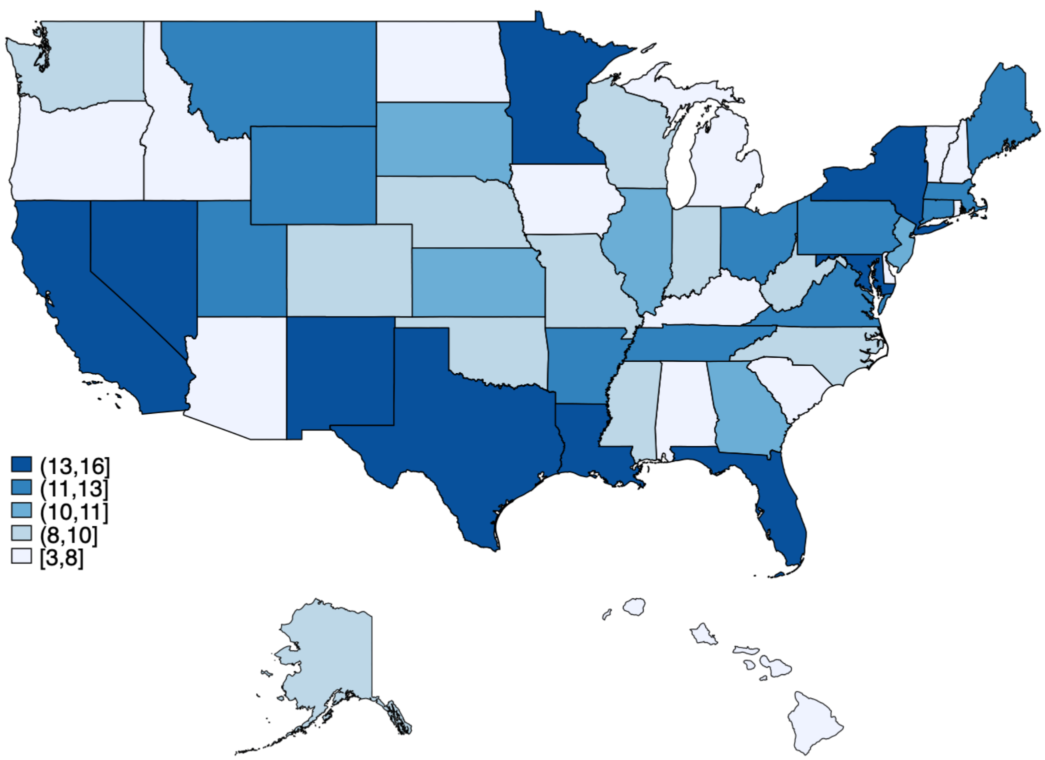
Notes: This figure shows an example of an insurance card. The highlight and expanded text is the indication that this insurance plan is self-funded.

Figure A3: Mandates Over Time (Including Non-Costly Mandates)



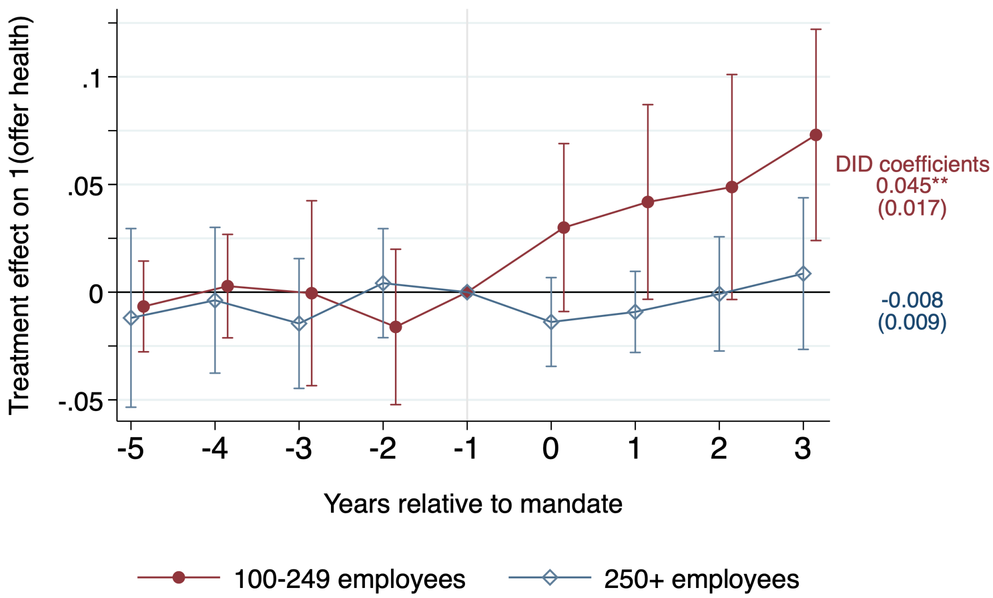
Notes: This figure shows the distribution of mandates across states over time. In each year, the mean number of mandates across states is shown. The median, 25th percentile, and 75th percentile are also shown. Mandates with negligible effects on costs are included.

Figure A4: Number of Mandates by State in 1998



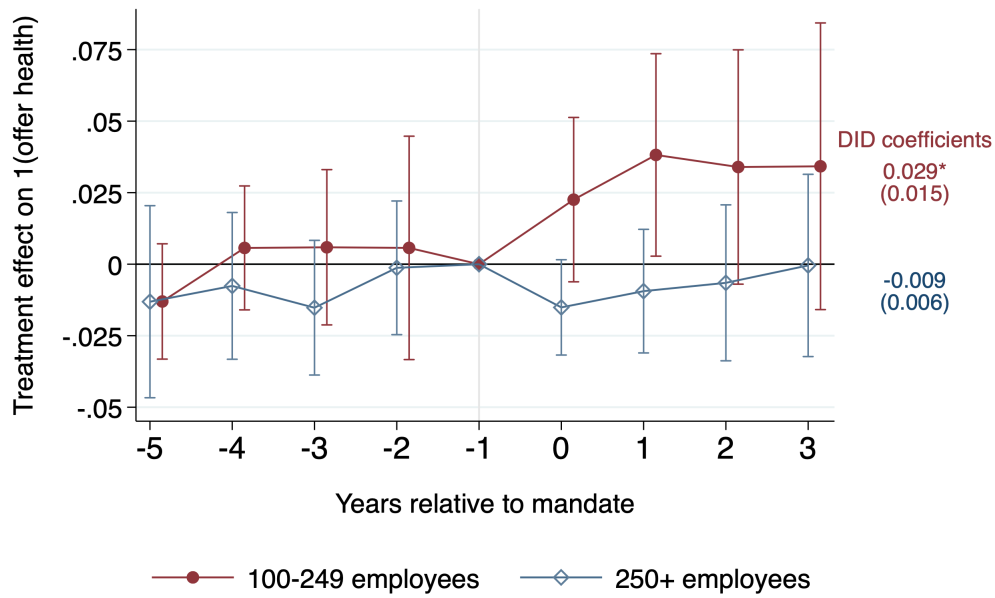
Notes: This figure shows the number of mandates in each state in the baseline year of 1998.

Figure A5: Excluding States with Additional
Mandates After Treatment Year



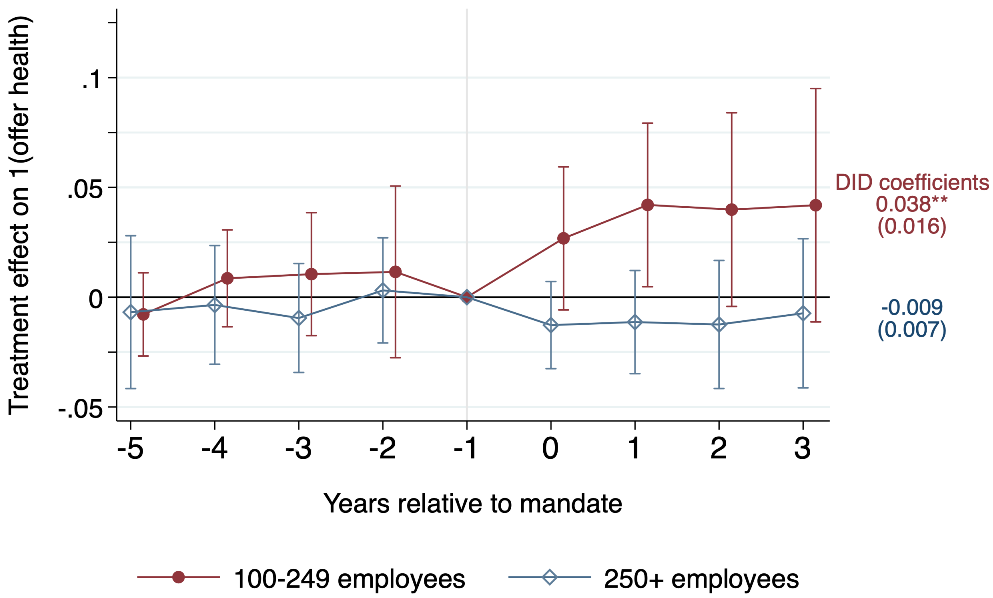
Notes: This figure shows the estimated effect of mandated benefits on whether firms self-fund their health coverage, where states that passed additional mandates after the treatment year are excluded. The sample includes firms that report offering health coverage through the Form 5500. Event study and difference-in-differences estimates are from a regression that interacts treatment with firm size category, controls for size category, and includes state and year fixed effects. Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure A6: Excluding States with More than One Mandate in Treatment Year



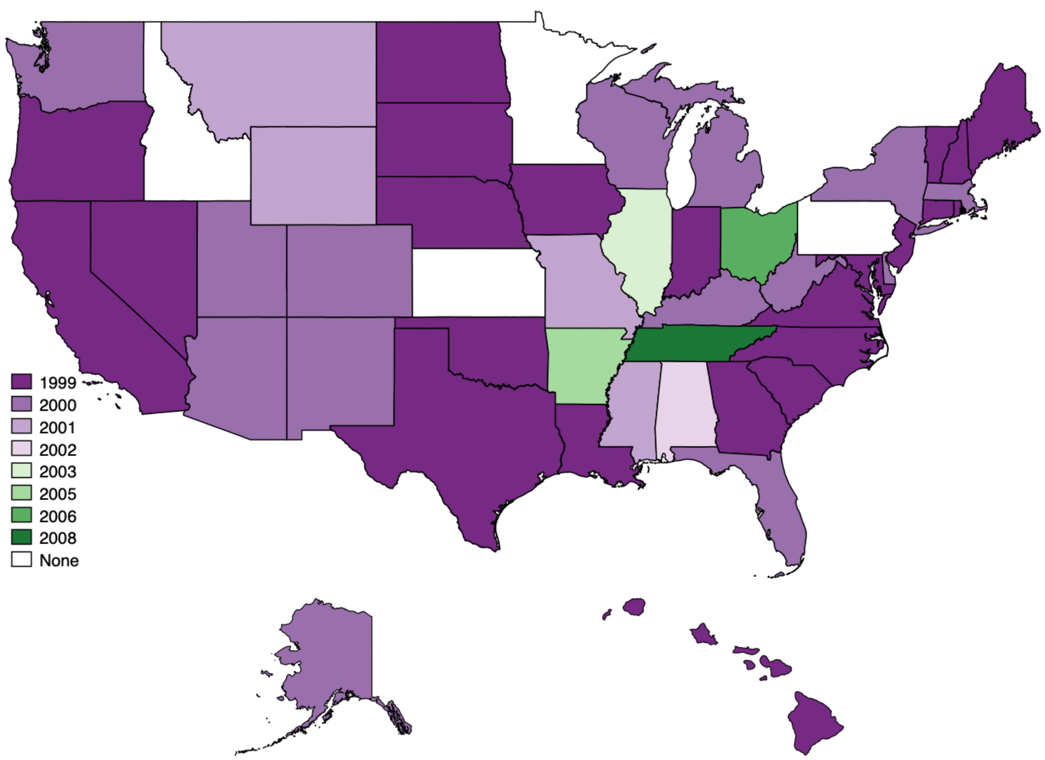
Notes: This figure shows the estimated effect of mandated benefits on whether firms self-fund their health coverage, where states that passed more than one mandate in the treatment year are excluded. The sample includes firms that report offering health coverage through the Form 5500. Event study and difference-in-differences estimates are from a regression that interacts treatment with firm size category, controls for size category, and includes state and year fixed effects. Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure A7: Excluding States with New Mandates
in Four Years Prior to Treatment



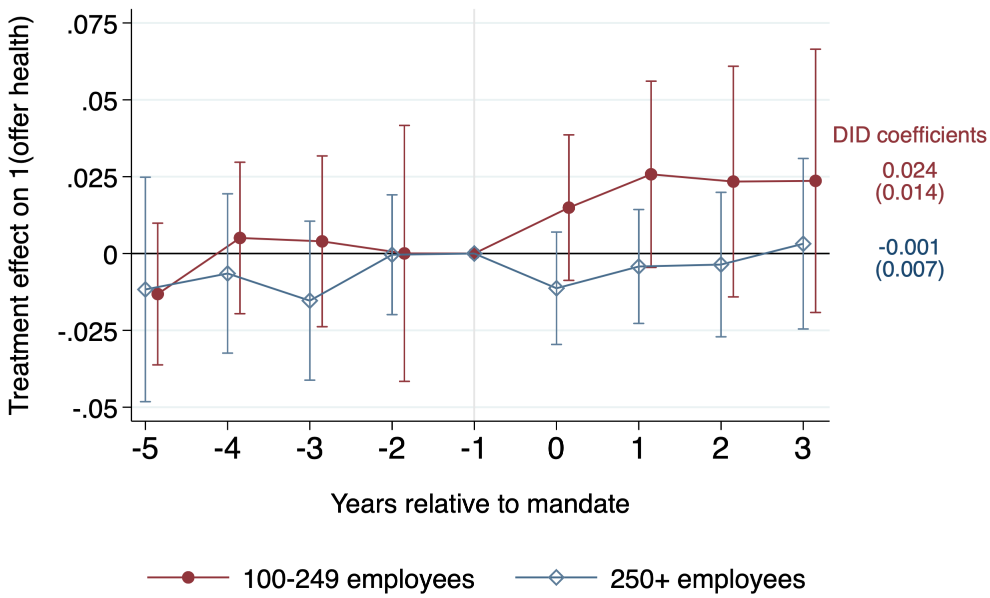
Notes: This figure shows the estimated effect of mandated benefits on whether firms self-fund their health coverage, where states that passed mandates in the previous four years are excluded. The sample includes firms that report offering health coverage through the Form 5500. Event study and difference-in-differences estimates are from a regression that interacts treatment with firm size category, controls for size category, and includes state and year fixed effects. Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure A8: Year of Treatment by State



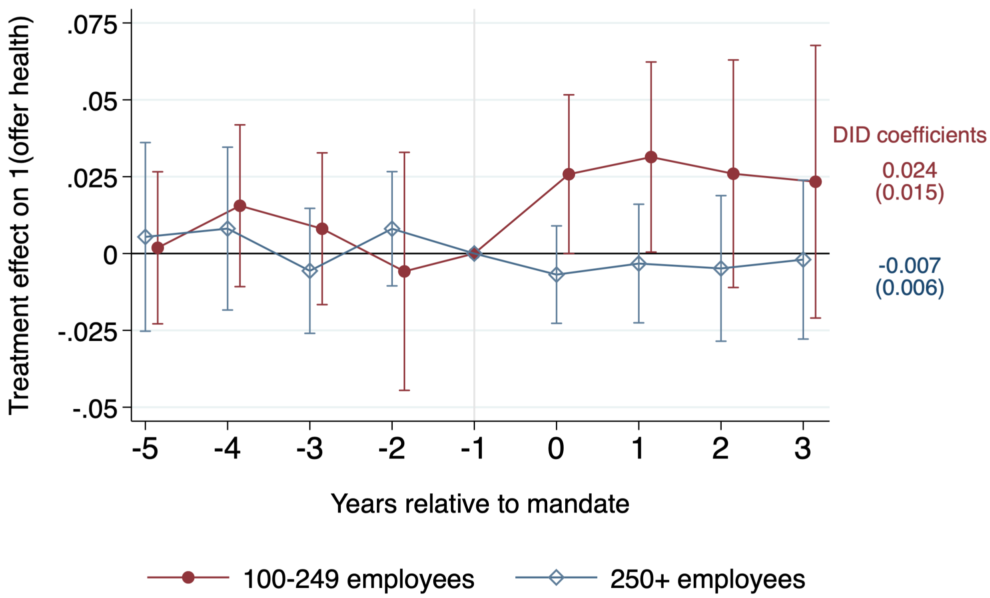
Notes: This figure shows the year of treatment for each state (the first year that state passes any costly mandate).

Figure A9: Excluding States with Mandates in 1999



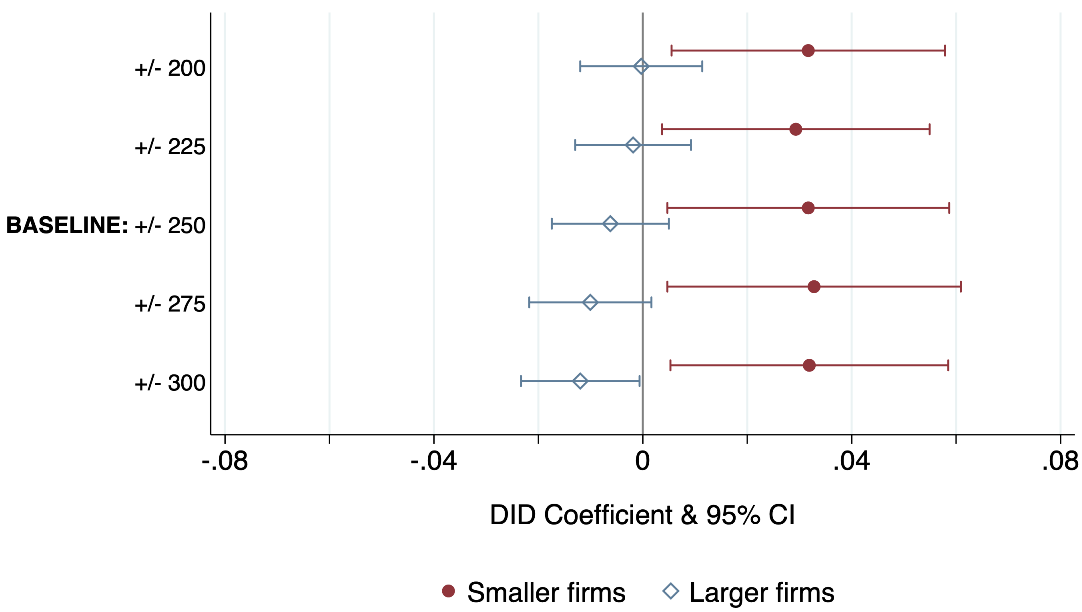
Notes: This figure shows the estimated effect of mandated benefits on whether firms self-fund their health coverage, where states that passed mandates in 1999 are excluded. The sample includes all firms that report offering health coverage through the Form 5500. Event study and difference-in-differences estimates are from a regression that interacts treatment with firm size category, controls for size category, and includes state and year fixed effects. Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure A10: Identifying Costly Mandates with CAHI Only



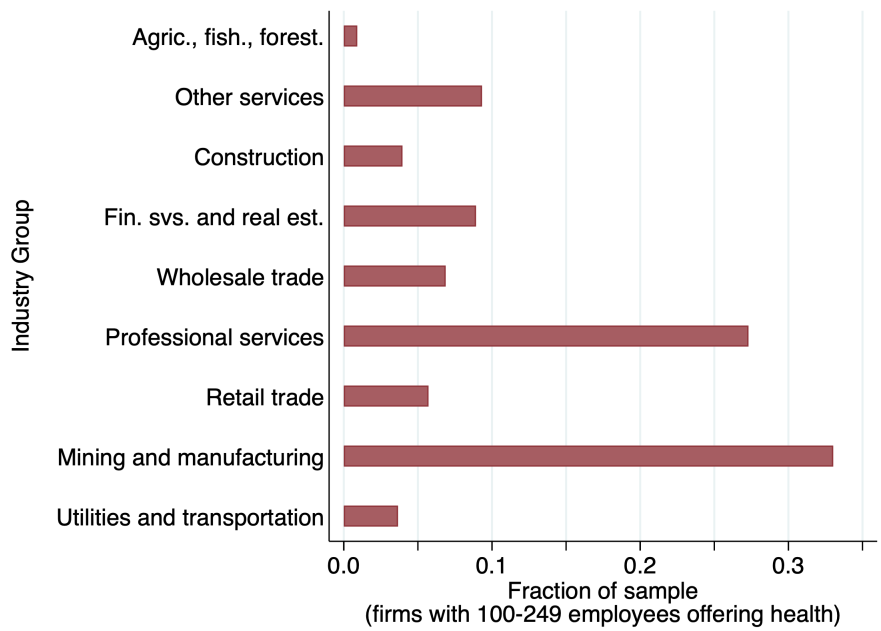
Notes: This figure shows the estimated effect of mandated benefits on whether firms self-fund their health coverage, using only the 19 costly mandates identified by CAHI. The sample includes firms that report offering health coverage through the Form 5500. Event study and difference-in-differences estimates are from a regression that interacts treatment with firm size category, controls for size category, and includes state and year fixed effects. Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure A11: Varying Cutoff Between Small and Large Firms



Notes: This figure shows the estimated effect of mandated benefits on whether firms self-fund their health coverage. For each specification, difference-in-differences estimates and 95% confidence intervals are shown for smaller and larger firms. All estimates are from a regression that interacts treatment with firm size category and controls for size category, and standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure A12: Distribution of Firms (100-249 Employees) Across Industry Groups



Notes: This figure shows how the sample of firms with 100-249 employees that offer health is distributed across industry groups.