Mandated Sick Pay: Coverage, Utilization, and Welfare Effects

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Abstract

This paper evaluates the effects of employer sick pay mandates on sick pay coverage, utilization, and labor costs in the U.S. Using the National Compensation Survey, we estimate difference-in-differences models in an event study design. Sick pay coverage increases significantly by 9 percentage points from a baseline level of 64 percent in the first two years, but then plateaus over the next four years. Newly covered employees take two additional sick days in the first quarter of the year, increasing labor costs by 23 cents per hour worked for marginal firms. However, we find little evidence that mandated sick pay crowds-out other non-mandated paid leave benefits. Finally, we develop a model of optimal sick pay provision along with a welfare analysis. Mandating sick pay likely increases welfare.

Keywords: sick pay mandates, sick leave, medical leave, employer mandates, fringe benefits, moral hazard, unintended consequences, labor costs, National Compensation Survey (NCS), welfare effects, optimal social insurance, Baily-Chetty

JEL classification: I12, I13, I18, J22, J28, J32

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1 Introduction

Of all countries in the Organization for Economic Cooperation and Development (OECD), only three do not provide universal access to paid sick leave for employees: The United States of America, Canada, and the Republic of Korea. In the U.S., the lack of federal regulation leads to substantial inequality in paid sick leave coverage across firms and industries. For instance, 97 percent of private sector employees in the finance and insurance industry have access to paid sick leave, whereas only 41 percent in the accommodation and food services industry have access (Susser and Ziebarth, 2016; Bureau of Labor Statistics, 2018b). Among low-income and part-time employees, coverage rates also lie below 50 percent (Bureau of Labor Statistics, 2018b). Put differently, the majority of low-income employees cannot take a paid sick day to recuperate when they (or their children) become ill. Many are not even eligible to take an *unpaid* sick day as the only existing federal law, the *The Family and Medical Leave Act of 1993 (FMLA)*, exempts part-time employees and employees in small businesses. As of 2012, an estimated 44 percent (or 49 million) private sector workers were not covered by FMLA (Jorgensen and Appelbaum, 2014). In sum, the absence of federal regulation leads to a patchwork sick leave landscape with high degrees of inequality within the U.S. labor market.

While there is little bipartisan will to mandate paid sick leave at the federal level, numerous U.S. cities and states have passed such mandates. San Francisco was the first city to implement a sick pay mandate, increasing the coverage rate above 90 percent (Colla et al., 2014). Contrary to predictions of opponents, San Francisco did not experience reduced labor demand or wage growth (Boots et al., 2009; Drum Major Institute for Public Policy, 2010; Appelbaum and Milkman, 2011; Colla et al., 2017; Pichler and Ziebarth, 2019). Based on the San Francisco experi-

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ence and also because polls show that 75% of Americans support sick pay mandates (National Paid Sick Days Study, 2010), many more cities and states passed sick leave legislation in the past decade. As of 2019, several dozen cities (including, among others, Chicago, Washington D.C., New York City, Philadelphia, Portland, and Seattle) and twelve states (including Arizona, California, Connecticut, Massachusetts and Oregon) have passed sick leave legislation (for an overview, see A Better Balance, 2019). It is easy to forecast that more states will follow in the next years.

The canonical economic model of mandated benefits predicts that employer mandates can be more efficient than direct government provision of benefits (funded through taxation). This is the case if employees value the benefit and accept lower cash wages in return (Summers, 1989). However, Gruber (1994) argues that anti-discrimination and minimum wage laws as well as social norms could prevent such wage reductions as they set a legally binding wage floor and prohibit wage differences for employees who perform the same work. In line with Gruber (1994)'s arguments, Pichler and Ziebarth (2019) find no evidence for significant and systematic employment or wage losses as a result of the recent sick pay mandates in the U.S. Moreover, the mandates are relatively mild and potentially have little bite: they stipulate that employees have the right to earn one hour of paid sick leave per 30 to 40 hours worked. Such an individualized sick leave account resembles medical savings accounts for health insurance, which are designed to minimize moral hazard and hence employer costs (Pauly et al., 1995; Keeler et al., 1996; Schreyögg, 2004). Lastly, because there is evidence that more generous sick pay reduces presenteeism ('working sick') behavior, it may actually increase work attendance and productivity by reducing the spread of diseases at the workplace (Pichler and Ziebarth, 2017; Stearns and White, 2018). In sum, while single empirical evidence has surfaced in recent years, the first order and welfare effects of mandating sick pay are still poorly understood.

This paper is the first to use administrative data to comprehensively evaluate the effects of the city- and state-level sick pay mandates on coverage rates, utilization, and employer costs in the United States. These first order effects are of crucial relevance for academics and practitioners in order to assess the effectiveness and functioning of these very popular mandates. Existing empirical evidence is very scant and mostly based on relatively noisy survey data (cf. Ahn and Yelowitz, 2016; Callison and Pesko, 2017). Further, this paper also studies whether sick pay mandates have unintended consequences. For instance, in response to the mandates, employers could have reduced non-mandated fringe benefits such as paid vacation days or paid maternity leave. To this end, we use restricted-access government data from the National Compensation Survey (NCS) over the period 2009 to 2018 coupled with differences-in-differences (DD) models and event studies.

In the final section, we apply and extend the standard Baily-Chetty framework of optimal social insurance benefits to the case of optimal sick pay (see Baily, 1978; Chetty, 2006; Chetty and Finkelstein, 2013). In our model, when sick pay becomes more generous, the social planner weighs the marginally higher consumption utility of workers against the firm costs of providing more sick pay. As work productivity decreases in the sickness level, we show that a profit maximizing firm would provide some level of sick pay even in the absence of a social planner. This is because, otherwise, sick workers would come to work, earn their regular salary, but their low work productivity makes them unprofitable for the firm. Sick pay incentivizes sick workers to call in sick and receive sick pay, αw, instead of the full salary w (with $\alpha w < w$). However, because firms solely maximize their profits but the social planner also considers worker utility, the optimal sick pay level set by the firm will be lower than the welfare maximizing level.

First, our findings show that city- and state-level mandates are effective in increasing coverage rates. Within the first two years, the probability that an employee has access to paid sick leave increases by 9 percentage points (or 14 percent) from a base coverage rate of 64 percent. The increase in coverage persists for at least four more years without increasing further. We also show that, as expected, the probability to take sick days increases significantly by 1.4 hours in the first quarter of the year. Scaling these 1.4 hours by the 9 percentage points increase in coverage implies that newly covered employees use two additional sick days between January and March of a given year (which coincides with the typical influenza season). Employer sick leave costs also increase as a result of the mandates, but only modestly. On average, the increase amounts to 2.4 cents per hour worked, or 27 cents per hour worked for a marginal employer. Further, we find little evidence that sick pay mandates crowd-out non-mandated benefits such as vacation days. Finally, our optimal sick pay model suggests that the absence of mandates likely results in an underprovision of sick pay; for the most plausible and identified parameter values, the mandates increased overall welfare .

The U.S. economic literature on sick leave is scarce. Gilleskie (1998, 2010) represent notable exceptions but these two important studies pre-date the current debate on sick leave mandates. Few studies empirically evaluate the recent U.S. sick pay mandates mostly due to the lack of data.[1] In an early but related study, Waldfogel (1999) shows that the 1993 *FMLA* increased coverage rates and leave utilization.[2] Hall et al. (2018) study the recent sick pay mandate in New York City (NYC) and find that 70 percent of employees receive sick pay after the law's implementation. Besides Pichler and Ziebarth (2017) and Pichler and Ziebarth (2019) (see above), two unpublished manuscripts use retrospectively reported information from the National Health Interview Survey (NHIS) to study short-run effects of several city- and state-level mandates (Ahn and Yelowitz, 2016; Callison and Pesko, 2017). Both studies find that the mandates increase sick leave use by one day per year. While these studies are a welcome addition to very limited scientific evidence due to data limitations (i) they cannot study the 'first stage' effects on coverage, (ii) rely on self-reports which may be measured with error, (iii) do not study mandate costs to employers or its incidence, (iv) do not study the potential crowd-out of non-mandated benefits, and (v) do not provide a welfare analysis. Our study uses rich government data specifically designed to measure both full employee compensation and employer costs. It builds on the existing literature on social insurance, paid leave, and employer mandates to enhance our understanding of the effects of mandated sick pay for employees and employers in the U.S.

The paper proceeds as follows: Section 2 discusses the U.S. sick leave mandates in detail and Section 3 explains the data. The empirical approach and identifying assumptions are in Section 4. Section 5 discusses the empirical findings. Section 6 measures welfare effects by developing an optimal sick pay model, and Section 7 concludes.

2 U.S. Sick Pay Mandates

Paid sick leave was an integral component of the first social insurance system in the world. The *Sickness Insurance Law of 1883* implemented federally mandated employer-provided health insurance in Germany, which covered up to 13 weeks of paid sick leave along with health-

[1]The European literature on paid sick leave is much richer. Several studies find that employees adjust their intensive labor supply in response to mandates (Johansson and Palme, 2005; Ziebarth and Karlsson, 2010, 2014; De Paola et al., 2014; Dale-Olsen, 2014; Fevang et al., 2014; Aaviksoo and Kiivet, 2016). Other papers investigate the role of probation periods (Ichino and Riphahn, 2005), culture (Ichino and Maggi, 2000), social norms (Bauernschuster et al., 2010), gender (Ichino and Moretti, 2009; Herrmann and Rockoff, 2012), income taxes (Dale-Olsen, 2013), union membership (Goerke and Pannenberg, 2015), career prospects (Chadim and Goerke, 2018), and unemployment (Nordberg and Røed, 2009; Pichler, 2015). There is also research on the impact of paid sick leave on earnings (Sandy and Elliott, 2005; Markussen, 2012).

[2]Note that paid sick leave differs from paid maternity leave in both aim and scope (Rossin-Slater et al., 2013; Lalive et al., 2014; Baum and Ruhm, 2016). Whereas sick leave coverage is an insurance against wage losses due to sickness, maternity leave mostly aim at balancing family and work and address gender inequality in the workplace (Dahl et al., 2016).

care. Insurance against wage losses due to health shocks was a crucial element of health insurance at that time, and valued by employees and unions alike. Given the limited availability of expensive healthcare treatments in the 19^{th} century, expenditures for paid sick leave initially accounted for more than half of all health insurance expenditures (Busse and Blümel, 2014). Subsequently, other European countries followed and implemented paid sick leave coverage for employees. Today, every European country provides universal access to paid sick leave.

The U.S. is one of only three OECD countries without universal access to paid sick leave. As a result, in 2011, approximately half of the U.S. workforce did not have access to paid sick leave (Susser and Ziebarth, 2016). Since then, this share has decreased to below 30% (Bureau of Labor Statistics, 2018b). Still, the only existing. federal law is *The Family and Medical Leave Act of 1993 (FMLA)*. This Act provides *unpaid* leave in case of pregnancy, own disease, or disease of a family member to employees who work at least 1,250 hours annually for an employer with 50 or more employees (cf. Waldfogel, 1999; Tominey, 2016). Given the exemptions to this law, Jorgensen and Appelbaum (2014) estimate that 44 percent of private sector employees are ineligible for FMLA. Susser and Ziebarth (2016) also document that many low-wage and service sector employees are either not covered by FMLA, or not aware of their rights. Although some exemptions exist, especially for smaller firms, the sick pay mandates analyzed here lead most employees to gain sick pay coverage.

Table A1 (Appendix) provides a detailed summary of most U.S. city- and state-level mandates passed to this date; this paper evaluates all listed mandates that were enacted between March 2009 and March 2018. While the details of the mandates differ from city to city and state to state, all existing mandates are employer mandates. Several mandates exclude small employers or include other exemptions. Employees "earn" a paid sick leave credit; typically 1 hour per 30 to 40 hours worked with a maximum of about 7 days per year. If unused, the sick leave credit rolls over to the next calendar year. Because employees must accrue the paid sick leave credit, most mandates explicitly state a 90 day accrual period in addition to waiting periods for new employees. However, several mandates that exempt small employers compel them to provide *unpaid* sick days (Massachusetts Attorney General's Office, 2016).

San Francisco was the first locality to mandate paid sick leave in the U.S. The law became effective February 5^{th}, 2007.[3] Washington D.C. enacted a mandate effective November 13^{th},

[3] In San Francisco, two laws that went into effect January 2008 could potentially confound a clean assessment of this mandate. First, the minimum wage has been increased in pre-determined steps annually from $8.50 in 2004 to $9.79 in 2009. Second, the *Health Care Security Ordinance* set minimum rates for employee healthcare spending by

2008, and expanded the scope of this mandate on Feb 22, 2014 to include temporary and tipped employees. Other cities that adopted sick pay mandates include Seattle (September 1^{st}, 2012), Portland (January 1^{st}, 2014), New York City (April 1^{st}, 2014), and Philadelphia (May 13^{th}, 2015).

Connecticut was the first state to mandate paid sick leave on January 1^{st}, 2012. However, the mandate only applies to service sector employees who work for large employers and, as a result, covers only 20 percent of the workforce. Over our study period, more states adopted sick pay mandates: California (July 1^{st}, 2015), Massachusetts (July 1^{st}, 2015), Oregon (Jan 1^{st}, 2016), Vermont (Jan 1^{st}, 2017), Arizona (July 1^{st}, 2017), Washington (Jan 1^{st}, 2018), and Maryland (Feb 11^{th}, 2018). New Jersey (Oct 29^{th}, 2018) and Michigan (March 29^{th}, 2019) followed recently.

Note that employers are generally required to post employee rights related to minimum wages, harassment and discrimination protection as well as sick pay at the workplace. Figure A1 shows two examples of such notices. Figure A1a shows an Earned Sick Time notice for Massachusetts that employers could post to comply with the Massachusetts workplace poster requirements (Commonwealth of Massachusetts, 2019). Alternatively, specialized companies offer posters like in Figure A1b (here for Arizona) that include *all* employee right provisions that employers must post to comply with the respective state laws (Industrial Commission of Arizona, 2019).

Whenever state and city laws coexist, legal complexities arise. When states pass mandates, existing city laws are typically preempted, as in the case of the 13 existing New Jersey city laws that existed prior to the state law (Title 34. Chapter 11D. (New) Sick Leave §§ 1-11).[4] However, this is not always the case, especially not when city laws are passed *after* the state law and are more comprehensive. Fortunately, the complexity of this city-state legal interplay is reduced in our setting because most state laws are very recent, and often too recent for our data to cover them; this means that we can disregard any city law that was passed after March 2008.[5] Moreover, to our knowledge, in Connecticut, Massachusetts and Oregon (the remaining main states in this paper), no other city laws were passed after the state mandates became effective.

A final institutional point is worth mentioning. In several cases, laws were challenged in court, mostly by business groups. For example, Pittsburgh's paid sick leave ordinance was

employers (those vary by firm size and for-profit status). However, as this mandate became effective prior to our study period, 2009 to 2018, we do not use variation from San Francisco for identification.

[4]See for the detailed bill `https://www.njleg.state.nj.us/2018/Bills/AL18/10_.HTM`

[5]California passed one of the broadest mandates that covered all businesses and part-time employees; therefore, we disregard single and slightly more generous city laws which were implemented subsequently.

approved on August 3, 2015 (Table A1). However, shortly after, business groups sued and lower courts rules against the law (because of unique language in the state's home rule charter). However, the city has appealed the decision to Pennsylvania's Supreme Court, where it is currently pending (Moore, 2018). Although it is unclear whether the laws are fully enforced in such cases (in case of Pittsburgh, enforcement was explicitly put on hold), we decided to not differentiate empirically by whether a lawsuit is pending anywhere at a given time for a specific jurisdiction.[6] Instead, we will focus on our heterogeneity analysis, differentiate between state and city-laws, and discuss any systematic pattern in the state-level results, depending on whether major lawsuits are pending.[7]

3 National Compensation Survey (NCS)

We use the restricted access version of the National Compensation Survey (NCS) collected and maintained by the Bureau of Labor Statistics (BLS). These data include highly detailed information on geographic location of establishments, which allows us to accurately match city- and state-level paid sick leave mandates to the data.[8] The NCS is particularly well-suited to our research question as the dataset is designed to provide official government statistics on a wide range of compensation and labor cost items. It is also used to adjust wages for federal employees. Most important, the NCS includes information on access to paid sick leave, paid and unpaid sick leave use, and leave costs to employers. Further, the data allow us to explore potential spillovers from sick pay mandates to non-mandated benefits that employers could reduce to offset paid sick leave costs; for instance, paid vacation or maternity leave.

The NCS is nationally representative.[9] In the NCS, random sampling is first carried out at the establishment level. Establishments are defined by the U.S. Census Bureau as "a single physical location where business is conducted or where services or industrial operations are performed (Bureau of Labor Statistics (BLS), 2018a)." Second, within establishments, and de-

[6]In another pending case, Airlines for America has sued the states of Massachusetts and Washington to seek an exemption from the law, arguing that the law would adversely affect their carrier prices, routes and services (Bloomberg BNA - Workplace Law Report, 2018).

[7]As another example of pending legal questions, the Massachusetts Supreme Judicial Court ruled that sick pay does not constitute wages, which implies that employers are not liable if they do not pay out unused sick days (Kaczmarek, 2018).

[8]The restricted access version of the NCS is only accessible in a BLS data research center located in Washington D.C.

[9]Obviously, an ideal dataset would be representative at the city and state level. To the best of our knowledge, no such dataset exists. However, to the extent that our identification assumptions hold, non-representativeness is no threat to the internal validity of our estimates.

pending on establishment size and number of different occupations within the establishment, the NCS collects information on compensation and benefits at the *establishment-occupation* level (Bureau of Labor Statistics (BLS), 2018b).

The main NCS survey is carried out in March of each calendar year. Human resource administrators of the establishment provide detailed information to the BLS surveyors on a range of offered benefits (including paid sick leave). Because the information is based on establishment-level administrative records, the procedure minimizes response error due to, for example, employees being unaware of their benefits. We leave the microdata in its original form, the establishment-occupation level, and focus on the March data in our main analysis. We also restrict the sample to private sector establishments as the mandates only affect the private sector. In our analyses, we routinely use the survey weights provided by the BLS to provide nationally representative estimates.

[Insert Table 1 about here]

Table 1 reports the summary statistics of all variables used. In our main analysis sample, we have 428,818 observations at the establishment-occupation level for the years 2009 to 2018. Using the Consumer Price Index, we convert all dollar values to 2018 U.S. dollars.

3.1 Main Variables

The main objective of our study is to comprehensively assess how sick pay mandates affect employer propensities to offer mandated and non-mandated benefits, employee use of paid and unpaid sick leave as well as employer costs related to sick leave. Hence, our first outcome variable measures an employee's access to paid sick leave through her employer. *Sick leave offered* is coded one if an employee has access to paid sick leave and zero otherwise. The baseline coverage rate is 64 percent in our sample (cf. Susser and Ziebarth, 2016).

Our second outcome measures employees' use of paid sick leave. *Paid sick hours taken* indicates the number of hours of paid sick leave taken by the employee in the first quarter of the year (January through March). The average is 16.5 hours, which corresponds to just over 2 days of paid sick leave.

Our third outcome measures unpaid hours of sick leave taken. Unpaid sick leave may act as a substitute to paid sick leave. The average number of *unpaid sick hours taken* is 0.8 per employee per first quarter in our sample. Because the utilization measures refer to the first quarter of the year, and thus the the influenza season, we expect that both paid and unpaid sick leave use may be higher than in the remaining quarters.

The final two main outcomes measure employer sick leave costs. *Sick leave total costs* is the total number of paid sick leave hours taken (in the first quarter) multiplied by the hourly wage, inclusive of fringe benefits, for each employee.[10] Dividing the reported $476 sick leave costs by the 16.5 paid sick leave hours yields a total hourly wage of $28.84 for our sample. This number includes employer benefits; the gross wage paid out to employees is $22.22, see second panel of Table 1. *Sick leave costs per hour worked* divides *sick leave total costs* by the number of hours worked per quarter. The average is 27 cents per hour worked.

3.2 Additional Variables

We also assess whether mandated sick pay crowds-out non-mandated benefits. To meet this objective, we examine how sick pay mandates affect a wider set of fringe benefits and other non-wage compensation. Table 1 lists such additional compensation measures. For example, 77 percent of all jobs offer paid vacation days, 70 percent offer health insurance coverage, and 57 percent offer life insurance coverage.

The remaining panels in Table 1 list control variables or variables to stratify the main estimates; these are measures for full-time work, unionization, occupation, and industry. Approximately three quarters of the jobs in our sample are full-time jobs and just under ten percent of jobs are unionized. The three most common occupations are 'office & administrative,' 'sales' as well as 'food preparation & serving.' The three most common industries are 'healthcare & social assistance,' 'retail & trade' as well as 'manufacturing.'

4 Empirical Approach

4.1 Differences-in-Differences

We use the staggered implementation of the sick pay mandates in different cities and states at different points in time to estimate differences-in-differences (DD) models:

[10] This is a variable generated by BLS NCS survey administrators. It assumes that sick hours represent 100 percent lost labor and does not consider changes in employee on-the-job productivity because of sick pay, or compensatory behavior by employees after returning to work.

$$y_{j,e,c,t} = \gamma_{e,j} + \delta_t + \phi D_c \times T_t + \rho X_{e,j,t} + \mu_{e,j,c,t} \quad (1)$$

where $y_{e,j,c,t}$ is one of the outcome variables (e.g., *paid sick leave offered*) in job j in establishment e in county c and year t. $\gamma_{e,j}$ are establishment-job fixed effects and δ_t are year fixed effects from 2009 to 2018.

D_c is a treatment indicator, which is coded one for counties, and counties within states, that implemented a sick pay mandate between 2009 and 2018. The interaction of D_c with the vector T_t yields the binary DD variable of interest. The interaction term is one for counties and time periods in which a paid sick leave mandate is in effect (see Table A1, column (3)).

$X_{e,j,t}$ is a vector of control variables that we include in the saturated specifications, e.g., to control for full or part-time jobs. The standard errors $\mu_{e,j,c,t}$ are clustered at the state-level (Bertrand et al., 2004). Given that both cities and states mandate sick pay, clustering at the state level yields the most conservative standard error estimates. However, in refined analyses, we estimate separate DD models for city and state-level mandates and cluster accordingly.

Given the identification assumptions hold up, Equation (1) estimates ϕ—the causal effect of mandated sick pay on sick pay coverage, utilization, labor costs and substitution effects.

4.2 Event Study

We also estimate and visually illustrate event study models. To this end, we decompose the binary T_t time indicator in Equation (1) into a series of leads and lags around the passage date of each mandate. To do this, we construct indicators for five years through one year in advance of the mandate ('leads', $\sum_{j=-5}^{-2} Lead_{c,j}$), the year of the mandate, and one through five years following the mandate ('lags', $\sum_{k=0}^{5} Lag_{c,k}$). Doing so, we center the data around the mandate passage, with the March before as the base year. We assign all localities without a mandate a zero for all lead and lag variables. Our event study equation is as follows:

$$y_{j,e,c,t} = \gamma_{e,j} + \delta_t + \kappa_j \sum_{j=-5}^{-2} Lead_{c,j} + \gamma_k \sum_{k=0}^{5} Lag_{c,k} + \rho X_{e,j,t} + \mu_{e,j,c,t} \quad (2)$$

The refined event study model offers at least two advantages over the basic DD model. First, visual examination of the policy leads allows us to test for and assess the plausibility of the common time trends assumption. Second, the lag variables allow treatment effects to vary over time in the post-mandate years; if employers are slow to comply with the mandated benefits or employees require time to learn about their new benefits, allowing for dynamic treatment effects and differentiating between short- and long-term effects may be crucial.

4.3 Identification

Because we rely on variation over one decade and across a dozen U.S. regions, to identify causal effects, we require fewer assumptions than in the canonical DD setting with just one treatment and one control group. Overall, we evaluate the average impact of the mandates for seven cities, D.C. as well as Connecticut, California, Massachusetts, and Oregon; that is, the mandates that were enacted between March 2009 and March 2018.

If the mandates were a reaction to pre-existing trends in the outcome variables in the treated regions, we would be able to identify such an endogenous implementation via our event study (i.e., mandate leads that are statistically different from zero). Similarly, anticipation effects should be identifiable in the event study.

The main remaining, and relatively weak, identification assumption is the absence of other confounding effects that are correlated with the staggered implementation of the sick pay mandates in all regions over an entire decade. Specifically, the implementation of the mandates and the outcome variables must not be correlated with a systematic, third, unobservable driving force. Note that the mandates were implemented at different times of the year, in January as well as May or July (Table A1), which adds to the credibility of the identifying assumption.

If the identification assumptions hold up, Equations (1) and (2) identify internally valid causal mandate effects. To what extend these estimates are externally valid for other U.S. regions is difficult to assess. For such predictions, using city or state-level estimates of regions whose labor markets are most similar to those in the region of interest is a promising approach. Our detailed heterogeneity analysis by industries, type of firm, and mandate specifics will also provide additional guidance.

5 Results

We begin this section by estimating Equation (1). That is, we implement difference-in-differences (DD) models to estimate the average intent-to-treat (ITT) effects of the mandates in a dozen U.S. regions. We then supplement these average post-reform estimates with event studies that visualize how the effects have evolved over time and allow us to test for conditional parallel trends between the treatment and comparison groups. Next, we assess effect heterogeneity and stratify the mean effects by type of job and type of mandate. Finally, we provide evidence for compensatory behavior by employers. We do this by estimating the impact of the mandates on non-mandated benefits such as paid vacation days.

5.1 Impact of the Mandates on Coverage Rates, Utilization and Labor Costs

DD Regression Models

Table 2 reports the results generated by Equation (1) for our main outcome variables. Each panel reports results from separate DD models that control for an increasingly larger set of covariates. Panel A includes year and establishment fixed effects, whereas Panel B adds employee controls and Panel C adds establishment-job fixed effects along with state-specific linear time trends. Overall, our results are highly robust across the various specifications.

[Insert Table 2 about here]

Coverage Rates. The three DD models in Column (1) of Table 2 shows that sick pay mandates increased coverage rates by 9 percentage points. Relative to the baseline coverage rate of 64 percent, the effects translate into an increase by about 14 percent. The point estimates are robust and significant at the 5 percent significance level across all three specifications.

A reasonable question to ask is why do coverage rates only increased by 9 percentage point to 73 percent? Note that our sample includes only private sector establishments for whom the mandates *should* be binding. In the following, we offer some hypotheses.

First, establishments may not comply with the mandates and/or human resources (HR) administrators (who provide the NCS benefit information) may be unaware of all benefits; particularly benefits that were only recently added. While HR administrators should respond to the survey, we cannot exclude the possibility that in fact employees respond to the NCS questionnaires themselves; it simply could be the case that employees are not *aware* of their rights and the new law. Such unawareness has been documented in other settings. Hall et al. (2018) find that 30 percent of all employees were unaware of the mandate in the first year in NYC. This is very consistent with our estimated post-reform coverage rate of around 73 percent. Additionally, similar to non-compliance in case of minimum wage laws (Basu et al., 2010), deliberate non-compliance could limit coverage uptake (on the other hand, employers respond to a government agency and could face penalties, e.g., administrative fines up to $4,000 in California, see for example Lexis Practice Advisor©, 2017).

Second, our classification of establishments and mandates may include measurement errors. The NCS survey question, which is not specifically designed to evaluate sick pay mandates does not perfectly mirror the details of the law. That is, the survey question simply refers to paid sick leave coverage but does not elicit additional details that would be relevant for the mandate. As an example, in NYC, the law covers employees who work more than 80 hours per year in firms with more than four employees *or* one domestic worker. Consequently, because questionnaires are filled out at the establishment-occupation level, even though employees in a non-small firm should be covered, it could be that an actual employee on this job is not covered at the time of the survey.

Moreover, in case of the city-level mandates, county and city boundaries are not always identical. This mismatch implies that some county identifiers include non-covered businesses. For instance, Portland almost entirely lies within Multnomah County, but small portions of the city cross into Clackamas and Washington County, and these two counties include large areas that are *not* with Portland's boundaries. Further, Seattle, Newark, and Jersey City all lie *within* the county that we use as treatment unit. For example, in 2018, King County had a population of 2,233,163, but Seattle only 744,955, or a third of the total county population (United States Census Bureau, 2019b,a). Given that several cities only capture a share of the counties in which they are situated implies that, for these cities, we evaluate the ITT effect for the entire county, which we expected to lie substantially below 100 percent coverage.

Finally, although our study period extends to 2018 with several post-reform years for most laws, it could be that coverage rates will further increase over time. For example, for larger states (i.e., California, Massachusetts and Oregon) our data include just two post-reform years.

We note that the NCS is used for official government statistics and to adjust federal employees' compensation; thus substantial misreporting is unlikely to be severe issue in our setting. Moreover, we use survey weights provided by the BLS, which are designed to correct for selective survey non-response and other data limitations (Ponikowski and McNulty, 2006).

Utilization. Columns (2) and (3) of Table 2 show the estimated effects on paid and unpaid sick leave hours taken in the first quarter of the year (recall that the NCS is administered by BLS at the end of March). As seen in column (2), there is robust evidence that, on average, paid sick hours taken increase by approximately 1.4, which corresponds to 8.5 percent relative to the baseline. Scaling this average effect by the 9 percentage point increase in coverage rates (column (1)) yields 15.6 hours or about 2 additional sick days taken during the first quarter of the year. This effect appears plausible and is in line with studies that find a decrease in influenza-like illness rates as a result of the mandates (Pichler and Ziebarth, 2017).

Equivalently, the number of unpaid sick hours taken doubled to 0.6 (column (3)), which yields a scaled effect of 6.7 hours or roughly one work day. Recall that many employees also gained the right to take unpaid leave as a result of the mandates. Jorgensen and Appelbaum (2014) report that in 2012, almost half the U.S. workforce has not been eligible for FMLA (also see Section 2).

Labor Costs. Columns (4) and (5) of Table 2 show the estimated effects on associated employer labor costs. Labor costs are important to assess in this context because critics commonly cite rising labor costs and depressed labor demand as reasons against government mandated sick pay (Kruth, 2018). However, using the Quarterly Census of Employment and Wages and synthetic control group methods, Pichler and Ziebarth (2019) do not find evidence that wages and employment decreased by more than two percent as a result of the mandates at the county level. Columns (4) and (5) provide a possible explanation for this null finding. In the NCS, we find that mandates increase total sick leave costs by 8 percent (column (4), Panel C) to \$476 per job in the first quarter; however, the costs per hour worked only increase by 2.1 cents (column (5), Panel C). Scaling this hourly cost increase by the 9 percentage point increase in coverage rates, costs increase by "only" 23 cents per hour for the marginal employer.

We note that this sick leave cost estimate is a static calculation. It does not consider possible changes in work productivity attributable to the mandate. For instance, overall work productivity could increase because workers can recover from their illness, because work moral goes up or because workers (over)compensate for lost labor after their sick leave. On the other hand, shirking and a lower work morale among coworkers could reduce productivity.

While the labor cost estimate does not consider changes in productivity, it implicitly considers that reduced presenteeism behavior could reduce infections and sick leave taken by coworkers (cf. Pichler and Ziebarth, 2017). That is because labor costs are the product of actual sick leave taken and hourly wages (Section 3.1). If sick leave hours actually *decreased* as a result of less presenteeism behavior and fewer infections (cf. Stearns and White, 2018), our labor cost estimate implicitly considers such an effect.

Event Studies

Figure 1 a to c plot events studies estimated by Equation (2). This specification replaces the post-mandate dummy T_t with $\kappa_j \sum_{j=-5}^{-2} Lead_{c,j} + \gamma_k \sum_{k=0}^{5} Lag_{c,k}$. The March before the mandate's enactment is our reference period. The x-axis of Figure 1 shows the normalized time dimension for all treatment regions and the y-axis the treatment effect in natural units.

All three event studies confirm the findings in Table 2. The event studies additionally illustrate how the treatment effects evolve over time. Further, by examining the mandate leads, the event studies allow us to asses the credibility of our main identification assumption. As seen, differential trends between the treatment and control groups are largely absent; the pre-mandate point estimates are small in magnitude and the gray confidence bands surrounding these point estimates entirely cover the 0-line on the y-axis.

[Insert Figure 1 about here]

Figure 1a documents a substantial increase in sick pay coverage rates in the year of the mandate (for example, in Oregon, where the law became effective January 1, 2016, $\gamma = 0$ refers to the survey as of March 2016). In the first post-mandate year, $\gamma = 1$, coverage rates further increase to roughly 10 percentage points and then remain at this level for the next four years, that is, through $\gamma_k \sum_{k=0}^{5} Lag_{c,k}$. These dynamic pattern are important. In particular, they suggest large increases in coverage during the first two years post-mandate, but no further increases in the following years. Put differently, the long-term effects appear to equal the short-term effects.

Figure 1b shows the dynamic effects on actual utilization of paid sick leave. Pre-mandate, there is no evidence of differential trends between localities that will, and will not, eventually implement a mandate. However, in contrast to coverage rates, post-mandate, utilization increases strongly, significantly, and almost linearly for the first four post-reform years. Utilization does not plateau. This pattern is plausible, as employees accrue sick days over the course of the year. Moreover, it is likely that awareness of the law and new benefit also increases over time among employees. The event study for unpaid sick days resembles Figure 1a (available upon request); it has a plateauing pattern which further corroborates the claim that accrual and awareness are the driving forces of the linear increase in Figure 1b.

Figure 1c shows the event study for labor costs per hour. The estimated pattern of results closely resembles Figure 1b with no pre-trending and approximately linearly increasing costs over time in post-mandate years.

Heterogeneity in Mandate Effects

We next explore effect heterogeneity in mandate effects by type of job and firm. Mirroring the large inequalities across employers and employees in the unregulated pre-mandate era (Susser and Ziebarth, 2016), one would hypothesize that heterogeneity in tretment effects should be large as well. In other words, we expect the mandates to have more bite in part-time and low-wage industries where coverage was particularly low pre-reform.

To this end, we re-estimate an augmented version of Equation (1) by estimating triple difference models. Specifically, we construct a triple interaction term $D_c \times T_t \times covariate$ and include this variable in Equation (1) along with the additional associated two-way interactions, $T_t \times covariate$ and $D_c \times covariate$. For readability, we report only the triple interaction terms; all other terms are available upon request.

[Insert Table 3 about here]

Table 3 shows the results. As seen, we test whether the treatment effects differ by full-time vs. part-time jobs (Panel A), union vs. non-union jobs (Panel B), and large (Panel C) vs. small (Panel D) establishments. Focusing on the triple interaction term in Panel A, the increase in coverage is larger in part-time (vs. full-time) jobs, non-unionized (vs. unionized) jobs, and small (vs. large) establishments. These differential effects are entirely in line with our priors above.

The findings for paid and unpaid sick leave use largely follow the pattern coverage rates, although there are some notable exceptions. First, employees in small establishments with fewer than 50 employees are more likely to take paid and unpaid sick days as a result of the mandates (columns (2) and (3), Panel D). Second, for full vs. part-time employees, we do not find statistically significant differences. We hypothesize that the larger coverage increase for part-time employees is counteracted by fewer opportunities of these employees to take sick days due to, among other factors, fewer work hours.

A similar countervailing force likely operates for the labor cost changes in columns (4) and (5): Because wages in small establishments and non-unionized jobs are lower (e.g., $X in small vs. large establishments), we find no significant differences in labor cost effects between large and small establishment as well as unionized and non-unionized jobs—although the former job-types experienced much larger coverage rate increases. An alternative explanation is that employees in small establishments and non-unionized jobs are less likely to be aware of their rights (Hall et al., 2018), or are less likely to take sick days out of concern that it may trigger negative job consequences (Shapiro and Stiglitz, 1974; Ziebarth and Karlsson, 2014).

5.2 Impact on Non-Mandated Benefits, Hours Worked, and Type of Sick Plan

Table 4 reports DD estimates for other components of employee compensation. We select these additional benefits as they are plausibly valuable to employees, but costly to employers and not mandated. Hence these benefits could be curtailed to offset increased sick leave costs. In these auxiliary analyses, we thus test for unintended compensatory and spillover effects of sick leave mandates.

Crowding-Out of Non-Mandated Benefits

Columns (1) and (2) of Table 4 test for substitution or crowding-out effects of non-mandated benefits. They estimate the effect of the mandates on paid vacation and paid holiday hours. The average annual number of paid vacation hours provided by employers is 71, which equals roughly 9 days for a full-time employee. The average annual number of paid hours for national holidays is 45, which equals almost 6 days for a full-time employee (Table 1).

The first two columns of Panels A to C show that all six DD point estimates are relatively small and statistically indistinguishable from zero, yielding no evidence that employers reduce paid vacation or holiday hours in response to sick pay mandates. For example, the positive point estimate in Panel C, column (1), would equal a non-significant increase in paid vacation hours of 0.4 percent of the mean. The negative point estimate in Panel C, column (2), would equal a non-significant decrease in paid national holidays of 0.6 percent of the mean. In both cases, a reduction of by 1 hour lies outside of the 90 percent confidence interval.

[Insert Table 4 about here]

Annual Hours Worked and Paid

Columns (3) to (5) of Table 4 test for mandate-induced changes in (i) hours worked per year, (ii) hours paid per year, and (iii) hours of paid leave per year; the final variable includes all forms of paid leave such as paid sick days, maternity leave, eldercare, paid vacation, and paid national holidays. First, there is no statistically significant evidence sick leave mandates affect hours worked. The point estimates in column (3) have alternating signs and are small relative to the mean. For example, in Panel C, the non-significant point estimate is positive and equals 0.02 percent of the mean.

Likewise, there is little evidence that the annual number of work hours paid and the annual number of hours on paid leave in general changed substantially in columns (4) and (5). However, the point estimates for these two outcomes are marginally significant and 0.1 percent and 0.6 percent of the mean, respectively. These marginally positive increases are consistent with, and likely the result of, the increased utilization of sick days.

Type of Sick Leave Plan

Finally, we investigate whether sick pay mandates alter the type of plan offered to employees. Columns (6) and (7) of Table 4 test for whether a mandate alters the propensity that employers offer "fixed" sick leave plans (column (6)) vs. "consolidated" sick leave plans (column (7)).

Table 1 shows that 16 percent of all establishment-job observations come with the benefit of a consolidated plan. These are also called consolidated "Paid-Time-Off" (PTO) plans and have become increasingly popular in the United States. Under a PTO plan, employers do not provide *separate* number of days for sick leave, vacation or maternity leave, but aggregate or "consolidate" the total number of paid leave days per year independent of reason (Lindemann and Miller, 2012). For instance, the BLS reports that the average consolidated PTO plan has accumulated 19 days of available paid leave after 5 years of service with the employer (Bureau of Labor Statistics, 2018a). Paid sick leave mandates are in compliance with such PTO plans as long as they are as least as generous as the sick leave accounts required by the law (ATP©, 2016).

As a result of the mandate, column (6) shows a strong increase in the share of jobs with separate sick leave plans. The increase is at 9 percentage points and basically identical to the main coverage increase in column (1) of Table 2. The mandate-induced likelihood that a job comes with a PTO plan either decreases slightly by 1.2 percentage points (column (7), Panels A and B) or does not appreciably change (column (7), Panel C). In conclusion, columns (6) and (7) imply that sick pay mandates overwhelmingly induce employers to set up separate sick leave plans, as intended, likely to avoid uncertainty whether their a consolidated PTO plan would comply with the law (Miller, 2015).

6 Optimal Sick Pay and Welfare Effects

This section develops a model of optimal sick pay to evaluate the welfare effects of mandating sick pay. Our intention is not to explain *why* coverage rates are highly unequal across types of jobs and *why* private insurance markets for short-term sick leave policies are basically not existent in the U.S. (cf. Hendren, 2013, 2017, for similar analyses related to health insurance), despite clear evidence that workers highly value sick pay (cf. National Paid Sick Days Study, 2010; Maestas et al., 2018). Rather, as in the Baily-Chetty framework following Baily (1978), Chetty (2006) and Chetty and Finkelstein (2013), we will use the model to derive sufficient statistics. Unlike Baily-Chetty, however, will not assess optimal unemployment benefits but optimal sick pay. Without the need to estimate model parameters, this setup allows us to use the estimated elasticities of the previous section to derive welfare implications, similar to the case of unemployment insurance (cf. Chetty, 2008).

Our ultimate goal is to assess whether increasing access to paid sick leave through government mandates is welfare improving or not. In other words, we will assess whether the voluntary provision of sick pay by firms—as it is currently still the case in the majority of U.S. states—leads to an underprovision of sick pay, and whether the optimal level of sick pay would be higher.

6.1 Model Setup

Our model is a simple one period model. The model considers worker utility and firm profits. The social planner maximizes the sum of both and thus overall welfare.

Workers

Representative workers maximize their utility u, which is a function of their sickness level σ, their consumption c, and their leisure time l. Hence their utility function is $u(\sigma, c, l)$.

The sickness level σ is continuous and bounded between 0 and 1. It is 0 when the worker is perfectly healthy and positive when the worker is sick, the latter occurring with probability p. Sickness has a density $f(\sigma)$ and a cumulative distribution $F(\sigma)$.

Workers consume their income from work, which is w when they work and αw (with $\alpha \in [0, 1]$) when they are on sick leave. Note that we study the implementation of U.S. sick pay mandates, which provide sick pay at a replacement rate of 100% *for the amount of sick hours accumulated*. Although this case slightly differs from the standard social insurance framework with $\alpha \in [0, 1]$, one can normalize and rewrite the actual sick pay level as a standard $\alpha \in [0, 1]$ case.[11]

With h representing contracted work hours and T total time, leisure time equals $l = T - h$ when workers works and $l = T$ when they are on sick leave. Moreover, utility decreases in sickness, but increases in consumption and leisure over the whole domain. Finally, we assume that leisure time is more valuable when sick ($\frac{\partial^2 u}{\partial \sigma \partial l} > 0$), whereas consumption is less valuable when sick ($\frac{\partial^2 u}{\partial \sigma \partial c} \leq 0$), see Finkelstein et al. (2013) for empirical evidence on the latter.

Given these model parameters, we define the utility differential between work and sick leave as $\triangle = u(\sigma, w, T - h) - u(\sigma, \alpha w, T)$. If $\triangle$ is positive, workers will work; otherwise, they will call in sick. Setting $\triangle = 0$ gives a unique indifference level of sickness σ^*_α for a given replacement rate α.

Summing up, at the population-level, total worker utility is:

[11]For newly covered employees who have accumulated sufficient sick pay credit, mandates imply an increase in α from 0 to 1. For newly covered employees who cannot cover their sick leave needs with the available credit, mandates imply an increase in α from 0 to [sick hours accumulated/sick hours needed]. At the population level, the mandates imply an increase in the weighted average α of workers who had sick pay before the reform, and workers who gained access through the reform. In the welfare analysis, we will use this population-level interpretation and causal changes in population coverage rates as empirical inputs for α.

$$U = (1-p)u(0,w,T-h) + p\int_0^{\sigma_\alpha^*} f(\sigma)u(\sigma,w,T-h)d\sigma$$
$$+p\int_{\sigma_\alpha^*}^1 f(\sigma)u(\sigma,\alpha w,T)d\sigma, \qquad (3)$$

The first term represents utility for healthy workers who work with $\sigma = 0$. The second term represents utility for sick workers who work ("presenteeism"); and the last term represents utility for sick workers on sick leave.

Next, Equation (4) shows how a change in sick pay α affects total worker utility:

$$\frac{dU}{d\alpha} = pw\int_{\sigma_\alpha^*}^1 f(\sigma)u_c'(\sigma,\alpha w,T)d\sigma > 0. \qquad (4)$$

Because of the envelope theorem, all other behavioral adjustments have no effect on total worker utility. For instance, this is the case for the labor supply reaction ("moral hazard"); that is, workers will call in sick more often because of more generous sick pay, $\frac{\partial\sigma_\alpha^*}{\partial\alpha} < 0$.

Firms

Representative firms cannot observe worker sickness σ.[12] Moreover, workers with sickness level σ have work productivity $\pi(\sigma)$ with $\pi'(\sigma) < 0$, which is also unobservable. In other words, sickness makes workers less productive. Given σ_α^* and normalizing the workforce to unity, total firm profits are then

$$\Pi = (1-p)(\pi(0)-w) + p\int_0^{\sigma_\alpha^*} f(\sigma)(\pi(\sigma)-w)d\sigma - p\alpha w\int_{\sigma_\alpha^*}^1 f(\sigma)d\sigma. \qquad (5)$$

The first term represents profits generated by healthy workers who work. The second term represents profits generated by sick workers who work. Because of their sickness, sick workers have lower productivity, but still earn wage w. The last term represents profits—or rather

[12] In reality, sickness is partially observable at best. First, sickness may not result in physical and observable symptoms. Second, OTC drugs that suppress sickness symptoms, e.g. cold symptoms, are widely available (Earn et al., 2014).

losses—generated by workers on sick leave, $p \int_{\sigma_\alpha^*}^{1} f(\sigma) d\sigma$ who obtain sick pay αw, while not participating in production.

Following Chetty (2006), we assume that wages are exogenously given, in the sense that firms pay market wages w. That is, approximating reality, we assume rigid wages and productivity to be not fully observable; otherwise, the firm's optimization problem would become trivial as they would then simply pay workers according to their daily productivity. In our model, firms can only optimize over sick pay generosity αw. Equation (6) shows how a change in α affects firm profits:

$$\frac{\partial \Pi}{\partial \alpha} = p \frac{\partial \sigma_\alpha^*}{\partial \alpha} f(\sigma_\alpha^*)(\pi(\sigma_\alpha^*) - w) + p \frac{\partial \sigma_\alpha^*}{\partial \alpha} f(\sigma_\alpha^*) \alpha w - pw \int_{\sigma_\alpha^*}^{1} f(\sigma) d\sigma. \tag{6}$$

In words: When the firm provides more generous sick pay, first of all, fewer workers come to work. As seen in the first term of Equation (6), depending on the profitability of the marginal worker, the effect on profits might be positive or negative. Second, as more workers are on sick leave, the firm provides sick pay to more workers (second term of Equation (6)). Third, the sick pay amount provided by the firm is higher because of the increase in generosity α (third term of Equation (6)).

For the firm, sick pay is optimal when it incentivizes unproductive workers to call in sick and receive αw instead of w; that is, workers with $\pi(\tilde{\sigma}) < w$. Or, mathematically, because the second term and the third term of Equation (6) will always be negative[13], the firm will only increase sick pay if the first term is positive (and large enough).

In words: The firm will provide more sick pay if, under current sick pay levels, too many sick workers come to work and have a productivity below their wage. In fact, their productivity is so much lower than their regular wage w that providing αw instead (under zero productivity) is saving the firm money; more generous sick pay will then incentivize those unprofitable workers to call in sick, but require the firm to provide more generous sick pay, and more generous sick pay to more workers. Under optimal sick pay for the firm, all three factors in Equation (6) will sum to zero.

Rearranging Equation (6) yields:

[13] The second term is negative because of $\frac{\partial \sigma_\alpha^*}{\partial \alpha} < 0$.

$$\frac{\partial \Pi}{\partial \alpha} = p\frac{\partial \sigma_\alpha^*}{\partial \alpha} f(\sigma_\alpha^*)(\pi(\sigma_\alpha^*) - (1-\alpha)w) - p\int_{\sigma_\alpha^*}^{1} f(\sigma)wd\sigma. \tag{7}$$

Social Planner and Optimal Sick Pay

The social planner maximizes total welfare. Total welfare is the sum of total worker utility (Equation (1)) and total firm profits (Equation (5)):

$$\begin{aligned}
W \quad = \quad & (1-p)u(0, A+w, T-h) + p\int_0^{\sigma_\alpha^*} f(\sigma)u(\sigma, A+w, T-h)d\sigma + \\
& + \int_{\sigma_\alpha^*}^{1} f(\sigma)u(\sigma, A+\alpha w, T)d\sigma \\
& +(1-p)(\pi(0) - w) + p\int_0^{\sigma_\alpha^*} f(\sigma)(\pi(\sigma) - w)d\sigma - p\int_{\sigma_\alpha^*}^{1} f(\sigma)\alpha w d\sigma
\end{aligned} \tag{8}$$

The social planner varies sick pay generosity in order to maximize total welfare such that:

$$\begin{aligned}
\frac{dW}{d\alpha} \quad = \quad & \frac{dU}{d\alpha} + \frac{\partial \Pi}{\partial \alpha} = \\
& pw\int_{\sigma_\alpha^*}^{1} f(\sigma)u_c'(\sigma, \alpha w, T)d\sigma \\
& + p\frac{\partial \sigma_\alpha^*}{\partial \alpha} f(\sigma_\alpha^*)(\pi(\sigma_\alpha^*) - (1-\alpha)w) - p\int_{\sigma_\alpha^*}^{1} f(\sigma)wd\sigma
\end{aligned} \tag{9}$$

This means that the social planner considers the cost and benefits of more generous sick pay for both workers and firms. The second part of Equation (9) is the same as Equation (7) and shows how varying sick pay affects firms profits.

The first part of Equation (9) is the same as Equation (4) and shows how varying sick pay affects worker utility. More generous sick pay reduces labor supply and fewer workers will work. However, workers who work will be healthier and more productive and absent workers will be sicker, on average. Overall, more generous sick pay is beneficial for employees. Therefore, the social planner will choose a higher level of optimal sick pay than the profit maximizing firm.

When rearranging Equation (9), we obtain the welfare maximizing optimality condition, under which both sides of Equation (10) are equal:

$$\frac{w\int_{\sigma_\alpha^*}^{1} f(\sigma)(u_c'(\sigma,\alpha w,T)-1)d\sigma}{\int_{\sigma_\alpha^*}^{1} f(\sigma)d\sigma} = \varepsilon\frac{\pi(\sigma_\alpha^*)-(1-\alpha)w}{\alpha} \tag{10}$$

where the left-hand side (LHS) is the difference between marginal worker benefits (higher consumption utility) and marginal firm costs (higher sick pay), normalized by the share of sick workers. The right-hand side (RHS) is the difference between worker productivity when working sick ("presenteeism") and the difference between the wage and sick pay, weighted by the labor supply elasticity ε.[14]

Essentially, the social planner would increase sick pay as long as (i) the increase in marginal worker utility (because of the higher marginal consumption utility) exceeds marginal firm costs, *and* until this differential equals (ii) the differential between the lower productivity when working sick, and the difference between sick pay and wages.

Equation (10) is similar to the standard Baily-Chetty formula (Baily, 1978; Chetty and Finkelstein, 2013), but there are some notable differences. First, in the standard Baily-Chetty framework, workers pay for their own welfare benefits through higher taxes. This results in the balancing of marginal utilities in different states (low and high taxes). Our case is different because the employer provides sick pay; the social planner trades-off how much employees value more sick pay against the firm costs of providing it.

Second, sickness is a continuous state and affects work productivity. Hence, for the firm it is optimal to provide some sick pay to incentivize sick and unproductive workers to call in sick and take the lower sick pay, not the higher salary. However, because firms maximize profits and not worker utility, optimal firm sick pay will always be lower than welfare optimizing sick pay.

[14] $\varepsilon = \frac{\partial\int_{\sigma_\alpha^*}^{1} f(\sigma)d\sigma}{\partial\alpha}\frac{\alpha}{\int_{\sigma_\alpha^*}^{1} f(\sigma)d\sigma} = -\frac{\partial\sigma_\alpha^*}{\partial\alpha} f(\sigma_\alpha^*)\frac{\alpha}{\int_{\sigma_\alpha^*}^{1} f(\sigma)d\sigma}$

6.2 Welfare Effects of Mandating Sick Pay

Whether sick pay mandates increase welfare depends on Equation (10) and the empirical sufficient statistics inputs from the previous section. Under optimal sick pay, both sides of Equation (10) are identical. The LHS is the difference between higher marginal worker utility and higher marginal firm costs as a result of more sick pay, weighted by the share of workers on sick leave. The RHS is the effect of more sick pay on firm production and wage payments, weighted by the labor supply elasticity ε. When substituting λ and δ we can write Equation (10) as:[15]

$$w\lambda \gtreqless \varepsilon \frac{w\delta - (1-\alpha)w}{\alpha}. \tag{11}$$

Next we plug in our empirical inputs from the previous section to calculate the RHS. First, the elasticity ε can be calculated from Tables 2 and Table 1. We first use the point estimates in Panel C, columns (2) and (3), indicating the causal effect of obtaining access to sick leave on sick hours taken in the first quarter (1.304 + 0.512 = 1.816) as a share of total hours worked in the first quarter (1703/4 = 425, Table 1). Then we scale by the increase in the coverage rate $\partial\alpha = 0.089$ (column (1), Table 2). Second, we multiply by the baseline coverage level $\alpha = 0.642$ (Table 1) and also consider the baseline level of sick hours taken as a share of total hours worked in the first quarter (16.47+ 0.767 = 17.237/425, Table 1). We then obtain the elasticity as:

$$\varepsilon = \frac{\partial \int_{\sigma_\alpha^*}^{1} f(\sigma)d\sigma}{\partial\alpha} \frac{\alpha}{\int_{\sigma_\alpha^*}^{1} f(\sigma)d\sigma} = -\frac{\partial\sigma_\alpha^*}{\partial\alpha} f(\sigma_\alpha^*) \frac{\alpha}{\int_{\sigma_\alpha^*}^{1} f(\sigma)d\sigma} = \frac{1.816/425}{0.089} \frac{0.642}{17.237/425} = 0.76 \tag{12}$$

In the RHS of Equation (11), δ indicates work productivity when sick, which is challenging to elicit. However, the American Working Conditions Survey (AWCS) asked a nationally representative sample of U.S. adults to estimate their reduced work productivity when working sick (Maestas et al., 2018). The estimate for the average worker is a reduction by 23%, which is why we use $\delta = 0.77$ as our baseline scenario.

When plugging in the remaining values for w and α, taken from Table 1, we obtain a RHS value of $0.76 \times \frac{(22.2\times0.77-(1-0.642)\times22.2)}{0.642} = 10.8$. Figure 2 graphically plots the RHS values as a

[15] We substitute λ assuming on average that $u'_c(.) - 1 = \lambda$ for the population share $\int_{\sigma_\alpha^*}^{1} f(\sigma)d\sigma$. We also substitute $w\delta$ for $\pi(\sigma_\alpha^*)$ assuming that work productivity can be written as a multiplier of the wage.

solid black line and function of δ; the x-axis indicates all possible δ values, which we allow to vary as a sensitivity test. As seen, for $\delta = 0.77$, the sample average taken from the AWCS, we obtain a y-axis value of 10.8.

[Insert Figure 2 about here]

The y-axis in Figure 2 indicates the LHS of Equation (11) for different values of λ. Recall that the LHS is the difference between the marginal increase in worker utility and the marginal firm costs when sick pay becomes more generous. As already noted by Summers (1989), this difference between the employee value of a mandated benefit and the firm cost of providing it, should be fundamental in the social planner's decision to mandate benefits. If this difference was negative, the costs of the benefit would exceed its value to the employee. In that case, mandating the benefit cannot be welfare improving. Sick pay is thus optimal when the differential is positive and equal to the RHS of Equation (11) as in Figure 2. As derived above, for $\delta = 0.77$, this would be the case if the LHS equaled 10.8.

So how can we determine λ and the LHS? We offer three approaches. First, there is suggestive evidence that workers value sick pay a lot, as polls imply. Recall that 75% of Americans support sick pay mandates and 69% consider it "very important" for them; a clear majority considers it a basic worker's right and believe that it is more important than existing workers' rights such as the right to join a union (National Paid Sick Days Study, 2010).

Second, as seen, Figure 2 includes several gray horizontal lines for different LHS values, assuming a constant marginal utility. To test for the robustness of our conclusions, we display several horizontal lines for $\lambda \in 0; 0.2; 0.4; 0.6; 0.8$. For a RHS value of 10.8, we thus find that λ has to exceed 0.49 for it to be welfare improving to mandate sick pay. In other words, for our baseline scenario, the welfare model suggests that mandating sick pay would be welfare improving as long as the marginal worker utility exceeds the marginal firm costs by 50% or more. Recall that our estimate of the increase in labor costs is about $0.28 per hour worked for the marginal firm (Section 5.1 and Table 2, Panel C).

Finally, we refer to a recent study by Maestas et al. (2018), who experimentally elicit the willingness to pay (WTP) for 10 PTO days among a representative sample of U.S. employees. The findings shows that the average WTP equals 15% of the annual gross wage. In fact, assuming 260 workdays per year, for an annual gross wage of $50K, this WTP equals $750 per day whereas the daily gross wage is only $192. In any case, the elicited WTP value clearly exceeds even the largest possibly assumed LHS differential of 80% in Figure 2. If $\lambda = 0.8$, independent of the work productivity when working sick, the LHS would always exceed the RHS in Figure 2 and more generous sick pay would always increase welfare.

In conclusion, if the true employee WTP of more generous paid sick leave is anywhere close to the elicited WTP in Maestas et al. (2018), it would be welfare improving if more states mandated sick pay in the U.S. Specifically, based on our model of optimal sick pay and our estimates for a dozen U.S. regions, this would be the case if marginal workers' valuation of gaining access to sick pay exceeded the firm costs of providing it by at least 50%. A final note of caution almost always applies in such calculations, but is still worth mentioning: The empirical inputs for these welfare calculations stem from average point estimates for a dozen U.S. regions and the first post-reform years. Considering effect heterogeneity, statistical uncertainty, and alternative economic conditions would naturally introduce wider bandwidths.

7 Discussion and Conclusion

This paper estimates the effects of recent city- and state-level sick leave mandates on sick leave coverage rates, paid and unpaid sick leave utilization, labor costs, and non-mandated benefits in the United States. In particular, we leverage the experiences of a dozen U.S. regions with more than 70 million residents. We use the National Compensation Survey (NCS) from 2009 to 2018, coupled with difference-in-differences (DD) and event study models. The NCS is a rich administrative dataset at the job-establishment level specifically designed to measure and track labor compensation and costs.

Our findings address important gaps in the U.S. literature on labor market inequalities and employer mandates more broadly. The U.S. are a country with one of the least generous social insurance systems among all OECD countries. In particular, federal minimum standards concerning paid vacation, paid parental leave, paid eldercare or paid sick leave are largely absent, leading to large variation in the voluntary provision of such benefits by employers. In general, better paying jobs for higher educated workers tend to offer paid leave benefits, whereas part-time and low-income jobs for lower educated workers do not. A big open question is to what extent employer mandates—for example, as they are common in European countries—are effective in providing and facilitating the use of mandated benefits; or whether they have unintended consequences and lead to a reduction, and potentially inefficient reallocation, of non-mandated benefits (that workers may actually value more). Other crucial questions are to what extent such mandates increase labor costs and dampen employment and wage growth. Pichler and Ziebarth (2019) find no evidence that the U.S. sick pay mandates significantly affected employment and wage growth, or dampened its growth rate by more than two percent.

This paper studies the important "first stage" effects of sick pay mandates on coverage rates. We also provide state-of-the-art empirical evidence on the overall effectiveness of the mandates along several margins and provide a welfare analysis. To this end, we use administrative data to estimate their effect on sick leave utilization ("moral hazard") and test for whether employees respond by substituting unpaid leave for paid leave. We also assess the relevance of mandates for labor costs and estimate the extent to which employers respond by curtailing other forms of compensation. In the final part, we develop a model of optimal sick pay and use the empirical inputs to assess whether mandating sick pay is likely welfare improving or not. Our research provides timely evidence on all these questions and contributes to a better understanding of how recent mandates function, which is relevant from both an economic and a policy perspective.

Our DD models and event studies leverage the policy-induced variation across U.S. regions and over time in the implementation of sick leave mandates over the past decade. Importantly, we find no evidence of endogenous implementation of the mandates; that is, mandates do not appear to be a direct reaction by policymakers to pre-existing trends in sick leave or related labor market outcomes. Our empirical tests strongly suggests that we identify causal effects triggered by the mandates rather than spuriously occurring confounding trends.

Our findings show a clear and significant increase in sick leave coverage rates of 9 percentage points (or 14 percent relative to the sample mean of 64 percent) in the four years following mandate passage. Interestingly, after an initial strong increase in coverage rates, we find no further increase in subsequent years. Further research should probe the persistent coverage gap that we document here. Non-compliance and lack of awareness are both plausible explanations. For instance, Hall et al. (2018) report that, in New York City, only 28 percent of employees had heard about the new sick pay mandate in the first year after the implementation. However, more data-driven explanations of this finding are an important path for future work.

As expected, we also find a significant 1.4 hours increase in paid sick leave taken by employees in the first quarter of each year following mandate implementation. Scaling this average increase by the share of marginal jobs that have been covered by the mandates suggests that newly covered employees take, on average, two additional sick days during the first three months of a calendar year. The implied elasticity is 0.8, meaning that the share of total work time spend on sick leave increases by 0.8 percent for every increase in the coverage rate by one percent. Further, we find that total sick leave costs increase by almost 10 percent, which translates to 23 cents per hour for marginal firms. Moreover, we find no evidence that employers curtail non-mandated benefits as a response to the mandates to reduce overall labor costs.

Finally, we develop a welfare model of optimal sick pay. First, it shows that profit maximizing firms would also provide some level of sick pay in the absence of mandates. The reason is that work productivity decreases when employees work sick; when wages clearly exceed the productivity of the working sick, sick pay incentives those employees to call in sick and take(the lower) sick pay instead. Second, the profit maximizing sick pay level of the firm falls short of the level that a social planner would set because the social planner also considers worker utility. Third, for the social planner to mandate sick pay, it has to be the case that (a) the worker utility of more generous sick pay exceeds the firm costs of providing it, and (b) this differential has to be balanced against the effects of more sick pay on firm production, specifically the changes in productivity and wage payments, weighted by the labor supply elasticity. Finally, when plugging in sample means and our elicited causal effects, we find that mandating sick pay is welfare-improving in the U.S., as long as the employee valuation of the benefit exceeds the firm costs by 50%. Survey evidence as well as evidence of experimentally validated compensating wage differentials suggest that this is the case (National Paid Sick Days Study, 2010; Maestas et al., 2018).

As cities and states will be implementing more sick pay mandates, more empirical evidence on the indented and unintended consequences of these mandates will become available. We look forward to fruitful discussions among social scientists.

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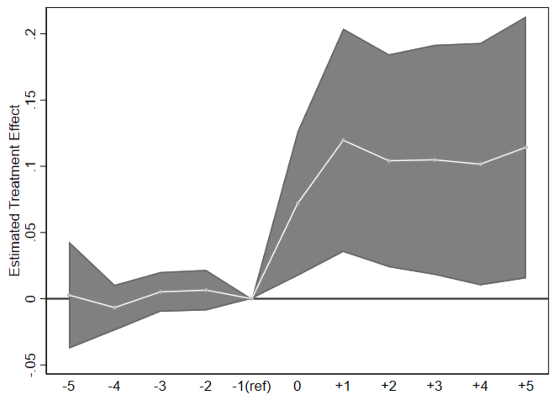
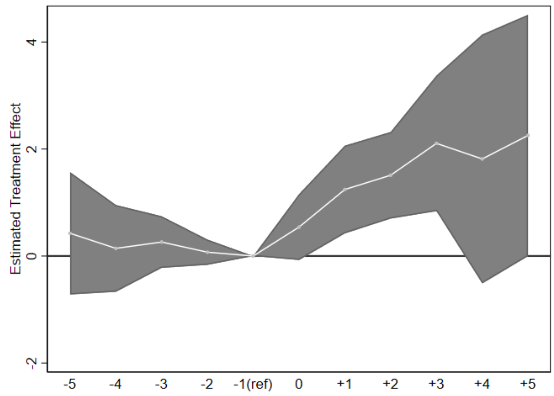
Figures and Tables

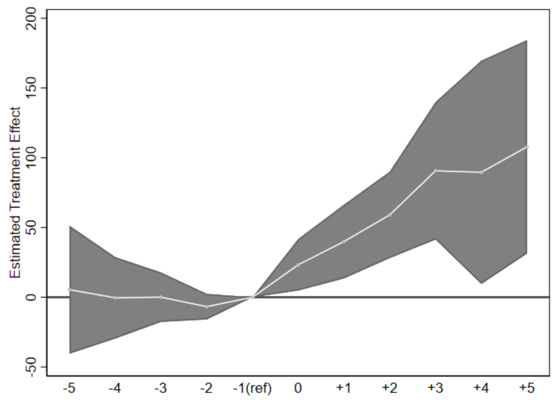
Figure 1: Event Studies from Difference-in-Differences Models



(a) Effect on sick pay coverage



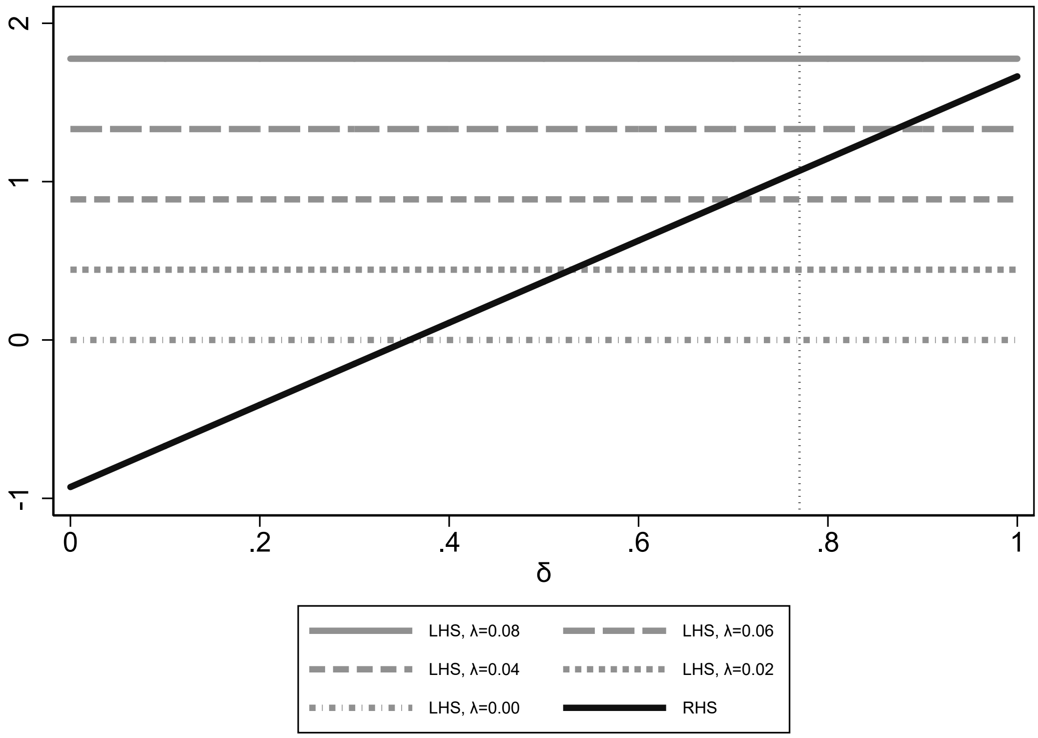
(b) Effect on paid sick leave hours taken in first quarter



(c) Effect on employer sick leave costs per hour worked

Notes: The graphs show event studies based on DD models as in Equation (2). All models include establishment-job fixed effects, time fixed effects and state time trends. The errors terms are clustered at the state level and the gray areas depict 95% confidence intervals. For more information about the sick pay reforms, see Table A1.

Figure 2: Welfare Effects of Sick Pay Mandates



Notes: The graph depicts the LHS and RHS of Equation (11) for different values of λ on the y-axis and δ on the x-axis. If the LHS exceeds the RHS of Equation (11), more generous sick pay is welfare improving.

Table 1: Descriptive Statistics from the National Compensation Survey (NCS), 2009-2017 (Weighted)

Sample:	Full	Treated (t<T)	Control
Outcomes			
Sick leave offered (binary)	0.642	0.685	0.621
Paid sick hours taken (hours per quarter)	16.47	19.69	15.50
Unpaid sick hours taken (hours per quarter)	0.767	0.633	0.775
Sick leave costs total (in 2017 $)	476.1	635.9	424.9
Sick leave cost per hour worked (in 2017 $)	0.268	0.371	0.236
Other benefits & characteristics			
Full time employment (binary)	0.742	0.743	0.742
Part time employment (binary)	0.258	0.257	0.258
Unionized (binary)	0.093	0.128	0.0840
Hourly wage (in 2017 $)	22.2	25.63	21.05
Hourly non-production bonus (in 2017 $)	0.656	0.871	0.554
Hourly vacation cost (in 2017 $)	1.123	1.370	1.036
Hourly health insurance cost (in 2017 $)	2.403	2.713	2.282
Annual hours worked	1703.2	1681.5	1711.0
Annual hours paid	1844.4	1831.1	1849.6
Annual hours paid leave	141.1	149.6	138.4
Fixed paid sick time (binary)	0.439	0.505	0.413
Consolidated sick plan PTO (binary)	0.163	0.134	0.169
Paid vacation days	71.03	73.68	70.10
Paid national holiday hours	45.30	48.73	44.41
Paid overtime hours	56.68	48.88	59.61
Other paid hours	7.007	6.001	7.087
Medical insurance offered (binary)	0.697	0.709	0.693
Life insurance offered (binary)	0.571	0.533	0.578
Paid vacation offered (binary)	0.766	0.756	0.769
Main worker occupations (sorted by frequency in full sample)			
Office & administrative	0.167	0.177	0.165
Sales & related	0.111	0.103	0.114
Food preparation & serving	0.102	0.102	0.103
Transportation & material	0.0847	0.0775	0.0872
Production	0.0825	0.0648	0.0888
Health practitioners & technicians	0.0613	0.0589	0.0623
Management	0.044	0.0605	0.0390
Installation, maintenance, & repair	0.0436	0.0371	0.0456
Business & financial operations	0.042	0.0428	0.0393
Main establishment industries (sorted by frequency in full sample)			
Healthcare & social assistance	0.16	0.156	0.161
Retail trade	0.136	0.129	0.139
Manufacturing	0.115	0.101	0.121
Accommodation & food services	0.111	0.106	0.113
Admin & support & waste man. & remed. services	0.0725	0.0684	0.0728
Professional, scientific, & technical services	0.069	0.0757	0.0658
Finance & insurance	0.0525	0.062	0.0500
Construction	0.0488	0.0439	0.0501
Wholesale trade	0.0474	0.049	0.0479
Transportation & warehousing	0.0406	0.0337	0.0421
Establishment size	648.5	814.1	591.3
Observations	428,818	64,958	341,037

Source: NCS 2009-2017 (Bureau of Labor Statistics (BLS), 2018c), own calculation and illustration. Yearly data at the firm-occupation level. Weights are provided by the BLS.

Table 2: Effect of Mandates on Coverage, Utilization and Labor Costs

Outcome	**Sick leave offered (1)**	**Paid sick hours taken (2)**	**Unpaid sick hours taken (3)**	**Sick leave costs total (4)**	**Sick leave costs per hour (5)**
Sample mean:	0.642	16.47	0.77	476.1	0.268
Panel A					
Sick leave mandate	0.089**	1.434**	0.619**	42.252***	0.024***
($D_c \times T_t$)	(0.037)	(0.574)	(0.275)	(11.700)	(0.006)
Year FE	X	X	X	X	X
Establishment FE	X	X	X	X	X
Panel B					
Sick leave mandate	0.090**	1.453**	0.618**	43.166***	0.025***
($D_c \times T_t$)	(0.037)	(0.568)	(0.276)	(11.566)	(0.006)
Year FE	X	X	X	X	X
Establishment FE	X	X	X	X	X
Employee Controls	X	X	X	X	X
Panel C					
Sick leave mandate	0.085**	1.304**	0.512**	38.216**	0.021***
($D_c \times T_t$)	(0.041)	(0.640)	(0.200)	(15.391)	(0.007)
Year FE	X	X	X	X	X
Establishment-job FE	X	X	X	X	X
State Time Trends	X	X	X	X	X

Source: NCS 2009-2017 (Bureau of Labor Statistics (BLS), 2018c), own calculation and illustration. Yearly data at the firm-occupation level. Each column in each panel stands for one DD model as in Equation (1). ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. All models are weighted using NCS weights. Employee Controls: Union, Part Time. Standard errors clustered at the state level and reported in parentheses. All models have 427,864 establishment-job observations, except for column (3) which has 341,803 observations.

Table 3: Effect Heterogeneity of Mandates: Coverage, Utilization and Labor Costs

Outcome	**Sick leave offered (1)**	**Paid sick hours taken (2)**	**Unpaid sick hours taken (3)**	**Sick leave costs total (4)**	**Sick leave costs per hour (5)**
Sample mean:	0.642	16.47	0.77	476.1	0.268
Panel A: Full-time vs. part-time					
Sick leave mandate	0.094**	0.771***	0.206**	11.576**	0.014***
$(D_c \times T_t)$	(0.040)	(0.269)	(0.089)	(4.666)	(0.004)
Sick leave mandate	-0.072**	0.269	0.158	28.248**	0.005
$\times$full-time	(0.033)	(0.321)	(0.169)	(11.171)	(0.005)
Panel B: Union vs. non-union					
Sick leave mandate	0.058***	1.007**	0.471***	31.948***	0.017***
$(D_c \times T_t)$	(0.020)	(0.381)	(0.123)	(9.864)	(0.005)
Sick leave mandate	-0.098***	-0.128	-1.088	6.952	0.004
$\times$union	(0.034)	(0.574)	(1.007)	(10.061)	(0.008)
Panel C: Large establishments (>500 employees)					
Sick leave mandate	0.060**	1.069***	0.477**	31.811***	0.017***
$(D_c \times T_t)$	(0.024)	(0.390)	(0.202)	(8.777)	(0.004)
Sick leave mandate	-0.053**	-0.245	-0.494**	3.075	0.002
$\times$large establishments	(0.025)	(0.338)	(0.236)	(5.507)	(0.003)
Panel D: Small establishments (<50 employees)					
Sick leave mandate	0.017*	0.754***	-0.015	33.171***	0.016***
$(D_c \times T_t)$	(0.008)	(0.263)	(0.099)	(8.325)	(0.003)
Sick leave mandate	0.089***	0.568*	1.156***	-2.720	0.004
$\times$small establishments	(0.033)	(0.285)	(0.384)	(6.939)	(0.006)

Source: NCS 2009-2017 (Bureau of Labor Statistics (BLS), 2018c), own calculation and illustration. Each column in each panel stands for one model similar to Equation (1), but augmented with triple interaction terms and all two-way interactions, see main text for details. ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. All models are weighted using NCS weights. Standard errors clustered at the state level and reported in parentheses. All models have 427,864 establishment-job observations, except for column (3) which has 341,803 observations. All models in all panels control for year FE, establishment-job FE, and state time trends. Controls for all other two-way interaction terms are included in all models but not shown (available upon request).

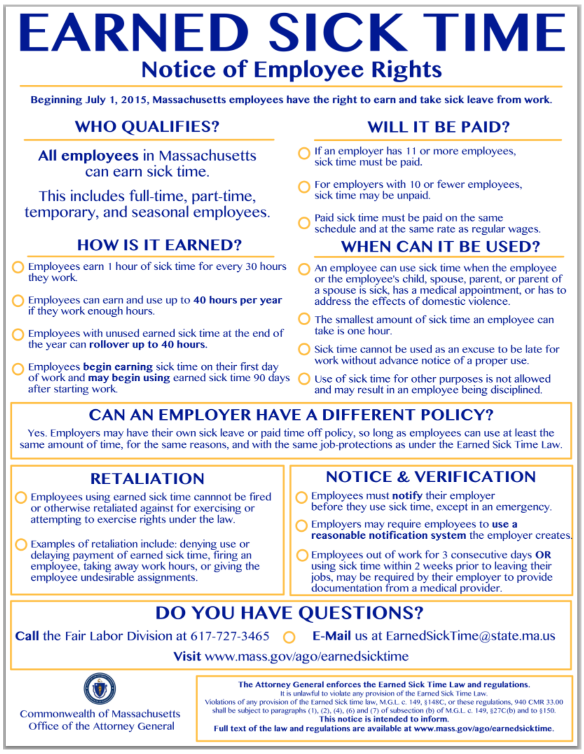
Table 4: Effect of Mandates on other Non-Mandated Benefits

	Paid hours		Annual hours			Paid sick leave	
	vacation	holiday	worked	paid	paid leave	fixed	consolidated
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample mean:	71.03	45.30	1703.2	1844.4	141.1	0.439	0.163
Panel A							
Sick leave mandate	-0.270	-0.497	-0.984	-0.501	0.497	0.093**	-0.012**
$(D_c \times T_t)$	(0.306)	(0.330)	(1.417)	(1.342)	(0.471)	(0.040)	(0.006)
Year FE	X	X	X	X	X	X	X
Establishment FE	X	X	X	X	X	X	X
Panel B							
Sick leave mandate	-0.084	-0.412	1.235	2.045*	0.823*	0.094**	-0.012**
$(D_c \times T_t)$	(0.295)	(0.327)	(1.403)	(1.168)	(0.414)	(0.040)	(0.006)
Year FE	X	X	X	X	X	X	X
Establishment FE	X	X	X	X	X	X	X
Employee Controls	X	X	X	X	X	X	X
Panel C							
Sick leave mandate	0.272	-0.268	0.404	1.535	1.146	0.085*	-0.005
$(D_c \times T_t)$	(0.661)	(0.444)	(1.507)	(1.442)	(0.728)	(0.043)	(0.006)
Year FE	X	X	X	X	X	X	X
Establishment-Job FE	X	X	X	X	X	X	X
State Time Trends	X	X	X	X	X	X	X

Source: NCS 2009-2017 (Bureau of Labor Statistics (BLS), 2018c), own calculation and illustration. Each column in each panel stands for one DD model as in Equation (1). ***, **, and * = statistically different from zero at the 1%, 5%, and 10% level. All models are weighted using NCS weights. Employee Controls: Union, Part Time. Standard errors clustered at the state level and reported in parentheses. All models have 412,663 establishment-job observations.

Appendix

Figure A1: Examples of Legally Required Employee Right Notifications



Left figure shows an Earned Sick Time poster from Massachusetts (Commonwealth of Massachusetts, 2019). Right figure shows a general workplace poster that is compliant with notification requirements in Arizona (Industrial Commission of Arizona, 2019). The Arizona poster includes all labor laws that employers are required to post at the workplace in Arizona.

Table A1: Overview of Employer Sick Pay Mandates in the US

Region (1)	**County** (2)	**Law Passed** (3)	**Law Effective** (4)	**Content** (5)
San Francisco, CA	SF	Nov 7, 2006	Feb 5, 2007	all employees including part-time and temporary; 1 hour of paid sick leave for every 30 hours worked; up to 5 to 9 days depending on firm size; for own sickness or family member; 90 days accrual period
Washington, DC	DC	May 13, 2008	Nov 13, 2008	'qualified employees'; 1 hour of paid sick leave for every 43 hours, 90 days accrual period; up to 3 to 9 days depend. on firm size; own sickness or family; no health care or restaurant workers
		Dec 18, 2013	Feb 22, 2014 (retrosp. in Sep 2014)	extension to 20,000 temporary workers and tipped employees
Connecticut		July 1, 2011	Jan 1, 2012	full-time service sector employees in firms>49 employees (20% of workforce); 1 hour for every 40 hours; up to 5 days; own sickness or family member, 680 hours accrual period (4 months)
Seattle, WA	King	Sep 12, 2011	Sep 1, 2012	all employees in firms with >4 full-time employees; 1 hour for every 30 or 40 hours worked; up to 5 to 13 days depending on firm size, for own sickness or family member; 180 days accrual period
New York, NY	Bronx, Kings, New York, Queens, Richmond	June 26, 2013 Jan 17, 2014 extended	April 1, 2014	employees w >80 hours p.a in firms >4 employees or 1 domestic worker; 1 hour for every 30 hours; up to 40 hours; own sickness or family member; 120 days accrual period
Portland, OR	Multnomah	March 13, 2013	Jan 1 2014	employees w >250 hours p.a. in firms >5 employees; 1 hour for every 30 hours; up to 40 hours; own sickness or family member
Jersey City, NJ	Hudson	Sep 26, 2013 Oct 28, 2015 extended	Jan 22, 2014	all employees in private firms with >9 employees; 1 hour for every 30 hours; up to 40 hours; own sickness or family; 90 days accrual period
Oakland, CA	Alameda	Nov 4, 2014	March 2, 2015	all employees in firms >9 employees; 1 hour for every 30 hours; 90 days accrual period; up to 40 to 72 hours depending on firm size; own sickness or family member
Newark, NJ	Essex	Jan 29, 2014	May 29, 2014	all employees in private companies; 1 hour for every 30 hours; 90 days accrual period; up to 24 to 40 hours depending on size; own sickness or family
Philadelphia, PA	Philadelphia	Feb 12, 2015	May 13, 2015	all employees in firms >9 employees; 1 hour for every 40 hours; up to 40 hours; own sickness or family member; 90 days accrual period
California		September 19, 2014	July 1, 2015	all employees; 1 hour of paid sick leave for every 30 hours; minimum 24 hours; own sickness or family member; 90 days accrual period
Massachusetts		Nov 4, 2014	July 1, 2015	all employees in firms >10 employees; 1 hour for every 40 hours; up to 40 hours; own sickness or family member; 90 days accrual period
Oregon		June 22, 2015	Jan 1, 2016	all employees in firms >9 employees; 1 hour every 30 hours; 90 days accrual period; up to 40 hours; own sickness or family member

Source: several sources, own collection, own illustration.

Overview of Employer Sick Pay Mandates in the US (II)

Region (1)	County (2)	Law Passed (3)	Law Effective (4)	Content (5)
Montgomery County		July 2, 2015	Oct 1, 2016	all employees except independent contractors, those without regular schedules and agency workers ; 1 hour every 30 hours; up to 56 hours p.a. in firms >4 employees, up to 32 paid and 24 unpaid in firms < 5 employees; own sickness or family member; 90 days accrual
Vermont		March 9, 2016	Jan 1, 2017	employees w/ 18 hours/week & >20 weeks/year in firms > 5 employees; 1 hour every 52 hours; up to 24 hours in 2017, 40 hours thereafter; own sickness or family member; underage employees and firms in first year exempt; some state employees & per diem employees in health care or long-term care facility exempt
Arizona		November 8, 2016	July 1, 2017	all employees; 1 hour for every 30 hours; up to 40 hours in firms >14 workers, up to 24 hours <15 workers; own sickness or family member; employers can impose 90 day accrual period for new employees
Cook County & Chicago, IL		June 2, 2016	July 1, 2017	all employees w/ 80 hours in 120 days, some local gov employees exempt; 1 hour for every 40 hours; carry over half of unused up to 20 hours (40 hours if FMLA covered); can use up to 40 hours/years; own sickness or family member; 180 day accrual period for new employees
Minneapolis, MN	Hennepin County	May 26, 2016	July 1, 2017	all employees w/ 80 hours in firms > 5 employees (<6 employees & first year of business: unpaid), ind. contractors exempt; 1 hour for every 30 hours up to 48 hours a year; own sickness or family member; 90 day accrual for new employees
Saint Paul, MN	Ramsey County	Sep 7, 2016	July 1, 2017 (firms >23 empl.) Jan 1, 2018 (firms <24 empl.)	all employees w/ 80 hours (first 6 months of business: unpaid), ind. contractors exempt; 1 hour for every 30 hours up to 48 hours a year own sickness or family member; 90 day accrual for new employees
Washington		Nov 8, 2016	Jan 1, 2018	all employees except those who are exempt from minimum wage law; 1 hour for every 40 hours; no cap but no more than 40 hours carry over; own sickness or family member; 90 day accrual for new employees
Tacoma, WA	Pierce County	Sep 26, 2017	Jan 1, 2018	all employees w/ 80 hours; ind. contractors, single person firms, and fed. gov. workers exempt; 1 hour for every 40 hours; employers can cap carry over at 40 hours own sickness or family member; 90 day accrual period for new employees
Austin, TX	Travis County, (+ Hays & Williamson)	Feb 16, 2018	Oct 1, 2018 (firms >4 empl.) Oct 1, 2020 (firms <5 empl.)	all private sector employees w/ 80 hours , ind. contractors and unpaid interns exempt; 1 hour for every 30 hours up to 64 hours a year for firms > 15 employees (48 hours for firms <5 employees); own sickness or family member; 60 day accrual period for new employees
Maryland		Jan 12, 2018 (override veto by gov.)	Feb 11, 2018	employees w/ 12 hours/week in firms > 14 employees (<15 employees 40 hours unpaid); 1 hour for every 30 hours; employers can cap at 64 hours accrual and 40 hours carry over; own sickness or family member, also for parental leave; certain groups exempt (e.g. temp. agency workers)
New Jersey		May 2, 2018	Oct 28, 2018	all employees; 1 hour for every 30 hours up to 40 hours/year; per diem health care workers exempt own sickness or family member; 120 day accrual for new employees; preempts city laws
Michigan		Dec 13, 2018 (weakened in lame duck session)	March 28, 2019	employees w/ 25 hours/week employed for 25 weeks in firms > 49 employees; 1 hour for every 35 hours; gov workers, certain railway and air carrier workers exempt; own sickness or family member; 90 day accrual for new employees

Source: several sources, own collection, own illustration.