The Impact of Obamacare on Firm Employment and Performance[*]

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Abstract

We study the impact of Obamacare on firm employment and performance using hand-collected firm-level employee health insurance data. We show that Obamacare is associated with a significant increase in health insurance premia for employees in company-sponsored health insurance plans. Perhaps because of this increase in cost, companies with a large fraction of employees on their health insurance plans prior to Obamacare actively reduce enrollment in these plans after the law was enacted. We also find evidence that these same companies shift their employment composition from full-time employees to part-time, temporary, or seasonal workers, who are not covered in employer-sponsored health insurance plans. We do not find any evidence of deterioration in health insurance plan quality or in performance at companies that were more exposed to the increase in health insurance premia, perhaps because these companies adjust to the new regulation by changing the composition of employment towards part-time employees.

1. Introduction

The Patient Protection and Affordable Care Act (PPACA), often shortened to the Affordable Care Act (ACA) and nicknamed Obamacare, is one of the most comprehensive overhauls of the United States health care system. It was signed into law by President Barack Obama on March 23, 2010. This historic reform is aimed to improve the accessibility, affordability, and quality of health care in the U.S., through consumer protections, mandates, subsidies, taxes, and insurance exchanges (Obama, 2016). Understanding the effect of Obamacare on employers' health insurance provision and employment decisions is of crucial importance to both researchers and policy makers.

In this paper, we focus on the impact of Obamacare on firm employment and performance. Using hand-collected firm-level employee health insurance data, we show that after the introduction of the PPACA, employers on average spend 10% more on health insurance premium for each employee. In addition, we find that companies with a higher fraction of employees covered by employer-sponsored health insurance plans before the PPACA actively reduce their enrollments after the law enactment in order to contain the cost increase associated with Obamacare. We also find evidence that these same companies shift their employment composition from full-time employees to part-time, temporary, or seasonal workers, who are not covered in employer-sponsored health insurance plans. We do not find any evidence of deterioration in health insurance contract terms or in performance at companies that were more exposed to the increase in health insurance premiums, perhaps because these companies adjust to the new regulation by changing the composition of employment towards part-time employees.

Before we discuss our empirical strategy and findings, it is important to understand the institutional framework associated with Obamacare. Health insurance provision in the United States is characterized by heavy involvement of employers, especially for the working-age

population.[1] According to the U.S. Census Bureau, 55.1% of the U.S. population, or 68.2% of the employed population aged 18 to 64, had employment-based health insurance coverage in 2011 (DeNavas-Walt, Proctor, and Smith, 2011; Janicki, 2013). From firms' perspective, /health insurance represents an important item in the cost structure of many American corporations. For example, in 2010, the median employer contribution to health insurance premiums amounted to 12.8% of payroll costs (The Henry J. Kaiser Family Foundation, 2012).

The central goal of the PPACA is to achieve near-universal coverage through shared responsibilities among individuals, employers, insurers, and the government. The main component of the Act that affects employers is the employer mandate, also referred to as the employer shared responsibility provisions or the "play or pay" provisions. The employer mandate requires that employers with 50 or more full-time equivalent (FTE) employees provide health insurance to at least 95% of their full-time employees and their dependents up to 26 years of age. The coverage offered must be considered "affordable" (i.e., the coverage must cost no more than 9.5% of an employee's household income after the employer's contribution) and must provide "minimum value" (i.e., the plan must cover at least 60% of the covered health care expenses for a standard population). An applicable employer who either does not offer coverage or offers coverage that does not meet the affordability and minimum value standards faces penalties, officially called "an employer shared responsibility payment", owed to the Internal Revenue Service.[2]

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[1] A number of institutions are established to provide health insurance to individuals who are precluded from participating in the employer-provided insurance market. Examples of such institutions include Medicaid (for individuals and families with low income), Medicare (for people who are 65 or older and people with disabilities), and non-group private insurance markets and other miscellaneous programs that aim at certain populations (e.g., self-employed individuals and college students). For a detailed discussion of the U.S. health insurance system, see Currie and Madrian (1999).

[2] The employer shared responsibility payment is $2,000 per full-time employee (with the first 30 full-time employees being exempt) for employers who do not provide coverage. For employers who provide coverage that does not meet the affordability or the minimum value standards, the payment is $3,000 for each full-time employee receiving any premium tax credit, up to a maximum of $2,000 times the number of full-time employees (minus 30).

In addition, the PPACA considerably expands the federal insurance standards for group health coverage including employer-sponsored health benefit plans. These additional requirements include coverage of children up to age 26 under their parents' plans, coverage for clinical preventative care, a ban against exclusions of children with pre-existing conditions, restrictions on annual or lifetime limits, compliance with new claims procedures and reporting (to the government) and disclosure (to plan participants) obligations, etc.

Since its inception, Obamacare has sparked mixed public reactions and ongoing national debates over a wide range of issues. The discussions pertaining to employers largely center on a set of closely related questions: whether the PPACA leads to significant cost increases for employers, whether the law affects how employers provide health care for their employees, and how the health reform influences employers' hiring and staffing decisions and ultimately impacts employment.

Regarding the cost impact of Obamacare on employers, proponents of the law argue that by driving waste and inefficiencies out of the health care system, the PPACA's reforms can reduce health care cost and slow down health care spending system-wide, and that the slowdown in health care cost growth would benefit employers by reducing the growth of employer health insurance premiums (Executive Office of the President, 2013).[3] These potential benefits, however, may take time to materialize. In the meantime, a wealth of survey evidence suggests that employers in general anticipate that the PPACA will lead to significant increases in the cost of employer-sponsored health care plans.[4] The increases are largely attributed to the mandated requirements (e.g., new costs associated with the age 26 dependent coverage requirement), taxes

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[3] For example, the effect of the PPACA provisions that reduce Medicare overpayments to private insurers and medical providers is estimated to have accounted for a 0.2 percentage point reduction in health expenditures over 2010 to 2013 (Executive Office of the President, 2013).

[4] See, for example, the annual strategic benefits–health care surveys conducted by the Society for Human Resource Management (2012-2015), the surveys conducted by the International Foundation of Employee Benefits Plans on the PPACA's impact on employer-sponsored health care (2013-2015), Mercer's survey on health care reform (2014), and the survey on the cost of the PPACA to large employers by the American Health Policy Institute (2014), among many others.

and fees (e.g., exercise tax on high-cost plans and reinsurance fees), and administrative burdens (e.g., new costs for general implementation, administration, and reporting, disclosure, and notification requirements) associated with the PPACA.

Despite all their concerns about cost, the vast majority of employers to date have remained committed to providing health benefits to full-time employees. This is consistent across a multiplicity of employer surveys and in contrast with the widespread speculation at the onset of the reform that the PPACA's incentives would encourage employers to drop coverage and induce a wholesale shift away from the employer-sponsored health insurance system. The main reasons to continue coverage, according to surveyed employers, are to attract future talent, to retain current employees, and to maintain employee satisfaction and loyalty (International Foundation of Employee Benefits Plans, 2013-2015). From the employees' perspective, tax-subsidized employer-sponsored coverage is on average as good as or better than the PPACA exchange coverage for the majority of employees, i.e., those whose income is above 250% of the federal poverty level (Holtz-Eakin and Smith, 2010; Garrett and Buettgens, 2011). Overall, simulations and analyses conducted by the Congressional Budget Office and the Urban Institute also conclude that based on the terms of the PPACA, worker characteristics, and the fundamental economics of competitive labor markets, the law would leave employer-sponsored coverage large intact (Blavin, Buettgens, and Roth, 2012; Blumberg, Buettgens, Feder, and Holahan, 2012).

If employers continue to provide health coverage to their employees and the law leads to significant cost increases for them to do so, then employers may have incentives to pursue cost-containment measures, which, in turn, can have significant implications for their employment decisions. Whether and how Obamacare affects employment has been a heated topic of discussion. Critics of the PPACA maintain that the increased health care costs spurred by the law will induce employers to cut jobs and reduce hiring. Moreover, in addition to affecting overall employment, the mandates and penalties of the PPACA may induce employers to change their employee mix. To circumvent the employer mandate, employers can choose to hire more

part-time employees, whose work less than 30 hours per week and therefore are not covered by the mandate, to replace full-time employees. Alternatively, employers may move jobs originally performed by domestic employees overseas and instead hire foreign employees, who are not subject to the law's requirements. Anecdotal evidence abounds and seems to suggest that the PPACA impacts overall employment and employee composition.[5] Researchers analyzing aggregate population data such as the Bureau of Labor Statistics data and Census Bureau's Current Population Survey, however, suggest that it is unclear to conclude from patterns in the aggregate data that there is a significant change in total employment or in part-time employment that can be attributed to the PPACA.[6] The lack of firm-level data makes it difficult to link any data pattern to employer decisions in response to the law.[7]

In this paper, we aim to bridge this gap by analyzing the impact of Obamacare on employers' employment decisions from firms' perspective using health insurance information collected from Form 5500 Annual Return/Report of Employee Benefit Plan filings and firm employment data. We begin our study by showing that there is a sharp increase in health insurance cost after the PPACA. After the introduction of the PPACA, the total health insurance premium per firm increases more than 20% on average. To assess whether such an increase is attributable to premium hikes or enrollment increases, we examine the per person cost of employer-sponsored health insurance premium. We find that on average, an employer spends at least 10% more on health insurance premium for each employee.

A natural follow-up question is: how do employers adjust their labor policies to contain the increase in health insurance costs? Using firm-level employee health insurance cost data

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[5] See, for example, "Who can deny it? Obamacare is accelerating U.S. towards a part-time nation" (Forbes, July 31, 2013, and "Fed Survey: Obamacare Causing Companies to Cut Jobs" (The Wall Street Journal, August 16, 2016).

[6] See, for example, "Employment impacts of the Affordable Care Act" (The Brookings Institution, March 20, 2015).

[7] Another potential channel for firms to reduce employee health insurance costs is to change the terms in the insurance plans such as increasing copay or coinsurance. We explore this possibility in detail in Subsection 3.6.

(collected from Form 5500 filings), we measure a company's exposure to Obamacare by the proportion of employees covered by its employer-sponsored health insurance plan in 2007 (prior to Obamacare). We find that a one-percentage-point increase in this exposure reduces the fraction of employees covered by employer-sponsored health insurance plans by 0.3 percentage points after the PPACA. This result holds up to a battery of robustness tests. Thus, firms with proportionally more employees on their health insurance plans before the PPACA actively reduce their enrollments after the law enactment, likely to contain the cost increase associated with Obamacare.

How do employers achieve this goal? Anecdotal and survey evidence suggest that employers may respond to increased health insurance costs by shifting their employee composition from full-time to part-time, and from domestic to overseas, since part-time and foreign employment is not subject to the PPACA requirements. Accordingly, we first examine the hypothesis that employers ship job opportunities overseas. We calculate the number of foreign employees as the difference between total employment from Compustat and employment aggregated from the National Establishment Time Series (NETS) database.[8] We fail to find a relationship between exposure to Obamacare and changes in foreign employment following the PPACA, suggesting that overseas employment shifting is unlikely the main channel through which employers reduce the number of domestic employees covered in company-provided health insurance plans.

Next, we explore the effect of Obamacare on the composition of domestic employment. We find that the number of domestic employees who do not participate in their employers' health insurance plans increases after the introduction of the PPACA.[9] Given that employees in employer-provided health insurance plans are most likely to be full-time and employees who are

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[8] Total employment from Compustat represents both domestic and foreign employees. The NETS database provides us with employment counts of all domestic establishments.

[9] This measure is proxied by the difference between a company's employment number aggregated from NETS and the employment number covered by its employer-sponsored health insurance plans (from Form 5500).

not covered under those plans tend to be part-time, this result provides us with indirect evidence that employers shift their domestic employment composition from full-time employees to part-time, temporary, or seasonal workers.

Apart from adjusting labor policies, an alternative, non-mutually exclusive approach that firms could adopt to contain health insurance costs is to offer plans with lower quality. To test whether firms employ this approach, we assemble another unique data set using the Kaiser Foundation Employer Health Survey data. This data set contains details on health insurance contracts and thus enables us to examine whether the insurance contract terms experience any significant changes around the PPACA. Specifically, we examine maximum out-of-pocket costs, regular doctor office visit copays, specialist office visit copays, hospital admission coinsurance, and whether firms offer high-deductible health plans. We do not find any significant changes to support the notion that firms offer inferior health insurance plans to their employees after the passage of the PPACA compared to before the PPACA. The results from this analysis suggest that firms do not seem to rely on lowering plan quality to curb increased health insurance costs.

Additionally, we examine whether the increase in health insurance costs associated with the PPACA negatively affects firms' operational performance. We do not find any evidence for performance deterioration after Obamacare for companies that are more exposed to the law change. This result suggests that firms absorb the increase in health insurance costs by adjusting their labor structure, thereby avoiding a hit to performance.

Our paper contributes to the literature that examines the relationship between health insurance and labor market outcomes. Existing empirical evidence shows that health insurance is a central determinant of individual labor supply decisions because individual and household health insurances are closely tied to one's employment status.[10] Policy makers are well aware of the pitfalls of the employer-dominant health insurance system, which precludes unemployed

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[10] See Gruber and Madrian (2002) for a comprehensive review of this literature.

individuals from participating in such plans.[11] Our paper suggests that while the PPACA seeks to improve the accessibility and quality of health care, the associated increase in health insurance costs can induce companies to change the structure of employment.

Our paper also adds to a growing number of studies and reports that seek to understand the effects of the PPACA on health insurance coverage and on employment. These existing studies chiefly rely on survey data. For example, focusing on individual outcomes, Frean, Gruber, and Sommers (2017) study the American Community Survey data and find that the PPACA has increased health coverage. Using data from the Medical Expenditure Panel Survey, Abraham, Royalty, and Drake (2016) find no evidence that the PPACA provisions have influenced employers' decisions to (not) offer health insurance. Studies using the American Community Survey and the Current Population Survey data to analyze the impact of the PPACA on employment turn up mixed evidence on whether Obamacare is associated with a shift from full-time to part-time employment (e.g., Jorgensen and Baker, 2013; Dillender, Heinrich and Houseman, 2016; Mathur, Slovov and Strain, 2016; Moriya, Selden and Simon, 2016).

Unlike these previous studies that use survey data, in which the lack of firm-level data makes it difficult to link data patterns to employer decisions in response to the law, we compile a novel data set from firm-level Form 5500 filings, which report annual employer-level health insurance coverage and costs. With the further help of the NETS data on domestic employment statistics, we are thus able to assess the impact of the PPACA on health insurance costs, employment decisions, and performance from the firms' perspective. To the best of our knowledge, ours is the first paper to address these questions using firm-level data and analysis.

2.   Data

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[11] Occasionally, new regulations weaken the link between health insurance and employment status, e.g., the expansion of Medicaid program to pregnant women and children and to low-income parents without welfare (Cutler and Gruber, 1996; Aizer and Grogger, 2003). These pre-Obamacare regulation reforms, however, target very specific groups of individuals while employer-sponsored health insurance continues to finance a majority of health care costs in the United States.

2.1.   Form 5500 data

The Employee Retirement Income Security Act of 1974 (ERISA) and the Internal Revenue Code require welfare and pension benefit plans with more than 100 participants to file Form 5500 annually to report their detailed plan information including coverage, financial condition, investments, and operations. Similar to the personal tax return Form 1040, Form 5500 consists of a main form and a variety of schedules. The main form contains general demographic and basic plan information regarding the filing entity and indicates which schedules are included. Schedule A reports insurance plan information. This schedule includes insurance carrier information, insurance type (e.g. health, dental, vision), number of persons covered under each insurance plan, plan premium, etc. We consider the main form and Schedule A the most relevant to our study. The rest of the schedules report additional welfare and pension plan-related aspects of the filing entity, which are not pertinent to our analysis.[12] Form 5500 data are maintained by the IRS, Department of Labor, and Pension Benefit Guaranty Corporation and made available to the public under a Freedom of Information Act request. The government release Form 5500 data by filing year and by schedule from 1999 to 2016.

We start by downloading the annual main form. To be included in our study, we require the firms to specify that they have health insurance plan, HMO plan, PPO plan, or indemnity plan on the main form, as those types of insurance contracts are affected by the ACA. We also make sure that the firms checked a box on the main form indicating that they have filed the corresponding Schedule A. We then download the Schedule A data and merge with the main form. We take advantage of a unique identifier provided by the Department of Labor that links each Schedule A to its main form. Each Schedule A can only report one type of insurance plan.

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[12] For more information regarding Form 5500 and the schedules, please see https://www.dol.gov/agencies/ebsa/employers-and-advisers/plan-administration-and-compliance/reporting-and-filing/form-5500 and https://www.irs.gov/retirement-plans/form-5500-corner.

For example, a firm that allows employees to choose between an HMO plan and a PPO plan needs to file two forms of Schedule A's. We address this multiple Schedule A's issue by aggregating all the Schedule A's within each year to the main Form 5500 level. Again, we make sure that we only include the ones covering health insurance plan, HMO plan, PPO plan, and indemnity plan in our sample.

Another potential issue arises when matching the Form 5500 company to the Compustat company. More specifically, regulations do not require firms to file Form 5500's at the firm level. Rather, some firms file one form per firm and others file one form per subsidiary. Even though each form is associated with an Employer Identification Number (EIN), Compustat only reports one EIN per firm, which is at the consolidated company level. The EINs reported on Form 5500's might not be at the same level. The problem at hand is to accurately match as many Form 5500's to Compustat as possible. We address this problem in three ways. First, we hand-match the filing entity name to the Compustat firm name. We also make sure other firm demographics are in line with each other to consider it a good match. Second, we hand-match the address reported on Form 5500's to the address provided by Compustat. When the Form 5500 firm and Compustat firm share the same address, we take on additional web search efforts to check whether they are indeed the same entity. Third, we conduct web and Edgar searches to identify the subsidiaries of each Compustat company. We then match those subsidiaries to Form 5500's. After the matching procedure, we aggregate all the Form 5500s to the Compustat company level, yielding us a firm-year panel.

In summary, we are able to obtain firm-level insurance coverage information and their corresponding insurance premium in each year. We demonstrate how we construct our main variables for the analysis using this information in Section 2.3.

2.2. NETS data

Developed by Walls & Associates and Dun and Bradstreet (D&B), the National Establishment Time Series (NETS) database provides a comprehensive coverage of all domestic establishments at annual frequency. D&B is a leading credit rating provider that maintains a detailed data set regarding each establishment through annual surveys and self-reporting. D&B spends multi-million dollars each year to ensure the accuracy and integrity of the data provided.

The NETS data provides information on business name, address, and number of employees, among over 350 data fields. We use the Publicly Listed Companies database from NETS, which tracks all the publicly listed firms and their establishments in the U.S. The data also track the inclusion and exclusion of establishments at each firm and identifies such events accordingly, providing us with information on the composition of each firm across time. Most relevant to our study, this database allows us to track firms' domestic employment levels. The database provides an identifier that links each establishment to its ultimate parent. This allows us to focus on the ultimate parent when we perform the matching procedure to Compustat. We match the NETS data to Compustat by name and address. We make sure that the names are exact matches and take on additional effort to check for alternative names and addresses used by the firms to ensure a high matching rate.

The main piece of information we extract from the NETS database is the employment count. Since our unit of analysis throughout the paper is at the firm level, we aggregate all the employment numbers across all establishments within each firm by year. The NETS database covers U.S. firms and establishments only. The employment count reported covers domestic employees only, including both full-time and part-time employees. We provide more details on constructing our variables for the analysis using this data set in the next subsection.

2.3. Other data and variable construction

Throughout our analysis, we supplement the datasets with firm characteristics from Compustat. We eliminate the financial services and utilities industries from our sample.

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We first construct our main outcome variables used in the analysis. The first variable is total healthcare premium. We aggregate all the healthcare premiums reported in the Schedule A's for each firm at any given year. For the analysis, we take the natural logarithm of the total healthcare premium. We then calculate total premium/covered employees and total premium/total employees. The former is the total dollar value of total healthcare premium scaled by the number of employees covered by company-provided insurance, and the latter is the total dollar value of total healthcare premium scaled by the total number of employees. We obtain our total number of employees from Compustat ("total employees"). The number of employees covered by company-provided insurance comes from Form 5500's. We, again, aggregate the number of employees enrolled in each plan as reported in the Schedule A's and name this variable covered employees. We construct covered employees/total employees as the ratio of the number of covered employees to the total number of employees. Since NETS covers all full-time and part-time employees in the U.S. (which we label as domestic employee) and Compustat reports all employees both domestic and foreign, we are able back out the number of foreign employees by taking the difference between the number of total employees and the number of domestic employees. We scale foreign employees by total employees to obtain foreign employees/total employees. Similarly, we are able to calculate domestic non-covered employees by subtracting the number of covered employees from the total number of domestic employees and scale it by total employees to construct domestic non-covered employees/total employees.

For our operating outcome analysis, we consider three variables. Market share is based on the previous year sales data at the three-digit SIC code level. ROA is defined as the net income over total assets. EBIT is earnings before interest expenses and taxes over total assets.

We include employment, size, Q, leverage, tangibility, cash holding, cash flow, and foreign pretax income. Employment is the total number of employees in each firm. We take the natural logarithm of total number of employees to control for the difference in work-force size at each firm. Total asset is the total book value of assets. We take the natural logarithm of total asset to proxy for firm size. Q is the book value of assets plus the market value of equity minus

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total debt and deferred taxes all over assets. Leverage is the sum of short-term debt and long-term debt scaled by total assets. Tangibility is property, plant, and equipment scaled by assets. Cash holding is cash and short-term investments over assets. Cash flow is the sum of income before extraordinary items and depreciation and amortization scaled by assets. Foreign income is pretax income from foreign operations scaled by total assets. All the variables are deflated accordingly. We winsorize all of the continuous variables at the 1% level to reduce the effect of outliers.

2.4. Summary statistics

We present the summary statistics for the variables in Table 1. In Panel A, we report summary information regarding the firms in our analysis. We see that the average firm spends around $8 million per year on employee health insurance premium payments. The average premium for each covered employee is around $3,100. The average firm provides health insurance coverage to 5,200 employees, or approximately 62% of the total number of employees at each firm. Each firm, on average, has 20% of the domestic labor force without company-provided health insurance coverage.

[Place Table 1 about here]

In Panel B, we compare our sample firm, i.e. the ones with Form 5500 filings, to the firms in Compustat that do not file Form 5500's to get a sense of our sample firm characteristics. In compassion, our sample firms are considerably larger in terms of employment and size. For example, our sample firms on average have 19,400 employees as opposed to 9,300 employees for Compustat firms without Form 5500 filings. Our sample firms also seem to be less capital intensive: the average property, plant, and equipment to asset ratio is around 27% for our sample firms versus 33% for the firms without Form 5500's. In terms of *Q*, leverage, cash holding, and cash flow, the two groups look qualitatively similar.

3.   Empirical Results

In this section, we present our empirical results. We first examine and document the effect of the PPACA on firms' insurance premium costs. We then describe the empirical design used to analyze the effects of the PPACA on firms' employment and performance. Our main analysis focuses on the impact of the PPACA on insurance covered employment, foreign employment, and domestic employment at the firm level. We also study operating performance outcomes and conclude this section with placebo tests and a matching estimator analysis.

3.1. Insurance premium

Does Obamacare increase health insurance costs to employers? In this subsection, we investigate the changes in health insurance premium in employer-sponsored plans before and after the passage of Obamacare. Specifically, we estimate the following OLS regression:

$$Outcome_{it} = \alpha + \beta_1 \cdot After + \beta_2 \cdot Time\ trend_t + \beta_3 \cdot Time\ trend_t^2 + \beta_4 \cdot X_{it} + \theta_i + \epsilon_{it}$$

$$(1)$$

Our dependent variable, $Outcome_{it}$, denotes the natural logarithm of the total healthcare premium, total premium/covered employees, and total premium/total employees. After is a dummy variable that equals one if the majority of a firm's fiscal year falls after the passage date of Obamacare, i.e., March 23, 2010, and equals zero otherwise. We include time trend and time trend squared terms to control for any seasonality and growth in insurance premium due to reasons unrelated to Obamacare. X_{it} represents a battery of firm-level controls to account for other firm decisions that could potentially confound the changes in insurance premium. θ_i captures firm fixed effects that account for firm-level heterogeneities. β_1 is our key coefficient of interest. If health insurance premiums go up in the period after the passage of Obamacare, we would expect β_1 to be positive and significant.

For our first set of analysis, we utilize all firms in the Form 5500 data set. That is, we include firms that are both public and private. We report the results in Table 2.

[Place Table 2 about here]

In Columns (1) to (3), we use the natural logarithm of the total healthcare premium as the dependent variable. Focusing on the full sample in Column (1), the regression coefficient on the *After* dummy is 0.22, indicating that after the passage of the PPACA, firms' health insurance premiums on average increase 22% compared to the period before Obamacare. We then breakdown our sample into firms with different sizes to see Obamacare has a different impact on large firms versus small firms. Specifically, we study the smallest 25% of the sample firms and report the result in Column (2), while Column (3) presents the results using the largest 25% of the firms in our sample. We find that the smaller firms experience a 19% increase in insurance premium whereas the larger firms experience a 28% increase in insurance premium. One potential explanation is that the smaller firms are able to take advantage of the many credits made available through the PPACA to help defray some of the costs associated with the Act, and such credits are not available to the larger employers.

In Columns (4) to (6), we repeat the same analysis by replacing our dependent variable with the natural logarithm of health insurance premium per covered employee. On a per covered employee basis, we find a 17% increase in premium on average. Using the subsamples, we find that the increases in smaller firms and larger firms are approximately 10% and 25%, respectively. Again, these results suggest that smaller firms experience less health insurance price hike after the passage of the PPACA compared to their larger counterparts.

One major drawback of using the entire Form 5500 sample is that firm-level characteristics that may influence firm-level health insurance costs and employment policies are not available for all firms. Additionally, Form 5500 does not require firms to report their total number of employees, which is a key focus of our empirical analysis. In our main empirical analysis, therefore, we focus on the merged Compustat and Form 5500 sample. We first examine the insurance premium for this merged sample and report the results in Table 3.

[Place Table 3 about here]

In Column (1) of Table 3, we use the natural logarithm of the total healthcare premium as the dependent variable. The regression coefficient on the *After* dummy is 0.23, indicating that after the passage of the PPACA, firms' health insurance premiums on average increase 23% compared to the period before Obamacare. Given the unconditional mean of total healthcare premium at $7.8 million, this represents a nearly $1.8 million increase in healthcare expenditure per firm. In Columns (2) and (3), we use two different measures to gauge the changes in health insurance cost on a per person basis. We observe a 10% increase in health insurance premium per employee, both in terms of number of covered employees and number of total employees. These results are consistent with those obtained using the entire Form 5500 sample.

Overall, the results indicate that in the period after Obamacare, firms in general face significantly higher healthcare insurance premiums. Given these increased costs associated with Obamacare, we next explore how firms adjust their employment composition in response so as to potentially reduce health insurance costs and whether there is any implication on firm performance.

3.2. Empirical design

The focus of our paper is to examine the impact of the PPACA on firm employment decisions and firm performance. The main empirical challenge is to measure the changes in these firm outcomes were the PPACA not in place, which are not observable to the econometrician. Our approach is to try to create plausibly counterfactual changes in firm outcomes during the same period surrounding the passage of the PPACA, and gauge the differences between those counterfactual changes and the changes observed in the data. We rely on the idea that employers who provide health insurance to a larger number of employees before the enactment of the PPACA are more exposed to the cost impact from the provisions of the newly passed PPACA than otherwise similar employers with lower proportions of covered

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employees. Therefore, by examining the difference in changes in employment decisions between otherwise similar firms with different levels of covered employees, we could shed light on the effect of the PPACA on firm outcomes. Throughout the paper, we use the following regression specification:

$$Outcome_{ijt} = \alpha + \beta_1 \cdot \frac{Covered\ employees}{total\ employees}_{2007} + \beta_2 \cdot After + \beta_3 \cdot \frac{Covered\ employees}{total\ employees}_{2007} \cdot After + \beta_4 \cdot X_{it} + \beta_5 \cdot$$

$$X_{it} \cdot After + \beta_6 \cdot Prior\ trend_{ijt} + \theta_i + \tau_t + \eta_{jt} + \epsilon_{ijt} \qquad (2)$$

where $Outcome_{ijt}$ represents our dependent variable. For each employer, $\frac{Covered\ employees}{total\ employees}_{2007}$ is the number of employees covered by the health insurance plan sponsored by the employer as a proportion of the employer's total employment at the end of 2007.[13] After is a dummy variable that equals one if the majority of a firm's fiscal year falls after the passage date of Obamacare, i.e., March 23, 2010, and equals zero otherwise. Our main coefficient of interest is β_3, which captures the differences in changes in the outcome variable between firms with different fractions of covered employees around the enactment of the PPACA. We include the following control variables in the vector X_{it}: log(employment), size, Q, leverage, tangibility, cash holdings, cash flow, and foreign income. Our empirical strategy is to compare the changes in firm outcomes after the enactment of the PPACA for firms with different levels of exposures to the PPACA yet with otherwise similar characteristics before the passage of the PPACA. Therefore, we fix our firm-level controls at the end of year 2007, for the post-PPACA years, to be consistent with our treatment variable. To allow for potential non-linear changes in the control variables that might affect the dependent variables during periods before and after Obamacare, we also include interaction terms between the control variables and the After dummy. $Prior\ trend_{ijt}$ is the change in the dependent variables in the prior two years, capturing any time trend in the dependent variables leading up to the passage of Obamacare. To control for macroeconomic and industry-level business cycles, as well as unobservable time-

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[13] We fix the treatment variable at a time before the passage of Obamacare in the spirit of Acemoglu, Autor and Lyle (2004). Due to the onset of the financial crisis from the end of 2007 that can potentially contaminate firm outcomes, we decide to use the year 2007 throughout the analysis. Using year 2009, the year right before the PPACA, as the year to fix this treatment variable yields qualitatively similar results.

invariant firm characteristics, we include firm fixed effects, year fixed effects, and industry times year fixed effects. We denote them θ_i, τ_t, and η_{jt}, respectively.[14]

In Table 4, we run OLS regressions of our treatment variable, i.e., $\frac{Covered\ employees}{total\ employees}_{2007}$, on firm characteristics along with a host of fixed effects using data from the period before the passage of Obamacare, in order to understand the determinants of the treatment variable. We find that log employment is negatively correlated with this health insurance coverage ratio. In addition, in some specifications, the fraction of part time employees is negatively correlated with the treatment variable.

[Place Table 4 about here]

3.3. The effect of the PPACA on insured employment

In this section, we examine the impact of the PPACA on insured employment. To do so, we examine three measures, log(covered employees), log(total employees), and covered employees/total employees, as defined in Section 2.3. We run firm-level regressions per Equation (2). We define the six years before and the six years after the passage of the ACA as our sample period.

We report the results in Table 5. In Columns (1) through (3), we use log(covered employees) as the dependent variable. We see negative and significant coefficients on the interaction term, indicating that firms with higher fractions of insured employees before the passage of the PPACA reduce the number of insured employees by a greater extent afterwards. The number of total employees, however, does not seem to be affected disproportionately. In Columns (4) to (6), in which we use log(total employees) as the dependent variable, we observe no statistically significant results, and the point estimates are so small that they are not economically meaningful. In Columns (7) to (9), we use the ratio of total covered employees to

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[14] In the robustness tests, we implement a placebo test and a matching estimator approach. We find results consistent with our main findings.

total employees as the dependent variable, i.e., covered employees/total employees. Taking Column (9) as an example, we observe a point estimate of -0.31 on the interaction term, which is statistically significant at the 1% level. This result is also economically meaningful. Given a one-percentage-point increase in the coverage ratio in 2007, for those firms that cover a lot of employees, they reduce health insurance coverage by 0.33% in the period after the PPACA compared to the ones covering a few employees.

Overall, we see that firms with higher covered employees/total employees ratios prior to the PPACA on average reduce health insurance coverage more after the law enactment. Firms may reduce health insurance coverage in two ways that circumvent the requirements of the PPACA. One is that firms can employ foreign workers instead of domestic workers. The other is that firms can substitute full-time employees with part-time employees. We explore these two possibilities in turn in the next two subsections.

[Place Table 5 about here]

3.4. Foreign employment

One potential way for firms to avoid the PPACA's jurisdiction is to shift employment overseas as the law only affects employees in the U.S. We empirically test this possibility using data on foreign employment.

We implement the same empirical strategy depicted in Equation (2), using foreign employees/total employees as the dependent variable. We report the results in Table 6. In all three specifications, we find that firms that provide health insurance to a larger fraction of employees before the ACA are not actively shifting their workforce to overseas compared to otherwise similar firms that only insure a smaller fraction of employees. In other words, firms do not seem to engage in shifting employment overseas in response to the PPACA. Our results suggest that it might be costly for firms to acquire new sites overseas or to move operations to existing foreign subsidiaries, at least in the short run.

[Place Table 6 about here]

3.5. Domestic employment

The other potential method for firms to save on health insurance costs is to substitute some jobs requiring full-time workers to part-time workers, thereby reducing coverage obligations as the PPACA does not require health insurance coverage for part-time employees.

Since our data sets do provide an exact measure for the number of part-time employees, we instead examine the number of domestic non-covered employees as an alternative. We take the difference between the number of domestic employees reported by NETS and the number of covered employees reported in Form 5500 to back out the number of domestic non-covered employees. To the extent that the majority of a firm's domestic full-time employees are covered in the firm-sponsored health insurance plan, which is a reasonable assumption, this measure serves as a first-order approximation for the number of part-time employees.[15]

Following the regression specification in Equation (2), we present the results in Table 7. We use domestic non-covered employees/total employees as the dependent variable in Columns (1) to (3). We observe positive and significant coefficients on the interaction term, indicating that firms with a higher fraction of insured employees before Obamacare are indeed increasing the number of domestic non-covered employees in the period after Obamacare compared to otherwise similar firms that cover a lower fraction of insured employees before Obamacare. We interpret these results as evidence that firms are shifting full-time jobs to part-time in response to the PPACA.

[Place Table 7 about here]

In Columns (4) to (6) and (7) to (9), we show the effects of Obamacare on domestic employment using log(domestic employees) and domestic employees/total employees,

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[15] In cases where firms also enroll some part-time employees in their health insurance programs, the inclusion will only bias against our results, making our finding a lower bound estimate.

respectively, as the dependent variables. We find no statistically significant results on the interaction terms, and the coefficients are small in magnitude. These results are not surprising because the domestic employment measures are mere differences between the number of total employees and the number of foreign employees, both of which are not affected by Obamacare we have shown in earlier results.

Together, our employment results suggest that the adjustment in employment composition in response to the PPACA seems to take place at the domestic level, i.e., firms are moving domestic full-time jobs to domestic part-time jobs, and not across border. This is consistent with the drop in the ratio of covered employees to total employees and no change in the total number of employees or the number of foreign employees that we observe in the data.

3.6.   Health insurance contract terms

Apart from adjusting labor policies, an alternative, non-mutually exclusive approach that firms could adopt to help contain health insurance costs is to offer plans with lower quality. To test whether firms employ this approach, we examine health insurance contract terms in detail in this subsection. This is not an easy task as firms are not required to publicly file their employee health insurance plan contracts. For example, a thorough search of firms SEC filings yields very few such plans. We overcome this data availability issue by assembling a unique data set containing details on health insurance contracts using the Kaiser Foundation Employer Health Benefit Survey data.[16] The Kaiser Foundation conducts a detailed survey among a sample of employers regarding their employer-provided health insurance plans every year. There is a substantial overlap in the firms surveyed by Kaiser every year. We are therefore able to construct a firm-year panel by compiling the survey data, which allows us to compare the insurance contract terms before and after the PPACA. In this analysis, we focus on five measures reported in the surveys to gauge the changes in insurance contract quality. Specifically,

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[16] We thank the Kaiser Family Foundation for providing the annual survey microdata.

we study the maximum out-of-pocket cost, the copay for regular doctor's office visit, the copay for specialist's office visit, the coinsurance rate for hospital admission, and whether firms offer a high-deductible health plan. We again follow the regression specification in Equation (2).

In Table 8, we present the results of this analysis. Across all measures, the coefficients on the interaction term are neither statistically significant nor economically meaningful, suggesting that health insurance contract terms do not change significantly after the PPACA. These results show that firms do not seem to rely on lowering insurance plan quality to curb increased health insurance costs.

[Place Table 8 about here]

3.7. Operating performance

So far, we have examined the changes in employment composition and health insurance contract terms at the firm level after the passage of the PPACA. In this subsection, we examine changes in firm operating performance around the law enactment.

We focus on three of the most commonly used operating performance measures. Specifically, we examine market share, ROA, and EBIT as the dependent variables in our analysis. We estimate the same regression specification as shown in Equation (2). Specifically, we run OLS regressions of the dependent variables, respectively, on the interaction term, firm-level controls, firm fixed effects, year fixed effects, industry times year fixed effects, and interaction terms between the After dummy and firm-level controls.

We present the results in Table 9. The coefficients on the interaction term are insignificant, statistically and economically. There are no significant differences in operating outcome changes between the firms with more insured employees and the ones with fewer insured employees around the passage of the PPACA. Viewed together with our previous

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findings, these results suggest that the employment composition shifts that firms implement may have helped firms to avoid deterioration in operating performance.[17]

[Place Table 9 about here]

3.8. Robustness

In this subsection, we carry out a host of robustness tests. We first conduct placebo tests assuming the PPACA took place in a different year. We then implement a matching estimator approach.

3.8.1. Placebo tests

One concern with our empirical strategy is that our battery of control variables and fixed effects cannot fully rule out the possibility that there is a latent variable driving our results. Hence, it might invalidate our assumption that the changes in outcome variables are through no other channels but their exposure to the PPACA before the passage of the law.

To address this problem, we conduct the same experiment for the March 2010 passage of the PPACA using a placebo event year. Specifically, we perform the same tests around March 2006 using 2002 to 2005 as the pre-event period and 2006 to 2009 as the post-event period.[18] Following our empirical strategy, we define the treatment variable as the ratio of total number of covered employees to total employees in year 2005, which is the year prior to the placebo event

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[17] In unreported results, we split the sample into large versus small firms. We do not find any differential effects on operating performance for the two groups of firms.

[18] Due to data constraint, we are only able to carry out the placebo test with one placebo event year. More specifically, complete Form 5500 data coverage and hence our sample start from the year 2000. We need two years to calculate the prior trend in the dependent variables, which leaves us a starting year of 2002 in our empirical estimation. Because Obamacare took effect in 2010, we stop the placebo sample in 2009 to avoid any effects after the passage of Obamacare. These data restrictions leave us only data from 2002 to 2009 to perform the placebo test.

year. For the years after the event, we continue to fix our firm level control variables at the year prior to the event.

Like before, we run firm-level regressions as shown in Equation (2). We focus on log(covered employees), covered employees/total employees, and domestic non-covered employees/total employees as the dependent variables. We present the results in Table 10. The interaction terms show no statistically significant results. The magnitudes of the regression coefficients are also much smaller than the ones from the actual event.

[Place Table 10 about here]

3.8.2. Matching estimator

In theory, our results could be due to other subtle firm-level heterogeneities that we cannot fully control for in the analysis. Ideally, the assignment of the treatment, in our case, the proportion of covered employment, should be randomly distributed across firms in our sample. Equation (2) with controls does not fully address the concern that firms being compared may have very different characteristics. To overcome this issue, we utilize the Abadie and Imbens (2006) matching estimator approach. The matching estimator analysis ensures that the assignment of treatment is orthogonal to the outcome variable, and also addresses the concern that the firms being compared may have different characteristics, which might in turn affect the outcome variable.

Our main results are based on a continuous treatment variable, which is defined as the ratio of total number of covered employees to total employees in year 2007. It is impossible to apply the difference-in-difference matching estimator to a continuous treatment variable. Therefore, instead, we sort our treatment variable from the largest to the smallest and create a dummy variable *treatment dummy* that equals to one if the continuous treatment variable is in the top 20% and equals to 0 if falls into the bottom 80%. Firms with *treatment dummy* equal to one become our treated firms, and firms with *treat dummy* equal to 0 are our non-treated firms. For

each treated firm, we first match it with a firm ("control firm") from the non-treated group that is in the same industry as the treated firm and has the minimal distance (i.e., the Mahalanobis distance) to the treated firm along the vector of observed covariates, namely log number of employees, firm size, Q, leverage, tangibility, cash holding, cash flow, and the trends in the dependent variable in the years leading up to the event. This first step ensures that the treated and control observations have identical distributions along each one of the covariates chosen. In the second step, we estimate the average treatment effect on the treated (ATT) using our matched sample. The set of counterfactuals is restricted to the matched controls. The crucial assumption here is that in the absence of the treatment, the treated group would have behaved similarly to the control group.

We report the results in Table 11. In Panel A, we report the summary statistics of the matched treated sample, non-treated sample, and the matched control sample. We also report the Kolmogorov-Smirnov test p-values between the treated and control groups. The two groups are similar but not perfectly, mainly due to the log employment variable. The treated firms on average have fewer employees than the control firms. Although the match is imperfect, the magnitudes of the differences are too small compared to the unconditional means to be economically meaningful. Panel B shows the biased-adjusted ATT estimator coefficients. They are qualitatively similar to the main results reported in earlier tables, providing further support to our interpretation.

[Place Table 11 about here]

4.   **Conclusion**

Obamacare is associated with a significant increase in health insurance premiums for employees in company-sponsored health insurance plans. Perhaps because of this increase in cost, companies with a large fraction of employees on their health insurance plans prior to Obamacare actively reduce enrollment in these plans after the law was enacted. We also find

evidence that these same companies shift their employment composition from full-time employees to part-time, temporary, or seasonal workers, who are not covered in company-sponsored health insurance plans. We do not find any evidence of deterioration in health insurance plan quality or in performance at companies that were more exposed to the increase in health insurance premiums, perhaps because these companies adjust to the new regulation by changing the composition of employment towards part-time employees.

To the extent that part-time employment is less desirable than full-time, our results point out to a negative, unintended consequence of Obamacare. However, it is important to point out the limitations of what we can conclude from our results. First, since we cannot directly measure part-time employment, we cannot rule out the possibility that our results are driven by channels other than the change in the composition of employment. For example, it may be that (full-time) employees voluntarily left company-sponsored health plans. Second, we cannot rule out the possibility that health care premiums would have increased even more, had Obamacare not been enacted. The period we are examining is characterized by sharp increases in health care costs, and we cannot measure the counterfactual increase in health care costs in the absence of the law change. Examining these issues is an interesting topic for future research.

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Table 1
Summary statistics

This table presents summary statistics for our sample. Panel A presents the summary statistics for firms in the analysis, and Panel B provides a comparison between the firms with and without Form 5500 filings. Total healthcare premium is the total dollar value of health insurance premium reported on Form 5500. Total premium/covered employees is the total dollar value of insurance premium scaled by the number of employees covered by firm-provided insurance. Total premium/total employees is the total dollar value of insurance premium scaled by the total number of employees. Size is the natural logarithm of book value of asset. Q is defined as the book value of assets plus the market value of equity minus total debt and deferred taxes all over assets. Leverage is defined as the sum of long-term debt and debt in current liabilities all over assets. Tangibility is defined as the property, plant and equipment scaled by total assets. Cash holding is cash and short-term investments scaled by total assets. Cash flow is depreciation and amortization plus income before extraordinary items scaled by total assets. Foreign income is pretax income from foreign operations scaled by total assets. Treatment is the ratio of covered employees to total number of employees in 2007. Covered employees is the number of employees covered by firm provided insurance. Total employees is the total number of employees. Covered employees/total employees is the ratio of covered employees to total number of employees. Foreign employees/total employees is the number of total employees minus the number of domestic employees scaled by total employees. Domestic non-covered employees/total employees is the number of domestic employees minus the number of domestic covered employees scaled by total employees. Domestic employees is the number of employees reported in the NETS data. Domestic employees/total employees is the ratio of domestic employees to total number of employees. Market share is based on the previous year sales data at the three-digit SIC code level. ROA is defined as net income over total assets. EBIT is earnings before interest expenses and taxes over total assets.

Panel A: Summary statistics for firms in the analysis

Variable	N (1)	Mean (2)	SD (3)	Median (4)
Total healthcare premium ($)	9,098	7,809,281	18,300,000	727,135
Total premium/covered employees ($)	9,098	3,072	2,442	1,365
Total premium/total employees ($)	9,098	1,604	2,177	128
Total employees	9,098	19,434	35,335	4,400
Size	9,098	6.9946	1.9085	6.8971
Q	9,098	2.1228	1.6903	1.6823
Leverage	9,098	0.2100	0.2006	0.1849
Tangibility	9,098	0.2684	0.2283	0.1916
Cash holdings	9,098	0.1913	0.2083	0.1106
Cash flow	9,098	0.0847	0.1164	0.0965
Foreign income	9,098	0.0186	0.0336	0.0010
Treatment	9,098	0.7041	1.0428	0.4379
Covered employees	7,725	5,198	13,095	1,080
Covered employees/total employees	7,725	0.6237	0.7340	0.3695
Foreign employees/total employees	6,934	0.2003	0.5736	0.3038
Domestic non-covered employees/total employees	6,934	0.1747	0.8632	0.2175
Domestic employees	6,934	12,852	33,031	2,730
Domestic employees/total employees	6,934	0.7252	0.2688	0.6962
Market share	7,957	4.3214	1.5981	4.3982
ROA	7,957	0.1298	0.1052	0.1292
EBIT	7,957	0.0857	0.1025	0.0869

Panel B: Summary statistics for firms with and without Form 5500

	With Form 5500			Without Form 5500		
Variable	N (1)	Mean (2)	SD (3)	N (4)	Mean (5)	SD (6)
Total employees	9,098	19,434	35,335	16,564	9,324	23,711
Size	9,098	6.9946	1.9085	16,564	5.8528	2.0267
Q	9,098	2.1228	1.6903	16,564	2.3027	1.9042
Leverage	9,098	0.2100	0.2006	16,564	0.2111	0.2166
Tangibility	9,098	0.2684	0.2283	16,564	0.3257	0.2960
Cash holdings	9,098	0.1913	0.2083	16,564	0.2123	0.2451
Cash flow	9,098	0.0847	0.1164	16,564	0.0772	0.1603
Foreign income	9,098	0.0186	0.0336	16,564	0.0086	0.0296

Table 2
Insurance premium: all firms filing Form 5500

      This table reports OLS regression results for firms' insurance premium around the passage of the PPACA using data on all firms filing Form 5500. The dependent variables in Columns 1 to 3 are the natural logarithm of total insurance premium, and the dependent variables in Columns 4 to 6 are the natural logarithm of healthcare premium scaled by covered employees. After is a dummy variable that equals one for the period after the passage of the PPACA and equals zero otherwise. Robust standard errors clustered by firm are in parentheses. ***, **, and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.

| | Log(total premium) | | | Log(total premium/covered employees) | | |
| | All firms | Smallest 25% | Largest 25% | All firms | Smallest 25% | Largest 25% |
Variables	(1)	(2)	(3)	(4)	(5)	(6)
After	0.2182***	0.1922***	0.2839***	0.1793***	0.1085***	0.2462***
	-0.0102	(0.0187)	(0.0207)	(0.0071)	(0.0137)	(0.0143)
Time trend	Y	Y	Y	Y	Y	Y
Time trend squared	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Observations	255,165	68,318	74,271	255,165	68,318	74,271
Adjusted R-squared	0.5770	0.5635	0.5518	0.5632	0.5484	0.5511

Table 3
Insurance premium: main sample

This table reports OLS regression results for firms' insurance premium around the passage of the PPACA. The dependent variables in Columns 1 to 3 are the natural logarithm of total insurance premium, the natural logarithm of healthcare premium scaled by covered employees, and the natural logarithm of insurance premium scaled by total employees, respectively. After is a dummy variable that equals one for the period after the passage of the PPACA and equals zero otherwise. All the variables are defined in Table 1. Robust standard errors clustered by firm are in parentheses. ***, **, and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	(1) Log(total premium)	(2) Log(total premium /covered employees)	(3) Log(total premium /total employees)
After	0.2317***	0.1084**	0.1029**
	(0.0625)	(0.0426)	(0.0431)
Log(employment)	0.3772**	-0.0055	-0.0850
	(0.1721)	(0.1060)	(0.1351)
Size	-0.1689	-0.0963	-0.1991*
	(0.1509)	(0.0892)	(0.1140)
Q	-0.0278	-0.0117	-0.0423**
	(0.0205)	(0.0103)	(0.0188)
Leverage	-0.8778**	-0.1951	-0.5800**
	(0.3727)	(0.2283)	(0.2767)
Tangibility	0.2713	-0.0374	0.2953
	(0.5192)	(0.3830)	(0.3959)
Cash holdings	0.0614	0.0151	0.0691
	(0.2436)	(0.1698)	(0.1986)
Cash flow	-0.2024	0.0243	-0.4215
	(0.3792)	(0.2305)	(0.2685)
Foreign income	-2.9184	-1.2126	-1.8271
	(2.4772)	(1.5172)	(1.6360)
Time trend	Y	Y	Y
Time trend squared	Y	Y	Y
Firm FE	Y	Y	Y
Observations	9,033	9,033	9,033
Adjusted R-squared	0.5982	0.5202	0.7483

Table 4
Determinants of the treatment variable

This table reports OLS regression results for the determinants of the treatment variable. The treatment variable is the ratio of covered employees to total number of employees in 2007. All the variables are defined in Table 1. Robust standard errors clustered by firm are in parentheses. ***, **, and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	(1)	(2)	(3)	(4)	(5)
	Covered employees/total employees in 2007				
Log(employment)	-0.2239***	-0.1820**	-0.2225***	-0.1842**	-0.1949**
	(0.0215)	(0.0827)	(0.0217)	(0.0815)	(0.0926)
Size	0.0246	0.1391*	0.0230	0.1645**	0.1277
	(0.0275)	(0.0774)	(0.0281)	(0.0733)	(0.0811)
Q	-0.0034	0.0004	-0.0033	0.0008	0.0038
	(0.0131)	(0.0108)	(0.0130)	(0.0110)	(0.0132)
Leverage	-0.1741	-0.1147	-0.1749	-0.1114	-0.0930
	(0.1294)	(0.0989)	(0.1296)	(0.0986)	(0.1042)
Tangibility	-0.0501	0.1318	-0.0486	0.1214	-0.0222
	(0.0991)	(0.1655)	(0.0989)	(0.1655)	(0.1775)
Cash holdings	-0.2024	-0.0481	-0.1969	-0.0515	0.0195
	(0.1440)	(0.1187)	(0.1423)	(0.1199)	(0.1507)
Cash flow	0.0198	-0.0415	0.0296	-0.0317	-0.0027
	(0.1993)	(0.2294)	(0.1992)	(0.2285)	(0.2422)
Foreign income	-0.0309	1.1926	-0.0723	1.3150	1.4551
	(1.5521)	(1.2905)	(1.5391)	(1.2590)	(1.1685)
% part time employees>10	-0.0760*	0.0085	-0.0785*	0.0132	0.0671
	(0.0411)	(0.0688)	(0.0417)	(0.0685)	(0.0749)
Year FE	N	N	Y	Y	Y
Firm FE	N	Y	N	Y	Y
Industry x year FE	N	N	N	N	Y
Observations	5,544	5,468	5,544	5,468	5,113
Adjusted R-squared	0.1221	0.6498	0.1219	0.6498	0.6370

Table 5
The effect of Obamacare on health insurance coverage

This table reports OLS regression results for firms' employee health insurance coverage around the passage of the PPACA. The dependent variable in Columns 1 to 3 is the natural logarithm of the number of insured employees. The dependent variable in Columns 4 to 6 is the natural logarithm of the number of total employees. The dependent variable in Columns 7 to 9 is the ratio of covered employees to total employees. All the variables are defined in Table 1. Robust standard errors clustered by firm are in parentheses. ***, **, and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	Log (covered employees)			Log (total employees)			Covered employees/total employees		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treat	0.4102***	0.4317***	0.4145***	-0.0238***	-0.0210***	-0.0216***	0.4407***	0.4495***	0.4429***
	(0.1179)	(0.1238)	(0.1180)	(0.0080)	(0.0073)	(0.0073)	(0.0989)	(0.1021)	(0.0994)
After	0.1942*	1.4135***	1.3760***	0.0461**	0.3422***	0.3215***	0.1945***	0.7661***	0.7243***
	(0.1173)	(0.3821)	(0.3703)	(0.0203)	(0.1183)	(0.1118)	(0.0611)	(0.2013)	(0.1984)
Treat x After	-0.1907***	-0.3106***	-0.2657***	0.0259	-0.0040	-0.0056	-0.2879***	-0.3352***	-0.3133***
	(0.0368)	(0.0545)	(0.0573)	(0.0160)	(0.0131)	(0.0115)	(0.0403)	(0.0570)	(0.0594)
Log(employment)	0.6384***	0.5559***	0.5124***	0.4702***	0.4392***	0.3304***	0.0572	0.0382	0.0534
	(0.1777)	(0.1692)	(0.1596)	(0.0664)	(0.0635)	(0.0679)	(0.0784)	(0.0763)	(0.0762)
Size	-0.0939	-0.0677	-0.0272	0.0709	0.0460	0.1024**	-0.1096	-0.0992	-0.1024
	(0.1742)	(0.1648)	(0.1591)	(0.0515)	(0.0486)	(0.0510)	(0.0776)	(0.0748)	(0.0731)
Q	-0.0303	-0.0380	-0.0312	0.0211**	0.0166**	0.0122	-0.0200	-0.0172	-0.0144
	(0.0379)	(0.0333)	(0.0311)	(0.0085)	(0.0082)	(0.0081)	(0.0151)	(0.0138)	(0.0137)
Leverage	-0.8589*	-0.7477*	-0.6616*	-0.1975***	-0.1753***	-0.2045***	-0.0034	0.0228	0.0352
	(0.4449)	(0.3975)	(0.3650)	(0.0660)	(0.0633)	(0.0646)	(0.0956)	(0.0915)	(0.0915)
Tangibility	0.7412	0.7921	0.7604	0.0168	-0.0183	-0.0276	-0.2820	-0.2633	-0.2659
	(0.5758)	(0.5691)	(0.5533)	(0.1853)	(0.1775)	(0.1641)	(0.1737)	(0.1766)	(0.1801)
Cash holdings	0.3624	0.3964	0.3737	-0.0350	0.0144	0.0005	0.0081	-0.0078	-0.0064
	(0.3195)	(0.2884)	(0.2795)	(0.0769)	(0.0738)	(0.0732)	(0.1178)	(0.1166)	(0.1147)
Cash flow	-0.6224	-0.4486	-0.4295	0.3054***	0.1950**	0.1864**	-0.3641**	-0.2882*	-0.2663*
	(0.4084)	(0.3396)	(0.3313)	(0.0840)	(0.0795)	(0.0799)	(0.1546)	(0.1625)	(0.1588)
Foreign income	-0.1077	1.0173	0.9426	0.4121	-0.0539	0.0203	-0.2295	0.0010	-0.0467
	(1.4607)	(1.4286)	(1.3742)	(0.4376)	(0.4005)	(0.3937)	(0.5644)	(0.5376)	(0.5299)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry x year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls x after	N	Y	Y	N	Y	Y	N	Y	Y
Prior trends control	N	N	Y	N	N	Y	N	N	Y
Observations	6,746	6,746	6,746	6,746	6,746	6,746	6,746	6,746	6,746
Adjusted R-squared	0.6758	0.6853	0.6973	0.9845	0.9853	0.9860	0.6996	0.7069	0.7149

Table 6
The effect of Obamacare on foreign employment

This table reports OLS regression results for firms' foreign employment around the passage of the PPACA. The dependent variable is the ratio of foreign employees to total employees. All the variables are defined in Table 1. Robust standard errors clustered by firm are in parentheses. ***, **, and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	Foreign employees /total employees		
	(1)	(2)	(3)
Treat	-0.0368**	-0.0359*	-0.0369**
	(0.0186)	(0.0185)	(0.0175)
After	0.0220	0.1977*	0.1859*
	(0.0231)	(0.1012)	(0.0970)
Treat x After	0.0001	-0.0065	-0.0076
	(0.0124)	(0.0134)	(0.0129)
Log(employment)	0.0391	0.0405	-0.0466
	(0.0620)	(0.0613)	(0.0605)
Size	-0.1162**	-0.1192**	-0.0362
	(0.0560)	(0.0561)	(0.0526)
Q	0.0014	0.0008	0.0012
	(0.0097)	(0.0100)	(0.0099)
Leverage	-0.0933	-0.0746	-0.0988
	(0.1104)	(0.1036)	(0.0968)
Tangibility	-0.0796	-0.0645	-0.0232
	(0.1688)	(0.1651)	(0.1534)
Cash holdings	-0.1099	-0.0727	-0.0798
	(0.0954)	(0.0922)	(0.0882)
Cash flow	0.2439**	0.1953*	0.1918**
	(0.1040)	(0.0999)	(0.0969)
Foreign income	0.8363*	0.6758	0.6507
	(0.4920)	(0.5014)	(0.4612)
Year FE	Y	Y	Y
Firm FE	Y	Y	Y
Industry x year FE	Y	Y	Y
Controls x after	N	Y	Y
Prior trends control	N	N	Y
Observations	6,042	6,042	6,042
Adjusted R-squared	0.8108	0.8118	0.8244

Table 7

The effect of Obamacare on domestic employment

This table reports OLS regression results for firms' domestic employment around the passage of the PPACA. The dependent variable in Columns 1 to 3 is the ratio of domestic non-covered employees to total employees. The dependent variable in Columns 4 to 6 is the natural logarithm of the number of domestic employees. The dependent variable in Columns 7 to 9 is the ratio of domestic employees/total employees. All the variables are defined in Table 1. Robust standard errors clustered by firm are in parentheses. ***, **, and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	Domestic non-covered employees /total employees			Log(domestic employees)			Domestic employees /total employees		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treat	-0.4513***	-0.4575***	-0.4435***	-0.0077	-0.0060	-0.0055	0.0106*	0.0106*	0.0109*
	(0.1022)	(0.1039)	(0.1007)	(0.0143)	(0.0136)	(0.0123)	(0.0059)	(0.0058)	(0.0057)
After	-0.2216***	-0.9860***	-0.9376***	0.0012	0.0869	0.0964	-0.0252**	-0.0604	-0.0565
	(0.0676)	(0.2099)	(0.2044)	(0.0429)	(0.2119)	(0.2047)	(0.0121)	(0.0445)	(0.0432)
Treat x After	0.2454***	0.2905***	0.2684***	0.0225	0.0060	0.0053	0.0035	0.0023	0.0026
	(0.0513)	(0.0637)	(0.0640)	(0.0242)	(0.0215)	(0.0196)	(0.0046)	(0.0049)	(0.0048)
Log(employment)	-0.1168	-0.1105	-0.0778	0.5981***	0.5838***	0.5858***	-0.0266	-0.0283	0.0006
	(0.0966)	(0.0955)	(0.0923)	(0.1553)	(0.1469)	(0.1441)	(0.0285)	(0.0279)	(0.0281)
Size	0.1839*	0.1897*	0.1603*	0.1274	0.1109	0.0499	0.0663**	0.0655**	0.0379
	(0.1001)	(0.0968)	(0.0937)	(0.1034)	(0.1030)	(0.1009)	(0.0276)	(0.0277)	(0.0272)
Q	0.0086	0.0059	0.0053	0.0051	-0.0034	-0.0074	0.0006	0.0000	-0.0001
	(0.0207)	(0.0195)	(0.0189)	(0.0138)	(0.0143)	(0.0136)	(0.0040)	(0.0041)	(0.0041)
Leverage	0.1657	0.0986	0.0872	-0.6704	-0.6745	-0.6993	0.0691	0.0651	0.0731
	(0.1319)	(0.1293)	(0.1230)	(0.5144)	(0.4882)	(0.4831)	(0.0626)	(0.0598)	(0.0574)
Tangibility	0.5517	0.5243	0.4485	0.0791	0.0353	0.0448	0.0462	0.0368	0.0231
	(0.3602)	(0.3504)	(0.3513)	(0.4871)	(0.4805)	(0.4710)	(0.0699)	(0.0687)	(0.0670)
Cash holdings	0.1862	0.1653	0.1756	0.1613	0.1620	0.1637	0.0413	0.0326	0.0349
	(0.1594)	(0.1591)	(0.1572)	(0.1449)	(0.1407)	(0.1357)	(0.0455)	(0.0446)	(0.0433)
Cash flow	-0.0802	-0.0597	-0.0933	-0.2581	-0.1885	-0.2185	-0.1081**	-0.0844*	-0.0833*
	(0.2282)	(0.2480)	(0.2361)	(0.2289)	(0.2045)	(0.2019)	(0.0509)	(0.0476)	(0.0468)
Foreign income	-0.5271	-0.4294	-0.3309	-1.5063**	-1.6815**	-1.5900**	-0.3507*	-0.2700	-0.2616
	(0.8125)	(0.8284)	(0.7865)	(0.6904)	(0.7065)	(0.6852)	(0.2023)	(0.1980)	(0.1944)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry x year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls x after	N	Y	Y	N	Y	Y	N	Y	Y
Prior trends control	N	N	Y	N	N	Y	N	N	Y
Observations	6,042	6,042	6,042	6,042	6,042	6,042	6,042	6,042	6,042
Adjusted R-squared	0.6885	0.6935	0.7032	0.9427	0.9429	0.9454	0.8003	0.8018	0.8082

Table 8
The effect of Obamacare on health insurance contract terms

This table reports OLS regression results for firms' health insurance contract terms around the passage of the PPACA. The dependent variable in Column 1 is a dummy variable that equals one if the firm offers high deductible health plan and zero otherwise. The dependent variables in Columns 2 to 5 are the natural logarithm of maximum out-of-pocket cost, the natural logarithm of regular office visit copay amount, the natural logarithm of specialist office visit copay amount, and the hospital admission coinsurance percentage, respectively. We control for insurance premium and total number of employees in the regressions. Robust standard errors clustered by firm are in parentheses. ***, **, and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	High-deductible plan (1)	Maximum out-of-pocket cost (2)	Office visit copay (3)	Specialist visit copay (4)	Hospital coinsurance (5)
Treat x After	-0.0183	-0.0136	-0.0043	-0.0028	-0.0004
	(0.0119)	(0.0140)	(0.0054)	(0.0061)	(0.0007)
Year FE	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y
Industry x year FE	Y	Y	Y	Y	Y
Controls x after	Y	Y	Y	Y	Y
Prior trends control	Y	Y	Y	Y	Y
Observations	1,223	1,223	1,223	1,223	1,223
Adjusted R-squared	0.6124	0.3012	0.7734	0.7467	0.8214

Table 9
Operating performance

   This table reports OLS regression results for firms' operating performance around the passage of the PPACA. The dependent variable in Columns 1 to 3 is the market share. The dependent variable in Columns 4 to 6 is ROA. The dependent variable in Columns 7 to 9 is EBIT. All the variables are defined in Table 1. Robust standard errors clustered by firm are in parentheses. ***, **, and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	Market share			ROA			EBIT		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treat	-0.0156	-0.0120	-0.0149	-0.0027	-0.0028	-0.0036	-0.0023	-0.0025	-0.0032
	(0.0125)	(0.0130)	(0.0122)	(0.0058)	(0.0061)	(0.0057)	(0.0055)	(0.0057)	(0.0054)
After	0.0550**	0.2600**	0.2515**	0.0284***	0.0469**	0.0437**	0.0268***	0.0352	0.0322
	(0.0214)	(0.1139)	(0.1040)	(0.0060)	(0.0221)	(0.0217)	(0.0059)	(0.0226)	(0.0222)
Treat x After	0.0172	-0.0136	-0.0124	0.0012	0.0006	0.0010	0.0003	0.0002	0.0007
	(0.0123)	(0.0107)	(0.0099)	(0.0025)	(0.0024)	(0.0023)	(0.0025)	(0.0025)	(0.0023)
log(employment)	0.3818***	0.3554***	0.3063***	0.0031	0.0079	0.0036	0.0016	0.0067	0.0030
	(0.0552)	(0.0524)	(0.0511)	(0.0121)	(0.0115)	(0.0109)	(0.0118)	(0.0113)	(0.0108)
Size	0.1510***	0.1186**	0.1367***	-0.0569***	-0.0535***	-0.0456***	-0.0511***	-0.0479***	-0.0404***
	(0.0511)	(0.0471)	(0.0444)	(0.0133)	(0.0127)	(0.0123)	(0.0132)	(0.0126)	(0.0122)
Q	0.0448***	0.0321***	0.0250**	0.0121***	0.0110***	0.0103***	0.0127***	0.0114***	0.0106***
	(0.0141)	(0.0122)	(0.0108)	(0.0031)	(0.0028)	(0.0027)	(0.0031)	(0.0029)	(0.0027)
Leverage	-0.0315	-0.0089	-0.0280	-0.0267*	-0.0288*	-0.0274*	-0.0105	-0.0135	-0.0123
	(0.0639)	(0.0600)	(0.0575)	(0.0156)	(0.0156)	(0.0150)	(0.0147)	(0.0149)	(0.0143)
Tangibility	0.1185	0.0821	0.0478	-0.0743***	-0.0680**	-0.0620**	-0.1093***	-0.1026***	-0.0916***
	(0.1265)	(0.1208)	(0.1174)	(0.0288)	(0.0273)	(0.0262)	(0.0278)	(0.0264)	(0.0253)
Cash holdings	0.0170	0.0549	0.0310	-0.0664***	-0.0650***	-0.0629***	-0.0502**	-0.0475**	-0.0453**
	(0.0921)	(0.0777)	(0.0728)	(0.0239)	(0.0232)	(0.0229)	(0.0241)	(0.0232)	(0.0229)
Cash flow	0.3713***	0.3803***	0.3179***	-0.0362	0.0272	0.0006	-0.0231	0.0419	0.0148
	(0.1074)	(0.1040)	(0.0930)	(0.0290)	(0.0327)	(0.0315)	(0.0282)	(0.0316)	(0.0306)
Foreign income	0.0666	-0.1686	-0.1857	0.0835	0.1395	0.1399	0.0514	0.1169	0.1135
	(0.4088)	(0.3704)	(0.3680)	(0.1089)	(0.1034)	(0.1000)	(0.1117)	(0.1055)	(0.1018)
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry x year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls x after	N	Y	Y	N	Y	Y	N	Y	Y
Prior trends control	N	N	Y	N	N	Y	N	N	Y
Observations	7,168	7,168	7,168	7,168	7,168	7,168	7,168	7,168	7,168
Adjusted R-squared	0.9803	0.9811	0.9824	0.7027	0.7114	0.7206	0.6916	0.7014	0.7114

Table 10
Placebo tests

This table reports OLS regression results for the placebo tests. We examine the key outcome variables using 2002 to 2009 data. The placebo event is March 2006. The dependent variables in Columns 1 to 3 are the natural logarithm of the number of insured employees, the ratio of covered employees to total employees, and the ratio of domestic non-covered employees to total employees, respectively. All the variables are defined in Table 1. Robust standard errors clustered by firm are in parentheses. ***, **, and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	Log (covered employees) (1)	Covered employees/total employees (2)	Domestic non-covered employees/ total employees (3)
Treat	0.2014***	0.3372***	-0.3054***
	(0.0532)	(0.0502)	(0.0526)
After	0.2328	-0.0934	-0.0448
	(0.3352)	(0.1884)	(0.2301)
Treat x After	0.0777	-0.0200	0.0287
	(0.0794)	(0.0554)	(0.0680)
Log(employment)	0.2776*	-0.3093***	0.0348
	(0.1500)	(0.0756)	(0.0764)
Size	0.1765	0.1213*	0.0433
	(0.1497)	(0.0678)	(0.0850)
Q	0.0259	0.0091	-0.0107
	(0.0206)	(0.0100)	(0.0128)
Leverage	-0.0984	0.0611	0.1985
	(0.3146)	(0.1336)	(0.1869)
Tangibility	0.2271	0.0077	-0.2059
	(0.4574)	(0.1737)	(0.2373)
Cash holdings	-0.4409*	-0.2620*	0.1301
	(0.2375)	(0.1424)	(0.1838)
Cash flow	0.4299	-0.0402	0.0035
	(0.2908)	(0.1789)	(0.2775)
Foreign income	-1.0140	0.3141	-0.9006
	(1.3570)	(0.5843)	(0.8449)
Year FE	Y	Y	Y
Firm FE	Y	Y	Y
Industry x year FE	Y	Y	Y
Controls x after	Y	Y	Y
Prior trends control	Y	Y	Y
Observations	3,671	3,671	3,671
Adjusted R-squared	0.8300	0.7980	0.7708

Table 11
Matching estimator

      This table reports the estimation results using the matching estimator. We sort firms into the treated group if the continuous treatment variable is ranked in the top 20% and into the nontreated group if the continuous treatment variable is in the bottom 80%. We match treated firms to control firms based on log number of employees, firm size, Q, leverage, tangibility, cash holding, cash flow, foreign income, industry, and the trends in the dependent variables in the years leading up to the event. Panel A reports the differences of the matching variables between the treated, non-treated, and control groups after the matching procedure. Panel B reports the ATT estimation results. Robust standard errors clustered by firm are in parentheses. All the variables are defined in Table 1. Robust standard errors clustered by firm are in parentheses. ***, **, and * denotes statistical significance at the 1%, 5% and 10% levels, respectively.

	Panel A: Matched samples			
	Treated	Non-treated	control	Kolmogorov-Smirnov p-value
Log(employment)	7.0185	8.31194	7.3889	0.05**
	(1.4837)	(1.8894)	(1.6336)	
Size	5.8678	6.9265	6.0805	0.32
	(1.4711)	(1.8978)	(1.5073)	
Q	2.2046	2.3742	2.0470	0.32
	(1.2786)	(2.2193)	(1.1859)	
Leverage	0.1723	0.2053	0.1575	0.82
	(0.2067)	(0.2075)	(0.1800)	
Tangibility	0.2640	0.2831	0.2372	0.39
	(0.2492)	(0.2456)	(0.2312)	
Cash holdings	0.2339	0.2047	0.2233	0.64
	(0.2363)	(0.2047)	(0.2294)	
Cash flow	0.0810	0.0951	0.0815	0.47
	(0.1267)	(0.0951)	(0.1035)	
Foreign income	0.0095	0.0191	0..0087	0.82
	(0.0275)	(0.0191)	(0.0237)	
	Panel B: ATT estimator			
ATT - log (covered employees)	-0.4151***			
	(0.1302)			
ATT - covered employees/total employees	-0.5109***			
	(0.0759)			
ATT - domestic non-covered employees/total employees	0.5458***			
	(0.0875)			