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RESEARCH ARTICLE

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Health insurance benefits as a labor market friction: Evidence from a quasi-experiment

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Abstract

Research Summary: This study examines the propensity of small firms to provide health insurance in response to high state-level unemployment insurance (UI) benefits, given that generous UI benefits reduce labor market frictions that constrain employee mobility. We exploit a unique data set of over 15,000 small private firms in the United States and find that when state UI benefits are high, firms will offer their employees health insurance benefits—especially when those firms rely on human capital that is difficult to replace. We find positive effects of health insurance policy on worker retention, worker productivity, and firm performance. We discuss the implications of our findings to the theory development on the relationship between exogenous labor market frictions and firms' responses to those frictions.

Managerial Summary: This study examines whether small firms that offer health insurance to their employees have better performance outcomes. Even though health insurance is a costly investment for small firms, there has been scant strategy- and evidence-based guidance for managers regarding the conditions that can render investments in employee health ultimately worthwhile. The study analyzes data from 15,000 small firms in the United States and finds that offering health insurance when retaining and replacing workers by firms is more difficult. Firms that offer health insurance also have better worker retention, productivity, and profitability compared to firms that do not offer health insurance. The results suggest that investments in employee

health and well-being may provide a competitive edge to firms, especially when labor market competition for workers is high.

KEYWORDS

employee benefits, health insurance, labor market frictions, labor productivity, small firms

1 | INTRODUCTION

Human capital can be a significant source of competitive advantage for firms (Campbell, Coff, & Kryscynski, 2012; Chadwick, 2017; Coff, 1999). The extant work in the strategic human capital literature has mostly emphasized the importance of worker knowledge and skills (e.g., Coff & Kryscynski, 2011; Ployhart & Moliterno, 2011; Wang, He, & Mahoney, 2009). However, research has paid less attention to employee health and well-being as human capital attributes that can drive value creation, even though early work has underscored how firm investments in workers' mental and physical health can impact their productivity. For example, Adam Smith (1812) notes in Wealth of Nations that employees are less likely to work at full capacity "when they are disheartened than when they are in good spirits, [and] when they are frequently sick than when they are generally in good health." (p. 112). Further, Gary Becker (1962) argues that "One way to invest in human capital is to improve emotional and physical health" (p. 27) and that these investments into employee health will be made by firms if they "could benefit from the resulting increase in productivity" (p. 28).

This study addresses this gap and examines employer-provided health insurance as an investment in employee health and well-being that can improve worker retention and productivity. Research shows that access to health insurance significantly improves workers' financial, physical, and mental well-being (Finkelstein et al., 2012; Finkelstein, Mahoney, & Notowidigdo, 2018; Franks, Clancy, & Gold, 1993; Wilper et al., 2009; Woolhandler & Himmelstein, 1988). Access to preventive care (Sudano & Baker, 2003), management of chronic diseases (Christian, Eisenkraft, & Kapadia, 2015; Rosekind et al., 2010), and decreased financial burdens from the rising health care costs (Finkelstein et al., 2018; Goh, Pferrer, & Zenios, 2016) can improve employees' well-being, with positive effects on worker productivity (Gubler, Larkin, & Pierce, 2017). Moreover, health insurance can improve worker retention by creating "job-lock" (e.g., Bansak & Raphael, 2008; Gruber & Madrian, 1994; Madrian, 1994). Transaction costs involved in changing insurance with job changes and difficulty comparing policies across employers can constrain worker mobility (Kryscynski, Coff, & Campbell, 2021). Thus, investments in employee health and well-being can positively affect firm performance owing to greater worker retention and productivity.

Although health insurance appears to be an important policy lever for firms, there is a considerable variation in the provision of employer-provided health insurance in the United States (SBA, 2011). Employer-provided health insurance is in high demand, even in small firms: When offered the option, equivalent shares of employees obtain health insurance through their employers in small and large firms (Kaiser Family Foundation; KFF, 2017). To motivate employers to meet this demand, the U.S. tax code provides significant tax subsidies to workers by excluding the expenditures for employer-provided health insurance from individual taxable income, thereby making such benefits more attractive than buying health insurance with after-

tax wages. This employer-provided tax benefit is the largest U.S. tax exclusion, costing the Treasury an estimated $299 billion annually in foregone revenues—far greater than federal spending on Medicaid (Joint Committee on Taxation, 2019).

If providing health insurance confers performance benefits and carries large tax incentives, why do not all firms offer health insurance? To answer this question, we draw from the market frictions perspective to propose that investments in employee health are more likely when external labor market frictions are low, which increases the risk of losing workers.

Labor market frictions can create isolating mechanisms that support human capital–based competitive advantages (Campbell et al., 2012; Chadwick, 2017; Mahoney & Qian, 2013). When institutional environments may limit labor market mobility through legal means, such as noncompete agreements (Marx, Strumsky, & Fleming, 2009; Starr, Ganco, & Campbell, 2018), or affect labor market mobility via employment protection legislation (Belenzon & Tsolmon, 2016), firms should leverage these external frictions to try to attract, motivate, and retain key employees. In contrast, if institutional constraints are weak, firms may need to impose their own internal constraints to limit mobility (Flammer & Kacperczyk, 2019; Flammer & Luo, 2017; Mahoney & Qian, 2013).

Although the literature has suggested a general substitution effect between external and internal labor market frictions (Flammer & Luo, 2017; Mahoney & Qian, 2013), this work has been fragmented. One stream focuses on firm-level outcomes vis-à-vis the external frictions with less emphasis on specific firm policies (Belenzon & Tsolmon, 2016; Flammer & Kacperczyk, 2019; Kang & Lee, 2021; Kim & Marschke, 2005; Png, 2017; Starr et al., 2018; Starr, Frake, & Agarwal, 2019). The other stream examines the effects of human resource and employee-focused corporate social responsibility policies on firm outcomes with little focus on external labor markets (Burbano, 2016; Carnahan, Kryscynski, & Olson, 2017; Delery & Roumpi, 2017; Gubler et al., 2017; Lepak & Snell, 1999). As a result, the extant work has yielded limited empirical evidence for the external labor market conditions under which firms can effectively pull internal employment policy levers.

Building on this idea, we propose that firms invest in employee well-being in the presence of low external labor market frictions. Specifically, we examine the extent to which unemployment insurance (UI) benefits, an institutional labor market friction, affect firms' adoption of health insurance provision—a firm-level labor market friction. Using a novel set of data from more than 15,000 small firms in the United States, we empirically examine firms' adoption of health insurance policies in response to changes in external labor market frictions and investigate performance implications.

The voluntary provision of health insurance benefits by small U.S. firms is an ideal setting for this research because the firm policy is discretionary, fairly standardized, and easily observed. One of the most pressing and important employment issues for small firms, health insurance, is in high demand among employees, yet whether firms offer health insurance to employees varies considerably (KFF, 2017). In this setting, offering health insurance is a good proxy for a firm's investment in employee health for two reasons: (1) the substantial tax subsidy of employer-provided health insurance makes it more attractive for small firms to offer health insurance in lieu of paying the equivalent amount in wages and bonuses (Finkelstein, 2002; Gruber, 2001; Gruber & Lettau, 2004; Royalty, 2000) and (2) the impact of health insurance to mitigate the effects of UI benefits on worker productivity and retention. Namely, higher UI benefits reduce workers' incentives to perform well and retain their current jobs by increasing the attractiveness of outside options (Acemoglu & Shimer, 2000; Flammer & Luo, 2017). Thus, in the face of low external market frictions, firms that offer health insurance can reduce employee

turnover (Madrian, 1994) and increase employee physical and psychological well-being and job satisfaction, resulting in greater worker productivity (Gubler et al., 2017).

Firms may adopt a policy of providing health insurance benefits either along with or instead of other employment policies that may be aimed at improving employee well-being. Our study uses the adoption of health insurance as a proxy for firm policies aimed at employee health and estimates the effects of—and on—health insurance while controlling for other observable firm policies (regarding, e.g., other forms of compensation).

We find that when UI benefits are high, firms provide health insurance benefits and are especially inclined to do so if replacing human capital is costly. We address the issue of causality by using a quasi-experimental approach to examine firms' subsequent provision of health insurance benefits in response to exogenous changes in state-level UI benefits. We also find that firms with health insurance benefits have lower employee turnover, greater employee productivity, and better financial performance, especially where UI benefits are high. We also take an instrumental variables (IV) approach to checking the robustness of our empirical analyses. To further explore possible mechanisms suggested by our main results, we analyzed employee reviews from Glassdoor and found higher reported employee job satisfaction in firms that offered health insurance. Finally, we explore the implications of our findings for theory development and discuss the generalizability of our findings to other labor market conditions, other firm policies, and larger firms.

The findings of this study contribute to several streams of research. First, we contribute to the strategic human capital literature with empirical evidence for the adoption and effects of endogenous mechanisms through which human capital management policies can be leveraged to counteract effects of low labor market frictions (cf. Belenzon & Tsolmon, 2016; Campbell et al., 2012; Chadwick, 2017; Mahoney & Qian, 2013; Starr et al., 2018). Furthermore, we provide empirical evidence for the effects of health insurance policies on firm outcomes. Additionally, our results have managerial and public policy implications. Although health insurance is a costly investment for small firms, there has been scant strategy-based and evidence-based guidance for managers—aside from social responsibility aspects—regarding the conditions that can render investments in employee health ultimately worthwhile (Becker, 1962).

2 | DATA AND METHODOLOGY

2.1 | Data and variables

2.1.1 | Sample

Our firm-level data are from market-leading financial software that owners and managers of small and medium-sized businesses use to organize and manage financial records, including bookkeeping, payroll, invoicing, taxes, and data analysis. The data set includes accounting details on all the firms' expenses and revenues, as well as employee records, for the period 2006–2011.

There are several advantages to using these data for our study.[1] First, our study exploits novel firm-level panel data and the large variation in voluntary health insurance provision

[1]We define small firms as those that employ no more than 500 employees; this figure is a conservative average of the Small Business Administration's (SBA's) size standards for "small" firms across industries (see www.sba.gov).

among small firms to study firm responses to decreasing market frictions. Second, unlike other (typically survey-based) data on employer-provided health insurance, our data record *actual* expenses.[2] Third, the effects of health insurance policies are likely to be more prominent in small firms, which need to attract and retain a high-quality workforce in a context characterized—relative to large firms—by more "legitimacy" issues and less financial stability. It follows that the effects of turnover and labor productivity should be more easily detectable in small firms, where even a single employee's absence or shirking can have a significant effect on firm operations.

To ensure our data are representative of small U.S. firms, we compared them with the national averages for small U.S. firms, using the 2011 version of the Medical Expenditure Panel Survey-Insurance Component (MEPS-IC) data. According to these data, on average, 28.3% of firms with fewer than 10 employees offer them health insurance (MEPS-IC, 2011a), close to the 25% observed in our data. Moreover, the share of firms offering health insurance and the number of enrolled employees were comparable for firms with fewer than 100 employees. For other firms, the share offering health insurance (resp., the enrollment rate) increased (resp., decreased) with firm size (MEPS-IC, 2011a, 2011b).

We restrict our analysis to firms with more than two employees to capture the nature of employment relationships. Our data set covers 15,391 firms and 38,987 firm-year observations.

2.1.2 | Dependent variables

For each firm, we have complete employment records for our sample years, including each employee's compensation broken down by salary, bonus, and pension program. These data enable us to observe whether each employee made a pretax contribution to the employer's health insurance plan. We use this information to construct several measures for whether a firm offered such a plan.

Health insurance

We constructed an indicator variable set to 1 for firms in which at least one employee makes a pretax contribution to the employer's health insurance plan (and set to 0 otherwise). In our sample, about one fourth (3,879) of the firms offered health insurance in at least 1 year.[3]

Start health insurance

We constructed an indicator variable set to 1 if a firm starts offering health insurance during our sample period (and otherwise set to 0). Among our sample firms, 5.3% of them started offering health insurance during this period.

[2]Most other empirical studies that examine firms' provision of health insurance rely on individual-level, survey-based data. The most comprehensive firm-level data are obtained by matching U.S. Census Bureau employee–employer linked data with Internal Revenue Service Form 5500, on which firms report pension and health insurance expenditures. But such matched data exclude, due to different reporting requirements, most firms employing fewer than 100 workers (Decressin, Lane, McCue, & Stinson, 2004). Our data are limited to small firms and detail, for each firm, its spending on—and share of employees covered by—health insurance.

[3]We also constructed a variable percentage with health insurance, a continuous variable for what percentage of the firm's employees have health insurance—that is, the share of employees enrolled in the employer-provided health insurance plan. This variable equals zero for any firm that does not offer health insurance. About 30% of the insurance-providing firms' employees participated in these programs (median = 25%). We used this variable as an alternative dependent variable with essentially similar results. We did not observe whether all employees were actually eligible for the benefits. One of our robustness checks excluded part-time employees (as determined by wages), who likely do not qualify for health insurance benefits but delivered qualitatively similar results.

We also constructed three variables for key firm outcomes.

Employee turnover

We constructed a measure of annual employee turnover as the number of departing employees *divided by* the (lagged) total number of employees.

Labor productivity

To assess the extent to which health insurance increases employee productivity, we calculated—for each firm-year—the sales per employee (natural log).

Financial performance

Firm profitability (natural log of total reported profits) was used to measure firm performance. As alternative measures, we used returns on assets and profits per employee.

2.1.3 | Independent variables: Exogenous market frictions

UI benefits

To measure labor market conditions, we follow Flammer and Luo (2017) and use (plausibly exogenous) changes in state UI benefits over time. As compared to other measures of labor market friction used in the literature, UI benefits (i) are not restricted to "knowledge" workers (as in regimes that enforce noncompete clauses and/or involve trade secrets), (ii) are not limited to the lowest paid workers (as minimum wage regulations are), and (iii) can affect employee turnover as well as productivity. Higher UI benefits reduce worker incentives to retain and perform well and also increase the attractiveness of outside options (Acemoglu & Shimer, 2000), factors that encourage workers to engage in adverse behaviors such as shirking, absenteeism, risk-taking, and fraud (Autor, Donohue, & Schwab, 2006; Bassanini, Nunziata, & Venn, 2009; Gormley, Liu, & Zhou, 2010; Ichino & Riphahn, 2005; Pierce, Snow, & McAfee, 2015; Scoppa, 2010; Shapiro & Stiglitz, 1984). Thus, the higher the UI benefits, the lower the frictions that keep workers employed and productive.

The generosity of UI benefits

We follow Flammer and Luo (2017) in constructing a variable that measures the generosity of UI benefits.[4] The underlying data come from the U.S. Department of Labor's "Significant Provisions of State UI Laws," which offers detailed state-level UI benefits (viz., maximum weekly benefit amount, maximum duration). The *generosity* of UI benefits is the product of the maximum benefit amount and the maximum duration allowed; we calculate this measure for each state and year in our data. There is wide variation across states in the generosity of their UI benefits.

Change in UI benefits

We also exploit within-state variations to determine whether firms respond to *changes* in the generosity of UI benefits by offering health insurance. Compared with the previous year, positive (resp., negative) values indicate an increase (resp., decrease) in generosity. No single state or geographic region drives the time variation in UI benefits (cf. Flammer & Luo, 2017).

[4]We are grateful to Caroline Flammer and Jiao Luo for generously sharing their data.

2.1.4 | Moderator: Type of human capital

Industry-level Human Capital (HC) training measure

We measure how difficult it is to replace employees by the degree of firm-provided training. The more firm-level training workers need, the more idiosyncratic human capital is required and the harder it is to replace employees (Lazear, 2009). The firm's costs of replacing employees increase as workers gain firm-specific skills and know-how (Wang et al., 2009) or possess generic human capital characterized by complementarities with the firm's other resources and capabilities (e.g., Chadwick, 2017; Molloy & Barney, 2015).

We used an industry-level measure to capture how much firm-provided training is required. This measure is obtained from the 2008 Bureau of Labor Statistics National Longitudinal Survey of Youth, which follows a panel of 12,000 individuals from 1979 to 2008 (Coff, 1999). The survey asked respondents to specify how many hours per week they devote to employer-provided training to maintain or upgrade their skills. The training hours reported were then aggregated to their employers' two-digit Standard Industrial Classification (SIC) industries. The measure ranked industries by the level of employer-provided training, from 0 to 50 hr annually. We transformed the number of hours into a natural log to normalize the skewness of the data. Our indicator variable is set to 1 (resp., to 0) if the firm-provided training average is above (resp., below) the median.

Industries that ranked high on firm-provided training included motion pictures, legal services, and miscellaneous services; industries that ranked low included museums, art galleries, botanical and zoological gardens, motor freight transportation and warehousing, and depository institutions. A "comparison of means" test suggested that firms offering health insurance provided more training than firms not offering health insurance ($p = .001$).

2.1.5 | Control variables

Our regressions control for firm-, industry-, and state-level characteristics that could affect the propensity of firms to offer health insurance and/or the generosity of states' UI benefits.

Firm-level controls

All firm-level controls are derived from our data set. In particular, *size* is the natural logarithm of the total number of employees, and *wages* is the natural logarithm of the annual wages net other compensation (e.g., health insurance, bonuses, and pension). The *bonuses* and *pension* terms are the natural logarithms of the amount paid in bonuses and pensions; *training* represents the natural logarithm of the amount spent on firm-provided training. *Sales* represents the natural logarithm of total sales. Firm size and all financial controls are lagged by 1 year. *Firm age* is the difference between the data year and the year of the firm's founding.

Industry-level controls

We include a full set of two-digit SIC indicators to account for industry-specific factors that might influence the propensity of firms to offer health insurance.

State-level controls

We control for state-level factors that may drive changes in the UI laws and/or the cost and accessibility of health insurance programs. After Flammer and Luo (2017), we include the gross

domestic product (*GDP*) *growth* and *unemployment rate* for each state. Data on state-level GDP growth are from the U.S. Bureau of Economic Analysis, and state-level unemployment rates are from the U.S. Bureau of Labor Statistics.[5] We also include a measure for the annual *state-level* health maintenance organization (*HMO*) *penetration rate* since the presence of HMOs can affect insurance accessibility and affordability.[6] In some specifications, we include metropolitan statistical area (MSA) indicators to capture differences in the economic and social dynamics within a state.

2.1.6 | Summary statistics

In our sample, on average, firms generated $1.5 million in annual sales with a median of $619,000. The number of employees ranged from 3 to 467, where the median was 8 employees per firm. Median wages were about $16,000 annually, with the lowest and highest decile of wages at $6,032 and $43,335, respectively; thus, firms likely employed a mix of part-time hourly and full-time salaried workers. One of our robustness checks tested for whether different effects were observed for part-time versus full-time employees. The mean for firm age was 8 years; the median was 5 years. For the descriptive statistics and a correlation matrix for main variables, see Online Appendix Table A1.

There is a large variation in the health insurance provision by the industries represented in our sample (Table A2 in the Online Appendix). Industries with the highest share of firms offering health insurance to their employees are electronics and information technology (38%), engineering (36.3%), and professional services (34.2%). Industries with the lowest share of firms offering health insurance are restaurants and food services (12.7%); laundry, carpet, and related cleaning services (14.4%); and hotels (17.1%).

2.2 | Methodology

We use a panel linear probability model to examine the relationship between UI generosity and the provision of health insurance benefits. Our baseline empirical specification is as follows:

$$\Pr(\text{Health insurance})_{ist} = \alpha_0 + \alpha_1 \ln(\text{UI benefits})_{st-1} + \chi'_{it-1}\alpha_2 + \gamma_s + \varphi_j + \tau_t + \varepsilon_{it}. \quad (1)$$

Here, i denotes firms, the unit of observation, in industry j; t denotes year; s indexes states; χ is a vector of firm-level control variables (size, age, performance, wages, and other compensation) in the preceding year; γ_s, φ_j, and τ_t are complete sets of (respectively) MSA, industry, and year dummies; and ε_{it} is an independent and identically distributed error term. Health insurance is an indicator variable that equals 1 if a firm offers health insurance in the focal year and equals

[5]Bureau of Labor Statistics, U.S. Department of Labor, Occupational Employment Statistics (www.bls.gov/oes).

[6]A health maintenance organization (HMO) offers prepaid comprehensive health coverage for both hospital and physician services with designated health care providers using a fixed structure or "capitated" rates. Figures for HMO enrollment include enrollees in traditional HMOs and in HMO point-of-service plans through group/commercial plans, Medicare, Medicaid, or the Federal Employees Health Benefits Program. The HMO data are from HealthLeaders-InterStudy, the leading provider of managed care market data: http://www.healthleaders-interstudy.com, a part of Clarivate (the company behind the Web of Science and Derwent: https://www.clarivate.com).

0 otherwise; ln(UI benefits) is the natural logarithm of the preceding year's generosity index of UI benefits in the firm's state. Because variation in UI benefits is observed at the state level, we cluster standard errors at that level (cf. Bertrand, Duflo, & Mullainathan, 2004). We also clustered the standard errors at the firm level with similar results. The coefficient of interest is $\widehat{\alpha}_1$, which captures the difference in firms' propensity to offer health insurance: If firms are more likely to offer health insurance in states that increase their UI benefits, then we expect $\widehat{\alpha}_1 > 0$.

2.2.1 | Identification

Our identification strategy relies on the assumption that variation and changes in UI benefits are exogenous with respect to the provision of health insurance benefits. We follow Flammer and Luo's (2017) approach to mitigating concerns that omitted variables may influence both UI policies and the firm's decision to offer health insurance. We first establish that firms' decisions to start offering health insurance are *preceded* by changes in UI benefits. Second, we conduct a placebo test to demonstrate that firms' health insurance decisions are not driven by trends (omitted from the regressions) related to regional economic and social conditions; thus, we test whether UI changes in *neighboring* states affect a firm's propensity to offer health insurance. Third, we control state-level rates of GDP growth, unemployment, and HMO penetration; we also include granular MSA-level controls. Fourth, we use other benefits offered by firms—*bonuses*, *pension*, and *firm training*—as dependent variables to show that UI benefits have no relationship with these other benefits. Finally, because our sample firms are small, we expect that any effects of their lobbying on UI policies are minimal.

3 | RESULTS

3.1 | Main results

3.1.1 | Propensity to offer health insurance

Table 1 reports the estimation results for the effect of labor market frictions on the propensity of firms to offer health insurance to employees. The estimated coefficient for ln(UI benefits) is positive, implying that an increase in UI benefits of 100 log points is associated with an increase in the probability of a firm offering health insurance of about 59 percentage points over the sample average.[7]

Next, in Columns 2 and 3, we present the results including the HC training variable as a moderator. HC training is an indicator variable (1 = high, 0 = low) for the level of firm-provided training in the firm's industry. The estimated coefficient for this variable, shown in Column 2, is positive (*p value* = .000); this result is indicative of a positive association between health insurance and firm-provided training. Column 3 introduces a term for the interaction between ln(UI benefits) and HC training. The estimated coefficient for the interaction variable is positive (*p value* = .016). The results suggest that for a firm in an industry that ranks high in

[7]We build the full model in Online Appendix Table A3 by first regressing the health insurance variable on ln(UI benefits) while incorporating firm and year fixed effects (Column 1), then including firm-level controls (Column 2), and finally adding our state-level controls (Column 3).

TABLE 1 Propensity of firms to offer health insurance by exogenous market frictions and human capital type

Dependent variable	(1) Indicator for health insurance	(2) Indicator for health insurance	(3) Indicator for health insurance
$\ln(\text{UI benefits})_{t-1}$	0.112	0.043	0.019
	(0.071)	(0.011)	(0.014)
HC training		0.230	−0.330
		(0.224)	(0.199)
$\ln(\text{UI benefits})_{t-1} \times$ HC training			0.029
			(0.010)
Firm controls	Yes	Yes	Yes
State controls	Yes	Yes	Yes
Firm fixed effects	Yes	No	No
Industry fixed effects	No	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Quantification of the effects	58.9%	22.6%	15.3%
Observations	23,105	21,398	21,398
R^2	0.87	0.12	0.12

Note: This table presents results from linear probability models estimating the propensity of firms providing health insurance by generosity of state-level UI benefits and HC type. Unit of observation is firm-year. The quantification of the effects is an increase in percentage of firms offering health insurance with a unit increase in ln(UI benefits) over the sample average value of percentage of firms with health insurance. Robust standard errors (in parentheses) are clustered by state.
Abbreviations: HC, human capital; UI, unemployment insurance.

HC training, a 100–log point increase in UI benefits is associated with a 2.9% increase in the probability of a firm offering health insurance, a 15.3% increase over the sample average.

3.1.2 | Identification and robustness

Dynamics

In Table 2, we present results from regressions that estimate the dynamics between changes in UI benefits and the provision of health insurance benefits. The dependent variable in all specifications is $(\text{Start health insurance})_t$, which we regress on ln(change in UI benefits). If firms adopt a policy of providing health insurance in response to decreases in labor market frictions, then the estimated coefficient for ln(change in UI benefits) should be positive, and changes in ln(change in UI benefits) should precede the decision to provide health insurance.

The independent variables in all specifications are the lagged and forward values of ln(change in UI benefits). The largest estimated coefficient (with p *value* = .056) is for the 1-year-lagged ln(change in UI benefits) in Column 2. The results suggest that a 100–log point increase in UI benefits is associated with an approximate 9% increase in the probability of a firm to start offering health insurance the following year, a 167% increase over the sample average. The estimated coefficients for the 2-year lag in Column 1, the contemporaneous variable in Column 3, and the forward values in Columns 4 and 5 are much smaller (with large p *values*).

TABLE 2 Propensity of firms to start offering health insurance when market frictions decrease

Dependent variable	(1) Start health insurance	(2) Start health insurance	(3) Start health insurance	(4) Start health insurance	(5) Start health insurance
Time lag for change in UI benefits	$t-2$	$t-1$	t	$t+1$	$t+2$
ln(change in UI benefits)	0.049 (0.044)	0.087 (0.046)	0.045 (0.043)	0.045 (0.043)	0.050 (0.044)
Firm controls	Yes	Yes	Yes	Yes	Yes
State controls	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Quantification of the effects	—	167.3%	—	—	—
Observations	18,146	18,146	18,146	18,146	18,146
R^2	0.03	0.03	0.03	0.03	0.03

Note: This table presents results from linear probability models estimating the change in propensity of firms providing health insurance by changes in generosity of state-level UI benefits. The quantification of the effects is an increase in percentage of firms starting to offer health insurance with a unit increase in ln(change in UI benefits) over the sample average value of percent of firms starting to offer health insurance. Unit of observation is firm-year. Robust standard errors (in parentheses) are clustered by state.

Abbreviations: UI, Unemployment insurance.

This analysis suggests that firms do indeed respond to changing labor market frictions by adopting firm-level policies. Furthermore, these results mitigate concerns about omitted variable biases due to, for instance, unobserved regional social and economic trends.

Quality of labor

We performed a robustness check to ensure that health insurance provision was not proxying for a higher quality of labor, excluding firms with mostly part-time and low-wage employees from our sample and repeating the analyses. Because we did not observe whether employees were salaried or paid hourly, we proxied part-time and hourly workers by their average hourly rate: Workers whose hourly wages approximated the federal minimum wage were classified as hourly or part-time employees. On average, firms *not* offering health insurance relied more on part-time employees than did firms that offered health insurance. Thus, 46.5% (resp., 33.4%) of the former's (resp., the latter's) workforce consisted of part-time workers; the difference in means is statistically significant (p *value* = .000). None of our results were affected when we excluded firms with mostly part-time and low-wage employees (see Column 1 in Online Appendix Table A4).[8]

Placebo test: Border states

We ran a placebo test by examining the relationship between health insurance benefits and UI benefits in neighboring states. For every state and year, we calculated a median value of ln(UI benefits) in the firm's border states and then reestimated our baseline

[8]We also ran alternative analyses based on excluding firms with mostly high-paid employees and then splitting the sample by median employee pay. We obtained similar results (unreported).

specification while incorporating this measure as a control variable. The estimated coefficients for ln(UI benefits) and for the interaction term are essentially the same with this control (Column 2 in Table A4), indicating that omitted regional trends do not drive the main effect.

Other firm benefits

We constructed indicator variables for whether firms offered *bonuses*, *pension*, or *firm training* to examine the relationship between these firm-level benefits and UI benefits. The results suggest that UI benefits have no notable relationship with the propensity of firms to offer other observable firm-level benefits (see Columns 3–5 in Table A4).

3.2 | Firm outcomes associated with health insurance

3.2.1 | Turnover

Next, we examined the relationship between health insurance benefits and firm outcomes. Table 3 presents results from ordinary least-squares estimations. We build the model by first including firm fixed effects (Column 1). The estimated coefficient for our health insurance indicator variable is negative in Column 2, suggesting that firms offering health insurance experience less employee turnover than firms that do not. The estimated coefficient translates to an approximate 9% decrease for firms with health insurance. This reduction in employee turnover is driven by firms in states with high UI benefits: The estimated coefficient for health insurance is negative (p *value* = .000) in Column 3 but small (p *value* = .567) in Column 4. These results suggest that firms with health insurance benefit from a lower turnover when external labor market frictions are low.

3.2.2 | Labor productivity

The estimated coefficient for health insurance is positive (p *value* = .001) in Columns 4 and 5, which means that firms offering health insurance have higher labor productivity than firms not offering such insurance. Based on prior literature, firms that offer health insurance should experience higher productivity—especially when labor market frictions are low. When we split the sample into states with high versus low UI benefits, the estimated coefficients for health insurance in both subsamples are positive (Columns 6 and 7). The coefficient estimated for the high-UI sample is slightly larger than that for the low-UI sample (0.048 vs. 0.040). Thus, firms offering health insurance tend to benefit from higher labor productivity irrespective of labor market frictions.

3.2.3 | Firm performance

In Table 4, we report estimation results from examining whether firms offering health insurance perform better than other firms and testing the conditions under which this relationship may be stronger. The models in Columns 1 and 2 estimate the coefficients for health insurance on firm profitability with different fixed effects to account for various unobserved time-invariant

TABLE 3 Relationship between health insurance and employee turnover and productivity

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Employee turnover				Labor productivity			
Sample	All	All	High UI	Low UI	All	All	High UI	Low UI
Health insurance	−0.026	−0.031	−0.042	0.003	0.023	0.044	0.048	0.040
	(0.007)	(0.004)	(0.005)	(0.006)	(0.019)	(0.013)	(0.015)	(0.016)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State controls	No	No	Yes	Yes	No	No	Yes	Yes
Firm fixed effects	Yes	No	No	No	Yes	No	No	No
Industry fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
State fixed effects	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quantification of the effects	−7.2%	−8.6%	−13.1%	—	2.3%	4.4%	4.8%	4.0%
Observations	18,405	18,405	12,502	10,603	18,405	18,405	12,502	10,603
R^2	0.25	0.31	0.27	0.15	0.18	0.68	0.66	0.69

Note: This table presents results from OLS models examining conditional correlations between health insurance benefits and employee turnover and labor productivity. The sample is split into high and low UI subsamples by the median value of UI benefits. The quantification of the effects is an increase in the dependent variable with indicator for health insurance equaling to 1 over the sample average value of the dependent variable. Unit of observation is firm-year. Robust standard errors (in parentheses) are clustered by state.

Abbreviations: OLS, Ordinary least squares; UI, unemployment insurance.

factors. The estimated coefficient for the interaction between health insurance and HC training is positive in Column 3 (p *value* = .034). The results in Columns 4 and 5 are based on splitting the sample into states with, respectively, high and low UI benefits. The estimated coefficient for the interaction term is positive (p *value* = .073) in the high-UI sample, whereas the coefficient is twice as small (p *value* = .469) in the low-UI sample. These results suggest that firms offering health insurance perform better financially than other firms, especially when external market frictions are low and human capital is difficult to replace.

3.2.4 | Identification and robustness

Having established the foregoing conditional correlations, in Table A5, we present results from the IV estimates—which support the existence of a causal relationship between the provision of health insurance and firm outcomes. In the first-stage regressions of all specifications, the estimated coefficient for tax price of health insurance is negative (with p *value* = .000). This finding indicates a negative relationship between that tax price and the provision of health insurance: The lower the tax price, the greater the propensity to offer health insurance.

The results from our IV estimations of how health insurance affects firm outcomes are consistent with our conditional correlation results (Columns 1–3). These results support the possibility of causality: Firms that offer health insurance have less employee turnover, greater labor productivity, and higher profitability. Additional tests for the IV estimation are outlined in Online Appendix I.

TABLE 4 Relationship between health insurance and firm performance

Dependent variable Sample	(1) Profitability All	(2) Profitability All	(3) Profitability All	(4) Profitability High UI	(5) Profitability Low UI
Health insurance × HC training			0.013 (0.006)	0.015 (0.008)	0.007 (0.010)
Health insurance	0.029 (0.003)	0.025 (0.003)	0.018 (0.004)	0.018 (0.005)	0.033 (0.007)
HC training		0.013 (0.002)	0.010 (0.002)	0.008 (0.004)	0.013 (0.003)
Firm controls	Yes	Yes	Yes	Yes	Yes
State controls	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	No	No	No	No
Industry fixed effects	No	Yes	No	No	No
State fixed effects	No	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Quantification of the effects	2.9%	2.5%	1.3%	1.5%	—
Observations	17,199	17,199	17,199	9,383	7,816
R^2	0.47	0.72	0.72	0.71	0.64

Note: This table presents results from OLS models examining conditional correlations between health insurance benefits and profitability. Unit of observation is firm-year. The sample is split into high and low UI subsamples by the median value of UI benefits. The quantification of the effects is an increase in firm profitability with indicator for health insurance equaling to 1 over the sample average value of profitability. Robust standard errors (in parentheses) are clustered by state.
Abbreviations: OLS, Ordinary least squares; UI, unemployment insurance; HC, human capital.

3.3 | Further explorations of the mechanisms

To explore the underlying mechanisms for why health insurance may result in desirable firm outcomes, we collected data from personal interviews with small business owners and analyzed employee review data from Glassdoor.com. Our main goal with these additional analyses is to find further support for our key empirical results that provision of health insurance is associated with external labor market frictions and results in higher employee satisfaction and well-being. Details on the data collection, analyses, and interviews are outlined in Online Appendix II.

We collected employee review data from Glassdoor.com for 761 firms in our sample. Table A6 presents the difference in means statistics for the average rating scores between firms that offer health insurance and those that do not. The ratings that reflect most closely the employees' overall satisfaction with the firm and their jobs are consistently higher for firms with health insurance.

We also conducted open-ended personal interviews with 11 randomly selected small business owners representing different industries and firm sizes in a major metropolitan area to inquire about their reasons for offering health insurance. Business owners cited the ability of health benefits to attract and retain employees and to increase worker productivity through improved health and security. These analyses and interviews support our finding that health insurance benefits can improve firm outcomes by improving employee wellness and satisfaction.

4 | DISCUSSION AND CONCLUSION

Examining the relationship between exogenous market frictions and the endogenous response of firms to those frictions, we show that when such frictions are low and human capital is costly to replace, firms are more likely to adopt health insurance to restrict employee mobility. Under these conditions, firms benefit from reduced turnover, higher productivity, and better financial performance.

This work contributes to several streams of research. First, we contribute to the strategic human capital literature by identifying empirically the conditions under which labor market frictions may impair a firm's competitive advantage and by suggesting endogenous mechanisms through which human capital management policies can be leveraged to counteract those effects (cf. Belenzon & Tsolmon, 2016; Campbell et al., 2012; Chadwick, 2017; Mahoney & Qian, 2013; Starr et al., 2018). We suggest the antecedents of firm-level policies that create and leverage labor market frictions to increase retention, worker productivity, and firm performance. As such, our study yields insight into the heterogeneity of firm resources and capabilities in managing human capital.

We contribute to the literature on endogenous responses to labor market frictions with its novel data set. We present rich, firm-level data previously unavailable and employ rigorous empirical methodologies to "triangulate" the observed effects. Our study also contributes to the employee wellness literature (see, e.g., Gubler et al., 2017; Jones, Molitor, & Reif, 2019; Song & Baicker, 2019). We present empirical evidence from multifirm panel data to show that labor market conditions may drive the relationship between policies aimed at employee wellness and firm outcomes.

Furthermore, our paper is the first to explain health insurance provision among small firms from the perspective of human capital management and to test its impact on firm performance empirically. Health insurance is the most expensive form of nonwage compensation in firms and a widely deliberated aspect of small firms' human capital management. Our empirical setting sheds light on an understudied yet economically significant sector of the economy, as small firms in the United States generate 46% of all private-sector output and employ nearly half of the country's labor force (Small Business Administration, 2019a, 2019b).

Our results have managerial and public policy implications. The provision and effects of employee health insurance lie at the interface of major public policy debates and firm strategy, but the strategy literature has surprisingly devoted little attention to this important topic. We offer our empirical evidence and conceptual implications regarding the conditions that can render such investments ultimately worthwhile. The results also have firm performance implications for current health care policy debates involving small firms and their provision (or not) of health insurance.

This research also has implications for large firms, most of which provide health insurance but whose benefits differ in generosity (Sommers & Crimmel, 2006). Given our finding that policies intended to increase employee wellness can affect turnover, productivity, and firm performance, large firms should consider increasing the employee uptake rate of health benefits by bearing a greater share of the insurance costs themselves. Firms have been shifting the costs of health care to employees (KFF, 2017), but as Pfeffer (2018) points out, modern management practices that seem cost-effective may actually erode human capital performance. Hence, firms might be wise to view employee health benefits as an investment that can yield significant returns.

Our study's contributions and limitations suggest avenues for additional research. Beyond health insurance, future work could examine how other market frictions can influence the adoption of firm policies—on their own or as substitutes or complements—and in the context of different types of human capital (Mahoney & Qian, 2013; Starr et al., 2018). Firms may also

benefit from externalities emerging from *other* firms seeking to leverage institutional-level market frictions. If an industry's leading players leverage frictions and constrain labor market mobility, other firms are likely to be affected. Exploring competitive industry dynamics and labor market competition may yield additional insights on how firms can gain a competitive advantage from human capital.

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DATA AVAILABILITY STATEMENT

Research data are not shared.

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Medical Expenditure Panel Survey-Insurance Component. (2011b). Table II.B.2.b. Percent of private-sector employees that are enrolled in health insurance at establishments that offer health insurance by firm size and State, 2011. Agency for Healthcare Research and Quality, Center for Financing, Access and Cost Trends.

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