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ABSTRACT

We develop a model of premium sharing for firms that offer multiple insurance plans. We assume that firms offer one low quality plan and one high quality plan. Under the assumption of wage rigidities we found that the employee's contribution to each plan is an increasing function of that plan's premium. The effect of the other plan's premium is ambiguous. We test our hypothesis using data from the Employer Health Benefit Survey. Restricting the analysis to firms that offer both HMO and PPO plans, we measure the amount of the premium passed on to employees in response to a change in both premiums. We find evidence of large and positive effects of the increase in the plan's premium on the amount of the premium passed on to employees. The effect of the alternative plan's premium is negative but statistically significant only for the PPO plans.

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1. Introduction

Over the last decade, health insurance premiums have increased much faster than general wage growth. Between 2000 and 2010, the hourly cost of health insurance doubled while wages only grew by 33 percent.¹ As health insurance costs have grown to constitute a larger share of the total compensation package paid by employers, researchers have paid greater attention to the issue of access to health insurance through employer sponsored plans. Most of the existing literature has focused on the extensive margin of health insurance access, i.e. whether firms make employer sponsored plans available to their employees. Significantly less attention has been paid to the intensive margins – how much of the cost of providing health insurance is paid for by firms or the average quality

of these insurance plans. This paper focuses on the first of these intensive margins, asking how the price of health insurance affects workers' contributions when firms offer multiple health insurance plans.

The literature on the firm's decision to include health insurance in the compensation packages for workers has concluded that this decision is typically price inelastic.² In fact, while the percentage of firms that offered health benefits decreased from 68 percent in 2000 to 59 percent in 2009, this drop seems to be driven primarily by firms employing less than 10 workers (Kaiser/HRET, 2007, Exhibit 2.2). The percentage of large firms (i.e. firms that employed more than 200 employees) that offered health insurance did not change at all during the same period. Large firms almost universally offer health benefits (99 percent), and this rate has remained unchanged over the same time period. We argue that, although the premium size may not have an impact on a firm's decision to offer health insurance, it could have an effect on the employer's decision at the intensive margin, i.e. how to split the cost with workers. In fact, the percentage of firms paying for the entire cost of a single coverage plan decreased dramatically from 32 percent in 2001 to 18 percent in 2009, (Kaiser/HRET, 2007, Exhibit 6.15). In light of this evidence, the question of how premium sharing between

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¹ Bureau of Labor Statistics, "Employer Costs for Employee Contribution", various years (<http://www.bls.gov/schedule/archives/ecec.nr.htm>).

² See Table 1 in Marquis and Long (2001b) for a summary of the results in this literature.

employees and employers responds to increases in health insurance premiums becomes a pressing one since shifting the cost of health insurance onto workers may affect the probability a worker enrolls in the company plan. In fact, [Cutler \(2003\)](#) shows that most of the recent decrease in employer sponsored health insurance coverage can be explained by a decrease in take-up rates by employees due to an increase in the cost born by them rather than a decrease in offering rates by employers. In this study we want to disentangle what has affected this shift in the cost of health insurance on workers and specifically whether the size of the premium itself is a determinant of the cost sharing selected by the firm. We show that this is not a trivial question since, in a world of perfect sorting and flexible wages, health insurance premiums should not affect a worker's contribution, at least for the low quality plan.

In addition to almost universally offering health insurance, large firms are also more likely to offer multiple plans compared to smaller employers. In 2001, 56.7 percent of firms with more than 50 employees offered more than one plan in 2001, while only 12.5 percent of smaller firms offer multiple plans ([Crimmel, 2001](#)). For this reason, we develop a model in which firms offer a choice of two plans to attract workers with heterogeneous preference for health coverage. This is an important contribution to the current literature, since previous studies all assume that each firm offers only one plan, which is an unreasonable assumption for large firms. Our theoretical model predicts that, under the assumption of wage rigidities, premium sharing should be a function of the own premium cost as well as the cost on any other plan offered by the firm. We estimate our model using information on firms that offer both Health Maintenance Organization (HMO) plans and Preferred Provider Organization (PPO) plans. We find that the own-premium elasticities, i.e. the percentage increase in the worker's contribution following a 1 percentage increase in the premium, are generally all greater than 1, implying that firms shift the burden of rising premiums onto workers. The rest of the paper is organized as follows: the next section reviews the literature on this topic. Section 3 describes the model and Section 4 outlines the methodological strategies adopted for the estimation. Section 5 describes the data while the empirical results are discussed in Section 6. We conclude with some final remarks on the main finding of this paper.

2. Literature review

In a world of perfect sorting, firms would choose to offer only one health insurance plan, if any: firms that have access to cheaper health insurance would offer health insurance ([Goldstein and Pauly, 1976](#)). Workers will sort themselves across firms according to their preferences for health insurance versus monetary wages and, because employer contributions are tax exempt, no employee contribution will be required. In a more realistic model, firms do not necessarily hire workers with homogeneous preferences with respect to health insurance coverage and can require a contribution to participate into the employer sponsored program to sort individuals according to their demand for health benefits. Under this scenario, the employee's share of the premium should increase in the level of the premium since the benefit of sorting should increase as the premium increases ([Levy, 1998](#)). One reason why some individuals may have a weaker preference for health insurance is related to the availability of coverage through an alternative source. In fact, [Shore-Sheppard et al. \(2000\)](#) and [Buchmueller et al. \(2005\)](#) found that the share of the premium passed on to workers increases with the proportion of employees eligible for Medicaid. Similarly, [Dranove et al. \(2000\)](#) and [Vistnes et al. \(2006\)](#) found that employers raise employee contributions to encourage them to obtain coverage from their spouses' employers.

Consistent with the theory of sorting, [Gruber and McKnight \(2003\)](#) find that the growth in health insurance premiums (proxied by the average state per-capita spending on medical care) explains 47 percent of the decline in the probability that an employer offered a health plan free of charge to its workers from 1982 to 1996. The tax subsidy on employer contribution and the availability of coverage outside the firm had only marginal roles. [Marquis and Long \(2001a\)](#) find that the employer's premium share is higher when the firm operates in tighter labor market conditions, when there is greater union penetration and a greater share of workers are employed in big business. Similar to [Levy \(1998\)](#) they found that state income tax rates do not have a significant impact on the employer's contribution.

More recently, papers have examined the role wage rigidities might play in how firms distribute the burden of higher plan premiums. [Sommers \(2005\)](#) develops a simple theoretical model predicting that wage rigidities might cause firms to pass some of the costs of rising health insurance premiums by requiring larger employee contribution. Their empirical analysis provides some support for the theoretical model for low-wage workers during a period of rapid premium growth. [Vistnes and Selden \(2011\)](#) find that premium inflation lowers the probability small, low-wage employers will offer health insurance while larger low-wage employers continue to offer insurance but reduce eligibility. Both raise employee contributions when faced with rapidly rising premiums. By contrast, high-wage employers increase deductibles. Overall, these papers support the notion that wage rigidities, combined with rapidly rising wage premiums might lead firms to use premium sharing as a way of containing the rising costs of health insurance.

The literature on premium sharing has assumed that firms offer only one health plan.³ When multiple plans are offered, often a weighted average premium is used in the estimation. However, premium aggregation may not be a reasonable estimation strategy since the evidence suggests that there are interrelations between the premiums of alternative health plans. For example, [Feldman et al. \(1993\)](#) found that offering an HMO increases the weighted average premium of a firm offering multiple plans. Both [Baker and Corts \(1995\)](#) and [Morrisey et al. \(2003\)](#) conclude that this increase in the average premium is due to the fact that higher HMO penetration decreases the premium on HMO plans but it increases the premium in non-HMO plans, such as PPO or conventional plans. The finding that HMO penetration can affect health insurance premiums together with [Gruber and McKnight's \(2003\)](#) hypothesis that higher HMO penetration induces employers to increase worker's contribution (to push worker toward the cheaper option), lead to conjecture that HMO insurance premiums can have different effects on the premium sharing set by the firm for each of its health plans. By assuming that firms offer only one plan, the current literature has failed to shed light on this important aspect. This paper aims at filling this gap by presenting a model of the contribution schedule set as a function of the premiums of all the type of plans offered by a firm.

3. Theoretical background

A firm offers all employees the same wage, w , and two health insurance plans with different quality levels, Q_L and Q_H , and associated premiums P_L and P_H . The firm must choose the employee

³ The only exception is [Vistnes et al. \(2006\)](#) which estimates the effect that the individual coverage premiums has on the "marginal employee premium contribution", i.e. the difference between the contributions for individual and family coverage.

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