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The reallocation of compensation in response to health insurance premium increases

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Abstract

We examine how employees reallocate compensation in response to increase in health insurance premiums. We find that a $1 increase in insurance premiums leads to a 52-cent increase in health insurance expenditures. Approximately 2/3 of this increase is financed through reduced wages and 1/3 through other benefits.

Keywords: Premiums; Fringe benefits; Compensation; Health insurance

JEL classification: I11; J32; J33

1. Introduction

To combat rising health benefit costs, many companies have redesigned their benefits plans to require employees to pay the full marginal cost (pre-tax) of more expensive plans. Research has shown that employee insurance choices are quite responsive to this 'fixed subsidy' scheme (Cutler and Reber, 1998).

What is less clear is how the total compensation package – e.g. retirement benefits – changes when health insurance premiums rise. If the price elasticity of demand for health insurance is less than one –

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Table 1
Descriptive statistics ($N=7896$ employee-years)

Variable	Mean	S.D.	Minimum	Maximum
Age	35.1	10.8	18	64
Tenure (years)	6.1	6.5	0	44
Female	0.70	0.45	0	1
Health insurance benefit[a]	$623	$236	0	$1428
Other fringe benefits[a,b]	$286	$280	0	$5335
Net wages[a]	$26,504	$11,582	$6593	$109,303
Total compensation[a]	$27,412	$11,733	$7277	$110,994

[a] All amounts are in 1989 constant dollars.
[b] Other benefits include retirement benefits, dental insurance, life insurance, and disability insurance.

and the evidence strongly suggests it is – then workers will increase expenditures on health insurance as their share of premiums rise. But if labor supply and demand remains fixed, then total compensation should not change (Smith and Ehrenberg, 1983; Summers, 1989). Thus, higher premiums must induce changes in composition of total compensation.

This paper uses data on employee choices within a single large firm with a flexible benefits plan to examine how workers change their compensation package in response to changing health insurance premiums.[1] To the extent that workers do not completely substitute away from rising premiums, we are particularly interested in whether employees finance health insurance by reducing current income (essentially wages) or other benefits (life insurance, disability insurance, and other benefits).

The effect of health insurance premiums on allocation of compensation is identified by the substantial variation in premiums across years. The results suggest that about two-thirds of the premium increase is financed out of cash wages and the remaining one-thirds is financed by a reduction in benefits.

2. Data

The data consists of 3 years (1989–1991) of earnings, demographic, and benefit information for employees dispersed across 47 states at a single U.S. company.[2] While these data are 10 years old, this period has the advantage that it was a time of large premium increases in the U.S. Our study focuses on single employees who signed up for a health insurance plan. Families are excluded because we have no information on the health insurance opportunity sets of spouses. We also restrict our sample to employees with at least 2 years of data—resulting in an analysis sample of 7896 employee-year observations.

Table 1 presents descriptive statistics for the sample. Total compensation averaged $27,412. Approximately 2.3% of compensation ($622) was spent on health insurance, 1.1% ($286) was spent on other benefits, and the remaining was taken as wages.

[1] Flexible benefit or cafeteria plans allow employees to explicitly allocate compensation between cash and various benefits such as retirement, health insurance, and life insurance.
[2] These data were obtained from a benefits consulting firm. The terms of the data release precluded us from providing detail about the company, including its industry.

Employees in this firm are given a menu of benefit options. Rather than estimate models for all of them, we aggregate these into three broad categories—wage, health insurance, and other benefits. To finance these benefits each employee is also given a completely fungible credit allocation. However, the credit allocation does not determine expenses on benefits as employees can make additional deductions from their salaries to finance benefits. In addition, employees can also choose to cash-out most of their credit allocation.

The company offers both fee-for-service (FFS) and HMOs plans. Within the FFS class, there are three types of plans: a catastrophic plan with a deductible of 5% of salary and plans with deductible of $300 and $150, respectively. The other plans consist of 43 HMOs nationwide, with each employee's available options depending on state of residence and year. This company contributes towards the purchase of these plans by providing a 'fixed subsidy' that is equal to the premium for the catastrophic plan. By not contributing more generously to more expensive plans, the employer makes employees face the full marginal cost of more generous coverage (on a pre-tax basis).

3. Methods

We model how the allocation of compensation varies with an increase in costs of health insurance for employees. The key challenge is to measure changes in the costs of health insurance for employees.[3]

Most indices of cost changes calculate the difference in costs of obtaining a fixed basket of goods at a new vector of prices. Two well-known indices are the Laspeyres index that measures the difference in costs of purchasing the base year basket of goods and the Paasche index that measures the difference in costs of purchasing the current year basket of goods. However, these fixed weight indices ignore the possibility of substitution among goods due to changes in relative prices. For example, employees might switch to cheaper health plans in response to changes in the relative price of health plans. Thus using base year enrollment in different health plans, as weights for the cost index will overstate the increase in the cost of insurance. We use the Fisher index that is the geometric mean of the Laspeyres and Paasche index. This index has much lower substitution bias and other desirable properties compared to other fixed weight indices (Diewert, 1976).

Since copremiums (employee share of premiums) vary with the state of residence we create separate indices for each state in our data. If the vector $\boldsymbol{P}_{s,t}=(\boldsymbol{P}_{1,s,t}, \boldsymbol{P}_{2,s,t}, \ldots, \boldsymbol{P}_{j,s,t}, \ldots, \boldsymbol{P}_{J,s,t})$ represent the insurance copremiums for each of the J health plans offered in state s in year t and the vector $\boldsymbol{Q}_{s,t}=(\boldsymbol{Q}_{1,s,t}, \boldsymbol{Q}_{2,s,t}, \ldots, \boldsymbol{Q}_{j,s,t}, \ldots, \boldsymbol{Q}_{J,s,t})$ represents the percentage of employees enrolled in each of the J health plans in state s in year t, then the Fisher index for state s in year t is defined as:

$$Fisher_{s,t} = \sqrt{\left(\frac{\boldsymbol{P}_{s,t}\cdot\boldsymbol{Q}_{s,89}}{\boldsymbol{P}_{s,89}\cdot\boldsymbol{Q}_{s,89}}\right)\left(\frac{\boldsymbol{P}_{s,t}\cdot\boldsymbol{Q}_{s,91}}{\boldsymbol{P}_{s,89}\cdot\boldsymbol{Q}_{s,91}}\right)} \quad (1)$$

Finally we create a cost of insurance variable for each state s in year t ($\text{Cost}_{s,t}$) by multiplying the Fisher index for each state-year with the average copremiums in that state in 1989. This rescales the unit-

[3] This study measures the costs of insurance rather than the price of insurance. Costs of health insurance might increase with the increase in medical care costs or with the increase in the loading factor (the economic price) of health insurance.

less Fisher index to 1989 copremium dollars in each state and thus makes our regressions results easy to interpret.

$$Cost_{s,t} = Fisher_{s,t}{}^{*}\left(\boldsymbol{P}_{s,89} \cdot \boldsymbol{Q}_{s,89}\right) \tag{2}$$

We estimate separate employee fixed-effects models for each component of total compensation. This model controls for employee-specific time invariant unobservables (such as preferences for insurance) and primarily uses variation in costs over time to identify parameter estimates. If i and t subscript the employee and year – and s subscripts the state of residence for person i in year t – then our empirical model can be summarized by the following equations:

$$Wage_{i,t} = \alpha_i^{\text{wage}} + \delta^{\text{wage}} Cost_{s,t} + \boldsymbol{\beta}^{\text{wage}} X_{i,t} + \varepsilon_{i,t}^{\text{wage}} \tag{3}$$

$$Benefit_{i,t} = \alpha_i^{\text{benefit}} + \delta^{\text{benefit}} Cost_{s,t} + \boldsymbol{\beta}^{\text{benefit}} X_{i,t} + \varepsilon_{i,t}^{\text{benefit}} \tag{4}$$

$$Health\ Insurance_{i,t} = \alpha_i^{\text{health}} + \delta^{\text{health}} Cost_{s,t} + \boldsymbol{\beta}^{\text{health}} X_{i,t} + \varepsilon_{i,t}^{\text{health}} \tag{5}$$

$$Total\ Compensation_{i,t} = Wage_{i,t} + Benefit_{i,t} + Health\ Insurance_{i,t} \qquad \forall i,t \tag{6}$$

where, α^k is the employee fixed effects for benefit k, α^k measures the increase in expenditures on benefit k due to a one dollar increase in the cost of health insurance, and the vector $\boldsymbol{\beta}^k$ measures the changes in benefit k due to changes in other covariates X. Eq. (6) is an accounting identity and states that expenditures on wages, health insurance, and other benefits add up to the total compensation. Eq. (6) along with the three behavioral Eqs. (3)–(5) also implies that $\sum_k \delta^k = 0$. That is, given that total compensation is fixed, any change in health insurance expenditures must be financed entirely by changes in benefits or wages. We also compute the expenditure elasticity of each benefit category k with respect to the health insurance cost at the mean benefit allocations in 1989.

4. Results

The parameter estimates from models (3)–(5) are presented in the Table 2. The results show that a $1 increase in the cost of health insurance leads to a 52-cent increase in health insurance expenditures. This 52-cent increase in health insurance expenditures is financed by a 37-cent reduction in take home wages

Table 2
Employee fixed-effect model of increase in health insurance costs on allocation of total compensation (N=7896 employee-years)

Variable	Wages		Other benefits		Health insurance expenditures	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Cost	−0.37	−3.04	−0.15	−1.86	0.52	6.25
Age	−16.97	−0.56	108.83	5.33	−91.86	−4.43
Age square	0.06	0.36	−0.95	−8.73	0.89	8.09
Tenure	49.07	1.84	−64.49	−3.57	15.43	0.84
Total compensation	0.99	413.22	0.01	4.61	0.01	3.36
Intercept	−97.66	−0.12	−1,963.97	−3.64	2061.63	3.76
Expenditure elasticity	−0.0083	−3.04	−0.2870	−1.86	0.5136	6.25

and a 15-cent reduction in other benefits. Thus approximately 70% of the increase in health insurance expenditures due increase in costs is financed by wage reductions. Put in elasticity terms, each 100% increase in the cost of health insurance leads to a 50% increase in health insurance expenditures, a 1% decrease in take home wages, and a 28% decrease in other benefits.

These results suggest that rising health insurance costs not only reduce resources for current consumption but also lower insurance purchases against a variety of risks. If health insurance costs continue to rise and individuals continue to reduce their purchase of health insurance and other insurance products they might leave them vulnerable to health, mortality, disability, and other significant risks in the long run.

The results also show that when employees are given the choice of absorbing premium increases through salary reductions or limiting expenditures on health and other benefits, they primarily choose to reduce take-home pay. This choice might reflect the advantage to employees of retaining non-taxed compensation in the form of benefits, and instead reducing taxable income.

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