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Subsidies to employee health insurance premiums and the health insurance market

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Abstract

One approach to covering the uninsured that is frequently advocated by policy-makers is subsidizing the employee portion of employer-provided health insurance premiums. But, since the vast majority of those offered employer-provided health insurance already take it up, such an approach is only appealing if there is a very high takeup elasticity among those who are offered and uninsured. Moreover, if plan choice decisions are price elastic, then such subsidies can at the same time increase health care costs by inducing selection of more expensive plans. We study an excellent example of such subsidies: the introduction of pre-tax premiums for postal employees in 1994, and then for the remaining federal employees in 2000. We do so using a census of personnel records for all federal employees from 1991 through 2002. We find that there is a very small elasticity of insurance takeup with respect to its after-tax price, and a modest elasticity of plan choice. Our results suggest that the federal government did little to improve insurance coverage, but much to increase health care expenditures, through this policy change.

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1. Introduction

The number of uninsured persons in the United States has risen steadily over the past two decades. Forty-five million Americans, or 16% of the non-elderly population, are without health insurance coverage (Center on Budget and Policy Priorities, 2002). This is despite significant expansions in the public insurance safety net over the past 15 years, particularly for children. Thus, many have advocated an alternative approach to increasing insurance coverage: subsidizing individuals to take advantage of their existing employer-provided insurance options.

The appeal of this approach is motivated by two facts. First, roughly one-quarter of the uninsured are individuals who are offered health insurance through their job or the job of a family member, but do not take it up. These are individuals who have access to the employer-provided insurance system, and for whom employers are already paying a sizeable share of their insurance costs. Thus, it seems that these are the “low hanging fruit” of the uninsured population, the cheapest group to bring into the ranks of the insured. Second, the decline in insurance coverage over the past two decades has been almost exclusively through reduced takeup of insurance among those offered, not reduced offering. So, premium subsidies are motivated as a means of offsetting this pernicious time trend.

But such subsidies will only be effective if the decision to take up employer-provided insurance conditional on offering is very price elastic. A small number of studies suggest that this is not the case, finding that takeup decisions are not very sensitive to employee premiums. But this existing literature generally suffers from the problem that employee premiums are a choice variable of the firm, and they might therefore respond to employee tastes for insurance, potentially biasing any estimated takeup elasticities. What is required to estimate elasticities is exogenous variation in the price of insurance that is independent of employee tastes.

In this paper, we study such an exogenous price change, through tax subsidization of the employee share of premiums for federal workers in the Federal Employee Health Benefit Program (FEHBP). Roughly one-half of all employees in the U.S. pay their insurance premiums on a pre-tax basis (Gruber and McKnight, 2002). But, until 1994, employee premium payments were made on a post-tax basis by virtually all federal employees insured through the Federal Employee Health Benefit Program. Then, in 1994, employees of the postal service, who represent roughly one-third of all federal workers, were given the right to pay their insurance premiums on a pre-tax basis. The remaining federal employees were given this right in October 2000 (for the 2001 plan year open enrollment).

These changes provide an excellent laboratory for learning about the impact of premium subsidies on insurance takeup. The changes introduced a sizeable reduction in the after-tax price of FEHBP insurance for postal workers in 1994, and then for all remaining federal workers in 2000. Moreover, the reduction varies by income group (due to the differential tax benefits of tax-shielded premium payments) and states (due to differential state income tax rates). Thus, there is extensive variation across otherwise identical workers in the after-tax size of employee premiums.

We use this laboratory to ask two questions about the impact of premium subsidies on the market for employer-provided health insurance. First, can premium subsidies effectively increase the takeup of employer-provided health insurance? Second, how do premium sub-

sidies impact the cost of employer-provided health insurance? By subsidizing insurance costs on the margin, premium subsidies may encourage employees to choose more expensive health insurance plans. This can serve to increase total health care costs even as it increases takeup among the existing uninsured.

We explore these issues using a unique and valuable new source of data: a complete census of personnel records for all federal employees since 1991. These personnel records include information on health insurance takeup, plan choice, and type (single or family) of plan choice. We match this plan choice and type information with publicly available data on the cost of each insurance plan offered to federal employees. In addition, the individual micro-data provide sufficient information on federal employee earnings and other characteristics to compute the impact of the tax subsidy on the individual employee.

We have two central findings. First, there is only a very small impact of premium subsidies on the decision to take up insurance, with elasticities of insurance takeup of roughly -0.02 . Second, there is a modest impact of premium subsidies on plan costs, so that subsidizing premiums in the FEHBP significantly raised program costs. Overall, we estimate that the premium subsidies introduced by FEHBP cost the government roughly US\$ 700 million dollars, while newly insuring at most 8000–22,000 new persons, for a cost per newly insured of US\$ 31,000–83,000.

Our paper proceeds as follows. Section 2 presents some background on the employer-provided health insurance market, and discusses the case for and against premium subsidies. Section 3 discusses the key institutional features of the FEHBP and the policy change we study. Section 4 presents our unique dataset and the empirical strategy we will employ to study it. Section 5 presents our results, and in Part V we compute the benefits and costs to the government from this policy change. Part VI concludes.

2. Part I: Background

2.1. *Employee contributions for health insurance*

Currently, on average, employees pay US\$ 174 per month for family coverage, and US\$ 38 per month for single coverage. These represent 27% and 16%, respectively, of the total cost of insurance to the firm. Employee percentage shares rose dramatically from 1988 to 1993, then fell by the middle of the decade before remaining relatively stable over the past few years (Kaiser Family Foundation, 2002). In the federal employees data that we use, federal employees paid on average one-fifth of the cost of their insurance, which is fairly consistent with the private sector. On the other hand, the share of premiums paid by federal employees is almost identical for family and single plans; whereas, in the private sector, the share is much higher for family plans.

The rise in employee premium shares for private health insurance closely mirrors the major trend in health insurance markets of the past two decades: the decline in employer-provided health insurance coverage. The share of workers covered by employer-provided insurance fell from 80% in 1982 to 72% in 1998 (Gruber and McKnight, 2002). The time series pattern of decline in insurance parallels the rise in employee premium contributions,

with the largest reduction in insurance occurring in the 1988–1993 period when employee premiums were rising most rapidly.

This close correspondence naturally suggests a causal role for employer premium sharing policies in driving the reduction in insurance coverage during the 1980s and 1990s. This role is further supported by recent studies which suggest that most of the decline in coverage over this period was due to a reduction in employee takeup, not a reduction in employer offering of insurance (Cooper and Schone, 1997; Farber and Levy, 2000).

As noted by Pauly (1986), the presence of *any* employee contributions suggests imperfect worker sorting across firms, because in general employer contributions for health insurance are excluded from taxation while employee contributions are not. Since the time of his article, employee contributions have also become shielded from taxation in a number of firms due to the growing use of IRS Section 125 plans. But such protection of employee contributions is far from complete, although data on the prevalence of such arrangements are sketchy. The most recent available data, from a survey of employers by the Kaiser Family Foundation, suggest that half of all workers are in firms that offer such flexible benefit plans.¹

Levy (1997) highlights two possible explanations for the existence of employee contributions. The first is the “fixed subsidy” model, whereby employers with multiple insurance plans ask their employees to contribute funds towards insurance in order to allow employees to pay the marginal cost of insurance and then choose the plan they like. If this were the only motivation for employee contributions, employers would contribute the amount of the minimum cost plan, and employers with only one plan would never have employee contributions. In fact, as Levy (1997) points out, the second of these conditions does not hold in practice: more than half of firms with only one plan require an employee contribution. Overall, she finds that only about one-sixth of employee contributions are paid by workers who have the option of a cheaper plan with no contribution required.

Alternative explanations for employee contributions rely on imperfect worker sorting across firms, and Levy (1997) and Dranove et al. (2000) present two different models of this imperfect sorting. The key notion behind these models is that there is not perfect worker-by-worker shifting of insurance costs to wages, so that with heterogeneity in tastes premium contributions become a useful tool for separating worker types. By requiring contributions, the firm can provide insurance only to those who demand it, and can pass the savings back to employees in the form of higher wages.

Levy (1997), Dranove et al. (2000), and Gruber and McKnight (2002) provide tests of some of the predictions of these models. The evidence generally supports the important role of the imperfect worker sorting model: firms where workers have lower demand for insurance, or better outside options for insurance coverage, have higher premium payments.

¹ In principle, every firm should set up a Section 125 plan to further maximize the size of the pie by making employee contributions pre-tax as well. The reason for less than full coverage of this generous tax benefit in practice is unclear, but some of it may have to do with extensive IRS regulation of these arrangements to ensure that they are not abused. For example, the regulations state that no more than 25% of the benefits of a plan can be attributed to any “highly compensated” employee, essentially ruling out the availability of Section 125 plans for very small firms. Moreover, there are strict and complicated rules that limit the flexibility of employees to switch sources of insurance coverage during the year if they are paying their health insurance contributions on a pre-tax basis.

In particular, Gruber and McKnight find that in firms where employees have more access to public insurance through Medicaid, premium shares are higher. Gruber and McKnight also find that firms with higher worker tax rates share less of the premiums with their workers, consistent with the tax-bias towards employer payments; this conclusion is confirmed by Cutler (2002), using state average tax rates.

2.2. *The case for and against subsidizing employee premiums*

There is enormous interest in the policy arena in using subsidies to employer premiums as a tool to combat uninsurance. This interest arises from two important facts, as noted in the introduction: roughly one-fifth of the uninsured are offered health insurance at work; and the decline in insurance coverage has been almost exclusively through reduced takeup, not reduced offering. A number of policy analysts have suggested premium subsidies as a key part of health insurance reform (e.g. Lemieux et al., 2000). Premium subsidies are already encouraged as a policy option under the State Children's Health Insurance Program (SCHIP), an extension of public insurance to children up to 200% of the poverty line that was passed in 1997. That legislation allows states to, in place of directly expanding public insurance entitlements, "buy into" the employer-provided insurance held by those newly eligible. The motivation for this type of buy-in approach is to leverage existing employer payments to expand insurance at a lower cost. As Henneberry and Hearne (1998) write "Federal and state resources for children's health insurance could cover more children if employers make contributions toward the insurance premiums for children who are eligible for SCHIP. By combining private dollars and SCHIP funds to support employer-sponsored insurance coverage rather than offering only the publicly funded program, states may be able to cover more children".

While attractive in theory, this approach runs into an important problem in practice: while a large share of the uninsured are offered health insurance, they only amount to a very small subset of the total offered population. Calculations from the 2001 Current Population Survey (CPS) show that only 7% of those offered insurance are uninsured.² This is simply a function of the fact that the total pool of individuals offered insurance is much larger than the pool of uninsured. Thus, overall, providing subsidies for employee takeup could be a very poorly targeted policy.

Moreover, takeup of insurance among those offered is high in all easily identifiable subgroups, so that it is difficult to even effectively target employee premium subsidies. Even among those below the poverty line, fewer than 25% of those offered insurance are uninsured. Between the poverty line and twice the poverty line, only 15% of those offered insurance are uninsured; between 200% and 300% of poverty, only 7% of the offered are uninsured. Likely decliners are a hard group to target even using very tight income criteria.

Thus, the key question becomes: is takeup sufficiently price elastic among the offered uninsured to overcome this poor targeting? If takeup is very price elastic, then this can be an effective tool even given the small target population. Note that takeup need not be particularly elastic to explain the time series trends, given the large rise in employee contributions over the 1980s and 1990s. Cutler (2002) notes that his small estimated elasticity of

² Authors' tabulations from a match of the 2001 February and March supplements to the CPS.

–0.12 (described below) can *more than explain* the time series trend in employer-sponsored insurance takeup.

Several previous studies have explored the price elasticity of takeup by offered employees. The first was [Chernew et al. \(1997\)](#), who used data from a sample of small firms in seven cities to model employee takeup of insurance as a function of employee premiums. They find significant but modest effects, with an implied elasticity of takeup with respect to employee premiums of –0.066. [Blumberg et al. \(2001\)](#) pursued a similar approach for a nationally representative sample of firms, and found somewhat smaller effects, with an elasticity of takeup with respect to premiums of –0.04.

The problem with their approaches, however, is that both employee takeup and employee premium contributions are choice variables of the firm, and employee premiums may be endogenous with respect to the taste for insurance in the firm. If, for example, employers cover a larger share of health insurance premiums when employees have tastes for insurance coverage (because such workers demand jobs with low employee premiums), then this could lead to a downward bias (in absolute value) to the estimated elasticity of takeup. On the other hand, if employers cover a larger share of health insurance premiums when employees do not have tastes for insurance coverage (either because of paternalism, or to meet insurer requirements on employee takeup), then this could lead to an upward bias. Thus, there is an uncertain bias to these previous estimates.

[Cutler \(2002\)](#) takes a different approach to estimating the price elasticity of takeup by offered employees: he instruments for the employee premium share with the state tax rate, under the argument that states with higher tax rates will have smaller employee premiums. Doing so, he estimates an elasticity of takeup with respect to employee premiums of –0.12. But this approach also runs into problems. First, tax rates are directly correlated with the attractiveness of offering health insurance; [Gruber and Lettau \(2004\)](#) find a fairly sizeable impact of tax rates on firms' decisions to offer health insurance.³ Thus, states with higher tax rates will potentially have a very different pool of firms offering insurance than states with lower tax rates, and Cutler's elasticity is estimated on the sample of firms that offer insurance. For example, if those workers who are newly offered when the tax rate rises are particularly unlikely to take up, then the estimate is biased downwards; if they are particularly likely to take up, then the estimate is biased upwards. Second, the average tax rate in a state may directly reflect demand for insurance, either because of the fact that it is a function of state incomes, or because policy-makers respond to insurance tastes in setting state tax rates.

The literature on subsidizing employee premiums has not generally discussed another outcome of such subsidies: selection of more generous plans by those who do takeup insurance. Indeed, there is another large literature, which documents the very high price sensitivity of insurance plan takeup to employee out of pocket premiums. For example, [Cutler and Reber \(1998\)](#) find an elasticity of plan takeup with respect to employee premiums of –2, and [Buchmueller and Feldstein \(1997\)](#) find similarly large effects; see [Cutler and Zeckhauser \(2001\)](#) for a theoretical and empirical review of this literature. Given these high

³ [Cutler \(2002\)](#) considers this possibility, but reports that tax rates are not significantly associated with new offering in his data. However, other work ([Gruber, 2002a](#)) has found that tax rates do determine offering rates in the CPS.

price sensitivities, it seems likely that an important outcome of premium subsidies could be higher plan costs. This would in turn translate to higher subsidy costs if the subsidies are open ended (or even to the extent that they are more generous than ex ante insurance spending by some enrollees). Even if the amount of the subsidy is capped, the selection of higher cost plans could raise employer spending on insurance, which would erode the tax base. This would significantly raise the cost of premium subsidies per newly insured.

3. Part II: The federal policy change

3.1. The FEHBP

Federal employees are insured through the Federal Employees Health Benefit Program. At open enrollment each year, employees are given the choice of a range of insurance options through the FEHBP. These options consist of a set of national fee-for-service insurance plans, and a set of Health Maintenance Organization (HMO) plans that vary by location.

Premium contributions of employees are determined by formula, and the formula differs for postal and non-postal workers. For non-postal workers (about two-thirds of federal employees) and retirees, the government pays 75% of the cost of any particular plan, up to a cap which is equal to 72% of the weighted average biweekly premium for the set of plans chosen (separately for family and self-only plans). Beyond this cap, employees are responsible for 100% of plan costs. This formula changed somewhat during our sample period. Before 1999, it was based on an average of only the five or six (depending on the year) leading plans in the FEHBP. But when the FEHBP went to a broader average, it adjusted the percentages so that there was no net impact of the policy change.

Coverage of postal employees is considerably more generous. For postal employees, the government pays 88.75% of the cost of the chosen plan up to 85% of the weighted average biweekly premium of the set of plans chosen by postal employees. Once again, this formula changed during our sample period; these changes are described in more detail below.

3.2. The policy change

Before 1994, the federal government, like the majority of employers during this era, did not allow federal employees to pay their premiums on a pre-tax basis. Then, in 1994, as a result of collective bargaining negotiations between the postal service and its unions, an arbitrator ruled that (a) postal workers should pay a larger share of their health insurance premiums, but (b) those premium payments should be pre-tax.⁴ These changes happened at slightly different rates for different postal unions, but the overall trend was similar: an immediate reduction in after-tax costs, but an eventual rise as the increase in employee premium shares that outweighed the tax subsidy to those premiums.

⁴ A brief history of these changes is at <http://www.usps.com/history/PS-CHI.HTM>. We are grateful to Alan Rouf and Trina King of the U.S. Postal Service for discussing these changes with us and providing us with the necessary information to model them.

Table 1

Means of after-tax share by postal/non-postal and year

Year	Postal ATSHARE	Non-postal ATSHARE
1991	.0625	.25
1992	.0625	.25
1993	.0625	.25
1994	.0502	.25
1995	.0558	.25
1996	.0648	.25
1997	.0725	.25
1998	.0729	.25
1999	.0715	.25
2000	.0713	.25
2001	.0717	.1577
2002	.0722	.1569

Notes: Table reports the mean of after-tax share of premiums borne by federal employees over time. First column shows means for postal workers, and second column shows means for non-postal workers.

In October 2000, the remainder of federal employees were offered “premium conversion”, or pre-tax payment of their premiums. This was offered as part of a package of improvements for civil servants in President Clinton’s February, 2000 budget, including a 3.7% pay raise and improvements in FEHBP benefits coverage (Causey, 2000; OPM, 2000). This change was put in place shortly before the open enrollment for 2001. As a result, by the time of the 2001 enrollment, all federal employees could pay their premiums on a pre-tax basis.⁵

These changes induced quite large reductions in the after-tax price of insurance to federal employees. For example, consider a federal employee with family income of US\$ 60,000 and living in Washington DC, who faces a payroll tax rate of 7.65%, a federal income tax rate of 28%, and a district income tax rate of 9.5%.⁶ Suppose that this employee chooses family insurance through the Blue Cross low option plan, at an employee cost of US\$ 2466 per year. Then premium conversion saves that employee 45.15% of their premium costs, or US\$ 1113. This is a large amount, which is over 13% of the full cost of the plan.

More generally, Table 1 shows the impacts of the policy change on the after-tax share of premiums paid by employees. This is measured as:

$$\text{ATSHARE} = \left(\frac{\text{employee premium}}{\text{total premium}} \right) (1 - \tau_f - \tau_s - \tau_{ss} - \tau_{mc})$$

where τ_f is the federal marginal tax rate, τ_s the state marginal tax rate, τ_{ss} the marginal Social Security (FICA) payroll tax rate, and τ_{mc} is the marginal Medicare HI payroll tax

⁵ Some very small groups of non-postal federal employees were able to pay premiums on a pre-tax basis even before 2000: employees of the Legislative branch, Judicial branch, Federal Reserve System, Comptroller of the Currency, Federal Deposit Insurance Corporation, and the Office of Thrift Supervision. Employees of these agencies amount to between 1% and 1.5% of our observations in the 1991–2002 period. We exclude these employees from all of our regression analysis.

⁶ For this example, we assume that the employee is not itemizing his taxes; for our empirical work below, we explicitly model itemization.

rate (which is distinguished from τ_{ss} because it is uncapped, while τ_{ss} has a maximum taxable amount).⁷

Table 1 shows the mean ATSHARE, separately for postal and non-postal workers, over time. For postal workers, their ATSHARE was .0625 before the 1994/1995 reforms. It then dropped in 1994 and 1995, as the tax subsidy was put in place but the increased premium sharing had not yet fully phased in. However, by 1996 the ATSHARE was already above its pre-reform levels, and in steady state was about .072. For non-postal workers, ATSHARE was .25 through the year 2000, then dropped after reform to .16.

Of course, a major concern with this empirical approach is that workers are not aware of this change in the tax treatment of employee premiums. While all workers were notified of this change in tax treatment, and it is noted in the guide to employee plan choice, it is possible that employees were not paying attention or do not understand the important savings associated with this policy change. The fact that we find a sizeable response below in terms of plan choice suggest that there was some awareness of this program on the margin, but awareness may have been much less than complete. Thus, relative to a premium subsidy where all workers are fully aware and understand its savings implications, these estimated effects may be lower bounds.

But it is not clear that full information/awareness is the relevant benchmark for assessing the efficacy of public policy in this area. All such subsidy programs, which are typically carried out through the tax code, face the problem of imperfect information and understanding. Thus, this policy change for the federal government may be a reasonable approximation to the information content in a broader federal subsidy program for employee premiums.

It is also important to note that increasing insurance coverage was *not* the stated goal of this government policy change. This change was motivated by a desire to increase the attractiveness of federal employment by matching the type of insurance benefits offered in the private sector (OPM, 2000). It is unclear whether this goal was met. But, even though this was not the stated goal, this government policy change provided an excellent laboratory for learning about the (incidental) impacts of employee subsidies on insurance coverage.

4. Part III: Data and empirical strategy

4.1. Data

Our data for this analysis are a census of personnel records for all federal employees for each March from 1991 through 2002. These data were requested through the Freedom of Information Act, and purchased separately from the Federal Office of Personnel Management (which administers FEHBP to all non-postal employees) and the Postal Service. There are roughly 2.7 million observations per year, one-third of which are typically postal workers. We restrict our sample to full-time, health insurance eligible workers ages 21–64 whose records show valid state, race, and education data (education data are only available

⁷ Premiums are not deductible from state taxes in New Jersey, which we account for in our computation of ATSHARE.

for non-postal workers). These criteria reduce our dataset by 18% for a final sample of nearly 27 million observations.⁸

These data contain information on each employee's wages and salaries (including bonuses); sex, age, and race; whether they are a veteran; whether they are handicapped; state; full or part-time status; and their choice of health plan (or whether they do not choose one). We match these data to information from the OPM Office of the Actuary on the employee and government cost of each plan.⁹ One concern with these data is that plan pricing may respond endogenously to the tax subsidization of employee choice.¹⁰ We therefore convert premium costs to real terms by assigning each plan its constant 1993 premium costs in each year, avoiding any issue of plan pricing changes in response to premium conversion; we then inflate all cost figures to US\$ 2002 for ease of interpretability. For plans missing the 1993 cost data, we impute this value by computing the ratio of that plan's cost to the median plan cost in that plan's census region, in the year closest to 1993 for which we have plan data; we then multiply that ratio by the 1993 median cost for the region, to impute a 1993 cost for the plan. The results are very similar if we follow the same procedure using year 2000 as our base.

Although these data have a number of advantages for our purposes, they have one important weakness: they do not have complete data for perfectly assigning tax rates. In particular, these data are missing information on earnings of other family members, other family income, marital status, and itemization status. Therefore, we augment these OPM data with data on individual workers from the Current Population Survey, and with data on family taxes from the Statistics of Income data (SOI). We then impute tax rates to the workers in our sample in five steps.

First, for each observation, we create four states of the world: married, non-itemizer; married, itemizer; single, non-itemizer; and single, itemizer. Second, we impute to each observation in each state of the world the other elements of taxable income using demographic and income information from the CPS and itemization information from the SOI. For the CPS, we use data on age, sex, race, education (non-postal workers only), wages, full-time/part-time status, and region to impute spousal earnings (for the two cases where the worker is married) and non-earned taxable income (using separate models for those married and single). We do this imputation separately for postal and non-postal workers, using data on the corresponding groups in the CPS.¹¹ From the SOI, which is a dataset with information on all elements of taxable income and taxes paid for a nationally representative sample of workers in each year, we use information on

⁸ One concern with this sample selection is that takeup may not be responsive for older federal workers due to the regulatory requirement of 5 years of FEBHP coverage to qualify for retiree insurance. In fact, however, takeup rates are only modestly higher after age 50 than before. And our results are almost identical if we restrict to the sample of workers below age 50.

⁹ We are grateful to Rose Chu of Actuarial Research Corporation and to Walt Francis for providing these data to us.

¹⁰ While this is not possible in principle, since the federal FFS plan is experience rated and the local HMOs are supposed to provide the government with their best area price, it may occur in practice. Feldman et al. (2002) discuss a variety of incentives for local HMOs in FEHBP to adjust their pricing to the government.

¹¹ In order to ensure sufficient sample size, we use a rolling average of three CPS surveys around the survey year.

Table 2
Sample means of OPM/postal dataset

Variable	Overall	Postal sample	Non-postal sample
ATSHARE	.15	.065	.235
Family takeup rate	.615	.688	.542
Single takeup rate	.253	.221	.286
Total takeup rate	.868	.909	.828
Government share of family premiums (US\$ 2002)	4835	5415	4256
Employee share of family premiums (US\$ 2002)	1064	557	1571
Total family premiums (US\$ 2002)	5899	5972	5826
Government share of single premiums (US\$ 2002)	2174	2432	1915
Employee share of single premiums (US\$ 2002)	468	246	691
Total single premiums (US\$ 2002)	2642	2678	2606
Real wage (US\$ 2002)/10,000	4.57	4.23	4.91
Non-White	.238	.256	.219
Veteran	.263	.298	.227
Handicapped	.071	.074	.067
Number of observations	24480	12440	12440

Notes: Table shows sample means from the dataset described in text. First column shows full sample means; second column shows means for postal sample only; third column shows means for non-postal sample only.

income and state of residence to impute the average amount itemized, conditional on itemizing.

For each observation in each state of the world, we then compute the marginal tax rate. We do this using the NBER's TAXSIM model, which takes input on the major elements of taxable income and computes both a federal and state marginal tax rate.¹² We then use the CPS and SOI data to impute the odds of being married (the CPS) and of itemizing (SOI). Finally, we compute a weighted average marginal tax rate by taking the odds of being married and itemizing as the weights to average the tax rates from these four states of the world.

We then collapse the data into cells by states (51), years (12), income deciles (10), sex (2), and postal versus non-postal workers (2), for a total of 24,480 observations. Collapsing the data in this way makes the analysis much more manageable than working with the underlying 27 million observations. Moreover, it allows us to clearly understand, and control for, the sources of variation in ATSHARE, as described below. We then weight the regressions by the number of observations in each cell, so that we replicate the underlying distribution of the micro-data.

Our key dependent variables are the mean takeup rate of family plans and self-only plans in the cell, and the average (total, government plus employee) cost of the family and self-only insurance plans chosen in the cell. Since the policy change may itself-impact the mix of family and self-only policies, we analyze separately these categories, as well as showing the total effect on any takeup.

The means of our data are shown in Table 2. The takeup rate for family insurance is much higher for postal workers than for non-postal workers, which is potentially consistent

¹² For more information about TAXSIM, see Feenberg and Coutts (1993). A public use version of TAXSIM is available at www.nber.org/taxsim.

with the larger subsidization of insurance for that group, although it may also reflect other factors (such as lower levels of spousal insurance coverage). This is offset to some extent by a lower takeup rate for single postal workers than for single non-postal workers. This is a high earning sample on average, with mean real wages (in US\$ 2002) of US\$ 45,700; earnings are higher for the non-postal sample. Roughly one-quarter of the sample is non-White, and one-quarter is veterans, with both proportions somewhat higher in the postal than the non-postal sample. Seven percent of the sample is handicapped.

4.2. Empirical strategy

We use the data described above to estimate equations of the form:

$$Y_{cpsy} = \alpha + \beta \text{ATSHARE}_{cpsy} + \delta X_{cpsy} + \eta_c + \lambda_p + \mu_s + \tau_y + \epsilon \quad (1)$$

where c indexes income \times sex cells; p postal/non-postal; s states; y years; Y one of our dependent variables (premiums or takeup); ATSHARE the after-tax share of premiums paid by the employee; X a set of cell-level characteristics; η_c , λ_p , μ_s , and τ_y are fixed effects for income \times sex, postal/non-postal, states, and years.

As tax subsidies lower employee premiums, given a premium sharing rule, ATSHARE falls. This should lead to higher takeup and a shift to more expensive plans, so that the coefficient β is negative.¹³ We control also for the available exogenous characteristics of workers in each cell: the average real (US\$ 2002) earnings level in the cell; the percent in each age group aged less than 25, age 25–29, . . . , age 60–64; the percent of workers who are non-White; the percent of workers who are veteran (and the percent who have missing veterans status); and the percent of workers who are handicapped (and the percent who have missing handicap status). Finally, we include a full set of fixed effects for each dimension along which our collapsed data vary; that is, we include a full set of dummies for income/sex, postal/non-postal, states, and years.

One advantage of collapsing our underlying micro-data is that the source of variation in ATSHARE is clear: it arises from variation across income/sex groups, across postal/non-postal groups, across states, and across years. Obviously each of these dimensions is correlated with tastes for insurance, so we control in the regression for every category used to collapse the data. In this specification, identification therefore comes from the variation in the after-tax premium share within these groups. That is, this approach uses the fact that the tax subsidy changes for postal versus non-postal workers over time, and that this change is differential by states and income/sex groups.

This is a powerful empirical framework. It allows for differences in tastes for insurance between postal and non-postal workers, and controls for any observable factors which might change the relative demand for insurance by postal versus non-postal workers over time. Of course, there are potential concerns that other changes that are correlated with the change in the after-tax premium share could bias these estimates. Thus, we explore below the sensitivity of our findings to controls for these alternative hypotheses.

¹³ It is conceivable that takeup or plan choice respond to changes in tax subsidies with a lag. But our results are very similar if we use a lagged value of ATSHARE instead.

As [Bertrand et al. \(2004\)](#) emphasize, even with these grouped data, the standard errors are likely to be downward biased if we ignore the natural auto-correlation across groups over time. We therefore estimate all models clustering the standard errors on postal/non-postal, income group, sex, and state, to correspond to the cross-sectional variation in our data.

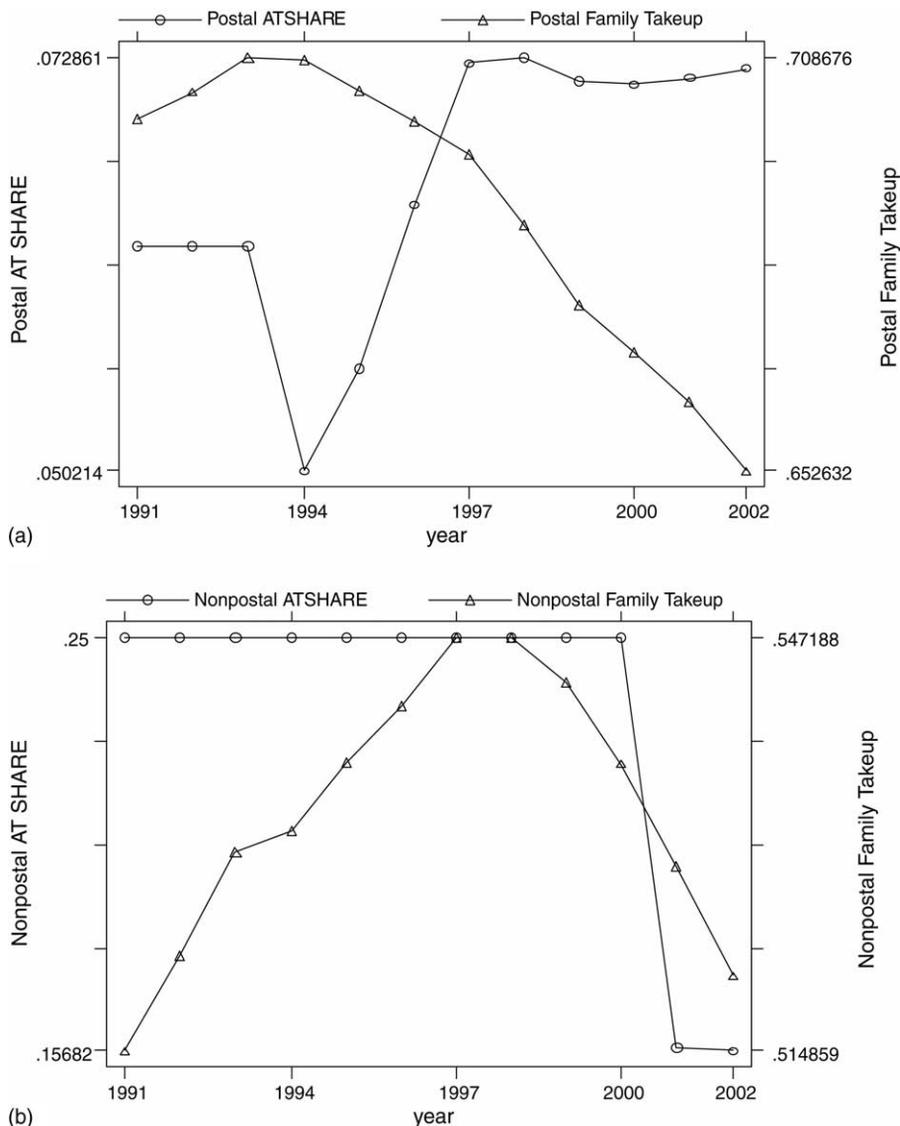


Fig. 1. Takeup vs. ATSHARE for (a) postal workers over time; (b) non-postal workers over time.

5. Part IV: Results

5.1. Basic results

Figs. 1 and 2 present some graphical evidence on the aggregate impacts of these policy changes on takeup. Fig. 1 shows the time series movements in ATSHARE and family takeup for postal (panel a) and non-postal (panel b) workers. There is little negative relationship apparent in these figures between ATSHARE and takeup. The rise in ATSHARE for postal workers from 1994 to 1997 is associated with some decline in takeup, but takeup declines even more steeply after 1997 when ATSHARE is constant. For non-postal workers, the only change is the sizeable reduction in ATSHARE starting in 2001, which is associated with a large reduction, not increase, in takeup.

Fig. 2 extends this analysis by showing the difference between the ATSHARE of postal and non-postal workers; that is, as the tax price rises for postal workers relative to non-postal workers, this difference increases. The second line shows the difference in residual family takeup between postal and non-postal workers. That is, we first estimate family takeup equations separately for postal and non-postal workers, as a function of the *X*s included in our model (other than year). We then obtain the residuals from these takeup equations, multiply them by 10 (to put them on a comparable scale to the difference in ATSHARE), and take the difference between the postal and non-postal takeup residuals. We use these residuals because the characteristics of the postal and non-postal samples differ in important ways, so we cannot simply compare their takeup rates. By comparing these residuals, we control for differences in the observable characteristics of the postal and non-postal sample.

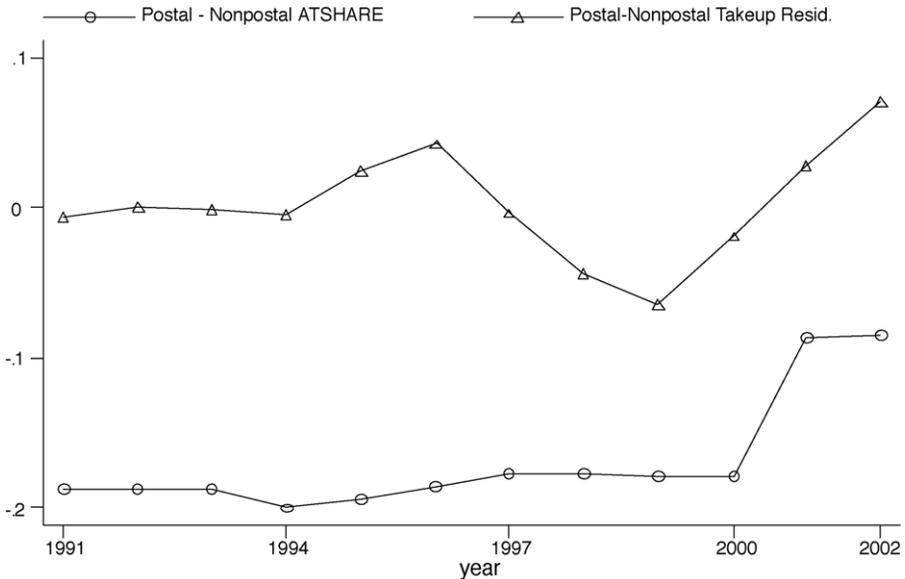


Fig. 2. Difference in takeup vs. difference in ATSHARE over time.

If there is an effect of ATSHARE on takeup, then these series should move in opposite directions: as the gap in ATSHARE gets more negative (postal workers getting a larger subsidy relative to non-postal workers), the gap in family takeup should get more positive (postal workers seeing a relative increase in takeup). It is clear, however, that no such negative relationship exists. When the ATSHARE of the postal workers falls slightly relative to non-postal workers in 1994, there is no change in relative takeup. Over the next few years, as the ATSHARE of postal workers rises relative to non-postal workers, takeup of postal workers is actually rising relative to non-postal workers as well. From 1997 through 1999, there is a decline in the relative takeup of postal workers that does not correspond to any obvious movement in relative prices.

Finally, there is no obvious effect of the large policy change in 2000, which caused a sharp decline in ATSHARE for non-postal workers, and therefore a rise in the postal-non-postal difference in ATSHARE. Despite the fact that insurance was getting relatively more costly for postal workers, there is actually a rise in postal takeup relative to non-postal takeup from 2000 onwards. Thus, the trends in differential takeup across these groups appear to be causally unrelated to changes in ATSHARE; but this approach is fairly low powered, and does not exploit the full variation in incentives across income and state groups to allow us to control for other time trends.

Table 3 shows our basic results from the regression specification detailed above, for family and single takeup. In fact, we find that there is a negative effect of ATSHARE on family takeup, which is right-signed, and is statistically significant. However, the estimate is quite small, implying that, for each 10 percent of premiums that the employee bears, they are 0.68% less likely to take up insurance. Employees pay roughly 20% of premiums, and mean family takeup is 61.5%, so this implies an elasticity of takeup with respect to

Table 3
Takeup results

Variable	Family takeup	Single takeup	Overall takeup
ATSHARE	-.068 (.028) [-0.022]	.036 (.022) [0.028]	-.032 (.018) [-0.007]
Real wage (US\$ 2002)	.035 (.016)	-.008 (.001)	.027 (.001)
Age less than 25	.242 (.086)	.044 (.059)	.286 (.059)
Age 25–29	.383 (.078)	-.006 (.055)	.378 (.048)
Age 30–34	.267 (.056)	-.081 (.043)	.187 (.039)
Age 35–39	.258 (.054)	-.193 (.041)	.065 (.037)
Age 40–44	.371 (.053)	-.148 (.04)	.223 (.037)
Age 45–49	.390 (.051)	-.187 (.04)	.203 (.037)
Age 50–54	.308 (.055)	-.094 (.044)	.214 (.039)
Age 55–59	.471 (.063)	-.294 (.046)	.177 (.048)
Non-White	.095 (.019)	-.07 (.014)	.025 (.012)
Veteran	.051 (.011)	-.049 (.009)	.002 (.006)
Veteran status missing	.025 (.005)	-.038 (.004)	-.013 (.003)
Handicapped	-.203 (.041)	.224 (.028)	.022 (.027)
Handicap status missing	.056 (.066)	-.184 (.047)	-.128 (.044)
Number of observations	24480	24480	24480

Notes: Estimates of Eq. (1) in text. Standard errors in parentheses; elasticity in first row in square brackets. Regressions also control for fixed effects for state, year, postal/non-postal, and sex/income group. First column shows regression results for family takeup, second column shows regression results for single takeup.

employee premiums of -0.022 . This is smaller than even the lowest estimates from the previous literature, and yet it is very precisely estimated. For takeup by singles, on the other hand, we find that there is a wrong-signed coefficient, implying that for each 10% of premiums that the employee bears; they are 0.36% *more* likely to take up insurance. Off the smaller base of takeup by single employees, this estimate implies a wrong-signed elasticity of takeup of 0.028. In total, treating singles and families as comparable units, the net effect on policy takeup is a fall in takeup of 0.32% for each 10% of premiums that employees bear, an estimate, which is not quite statistically significant.

Interpreting these findings in terms of the reduction in the uninsured is difficult, since we observe only FEHBP coverage, not overall insurance rates. In particular, the positive coefficient on the single takeup regression likely arises from individuals shifting from single to family policies as the subsidy to insurance rises. For those individuals, there is clearly no change in insurance coverage, but their family members may be gaining coverage. We return to this set of issues in our policy simulations below.

The control variables have their expected signs in Table 3. One interesting finding is that the impact of higher wages is positive on takeup of family plans, but negative on takeup of single plans, suggesting that higher incomes lead to a shift from single to family coverage; this is consistent with our ATSHARE coefficients. Demand for family coverage rises, and demand for single coverage falls, with age. Non-Whites and veterans are more likely to demand family coverage and less likely to demand single coverage, and, somewhat surprisingly, demand for both types of coverage is smaller for handicapped employees; this may pick up omitted income effects.

Table 4 examines the impact of after-tax premium costs on the costs of plans chosen by employees. We look at the impacts separately for employee and government share of costs, and then combine the two to look at the impacts on total costs, for both self- and family plans.

We find strong evidence that lower premium shares are associated with choosing more expensive plans. For family plans, our estimates imply that, for each 10% increase in their share of the premiums, employees choose an insurance plan that costs US\$ 46 less. This is composed of a reduction in employee spending of US\$ 15, and a reduction in government spending of US\$ 31. Mean family premiums in our sample are US\$ 5898 (in US\$ 2002). So, this suggests that for each US\$ 590 increase in employee premiums, the worker chooses a plan, which lowers his costs by US\$ 15.

For single plans, we find a similar pattern of results. For each 10% increase in their share of the premiums, employees choose a plan, which costs US\$ 18 less; this is composed of a reduction in employee costs of US\$ 7, and a reduction in government costs of US\$ 11. Mean single premiums in our sample are US\$ 2642 (in US\$ 2002). So, this suggests that for each US\$ 264 increase in employee premiums, the worker chooses a plan, which lowers his costs by US\$ 7.

Are these plan switching effects large or small? It depends on the frame of reference. On the one hand, employees offset only about 2.5% of the higher costs of insurance by choosing less expensive plans (although these choices do involve additional savings for the government which are two to three times as large). On the other hand, these findings may imply sizeable plan switching. Among family plans chosen by non-postal employees, for example, the standard deviation in employee premiums is US\$ 600. Suppose that the

Table 4
Health benefits costs results

Variable	Family			Self		
	Worker	Government	Total	Worker	Government	Total
ATSHARE	–150 (64.6)	–312 (23.54)	–462 (78.02)	–70.7 (20.9)	–107 (20.8)	–178 (37.04)
Real wage (US\$ 2002)	1.98 (2.07)	9.12 (1.16)	11.1 (2.8)	1.97 (.86)	10.3 (.86)	12.3 (1.5)
Age less than 25	–325 (115.7)	–86.0 (50.1)	–411 (149.3)	–255 (46.9)	–142 (40.7)	–396 (74.2)
Age 25–29	–151 (115.9)	–70.1 (50.5)	–221 (149.5)	–392 (45.2)	–184 (39.1)	–575 (70.1)
Age 30–34	–307 (97.4)	–99.3 (42.9)	–406 (125.4)	–290 (41.9)	–156 (34.2)	–445 (63.7)
Age 35–39	–535 (100.4)	–209 (46.1)	–744 (130.4)	–307 (42.9)	–187 (34.8)	–494 (64.8)
Age 40–44	–472 (98.5)	–218 (44.1)	–689 (127.8)	–320 (42.4)	–210 (35)	–530 (64.5)
Age 45–49	–314 (100.9)	–99.8 (46)	–414 (132.1)	–281 (43.4)	–129 (36.1)	–410 (67.1)
Age 50–54	–554 (112.6)	–184 (49.5)	–738 (146.9)	–327 (46.6)	–192 (39.3)	–519 (73.5)
Age 55–59	–389 (117.5)	–104 (52)	–493 (151.1)	–276 (46.7)	–131 (42.5)	–407 (78)
Non-White	53.9 (17.21)	24.9 (8.73)	78.8 (23)	–20.8 (6.9)	–39.7 (8.2)	–60.5 (12.9)
Veteran	19.3 (15.4)	13.4 (6.9)	32.7 (20.6)	14.7 (4.6)	–10.1 (5.9)	4.57 (8.84)
Veteran missing	12.0 (7.9)	–3.6 (3.2)	8.4 (10)	1.2 (2.67)	–1.2 (2.5)	.08 (4.04)
Handicap	155 (45.3)	–82.3 (23.9)	72.6 (60.8)	–51.2 (16.1)	–108 (22.2)	–159 (31.65)
Handicap missing	38.0 (96.1)	79.1 (50.9)	117 (131.8)	108 (42.3)	127 (43.1)	235 (70.1)
Number observed	24479	24479	24479	24476	24476	24476

Notes: Estimates of Eq. (1) in text. Standard errors in parentheses. Regressions also control for fixed effects for state, year, postal/non-postal, and sex/income group. First three columns show regression results for family premiums, second three column show regression results for single premiums. Within each set of columns, first column shows effect on worker share of premiums, second column shows effect on government share of premiums, and third column shows effect on total premiums.

typical person switching plans in response to an increase in ATSHARE moves by one standard deviation of plan costs, or US\$ 600. Under this assumption, for average cost to fall by US\$ 46 (as would be true for a 10% rise in ATSHARE), 20% of workers would have to switch. But the US\$ 46 increase in costs is only about 5% of the average employee premium. So, this suggests that a 5% rise in premiums leads to 20% switching, for an elasticity of switching of -4 .¹⁴

5.2. Omitted factors

One identifying assumption of the regression framework used thus far is that the relative change in after-tax premiums across postal workers and non-postal workers over this period is independent of any other factors which might determine the demand for FEHBP coverage. But this may not in fact be true. There may be other changes in the environment, which are correlated with both changes in ATSHARE and changes in takeup and plan choice. The existence of such factors is suggested by the strong time trend in takeup for both between postal and non-postal workers shown in Fig. 1, which appears to be unrelated to the policy change of this era.

There are other potential issues of this nature as well. For example, it may be that states are changing their tax rates over time in response to the insurance status of their citizens, and that could cause a spurious bias between takeup decisions and after-tax prices. Alternatively, it could be that the widening of the income distribution changes the takeup decisions of higher versus lower income federal employees, perhaps because spouses of higher income federal employees now have better insurance options.

Similarly, our regression framework also assumes that there are no important fixed differences in different groups of workers across states. But it is possible that the postal workers in one state are quite different than in another, in a way, which is reflected both in their tax rates and their demand for insurance. To the extent that any of these omitted factors work through observed characteristics such as age, race, or wages, they will be captured by our existing set of controls. But it is possible that they may work through unobserved channels.

Thus, we consider next an alternative specification that controls for all “second-level” interactions of income/sex, postal/non-postal, state, and year:

$$Y_{cpsy} = \alpha + \beta ATSHARE_{cpsy} + \delta X_{cpsy} + \eta_c + \lambda_p + \mu_s + \tau_y + \eta_c \cdot \lambda_p + \eta_c \cdot \mu_s + \lambda_p \cdot \mu_s + \eta_c \cdot \tau_y + \lambda_p \cdot \tau_y + \mu_s \cdot \tau_y + \epsilon \quad (2)$$

In this specification, we control for all interactions between postal/non-postal and income/sex group, income/sex group and state, postal/non-postal and state, income/sex group and year, postal/non-postal and year, and between state and year. We allow, for example,

¹⁴ These results may be biased downward (in absolute value) by the measured takeup response: to the extent that there is impact on takeup, and to the extent that those newly taking up are taking up less expensive plans, that will offset more expensive plan choice by the existing uninsured. But our takeup results are sufficiently small that any bias would be minor. For example, imagine that those families newly taking up take up at the 1st percentile of plan costs in our data, US\$ 4370, rather than the sample mean of US\$ 4737. At our estimated family takeup elasticity, this would lead to a positive bias to our estimates of total cost impacts of US\$ 2.50, which is roughly 5% of the estimated US\$ 46 effect.

Table 5
Specification with second-level interactions

Dependent variable	ATSHARE coefficient
Family takeup	-.071 (.11)
Single takeup	-.038 (.08)
Overall takeup	-.11 (.09)
Employee premiums, family plans	-189 (272)
Government premiums, family plans	-357 (96)
Total premiums, family plans	-546 (336)
Employee premiums, self-plans	-238 (78)
Government premiums, self-plans	-159 (87)
Total premiums, self-plans	-397 (140)

Notes: Estimates of Eq. (2) in text. Standard errors in parentheses. Each row shows coefficient on ATSHARE from a separate regression, where dependent variable is shown in first column. Regressions also control for fixed effects for state, year, postal/non-postal, and sex/income group; and for interactions of postal/non-postal times sex/income group; postal/non-postal times state; sex/income times state; postal/non-postal times year; sex/income times year; and state times year.

for distinct time trends for postal and non-postal workers, to capture the trends shown in Fig. 1. We also allow there to be distinct time patterns by income/sex group, and by state. And we control for any differences between postal and non-postal workers by income level, or any differences in these groups by state. This is a much more rigorous regression specification which controls for a host of alternative explanations for our findings.

Table 5 shows the results of estimating Eq. (2). Adding these controls does not change the central message of our earlier findings, although the estimates are now less precise. The coefficient on family takeup has not changed, but the standard error has risen by a factor of four, so that the estimate is insignificant. The coefficient on single takeup is now negative, suggesting that there is not (on net) a shift from single to family coverage, but it is also highly insignificant.

Despite these higher standard errors, however, we can continue to reject fairly small elasticities of takeup. For example, given the estimated coefficient and standard errors, we can reject that there is an elasticity of family takeup that is greater (in absolute value) than -0.094 , which is still very small. Similarly, we can reject that there is an elasticity of single takeup that is greater (in absolute value) than -0.154 , which is larger, but still fairly modest.

The effect on family premiums is slightly larger than in Table 4; our estimates now imply that for each US\$ 590 increase in their share of premiums, employees choose a family plan which has a cost to them which is US\$ 19 lower (a 3.2% offset). The effect on single premiums is now much larger than in Table 4; the effect on government spending has not changed, but the impact on own employee spending is much larger. So we now find that, for singles, employees offset each US\$ 264 in premiums by choosing a single plan that costs US\$ 24 less (a 9.1% offset).

Overall, this fairly radical change to the specification did not much change the conclusions of the earlier analysis. Takeup and total costs are very modestly related to changes in the after-tax premium cost of insurance to employees.

6. Part V: Implications

Our results show that there is essentially no impact of employee after-tax premiums on the decision to take up health insurance, and a small impact on the cost of health insurance plans. In this section, we use these results to simulate the implications of these policy changes for the federal government. In doing so, we can provide some guidance as to the efficiency of premium subsidies as a tool for expanding health insurance coverage.

To undertake this simulation, we must make several assumptions. Most importantly, we must make some assumption about the extent to which increased take up comes solely from those who would otherwise be uninsured, as opposed to partly from other sources of insurance coverage. We cannot tell these channels apart in our data. Thus, for the simulations, we make two assumptions: that all of those taking up were previously uninsured; and that half of those taking up were previously uninsured. For families, we assume that taking up means bringing four new persons into the FEHBP system; for singles, it means bringing one new person into the system.

When those taking up were previously insured, we assume that they are giving up insurance which parallels the typical government plan in terms of costs and premium sharing, but that premium shares were not subsidized in their previous insurance. This implies some offsetting savings in terms of the employer tax break on their previous insurance costs. In practice, as we show below, these assumptions are not very important; the general pattern of findings is quite similar in all cases.

It is also unclear how to model the differential impact on employee and government costs. In the short run, any increase in government costs is a dollar-for-dollar cost to the U.S. taxpayer, while an increase in employee costs only raises costs to the taxpayer to the extent that these employee costs are tax subsidized. In the long run, however, if there is shifting of insurance costs to wages in the public sector (as evidence suggests to be the case in the private sector; see Gruber (2001) for a review), then the increase in government costs will be reflected in lower wages for federal employees. This will only raise costs through reduced tax revenues on federal employee wages. So, we consider both “short” and “long” run scenarios in these estimates.

We consider the impact of the premium conversion for non-postal employees in 2000 in Table 6. The first set of columns refers to the estimates of Eq. (1) shown in Tables 3 and 4; the second set of columns refers to the estimates of Eq. (2) shown in Table 5. The first column corresponds to short run, for the case where all of the coverage increase represents a reduction in the uninsured. In this case, there are 4847 newly insured families, but 1434 fewer insured singles, for a total number of newly insured persons of 17,954. The government spends US\$ 46 million more on its insurance premiums, which reflects both the spending on those newly insured, and the increased spending on the existing insured who choose more expensive plans. The cost in terms of foregone tax revenues on employee spending from this new tax subsidy is US\$ 647 million, which reflects a small amount of subsidy to those newly insured and a large amount of subsidy to those who already held FEHBP plans. So the total cost is US\$ 693 million, which represents spending of over US\$ 38,000 per person newly insured by this policy.

The remaining columns vary our two key assumptions. In column 2, we retain the short run perspective, but assume instead that only half of those newly taking up FEHBP were

Table 6
Simulations of impact of premium conversion for non-postal employees

	Equation (1)				Equation (2)			
	Short run		Long run		Short run		Long run	
	No crowdout	50% crowdout	No crowdout	50% crowdout	No crowdout	50% crowdout	No crowdout	50% crowdout
Newly insured families	4847	2424	4847	2424	5060	2530	5060	2530
Newly insured singles	−1434	−1434	−1434	−1434	1510	705	1510	705
Newly insured persons	17,954	8261	17,954	8261	21,760	10,880	21,760	10,880
Government premium/tax cost (US\$ in millions)	46	42	17	13	58	53	21	17
Employee premium tax cost (US\$ in millions)	648	648	648	648	652	652	652	652
Total costs (US\$ in millions)	694	690	665	661	710	705	674	669
Cost per newly insured (US\$)	38,620	83,460	37,020	73,600	32,630	64,840	31,000	61,500

Notes: Table shows results of simulation of impact of premium conversion for non-postal employees on government costs and insurance coverage. First set of four columns show result using estimates from Eq. (1) shown in Tables 3 and 4; second set of four columns show results using estimates from Eq. (2) shown in Table 5. Within each set of columns, first two columns show short run estimates, and second two columns show long run estimates; in the latter case, we assume that the cost to the government in terms of higher premiums is passed on to workers in lower wages. Within each of these two columns, we show estimates assuming that all of those taking up FEHBP were previously uninsured (“no crowdout”), and assuming that only half of those taking up FEHBP were previously uninsured (50% crowdout).

previously uninsured. In this case, the costs fall slightly, since we incorporate the tax savings from those already insured leaving their privately insured plans to join the government plan. But, at the same time, the number of newly insured is less than half as large (8261) for a cost per newly insured of over US\$ 83,000.¹⁵

In the third and fourth columns, we replicate the analysis from the long run perspective, when wages have been reduced to reflect the fact that the government is paying more for health insurance, so that from both sides the only loss is through reduced taxes. This lowers the cost estimates somewhat, so that total costs are now US\$ 660–665 million, for a cost per newly insured of between US\$ 37,000 and 73,600.

The second set of four columns uses the estimates from [Table 5](#) to replicate these simulation exercises. These estimates show somewhat larger net impacts on insurance coverage, since the coefficient on family takeup did not change but the coefficient on single takeup became negative in this more general specification. But costs are also higher, due to a larger increase in the cost of plans chosen, and the costs associated with higher takeup. Thus, on net, the results are similar, with a cost per newly insured in the range of US\$ 31,000–65,000.

7. Part VI: Conclusions

To many policy-makers and analysts, the uninsured who currently are offered health insurance coverage provide a natural population to target with public interventions. These are individuals who can easily access the benefits of group insurance, and for whom the public sector can potentially leverage the large share of costs typically already paid by employers.

But this argument ignores two central facts. First, this population is a very small share of the total population offered health insurance, making it very costly to target interventions to them. Second, the very fact that these individuals are turning down such a highly subsidized product suggests that they may not be price sensitive in their insurance decisions. While there is a small literature investigating the price sensitivity of demand among employees offered insurance, existing studies have generally relied on variation across employers in the subsidy rates of insurance to employees, which may be a direct function of tastes for insurance.

We surmount this problem by studying an explicit change in policy to subsidize the employee premiums of federal employees, first for postal workers, and then for non-postal workers. The fact that these changes had differential effects as well by income group and state of residence causes extensive variation in the impacts of the policy change, which can be exploited. We do so using a unique dataset, which contains personnel records for every federal employee over the 1991–2002 period.

We find, consistent with previous work, that there is very little response of insurance takeup to premium subsidies. Our central estimates are even lower than those of previous studies, and suggest elasticities, which are in the range of -0.02 . Moreover, we find that subsidizing employee premiums causes employees to choose more expensive insurance

¹⁵ The reduction in uninsured is less than half as large because all of those dropping single coverage are losing coverage, but only half of those moving onto family coverage are assumed to be gaining coverage.

plans, further raising the cost of such interventions. Overall, our findings suggest that the federal government spent between US\$ 31,000 and 83,000 per person who was newly insured by the introduction of this subsidy policy. This is much higher than simulations of the costs per newly insured from most other policies that are currently contemplated for insurance expansion (Gruber, 2002b).

Thus, our findings suggest that subsidizing employee premiums is unlikely to be a cost-effective avenue for increasing insurance coverage. Of course, there are a number of limitations in extrapolating these findings to a broader premium subsidy program. While federal employees were notified extensively about the availability of this tax subsidy, and while the fact that premiums changed significantly suggests that it did impact their behavior, it is possible that a national program of premium subsidies that is more effectively advertised could have a bigger impact. Similarly, a more targeted subsidy program, perhaps focused on the low income populations where a larger share of those offered insurance decline that coverage, could be more cost-effective. But, given the very high takeup rates for insurance, even in low income populations, it is unlikely that even a very targeted intervention could have a major effect on the number of uninsured. It appears that policy-makers will have to look elsewhere for effective routes to expanding insurance coverage in the U.S.

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