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The Effect of Health Reform on Public and Private Insurance in the Long Run

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Abstract

We use established methods and recent data to estimate the effects of changes in premium taxes and Medicaid eligibility on the likelihood of being covered by public or private insurance. We find Medicaid expansion for working adults will crowd-out private insurance at a high rate and that premium taxes will make private coverage less attractive and public coverage more attractive to lower-income workers. We illustrate the implications of these findings by simulating the consequences of the Patient Protection and Affordable Care Act of 2010. As the high-premium excise tax affects increasing numbers of workers between 2018 and 2030, we predict that some will shift from private to public coverage, amplifying the effect of Medicaid expansion. The proportion of workers and their families covered by public insurance will grow from 6% in 2006 to about 14% in 2030 while about 5% will obtain subsidized coverage through exchanges. The fraction covered by private insurance will grow initially in response to the mandate and then decline in response to the tax.

Keywords: health insurance, Medicaid, crowd-out, premium tax, Affordable Care Act
Classification codes: I18, I38, J32

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Introduction

After a long and contentious debate, President Obama signed the Patient Protection and Affordable Care Act (PPACA) into law on March 23, 2010 (Cohn, 2010; Kaiser Family Foundation, 2010a). The CBO projects that this law will reduce the number of uninsured Americans by 32 million, reform private insurance business practices, and begin to slow the rate of growth in health care costs (Elmendorf, 2010). It aims to achieve these goals by building on the current employment-based health insurance system for most workers. Medicaid eligibility will expand and private insurance will be subject to new regulations coupled with premium subsidies for low- and moderate-income people and a legal requirement that practically all citizens must obtain coverage. The Medicaid expansion and premium subsidies will be financed principally by savings in Medicare and a new excise tax on high-premium insurance policies (Kaiser Family Foundation, 2010b). These changes will be initiated in phases from 2010 to 2018, so the full impact of the law will not be apparent for many years. The longest delay affects the excise tax, which is not scheduled to take effect until 2018. Furthermore, the threshold determining which policies will be subject to tax will grow at the rate of general inflation, so if health costs continue to grow faster than general inflation this tax will have a larger and larger impact in the years after 2018. Most analyses of the new law are limited to the standard ten-year federal budget forecast, so they do not consider these long-run effects (e.g., Foster, 2010).[1]

We begin to investigate the potential long-run effects of the Medicaid eligibility and excise tax provisions of PPACA by estimating the effects of past variations in marginal tax rates and Medicaid eligibility on employer-sponsored insurance offers and private and public coverage. If Medicaid eligibility expands, we expect some workers to choose Medicaid who

[1] An exception is CBO's 20-year forecast (Elmendorf, 2009b). The public description of this forecast does not include consideration of tax rate or Medicaid eligibility effects on private insurance coverage, but other CBO publications discuss these effects in general terms (CBO, 2008).

otherwise would have chosen private insurance. Past Medicaid expansions for children stimulated a large literature measuring these potential "crowd-out" effects (e.g., Cutler and Gruber (1996); Card and Shore-Sheppard (2004); Hudson, Selden and Banthin (2005); Gruber and Simon (2008)). Similarly, if taxes on employer-sponsored insurance increase, we expect some workers who would have taken up private insurance to choose public or no coverage instead. Historical variation in state tax rates enabled Royalty (2000), Bernard and Selden (2002) and Gruber and Lettau (2004) to measure these "tax price" effects.

Although these studies contain estimates of Medicaid eligibility and tax policy effects on enrollment in Medicaid and private insurance, they might not correspond very well to the provisions of PPACA. Previously published Medicaid crowd-out estimates are based on eligibility expansions targeted at mothers and children, but the PPACA Medicaid expansions will affect all individuals with incomes below 133 percent of the federal poverty level (FPL). We are principally interested in the effects of Medicaid eligibility expansion on working age individuals, so we estimate crowd-out effects based on recent Medicaid expansions targeted to workers. Tax policy changes might also affect Medicaid enrollment, but, with the exception of Gruber (2001), published estimates typically neglect to measure this effect, focusing exclusively on the effect on private insurance enrollment instead.

To address these gaps in the literature we estimate new models of the probability of being covered by public and private insurance featuring variables for tax policy and Medicaid eligibility policy relevant to workers and allowing for effects of policy that differ through the income distribution. We use recent individual-level data from the Medical Expenditure Panel Survey (MEPS) combined with tax rates generated by NBER's TAXSIM and state Medicaid policy parameters included in the Urban Institute's TRIM3 microsimulation model. We find

high rates of crowd-out for Medicaid expansions aimed at working adults (82%), suggesting that the Medicaid expansion provisions of PPACA will shift workers and their families from private to public insurance without reducing the number of uninsured very much. We also estimate elasticities of private coverage (-0.42) and public coverage (3.6) with respect to tax price and find that these effects are strongest for those in the first five family income deciles. These results suggest that the excise tax provisions of PPACA also have the potential to shift workers from private to public coverage.

We illustrate the implications of our estimates by predicting the effects of the Medicaid eligibility policy and tax changes scheduled under PPACA. We predict the number covered by public insurance, employer-sponsored insurance offers, and coverage from any private source in 2014, 2018 and 2030. We find that the Medicaid eligibility and tax policy changes have modest effects at first, but combine to shift large numbers of workers and their families from private insurance to public insurance as escalating health care costs cause growth in the proportion of private insurance policies affected by the tax. This tax-induced shift from private to public coverage is not explicitly discussed in the forecasts of the effects of PPACA prepared by the Congressional Budget Office or the Office of the Actuary (Elmendorf, 2009b; Foster, 2010; Sisko et al., 2010), perhaps because these forecasts emphasize the first 10-year period.

The mandate, insurance exchanges and premium subsidies may ultimately prove to be as important as Medicaid and tax policy, but because subsidized exchanges do not yet exist (except in Massachusetts) there is less data upon which to base a prediction. In addition, the impact of subsidized exchanges will be limited because most workers with an offer of employer-sponsored insurance will not have access to an exchange until 2017, when states may decide to admit employees of large firms. We attempt to account for the effects of these provisions as well, but

these predictions are by necessity more approximate than those related to Medicaid and tax policy. Our results suggest that the mandate will offset the decline in private insurance induced by the other provisions and will amplify the increase in public insurance. Accounting for the mandate, public insurance will grow from 6% in 2006 to 14% in 2030 while at least 5% will receive coverage through exchanges and the proportion obtaining private coverage will rise in response to the mandate and then fall back to where it started in response to the tax.

In the next section we present a simple conceptual model of employment-based health insurance that illustrates how tax rates and Medicaid eligibility policy affect employer offers, employer contributions, and employee enrollment decisions. The third section explains our statistical methods and the fourth section describes our data and sample. The fifth section presents our results and the final section discusses implications and concludes.

Conceptual Model

We develop a simple model of employer offer following Gruber and Lettau (2004). Employer-based health insurance is a component of total compensation that also includes wages. (For simplicity we ignore other forms of compensation.) An employer, wishing to minimize the cost of labor, will provide more compensation in the form of health insurance at the expense of wages if and only if it is cheaper to do so. The employer's annual cost for the i-th worker, C_i, is the sum of annual wages, W_i, and annual contribution to health insurance premium, H, assumed for simplicity to be constant for all workers of the establishment:

(1) $$C_i = W_i + H .$$

Meanwhile, the establishment's workers are sensitive to the value of after-tax wages and health benefits. For simplicity we assume that any contributions to health insurance premiums

made by workers are from taxable income and are therefore included in W_i. The i-th worker's utility of compensation, U_i, can be written as

(2) $$U_i = U\big((1 - t_i)W_i, H\big) .$$

where t_i is the individual's average tax rate. If marginal utility is the same for both, a dollar in health insurance is worth more than a dollar in wages to the worker. Using Equation (1), the employment cost, EC, to the establishment is

(3) $$EC = \sum_{i=1}^{N} C_i = NH + \sum_{i=1}^{N} W_i \ .$$

where the summation is over all N employees in the establishment. To maximize profit, the establishment minimizes EC with respect to both wage and health insurance contribution, subject to the constraint that the establishment must offer its employees at least the going level of utility in the labor market. The optimal value of health insurance contribution, H*, satisfies the first-order condition dEC/dH = 0.

Differentiating Equation (3) gives

(4) $$\frac{dEC}{dH} = N + \sum_i \frac{dW_i}{dH} = 0 .$$

Changes in wage and premium are related to one another through utility. Using Equation (2),

(5) $$dU_i = U^i_W(1-t_i)dW_i + U^i_H dH .$$

where U^i_W and U^i_H are the derivatives of individual i's utility with respect to W and H, respectively. If the establishment must fix utility at the market level then $dU_i=0$ and we have from Equation (5) that

(6) $$\frac{dW_i}{dH} = -\frac{U^i_H}{U^i_W} \times \frac{1}{(1 - t_i)} .$$

The term $(1-t_i)$ is called the "tax price" in the literature (Gruber and Lettau, 2004). As the tax rate approaches one an individual will be happy to exchange a greater amount of wage for a fixed amount of health insurance contribution. Therefore, we expect H* to be an increasing function of t_i.

Substituting Equation (6) into Equation (4), we find that

$$\frac{1}{N}\sum_i \left(\frac{U_H^i}{U_W^i}\right)\left(\frac{1}{(1-t_i)}\right) = 1. \tag{7}$$

Equation (7) implicitly relates establishment average reciprocal tax price to optimal health insurance contribution, H*, weighted by the relative marginal utility of employer-sponsored health insurance and wages. If tax rates increase (tax price decreases), the reciprocal tax price increases, so the ratio of marginal utilities must decrease, implying a shift of compensation from wages to health insurance.

One of the factors that affect this relative marginal utility is the availability of public health insurance through Medicaid. If Medicaid eligibility expands, the marginal utility of employer-sponsored health insurance will decline to zero for workers who enroll in Medicaid, shifting down the weighted average ratio of marginal utilities in Equation (7). Equilibrium can be restored by reducing H and increasing W. In practice, if the optimal employer contribution is low enough employers may choose not to offer any insurance. Hence, tax price and Medicaid eligibility policy variables should be related to the probability of employer offer, the size of the employer's contribution, and the likelihood of employee enrollment in public or private insurance.

Statistical Methods

As our conceptual model makes clear, tax prices and Medicaid eligibility ought to affect public and private insurance enrollment. We would like to estimate these relationships, but

individual-level Medicaid eligibility and tax prices are endogenous in an insurance offer or enrollment equation. Tax prices are endogenous because workers self-select into firms based on wage and benefit offers. Workers who value insurance will choose higher insurance offers and lower wages, resulting in lower taxes. In other words, unobservable worker preferences for insurance will be related to individual tax rates. Medicaid eligibility is endogenous because workers become eligible based on income, assets, and medical spending, among other factors, so, once again, unobservable factors that affect demand for insurance (like health status) also affect Medicaid eligibility.

To address the endogeneity of tax prices we follow Royalty (2000), Gruber (2001), Bernard and Selden (2002), and Gruber and Lettau (2004) by constructing an instrument for tax price that is exogenous to individuals within marital status-income decile-year cells. We use the national MEPS sample from each year and TAXSIM (Feenberg and Coutts, 1993) to simulate a complete set of tax prices for each observation, one for each state. The tax price instrument is the mean simulated tax price across the entire national sample matched to observations by cell and state. This instrument removes state differences in demographics and income as well as the effects of individual employment decisions, isolating the effects of tax policies. Although our approach very closely follows Royalty (2000), Gruber (2001), and Bernard and Selden (2002), it differs from Gruber and Lettau (2004) because ours is a sample of workers and Gruber and Lettau use a sample of jobs drawn from employer-based data. Like the other researchers who used samples of workers, we have to construct tax prices and link them to workers without knowing the actual mean tax price for the worker's firm. Gruber and Lettau could calculate more accurate firm-level tax prices, but had to impute worker characteristics from the Current Population Survey.

For Medicaid eligibility we follow Cutler and Gruber (1996), Hudson, Selden and Banthin (2005), Gruber and Simon (2008), and others by constructing a similar instrument for Medicaid eligibility within age-year cells. Again, we use the entire national sample and simulate a set of individual Medicaid eligibility indicators for each observation using Medicaid eligibility parameters for working adults in each state and year as recorded in documentation for the TRIM3 model (Urban Institute, 2010). The Medicaid eligibility instrument is the mean simulated eligibility rate matched to observations by cell and state (see Appendix for details). Effects of individual unobservables and state differences in income and demographics are removed, again isolating the effects of Medicaid eligibility policy differences.

Following standard practice in this literature we include a full set of control variables in our offer and coverage equations including all the variables used to define the cells (indicator variables for marital status, income decile, year, age group, and state). We also include state-year interactions and additional controls for sex, race, number of dependents, health, education, industry, union status, and firm size (see Table 1 for descriptive statistics). Identification in these models arises from interactions in the variables defining the cells that are not controlled for by interactions in independent variables. For example, the tax price effect is identified by differences in state-level changes over time in progressivity of the tax code (as in Gruber and Lettau). Similarly, longitudinal changes in state-level age eligibility gradients identify the Medicaid eligibility effect.

Using these instruments we estimate linear probability models to facilitate comparison of results with Bernard and Selden (2002) for tax price and Gruber and Simon (2008) for Medicaid.[2] Because we are using MEPS data, we also generally follow Bernard and Selden

[2] These estimates are two-step estimates, so the standard errors produced by the outcome models are not quite correct because the instruments are constructed. Gruber and Lettau (2004) argue that cell mean estimates are precise

(who also use MEPS) in our choice and definition of covariates. Like Bernard and Selden we estimate coverage models instead of take-up models. Private take-up means enrolling in one's employer's health plan and therefore would be conditional on receiving an offer. Coverage is broader, including insurance purchased individually and obtained through a spouse. This means we model tax price and Medicaid eligibility effects on total public and private insurance coverage, which is more useful for our purposes.

To check that our results are reasonable we compare our tax price and Medicaid eligibility effects to previously estimated elasticities and crowd-out effects. We use a simple definition of crowd-out, which is the proportion of the positive effect of Medicaid eligibility expansion on public insurance coverage that is offset by its negative effect on private coverage.

To explore the implications of our results, we use our tax price and Medicaid eligibility estimates to simulate the effects of changes in tax rates and Medicaid eligibility scheduled to take effect under PPACA. We start with a simulation of expanded Medicaid eligibility to all individuals under 133% of FPL with no changes in tax rates. This matches the law scheduled for 2014. Next, we simulate imposition of the "Cadillac tax," added to the Medicaid eligibility expansion. We do this in two stages with the first roughly corresponding to 2018, the first year of the tax, and the second roughly corresponding to 2030, twelve years later.

The Cadillac tax is a 40% excise tax on the portion of health insurance premium over a threshold. The tax starts in 2018 with exemptions of $10,200 and $27,500 for individual and family policies. There are adjustments for firms with older workers or high-risk professions, but not for geographic cost differences. Exemptions are indexed to the CPI-U starting in 2020. The CPI-U has historically grown more slowly than medical inflation, so, if this pattern continues,

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enough to ignore variability in the instruments and it is standard in this literature to do so. Any other approach would be further complicated in our case by data confidentiality restrictions that prevent us from merging the cell means to the person-level data ourselves.

the tax will affect a growing share of premium over time. Using distributions of premiums from the Kaiser Family Foundation (2009) and medical inflation rates we calculate that about 20% of families and 15% of individuals would have had policies exceeding the deflated values of these exemptions in 2009 (Figure 1).[3]

This tax ought to reduce demand for insurance products that have premiums over the threshold, motivating insurers to develop products that contain costs. The CBO and the Office of the Actuary assume this will happen to some degree (Elmendorf, 2009a; Foster, 2010). If costs can be contained to grow at or below the CPI-U then the thresholds will not decline in real terms and the tax price will not increase. In this paper we assume the opposite, that medical costs will continue to rise faster than general inflation and that average tax prices will increase as a result. In popular terms, we assume the Cadillac tax will be transformed by medical inflation into more of a Chevrolet tax by 2030, although successful cost controls could make this transition take longer.

The tax price is a function of marginal tax rates and the excise tax rate approximately offsets all the other payroll and income tax rates, so any firm paying a premium over the threshold faces an average tax price of approximately one. However, some firms and workers will have an incentive to rearrange compensation to stay below the excise tax threshold. Consider a firm with an average marginal tax rate of 35% and a health insurance premium rate above the threshold. The firm could reduce coverage in its insurance plan to obtain a premium rate just below the threshold and pay the savings in higher wages. Since the average marginal tax rate on wages is lower than the excise tax rate, the tax savings could be divided between the

[3] The exemption for family coverage will be $27,500 in 2018. Assuming health care costs grow at an annual rate of 6% (low by historical standards), $27,500 x 0.94^9 = $15,757. The 80th percentile of the family premium distribution was about $16,000 in 2009 (Figure 1; Kaiser Family Foundation, 2009).

workers and the owners of the firm.[4] Because the proportion of firms that will choose to do this is unknown, we select an arbitrary middle figure of 50% for simulation purposes and test alternatives of 40% and 60% for sensitivity. We do not have data on actual premiums paid, so we assume that those in firm size-state-income quintile cells with the highest mean spending on physician services covered by private insurance had the highest premiums and therefore would be most likely to exceed the threshold.

Medical inflation has averaged about 2.5 percentage points above GDP growth since 1970 (Kaiser Family Foundation, 2007), so if we assume that premiums will grow 2.5% faster than consumer prices the proportion of the premium distribution affected by the tax will grow from about 20% in 2018 to about 50% in 2030.[5] According to these calculations we simulate the effects of setting a fraction of the tax prices to one for the top 20% of the covered spending distribution in 2018 and for the top 50% of the covered spending distribution in 2030. We do this by replacing the observed tax price with a weighted average of its previous value and one.

Data and Sample

Overseen by the federal Agency for Healthcare Research and Quality, the Medical Expenditure Panel Survey (MEPS) aims to provide on-going, nationally-representative estimates of health care use, expenditures, payment sources, and insurance coverage for the civilian, noninstitutionalized U.S. population (Cohen 1997). Our study relied on person-level data from the household and medical provider components of MEPS, pooled across 2001-2006. Since MEPS has a rotating panel design with 2-year panels, we had two observations for each respondent. We used the first to measure health and functional status variables for each

[4] This kind of reorganization of compensation is not necessarily related to the rate of increase in health care costs. Costs could continue to rise at historical rates (as we assume) and firms could limit the increase in insurance premiums by shifting an increasing share of costs to workers through higher co-payments and deductibles.
[5] This is conservative because consumer prices typically grow more slowly than GDP.

respondent in the year prior to the insurance decisions under study. We employed survey weights and adjustments for complex survey design (sampling strata, primary sampling unit) as recommended in the MEPS documentation (MEPS 2007a). All analyses were done using Stata Version 11.

Given our focus on how PPACA's Medicaid expansion and high-premium excise tax will affect the working-age population, our data consisted of 31,428 observations from MEPS respondents who were between the ages of 25 and 61 and who had valid health status data from the prior year. We set our lower age cutoff at 25 years to eliminate college students who might have parental insurance as well as children who might qualify for Medicaid or CHIP directly. We set our upper age cutoff at 61 to exclude early retirees. We excluded the self-employed because the excise tax only applies to employer-based plans. We include part-time workers because they are an important component of the workforce and more likely to be influenced by changes in Medicaid policy. We include family members of workers (provided they are between 25 and 61 years old) to facilitate comparisons with previous studies and to obtain a sample that is representative of the working-age population.

We used MEPS because it reports detailed and frequent measures of health insurance status as well as standard demographics and income variables and a wide range of health and disability measures. Controlling for health and disability is a particular strength since such factors have the potential to affect Medicaid eligibility, tax rates (through income), and insurance offer (through job choice). The MEPS questionnaire asks respondents about having ever been diagnosed with any of nine conditions: asthma, chronic obstructive pulmonary disease, high blood pressure, coronary heart disease, angina, heart attack, other heart disease, stroke, and diabetes. In addition to including indicators of these conditions from the prior year in our

models, we included a measure of functional limitation. An observation is coded as having a functional limitation if it has affirmative indication of difficulty lifting, bending, reaching, grasping, standing, or walking in the previous year. We included separate variables for cognitive impairment, blindness, or major hearing impairment, persistent use of assistive devices, and indicators corresponding to self-reported health status (very good, good, fair, poor, etc.). We used lagged values of all health and disability variables so they would be predetermined relative to insurance status in the current year.

Our models also included family income, age, marital status, number of dependents, and educational attainment. Following Bernard and Selden (2002), we characterized insurance status (private or public coverage) as of December. All other variables were taken from earlier in the year.

State-level tax price and Medicaid eligibility variables described in the Statistical Methods section were merged by AHRQ staff using state identifiers not available to the public. Though the merged files did not identify states, a variable that grouped observations by state (encrypted state) was included so we could include state fixed effects in our models.

Individual tax price values, τ, that were grouped to form cell means were computed from constituent marginal tax rates according to the standard expression (Gruber and Poterba, 1996):

$$\tau = \frac{1 - t_f - t_s - t_{ss} - t_{mc}}{1 + t_{ss} + t_{mc}}$$

where t_f, t_s, t_{ss}, and t_{mc} are federal, state, Social Security, and Medicare marginal tax rates, respectively.[6] These marginal tax rates were computed from MEPS income and household composition data using TAXSIM (Feenberg and Coutts, 1993), which has a publicly available implementation accessible within Stata.

[6] Individual tax price values can be greater than one because the federal marginal tax rate can be negative for individuals with low incomes.

Sample means are shown in Table 1 and a few differences from previous studies warrant explanation. Compared to Bernard and Selden, our sample had lower offer rates (discussed below), was less male (49% vs. 57%), and more married (70% vs. 63%). Some of these differences were probably due to the exclusion of young workers (18-24 years old) and the inclusion of part-time workers in our sample. Compared to Gruber (2001), our sample had a higher rate of public insurance (6% vs. 2%) because Gruber sampled only workers, not families. Our public insurance variable is also broader, consisting of all sources of public insurance (Medicaid, TRICARE, and Medicare) in our sample. Our public insurance rate is lower than the ones in the crowd-out literature (for example Gruber and Simon find 18%) because those samples typically focus on children and parents.

Results

Comparison to the literature

Our results from the employer offer model are comparable to previously published estimates (Table 2). We find that tax prices had strong effects on employer offers and Medicaid eligibility policy did not. We estimate the elasticity of offer with respect to tax price at -0.56, which is larger in magnitude than Gruber and Lettau (2004) who found -0.25, and closer to Bernard and Selden (2002) who found -0.52 and Gruber (2001) who found -0.77. Gruber and Lettau use data from an employer survey (the Employee Compensation Survey) and employer surveys typically find higher offer rates than individual surveys (discussed in more detail by Bernard and Selden). Higher offer rates imply lower elasticities, holding effect sizes constant. The employer offer rate in our data (66%) was lower than Gruber and Lettau (91%) and lower

than Bernard and Selden (83%) who restricted their sample to full-time workers and their families.[7]

Our estimate of the elasticity of private coverage with respect to tax price is -0.42, which is only slightly lower in magnitude Bernard and Selden or Gruber (2001), who estimated -0.58 and -0.65, respectively. Our estimate of the elasticity of public coverage with respect to tax price also closely matches published estimates (3.6 compared to Gruber (2001), who found 3.7).

Turning to the effects of Medicaid eligibility, our results remain consistent with previously published estimates. The effect of Medicaid eligibility on private enrollment was -0.21 (Table 3) and statistically significant at P=0.10. Gruber and Simon (2008) found a smaller effect of -0.12. Our estimate of the effect of Medicaid eligibility on public enrollment is 0.25 (Table 4) and highly statistically significant. Gruber and Simon's estimate for family eligibility was 0.16. Combining these estimates, our measure of crowd-out is 0.82 (0.21/0.25), compared to 0.78 in Gruber and Simon.

Our estimates of the effects of specific health conditions, general health status, and functional impairments are consistent with expectations in that specific health conditions and functional impairments make public insurance coverage more likely (Table 4). Good, fair, and poor general health status also make public coverage more likely and the magnitude of effects grow as health status declines. One seemingly surprising result from the public coverage model is that workers in higher income deciles appear to be slightly more likely to be covered by public insurance. This occurs because the tax price variable is also a function of income decile, making

[7] If we restrict our sample to full-time workers and their families our offer rate increases to 80%. These studies were performed on older data (1983-95 for Gruber and Lettau and 1987 and 1996 for Bernard and Selden). Other sources confirm that the proportion of employers offering health insurance to their employees was declining over these years; for example, from 69% in 2000 to 61% in 2006 (Kaiser Family Foundation, 2009).

interpretation of income deciles while controlling for tax price difficult. Income deciles have the expected effects when we omit tax price from the model.

Our estimates of the effects of firm size correspond well with previous research. Firms with larger numbers of employees or multiple locations were more likely to offer insurance to their workers (Table 2). Workers in larger or multi-establishment firms were more likely to be covered by private insurance (Table 3), but there was not much of an effect on the probability of public insurance coverage (Table 4). Other estimates indicate that union workers were more likely to receive an employer offer (Table 2). Blacks, Hispanics, men and younger workers were less likely to be covered by private insurance while more educated workers were more likely (Table 3). Blacks and workers with dependent children were more likely to be covered by public insurance (Table 4).

Preferred specification

To this point we have followed the literature by estimating homogeneous tax price and Medicaid eligibility effects across the income distribution. These specifications facilitate comparison with the literature, but are not ideally suited to simulating the effects of tax and Medicaid eligibility policy changes scheduled under PPACA. The tax changes will affect workers in firms with high-premium health plans (a group that might have high average incomes) and the Medicaid eligibility changes will affect workers with lower incomes. To accommodate these differences we estimated specifications of the private and public coverage models in which we interacted the tax price and Medicaid eligibility variables with the set of income decile indicators. These are the specifications that we use as the foundation for policy simulations.[8]

[8] We also conducted policy simulations using the uninteracted specifications reported in Tables 3 and 4. Results were not qualitatively different.

The income-interacted private insurance model results (Table 5) indicate that Medicaid eligibility has a negative effect in the first decile (significant at P=0.10) that persists through the fifth decile and then reverts to zero in the higher deciles (illustrated in Figure 2). Tax price has a strong negative effect on the likelihood of private coverage in the first decile that declines gradually to zero by the tenth decile (Figure 3). Similarly, in the income-interacted public coverage model the effect of Medicaid eligibility is mostly confined to the first five income deciles (Table 6). The effect of tax price on public coverage, however, is strong in the first four deciles, weak in the middle, and strong again for the top three. Other results do not differ qualitatively from the specifications without income interactions.

The estimated effects of tax price on public coverage are the most novel results from these models and they have the biggest impact on policy simulations. As discussed above, the size of our estimated average effect matches other published estimates and we find that tax price affects the probability of public coverage at both ends of the income distribution. This is consistent with increased tax prices reducing the generosity of employer-sponsored insurance and increasing the likelihood that workers or family members will choose to enroll in public insurance if eligible. Most public insurance in the top two deciles is provided by TRICARE, the public insurance program for uniformed service members and retirees. Our results indicate that the choice between private insurance and TRICARE for these individuals is highly sensitive to the tax price.[9]

Our simulation results (Table 7) indicate that the scheduled expansion of Medicaid eligibility coupled with growth in the tax price will lead to a decline in private insurance and substantial growth in public insurance. Baseline results match descriptive statistics in Table 1:

[9] We estimated a version of our analysis with a sample that excluded TRICARE recipients to test the robustness of our results. Similar to the preferred sample, the restricted sample analysis predicted that public insurance will nearly double from baseline to 2030 (although from a lower base without TRICARE).

66% of workers received an offer from an employer, 80% were covered by private insurance, 6% were covered by public insurance, and 14% were uninsured. The simulation of expanded Medicaid eligibility to 133% of FPL for all individuals, scheduled to go into effect in 2014, has small effects. This is consistent with the fact that most workers already have insurance from other sources that they may prefer to Medicaid coverage because Medicaid is less broadly accepted by providers, can be stigmatizing, and is often administratively difficult to obtain (Zuckerman et al., 2004; Stuber and Kronebusch, 2004). The simulated offer rate declines by 2 percentage points, the private coverage rate declines by 1 percentage point, the public insurance rate rises by 1.7 percentage points, and the "uninsured" decline by 0.6. Recall that PPACA requires all individuals to have coverage in 2014, so the "uninsured" in this and subsequent simulations refers to those who would have chosen to remain uninsured if there were no individual mandate and no subsidized insurance exchanges. These results are roughly consistent with our crowd-out estimate that four fifths of the new Medicaid enrollment is expected to come from individuals who would have otherwise been privately insured.[10]

The next simulation increases the tax price for those in the top 20% of the covered spending distribution, which is the proportion that we predict will be affected by the excise tax in 2018 if health care costs continue to grow as they have in the past. Some firms will modify their insurance offer to avoid the tax and we have little empirical basis for estimating the proportion that will do so. In what follows, we assume that half the affected distribution avoids the tax and the other half faces a tax price of one.[11] This change reduces the predicted offer rate to 62% and

[10] The crowd-out rate in this simulation is 75%, which differs slightly from the previous crowd-out estimate because this simulation was based on the interacted models shown in Tables 5 and 6.

[11] The CMS Office of the Actuary predicts that firms will reduce benefits to eliminate 75% of the value of benefits over the threshold (Foster, 2010), but this does not translate easily into a proportion that will avoid the tax entirely. We conducted simulations featuring alternative tax avoidance assumptions (60% and 40%). Results are presented in the Appendix and do not differ qualitatively.

the private coverage rate to 78% while increasing the public coverage rate to 9% and reducing the "uninsured" rate to 13%. The last simulation replaces these tax price changes by setting tax price to 1 for half of the top 50% of the covered spending distribution, which is our prediction of the impact of the excise tax in 2030 if health care costs continue to grow. This version of the tax reduces the simulated offer rate to 59% and the private coverage rate to 77% while increasing the public coverage rate to 11% and reducing the "uninsured" rate to 12%.[12]

To help think about who the "uninsured" are and what they might do in the future we tabulated those in our sample who enrolled in neither public nor private insurance by FPL and computed the percentage in each income group that received an insurance offer from their employer (Table 8). Overall, the fraction with an offer was approximately 28%, with higher income workers more likely to receive an offer.

We can use this information to roughly estimate how the otherwise uninsured might be reallocated between public insurance, employer-sponsored insurance, and subsidized, exchange-purchased insurance under the mandate. Table 8 shows that about 24% of the uninsured had incomes below 133% FPL, so these individuals would qualify for Medicaid. About 55% the sample had incomes between 133% and 400% FPL and roughly 70% of this group did not receive an employer offer, so about 39% of the uninsured will probably find their best option to be subsidized insurance purchased through an exchange (55% x 70% = 39%). 17% of the uninsured were under 400% FPL, not eligible for Medicaid, and received an employer offer. Some would take it up and some would do better taking the subsidy in the exchange (provided they have access). In our calculations we assume that after the mandate all workers receiving an

[12] It is unlikely that higher tax prices will reduce the percentage uninsured. This result is generated in the simulation because the percentage uninsured is calculated as those not publicly or privately insured. As the tax price increases, the predicted percentage insured publicly increases more than the predicted decrease in the percentage insured privately. This anomaly disappears in the reallocated results.

offer from their employer will take it up. The remaining 21% of the uninsured was over 400% FPL, so their only option would be unsubsidized private insurance. These calculations suggest that roughly 63% (39% + 24%) of the "uninsured" in our projections are likely to choose Medicaid or subsidized insurance through exchanges. Most of the remaining 37% (about 5% of the total sample in 2030) will enroll in unsubsidized private insurance, more than offsetting the predicted decline in private enrollment. Adding it all up, our prediction is that public insurance will grow from covering about 6% of workers and their families to about 14% in 2030. The exchanges will enroll at least 5% with subsidies, and the remaining 81% will purchase unsubsidized private insurance either through their employers or the exchanges.[13]

Conclusion

We apply established methods to recent data from MEPS to estimate the effects of variations in the tax treatment of health insurance and Medicaid eligibility policy on enrollment by workers and their families in private and public health insurance. We find that Medicaid expansions for working adults crowd-out private insurance at a high rate and that higher tax prices make private coverage less attractive and public coverage more attractive to lower-income workers. We use these estimates to simulate the effects of the Cadillac tax and Medicaid eligibility provisions of PPACA in 2014, 2018, and 2030, assuming that health care costs continue to grow as they have in the past. We find that the Medicaid eligibility expansion will have relatively small effects on the number uninsured, with about four fifths of the public expansion crowding out private coverage. The excise tax will add to this trend, shifting additional workers and their families from private to public insurance, with the bulk of that shift occurring between 2018 and 2030 as the real value of exemptions from the tax erode due to

[13] A fraction of privately insured workers currently purchase insurance individually instead of through an employer. After 2014, some of these individuals will choose to obtain coverage through exchanges. We do not account for this in our calculations because our sample excludes the self-employed and so this fraction is very small.

health care cost inflation. The mandate is expected to offset what would otherwise be a decline in private insurance induced by the other provisions. At the same time, the mandate will amplify the increase in public insurance caused by the Medicaid expansion and the tax.

One question raised by these results is: how will an excise tax targeted at high-premium insurance plans (presumably purchased by relatively high-income workers) lead to increases in public coverage that is principally available to those with relatively low incomes? The answer is that workers in cells at the top of the covered spending distribution have relatively high family incomes on average, but there are still substantial numbers in the lower-income deciles (Figure 4). Our results show that higher tax prices induce lower income workers and their families to be less likely to enroll in private insurance and more likely to enroll in public insurance. One mechanism through which this could occur is if employer offers require larger employee contributions as tax prices rise. It is well known that a primary reason for not taking up an employer offer is the level of employee contribution required (Jacobs, 2009) and that the proportion of workers who choose not to take up their employer's offer has been growing in recent years (Cooper and Schone, 1997; Cutler, 2003).

There are several important cautions relevant to our predictions. First, the individual mandate and the subsidized exchanges created by PPACA do not exist in the data. Consequently, our predictions of the effects of these provisions are rough approximations. Second, the cost containment provisions of PPACA will probably succeed to some degree and we have assumed that they will have no effect. For this reason, actual coverage shifts might be smaller or take longer than our estimates indicate. Third, we do not have data on actual premiums paid and we do not know what proportion of employers will shift costs to workers to avoid paying the excise tax. To simulate the effects of PPACA we had to make assumptions in

these areas, but our underlying estimates of the sensitivity of coverage type to Medicaid and tax policy were not affected. Fourth, controversy remains about the best way to estimate the effects of Medicaid eligibility policy on public and private insurance enrollment (Ham and Shore-Sheppard, 2005; Gruber and Simon, 2008). We have chosen a method that is widely used and consistent with our approach to estimating tax policy effects. Other approaches might produce different results. Finally, there are many policy and program details that we cannot account for. For example, employers might prefer to have their workers obtain coverage through exchanges (where the subsidies are paid by the federal government) instead of through the employer-sponsored plan where the employer pays most of the cost of each enrollee at the margin. PPACA includes penalties to reduce the employer's incentive to send subsidy-eligible workers to exchanges, but we do not attempt to assess how effective they will be.

These and many other factors add to the uncertainty involved in making long-run projections, so the specific numbers in our simulations should be considered to be highly imprecise predictions. The general trends, however, are clear. If health care costs continue to rise as they have in the past, the tax price of employer-sponsored insurance will grow, beginning in 2018. This change will shift increasing numbers of workers from employer-sponsored insurance to public insurance and federally subsidized insurance purchased through exchanges. The associated demand for higher federal and state outlays will be substantial, although it may be offset by growing revenue from the excise tax (and the income tax as compensation shifts to wages).[14] Despite the effects of the tax and Medicaid provisions, the mandate and exchange provisions will cause a temporary increase in the proportion of workers and their families

[14] We do not attempt to predict how much revenue will be raised by these taxes. The Office of the Actuary assumes that the excise tax will generate revenue because exemptions will increase more slowly than costs, although firms will modify coverage to minimize their tax exposure (Foster, 2010). The CBO assumes that higher taxes on health insurance will shift total compensation to wages and increase income tax revenue (Elmendorf, 2009b).

covered by private insurance (the share covered by public insurance will grow too). This increase in private coverage will erode as the tax affects a growing share of the premium distribution. When the Medicaid, tax, exchange, and mandate provisions of PPACA are all considered over 20 years, the uninsured will be absorbed mostly by public insurance with substantial help from subsidized coverage through exchanges, and private insurance will remain about the same.

Variable Glossary	
Variable	**Description**
offer	Receives an employer offer
ins_pri_de	Covered by private insurance in December
ins_pub_de	Covered by public insurance in December
mcaid_elig	Medicaid eligibility instrument (see text and appendix)
mean_tp	Tax price instrument (see text)
age5_25_29	
age5_30_34	
age5_35_39	
age5_40_44	Five-year age band dummy variables for indicated age ranges.
age5_45_49	
age5_50_54	
age5_55_59	
male	Not female
black	African American
hispanic	Hispanic
edyrs12	12 years of education
edyrs13_16	13-16 years of education
edyrs17_up	17 or more years of education
marry[1]	Married
dep_chld[1]	Number of dependent children
msa	Lives in MSA
inctile2	
inctile3	
inctile4	
inctile5	
inctile6	Decile of family income
inctile7	
inctile8	
inctile9	
inctile10	
one_estab~20[2]	Single establishment firm, 11-20 workers
one_estab~50[2]	Single establishment firm, 21-50 workers
one_esta~200[2]	Single establishment firm, 51-200 workers
one_estab2~p[2]	Single establishment firm, 201+ workers
mult_estab[3]	Multiple establishment firm
manu_01[3]	Manufacturing industry indicator (pre-2002 definitions)
manu_02[3]	Manufacturing industry indicator (post-2001 definitions)
svc_01[3]	Service industry indicator (pre-2002 definitions)
svc_02[3]	Service industry indicator (post-2001 definitions)
union[3]	Union indicator
Lasthdx	Asthma diagnosis in prior year
Lhibpdx	High blood pressure diagnosis in prior year
Lchddx	CHD diagnosis in prior year
Langidx	Angina diagnosis in prior year

Lmidx	MI diagnosis in prior year
Lohrtdx	Other heart condition diagnosis in prior year
Lstrkdx	Stroke diagnosis in prior year
Lemphdx	Emphysema diagnosis in prior year
Ldiabdx	Diabetes diagnosis in prior year
Lhlth_vgood	
Lhlth_good	Self-reported health status in prior year
Lhlth_fair	
Lhlth_poor	
Lfunclim_s~e	Severe functional limitation in prior year
Lcoglim	Cognitive limitation in prior year
Lvisimp_se~e	Severe vision impairment in prior year
Lhearimp_s~e	Severe hearing impairment in prior year
Lassist	Use assistive devices in prior year
y01	
y02	Year indicators
y03	
y04	
y06	

[1]Status of highest earner in family was applied to all family members.
[2]Maximum value for family was used.
[3]Indicator coded affirmative if any members of family qualify for category.

Table 1. Weighted Means

Variable	Obs	Mean	Std. Dev.	Min	Max
offer	31428	0.661	0.473	0	1
ins_pri_de	31428	0.805	0.396	0	1
ins_pub_de	31428	0.056	0.230	0	1
mcaid_elig	31428	0.085	0.065	0.010	0.566
mean_tp	31428	0.652	0.089	0.500	1.024
age5_25_29	31428	0.121	0.326	0	1
age5_30_34	31428	0.150	0.357	0	1
age5_35_39	31428	0.152	0.359	0	1
age5_40_44	31428	0.163	0.369	0	1
age5_45_49	31428	0.150	0.357	0	1
age5_50_54	31428	0.132	0.339	0	1
age5_55_59	31428	0.104	0.305	0	1
male	31428	0.490	0.500	0	1
black	31428	0.113	0.317	0	1
hispanic	31428	0.135	0.342	0	1
edyrs12	31428	0.316	0.465	0	1
edyrs13_16	31428	0.434	0.496	0	1
edyrs17_up	31428	0.123	0.328	0	1
marry	31428	0.698	0.459	0	1
dep_chld	31428	0.863	1.133	0	10
msa	31428	0.842	0.365	0	1
inctile2	31428	0.069	0.253	0	1
inctile3	31428	0.080	0.271	0	1
inctile4	31428	0.093	0.290	0	1
inctile5	31428	0.094	0.292	0	1
inctile6	31428	0.106	0.308	0	1
inctile7	31428	0.114	0.318	0	1
inctile8	31428	0.126	0.331	0	1
inctile9	31428	0.126	0.332	0	1
inctile10	31428	0.134	0.340	0	1
one_estab~20	31428	0.034	0.181	0	1
one_estab~50	31428	0.038	0.192	0	1
one_esta~200	31428	0.045	0.208	0	1
one_estab2~p	31428	0.047	0.211	0	1
mult_estab	31428	0.689	0.463	0	1
manu_01	31428	0.041	0.198	0	1
manu_02	31428	0.273	0.446	0	1
svc_01	31428	0.066	0.249	0	1
svc_02	31428	0.550	0.498	0	1
union	31428	0.156	0.363	0	1
Lasthdx	31428	0.085	0.280	0	1
Lhibpdx	31428	0.173	0.379	0	1
Lchddx	31428	0.010	0.100	0	1
Langidx	31428	0.008	0.088	0	1

Lmidx	31428	0.011	0.105	0	1
Lohrtdx	31428	0.037	0.188	0	1
Lstrkdx	31428	0.007	0.082	0	1
Lemphdx	31428	0.004	0.067	0	1
Ldiabdx	31428	0.042	0.202	0	1
Lhlth_vgood	31428	0.362	0.480	0	1
Lhlth_good	31428	0.281	0.449	0	1
Lhlth_fair	31428	0.069	0.254	0	1
Lhlth_poor	31428	0.015	0.123	0	1
Lfunclim_s~e	31428	0.014	0.118	0	1
Lcoglim	31428	0.005	0.071	0	1
Lvisimp_se~e	31428	0.002	0.043	0	1
Lhearimp_s~e	31428	0.003	0.058	0	1
Lassist	31428	0.004	0.062	0	1
y02	31428	0.193	0.394	0	1
y03	31428	0.172	0.378	0	1
y04	31428	0.176	0.381	0	1
y05	31428	0.177	0.382	0	1
y06	31428	0.167	0.373	0	1

Omitting state effects and state-year interactions.
Weighted using MEPS person weight.

Table 2. Linear Probability Model for Receipt of Health Insurance Offer from Employer

	Coeff.	Std. Err.	t	P>|t|
mcaid_elig	-0.236	0.142	-1.66	0.096
mean_tp	-0.566	0.071	-8	0
age5_25_29	0.063	0.022	2.83	0.005
age5_30_34	0.062	0.022	2.85	0.004
age5_35_39	0.071	0.020	3.47	0.001
age5_40_44	0.060	0.019	3.19	0.001
age5_45_49	0.053	0.018	2.98	0.003
age5_50_54	0.033	0.018	1.87	0.062
age5_55_59	0.008	0.018	0.47	0.641
male	0.132	0.005	25.67	0
black	0.049	0.008	6.17	0
hispanic	-0.031	0.008	-3.87	0
edyrs12	0.075	0.008	9.2	0
edyrs13_16	0.101	0.009	11.74	0
edyrs17_up	0.149	0.011	13.07	0
marry	-0.197	0.007	-27.21	0
dep_chld	-0.019	0.002	-7.54	0
msa	-0.002	0.008	-0.28	0.781
inctile2	0.100	0.014	7.17	0
inctile3	0.148	0.018	8.31	0
inctile4	0.186	0.019	9.82	0
inctile5	0.217	0.020	10.88	0
inctile6	0.231	0.020	11.28	0
inctile7	0.247	0.021	11.64	0
inctile8	0.234	0.023	10.03	0
inctile9	0.211	0.026	8.2	0
inctile10	0.176	0.028	6.41	0
one_estab~20	0.004	0.015	0.29	0.774
one_estab~50	0.073	0.014	5.13	0
one_esta~200	0.122	0.013	9.41	0
one_estab2~p	0.141	0.013	10.61	0
mult_estab	0.146	0.008	19.39	0
manu_01	-0.075	0.028	-2.67	0.008
manu_02	-0.011	0.011	-0.97	0.333
svc_01	-0.069	0.027	-2.55	0.011
svc_02	-0.009	0.011	-0.81	0.418
union	0.066	0.007	9.06	0
Lasthdx	0.011	0.009	1.14	0.252
Lhibpdx	0.019	0.007	2.75	0.006
Lchddx	-0.035	0.033	-1.07	0.286
Langidx	0.001	0.034	0.02	0.987
Lmidx	-0.037	0.030	-1.21	0.228
Lohrtdx	0.012	0.014	0.88	0.379
Lstrkdx	-0.093	0.032	-2.91	0.004

Lemphdx	0.020	0.037	0.53	0.597
Ldiabdx	0.008	0.012	0.6	0.546
Lhlth_vgood	0.011	0.007	1.66	0.096
Lhlth_good	0.007	0.007	1.03	0.304
Lhlth_fair	-0.023	0.011	-2.13	0.033
Lhlth_poor	-0.090	0.021	-4.22	0
Lfunclim_s~e	-0.135	0.025	-5.46	0
Lcoglim	-0.152	0.036	-4.22	0
Lvisimp_se~e	0.135	0.063	2.15	0.031
Lhearimp_s~e	0.036	0.044	0.81	0.418
Lassist	-0.060	0.045	-1.35	0.178
y02	-0.028	0.035	-0.81	0.418
y03	-0.031	0.035	-0.88	0.377
y04	-0.057	0.036	-1.6	0.109
y05	-0.062	0.036	-1.72	0.086
y06	-0.087	0.035	-2.45	0.014
N	31,428			
R-squared	0.188			

State and year*state effects omitted.
Standard errors are heteroskedasticity robust.

Table 3. Linear Probability Model for Private Insurance Coverage

	Coeff.	Std. Err.	t	P>|t|
mcaid_elig	-0.208	0.104	-2	0.046
mean_tp	-0.513	0.062	-8.22	0
age5_25_29	-0.066	0.017	-4.02	0
age5_30_34	-0.042	0.016	-2.63	0.009
age5_35_39	-0.013	0.015	-0.87	0.384
age5_40_44	-0.021	0.014	-1.56	0.119
age5_45_49	-0.031	0.013	-2.43	0.015
age5_50_54	-0.028	0.013	-2.2	0.028
age5_55_59	-0.010	0.013	-0.82	0.415
male	-0.011	0.004	-2.68	0.007
black	-0.021	0.007	-3.12	0.002
hispanic	-0.096	0.007	-13.99	0
edyrs12	0.104	0.007	14.17	0
edyrs13_16	0.130	0.008	17.02	0
edyrs17_up	0.143	0.009	16.14	0
marry	-0.015	0.006	-2.38	0.017
dep_chld	-0.017	0.002	-8.56	0
msa	0.011	0.006	1.8	0.073
inctile2	0.123	0.013	9.57	0
inctile3	0.213	0.016	12.97	0
inctile4	0.289	0.017	16.65	0
inctile5	0.369	0.018	20.64	0
inctile6	0.406	0.018	22.41	0
inctile7	0.440	0.018	23.83	0
inctile8	0.443	0.020	21.71	0
inctile9	0.426	0.023	18.81	0
inctile10	0.413	0.024	17.22	0
one_estab~20	0.004	0.013	0.27	0.784
one_estab~50	0.051	0.013	4.07	0
one_esta~200	0.109	0.011	10.02	0
one_estab2~p	0.179	0.011	16.65	0
mult_estab	0.132	0.006	21.14	0
manu_01	-0.041	0.019	-2.13	0.033
manu_02	-0.036	0.008	-4.59	0
svc_01	-0.036	0.018	-1.98	0.048
svc_02	-0.041	0.007	-5.52	0
union	0.087	0.005	17.17	0
Lasthdx	-0.006	0.007	-0.81	0.416
Lhibpdx	0.020	0.005	3.78	0
Lchddx	0.033	0.025	1.35	0.178
Langidx	-0.023	0.028	-0.85	0.395
Lmidx	-0.064	0.025	-2.61	0.009
Lohrtdx	0.012	0.010	1.16	0.244
Lstrkdx	0.036	0.026	1.4	0.162

Lemphdx	0.030	0.031	0.99	0.324
Ldiabdx	0.018	0.010	1.81	0.071
Lhlth_vgood	0.006	0.005	1.22	0.222
Lhlth_good	-0.004	0.006	-0.75	0.45
Lhlth_fair	-0.033	0.009	-3.67	0
Lhlth_poor	-0.068	0.019	-3.58	0
Lfunclim_s~e	-0.021	0.021	-1	0.318
Lcoglim	-0.032	0.030	-1.05	0.292
Lvisimp_se~e	0.031	0.051	0.62	0.535
Lhearimp_s~e	-0.015	0.036	-0.41	0.681
Lassist	-0.007	0.035	-0.19	0.849
y02	-0.012	0.026	-0.45	0.655
y03	-0.041	0.027	-1.5	0.135
y04	-0.042	0.027	-1.56	0.118
y05	-0.035	0.028	-1.25	0.212
y06	-0.079	0.027	-2.88	0.004
N	31,428			
R-Squared	0.378			

State and year*state effects omitted.
Standard errors are heteroskedasticity robust.

Table 4. Linear Probability Model for Public Insurance Coverage

	Coeff.	Std. Err.	t	P>|t|
mcaid_elig	0.253	0.079	3.21	0.001
mean_tp	0.307	0.053	5.76	0
age5_25_29	-0.035	0.013	-2.72	0.007
age5_30_34	-0.056	0.013	-4.38	0
age5_35_39	-0.056	0.012	-4.66	0
age5_40_44	-0.044	0.011	-3.87	0
age5_45_49	-0.035	0.011	-3.35	0.001
age5_50_54	-0.017	0.011	-1.65	0.099
age5_55_59	-0.003	0.011	-0.27	0.787
male	-0.020	0.003	-7.15	0
black	0.026	0.005	5.14	0
hispanic	-0.020	0.005	-4.41	0
edyrs12	-0.008	0.005	-1.5	0.133
edyrs13_16	-0.020	0.005	-3.88	0
edyrs17_up	-0.023	0.006	-3.8	0
marry	0.005	0.005	1.14	0.255
dep_chld	0.026	0.002	16.34	0
msa	0.001	0.004	0.12	0.903
inctile2	-0.049	0.011	-4.46	0
inctile3	-0.070	0.013	-5.36	0
inctile4	-0.078	0.014	-5.7	0
inctile5	-0.104	0.014	-7.49	0
inctile6	-0.106	0.014	-7.4	0
inctile7	-0.109	0.015	-7.38	0
inctile8	-0.093	0.017	-5.59	0
inctile9	-0.087	0.018	-4.7	0
inctile10	-0.078	0.020	-3.98	0
one_estab~20	-0.014	0.008	-1.64	0.102
one_estab~50	0.000	0.009	-0.03	0.973
one_esta~200	-0.006	0.008	-0.76	0.446
one_estab2~p	-0.019	0.007	-2.7	0.007
mult_estab	-0.003	0.004	-0.73	0.465
manu_01	-0.071	0.020	-3.59	0
manu_02	-0.049	0.007	-6.87	0
svc_01	-0.063	0.019	-3.24	0.001
svc_02	-0.034	0.007	-4.85	0
union	-0.026	0.003	-7.44	0
Lasthdx	0.013	0.006	2.29	0.022
Lhibpdx	0.012	0.004	2.8	0.005
Lchddx	-0.027	0.022	-1.22	0.223
Langidx	0.076	0.026	2.88	0.004
Lmidx	0.037	0.021	1.77	0.076
Lohrtdx	0.011	0.009	1.28	0.2
Lstrkdx	0.050	0.025	2.01	0.044

Lemphdx	0.014	0.026	0.54	0.592
Ldiabdx	0.020	0.008	2.45	0.014
Lhlth_vgood	-0.003	0.003	-0.86	0.392
Lhlth_good	0.003	0.004	0.83	0.408
Lhlth_fair	0.029	0.007	4.13	0
Lhlth_poor	0.105	0.018	5.91	0
Lfunclim_s~e	0.160	0.023	6.9	0
Lcoglim	0.196	0.037	5.26	0
Lvisimp_se~e	-0.037	0.039	-0.94	0.346
Lhearimp_s~e	0.030	0.029	1.05	0.292
Lassist	0.219	0.046	4.78	0
y02	-0.041	0.024	-1.67	0.094
y03	-0.044	0.025	-1.74	0.082
y04	-0.028	0.025	-1.1	0.273
y05	-0.006	0.026	-0.25	0.806
y06	-0.019	0.026	-0.75	0.456
N	31,428			
R-Squared	0.124			

State and year*state effects omitted.
Standard errors are heteroskedasticity robust.

Table 5. Private Insurance Model with Income Decile Interactions

	Coeff.	Std. Err.	t	P>|t|
mcaid_elig	-0.275	0.170	-1.62	0.105
mcaid_inc2	-0.382	0.207	-1.85	0.065
mcaid_inc3	-0.239	0.195	-1.22	0.222
mcaid_inc4	-0.084	0.189	-0.44	0.658
mcaid_inc5	-0.034	0.184	-0.19	0.852
mcaid_inc6	0.116	0.171	0.68	0.496
mcaid_inc7	0.321	0.162	1.98	0.048
mcaid_inc8	0.332	0.154	2.15	0.031
mcaid_inc9	0.451	0.156	2.89	0.004
mcaid_inc10	0.434	0.158	2.75	0.006
mean_tp	-0.597	0.114	-5.26	0
tp_inc2	-0.089	0.149	-0.59	0.554
tp_inc3	-0.895	0.232	-3.85	0
tp_inc4	-0.752	0.295	-2.55	0.011
tp_inc5	0.224	0.199	1.13	0.26
tp_inc6	0.372	0.187	1.99	0.047
tp_inc7	0.677	0.180	3.76	0
tp_inc8	0.665	0.162	4.1	0
tp_inc9	0.491	0.206	2.38	0.017
tp_inc10	0.753	0.192	3.92	0
age5_25_29	-0.067	0.016	-4.05	0
age5_30_34	-0.045	0.016	-2.81	0.005
age5_35_39	-0.016	0.015	-1.11	0.268
age5_40_44	-0.024	0.014	-1.77	0.076
age5_45_49	-0.031	0.013	-2.48	0.013
age5_50_54	-0.026	0.012	-2.1	0.036
age5_55_59	-0.010	0.013	-0.76	0.445
male	-0.010	0.004	-2.39	0.017
black	-0.023	0.007	-3.43	0.001
hispanic	-0.093	0.007	-13.57	0
edyrs12	0.103	0.007	14.02	0
edyrs13_16	0.130	0.008	17.03	0
edyrs17_up	0.145	0.009	16.49	0
marry	-0.014	0.007	-1.97	0.049
dep_chld	-0.017	0.002	-8.42	0
msa	0.012	0.006	2.01	0.044
inctile2	0.217	0.127	1.71	0.087
inctile3	0.840	0.173	4.85	0
inctile4	0.782	0.207	3.77	0
inctile5	0.205	0.147	1.4	0.162
inctile6	0.131	0.139	0.94	0.346
inctile7	-0.048	0.135	-0.35	0.723
inctile8	-0.017	0.122	-0.14	0.888
inctile9	0.080	0.141	0.57	0.568

inctile10	-0.069	0.133	-0.52	0.604
one_estab~20	0.005	0.013	0.37	0.713
one_estab~50	0.053	0.013	4.18	0
one_esta~200	0.110	0.011	10.13	0
one_estab2~p	0.177	0.011	16.47	0
mult_estab	0.132	0.006	21.17	0
manu_01	-0.047	0.019	-2.48	0.013
manu_02	-0.036	0.008	-4.59	0
svc_01	-0.042	0.018	-2.31	0.021
svc_02	-0.042	0.007	-5.7	0
union	0.086	0.005	17.09	0
Lasthdx	-0.006	0.007	-0.87	0.386
Lhibpdx	0.020	0.005	3.69	0
Lchddx	0.039	0.024	1.58	0.115
Langidx	-0.027	0.028	-0.96	0.335
Lmidx	-0.067	0.024	-2.75	0.006
Lohrtdx	0.014	0.010	1.39	0.165
Lstrkdx	0.034	0.025	1.34	0.179
Lemphdx	0.026	0.030	0.87	0.383
Ldiabdx	0.017	0.010	1.67	0.094
Lhlth_vgood	0.007	0.005	1.34	0.179
Lhlth_good	-0.003	0.006	-0.62	0.533
Lhlth_fair	-0.033	0.009	-3.66	0
Lhlth_poor	-0.068	0.019	-3.6	0
Lfunclim_s~e	-0.023	0.021	-1.11	0.267
Lcoglim	-0.030	0.030	-1	0.317
Lvisimp_se~e	0.028	0.050	0.56	0.576
Lhearimp_s~e	-0.013	0.036	-0.35	0.727
Lassist	-0.008	0.035	-0.24	0.81
y02	-0.017	0.026	-0.67	0.503
y03	-0.044	0.027	-1.64	0.102
y04	-0.049	0.027	-1.82	0.069
y05	-0.038	0.028	-1.39	0.166
y06	-0.083	0.027	-3.07	0.002
N	31,428			
R-Squared	0.38			

State and year*state effects omitted.
Standard errors are heteroskedasticity robust.

Table 6. Public Insurance Model with Income Decile Interactions

	Coeff.	Std. Err.	t	P>|t|
mcaid_elig	1.136	0.171	6.63	0
mcaid_inc2	-0.267	0.197	-1.36	0.174
mcaid_inc3	-0.739	0.176	-4.19	0
mcaid_inc4	-0.772	0.172	-4.47	0
mcaid_inc5	-0.984	0.168	-5.84	0
mcaid_inc6	-1.164	0.160	-7.26	0
mcaid_inc7	-1.072	0.163	-6.58	0
mcaid_inc8	-1.123	0.161	-6.98	0
mcaid_inc9	-1.210	0.165	-7.35	0
mcaid_inc10	-1.276	0.162	-7.88	0
mean_tp	0.376	0.114	3.31	0.001
tp_inc2	-0.177	0.135	-1.31	0.19
tp_inc3	0.146	0.183	0.8	0.424
tp_inc4	0.244	0.215	1.13	0.257
tp_inc5	-0.432	0.144	-3.01	0.003
tp_inc6	-0.240	0.137	-1.75	0.081
tp_inc7	-0.206	0.145	-1.42	0.156
tp_inc8	-0.010	0.140	-0.07	0.942
tp_inc9	0.409	0.166	2.46	0.014
tp_inc10	0.138	0.163	0.85	0.396
age5_25_29	-0.041	0.013	-3.2	0.001
age5_30_34	-0.056	0.013	-4.46	0
age5_35_39	-0.054	0.012	-4.53	0
age5_40_44	-0.042	0.011	-3.75	0
age5_45_49	-0.035	0.010	-3.36	0.001
age5_50_54	-0.019	0.010	-1.78	0.075
age5_55_59	-0.003	0.011	-0.26	0.795
male	-0.021	0.003	-7.54	0
black	0.027	0.005	5.41	0
hispanic	-0.021	0.005	-4.52	0
edyrs12	-0.009	0.005	-1.77	0.076
edyrs13_16	-0.021	0.005	-4.08	0
edyrs17_up	-0.024	0.006	-3.95	0
marry	0.011	0.005	2.13	0.034
dep_chld	0.026	0.002	16.44	0
msa	-0.001	0.004	-0.25	0.801
inctile2	0.117	0.113	1.03	0.301
inctile3	-0.097	0.139	-0.7	0.486
inctile4	-0.161	0.156	-1.04	0.3
inctile5	0.281	0.113	2.48	0.013
inctile6	0.165	0.110	1.51	0.132
inctile7	0.130	0.114	1.15	0.251
inctile8	0.024	0.109	0.22	0.825
inctile9	-0.205	0.119	-1.71	0.087

inctile10	-0.030	0.118	-0.26	0.798
one_estab~20	-0.014	0.008	-1.64	0.101
one_estab~50	-0.001	0.009	-0.11	0.911
one_esta~200	-0.007	0.008	-0.99	0.32
one_estab2~p	-0.019	0.007	-2.79	0.005
mult_estab	-0.004	0.004	-0.88	0.378
manu_01	-0.067	0.020	-3.42	0.001
manu_02	-0.050	0.007	-6.99	0
svc_01	-0.060	0.019	-3.11	0.002
svc_02	-0.033	0.007	-4.79	0
union	-0.026	0.003	-7.37	0
Lasthdx	0.014	0.006	2.38	0.017
Lhibpdx	0.011	0.004	2.75	0.006
Lchddx	-0.028	0.022	-1.27	0.204
Langidx	0.077	0.026	2.94	0.003
Lmidx	0.039	0.021	1.85	0.064
Lohrtdx	0.009	0.009	1.06	0.288
Lstrkdx	0.048	0.025	1.95	0.051
Lemphdx	0.018	0.026	0.69	0.489
Ldiabdx	0.021	0.008	2.51	0.012
Lhlth_vgood	-0.003	0.003	-0.97	0.334
Lhlth_good	0.002	0.004	0.61	0.542
Lhlth_fair	0.031	0.007	4.31	0
Lhlth_poor	0.105	0.018	5.94	0
Lfunclim_s~e	0.164	0.023	7.07	0
Lcoglim	0.193	0.037	5.22	0
Lvisimp_se~e	-0.036	0.039	-0.92	0.356
Lhearimp_s~e	0.028	0.029	0.99	0.323
Lassist	0.217	0.046	4.75	0
y02	-0.038	0.024	-1.58	0.113
y03	-0.043	0.025	-1.71	0.086
y04	-0.026	0.025	-1.03	0.301
y05	-0.007	0.026	-0.27	0.784
y06	-0.017	0.026	-0.67	0.5
N	31,428			
R-Squared	0.132			

State and year*state effects omitted.
Standard errors are heteroskedasticity robust.

Table 7. Simulated Distribution of Workers and Families by Health Insurance Status

	Offer	Private Ins.	Public Ins.	Uninsured
Baseline	65.8%	79.9%	5.9%	14.3%
Simulations without reallocating uninsured*				
2014	63.8%	78.7%	7.6%	13.7%
2018	61.7%	78.2%	9.2%	12.6%
2030	58.6%	76.8%	11.4%	11.7%
Simulations with uninsured reallocated				
	Exchange	Private Ins.	Public Ins.	Uninsured
2014	5%	84%	11%	0%
2018	5%	83%	12%	0%
2030	5%	81%	14%	0%

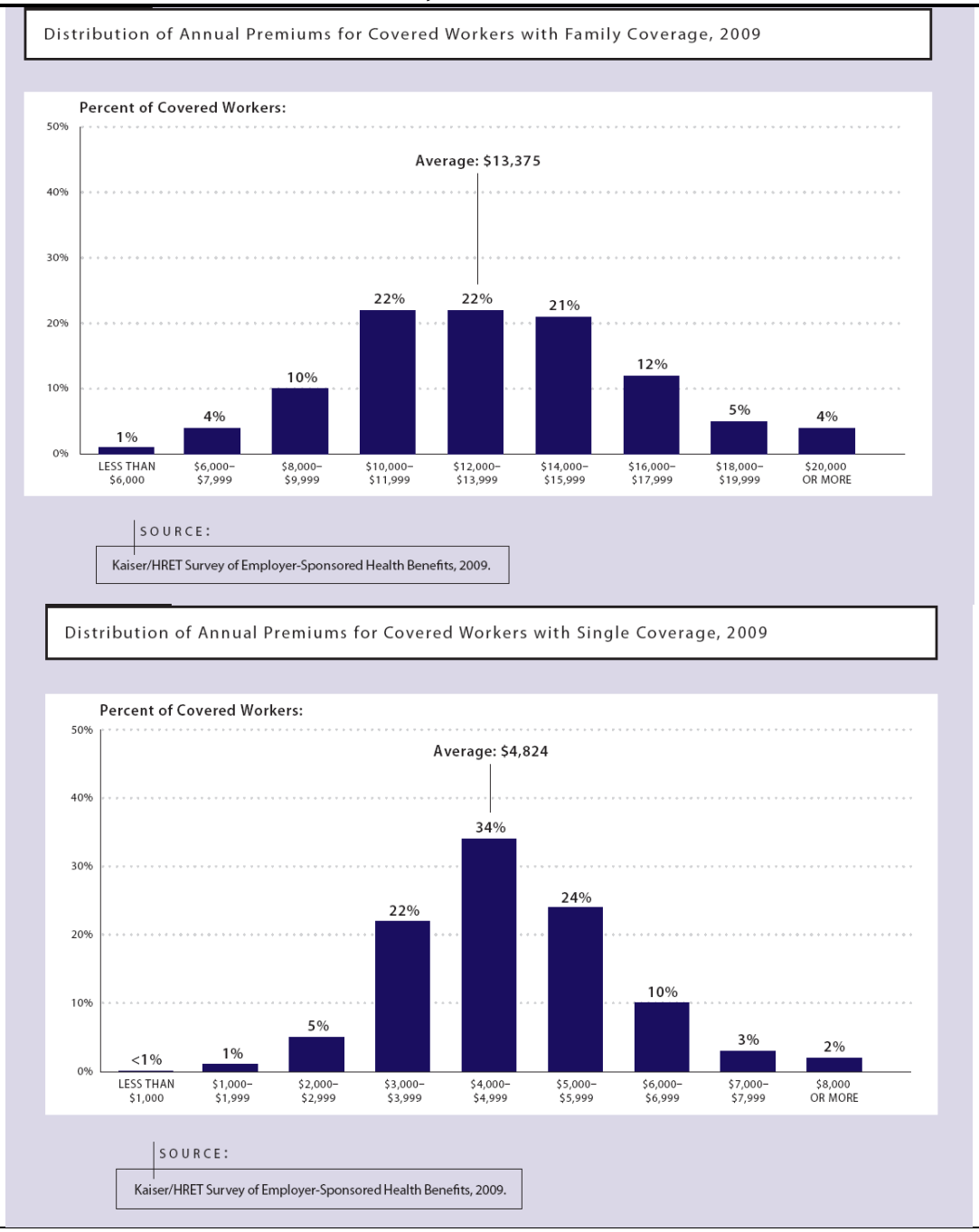
Offer: Received health insurance offer from employer.
Private Ins: Covered by private insurance.
Public Ins: Covered by public insurance.
Uninsured: Not covered by insurance; computed as remainder.
Exchange: Covered by subsidized insurance purchased through exchange.
*Uninsured will be subject to individual mandate in 2014. Effects of mandate and subsidized exchanges not directly simulated. Uninsured reallocated to Medicaid (24%), exchange (39%) and private coverage (37%).
Simulations
2014: Expansion of Medicaid eligibility to at least 133% FPL for all individuals.
2018: Expansion of Medicaid and set tax price = 1 for half of top 20% of covered spending distribution.
2030: Expansion of Medicaid and set tax price = 1 for half of top 50% of covered spending distribution.

Table 8. Uninsured by offer status and income

Family income	Received employer offer	% of uninsured
< 100% FPL	20.6%	14.7%
100% - 133%	20.7%	9.1%
133% - 200%	24.3%	19.1%
200% - 400%	30.5%	35.8%
> 400%	33.9%	21.3%
Total	27.7%	100.0%

FPL: federal poverty line.

Figure 1. Annual Premium Distributions, 2009



Reproduced from Kaiser Family Foundation (2009).

Figure 2. Effects of Medicaid eligibility by income decile

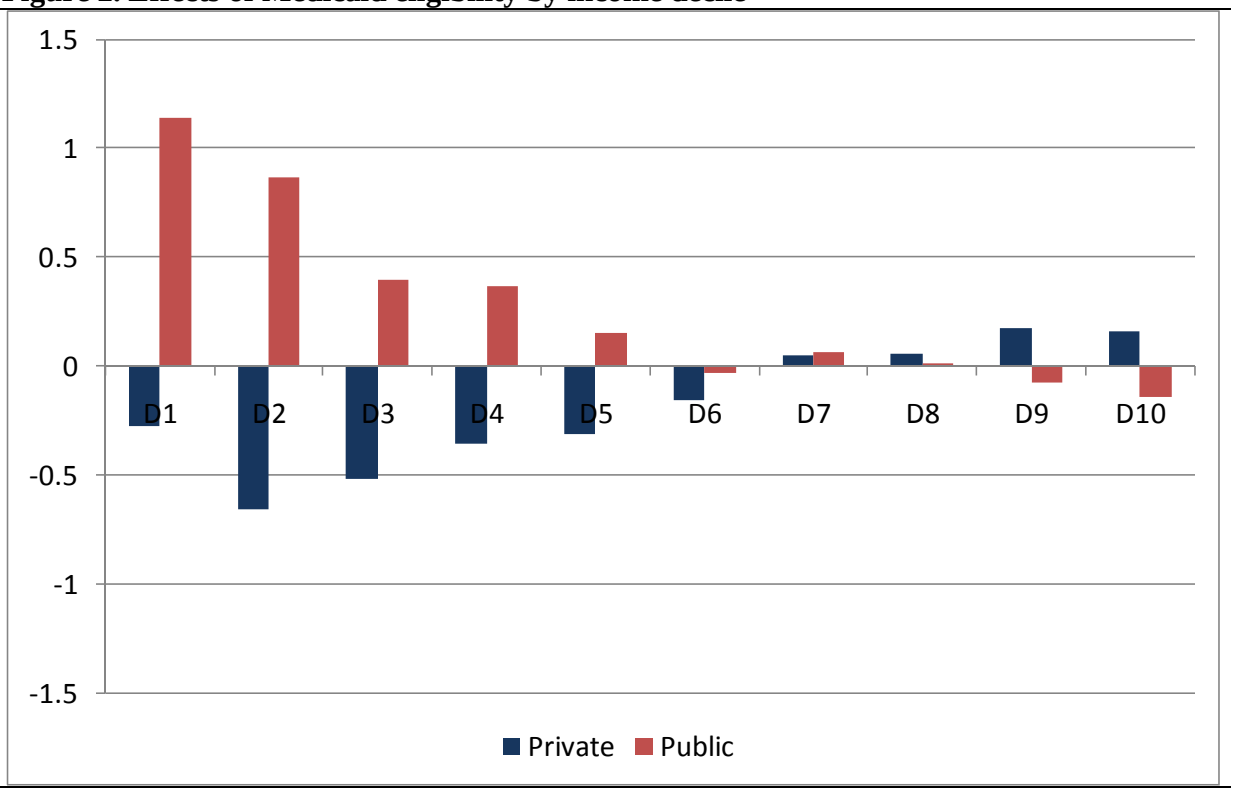


Figure 3. Effects of tax price by income decile

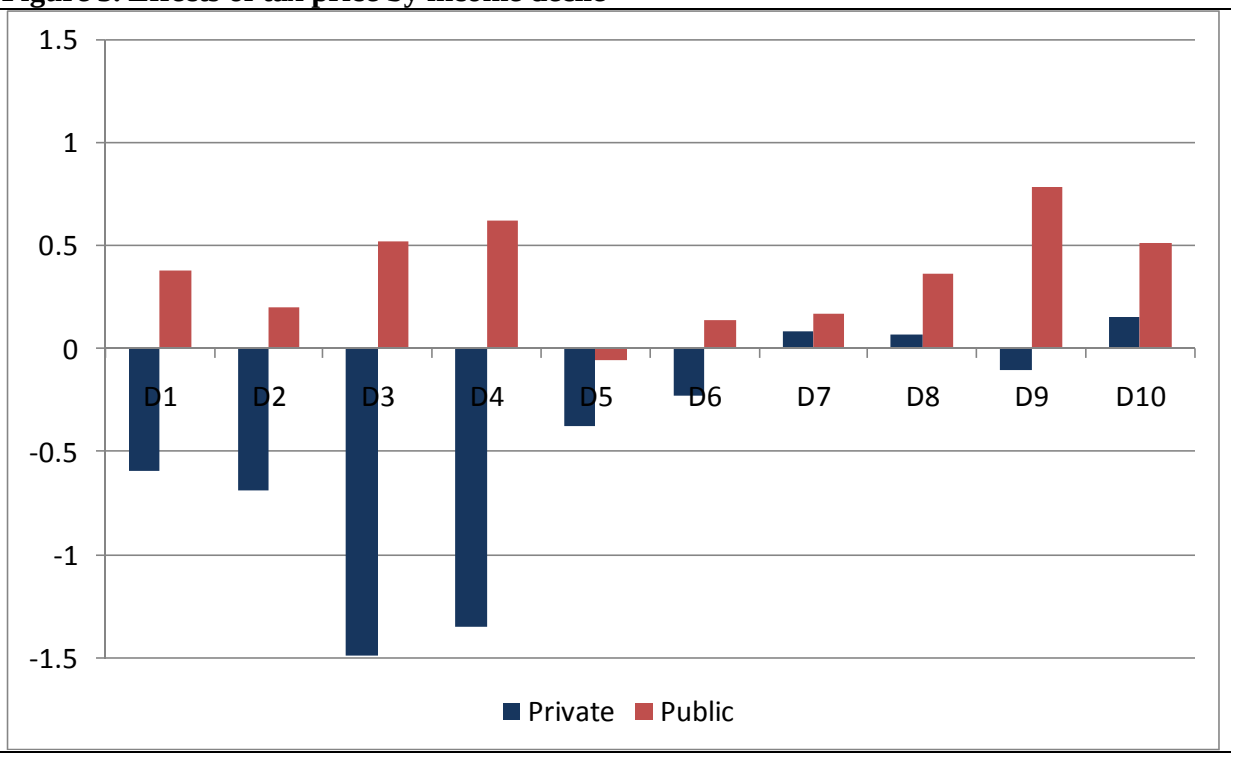
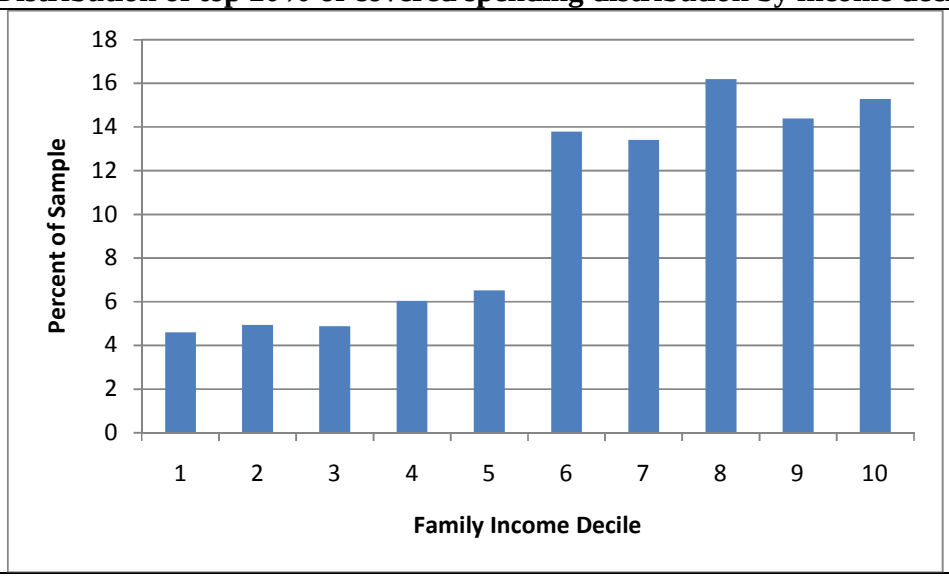


Figure 4. Distribution of top 20% of covered spending distribution by income decile



Covered spending distribution calculated from mean privately covered spending on physician services within firm size-state-income quintile cells.

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Appendix

Sensitivity of Simulations to Excise Tax Avoidance Assumption

Table 7A. Simulated Distribution of Workers and Families by Health Insurance Status

	Offer	Private Ins.	Public Ins.	Uninsured
Baseline	65.8%	79.9%	5.9%	14.3%
Simulations assuming 60% avoid excise tax				
2014	63.8%	78.7%	7.6%	13.7%
2018	62.1%	78.3%	8.9%	12.8%
2030	59.6%	77.2%	10.7%	12.1%
Simulations assuming 40% avoid excise tax				
2014	63.8%	78.7%	7.6%	13.7%
2018	61.2%	78.1%	9.5%	12.4%
2030	57.6%	76.5%	12.2%	11.3%

Offer: Received health insurance offer from employer.
Private Ins: Covered by private insurance.
Public Ins: Covered by public insurance.
Uninsured: Not covered by insurance.
Exchange: Covered by subsidized insurance purchased through exchange.
*Uninsured will be subject to individual mandate in 2014. Effects of mandate and subsidized exchanges not directly simulated. Uninsured reallocated to Medicaid (24%), exchange (39%) and private coverage (37%).
Simulations
2014: Expansion of Medicaid eligibility to at least 133% FPL for all individuals.
2018: Expansion of Medicaid and set tax price = 1 for 40% (60%) of top 20% of covered spending distribution.
2030: Expansion of Medicaid and set tax price = 1 for 60% (40%) of top 50% of covered spending distribution.

Construction of Medicaid Eligibility Instrument

In a series of papers including Currie and Gruber (1996) and Cutler and Gruber (1996), Gruber and colleagues studied the effects of Medicaid eligibility expansions for women and children in the 1990s. To produce a summary measure of the relative expansiveness of Medicaid eligibility policy from state to state, they applied income thresholds from each state to a nationally representative sample from the Current Population Survey (CPS). The resulting figures measured the proportion of the national population that would have been eligible had the entire population lived in the corresponding state. In contrast to actual proportions of state

populations enrolled, this measure reflects policy differences without the potentially confounding effects of state differences in income, employment, and medical costs. Unfortunately, because CPS does not collect data on medical spending or assets, Gruber and colleagues could not take medically needy programs into account.

Following this example, we constructed similar measures using income and asset thresholds for each state and a nationally representative sample from the Medical Expenditure Panel Survey (MEPS) from 1998. We chose MEPS instead of CPS because it includes detailed information on medical spending that enabled us to include thresholds for medically needy programs in our calculations.

We restricted our MEPS sample to those aged 25-61, avoiding those aged 62-64 because they could have been receiving Social Security for disability or early retirement and it is important to distinguish between these potential categories of Medicaid eligibility. Our extract included variables on family income, marital status, education, disability status, employment, Medicare status, and spending on health services by source of financing. Employment was determined by receipt of wage income. Status as a parent was determined by linking observations by family identification code. SSI enrollment was determined from an SSI indicator or from receipt of SSI income.

Several steps were required to prepare the data for the simulation. First, we imputed detailed family income because MEPS only provides family income in bands defined as multiples of the federal poverty line. The imputation uses variables for income band, age, education, and employment status in a statistical model that adds a random component. A second statistical model is used to impute assets in two categories: financial assets and house and car. This statistical model was developed in other work using the Survey of Income and

Program Participation and the Health and Retirement Survey (Frakt and Pizer, 2001). Next, another set of income and asset variables were computed for use in states with medically needy programs. These variables are lower, reflecting reductions in family income and financial assets attributed to medical expenses financed out-of-pocket or by Medicaid (we assume house and car assets are protected from Medicaid spend-down). We include Medicaid-financed care in the spend-down calculation under the assumption that this spending would have been financed out-of-pocket in the absence of Medicaid and because we do not want differences in actual Medicaid eligibility to affect our simulation.

Our simulation applies state policy variables to the constructed dataset and calculates simulated eligibility rates for each state. We begin by sorting observations into categories of potential eligibility: disabled, parents, and Medicare beneficiaries. Income and asset eligibility thresholds by eligibility category and state are available from the on-line documentation for the Urban Institute's TRIM3 microsimulation model (http://trim3.urban.org). Thresholds were obtained for all years from 1998 to 2006. For each category in each state and each year, our simulation determines a respondent's eligibility by comparing family income and assets to the appropriate threshold. If the state has a medically needy program that applies to the relevant eligibility category then the post-spend-down versions of income and asset variables are used. Respondents may qualify under multiple categories.

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