CUTTING TAXES FOR INSURING: OPTIONS AND EFFECTS OF TAX CREDITS FOR HEALTH INSURANCE

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Introduction

Despite rising real incomes and a tight labor market, the number of uninsured workers and dependents has been growing. Workers sometimes choose jobs at which no employment-based coverage is offered, and then fail to purchase individual coverage as a substitute, or they reject group insurance when it is offered to them at a fraction of its total premium. Since the failure to obtain insurance leads both to use of charity care and underuse of medical services relative to community norms, policymakers in both political parties have turned to the possible use of tax credits as a way to facilitate and encourage the purchase of private insurance coverage.

A tax credit for health insurance reduces the federal income and payroll taxes of a worker who obtains health insurance. Most proposals envision a refundable tax credit that will pay cash to a person who purchases insurance and whose federal tax liability is less than the value of the credit. In this paper we focus on the distributional and allocative effects of a variety of alternative forms of tax credits. We both describe the relative effects in qualitative terms and provide some estimates of the quantitative magnitude of the effects based on new methods for generating unbiased estimates of subsidies on the number of persons buying any insurance and the amount and type of

insurance purchased. We focus our investigation in two ways. We limit our analysis primarily to workers and their dependents, who constitute the great bulk of the uninsured and who are obviously falling beyond the reach of the current tax subsidy to employment-based health insurance. We also provide some detail regarding workers whose incomes place them above the poverty line but below the median family income; it is this group with incomes too high for traditional subsidy programs but too low to provide generous funding for insurance who are most difficult to reach with traditional welfare programs and who yet are the great bulk of the uninsured.

We consider a variety of options for designing the form of credit programs and for specifying eligibility for credits. Our estimates of the responsiveness of insurance purchasing behavior to credits begin with assumed utility maximizing behavior by risk-averse workers facing various net-of-tax premiums or prices for different amounts of insurance coverage. These "synthetic" estimates differ fundamentally from most of those presented thus far (e.g., Gruber, 1999; Sheils et al., 1999; Thorpe, 1999) which are based on extending to new credit programs the patterns of behavior exhibited in the past by workers who faced somewhat similar—but by no means identical—variations in the net price of coverage.

Our analysis differs from the conventional treatments of tax credit programs in two ways. First, it finds estimated impacts on the numbers of uninsured persons that are larger than those provided by other studies; we argue that these larger estimates are at least as plausible as those provided by others. Second, it focuses explicitly on the distinction between the "cost" to the federal government of tax credits (based on the usual accounting for tax credit programs) and the more relevant measures of impacts on

aggregate economic welfare and cost to the economy in terms of reallocation of resources. Using this perspective, some tax credit programs with "net costs to the federal government" substantially in excess of the premium per newly insured person actually have quite low true economic costs. The reason for the divergence is that much of the "cost to the government" is actually a transfer to some people presently insured or, more meaningfully, a tax cut for them which they may well deserve on equity and efficiency grounds. We suggest that economic cost, not cost to the government, is the most appropriate measure to be used in analyzing and comparing different tax credit policies. Nevertheless, we still find (as do most other studies) that modest subsidies will have little effect in reducing the number of the uninsured; subsidies will have to be the order of a third to a half of premiums to have any effect. However, beyond that threshold, the effect can be substantial.

The Features of a Tax Credit Program

The key defining features or parameters of a tax credit program are the following: 1) the level or schedule of dollar amounts of credits for which a person with a given set of characteristics is eligible; 2) the amount or type of insurance to which the credit may be applied; and 3) eligibility requirements for people with different characteristics. For example, one simple type of credit program would make a fixed dollar amount of credit available for a specified benchmark insurance policy to all workers and their dependents at a given income level. If the premium for the benchmark policy were $2500 per worker per year, and the credit was, say, $1000 for every uninsured worker, we would be interested in knowing what fraction of those persons would prefer paying $1500 for the

benchmark policy to remaining uninsured. That is, how many people have "reservation prices" for insurance above and below $1500? One simple type of synthetic estimate would postulate that a worker whose expected out-of-pocket "insurable" medical expenses exceeded $1500 have a reservation price of $1500 or more and therefore would surely prefer the credit to remaining uninsured. However, there still might be other risk-averse persons with lower expected losses who would prefer insurance with the subsidy. There is a variety of other design features and other motivations to value insurance which ought to be considered.

A Benchmark Case and Some Descriptive Statistics

The uninsured in the United States vary substantially across a large number of characteristics. Substantial fractions of the uninsured are both high and low income, both young and middle-aged, both in good health and in frail or poor health. In order to make clear the nature of the tradeoffs in different tax credit designs, we want to begin by focussing on a subset of the uninsured population that is both relevant to policy and more homogenous than the uninsured as a whole. Specifically, we limit our discussion to the population of full-time workers and their dependents. We have selected this population for several reasons. Workers and their dependents constitute a majority of the uninsured, and yet they are eligible for larger subsidies under the present tax code than any other population group that is neither poor nor elderly. The fact that the working uninsured have passed up significant subsidies already makes it likely that even larger subsidies will be needed to get the attention of this population and motivate them to obtain coverage.

Moreover, we begin by examining the subset of workers and dependents whose total family incomes lie between 200 and 250 percent of the federal poverty line. This population with incomes just above twice the poverty line represents the lower middle class who have the most difficult time obtaining insurance. Their incomes are too high for substantial Medicaid subsidies (although they have been targeted for the Children's Health Initiative Program (CHIP) in some states). They cannot expect to obtain a significant amount charity care except in the case of really severe illnesses; most of the time they should expect to pay something. And yet they have little discretionary income to spend on medical care or on individual, or "nongroup", insurance.

Table 1 provides some descriptive statistics both for the entire U.S. population of workers and their dependents and for this lower middle-income sub-sample, based on the large nationwide 1996 Medical Expenditure Panel Survey (MEPS). While a majority of those between 200 and 250 percent of poverty do obtain private insurance in some fashion, 21.9 percent of such individuals without public coverage are uninsured—significantly in excess of the national average proportion for workers. As expected, the proportion covered by public insurance is small, only about 10 percent of the total, some portion of which represents retired military. Of the uninsured workers and dependents at this income level, about 43 percent have a family member who was offered insurance in connection with their employment, declined it, and failed to obtain nongroup insurance—also significantly in excess of the national average of about 38 percent. The remaining 57 percent of these lower middle-income uninsured have no family member who took a job at which insurance was offered to them. (Based upon the 1993 Robert Wood Johnson Employer Survey, over 97 percent of firms offering insurance offer family coverage, so

these uninsured dependents of workers are indeed foregoing insurance as well—although perhaps at a substantial fraction of the total premium.) Of the insured, 94 percent obtain their coverage through an employer, while only 6 percent purchased private nongroup coverage.

Why did a sizeable minority fail to obtain coverage? There are some explanations we can rule out. One common hypothesis is that they could not "afford" coverage—presumably meaning that the purchase of insurance would leave too little income left for other necessities. There is no technical economic definition of "affordable" of which we are aware. However, income level alone cannot explain the failure to purchase since a majority of persons at the same income level did somehow obtain coverage. Another possibility is that workers not offered job-based coverage found the high loading or stricter underwriting of individual insurers to be a barrier. Since this data was taken from a time in which the unemployment rate was low (but not as low as it is at present), many of these workers would have had the opportunity to choose another job which did carry group coverage, but for some reason chose instead a job with no coverage but higher money wages. Moreover, recent research suggests that the individual insurance market is neither as costly nor as prone to rejecting high risks as many suppose (Pauly et al., 1999; Pauly and Herring, 1999). However, this same research does suggest that lower income high risks working for small firms were more likely to lack coverage than others of similar income, and it does note that the combination of relatively high administrative loading and no tax subsidy would at present make individual insurance rather unattractive (even if it is not "unaffordable").

Nevertheless, these results suggest that there is more to failing to obtain insurance for oneself and one's dependents among this population group than just income and insurance prices. Tastes for insurance may be weak, public or charity care opportunities may still exist, expected expense may be believed to be low, or there may be unusually pressing family financial needs that make the premium the uninsured would be willing to pay—their reservation price—substantially less than the lowest premium they have an opportunity to pay. While determining these "other reasons" would be highly useful research, we assume here that the distribution of reservation prices is given. We then estimate below what proportion of persons would have reservation prices below the price after it was reduced by a given tax credit program.

Before we consider the effects of new subsidy programs, however, we need to describe the pattern of subsidies currently received by this group. Virtually all subsidies to this group take the form of exclusion of employer paid premiums for group insurance from income and payroll taxes (at federal and state levels). For those who are not wage-earners, there is virtually zero federal income tax deductibility of premiums because this group very rarely has enough deductions and high enough total medical expenses to make itemization worthwhile. The self-employed are able to deduct a portion of their premiums, but again the low frequency of itemization in this income category makes such behavior very rare.

For purposes of illustration, consider a single, middle-aged, male wage-earner with total compensation of $20,000 a year; this gives him a marginal federal income tax rate of 15 percent and places him between 200-250% of the poverty line. If this worker is uninsured, or even a purchaser of nongroup insurance, his net federal tax equals $4,604

($3004, via a 1999 IRS tax table, plus an eight percent payroll tax of $1600). However, a similar worker at a firm offering insurance and covering eighty percent of a single-coverage premium of $1,847 (average amounts obtained from the MEPS Insurance Component data) with full incidence on wages pays $4,268 ($2,779 income plus $1,489 payroll) in taxes. This tax-exemption then provides a subsidy of $336 to such individuals who obtain employment-based coverage—approximately 1.7 percent of income and 7.3 percent of their tax liability. The magnitude of this subsidy—alternatively derived as one's marginal tax rate times the employer-paid portion of the premium—clearly increases as one's income rises. (This calculation is even likely to be an understatement of the size of the tax subsidy as it is believed that the incidence of the employer's payroll tax of 8 percent is on wages as well. However, for the purposes here, and further below, we only consider the employee-paid payroll tax.)

This differential subsidy has implications for efficiency and for the estimation of the effectiveness of alternative subsidy programs. The ideally efficient subsidy program would offer the same subsidy to a person with given characteristics in different settings. The present subsidy, however, induces people to choose group insurance more frequently than would be justified on the basis of its costs and benefits to them, to choose excessive amounts of insurance coverage, and to choose different employment settings from the efficient ones.

The presence of the tax subsidy also affects the impact of any new subsidy program. Many (though not all) of the currently uninsured could have taken advantage of the current subsidy. The most important way they could have done so (but chose not to) would have been to take a job at a firm offering insurance with full or partial employer

payment. They might also have refused insurance because of a positive employee premium at a firm that made insurance available. If the uninsured therefore contain disproportionate numbers of persons who have rejected coverage at the current subsidy, it follows that they will only purchase coverage (if at all) if they receive a subsidy larger than the current subsidy. This means that any effective new subsidy program must offer a subsidy to each income group larger than the subsidy or net insurance cost currently available to them through the tax advantages to employment-based insurance. In short, effective new subsidies must be relatively large because they must "climb over" the existing relatively generous set of subsides.

Design Options

Consider individuals with similar expected medical expense. Because of other influences, such as variation in risk-aversion, there will be variation in their willingness to pay or reservation price for a given specified insurance policy. Given some premium charged in the market, those with reservation prices greater than the market price will purchase the policy, but those with reservation prices less than the market premium will not purchase, and will become uninsured. If a uniform fixed dollar tax credit for the purchase of the benchmark policy is made available, some of the formerly uninsured will also purchase. The reduction in the number of uninsured will depend on the relative frequency of people with reservation prices between the original market price and that price less the credit.

If the purchase of at least a minimum benchmark policy is required in order to qualify for the fixed-dollar credit, some persons with high marginal values for insurance

might choose to purchase additional coverage beyond that level (depending on the market price for additional coverage). However, these choices will fully reflect the additional cost if markets are competitive, and therefore will be efficient. (This assumes that a single insurer sells the entire policy.)

Those who would, before the credit was offered, have been purchasing insurance would also be expected to claim the credit. As a result, the total amount of tax credits paid by the government will exceed the amount of the credits claimed by the formerly uninsured. The average credit amount per newly insured person could be substantial if there were relatively many previously insured persons made eligible for the credit.

This "excess credit" represents a transfer to those who had previously purchased insurance. It does not represent inefficiency from a resource allocation viewpoint. If the credit is viewed as public spending, one could say that the cost to the government per newly insured person is high. If, instead, the credit paid to those who already purchased insurance is viewed as a tax reduction for them, the process would be described as one which gives equal tax reductions to all those in the eligible set who purchased insurance. If purchasing insurance is viewed as "good" or "responsible" behavior, the plan could be described as one that gives equal tax cuts to everyone who engages in responsible behavior. In either case, the credit paid to those who had already purchased insurance does not represent a reallocation of productive resources from the private to the public sector; instead, it represents a transfer to insurance purchasers away from whoever else might have received the transfer.

Now suppose that expected expenses under the benchmark policy vary across potential insurance purchasers; that is, there is variation in "risk". If a uniform dollar

credit is provided, the effect on insurance purchasing should be approximately inversely proportional to the individual risk-level if individual market premiums reflect risk. However, for equity reasons it may be desired to vary the credit with risk; it may also be desirable to do so for those whose risk is so high that income effects (in terms of the value of the premium relative to total income) are large enough to seriously affect their likelihood of insurance purchasing. (More on this is provided below.)

Now suppose the benchmark policy is altered so that it is less comprehensive and therefore carries a lower premium. If the credit were kept at the same level, higher proportions of the relevant population would buy some insurance. The average level of coverage per insured person would fall, but the proportion of people without any insurance at all would also fall. Whether the average level of coverage per person eligible would rise or fall is unclear. In the limit, if the minimum policy's premium equaled the credit (or, equivalently, if the only requirement to qualify for the credit was buying a policy that cost at least as much as the credit), one would expect everyone to become insured. Insurance is free. No out-of-pocket premium would be required, and insurance of any positive amount should be worth something. (More on this is provided below, as well.)

An alternative to a fixed dollar or "closed end" tax credit is a credit that is a specified proportion of the policy premium (e.g., 25 percent). If there is a single benchmark policy that is eligible for credit and individual risk-level is uniform, there is no difference between a proportional credit and a fixed dollar credit equal to this proportion times the benchmark policy's premium. In the more reasonable case in which the benchmark policy is a minimum, proportional credits are inefficient because they

encourage additional coverage worth less than its cost. However, proportional credits are a partial (though very crude) substitute for risk adjustment. They are also appropriate if there is some positive social value attached to additional coverage beyond the minimum benchmark level.

Who in the population of lower middle-income workers and dependents might be made eligible for tax credits? We assume that it will never be desirable to offer credits only to those currently uninsured. While this might work the first time, eventually it will provide everyone with incentives to drop coverage so as to be eligible for the credit.

There are two practical options here. One is to make eligible for credits at a given income level only those who currently are not offered employment-based insurance. The other is to make every worker at that income level eligible. In this latter case, someone who receives a credit could not at the same time receive the benefit of the tax exclusion of any employer payments; such payments must in some fashion be added to taxable income before computing the credit.

The second option makes credits attractive to all workers for whom receiving the credit is more advantageous than paying taxes on the amount no longer excluded. The first option offers an incentive for workers for whom the credit is more attractive than the exclusion to move to jobs in which no employer-paid insurance is offered. If some workers currently offered employment-based insurance for whom the credit is more attractive choose not to change their situations, the total amount of tax credits paid will be less than in the situation in which the credit is offered to all workers who choose it.

It is plausible that, at least in the short run, workers currently offered insurance who would gain from the credit may fail to change their situation. Changing jobs or

replacing the employer payments with wage income will be inconvenient for some, and inefficient for others. The main tradeoff between these two options is therefore a lower level of tax credit payments when eligibility is limited, traded off against sometimes-strong incentives to change jobs or restructure to mix of compensation between money wages and paid health benefits. In some cases, an existing group insurance plan might be a casualty of the tax-credit-induced switch away from an employer-paid tax exclusion option. The other consideration (not really a tradeoff) is that the higher credit payments to those already purchasing insurance (all formerly insured workers under the first option, those who were buying nongroup coverage under the second) are transfers that are unequivocally more equitable than limiting the credit to those who were formerly uninsured. Those who had been purchasing insurance would be making the same or greater sacrifice to obtain coverage as those formerly uninsured who receive the credit and then purchase; they therefore deserve to pay the same net taxes. The only sense in which it is "inefficient" to subsidize those who were formerly insured is if the social objective is the welfare of those who manage (or are responsible for) the federal budget.

However, it is useful to note here that accepting a fixed credit that is less in dollar amount than the value of the exclusion one currently experiences may be desirable if the policy that can be obtained with the credit is more attractive than the policy associated with the exclusion. A policy could be more attractive either because it represents a different type of insurance (e.g., not a managed care plan) or because the employee's total net premium payment is lower than the policy associated with the exclusion. In a sense, the number of people who turn in expensive exclusions for cheaper credit would be a measure of the distortion presently caused by the exclusion

Estimating the Impacts of Tax Credits

There has been an explosion of efforts to estimate how many net new persons would be induced to become insured under various tax credit proposals, and the resulting total value of tax reductions caused by the availability of credits. In what follows we offer estimates which are novel in the following way. They are the only estimates of which we are aware that are explicitly based on a theory and data that determine which persons will be better off by choosing credits rather than by remaining uninsured. We call our estimates "synthetic" because they are based on models of choice of those workers made eligible for credits under specific credit proposals, rather than estimated from behavior of possibly (but not necessarily) similar consumers in situations similar (but not really identical) to those that would prevail under a particular tax credit plan.

The key insight in our approach is based on the observation that the great bulk of the working uninsured had, in a sense to be defined, an opportunity to obtain group insurance coverage at tax-subsidized prices which they rejected. Since they chose not to take advantage of that opportunity, it is highly likely that their reservation price is below the price they could have paid but did not. It follows that any tax credit proposal will only become effective if it can reduce the net premium for insurance below the level that prevailed in the rejected opportunity.

Suppose, for example, that we consider a worker in an occupation in which the typical firm size is 20 workers, and suppose this worker's marginal tax rate (income plus payroll) is 23 percent. Suppose that the loading for this size group is 30 percent of premiums. The net loading this person might expect to pay is therefore approximately

seven percent of premiums. Suppose finally that we observe that the person remains uninsured—because he is in a firm that does not offer benefits.

If we assume that this worker could have worked in a typical firm that did offer benefits and chose not to do so because he preferred the higher wages or other advantages of his current job, we could conclude that this person's reservation price is below 1.07 of his expected expense. With a tax credit applicable to individual insurance with loading assumed to be 40 percent of premiums, this person will surely not use the credit if it does not reduce the net loading on that policy below seven percent. If it does not offset this much of the nongroup premium, the only reason to use it is if the nongroup policy is more to the person's tastes than any group offering. In this particular example, using the credit will only become generally attractive when it covers about a third of the nongroup premium. That is, the credit has to be large enough to match the rejected tax subsidy-group loading combination before it can begin to make a serious dent in the numbers of uninsured. If one's marginal tax rate is higher or the group is larger than in the example, the credit will have to be larger still to become effective.

This story obviously permits of exceptions. On the one hand, there may be those with reservation prices above the tax subsidized group price but below the unsubsidized nongroup insurance price who are "trapped" in jobs where no insurance is offered, even though they would willingly accept lower wages to pay for it. While some percentage of uninsured workers would surely purchase coverage if they were offered it at the tax-subsidized group premium but are unable to obtain a job that offers insurance in exchange for lower wages, there must be some individuals, on the other hand, who would prefer to be uninsured but are "trapped" at jobs which offer insurance. Indeed, some

uninsured workers (about 20 percent on average), are at firms at which group insurance is offered but with employee premiums (Cooper and Schone, 1997); for them, the reservation price of insurance must be below the employee premium.

Two Methods, Two Estimates

We now illustrate likely responses to various amounts and types of tax credits to describe actual and potential insurance purchasing in response to tax and other subsidies and price changes. The first method we develop uses employment and insurance status data from individuals in the first round of the 1996 Medical Expenditure Panel Survey (MEPS) to impute the proportions of individuals purchasing insurance at various "net" prices. The second method we develop uses expenditure data from the 1987 National Medical Expenditure Survey (NMES) to attempt to determine reservation prices of the uninsured more directly. (The NMES data is used for this second method because expenditure data for the MEPS has yet to be released; however, we age this NMES data for estimates in 1997 dollars.)

This first method is more closely related to the theory outlined above; we determine for each family with at least one full-time worker the average net loading they face in the group market (or the nongroup market for the self-employed) and determine the proportion insured at each level of net loading. Specifically, we first determine the median number of workers per firm for each of twelve industries identified in the MEPS, and then, using estimates for group insurance loading by firm size in Phelps (1997), determine each worker's average administrative loading based upon the industry in which they are employed; we define four different sizes, with values for administrative loading

between fifteen to thirty percent of benefits. Then, for each family, we determine the administrative loading they face (i.e., the lower of the two for duel-earner couples) and their marginal tax rate (income plus payroll) based upon their total family wages and family structure; here, there are six different marginal income tax rates ranging from zero to 39.6 percent, with 8% payroll added to each. Thus, for each family with a wage-earner, we can define the "net" loading they currently face as $L_N = L_A - Et(1+L_a)$, where L_A is this administrative loading, E is the average fraction of the premium paid by the employer (based upon summary data from the MEPS Insurance Component), and t is their marginal tax rate. For families with only self-employed workers, the net loading they currently face is simply the administrative loading in the nongroup market, which we assume (initially) to be two-thirds of benefits, or 40% of premiums.

We now consider the effect of a tax credit defined to be a given proportion of the total nongroup premium; i.e., it is essentially risk-adjusted equivalently to whatever risk characteristics the individual insurance market uses to rates premiums. We assume here that the credit is applicable to a standard benefits package which does not vary. (We consider the effect of differing plan generosities somewhat in our second model.) Setting the loading for individual insurance at 40% of premiums, we then reduce the "net" loading by the amount of the tax credit, and assume that the proportion who will buy individual insurance at any given loading is at least as much as would have purchased group insurance at the same loading. Using these "data points" for the different current "net" loadings amassed above, we estimate this responsiveness separately for those with total family incomes either above and below 300 percent of the poverty line to disentangle the effect of income directly on insurance purchasing from the indirect effect

of increasing marginal tax rates. The intercept is obviously higher for the higher income, but the slope we observe (the change in probability of being insured as a function of net loading) is somewhat larger for those with lower incomes; higher price elasticities for insurance have been documented elsewhere—see for example, Holmer (1984) and Sheils et al. (1999). As noted above, because the net loading under group insurance is generally much less than that under individual insurance, it will take a fairly sizeable credit to prompt the uninsured who rejected a group insurance option to begin to buy insurance. Indeed this net loading under the current tax treatment of insurance averages –0.052, equaling 0.025 for low-income workers and dependents and –0.119 for those with high incomes. For example, we find that if the credit is 25 percent of individual insurance premiums, the only persons who will be newly enticed into the market will be some of those self-employed whose only option was nongroup insurance initially.

The top panel of Table 2 shows the present number and proportion of the uninsured with working family members, while the middle panel of this table shows the estimated effect of tax credits of 25, 33, and 50 percent of individual insurance premiums. Among low-income workers and dependents, the estimated current proportion uninsured is 34.8 percent. Smaller tax credits do not do much good in reducing the number of low-income uninsured, but a 50 percent credit cuts this proportion to 18.2 percent (a 47.6 percent reduction in their number of uninsured) and a credit of two-thirds of the premium would cause (results not shown) all of these low-income uninsured to seek coverage. The proportion uninsured among higher-income workers and dependents starts out lower (at 8.6 percent), and falls less dramatically to 5.3 percent at a credit equal to half of their nongroup premium. In addition to the equity

arguments against offering credits to higher income people, they are also relatively less effective in affecting the number of uninsured.

Results shown in the bottom panel of Table 2 instead use the assumption that administrative loading in the individual insurance market is 30 percent of premiums. (For reasons discussed in Pauly et al. (1999), this may increasingly be a reasonable assumption.) Clearly, the lower net price here induces more individuals to become insured. For instance, a proportional credit equal to one-half of the premium decreases the proportion of low-income uninsured to 9.1 percent or 6.3 million, a 73.8 percent reduction from the current number of 24 million.

Of course, as noted earlier, some individuals who are currently insured through their employers—particularly those with low incomes in small groups, and hence low marginal tax rates and high administrative loading—will also take advantage of these tax credits. The final column of this Table then shows the number of currently group-insured that would use credits for the individual market. For lower credits, few individuals drop group coverage as their tax-advantaged group price is than those generated by the individual insurance tax credits. However, larger credits can have a substantial number of individuals switching to individual insurance—thus increasing the program's "cost per newly insured," although as we argue earlier, such costs are actually properly viewed as transfers of wealth. (The large number of high-income individuals taking advantage of these credits—and thus dropping tax-subsidized group coverage—in the results from the simulation model presented here occur simply because we included no income-related eligibility criteria for the use of these credits in our model. Such criteria are likely to be

advocated by policymakers on grounds of equity and should be easily implemented without resulting distortions in behavior.)

This technique obviously assumes that one can translate behavior from the group market to the individual market, and does not pay attention to particular individual characteristics that may make seeking insurance compared to being uninsured more or less attractive. A second method, to compare with the results of the first, attempts to estimate reservation prices directly, by examining variations individual risk level (expected expense). We assume that a person currently uninsured whose available premium is reduced by a tax credit will choose to be insured if his or her utility is higher buying insurance than it would be if the person remained uninsured. The credit is often less than the assumed individual insurance premium, so the person will only buy if the gain from becoming insured, i.e., their reservation price, is less than the net premium to be paid. There are in general three components of the gain from becoming insured: a change in expected out-of-pocket payments with insurance, a reduction in risk due to the variation in out-of-pocket expenses, and the value of the additional care used because of moral hazard.

We begin with considering a fairly comprehensive policy, one with a $200 deductible, 20% coinsurance, and a $1500 stoploss. We first obtain for each uninsured individual aged 18-64 (N = 2,256) in the 1987 National Medical Expenditure Survey (NMES) an expected total uninsured expense and an expected uninsured out-of-pocket expense by regressing these actual uninsured expenses on age, gender, race, income, and indicator variables for the presence of eleven different pre-existing chronic conditions identified in the NMES. (All expenses from the 1987 NMES are inflated, though, to be

consistent with HCFA's (1998) estimates for the growth in per capita health expenditures from 1987 to 1997.) We then also determine for each uninsured individual a predicted expense (both total and out-of-pocket) as if they were insured with this benchmark plan. To do so, we use the distribution of actual expenses for insured individuals aged 18-64 in the NMES, first normalizing these expenses though for this benchmark plan using the American Association of Actuaries (1995) "induction" methodology, and then running similar regressions on these individual characteristics to estimate insured expense.

We then determine for each uninsured individual their reservation price directly as the sum of these three components: the change in expected out-of-pocket expenses plus the change in risk plus the change in consumer surplus. The results for expected out-of-expense expense are on the surface bizarre, in that these expenses are slightly higher on average ($6 more) for the insured than for the uninsured; however, this is explained both by the uninsured's out-of-pocket expenses being only a fraction of total expense due to the availability of charity care and by moral hazard stimulating additional spending with coinsurance. For the change in risk, we estimate the valuation of risk due to the variation in out-of-pocket expenses by one-half the Arrow-Pratt absolute risk aversion coefficient times the variance in actual out-of-pocket expense. Using a coefficient of 0.00045, estimated by Marquis and Holmer (1988), this valuation of risk is $49 if insured but $526 if uninsured. Finally, we estimate the value of additional care as one-half times the change in expected total expense; total expense for this entire sample of the currently uninsured average $1103 if uninsured and $1941 if insured. These reservation prices we determine are shown in the second column of Table 3A; we present these results (and those below) for 18 different "cells" based on age, gender, and the

presence or absence of one or more of these chronic conditions. (As one would expect, the willingness-to-pay for insurance increases with characteristics predicting higher medical expense, i.e., female gender, age, and the presence of pre-existing conditions.) Finally, we assume that the individual insurance is risk-rated based on age and gender only; average individual insurance premiums assuming administrative loading equal to 30% of premiums are shown in the third column of this Table.

We then simulate two types of credits, a proportional credit (which will increase as the risk-rated nongroup premium increases) and a flat dollar credit (which will be independent of risk). Average premiums for the entire sample of working-age adults 18-64 are estimated to be $2057 per person. We first compare a proportional credit equal to one-third of the nongroup premium (averaging $686 across all individuals) to a flat $686 credit for each individual. As shown in Table 3A, we find that the former reduces the uninsured by 8.8 percent while the latter cuts it by 34.1 percent. The patterns of reductions in the number of uninsured also differ. With a fixed-dollar credit, mainly uninsured men under the age of 45 become insured (because the credit for them is close to their risk-rated individual premium); a small portion of younger women with pre-existing conditions also purchase insurance due to their relatively large reservation prices. With the proportional credit, fewer people become insured for a given dollar subsidy but the reductions are concentrated among younger individuals with chronic conditions; a fixed credit provides more "bang for the buck" for younger individuals, but those with chronic conditions are more likely to purchase insurance that varies with only age and gender. Results are also shown here for both proportional credits and fixed dollar credits averaging half of the individual insurance premium. The number of uninsured are

reduced by 37.6 and 60.2 percent, respectively, with similar patterns of reduction by the different cell types.

We then simulated the response to credits applicable to a less comprehensive plan; specifically one with a $1000 deductible, 25% coinsurance, and a much higher out-of-pocket maximum of $25,000. As shown in Table 3B, the average risk-rated nongroup premium (incorporating loading equal to 30% of premiums) falls to $1,326. We again simulate both proportional credits and fixed dollar credits—each for values equal to both half and two-thirds of the individual insurance premium. For fixed relative to proportional credits here, the patterns of those obtaining insurance are similar to those under the more generous plan. Likewise, a 50 percent credit (either fixed or proportional) for the less comprehensive plan has a similar effects on the magnitude of the uninsured, relative to the more generous plan. However, the real difference is naturally the reduction in the uninsured that can be obtained for a *given magnitude* in credits. For instance, a flat dollar credit of $663 towards the less comprehensive plan decreases the number of uninsured by 58.3 percent while an almost equivalent (in magnitude) credit of $686 towards the more comprehensive plan reduces the number of uninsured by only 34.1 percent. Though not modeled explicitly here, this does support the notion that providing a credit to the uninsured that could be used on any form of insurance is something that every uninsured individual should (ignoring either inertia or some reluctant fringe that will not be insured without a mandate) be willing to use towards, at the minimum, purchasing a policy just equal in magnitude to the credit.

Alternative Methods to Estimate the Impact of Tax Credits

There have been a number of different methods used to estimate the impacts tax credits of various sizes and forms on the number of uninsured. One popular approach is to examine the experience with various levels of employee premium shares in employment-based group insurance. If the employee premium share in a set of firms is, say, half of the premium, one might use the proportion of their workers who choose to take neither the group insurance from that firm nor insurance from a spouse's job or the non-group market as an estimate of the proportion who would remain uninsured under a similar tax credit.

If workers were randomly assigned to firms, this procedure would be fully appropriate. However, the assumption of random assignment is surely not true, since the only rationale for offering a given group insurance option by an employer would be the intent to be selected by workers who value that option. However, while such sorting surely occurs, the observation that about one in five uninsured workers rejected a group insurance plan suggests that sorting is not perfect. If it were, no worker would ever take a job at a firm that reduces wages in order to pay part of the insurance premium and then decide not to take the insurance because of the size of the employee premium. It would be better for a worker with such a low reservation price to take a job at a firm that does not offer health insurance at all, and therefore increases money wages by approximately the full insurance premium. That is, it must be the case that, for some workers in some markets, finding a job at a firm that offers no insurance is impossible.

However, in the reasonable case in which there is some matching, even if imperfect, using the insurance purchase decisions of employees at firms that charge

positive employee premiums could yield biased estimates of the impact of partial premium shares. Consider the following numerical example in which we suppose that there are 10,000 workers in a local market, with an actual demand curve for insurance described as in Table 4.

Suppose there are five competitive employers in this labor market, each employing 2000 homogenous workers. The efficient sorting outcome would be for four firms to offer fully paid insurance, and one firm to offer no insurance. The 20 percent of workers with reservation prices below P* would then work for the firm that did not offer coverage. (Thus, we would observe 0% insured at an employee-premium of P*.) Suppose instead that four firms offered complete coverage at zero employee premium but one firm offered the same coverage and charged a premium of 0.5P*. That last firm would attract 2000 workers, half of whom would decline coverage. There would be, as indicated in the "true" demand curve, 10 percent of all workers without insurance, but the "observed" percentage uninsured at the firm charging a positive employee premium share would be 50%. Now consider a third case in which four firms offer full coverage and the fifth firm charges a 25 percent employee premium. That last firm would attract the 200 workers whose reservation prices are below 0.25P*; it would have 10% of its workforce uninsured. Finally, the last case is one in which all firms pay in full for coverage, and then all workers would be insured.

It is easy to see that if one focussed only on the one firm imposing employee premium shares, one would estimate the demand curve shown in the final column of Table 4. One would then conclude that, compared to zero employee premiums, modest employee premium shares would discourage coverage among the total population to a

much greater extent than they really would. The right technique would be to relate the premium share in the firm with the highest premium share in the market to the proportion of all workers in the market who choose not to be insured.

Obviously many different proposals have been made for adding refundable tax credits and reforming the tax treatment of employer-paid group health insurance. The options considered earlier, like most current proposals, do not involve requiring individuals or firms to pay higher taxes if they continue to provide employer-paid insurance. (See Pauly and Goodman (1995) for an early discussion of this issue.) It is the possibility that some employers or firms might be required to pay higher taxes that yields the result, in some analyses, that tax credit proposals might cause some people currently receiving group coverage to drop it (Cox and Topoleski, 1999); these analyses are largely irrelevant to the present debate on tax credit options. Those schemes which do envision removal or limiting the current tax subsidy all assume as well that there will be a mandate (individual, employer, or employer-enforced individual) to obtain subsidized coverage (Butler, 1991; Pauly et al., 1992).

Conclusions

The main issue about choosing tax credit options is how generous the credit is to be at various income levels. At a given income level, small credits will have little effect on the number of uninsured, whereas large credits will have large effects. If we focus on the large majority of the uninsured who have incomes above the poverty line, our general conclusion is that credits will need to be substantial to make much of a dent in the number of uninsured. For low-income workers and their dependents below 300 percent

of the poverty line where the uninsured are disproportionately found, we conclude that substantial reductions in the numbers of uninsured will require credits in the range of a third to a half of the individual insurance premiums, with credits needed to be even greater than 50 percent for families with incomes at the bottom of this range. Thus the most important tradeoff is between reductions in the number of the uninsured and tax revenues that could be spent on other public programs. However, note that much of the "cost" of tax credits does not represent a reallocation of real resources away from other uses and toward the health care needs of the previously uninsured; instead, much of the credit effectively represents a tax reduction for the majority of lower middle-income people who formerly had obtained health insurance for themselves and their families in some fashion. Limiting eligibility for the credit to a subset of those at the same income level engaging in the same health insurance purchasing behavior can reduce the "cost," but at the real expense of horizontal inequity and substantial distortion in the labor market.

Other tradeoffs involve the extent to which the credits are directed at different risk levels. Since a disproportionate number of the uninsured are low-risk (relative to the under-65 population), fixed dollar tax credits that are not risk-adjusted will, for the same "cost," actually pick up more of the currently uninsured than would proportional or risk-adjusted credits. The policy tradeoff here obviously involves distributional objectives in part, but it also relates to the imperfection of the "number of uninsured" measure. Some may feel that it is more important that formerly uninsured higher risks become insured than that lower risks do so.

To make such a judgment rationally, however, one would need more information than just a head count of the uninsured. The missing piece of information is one that is really essential for the entire policy exercise: how much an improvement in health is generated by the presence of insurance coverage (compared to its absence) for people at different income and risk levels? Almost all of the research on the impact of insurance coverage either looks at the uninsured as a group or singles out poor uninsured people, but the most relevant question is the amount of good health insurance would produce for a lower middle-income family (compared to being uninsured). As noted elsewhere by Pauly and Reinhardt (1996), our failure as researchers to produce this information on effectiveness makes more difficult the effort to persuade our fellow citizens to support tax credits or any other programs to reduce the numbers of the uninsured.

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TABLE 1
Insurance Status for the U.S. Population
Full-time Workers and their Dependents

	Percent of Population:			
	All Individuals	Excluding Public	Privately Insured	The Uninsured
All Income:				
Public insurance[a]	9.2	0.0	0.0	0.0
Current job offers insurance[b]	75.2	78.1	87.7	38.3
Private insurance	73.1	80.5	100.0	0.0
Employment-based	68.9	75.9	94.3	0.0
Nongroup Insurance	4.2	4.6	5.7	0.0
Uninsured	17.7	19.5	0.0	100.0
200-250% of Poverty Line:				
Public insurance	10.2	0.0	0.0	0.0
Current job offers insurance	77.7	78.7	88.7	43.1
Private insurance	70.0	78.1	100.0	0.0
Employment-based	65.6	73.2	93.7	0.0
Nongroup Insurance	4.4	4.9	6.3	0.0
Uninsured	19.7	21.9	0.0	100.0

Source: 1996 Medical Expenditure Panel Survey Data (N = 13,411)

Note: As individuals may have more than one source of insurance, "hierarchical" assumptions were made in that public coverage dominates private coverage and group coverage dominates nongroup coverage.

[a] Public Insurance includes Medicaid, Medicare, CHAMPUS, or any other federal or state program subsidizing coverage.

[b] Some individuals have employment-based coverage, but are not offered insurance through their *current* job, e.g., COBRA-continuation coverage or group coverage through a family member working part-time.

TABLE 2
Model 1: Effect of Tax Credits on the Uninsured: Full-time Workers and their Dependents

	Number of Uninsured:		Impact of Credits:	
	Number of Individuals[a] (Millions)	Percent of all Workers and Dependents	Percentage Decrease in the Uninsured	Number in Groups Switching to Nongroup[b]
Current Situation:				
Low Income	24.0 M	34.8%	n/a	n/a
High Income	8.3 M	8.6%	n/a	n/a
All Income	32.3 M	19.5%	n/a	n/a
Assumption of 40% Loading in Nongroup Market:				
Credit of 25% of Premium:				
Low Income	23.2 M	33.6%	3.3%	0.0 M
High Income	7.8 M	8.0%	6.5%	0.0 M
All Income	31.0 M	18.7%	4.1%	0.0 M
Credit of 33% of Premium:				
Low Income	21.2 M	30.8%	11.5%	0.9 M
High Income	7.6 M	7.8%	9.2%	0.0 M
All Income	28.8 M	17.4%	10.9%	0.9 M
Credit of 50% of Premium:[c]				
Low Income	12.6 M	18.2%	47.6%	32.2 M
High Income	5.1 M	5.3%	38.4%	52.3 M
All Income	17.7 M	10.7%	45.2%	84.5 M
Assumption of 30% Loading in Nongroup Market:				
Credit of 25% of Premium:				
Low Income	20.4 M	29.5%	15.1%	2.5 M
High Income	7.5 M	7.7%	10.2%	0.0 M
All Income	27.9 M	16.8%	13.8%	2.5 M
Credit of 33% of Premium:				
Low Income	17.6 M	25.5%	26.7%	10.0 M
High Income	6.9 M	7.2%	16.5%	3.4 M
All Income	24.5 M	14.8%	24.1%	13.4 M
Credit of 50% of Premium:[c]				
Low Income	6.3 M	9.1%	73.8%	42.8 M
High Income	0.0 M	0.0%	100.0%	87.4 M
All Income	6.3 M	3.8%	80.5%	130.2 M

Source: 1996 Medical Expenditure Panel Survey, re-weighted to 1998 estimates.

Note: Details of this simulation analysis are provided in the text.

[a] The MEPS data has a fair amount of observations with missing data, so the data here was re-weighted, i.e., inflated, to reflect that (as of the 1998 Census) there were 44.3 million uninsured in the U.S., 73% of which (32.3 million) have at least one family member working full-time.

[b] Currently, 130.2 million are insured through their employers, of which 42.8 and 87.4 million are low- and high-income, respectively. Income is defined here as total family income either above or below 300% of the poverty line.

[c] In results not shown, a tax credit equal to two-thirds of the premium decreased the number of uninsured to zero—for either the 40% or 30% loading assumptions. Doing so eliminates group insurance though; that is, a net price equal to one-third of the nongroup premium with 40% loading is below what one with the highest marginal tax rate in the largest group would face.

TABLE 3A
Model 2: Effect of Tax Credits on the Currently Uninsured: Comprehensive Individual Insurance Plan with 30% Loading[a]

Cell Name	Average R'vation Price	Average Total Premium	33% of Premium ($686) Proportional Credit	33% of Premium ($686) Flat Dollar Credit	50% of Premium ($1,028) Proportional Credit	50% of Premium ($1,028) Flat Dollar Credit
F, NCC, 18-24	821	1,685	0.0%	0.0%	61.2%	100.0%
F, NCC, 25-34	848	2,307	0.0%	0.0%	0.0%	0.0%
F, NCC, 35-44	1,215	2,615	0.0%	0.0%	0.0%	0.0%
F, NCC, 45-54	1,030	2,937	0.0%	0.0%	0.0%	0.0%
F, NCC, 55-64	1,265	4,407	0.0%	0.0%	0.0%	0.0%
F, YCC, 18-34	1,227	2,260	25.9%	31.0%	77.4%	48.1%
F, YCC, 35-44	1,625	2,705	25.7%	17.7%	82.7%	47.6%
F, YCC, 45-54	1,606	2,991	27.3%	15.8%	53.5%	37.6%
F, YCC, 55-64	1,879	4,407	7.6%	2.0%	17.8%	3.3%
M, NCC, 18-24	700	1,157	0.0%	100.0%	100.0%	100.0%
M, NCC, 25-34	380	1,122	0.0%	42.0%	0.0%	100.0%
M, NCC, 35-44	387	1,078	0.0%	55.5%	27.8%	100.0%
M, NCC, 45-54	956	3,279	0.0%	0.0%	0.0%	0.0%
M, NCC, 55-64	643	3,834	0.0%	0.0%	0.0%	0.0%
M, YCC, 18-34	941	1,191	86.9%	93.8%	92.1%	95.0%
M, YCC, 35-44	1,055	1,074	71.5%	91.9%	90.1%	94.3%
M, YCC, 45-54	1,657	3,281	14.3%	9.4%	37.5%	14.3%
M, YCC, 55-64	1,114	3,914	8.2%	6.9%	16.0%	8.2%
ENTIRE	890	2,057	8.8%	34.1%	37.6%	60.2%

Source: 1987 National Medical Expenditures Survey, inflated to 1997 dollars.

Note: Details of this simulation analysis are provided in the text.

[a] Comprehensive plan assumes a $200 deductible, 20% coinsurance, and a $1500 out-of-pocket maximum.

TABLE 3B
Model 2: Effect of Tax Credits on the Currently Uninsured: Less Comprehensive Individual Insurance Plan with 30% Loading[a]

Cell Name	Average R'vation Price	Average Total Premium	50% of Premium ($663)		67% of Premium ($884)	
			Proportional Credit	Flat Dollar Credit	Proportional Credit	Flat Dollar Credit
F, NCC, 18-24	511	1,065	46.2%	100.0%	100.0%	100.0%
F, NCC, 25-34	461	1,495	0.0%	0.0%	40.7%	0.0%
F, NCC, 35-44	800	1,690	25.8%	0.0%	100.0%	50.0%
F, NCC, 45-54	643	1,888	0.0%	0.0%	54.7%	38.0%
F, NCC, 55-64	769	2,935	0.0%	0.0%	0.0%	0.0%
F, YCC, 18-34	562	1,462	39.6%	29.1%	78.0%	62.8%
F, YCC, 35-44	865	1,746	67.2%	40.8%	82.1%	62.2%
F, YCC, 45-54	798	1,926	39.4%	31.7%	69.8%	42.1%
F, YCC, 55-64	902	2,936	12.6%	0.0%	53.2%	0.0%
M, NCC, 18-24	490	727	100.0%	100.0%	100.0%	100.0%
M, NCC, 25-34	189	701	0.0%	100.0%	27.6%	100.0%
M, NCC, 35-44	252	654	38.2%	98.7%	55.5%	100.0%
M, NCC, 45-54	503	2,185	0.0%	0.0%	2.2%	0.0%
M, NCC, 55-64	207	2,517	0.0%	0.0%	20.0%	0.0%
M, YCC, 18-34	505	748	82.1%	93.8%	85.1%	95.0%
M, YCC, 35-44	469	651	76.9%	88.5%	82.6%	93.1%
M, YCC, 45-54	712	2,187	11.0%	3.4%	46.9%	9.1%
M, YCC, 55-64	168	2,572	12.1%	4.2%	21.6%	9.8%
ENTIRE	481	1,326	34.1%	58.3%	61.3%	64.6%

Source: 1987 National Medical Expenditures Survey, inflated to 1997 dollars.

Note: Details of this simulation analysis are provided in the text.

[a] Less comprehensive plan assumes a $1000 deductible, 25% coinsurance, and a $25,000 out-of-pocket maximum.

TABLE 4
Illustration of Potential Bias in Estimating Demand from Employee Premium Shares (Total Group Premium = P*)

True Demand		Observed Demand	
Total Premium	Percent Insured	Employee-paid Premium	Observed Percent Insured
P*	80%	P*	0%
0.50P*	90%	0.50P*	50%
0.25P*	98%	0.25P*	90%
Zero	100%	Zero	100%

Details of this numerical example are provided in the text.