

The Role of Tax Subsidies in the Market for Health Insurance

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Abstract

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I. Introduction

The workplace has become much more than a source of income for most people. Employers administer pension plans, life insurance and health insurance for many workers. As many as ninety percent of privately insured Americans receive their primary health insurance through the workplace [EBRI, 1996]. Similarly, in Canada, more than two-thirds of the population receives supplemental health insurance through an employer (author's calculations). There are several reasons why the health insurance market is primarily administered through the workplace: large groups of employees may enjoy lower premiums because of the pooling advantages offered by groups. Administration of plans and informational asymmetries may be reduced by allowing employers to negotiate and interpret offers from insurance companies. Finally, governments in both countries subsidize health insurance provided through an employer by exempting the employer's contribution towards the employee's health insurance from the employee's taxable income. Previous literature has shown that subsidizing health insurance through the tax system by exempting employer contributions from income tax increases the quantity of health insurance demanded [Pauly, 1986, Stabile, 1999].

This paper investigates the role of tax subsidies in linking the health insurance market to the employment relationship. It investigates how these subsidies influence whether health insurance coverage is offered in different sized firms and whether it is offered through an employer versus the private individual market. The paper presents a

simple model of the decision to purchase health insurance by workers across different size firms and uses variation in tax subsidies across Canadian provinces and American states to test whether the tax-subsidies to employer-provided health insurance affect these decisions. In particular, it examines whether provinces and states which offer greater subsidies to employer-provided insurance have more small firms offering insurance than provinces or states which offer smaller subsidies. It investigates how levels of private health insurance, purchased outside the employment relationship, are affected by the tax subsidies. Using these estimates it calculates how the removal of the tax subsidies would alter the distribution of health insurance benefits across the workforce as well as in the private market.

II. How Do Tax-Subsidies Alter the Provision of Health Insurance in the Market?

Providing health insurance through employers as part of a compensation package instead of through individual markets for health insurance has several advantages for employees. Firstly, providing health insurance to a firm instead of an individual may be more attractive to an insurance company because they can pool risk across the firm. This may result in lower premiums for individuals who would otherwise be higher risks. Secondly, group insurance may lower the administrative costs of providing insurance by using payroll systems to keep track of individual contributions [Gruber and Poterba, 1996]. Thirdly, exempting employer contributions from the employee's income tax significantly subsidizes the cost of an insurance package.

The first two reasons outlined above suggest that larger firms should be able to offer the most attractive health insurance plans. Administrative costs generally increase at

a decreasing rate and hence the employee's share of these costs decreases with the number of employees. Further, more employees allow for greater risk pooling, lowering the impact of individuals who consume large amounts of health care on the average employee's premium. The data suggest that this is indeed the case. In Canada, in firms with less than twenty employees, only 24% of workers held supplemental health insurance benefits (health or dental). Among the largest firms, with over five hundred employees, 79% of workers held supplemental health insurance benefits (Table 1). In the United States, in firms with ten or fewer employees 30% of workers held health insurance benefits, while among the largest firms, with over one thousand employees, 72% of workers held health insurance benefits (Table 2).

On the other hand, the third advantage of employer-provided insurance, the tax subsidies, should not favor larger firms, but should favor employer based insurance over non-employer based insurance. The tax exemption for health insurance premiums is only available for employer based packages. In this case, the subsidy available to the worker is determined by his/her marginal tax rate and not by the firm's size. In the absence of government subsidies we would expect to see health insurance benefits concentrated in larger firms versus smaller firms and individual markets for reasons one and two above. However, in the presence of government subsidies, small firms now also have an incentive to offer health insurance benefits to their employees. By providing health insurance tax-free, even the smallest firms can offer health insurance at highly subsidized costs. Since many large firms would be likely to offer health insurance even in the absence of a subsidy, we might expect that the measured marginal effect of government subsidies on the decision to offer health insurance be larger in small firms.

More formally, an individual decision to purchase insurance can be represented as follows: Purchase Health insurance if

$$(1) \quad V^* = v_i\{w_i(1-t_i) - (c + x/N)\} - r_i v_i\{w_i(1-t_i) - M_i\} + (1-r_i)v_i\{w_i(1-t_i)\} > 0$$

where $v(\cdot)$ is the individual's indirect utility function, w is the individual's wage, r is the probability of getting sick, M is the cost of illness if sick, and t is the individual's average tax rate. Assume that individuals all face the same cost of insurance, c , whether insurance is purchased through an employer or purchased privately, but the administrative or loading costs of insurance, x , are dependent on the number of individuals in the group purchasing the policy, N . On the private market, $N=1$. Assume further that the utility function is well behaved. In the absence of any tax policy regarding health insurance, an individual will purchase insurance if the indirect utility from purchasing insurance is greater than the indirect utility from not purchasing insurance.

Suppose that the size of the firm only affects an individual's decision to purchase insurance through N . Since the cost of insurance is lower in large groups, an individual is more likely to purchase insurance if they are in a large firm than if they are in a smaller firm. Similarly, individuals are more likely to purchase insurance through their employer than on the private market. Suppose that initially for an individual, i :

$$(2) \quad V_{N=1 \text{ arg } e}^* > V_{N=\text{small}}^* > 0$$

Then we would expect this individual to buy insurance through his/her employer regardless of whether he or she is in a large or small firm.

Since $\frac{\partial V^*}{\partial N} > 0$ as long as $c < w(1-t) + x/N^2$, the larger the firm, the more advantageous it is to purchase health insurance through the employment relationship. The data presented in tables 1 and 2 support this hypothesis. Levels of employer based health insurance rise dramatically with the size of the firm in both countries.

Alternatively, suppose that for individual, i :

$$(3) \quad V_{N=large}^* > 0 > V_{N=small}^*$$

Then this individual will decide to purchase insurance if he works in a large firm and not to purchase insurance if he works in a small firm¹.

If we now allow the cost of employer contributions to health insurance to be tax deductible, the individual will purchase insurance if:

(4)

$$V^* = v_i \{w_i(1-t_i) - [\mathbf{a}(c + x/N)(1-t) + (1-\mathbf{a})(c + x/N)]\} - r_i v_i \{w_i(1-t_i) - M_i\} + (1-r_i) v_i \{w_i(1-t_i)\} > 0$$

where \mathbf{a} is the share of the premium paid by the employer.

For individual i the effects of subsidizing insurance depends on whether he is initially represented by equation (2) or equation (3). If, as in equation (2), this individual had already chosen to purchase insurance in order to maximize his indirect utility, regardless of the size of the firm he is employed in, then the presence of the tax subsidies will not influence the marginal decision to purchase any insurance for this individual. It may; however, lead him to purchase more insurance than he otherwise would since he now can receive this insurance tax-free.

On the other hand if the individual is initially represented by equation (3), such that he will purchase insurance if employed at a large firm but not if he is employed at a small firm, then we might expect the tax subsidy to influence the marginal decision to purchase any insurance. By subsidizing insurance through the tax system it may be the case that the indirect utility from purchasing insurance in small firms is now greater than not purchasing insurance. That is, in the presence of tax subsidies equation (3) becomes (assuming $\mathbf{a}=1$):

(3')

$$v_i\{w_i(1-t_i)-(c+x/N_L)(1-t_i)\} > v_i\{w_i(1-t_i)-(c(1-t_i)+x/N_S)\} > r_i v_i\{w_i(1-t_i)-M_i\} + (1-r_i)v_i\{w_i(1-t_i)\}$$

and the individual will now choose to purchase insurance.

If the world is made up of individuals whose decision to purchase health insurance can be represented by equation (2), then we would expect that subsidizing insurance may lead individuals who already have health insurance to purchase more health insurance tax free, but not to a large increase on the margin in the number of individuals deciding to purchase any health insurance. Also, we would expect that while large employers would be likely to offer insurance at savings over the private market, workers in smaller firms may choose to purchase insurance on the private (non-employer based) market. On the other hand, if many individuals can be represented by equation (3) then by subsidizing health insurance we would expect that individuals who are employed in smaller firms will now decide to purchase health insurance through the workplace and

¹ Individuals may sort themselves into different sized firms for a variety of reasons. Appendix A explores the distribution of workers across firm size and region in more detail.

we there will be an increase in the number of individuals holding employer based insurance.

III. Empirical Framework

If tax subsidies effect how health insurance is delivered in the market place then we would expect that the largest effect will be on whether health insurance is offered among smaller firms. In particular, if equation (3) describes the behavior of individuals in who are employed in small firms, then we would expect that tax subsidies will entice individuals to purchase insurance through a small firm employer instead of on the private individual market, or even forgoing insurance all together. On the other hand, if equation (2) more accurately describes the behavior of individuals, that is it is optimal for them to purchase insurance regardless of their employer's size, then we would not expect the tax subsidies to affect the decision to purchase insurance on the margin, although individuals may purchase more insurance than would be optimal in the absence of the subsidies. The empirical strategy presented below tests whether the equation (2) or equation (3) better describes observed behavior and attempts to assess the impact of tax subsidies on the decision to purchase insurance through an employer.

The empirical work exploits the variation in tax subsidies across Canadian provinces and American states. It examines differences in mean values of health insurance coverage by firm size across provinces and states, and then extends the analysis to a multivariate framework.

In Canada, it exploits unique tax laws in Quebec, which do not exclude employer contributions to an employee's health insurance from the employee's taxable income.

Therefore, employees in Quebec who have the same income and pay the same taxes as similar employees in the rest of Canada receive a subsidy to their health insurance which is considerably smaller (almost half the size) of that in other provinces. We would expect, then, that if these subsidies alter the distribution of health insurance across firms of different sizes, then this effect would be smaller in Quebec.

I use a difference-in-differences framework to estimate the effect of tax subsidies to employer provided health insurance on firm size. I compare the distribution of health insurance across large and small firms for provinces and states with varying tax-subsidies.

In Canada I compare the difference in supplemental health insurance in small and large firms in Quebec with the distribution between firm sizes in other Canadian provinces . The difference-in-differences estimator is then:

$$(5) \quad \hat{\mathbf{a}}_{dd} = (\bar{y}_{O,L} - \bar{y}_{O,S}) - (\bar{y}_{Q,L} - \bar{y}_{Q,S})$$

where subscript O denotes other provinces, subscript L denotes large firms (defined as five hundred or more employees), subscript Q denotes Quebec and subscript S denotes small firms (defined as fewer than twenty employees²).

In the United States I compare states with no state income taxes with those states with the highest rates of income tax. The states with no income taxes are Alaska, Florida, Nevada, South Dakota, Texas, Washington and Wyoming. The states with the highest income taxes are California, Iowa, Montana, New York, North Dakota, Oregon and the District of Columbia. I use a difference-in-differences estimator identical to that

² The definition of small firm is restricted by the categories available in the data sets. Therefore, small firms are defined as less than twenty employees in the SWA data and less than 25 employees in the CPS data.

described in equation (5), replacing the Canadian provinces with the states outlined above.

The estimate, $\hat{\mathbf{d}}$, represents the difference between small and large firms in the high subsidy versus low subsidy environments in employer-provided health insurance coverage. A negative value of $\hat{\mathbf{d}}$ suggests that the differences in health insurance coverage between large and small firms are greater in those states/provinces where subsidies for insurance are smaller. I take this to mean that the states/provinces with higher subsidies have higher levels of employer-provided health insurance coverage across smaller firms, and, therefore, more employer based health insurance in general.

I extend the differences-in-differences estimator into a multivariate framework to control for other factors which may influence the distribution of health insurance in particular states/provinces. Differences in wages, occupations, industry composition, as well as other demographic characteristics, may influence the distribution of health insurance benefits. To control for these differences I estimate a probit model for the probability of holding health insurance (hi):

(6)

$$Prob(hi_i = 1) = Prob[\mathbf{e}_i > -(Small * Region_i \mathbf{d} + SmallFirm_i \mathbf{q} + Region_i \mathbf{a} + \ln(w_i(1 - t_{fi} - t_{pi}))\boldsymbol{\xi} + X_i \mathbf{b})]$$

Where \mathbf{d} the coefficient on the interaction between being in a small firm in a low subsidy region is the multivariate difference-in-differences estimator. X is a vector of demographic characteristics including industry and union controls. w is the individual's after tax wage, $region$ includes a vector of state or provincial dummy variables and $small\ firm$ is a dummy variable for being in a small firm. As a cutoff for the size of small firm I use less than twenty employees in Canada and less than twenty-five in the U.S..

The above empirical analysis exploits differences in subsidies between two groups of provinces and states. However, there is considerable variation in the tax price of insurance within the two groups I examine. To exploit this variation I create a variable equal to the median price of insurance in each province and state. I then interact this median tax price with firm size to examine the implications of differing subsidies by firm size across provinces and states.

My analysis ignores a potentially important avenue for purchasing insurance: through group association. An alternative form of pooling risks and reducing administrative costs is to offer group insurance to individuals who belong to a common organization or group. For example, many academics may be able to purchase insurance through memberships with academic societies. These societies would then replace the employer as a means of pooling risk and reducing costs³. However, while offering these advantages, such organizations can not offer subsidized health insurance by exempting member contributions from the individual's wage. Therefore, while we might expect that some individuals choose to purchase health insurance through a non-employment related group, we would expect that individuals would switch to employer-provided plans if the tax subsidies were large enough such that it became economically superior for them to do so. In this case, we can treat these individuals as private insurance holders when examining the effects of tax subsidies on insurance in the workplace.

Non-Employer Provided Private Insurance

The model outlined above suggests that tax subsidies provide substantial advantages to purchasing insurance through an employer. If we expect that more small

firms will offer insurance as a result of higher tax subsidies, we might also expect that the levels of private (non-employer provided) insurance will be higher in areas with low tax subsidies. I test this hypothesis by comparing private (non-employer provided) health insurance coverage levels in states with high tax subsidies to private health insurance coverage in areas with smaller (no state level) tax subsidies. I first directly test the mean levels of private coverage and then extend this analysis into a multivariate framework similar to that outlined above.

IV. Data

My empirical analysis draws on two data sources. The first is the 1995 Survey of Work Arrangements (SWA). The SWA is a national cross-sectional survey conducted as a supplement to the larger Canadian Labor Force Survey, a monthly survey of employment and demographic data. The SWA sample contains information on approximately 25,000 employed individuals. In addition to information on employment status, the SWA provides detailed information about job characteristics for a subset of the workers surveyed in the Labor Force Survey. The SWA asks a series of questions on non-wage benefits, including supplemental health insurance and dental insurance. Benefit questions were only asked of non-self-employed individuals. The SWA also includes detailed information regarding the labor status and income of spouses. After eliminating self-employed individuals and individuals missing important information, the data set consists of 15,688 observations. I impute marginal tax rates for individuals in the SWA using tax information from the 1995 federal and provincial tax handbooks and from

³ I thank Mel Fuss for pointing this out.

information contained in *Tax Facts* (KPMG, 1996). These imputed marginal tax rates take into account the federal and provincial tax rates, federal and provincial surtaxes, and standard deductions, including pension plan deductions, unemployment insurance deductions, and deductions that might result from marital status and dependent children (see Stabile, 1999) for details.

Table 3 shows the differences in tax rates by province. We can see that there is considerable variation in the marginal tax rate, and hence the subsidy for employer based health insurance, across provinces. In Quebec, where employer-provided health insurance is not exempt from provincial income taxes, the variation in the tax price of insurance is considerably magnified.

The second data source is the 1995 March Current Population Surveys (CPS). The March CPS is a national survey of approximately fifty thousand households that includes demographic and labor force information, as well as information on health insurance coverage. In each survey year the CPS asks whether or not the individual is covered by Medicare, Medicaid or private health insurance. Those with private coverage are asked whether this coverage was made available through a current or former employer or whether they purchased the coverage privately. I focus only on health insurance made available through a current or former employer. I keep only those individuals who are working and exclude the self-employed unless I specifically note otherwise. I impute federal and state income tax rates on wage and salary income only for the CPS sample using information from federal tax forms and publications as well as the Advisory Commission on Intergovernmental Relations (1995). These tax rates are for a single individual or a married individual filing separately. The rates account for deductions of

federal taxes at the state level where appropriate. The average price per dollar of employer provided health insurance in those 7 states with the highest state taxes is \$0.80. In those states with no state taxes the average price per dollar of employer provided health insurance is \$0.73.

V. Empirical Results

Difference-in-Differences:

To test whether tax subsidies affect the level of coverage in the workplace I examine the differences in mean employer-provided supplemental health insurance coverage between large and small firms in Quebec and in the rest of Canada. I examine employer-provided coverage in firms with less than 20 people and compare them with firms with more than 20 people. In Quebec, tax laws do not permit workers to exempt employer contributions from their provincial income taxes; in the rest of Canada workers can exempt contributions from provincial taxes. Therefore, the subsidy for a dollar of health insurance is considerably smaller in Quebec than in the rest of Canada. While the other provinces receive combined federal and provincial subsidies as high as 54 percent, subsidies in Quebec are limited to a maximum of 31 percent. One would then expect, given the model outlined above, that fewer smaller firms would offer insurance in Quebec relative to larger firms. The difference-in-differences results confirm this hypothesis. Table 4 presents these results. In large firms levels of coverage in Quebec exceed those in the rest of Canada. In small firms levels of coverage in Quebec are significantly lower than the rest of Canada. The gap in coverage levels between small firms and large firms in Quebec is 7 percentage points larger than in the rest of Canada.

That is, not only are individuals in small firms in Quebec less likely to get insurance than individuals in large firms, but this difference is significantly larger than individuals in similar sized firms in the rest of the country.

Table 5 presents similar difference-in-differences results for the United States. Here I compare states with no state level income tax (and hence a smaller subsidy for employer-provided health insurance) to states with the highest levels of state income tax (and hence the largest subsidies for employer-provided health insurance). I choose the top seven states ranked by top income tax bracket to match the seven states without state level income tax. Again, a priori, we would expect that in individuals in smaller firms, those with less than 25 employees, are less likely to have health insurance than individuals in larger firms, those with 25 or more employees. Moreover, we expect that this difference will be larger in those states with small tax subsidies for employer-provided insurance. The data provide evidence to suggest that this is indeed the case. In large firms levels of coverage do not differ between high tax and low tax states. In small firms, levels of coverage are lower in low tax states. The gap in coverage levels between large and small firms is 3 percentage points larger in those states with low tax subsidies than in those states with high tax subsidies. This difference is significant at the 5% level.

Multivariate Results:

I extend this analysis into the multivariate framework outlined above by fitting a probit regression to the SWA and CPS data. The multivariate analysis allows me to control for other variation, which may influence the probability of holding employer-

provided health insurance. The results from the Canadian SWA data are presented in column 1 of Table 6. The multivariate results confirm the results above. Coverage levels for individuals in small firms versus large firms in Quebec are 7.5 percentage points lower than in the rest of Canada. Again, this reflects the difference between small and large firms in Quebec as compared to the difference between firms of similar sizes in the rest of the country.

Other explanatory variables have their expected effects on the probability of holding health insurance. The tax-price of a dollar of insurance has a negative and significant effect (see Stabile, 1999 for a full discussion of the impact of the tax-price on the decision to offer insurance). After-tax wages have a positive and significant effect on the decision to hold insurance. Individuals who work more hours, are members of a union, have longer tenures with their employers, and in larger firms are all more likely to have health insurance. Industry and occupation dummies are included. A chi-squared test for the joint significance of these dummy variables suggests that both sets are jointly significant variables in determining whether an individual holds supplemental health insurance through an employer.

One concern with examining employer-sponsored coverage in small firms is that some workers in small firms may have insurance coverage from other sources. In particular, workers who have coverage through a spouse's employer may choose to work in a firm without insurance to earn a higher wage. To try and test whether this type of behavior is driving the results reported above, I repeat the above analysis limiting my sample to non-married individuals. The results from this analysis are not presented here, but are almost identical (similar magnitude and significance) to the results obtained from

using the entire sample. This suggests that while joint maximization of benefits between spouses may be occurring, it is not driving the results presented above.

The second column of Table 6 exploits differences in the tax subsidies across all ten provinces instead of simply contrasting Quebec and the rest of Canada. I use the median tax subsidy in each province and interact this subsidy with a dummy variable for being in a small firm. The resulting coefficient is then a measure of how different provincial tax subsidies alter the probability of holding health insurance in small firms across all provinces. I find that the individuals in small firms are less likely to hold health insurance in provinces with lower tax subsidies.

I estimate similar equations using CPS data for the U.S. population (Table 7). Once again the multivariate analysis confirms, and even bolsters, the difference-in-differences results presented above. Coverage levels for individuals in a small firm in low subsidy states, relative to large firms, are 5 percentage points lower than coverage levels for individuals in states with higher subsidies. This result is strongly significant and slightly larger than the difference-in-differences result above. Other explanatory variables have similar effects to those in the Canadian data. The tax-price of health insurance has a negative and very significant effect on the probability of having health insurance. Wages are positively correlated with holding employer-provided health insurance, as is being a member of a union. Age is positively correlated with having health insurance whereas it is negatively correlated in the SWA data. The reason for this is that the SWA data has information on tenure with the current employer. Without the tenure information, the coefficients on age are similar in both data sets. Including tenure removes the positive correlation between age and health insurance suggesting that age is a proxy for tenure.

Once again, industry dummy variables are included, although not reported in Table 7. The second column of table 7 uses median tax subsidies by state instead of the dichotomous high subsidy state, low subsidy state distinction. Again I find that individuals in small firms are less likely to have insurance in states with low subsidies than in states with higher subsidies⁴.

In sum, the difference-in-differences analysis and the multivariate analysis in both Canada and the United States present consistent evidence that the tax-subsidies to employer-provided health insurance results in greater insurance coverage among individuals in smaller firms. This evidence supports the hypothesis outlined in equations (3) and (3') above which suggest that the tax-subsidies reduce the costs of insurance such that it is now profitable for individuals to purchase insurance regardless of the size of their employer. Therefore, the primary mechanism by which tax subsidies affect the margin of whether or not to buy any insurance through an employer is by promoting such insurance in small firms.

Non-Employer-Provided Health Insurance

The evidence above suggests that offering greater subsidies to health insurance may influence individuals in small firms to obtain coverage through an employer. In regions where tax subsidies are low, therefore, there is little incentive to purchase insurance through a small sized employer, and we might expect that individuals whose

⁴ As with the Canadian data, I repeat this analysis using single individuals only to check whether individuals with spousal coverage who work in small firms without coverage may be driving the results above. Once again, the results using non-married individuals only are of similar magnitude and significance to those presented above.

indirect utility from purchasing insurance is greater than not purchasing insurance will obtain coverage through the private (non-employer-provided) market. An initial examination of the CPS data suggest that this is indeed the case. Individuals in states with no state taxes (and hence lower subsidies for employer-provided health insurance) are approximately 16 percent more likely to hold private health insurance (1 percentage point). This difference is statistically significant at the 5 percent level.

I use a difference-in-differences estimator to examine whether the difference in private (non-employer provided) insurance rates between employees of small and large firms is greater in low tax states than in high tax states. I examine the difference between employees in small and larger firms because we should expect that larger firms can offer insurance well below the private market rate and as a result, employees of large firms who want health insurance would be very unlikely to purchase such insurance on the private market. Table 8 presents the difference-in-differences results. We see that in all firms with greater than 25 employees rates of private coverage among employees are identical. However, in small firms rates of private coverage among employees are approximately 2 percentage points higher in low tax (low subsidy) states than in high tax states. The difference-in-differences is approximately 2 percentage points and is significant.

I extend this into a multivariate regression framework by fitting a linear probability model to holding private health insurance outside the workplace⁵. I examine a model which simply includes a dummy variables for being in a low subsidy area and then extend this model to a difference-in-differences framework, interacting low subsidy areas

with being employed in a small firm.. Table 9 presents the results. The first column of Table 9 looks at whether being in a low tax state increases the probability that an individual holds private coverage outside the workplace. Being in a low tax state increases the probability of holding private coverage by approximately half a percentage point, although, unlike the analysis of straight means presented above, the multivariate analysis is not significant at the 10 percent level. The second column of Table 9 reproduces the difference-in-differences analysis in a multivariate framework. Similar to the straight difference-in-differences result, the gap in private, non-employer provided, insurance coverage between workers in large and small firms is 1.5 percentage points greater in low subsidy states than in high subsidy states, and this difference is significant at the 10 percent level. This is consistent with the hypothesis that tax subsidies encourage individuals to buy insurance through an employer. As the tax price of insurance comes closer to the price of insurance on the private market (one dollar) individuals are more likely to simply hold insurance purchased on the private market, instead of through an employer. Similarly, working in a small firm has a positive effect on holding private insurance outside an employment relationship. Relative to being in a small firm, each of the firm size dummies are negative and significant, suggesting that levels of private coverage decrease dramatically as firm size of employment increases.

These results suggest that tax subsidies may have a small impact on the propensity to hold private insurance outside the workplace, with individuals who face

⁵ I use linear probability models instead of probit models for the estimation because a very small percentage of the population has private insurance provided outside an employment relationship (4%) and the linear probability model does a much better job of returning the differences in means.

larger subsidies more likely to purchase insurance through an employer and less likely to purchase through the private market⁶.

Implications

I can use my estimates of how the tax subsidies affect coverage levels across firm sizes and between the employment and private market to examine how the subsidies have changed the distribution of health insurance coverage in the United States in order to examine the implications of removing the subsidies on health insurance coverage across firms and in the private market.

I can extrapolate how removing the subsidies would affect the gap in insurance coverage and the level of private, non-employer provided coverage, using the differences observed in data between low tax and high tax states. I assume that the level of coverage in large firms will not be affected by removing the subsidy⁷ (although we would expect that the amount of insurance purchased would decrease as the marginal cost of an additional dollar increases by an average of \$0.24). The removal of the subsidies would result in decreases in coverage in small firms and perhaps increases in coverage on the private market. Using an average gap in coverage between large and small firms of 35

⁶ If individuals do not value health benefits, they may choose to work in a firm which does not offer benefits, or alternatively, they may choose to be self-employed. If avoiding health insurance costs were a primary motive for choosing self-employment we would expect that levels of private coverage (obtained outside the employment relationship) would be quite low among such workers. However, data from the CPS suggests otherwise. If we examine all workers without employer provided health coverage, self-employed workers are much more likely to purchase private coverage, all else equal, than are not self-employed workers without employer coverage. This suggests that avoiding paying for health insurance is not causing people to select themselves into self employment. Research by Holtz-Eakin, Penrod and Rosen [1994] suggest that lack of health insurance coverage has had no noticeable effect on the movement of workers into self-employment, providing further evidence that health insurance coverage, or lack thereof, does not have a sizeable impact on the decision to be self-employed.

percentage points in the U.S. and an average tax-price of insurance of 0.76 in the U.S., my estimates suggest that removing the subsidy to employer provided health insurance completely would cause coverage levels in small firms to decrease by approximately 50 percent, increasing the gap between small and large firms to approximately 51 percentage points. The level of employer-provided health insurance coverage in small firms would then fall from its current level (1995 data) of 32% to 16% (see table 10). This decline would be partially offset by increasing in coverage in the private market. Extrapolating from the differences in private insurance coverage between states with high and low subsidies, removing the subsidies all together would cause an increase in private insurance coverage among workers in small firms from 9 percent to 14 percent (table 10).

Therefore, by removing the subsidies for employer provided health insurance we would see large changes in both the number of insured and the method by which people obtain health insurance. Workers in large firms would continue to purchase insurance through an employer because of the benefits other than the tax subsidies of doing so. Among the smallest firms, levels of coverage would drop dramatically because without the subsidy there is little to no advantage from buying insurance through an employer. Part of this drop would be offset by people buying health insurance on the private market. Presumably, part of the drop would result in a rise in the number of insured. It is difficult to accurately measure how the number of insured would change with such a policy change as other options for insurance, namely coverage as a dependent, would presumably be a potential substitute, along with private coverage, for coverage under one's own employer.

⁷ In the data presented the number of insured in large firms is invariant to changes in the tax subsidies.

VI. Conclusions

Tax subsidies to employer provided health insurance lower the costs of providing health insurance through an employer, regardless of the size of the firm. Unlike the other advantages of employer-provided health insurance, the tax-subsidies are determined by the individual employee's characteristics, namely his or her marginal tax rate. While smaller firms are still much less likely to offer insurance than larger firms, the subsidies may make insurance more attractive to workers in a small firm than purchasing insurance outside the workplace, or not purchasing insurance at all. Subsidies are unlikely to have any observable affect on coverage levels in large firms because of advantages large firms offer in the administration of insurance. The findings reported above confirm this hypothesis. Data from both the United States and Canada support the claim that the insurance coverage gap between small and large firms is smaller in those states or provinces which have higher tax subsidies. The gap is due to differences in coverage levels across small firms. Levels in large firms do not differ significantly according to the value of the subsidy. These findings are significant and consistent across several specifications. Furthermore, there is some evidence that rates of private coverage obtained outside any employment relationship are higher in those states with lower tax subsidies. Subsidies to employer-provided health insurance, therefore, have an observable affect on the marginal decision to hold insurance in smaller sized firms, thereby reducing the level of private, non-employer provided insurance. The subsidies thereby help to promote the link between employment and health insurance coverage, particularly among smaller firms.

My findings suggest that removing the subsidies to employer-provided health insurance will have a significant effect on the level of employer-provided health insurance coverage in small firms. Removing the subsidies all together would cause the level of coverage in small firms to fall by 50%. On the other hand, coverage levels in large firms are unlikely to change by very much with the removal of the subsidies. Small gains in private, non-employer provided insurance, would offset only a fraction of this decline.

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Table 1 Percentage of Workers with Employer Provided Health Insurance by Firm Size in Canada

# of Employees	Canada	Quebec	Canada excluding Quebec
< 20	21.4	18.8	22.3
20-99	54.1	52.4	54.7
100-500	68.1	76.1	65.4
500+	75.8	79.4	74.7

Source: 1995 Survey of Work Arrangements
Weighted tabulations using SWA final weights.

Table 2 Percentage of Workers with Employer Provided Health Insurance by Firm Size in the United States

# of Employees	All States	States with No Income Tax	States with Income Tax
<10	30.1	26.5	30.9
11-25	40.8	35.5	41.8
25-99	57.4	55.3	57.8
100-499	67.6	62.1	68.4
500-999	71.8	70.8	71.9
1000+	72.6	71.5	72.9

Source: 1995 Current Population Survey
Weighted tabulations using CPS March supplemental weights.

Table 3 Provincial Marginal Tax Rates and Tax Prices for Health Insurance

Province	Mean Marginal Tax Rate (%)	Variance in Marginal Tax Rates	Median Marginal Tax Rate (%)	Median Tax Price of Insurance (\$)
Newfoundland	30.4	0.026	29.1	0.71
P.E.I.	28.4	0.019	27.6	0.72
Nova Scotia	27.1	0.022	27.6	0.72
New Brunswick	29.6	0.020	28.4	0.72
Quebec	35.1	0.008	38.2	0.82
Ontario	32.3	0.021	41.8	0.58
Manitoba	31.3	0.021	28.4	0.72
Saskatchewan	29.6	0.021	28.9	0.71
Alberta	28.0	0.018	25.8	0.74
British Columbia	31.3	0.020	40.3	0.60

1. Source: 1995 Survey of Work Arrangements. Marginal tax rates are calculated by author.

Table 4 Difference-in-Differences: Employer-Provided Health Insurance Coverage in Quebec versus the Rest of Canada

	Other Sized Firms	Small Firms	Difference
Rest of Canada	0.677 (0.005)	0.224 (0.008)	-0.453 (0.009)
Quebec	0.712 (0.009)	0.187 (0.015)	-0.525 (0.017)
Difference	0.036 (0.010)	-0.037 (0.017)	-0.072 (0.020)

1. Source: 1995 Survey of Work Arrangements
2. Standard Errors in Parentheses
3. Small firms are defined as <20 employees.
4. Difference-in-Differences is displayed in the bottom right corner.

Table 5 Difference-in-Differences: Employer-Provided Health Insurance Coverage in States with no state tax versus states with highest state tax

	Other Sized Firms	Small Firms	Difference
High Tax States	0.668 (0.005)	0.329 (0.009)	-0.338 (0.010)
Low Tax States	0.667 (0.006)	0.298 (0.009)	-0.369 (0.011)
Difference	0.000 (0.008)	-0.031 (0.012)	-0.030 (0.014)

1. Source: 1995 CPS
2. Standard Errors in Parentheses
3. Small firms are defined as <25 employees.
4. Difference-in-Differences is displayed in the bottom right corner.

Table 6 The Effect of Health Insurance Subsidies on the Probability of Health Insurance Coverage in Small Firms; Canadian Data

N=15621	Employer-Provided Health Insurance	Employer-Provided Health Insurance
Small firm* Quebec (column 1), Small firm* Median Provincial Tax Price (column 2)	-0.074**	-0.853**
	(0.031)	(0.300)
Tax-price	-0.318**	-0.319**
	(0.083)	(0.083)
Wage	0.880**	0.881**
	(0.105)	(0.105)
Wage Squared	-0.115**	-0.115**
	(0.020)	(0.020)
Age	-0.013**	-0.013**
	(0.0052)	(0.0052)
Number of children	-0.0091*	-0.0091*
	(0.0048)	(0.0048)
Hours worked	0.012**	0.012**
	(0.00072)	(0.00072)
Married	0.064**	0.064**
	(0.017)	(0.017)
Male	-0.015	-0.015
	(0.013)	(0.013)
Spouse employed	-0.0029	-0.0029
	(0.016)	(0.016)
Tenure with Current Employer	0.088**	0.089**
	(0.0040)	(0.0040)
Senior member present in household	-0.019	-0.019
	(0.020)	(0.020)
Spouse's age	-0.018**	-0.018**
	(0.0033)	(0.0033)
Firm size 20-99	0.241**	-0.379*
	(0.017)	(0.224)
Firm size 100-500	0.307**	-0.313
	(0.017)	(0.224)
Firm size 500+	0.324**	-0.297
	(0.016)	(0.223)
Union	0.184**	0.184**
	(0.013)	(0.013)
Constant	-2.00**	-1.38**
	(0.183)	(0.285)

Source: 1995 Survey of Work Arrangements

1. Standard Errors in parentheses.
2. Includes occupational dummies, industry dummies and provincial dummies.
3. Coefficients presented as marginal effects.

Table 7 The Effect of Health Insurance Subsidies on the Probability of Health Insurance Coverage in Small Firms; U.S. Data

N=21663	Employer- Provided Health Insurance	Employer- Provided Health Insurance
Small firm* low subsidy state (column 1), Small firm * Median state tax price (column 2)	-0.053** (0.017)	-0.490** (0.206)
Tax price	-0.701** (0.082)	-0.697** (0.082)
Wage	0.375** (0.021)	0.375** (0.021)
Wage Squared	-0.039** (0.0039)	-0.039** (0.0039)
Age	0.0049** (0.00033)	0.0049** (0.00033)
Hours worked	0.011** (0.00041)	0.011** (0.00041)
Male	-0.016* (0.0086)	-0.016* (0.0086)
Married	-0.046** (0.0083)	-0.045** (0.0083)
Firm Size 10-24	0.112** (0.015)	0.112** (0.015)
Firm Size 25-99	0.193** (0.016)	-0.180 (0.167)
Firm Size 100-499	0.269** (0.016)	-0.104 (0.167)
Firm Size 500-999	0.337** (0.021)	-0.036 (0.167)
Firm Size 1000+	0.357** (0.015)	-0.016 (0.167)
Union	0.155** (0.023)	0.154** (0.023)
Constant	-0.887** (0.102)	-0.522** (0.198)

Source: 1995 CPS

1. Standard Errors in parentheses.

2. Includes State and Industry dummies. Only the 14 states representing the high and low tax states are included in the model.

3. Coefficients presented as marginal effects.

Table 8 Difference-in-Differences Estimates of Private (Non-Employer Provided) Insurance

	Large Firms	Small Firms	Difference
High Tax States	0.026 (0.002)	0.081 (0.005)	0.055 (0.005)
Low Tax States	0.026 (0.002)	0.099 (0.006)	0.073 (0.006)
Difference	0.000 (0.003)	0.018 (0.008)	0.018 (0.008)

Source: 1995 CPS

1. Standard Errors in Parentheses
2. Difference-in-difference estimate in lower right corner
3. Small firms are defined as <25 employees.

Table 9 Private (Non-Employer Provided) Insurance Coverage

N=21663	Private Health Insurance	Private Health Insurance
Small firm* low subsidy state	---	0.014*
	---	(0.0081)
Low Tax State	0.0051	---
	(0.0033)	---
Tax price	0.00094	0.061**
	(0.027)	(0.028)
Wage	-0.012	-0.0080
	(0.0086)	(0.0092)
Wage Squared	0.0018	0.0023
	(0.0016)	(0.0018)
Age	0.0018**	0.0018**
	(0.00016)	(0.00016)
Hours worked	-0.00057**	-0.00044**
	(0.00018)	(0.00018)
Male	0.0084**	0.0090**
	(0.0031)	(0.0031)
Married	-0.017**	-0.018**
	(0.0030)	(0.0030)
Firm Size <10	0.079**	0.070**
	(0.0060)	(0.0068)
Firm Size 10-24	0.040**	0.032**
	(0.0058)	(0.0067)
Firm Size 25-99	0.018**	0.015**
	(0.0041)	(0.0042)
Firm Size 100-499	0.0062*	0.0040
	(0.0035)	(0.0035)
Firm Size 500-999	-0.0037	-0.0045
	(0.0044)	(0.0044)
Union	-0.0055	-0.0045
	(0.0056)	(0.0057)
Constant	0.0065	-0.052
	(0.033)	(0.033)

Source: 1995 CPS

1. Standard Errors in parentheses.

2. Includes Industry dummies. Only the 14 states representing the high and low tax states are included in the model. Column 2 includes state dummies.

3. Coefficients presented as marginal effects.

Table 10

With Subsidies: Health Insurance by Firm Size

Firm Size	Employer-Provided Health Insurance (%)	Private, non-employer provided health insurance (%)
Small Firms (<25)	32	9
Larger Firms (>25)	67	3

Source: 1995 CPS

Without Subsidies: Health Insurance by Firm Size

Firm Size	Employer-Provided Health Insurance (%)	Private, non-employer provided health insurance (%)
Small Firms (<25)	16	14
Larger Firms (>25)	67	3

Source: 1995 CPS

APPENDIX A: Further Analysis on the Distribution of Workers Across Firms

The nature of employer-provided health insurance is that it is provided through the labor market. Since the market in question is for labor, and not health insurance, potential workers do not always have a choice of whether they can obtain health insurance at a given firm. In many cases, although certainly not all, the worker may have to choose a combination of wages and health insurance by choosing between firms which offer differing employment packages. A firm will offer an employment package in an attempt to attract the marginal or median employee (depending on whether the firm is unionized or not). In this case, workers will sort themselves into firms based on the combination of wages and benefits which provide the individual with the highest utility.

One concern about such sorting in the labor market is that individuals may sort themselves differently in different provinces or for reasons apart from the tax-subsidies for employer-provided health insurance. In this case, differences in health insurance coverage among people with differing tax subsidies, or across different size firms may be due to labor market sorting factors apart from health insurance coverage. While we can not completely determine why individuals sort themselves the way they do, the evidence provided in the chapters 2 and 3 suggests a story consistent with individuals responding to tax advantages for employer-provided insurance.

A second concern is that individuals take the best available job and that the “good jobs” come with health insurance, as well as other benefit packages, and the bad jobs do not. Therefore, the worker is not really making a choice regarding employer provided health insurance. There is recent evidence that suggests that this is not the case. The most

recent figures suggest that while the number of jobs offering health insurance has increased between 1987 and 1996, take-up rates (the number of workers accepting this offer of insurance) have declined [Cooper and Schone, 1997]. 1997 data shows that while 71.7 percent of all workers were employed in a firm that offered health insurance, 85.4 percent of these workers accepted coverage. Of the workers who turned down coverage, 22 percent went uninsured (no coverage from any other source) [Thorpe and Florence, 1999].

I have shown that health insurance is much more common in large firms, and among higher income individuals. Below I present an analysis of the differences in the distribution of workers across provinces to address concerns that the sorting mechanism used by individuals differs systemically by province. Table A1 below shows the distribution of health insurance benefits by firm size for each of the ten provinces. In all provinces the probability of holding insurance is greater in larger firms than in smaller firms, although as noted in chapter 3, Quebec has the largest difference in insurance coverage between the smallest and largest firms, consistent with the hypothesis presented in this chapter that the lower subsidies make it less attractive for smaller firms to offer health insurance coverage relative to larger firms.

Table A2 shows the distribution of workers with incomes greater than the median income across different size firms in all provinces. We might be concerned if, in Quebec, there was a larger portion of workers with incomes above the median income in small firms where the probability of health insurance is much lower. If this were the case we would see fewer workers with relatively high marginal tax rates (and hence high subsidies for employer-provided insurance) actually taking up coverage. However, this

does not appear to be the case. On average, 12 percent of workers in with incomes above the median income are in small firms. In Quebec, 10 percent of such workers are in small firms. In Ontario, the corresponding number is 11 percent. Quebec has 50 percent of workers with incomes about the median working in the largest firms. This is higher than provinces such as Alberta or British Columbia, but lower than Ontario.

Tables A3 and A4 examine hourly wages across firms and provinces/states. Table A3 presents a difference-in-differences estimate of the wage gap between the smallest and largest firms in Quebec versus the rest of Canada. The gap is significantly larger in Quebec than it is in the rest of Canada. However, this is not the case in the United States (Table A4). The gap between large and small firms in states with no income tax is actually smaller than it is in states with income taxes although this difference is not significant at the 10% level. Given that the hypothesis that small firms are more likely to offer insurance in high tax states than in low tax states holds for both Canadian and U.S. data, it does not appear to be the case that the difference in wage differentials for Quebec and the rest of Canada is driving this result.

Table A1 Percentage of Workers With Health Insurance by Firm Size and Province

Province/Firm Size	Less than 20	20 to 99	100 to 500	More than 500
Newfoundland	19.9	60.9	86.1	74.5
PEI	23.5	56.3	73.7	71.6
Nova Scotia	29.8	60.7	61.4	72.3
New Brunswick	23.2	45.2	61.0	72.1
Quebec	18.8	52.4	76.1	79.4
Ontario	22.2	58.0	67.7	77.6
Manitoba	25.8	55.2	58.3	73.6
Saskatchewan	19.3	43.7	57.8	58.7
Alberta	18.0	50.9	56.2	69.6
British Columbia	24.0	51.7	69.3	73.5
Total	21.4	54.1	68.1	75.8

1. Source: 1995 Survey of Work Arrangements

Table A2 Percentage of Workers with Incomes greater than the Median Income by Firm Size and Province

Province/Firm Size	Less than 20	20 to 99	100 to 500	More than 500
Newfoundland	13	8	24	55
PEI	16	16	22	47
Nova Scotia	12	13	16	59
New Brunswick	14	11	21	54
Quebec	10	15	24	50
Ontario	11	11	19	58
Manitoba	8	12	21	59
Saskatchewan	14	15	24	47
Alberta	15	15	22	48
British Columbia	14	18	20	48
Total	12	13	21	54

1. Source: 1995 Survey of Work Arrangements

Table A3 Difference-in-Differences: Hourly Wages by Firm Size, by Province in Canada

	Large Firms (500+)	Small Firms (<20)	Difference
All Provinces Except	16.785	11.080	-5.705
Quebec	(0.099)	(0.110)	(0.148)
Quebec	17.889	10.571	-7.318
	(0.221)	(0.181)	(0.286)
Difference	1.104	-0.509	-1.613
	(0.242)	(0.212)	(0.322)

1. Source: 1995 Survey of Work Arrangements
2. Standard errors in parentheses.

Table A4 Difference-in-Differences: Hourly Wages by Firm Size, by State, in the U.S.

	Large Firms (500+)	Small Firms (<25)	Difference
States with Tax	14.691	11.011	-3.680
	(0.094)	(0.128)	(0.159)
No Tax States	13.674	10.600	-3.074
	(0.463)	(0.289)	(0.546)
Difference	-1.017	-0.411	0.606
	(0.472)	(0.317)	(0.568)

1. Source: 1995 Current Population Survey
2. Standard errors in parentheses.