NBER WORKING PAPER SERIES

THE IMPORTANCE OF GROUP COVERAGE: HOW TAX POLICY SHAPED U.S. HEALTH INSURANCE

Melissa A. Thomasson

Working Paper 7543
http://www.nber.org/papers/w7543

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
February 2000

This research would not have been possible without the generous assistance of NSF Grant #SBR-9632121 and a grant from the University of Arizona. I would like to thank Pat Bova and the National Opinion Research Center for allowing me access to the data. Seminar participants at the University of Arizona and Northwestern University, as well as conference participants at the 1997 Cliometrics Conference and the 1997 NBER-DAE Summer Institute provided excellent and useful comments. All errors remain my responsibility. The views expressed herein are those of the authors and not necessarily those of the National Bureau of Economic Research.

The Importance of Group Coverage: How Tax Policy Shaped U.S. Health Insurance

Melissa A. Thomasson

NBER Working Paper No. 7543
February 2000
JEL No. H20, I10, N82

ABSTRACT

In 1954, the Internal Revenue Service stipulated that employer contributions to the health insurance plans of their employees were to be excluded from employee taxable income. Today, the tax subsidy is a major feature of the U.S. health care market. This paper examines the initial effects of the tax subsidy on the demand for health insurance using previously unexamined data from 1953 and 1958. Results suggest that the tax subsidy increased the growth of group insurance, particularly among union members and employed persons. This is a critical effect because group insurance is not only less expensive than individual insurance, but it is also easier to obtain, and households with access to group health insurance are far more likely to purchase health insurance coverage than those without similar access. By increasing access to group insurance, the tax subsidy fostered an increase in the purchase of group health insurance by people who may not have purchased individual coverage, and generated institutional change as it cemented an employment-based system of group health insurance in the United States.

Melissa A. Thomasson
Department of Economics
Miami University
Oxford, OH 45056
and NBER
thomasma@muohio.edu

I. Introduction

Nearly all of the 70 percent of Americans under age 65 who are privately insured receive health insurance coverage through their employers; only 4.5 percent of Americans opt to purchase individual coverage. (U.S. GAO/HEHS- 97-122, p. 22). The development of employment based insurance in the United States can be traced to several factors, including governmental policies in the 1940s and 1950s, as well as the early use of employee groups by insurance companies to counter adverse selection. Government policies that directly influenced the formation of employment-based insurance were a 1942 ruling by the War Labor Board that allowed employers to use fringe benefits to attract labor during World War II, and a tax policy first introduced in 1943 (and later codified in 1954) that enabled employer contributions to the health insurance plans of employees to be exempt from employee taxable income. These pro-employment based policies, combined with the fact that employment groups were profitable ways for insurance companies to sell insurance, led to the rise of the employment-based system of private health insurance in the United States.

Today, employment based group health insurance and the tax subsidy of employer contributions to health insurance dominate the U.S. health care market. However, they are also the target of critics who argue that curtailing or eliminating the tax subsidy, and severing the link between health insurance and employment would do much to alleviate the problems ailing the U.S. health care system. Employment-based insurance has been cited as a contributor to job lock (Madrian, 1994). Further, the tax subsidy results in a revenue loss to government and may also spur rising health care costs. Gruber and Poterba (1996) calculate that about 78 percent of U.S. households in the 1987 National Medical Expenditures Survey were directly eligible for the tax subsidy on employer contributions to their health insurance plans. Further, they note that the

exclusion of health insurance contributions from the income and payroll tax base in 1994 resulted in federal revenues being $90 billion lower (Gruber and Poterba, p. 137). Some researchers also suggest that the tax subsidy causes people to overinsure, and is a major factor in rising health care prices (see Pauly, 1974; Manning, Newhouse, Duan, Keeler, Leibowitz and Marquis, 1987 for greater discussion).

The importance of the tax subsidy in the modern health insurance market has led researchers to investigate how changing the tax subsidy might alter the demand for health insurance. However, little work has been done to analyze the initial impact of the tax subsidy on the market for health insurance, and to answer some primary questions: What was the initial effect of the tax subsidy on health insurance demand? Could the tax subsidy have engendered institutional change and actually shaped the modern market for health insurance? If so, what implications does this have for modern policy? Until this point, all of the studies investigating the impact of the tax subsidy have used data from the 1960s or later. As a result, none of them is able to address these questions about the history of U.S. health insurance.

In this paper, I use previously unexamined data from before and after the 1954 tax changes to present new evidence on the role of the tax subsidy in encouraging the expansion of the health insurance market in the 1950s. Results suggest that the implementation of the tax subsidy had two distinct, important effects on the market for health insurance.

First, the tax subsidy encouraged the growth of group health insurance, and sealed the institution of insurance in the U.S. as an employment based system. After the codification of the tax subsidy in 1954, employed persons and union members had greater access to group health insurance. In 1953, 48 percent of Americans had access to group coverage, and 63 percent had some type of insurance coverage. By 1958, 67 percent of Americans had access to group

insurance, and 74 percent had private health insurance coverage. Despite the disadvantages of this system, group insurance did give more people access to insurance coverage. People who have the opportunity to purchase health insurance within a group are more likely to have insurance, and they buy more coverage than those who purchase insurance individually. Today, evidence exists that employment separation is associated with large reductions in insurance coverage (Gruber and Madrian, 1997). Group insurance is less expensive than individual coverage because it is associated with lower administrative costs, and is less subject to adverse selection. Not only is group insurance less expensive than individual coverage, but it is also the case that certain people who could not obtain insurance coverage in the individual market can obtain group coverage. In addition, employer contributions to employee health insurance plans increased after the tax subsidy, leading households to purchase even more coverage. Thus, the tax subsidy may have opened the door to health insurance (and health care) to more people.

These results indicate that the effects caused by the change in tax policy go beyond the increase in insurance purchased generated with the direct tax subsidy. While this effect is important, the tax subsidy had more far-reaching implications in that it cemented the employment based system of private health insurance in the United States. The remainder of the paper is organized as follows. Section II provides a history of health insurance before 1954, sections III and IV discuss the data and methodology, results are presented in section V and section VI concludes.

II. The Health Insurance Market before the 1954 Tax Subsidy

Health insurance protecting consumers against uncertain medical expenditures is a relatively recent phenomenon in the United States. Prior to 1930, most health insurance was actually “sickness” insurance. Rather than providing protection against uncertain medical

expenditures, sickness insurance provided income replacement in the event of disability, illness, or accident. This relatively low state of medical technology is one reason health insurance did not develop in the twentieth century. Before 1920, most patients were still treated in their homes by family members. As a result, the major monetary losses associated with illness were generally confined to lost income. A 1919 State of Illinois Commission study estimated that lost wages for individual wage earners were about four times as great as medical costs (1919, pp. 15-17). The size of the wage loss relative to the monetary cost of medical expenditures contributed to the fact that sickness insurance policies designed to protect the insured against loss of income developed, while actual health insurance remained relatively unknown. The low cost of medical care largely made the need for health insurance "… difficult to justify in the context of the period… It was felt that the family should be thrifty and save for the rainy day of illness" (Anderson, p. 86).

By the late 1920s, the situation had changed dramatically. Medical expenditures were rising and becoming more variable as medical technology further advanced. The first Blue Cross plan is said to have been founded in 1929 when a group of Dallas teachers contracted with Baylor University Hospital to provide three weeks of hospital coverage for a pre-paid fee of $6.00 annually. Soon, hospitals everywhere were establishing prepayment plans. The American Hospital Association (AHA) encouraged such endeavors, and established a set of guidelines to eliminate inter-hospital competition. By 1937, all AHA-approved plans could begin to operate under the Blue Cross symbol. Physicians initially opposed any sort of insurance, fearing that third-party interference in the doctor-patient relationship would limit their autonomy and constrain their incomes. However, as the success and rapid growth of the Blue Cross plans demonstrated the demand for pre-paid medical services, physicians sought to develop a form of insurance that would protect their financial interests. Thus, they developed their own plans under

the name of Blue Shield. Blue Shield plans required free choice of physician, and ensured that physicians could retain their power to price discriminate by charging Blue Shield patients the difference between their actual charges and the amount that they were reimbursed by Blue Shield.

Blue Cross and Blue Shield became instantly popular with consumers. In 1940, 1.3 million people had some form of hospital insurance, with 49 percent of all policies issued by Blue Cross and Blue Shield. By 1945, 32 million people had such protection.[1] Initially, the Blues had an advantage over the commercial companies in that they enjoyed certain tax-exemptions because of their non-profit status. However, their non-profit status also required that they community rate policies; i.e. that they charge sicker people the same premium as healthier people. In contrast, commercial firms could engage in experience rating, and they focused their efforts on insuring healthy groups of people through their employers. Group insurance offered insurance companies an effective way to pool risks and avoid adverse selection. Further, it enabled them to lower administrative costs. As a result, commercial firms could offer employee groups lower rates than Blue Cross and Blue Shield, and the commercial insurance business boomed. Figure 1 illustrates the rapid growth of group policies relative to individual policies over the period 1940-1960. By 1951, commercial firms had more subscribers than both Blue Cross and Blue Shield.[2]

Besides having lower administrative costs and reducing the risks associated with adverse selection, some group policies offered by commercial insurance companies may have benefited from government tax policy in the 1940s.[3] In 1943, an administrative tax ruling stated that

[1] Health Insurance Institute, Source Book of Health Insurance Data, 1970, p. 17.
[2] Health Insurance Institute, 1965 Source Book of Health Insurance Data, p. 14.
[3] Other, non-tax rulings also contributed to the expansion of health insurance. Under the 1942 Stabilization Act, employers were allowed to offer health benefit packages to secure workers during a

employers' payments to commercial insurance companies for group medical and hospitalization premiums on behalf of their employees were not taxable as employee income.[4] While this tax policy further reinforced the efforts of business to attract workers during a period of scarce labor, it was very limited in scope and subsequent rulings by the Internal Revenue Service generated confusion surrounding the exemption of employer contributions to the health insurance premiums of employees. Many people were not eligible for the tax exemption and those who were may not have been certain of their eligibility.

The 1943 ruling was limited in its applicability since it only affected direct employer contributions to group plans issued by commercial insurance companies. Private programs of employee associations (such as unions), or other private plans were not covered under the ruling, nor were employer contributions to the individual health plans of employees. The limited applicability of the tax subsidy undoubtedly dampened its effect on health insurance demand, a situation that was exacerbated by later rulings by the Internal Revenue Service. Since there were no specific statutes in place to guide the tax treatment of employer contributions, IRS rulings often seemed contradictory. As the authors of one law review article noted, "… the tax treatment of employee health plans was uncertain because of the lack of specific statutory provisions."[5] First, there was confusion as to what actually constituted an "insurance" plan. Even plans that could meet the criteria of insurance such as contractual enforceability, indemnification, and limits of liability were often not considered to be covered under the 1943 ruling.[6] Furthermore, the Internal Revenue Service at times seemed to want to reinforce the limitations of the 1943

---

period of wage and price controls. In 1949, the ability of unions to negotiate health plans for workers was cemented when the National Labor Relations Board ruled that for the sake of negotiations, the term "wages" included health benefits (*Inland Steel Co. v. NLRB* (170 F. 2d 247 (7th Cir. 1948))).

[4] 3 CCH 1943 Fed. Tax Rep. ¶6587 (1943).

[5] "Taxation of Employee Accident and Health Plans Before and Under the 1954 Code." *Yale Law Journal*, 1954, vol. 64, no. 2, pp. 222-247.

ruling; at other times it seemed to want to broaden its scope. For example, in 1953, one IRS ruling emphasized its stand on the limitations of the 1943 ruling, stipulating that employers' contributions to individual health plans were considered to be taxable compensation to the employee. In contrast, another 1953 ruling specific to the New York workers' compensation law began to broaden the applicability of the 1943 exemption by extending it to employer contributions made to private (i.e. non-commercial) employee benefit plans under the New York workers' compensation laws.[7]

Thus, until 1954, the position of the IRS on the tax exemption was far from clear. Confusion about the tax exemption remained until 1954, when the new Internal Revenue Code codified and clarified earlier rulings. Prior to 1954, many people were not eligible for the tax exemption, and those who were may not have been sure of their exempt status. In 1954, changes in the Internal Revenue Code allowed the IRS to offer a concise standard and to eliminate substantial confusion about the tax exemption of employer contributions. The 1954 Code accomplished primarily three things. First, changes broadened the applicability of earlier rulings by extending the tax exemption of employer contributions to include contributions to individual health plans and to other plans formed by employee groups, such as unions. After 1954, smaller employers for whom group plans were not easily established may have been more likely to contribute to the health plans of their employees, and unions may have been more likely to sponsor health plans as well. Second, since it clarified earlier rulings, the 1954 IRC reduced much of the uncertainty surrounding the tax treatment of employer contributions. As a result, risk-averse firms unlikely to sponsor a health insurance plan for employees prior to 1954 may have done so after the new Code eliminated the uncertainty. Finally, the IRC was likely

---

[6] ibid.
[7] Rev. Rul. 130, 1953 *Internal Revenue Bulletin*, no. 15, p. 6.

associated with substantial announcement effects, since it provided a statutory basis for the tax treatment of employer contributions which were heretofore buried in administrative tax court cases.

III. The Debate on the Effects of the Tax Subsidy of Employer Contributions

Several studies have attempted to estimate the possible effects of the tax subsidy on the demand for health insurance, but there is little consensus among them. The price elasticity of demand for health insurance is a key factor in this debate. Modern estimates of the price elasticity of demand for health insurance range from Holmer's (1984) calculation of -0.16 to Phelps' (1973) estimate of -2.84. The differences are important because the estimated effect of changes in tax policy on health insurance demand depends crucially upon this elasticity. Taylor and Wilensky (1983) perform simulations using different values of the price elasticity of health insurance demand to illustrate the effect of altering the tax subsidy on health insurance premium expenditures. Setting the elasticity equal to -0.2 generates a 7.5 percent decline in total health insurance premiums if all exemptions are eliminated. When the elasticity of demand is equal to -0.5, expenditures on health insurance decline by 16.7 percent (Taylor and Wilensky, p. 171).

In addition to providing varying estimates of the price elasticity of demand for health insurance, all of these studies employ data collected after the 1954 changes in the Internal Revenue Code. As a result, many of the studies that actually attempt to gauge how changes in the tax code affect expenditures on health insurance must rely on simulation techniques (Feldstein and Friedman, 1977; Taylor and Wilensky, 1983), or make use of periods of tax reform to study how changes in tax policy affect health insurance demand (Woodbury and Hammermesh, 1992).

Until now, these have been the only means by which the effect of the tax subsidy can be measured. To conduct a direct test of the impact the implementation of the tax subsidy had on the

market, it is necessary to examine the demand for health insurance both before and after it went into effect in 1954. I accomplish this by using the 1953 and 1958 Nationwide Family Surveys conducted by the National Opinion Research Center (NORC). As part of its program to discover what kinds of health expenses Americans were incurring and how they were meeting those expenses, the NORC canvassed 8,846 members of 2,809 families in July, 1953. The families represented an area-probability sample of the non-institutionalized population, subdivided by age, gender, income, occupation, family size, area of residence, and region. To study how medical expenses and health insurance coverage changed over time, the NORC conducted five year re-surveys. Each subsequent survey queried a similar number of people, and was carefully designed to preserve comparability between different survey years. In 1958, 2,941 households were interviewed.

With the exception of aggregated statistics that were published at the time of the original studies, the individual 1953 and 1958 surveys remain unexamined. However, these are family-level surveys which are rich in information about the early market for health insurance, and which provide crucial insights into how the insurance market developed. Since the surveys represent one of the first comprehensive studies of nationwide health insurance, they play an important role in understanding the development of the market. Further, since the major changes in the Internal Revenue Code dealing with health insurance occurred between the 1953 and 1958 studies, they also provide a unique opportunity to gauge the effect of the tax subsidy on the early health insurance market.

IV. Using the NORC Data to Estimate the Effect of the 1954 Tax Subsidy

Measuring the Impact of the 1954 Tax Changes on the Health Insurance Market

As noted previously, the effect of the 1954 tax subsidy on the demand for health insurance is two-fold. First, it may have increased the number of employers and unions that offered group health insurance plans. Since group insurance is less expensive and is easier to obtain than individual coverage, an increase in access to group insurance would generate an increase in the number of the households with insurance coverage. Second, the tax changes directly made health insurance less expensive for those households with employers who contributed to their health plans because employees did not have to pay income taxes on these contributions. As a result, the "price" of health insurance to the employee fell, which should lead in an increase in the amount of coverage purchased.

To test these effects, I first examine the impact of the tax changes on the probability that a person had the opportunity to purchase group insurance coverage. If the tax subsidy did lead more employers and more unions to sponsor health insurance plans, then access to group insurance should have increased among employed persons and union members in 1958 relative to 1953. The second effect of the tax subsidy on increasing the amount of coverage purchased can be examined in two ways. First, probit estimation can be used to identify what factors influenced a household's decision to purchase health insurance coverage or not. This is especially important in determining how access to group insurance affects a household's decision to purchase health insurance coverage. In addition, it can shed some light on whether the tax changes influenced a household's decision to purchase health insurance or not. Second, while the tax changes may have induced some people to purchase coverage who would not have otherwise, it is more likely that households who had already made the decision to purchase health insurance

purchased a higher level of coverage after the tax changes were enacted. As a result, tobit estimation is used to gauge the effect of the tax changes on the amount of coverage purchased.

Estimating the Impact of the Tax Subsidy on Access to Group Insurance

Simple comparisons of the samples in 1953 and 1958 reported in Tables 1 and 2 suggest that more people had access to group insurance in 1958 than in 1953. In 1958, 67 percent of households had the opportunity to purchase health insurance through a group plan, compared to 48 percent of households in 1953. The 1954 tax changes resolved uncertainty surrounding the tax-exempt status of employer contributions, so more employers to sponsor plans. In addition, after 1954, union-sponsored plans that employers contributed to were also eligible for the exemption. Thus, access to group insurance should have increased in 1958 relative to 1953.

To specifically test this hypothesis, I estimate a probit model where the dependent variable is equal to one if the household had the opportunity to purchase group insurance, and zero otherwise. Independent variables include socioeconomic and demographic characteristics, including industry, occupation, age, union membership, and employment status. Of particular interest are the variables *union* and *employed*. *Union* is equal to one if the household head is a union member, and *employed* is equal to one if the head of the household is employed. *Union* is included because it may have been the case that they exerted pressure on employers to provide group health insurance plans, or themselves sponsored employee insurance plans, particularly after 1954 when tax exemption for employer contributions to such plans was assured. To test whether or not access to group insurance increased among union members and employed persons (the direct beneficiaries of the 1954 tax subsidy), I pool the 1953 and 1958 samples and include a year dummy equal to one in 1958. By interacting the year dummy with union membership and employment status, I can determine whether access to group insurance changed significantly

between 1953 and 1958. Specifically, if the estimated coefficients on *employed*year* and *union*year* are statistically significant, then employed persons and union members were more likely to have access to group insurance in 1958 than in 1953.

After eliminating observations with missing values for variables in the regression, the sample in 1953 has 2238 observations, while 2165 observations are in the 1958 sample. Thus, the pooled sample that is used to estimate the probit model contains 4403 observations. Results of the probit estimation, reported in Table 3, support the hypothesis that the 1954 tax changes increased access to employment-based group insurance. The estimated coefficients on *union*year* and *employed*year* are statistically significant, suggesting that union members and employed persons in 1958 had a higher probability of having access to group insurance than they did in 1953. A change in the *employed*year* dummy variable from zero to one leads to a 18.6 percent increase in the probability that the household had access to group health insurance in 1958 compared to 1953. The estimated coefficient on the *union*year* dummy suggests that nearly a union members in 1958 were roughly 15 percent more likely to have access to group health insurance than their counterparts in 1953. Clearly, more employers and more unions were sponsoring group health insurance plans after 1954. While the 1954 tax subsidy is not the only factor that led to an expansion of group insurance, it certainly provided many employers and unions with an additional incentive to sponsor group plans.

Estimating the Demand for Health Insurance Coverage

Given that the tax changes in 1954 increased access to group plans, how did this affect the probability that a household purchased health insurance coverage? To examine the effect of the tax subsidy on the demand for health insurance coverage, I first estimate a probit model to determine the factors that determine whether or not a household purchases health insurance. A

tobit model is then used to examine the factors that influence the amount of insurance coverage purchased by a household.

The demand for health insurance coverage is a function of socioeconomic and demographic characteristics, as well as the costs associated with obtaining insurance coverage. The costs associated with obtaining insurance coverage can be divided into two parts, the loading factor (load) on a policy, and the access costs associated with obtaining coverage. The loading factor on a policy is the percentage increase in the actuarially fair premium that insurance companies charge to cover expenses associated with the policy. The load on group insurance policies is lower than on individual policies because there are significantly lower administrative expenses associated with group insurance than with individual insurance. Employers may deduct the premium from employees' paychecks (eliminating the need for insurance companies to bill individuals), and insurance agents do not have to meet with people individually.

In addition to the load on a policy, other costs associated with obtaining coverage include the access costs of seeking out insurance, as well as the insurability of a person of obtaining coverage. Thus, even after controlling for the lower explicit load on group insurance, the transactions costs associated with enrolling in group insurance are much lower than those associated with having to seek out an insurance company and obtain coverage individually. Unlike an individual plan which requires that consumers contact an agent, complete a detailed medical history, and possibly undergo a physical examination, a typical group insurance application requires only that an individual fill out a simple enrollment card. Households who have to merely sign up with their employer are probably more likely to have coverage than households who do not have the same opportunity. At a time when health insurance premiums were fairly low relative to other goods, these transactions costs may have been a significant

portion of the total cost of insurance. In addition, group coverage is "… written without evidence of individual insurability when the individuals who comprise the group are bound together by some broad interest" (Faulkner, p. 199). Thus, it may be the case that some individuals who are considered "uninsurable" individually may be able to obtain group coverage since they do not have to undergo a rigorous screening process.[8]

To illustrate how individual households (denoted by the subscript *i*) may choose to allocate their budgets between spending on other goods, (c_i) and spending on health insurance, (h_i), I offer a straightforward model of utility maximization which provides a basis for the empirical relationship between consumption and spending on health insurance. Suppose a household has a probability π of suffering a sickness which causes an income loss of $\$S$, either due to medical expenditures or due to lost wages. To protect against this loss, the household can purchase a health insurance policy which pays $\$h_i$ in the event of illness. The cost of the policy is equal to the actuarially fair premium multiplied by $(1+\lambda_i)$, where $\lambda_i \in [0,\infty)$ is the loading fee on the policy, or the percentage increase in the actuarially fair premium that an insurance company charges to cover its administrative costs. Thus, the total premium of the policy is $p_i \cdot h_i$ where $p_i = \pi(1+\lambda_i)$. In addition to the premium, an individual who purchases health insurance coverage faces a fixed transaction cost, *F*, associated with obtaining coverage. The transactions costs associated with obtaining individual coverage are much greater than those associated with obtaining group coverage. While *F* may not affect the level of insurance coverage purchased at an interior solution, it will affect the size of the household's feasible set. Thus, a household

[8] This suggests a third reason why group insurance policies are typically less expensive than individual policies. Insuring younger, healthier groups of employees reduces the risks associated with adverse selection, so that the actuarial premium of a group policy is typically less than similar coverage available under an individual policy.

which purchases health insurance if transactions costs are low may opt not to purchase insurance if transactions costs are high.

In an expected utility framework, a household purchases health insurance if and only if its expected utility with health insurance coverage exceeds its expected utility without health insurance coverage. The price of the composite consumption good has been normalized to unity for convenience. The household's decision problem can be written as:

[1] $$\mathrm{E}[u_i(c,h)] = (1-\pi)\cdot c_i + \pi\cdot(c_i - S + \alpha_i \ln(1+h_i)),$$

$$\text{s.t.} \quad c_i + p_i h + F \le m_i .$$

Note that in this framework, the household is assumed to be risk-averse (so that they may purchase an actuarially unfair premium), but utility is well-defined even in the event that $h_i = 0$. In addition, α_i can be thought of as the individual's reservation price for insurance, and is a function of the individual's socioeconomic and demographic characteristics such as income, age, marital status and education.

For an interior solution, the model yields:

[2.1] $$h_i^* = \frac{\alpha_i \pi}{p_i} - 1$$

Substituting for p_i gives:

[2.2] $$h_i^* = \frac{\alpha_i}{(1+\lambda_i)} - 1,$$

so that the amount of health insurance a household buys is:

[3.1] $$h_i = \frac{\alpha_i}{(1+\lambda_i)} - 1 \qquad \text{if } \alpha_i > (1+\lambda_i), \text{ and}$$

[3.2] $h_i = 0$ otherwise.

I specify the reservation price as $\alpha_i = \exp(z_i\gamma + u_i)$, where z_i is a vector of these socioeconomic and demographic characteristics, and u_i is distributed normally with a mean of zero and a variance of σ^2.

Socioeconomic and demographic characteristics that contribute to a household's insurance decision include family size, age, income, region, race, occupation, and whether or not the individual has access to group insurance. Whether or not the person has a high school degree is also included since an individual's level of education may also be important (see Dewar, 1998). As noted previously, access to group insurance is important for three reasons. First, group insurance is less expensive than individual insurance, due to lower administrative costs. Second, people who may not have been able to purchase insurance in the heavily screened individual insurance market could have more easily purchased insurance through a group. To control for access to group insurance, I include the dummy variable *group* in the estimation. *Group* is equal to one if the person had access to group insurance, regardless of whether group insurance was actually purchased.

The marginal tax rate of a household may also have affected the household's health insurance coverage decision. In effect, the tax subsidy lowered the cost of employer provided health insurance, and this benefit increased with a household's marginal tax rate. Assuming a full compensating differential, the employee pays for the entire premium through lower wages regardless of the amount of employer contribution.[9] However, while the employee pays the entire premium, he or she enjoys a tax subsidy only on the explicit employer contribution. This tax subsidy offsets the loading factor, thus making the "price" of one dollar of coverage less expensive. The insurance premium faced by the employee is thus equal to

[5] $Premium = (1 - t)E + e$,

where t is the employee's marginal tax rate, E is the employer's contribution to the premium and e is the amount of the premium paid by the employee. As a family's marginal tax rate rises, employer provided health insurance becomes less expensive, leading to an increase in the amount of coverage purchased. To capture the effect of the tax subsidy on the demand for health insurance, I include a measure of the household's marginal tax rate (*mtr*) in the estimated equation[10]. *A priori*, the estimated coefficient on *mtr* should be positive, and given the substantial amount of uncertainty surrounding the tax policy of employer contributions to employee health insurance premiums prior to 1954, the effect of the marginal tax rate variable in 1953 should be small relative to its effect in 1958. To test this directly, I also include the dummy variable *mtr*year*, which is equal to the value of the household's marginal tax rate in 1958 and zero otherwise. If the tax subsidy did increase the probability that a household purchased insurance, the coefficient on *mtr*year* should be positive and statistically significant.

An additional effect of the tax changes in 1954 may have been to encourage more employers to not only sponsor group health insurance plans for their employees, but to contribute to (or contribute more to) employee health plans. As shown in table 2, employers more frequently contributed to employee coverage and more frequently paid the entire premium in 1958 compared to 1953. Only seven percent of households in 1953 had an employer who paid their entire health insurance premium. Seventeen percent had partial contributions to their

---

[9] Evidence exists for such compensating differentials (see Fishback and Kantor, 1995 for a brief overview).

[10] Unfortunately, in the 1953 sample income is upper-truncated at $10,000 so that the measure of the marginal tax rate for individuals with income over $10,000 is not directly observed. To preserve comparability between the 1953 and 1958 samples, I artificially truncate income in 1958 at $10,000 and include a dummy variable called *overten*, which is equal to one for households with income of $10,000 or greater. In addition, to preserve comparability with the 1953 data, I upper truncate income in 1958 at $10,000 as well. The results do not change substantially when I use actual reported income in 1958.

insurance premiums, and 77 percent of people with insurance did not have any employer contributions. In contrast, 18 percent of households in 1958 had their entire premium paid by their employers, 25 percent had partial contributions, and 58 percent paid their entire premium by themselves. After the tax change, more employers contributed to the health care plans of their employees, and employers who had already been contributing seem to have contributed more. The ideal variable to gauge the effect of increasing contributions is a measure of increasing contributions. Unfortunately, the NORC samples report employer contributions to employee health plans as "none," "some," or "all." Further, these indicator variables cannot be used in the probit estimation because the presence of employer contributions perfectly predicts insurance purchase[11]. To help capture the effect of the tax changes in increasing the amount of employer contributions, I include the interactive dummy *group*year*, which equals one in 1958 for a household with access to group insurance. If the estimated coefficient on this variable is statistically significant, it means that households with access to group insurance in 1958 are more likely to purchase insurance than households with access to group insurance in 1953. One reason for this may have been additional employer contributions that occurred after the implementation of the tax subsidy in 1954.

V. Results of Estimations

The data means reported in Table 1 suggest that the 1954 tax law contributed to a rise in the number of households with health insurance coverage: The percentage of households with health insurance coverage rose from 63 percent in 1953 to 76.4 percent in 1958. However, since the 1954 tax law was not the only change that occurred between 1953 and 1958, the effect of the tax subsidy on a household's decision to purchase insurance can be more carefully analyzed

[11] These variables can, however, be used to determine the amount of coverage (if any) a household purchased, as discussed below.

using probit estimation. In this way, the direct effect of the tax subsidy on the probability that a household purchased insurance, as well as the indirect of the tax subsidy in increasing insurance purchase by promoting access to group insurance can both be measured. The dependent variable in this model is binary: $h_i = 0$ if the individual does not insure, $h_i = 1$ if the individual does insure. Results from the probit estimation are reported in Table 4.

Overall, the results in Table 4 indicate the importance of having access to group insurance in determining whether or not a household had insurance coverage. A change in the group dummy variable from zero to one leads to a 46 percent increase in the probability that a household purchased insurance, even after controlling for the effect of the marginal tax rate. The significance of this variable reinforces the idea that households with access to group insurance were far more likely to purchase insurance coverage in the 1950s than households without access to group coverage. As noted previously, group health insurance was not only less expensive than individual coverage, but it was also much easier to obtain. In addition, the estimated coefficient on *group*year* is positive and statistically significant, indicating that households with access to group insurance in 1958 were more likely to purchase insurance than households with similar access in 1953. One reason for this may be because the 1954 tax changes contributed to the expansion of tax-exempt employer contributions to employee health premiums. However, after access to group insurance is controlled for, it does not appear that a household's marginal tax rate affected their decision to purchase health insurance or not. The estimated coefficients on both *mtr* and *mtr*year* are statistically insignificant. It may be that the strongest effects of the tax subsidy were to encourage the growth of group insurance and to encourage greater employer contributions, both of which led more people to purchase health insurance. The direct tax savings, which were fairly small on average due to the low cost of premiums relative to income,

probably did not cause people to decide to purchase health insurance. Other variables that have a positive, statistically significant effect on the probability of insurance purchase include family size, age, and education, while black households had a statistically significantly lower probability of purchasing health insurance coverage.

Clearly, the tax subsidy increased access to group insurance, particularly among union members and employed persons. Given the dominant influence of access to group insurance in determining health insurance status, how might this increase in the ability of households to purchase group insurance have influenced the number of people who gained health insurance between 1953 and 1958? One means of measuring this effect is to use a technique that decomposes the change in access to group insurance between 1953 and 1958 into two components. The first component is that which results from differences in sample characteristics between the two years, and the second is that which occurs because of differences in the estimated coefficients (Oaxaca, 1973; Even and Macpherson, 1990; Oaxaca and Ransom, 1994). One reason estimated coefficients might differ between the years is if a structural change occurred that altered the weight households give to various factors when making decisions about insurance purchase, such as how changes in the tax laws may have affected access to insurance among employed persons and union members.

To perform the decomposition, separate probit estimations are performed for 1953 and 1958.[12] In 1958, the predicted probability of access to group insurance increased by 19.43 percentage points from that of 1953 (from 47.46 to 66.89 percent). Following Even and Macpherson (1990), the fraction of the change attributable to structural changes occurring in the estimated coefficients while holding the sample characteristics constant is 10.68 percentage

points of the 19.43 percentage point increase, or 55 percent. Table 5 shows that the change in access to group insurance is even larger for union members and employed persons. Among union members, access to group insurance increased 14.82 percentage points from 1953 to 1958, while access to group insurance increased 12.57 percentage points for employed persons.

For the whole sample, if having access to group insurance increases the likelihood that a household purchases insurance by 46 percent, and if access to group insurance attributable to structural changes in the coefficient estimates increased by 10.68 percentage points between 1953 and 1958, then a simple back of the envelope calculation suggests that the increase in access to group insurance generated by the tax subsidy could explain up to 41 percent (5.5 percentage points) of the 13.52 percentage point increase in the predicted probability of buying insurance from 1953 to 1958.[13] These results clearly show that the increase in access to group insurance between 1953 and 1958 is an important initial effect of the changes in tax policy in 1954.

Measuring the Impact of the Tax Changes using Tobit

While the probit estimation provides clear information as to the factors that determine whether or not a household buys insurance, it may not fully capture the effect of the tax changes in 1954. While access to group insurance is an important determinant in whether or not people purchase health insurance coverage, it is not clear that after access to group insurance has been controlled for, the additional exemption of employer contributions from household income tax would induce people who would otherwise not purchase health insurance to purchase coverage. Thus, it may not be surprising that the estimated coefficient on *mtr*year* is not statistically

[12] These estimations are the same as for the pooled model but do not include the year dummy variables. Since the actual results are not relevant to the purpose here, they are not reported but are available upon request.

significant in the probit equation. Households probably did not base their decision to actually purchase health insurance or not on the possibility of a tax exemption. What is more likely is that once households had made the decision to purchase health insurance coverage, the exemption of employer contributions would enable them to buy a greater amount of coverage. Further, employers increased their contributions to employee premiums, possibly enabling households to buy additional coverage. Because the NORC samples provide data on the amounts of coverage purchased by households, it is possible to examine the effect of the 1954 tax changes not only on the probability that a household purchased insurance, but also on how much coverage a household purchased. Thus, I use tobit estimation examine the effect of the tax subsidy on the amount of expected health insurance coverage purchased by a household.

In the NORC samples, measuring the amount of health insurance coverage purchased by each household is complicated because of the way insurance benefits are reported in the surveys. The reported benefits include a variety of different attributes that must be put into comparable units before they can be summed to an aggregate value of coverage. In the 1950s, people who wanted to purchase insurance chose from a menu that included a per diem hospital benefit ranging from $3 to $22, for which they paid a premium for their selected level of coverage based on their age and gender. If they wished to add surgical protection to their coverage, they selected a surgical rider that paid a specified benefit (ranging from $20 to $450), and added the premium for the rider onto the premium for their hospital coverage. The household's insurance coverage cannot be determined by simply adding a $3 per diem benefit to a $400 surgical rider to get $403 in coverage. This method would give too much weight to the surgical coverage when surgery was a much lower probability event than hospitalization. Weights must be determined for each

[13] Calculated as (.4627+.0504)*.1068=0.055 percentage points of the .1352 percentage point change in predicted insurance purchase between 1953 and 1958.

feature of coverage that take into account differences in the likelihood of payment, which can then provide an expected value of the insurance coverage. A reasonable method for determining these weights is to examine how the insurance companies priced the various features.

When insurance companies in a competitive market rate policies, they charge a premium equal to the expected value of the coverage (what they expect to pay to consumers who have the policy), multiplied by a load ratio to cover their administrative costs. If a policy is actuarially fair (if there is no load), the premium on a policy is equal to the amount the insurance company expects to pay to the policyholder over the policy term. An actuarially fair premium is thus equal to the probability that the insured person will suffer a loss, multiplied by the amount of the loss. Because of this relationship between premiums and the expected benefit to the insured under the policy, the premium schedules of insurance companies can be used to determine universal weights for such diverse features as surgical riders and per diem hospital benefits. These weights can then be used to calculate a measure of expected value for the features of coverage selected in each individual household.

To do this, I use archival rate data for 1953 and 1958 from the nationwide insurance company, Mutual of Omaha. The Mutual of Omaha premium schedules provide the premium charged to a person for a given benefit level, conditional on the person's age and gender. For example, in 1958, a 35 year-old male who selects a $10 per day hospital benefit would pay $18.00 annually. If he elected to have a $225.00 surgical rider added to his policy, he would pay an additional $9.00, for an annual total of $27.00. If his 35 year-old wife children elected to purchase the same level of coverage, she would be charged $28.00 for the hospital benefit and an additional $12 for the surgical coverage. Using the Mutual of Omaha premium schedules, I estimate the weights that Mutual of Omaha used to determine a person's premium conditional on

their age and gender by regressing the premium schedule on a constant and the benefit schedule for each age/gender classification:

[6.1] $$(\textit{hospital premium})_{ij} = \hat{\alpha}_{ij}^{h} + \hat{\beta}_{ij}^{h}(\textit{hospital benefit})$$

[6.2] $$(\textit{surgical premium})_{ij} = \hat{\alpha}_{ij}^{s} + \hat{\beta}_{ij}^{s}(\textit{surgical benefit}),$$

where *ij* refers to the age (*i*) and gender (*j*) of the individual, and *h* and *s* refer to the hospital schedule or the surgical schedule. The results of the estimations are reported in the appendix.

To determine the expected value of coverage for an insured household in the NORC sample, I apply the estimates of the $\hat{\alpha}_{ij}$ and $\hat{\beta}_{ij}$ to the data on a household by household basis. If a household reports a hospital benefit of $10 per day, and a surgical benefit of $200, I calculate the expected value of coverage under their policy by inserting their reported benefit levels into either equation [6.1] or equation [6.2] for their relevant age and gender. The total value of expected coverage for the household is the sum of the value for each covered individual. In 1953, the mean of expected coverage for all persons is $18.27. For only those people who purchased insurance, the mean of expected coverage is $62.92. In 1958, the mean of expected coverage for all persons is $49.09. The mean of the variable conditional on insurance purchase is $103.46. Once the expected coverage under a particular policy has been determined, I pool the data and estimate the equation using tobit to measure the effect of various factors, including the marginal tax rate, on the amount of health insurance coverage purchased by households.[14]

[14] One shortcoming of this procedure is that many families knew they had insurance but did not know their benefit levels. As a result, it is impossible to compute the expected value of their insurance coverage, and they are eliminated from the sample. Out of 2165 observations in 1958, only 971 remain after dropping observations in which families do not know their benefit levels or the amount of their premium paid by their employer. In 1953, the original sample of 2238 falls to 1171 after dropping observations for missing benefit levels/employer contributions. A probit analysis of insurance conducted using the smaller data set does not differ substantially from the probit done using the full set of data, although the magnitude of the estimated coefficient on highmtr is greater, as is the effect of union membership in

However, given the nature of the data used in the tobit estimation, a more accurate means of measuring the effect of the tax changes can be used. As noted previously, one effect of the tax subsidy would be to increase the frequency and the amount of employer contributions to employee health plans. To control for this, I include a dummy variable (*contribution*) that is equal to one if the employer contributes to the household's insurance plan. In addition, I include *contribution*year*, which is equal to one for employer contributions in 1958. The interactive dummy provides a test of whether households receiving employer contributions in 1958 purchased more coverage than similar households receiving contributions in 1953, which would occur as a direct result of the 1954 tax changes.

Table 6 reports the estimates of the tobit equation using the expected dollar amount of health insurance coverage as the dependent variable. Overall, the results from the tobit estimation reinforce those of the probit, and demonstrate that the tax changes did have an effect on the amount of coverage households purchased in 1958 relative to 1953. Once again, the estimated coefficient on the dummy variable *group* is positive and statistically significant, indicating that the potential expenditures of households with access to group health insurance were $81.97 greater than the potential expenditures of households who did not have access to group coverage, even after controlling for the presence of employer contributions. Clearly, access to group insurance plays an important role not only in determining the likelihood that a person has coverage, but also in determining the amount of coverage that a person has. In addition, the estimated coefficient on the variable controlling for employer contributions is positive and statistically significant, supporting the hypothesis that even after controlling for the effect of group insurance, households who received employer contributions to their health

---

1958. Full probit results from estimating the smaller sample are available in the appendix, as are the descriptive statistics from the smaller sample.

insurance premiums purchased more coverage. Potential expenditures for households with employers contributing to their policies were $48.60 higher than for households who did not receive employer contributions. Further, the positive, statistically significant coefficient on *contribution*year* suggests that households who received employer contributions in 1958 purchased more coverage than similar households in 1953, and the positive, statistically significant coefficient on *mtr*year* suggests that people in higher tax brackets purchased more coverage than their 1953 counterparts. These results indicate that the tax subsidy did have a statistically significant, positive effect in increasing the amount of health insurance coverage households bought.

VI. Conclusions

This paper suggests that the initial effects of the 1954 tax subsidy go beyond that of increasing the relative amount of health insurance coverage purchased by decreasing its relative price. Results indicate that the tax subsidy promoted the growth of group insurance, and correspondingly enabled more households to gain access to health insurance coverage than before the changes occurred. Further, after 1954, people with access to group insurance were even more likely to purchase coverage, and people with employer contributions purchased more coverage than they did before. In the NORC sample, the number of people with access to group insurance rose 18.9 percentage points, from 47.8 percent to 66.7 percent. Both union members and employed persons in 1958 were statistically significantly more likely to have access to group health insurance than either group in 1953. Results indicate that up to 41 percent of the rise in the predicted probability of having insurance over the period may be attributable to changes in access to group insurance.

To some degree, this increase in access to group insurance may have made health insurance markets more complete by reducing risks of adverse selection and by lowering the administrative costs of insurance companies. These savings are in turn reflected in lower premiums for consumers relative to those of individual insurance coverage. Furthermore, people who may not have been able to buy insurance individually (in effect facing an infinite price) might have been able to do so with the less stringent group enrollment process. Results show that households with access to group insurance were 46 percent more likely to have health insurance than households without the opportunity to purchase group insurance. The effect of having access to group insurance is a strong one, then and now. If the tax subsidy encouraged the growth of group insurance, then it did far more than just lower the cost of insurance coverage by exempting employer contributions from income taxes— it also enabled many more people to have access to health insurance. If it is indeed the case that the effect of the tax subsidy in contributing to the growth of employment-based group insurance was important, then the tax subsidy may have actually engendered institutional change, and shaped the modern health insurance market. Given this, any modern policy decision that affects the tax subsidy must be evaluated not only with respect to how it would affect the relative price of health insurance, but also with respect to what ramifications it might have on group insurance and access to health insurance coverage.

Figure 1: Enrollment in Commercial Policies v. Blue Cross and Blue Shield

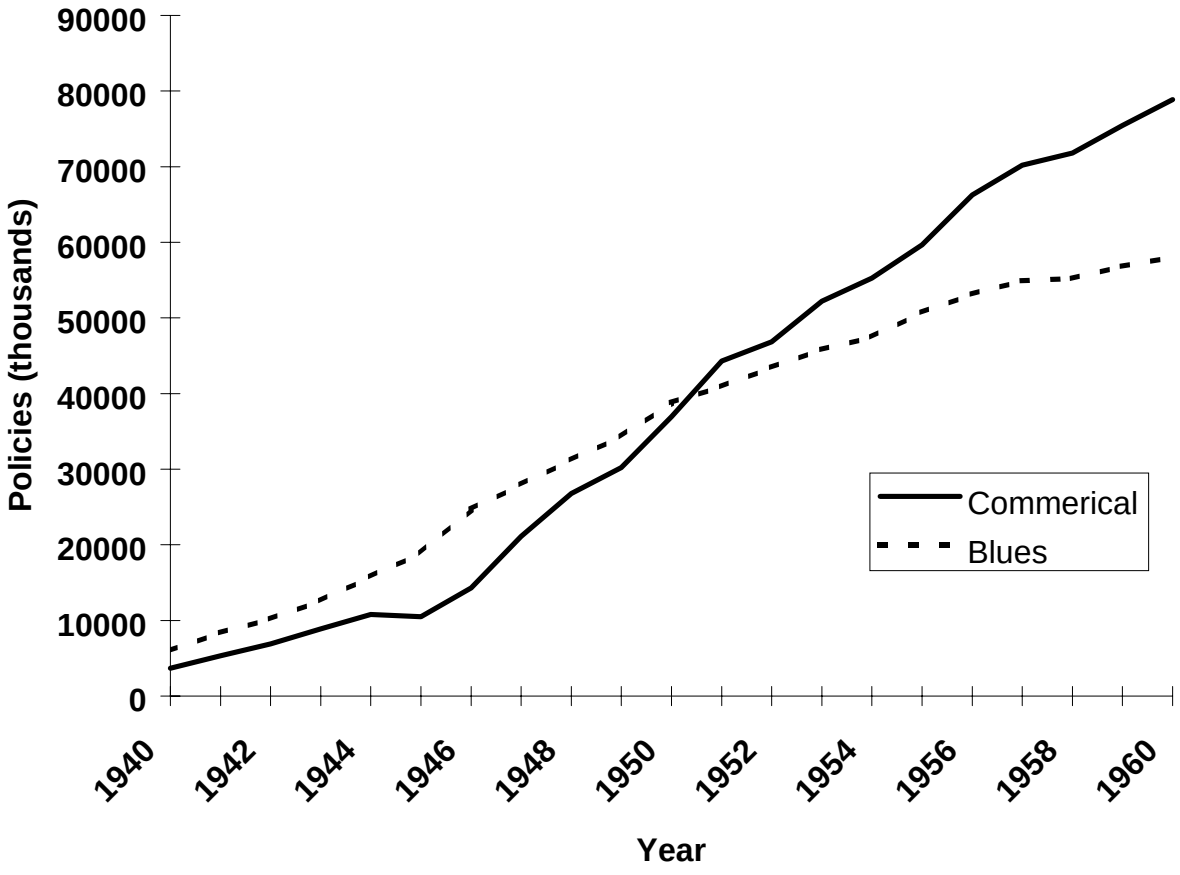

Table 1: Descriptive Statistics, 1953 and 1958*

Variable	Mean, 1953	Std. Dev, 1953	Min, 1953	Max, 1953	Mean, 1958	Std. Dev, 1958	Min, 1958	Max, 1958
Age	49.240	14.863	19	90	46.292	14.649	18	90
Age^2	2645	1536.341	361	8100	2358	1436.505	324	8100
Covg	18.27	35.251	0	197.93	49.09	62.97	0	348.45
Education	0.338	0.473	0	1	0.289	0.453	0	1
Employed	0.810	0.393	0	1	0.861	0.347	0	1
Family Size	3.113	1.678	1	13	3.363	1.742	1	14
$(\text{Family Size})^2$	12.508	14.323	1	169	14.341	16.076	1	196
Female Head	0.193	0.394	0	1	0.117	0.322	0	1
Group	0.478	0.500	0	1	0.667	0.471	0	1
Income	4187	2824	100	50000	5694	4108	37	57000
Insured	0.629	0.483	0	1	0.764	0.424	0	1
Lodge Member	0.197	0.398	0	1	0.255	0.436	0	1
Married	0.763	0.425	0	1	0.821	0.384	0	1
MTR	0.173	0.102	0	0.75	0.179	0.081	0	0.38
Overten	0.061	0.240	0	1	0.103	0.304	0	1
Premium	6.703	4.107	0	35.27	6.688	5.270	0	31
Black	0.103	0.304	0	1	0.086	0.280	0	1
Trunc. Income	4156	2584	100	10000	5282	2720	37	10000
Union Member	0.331	0.471	0	1	0.332	0.471	0	1
Occupation Dummies								
Professional	0.150	0.357	0	1	0.112	0.316	0	1
Farmer	0.106	0.308	0	1	0.06	0.237	0	1
Clerical	0.053	0.224	0	1	0.093	0.290	0	1
Sales	0.045	0.207	0	1	0.050	0.219	0	1
Craftsman	0.174	0.379	0	1	0.209	0.407	0	1
Service	0.077	0.266	0	1	0.076	0.265	0	1
Laborer	0.061	0.240	0	1	0.073	0.259	0	1
Operative	0.169	0.375	0	1	0.193	0.394	0	1
Industry Dummies								
Agriculture	0.121	0.326	0	1	0.079	0.270	0	1
Mining	0.105	0.307	0	1	0.026	0.159	0	1
Manufacturing	0.252	0.434	0	1	0.315	0.464	0	1
Finance	0.022	0.148	0	1	0.038	0.192	0	1
Service Industry	0.115	0.319	0	1	0.155	0.362	0	1
Public	0.041	0.199	0	1	0.061	0.239	0	1
Trade	0.134	0.341	0	1	0.144	0.351	0	1
Transportation	0.071	0.256	0	1	0.092	0.289	0	1
Regional Dummies								
Northeast	0.260	0.439	0	1	0.279	0.449	0	1
Northcentral	0.283	0.450	0	1	0.244	0.43	0	1
Southeast	0.146	0.353	0	1	0.149	0.356	0	1
Southcentral	0.168	0.374	0	1	0.171	0.377	0	1
Mountain	0.043	0.203	0	1	0.035	0.184	0	1
Pacific	0.100	0.300	0	1	0.118	0.322	0	1

* n = 2238 in 1953, n = 2165 in 1958.

Table 2: Percent of Households with Employer Contributions to Health Insurance

Household Reports:	1953	1958
No Contribution by Employer	77%	58%
Partial Contribution by Employer	17%	25%
Full Contribution by Employer	7%	18%

Table 3: Results from Pooled Probit Analysis

Dependent Variable: Access to Group Health Insurance (0, 1)

Variable	Marginal Effect	Std. Error	P-Value
Family Size	0.0152	0.0173	0.3800
$(\text{Family Size})^2$	-0.0028	0.0019	0.1440
Age	0.0137	0.0038	0.0000
$(\text{Age})^2$	-0.0002	0.0000	0.0000
Income	0.0001	0.0000	0.0000
Employed	0.0794	0.0393	0.0420
Union Member	0.1015	0.0257	0.0000
Lodge Member	-0.0357	0.0226	0.1130
Black	-0.1222	0.0314	0.0000
Professional	0.1681	0.0292	0.0000
Clerical	0.2368	0.0297	0.0000
Sales	0.1130	0.0385	0.0060
Craftsman	0.0862	0.0297	0.0050
Service	0.1276	0.0345	0.0010
Laborer	0.0806	0.0380	0.0400
Operative	0.1746	0.0292	0.0000
Agriculture	-0.1250	0.0410	0.0020
Manufacturing	0.2729	0.0236	0.0000
Finance	0.0139	0.0543	0.7990
Service Industry	-0.0251	0.0338	0.4560
Public	0.0625	0.0428	0.1550
Trade	-0.0281	0.0339	0.4060
Transportation	0.1929	0.0309	0.0000
Education	0.0340	0.0205	0.0980
Northeast	0.0021	0.0447	0.9620
North Central	-0.0719	0.0452	0.1100
Southeast	-0.0245	0.0475	0.6040
South Central	-0.1198	0.0477	0.0110
Pacific	-0.1167	0.0501	0.0190
Overten	-0.2626	0.0384	0.0000
Union*Year=58	0.1498	0.0360	0.0000
Employed*Year=58	0.1860	0.0477	0.0000
Year=58	-0.0612	0.0474	0.1980

*Marginal effects are reported as the change in probability for an infinitesimal change in each continuous variable. Dummy variables are reported as the change in probability as the dummy moves from 0 to 1. Mean of dependent variable is 0.571. N=4403, LRI=0.279.

Table 4: Results from Pooled Probit Analysis

Dependent Variable: Health Insurance Purchase(0, 1)

Variable	Marginal Effect	Std. Error	P-Value
Family Size	0.0473	0.0150	0.0020
$(\text{Family Size})^2$	-0.0056	0.0016	0.0000
Age	0.0111	0.0030	0.0000
$(\text{Age})^2$	-0.0001	0.0000	0.0010
Income	0.0000	0.0000	0.0000
Education	0.0368	0.0168	0.0320
Black	-0.0883	0.0281	0.0010
Professional	0.0093	0.0246	0.7080
Clerical	0.0933	0.0258	0.0020
Sales	0.0883	0.0275	0.0060
Craftsman	0.0584	0.0202	0.0060
Service	0.0636	0.0238	0.0150
Laborer	0.0059	0.0299	0.8440
Operative	0.0991	0.0194	0.0000
Overten	-0.0974	0.0444	0.0180
Northeast	0.0817	0.0341	0.0240
North Central	0.0579	0.0349	0.1120
Southeast	0.0322	0.0373	0.4050
South Central	0.0575	0.0350	0.1230
Pacific	-0.0189	0.0431	0.6540
Group	0.4627	0.0206	0.0000
Group*Year=58	0.0504	0.0292	0.0940
MTR*Year=58	0.1944	0.1484	0.1900
MTR	-0.0020	0.1184	0.9860
Year=58	-0.0265	0.0290	0.3620

*Marginal effects are reported as the change in probability for an infinitesimal change in each continuous variable. Dummy variables are reported as the change in probability as the dummy moves from 0 to 1. Mean of dependent variable is 0.695. N=4403, LRI=0.3733.

Table 5: Percentage Change in Access to Group Insurance Due to Structural Changes in Coefficients, 1953-1958*

Category	Percentage Change in Access to Group Insurance Due to Changes in Estimated Coefficients
Whole Sample	55%
Union Members Only	76%
Employed Persons Only	65%

*Access to group insurance rose by 19.43 percentage points over the period. Numbers in the table represent the portion of the increase in access to group attributable to changes in the coefficients (the unexplained decomposition = $\frac{\Phi(x_i^{58}{}'\beta^{58})}{n^{58}} - \frac{\Phi(x_i^{58}{}'\beta^{53})}{n^{58}}$) performed over the whole sample, and then separately across union members only and then employed persons.

Table 6: Results of Tobit Estimation, 1953 and 1958*

Dependent Variable: Coverage

Variable	Estimated Coefficient	Std. Error	P-Value
Family Size	21.4474	3.7575	0.0000
(Family Size)^2	-1.3699	0.3881	0.0000
Age	2.0644	0.8245	0.0120
(Age)^2	-0.0150	0.0084	0.0740
Income	0.0040	0.0013	0.0030
Education	4.5229	4.7323	0.3390
Black	-13.3387	6.9756	0.0560
Professional	9.7022	6.9385	0.1620
Clerical	14.4900	8.9572	0.1060
Sales	23.9023	9.4667	0.0120
Crafts	11.6710	6.2106	0.0600
Service	9.2686	8.0814	0.2520
Laborer	-0.9133	8.8743	0.9180
Operative	18.3797	6.4906	0.0050
Overten	-20.5533	9.5318	0.0310
Northeast	-15.7775	9.2230	0.0870
North Central	-4.6242	8.9441	0.6050
Southeast	-9.0874	9.2143	0.3240
South Central	-2.7447	9.1404	0.7640
Pacific	-14.5552	10.1237	0.1510
Group	81.9690	5.2381	0.0000
Employer Contribution	48.6005	7.6558	0.0000
Contribution*Year	16.3407	8.9084	0.0670
MTR*Year	103.3772	44.6318	0.0210
MTR	16.6829	34.1544	0.6250
YEAR	-0.6397	8.4730	0.9400
Constant	-199.0892	23.8668	0.0000
SIGMA	68.3296	1.9081	

n = 2123. Pseudo R^2 = 0.1224. Mean of dependent variable is $32.34.

Table A1: Limited Sample Descriptive Statistics,1953 (n=1171) and 1958 (n=971)

Variable	Mean, 1953	Std. Dev, 1953	Min, 1953	Max, 1953	Mean, 1958	Std. Dev, 1958	Min, 1958	Max, 1958
Age	50.984	15.879	19	90	46.670	15.527	18	90
Age^2	2851	1663	361	8100	2419	1537	324	8100
Coverage	18.268	35.251	0	197.934	49.093	62.970	0	348.45
Education	0.276	0.447	0	1	0.257	0.437	0	1
Employed	0.741	0.438	0	1	0.826	0.379	0	1
Family Size	2.974	1.706	1	13	3.391	1.880	1	14
$(Family\ Size)^2$	11.753	14.675	1	169	15.033	18.674	1	196
Female Head	0.227	0.419	0	1	0.106	0.308	0	1
Group	0.268	0.443	0	1	0.471	0.499	0	1
Income	3492	2857	100	50000	4957	4095	37	57000
Insured	0.290	0.454	0	1	0.475	0.500	0	1
Lodge Member	0.166	0.372	0	1	0.230	0.421	0	1
Married	0.717	0.450	0	1	0.826	0.379	0	1
MTR	0.150	0.111	0	0.75	0.160	0.092	0	0.38
Overten	0.044	0.204	0	1	0.074	0.262	0	1
Premium	7.036	4.127	0.5	35.27	6.156	5.070	0.85	27.18
Black	0.135	0.342	0	1	0.103	0.304	0	1
Trunc. Income	3450	2487	100	10000	4623	2752	37	10000
Union Member	0.260	0.439	0	1	0.252	0.435	0	1
Occupation Dummies								
Professional	0.168	0.374	0	1	0.100	0.300	0	1
Farmer	0.149	0.356	0	1	0.094	0.292	0	1
Clerical	0.044	0.206	0	1	0.061	0.239	0	1
Sales	0.035	0.184	0	1	0.049	0.217	0	1
Craftsman	0.143	0.350	0	1	0.206	0.405	0	1
Service	0.088	0.283	0	1	0.087	0.281	0	1
Laborer	0.070	0.255	0	1	0.093	0.290	0	1
Operative	0.132	0.338	0	1	0.184	0.388	0	1
Industry Dummies								
Agriculture	0.173	0.379	0	1	0.132	0.338	0	1
Mining	0.099	0.299	0	1	0.027	0.162	0	1
Manufacturing	0.178	0.383	0	1	0.277	0.448	0	1
Finance	0.019	0.136	0	1	0.036	0.186	0	1
Service Industry	0.112	0.315	0	1	0.165	0.371	0	1
Public	0.036	0.186	0	1	0.059	0.235	0	1
Trade	0.136	0.343	0	1	0.133	0.340	0	1
Transportation	0.056	0.231	0	1	0.066	0.248	0	1
Regional Dummies								
Northeast	0.194	0.395	0	1	0.179	0.384	0	1
Northcentral	0.264	0.441	0	1	0.247	0.432	0	1
Southeast	0.185	0.389	0	1	0.179	0.384	0	1
Southcentral	0.215	0.411	0	1	0.225	0.417	0	1
Mountain	0.046	0.210	0	1	0.046	0.210	0	1
Pacific	0.094	0.292	0	1	0.120	0.326	0	1

Table A2: Pooled Probit Estimation of Health Insurance Purchase, Limited Sample*

Dependent Variable: Health Insurance Purchase (0, 1)

Variable	Marginal Effect	Std. Error	P-Value
Family Size	0.0526	0.0262	0.0450
$(\text{Family Size})^2$	0.0526	0.0262	0.0450
Age	-0.0061	0.0028	0.0310
$(\text{Age})^2$	0.0134	0.0053	0.0120
Income	-0.0001	0.0001	0.0190
Education	0.0000	0.0000	0.0000
Black	0.0142	0.0314	0.6490
Professional	-0.0661	0.0393	0.1050
Clerical	0.0544	0.0459	0.2270
Sales	0.1140	0.0656	0.0730
Craftsman	0.1326	0.0690	0.0470
Service	0.0759	0.0416	0.0620
Laborer	0.1054	0.0538	0.0440
Operative	0.0088	0.0550	0.8720
Overten	0.1636	0.0449	0.0000
Northeast	-0.1446	0.0520	0.0150
North Central	-0.0536	0.0619	0.3980
Southeast	-0.0027	0.0626	0.9650
South Central	0.0744	0.0673	0.2600
Pacific	0.0995	0.0672	0.1310
Group	-0.1160	0.0608	0.0800
Group*Year=58	0.5463	0.0305	0.0000
MTR*Year=58	0.1395	0.0560	0.0110
MTR	0.4488	0.2799	0.1090
Year=58	0.0703	0.2079	0.7350
	-0.0750	0.0536	0.1640

*Marginal effects are reported as the change in probability for an infinitesimal change in each continuous variable. Dummy variables are reported as the change in probability as the dummy moves from 0 to 1. Mean of dependent variable equals 0.374. LRI = 0.3941.

Table A3: Results from Estimating Equations 6.1 and 6.2*

1953

Hospital Benefits

Age Category	Estimate of α	Estimate of β
under 17	-0.7346	1.3731
17-58	-1.5714	2.7626
59-65	-0.3857	2.9813
65 and over	-1.5714	4.7626

Surgical Benefits

Age Category	Estimate of α	Estimate of β
under 17	0	0.04
17-65	0	0.04
over 65	0	0.06

1958

Hospital Benefits, Male

Age Category	Estimate of α	Estimate of β
18-24	0	1.52
25-29	0	1.60
30-34	0	1.72
35-39	0	1.80
40-44	0	2.20
45-49	0	2.60
50-55	0	3.00
56-59	0	3.20
over 60	0	3.40

Surgical Benefits, Male

Age Category	Estimate of α	Estimate of β
18-63	0	0.04
over 63	0	0.07

Hospital Benefits, Female

Age Category	Estimate of α	Estimate of β
18-24	0	2.20
25-29	0	2.40
30-34	0	2.60
35-39	0	2.80
40-44	0	3.00
45-49	0	3.20
50-55	0	3.40
56-59	0	3.40
over 60	0	3.40

Surgical Benefits, Female

Age Category	Estimate of α	Estimate of β
18-63	0	0.053
over 63	0	0.067

Hospital Benefits, Minors under age 17

Age	Estimate of α	Estimate of β
under 17	0	1.00

Surgical Benefits, Minors under age 17

Age	Estimate of α	Estimate of β
under 17	0	0.32

* All coefficients are statistically significant at the 1% level.

REFERENCES

Anderson, Odin W. The Uneasy Equilibrium. New Haven: College & University Press, 1968.

Anderson, Odin W. with Jacob J. Feldman. Family Medical Costs and Voluntary Health Insurance: A Nationwide Survey. New York: McGraw-Hill, 1956.

Anderson, Odin W., Patricia Collette, and Jacob J. Feldman. Family Medical Care Expenditures and Voluntary Health Insurance: A Five-Year Resurvey. Cambridge: Harvard University Press, 1963.

Arrow, Kenneth J. "Uncertainty and the Welfare Economics of Medical Care." *American Economic Review*, December 1963, 77(5), 941-973.

Browne, Mark J. "Evidence of Adverse Selection in the Individual Health Insurance Market." *Journal of Risk and Insurance*, March 1992, 59, 1, 13-33.

Congressional Budget Office. Economic Implications of Rising Health Care Costs. Washington, D.C.: CBO, October 1992.

_____. The Tax Treatment of Employment-Based Health Insurance. Washington, D.C. : CBO, March 1994.

Davis, Michael M. and C. Rufus Rorem. The Crisis in Hospital Finance. Chicago: University of Chicago Press, 1932.

Dewar, Diane M. "Do Those with More Formal Education Have Better Health Insurance Opportunities?" *Economics of Education Review*, June 1998, 17, 3, 267-277.

Eilers, Robert D. Regulation of Blue Cross and Blue Shield Plans. Homewood, IL: Richard D. Irwin, Inc., 1963.

Even, William E. and David A. Macpherson. "Plant Size and the Decline of Unionism." *Economics Letters*, 1990, 32, 393-398.

Falk, I.S. C. Rufus Rorem, and Martha D. Ring. The Cost of Medical Care. Chicago: University of Chicago Press, 1933.

Farley, Pamela J., and Gail R. Wilensky. "Household Wealth and Health Insurance as Protection against Medical Risks," in Horizontal Equity, Uncertainty, and Economic Well-Being, eds. Martin David and Timothy Smeeding. Chicago: University of Chicago Press, 1986.

Faulkner, Edwin J. Health Insurance. New York: McGraw-Hill, 1960.

Feldstein, Martin, and Bernard Friedman. "Tax Subsidies, the Rational Demand for Insurance and the Health Care Crisis." *Journal of Public Economics*, 1977, 7, 155-178.

Fishback, Price V., and Shawn Everett Kantor. "Did Workers Pay for the Passage of Workers' Compensation Laws?" *Quarterly Journal of Economics*, August 1995.

Goldmann, Franz. Voluntary Medical Care in the United States. New York: Columbia University Press, 1948.

Gruber, Jonathan, and Brigitte C. Madrian. "Employment Separation and Health Insurance Coverage." *Journal of Public Economics*, 1997, 66, 349-382.

Gruber, Jonathan, and James M. Poterba. "Tax Subsidies to Employer-Provided Health Insurance," in Empirical Foundations of Household Taxation, eds. Martin Feldstein and James M. Poterba. Chicago: University of Chicago Press, 1996.

Health Insurance Institute. Source Book of Health Insurance Data ,1965. New York: Health Insurance Institute, 1965.

Holmer, Martin. "Tax Policy and the Demand for Health Insurance." *Journal of Health Economics*, 1984, 3, 203-221.

Judge, George G., W.E. Griffiths, R. Carter Hill, Helmut Lütkepohl, and Tsoung-Chao Lee. The Theory and Practice of Econometrics, 2nd Ed. New York: John Wiley and Sons, 1985.

Kantor, Shawn Everett, and Price V. Fishback. "Precautionary Saving, Insurance, and the Origins of Workers' Compensation." *Journal of Political Economy*, April, 1996.

Keeler, Emmett B., Daniel T. Morrow, and Joseph P. Newhouse. "The Demand for Supplementary Health Insurance, or Do Deductibles Matter? *Journal of Political Economy*, 1977, 85(4), 789-801.

Long, James E., and Frank A. Scott. "The Income Tax and Nonwage Compensation." *Review of Economics and Statistics*, May 1982, 64(2), 211-219.

Maddala, G.S. Limited-Dependent and Qualitative Variables in Econometrics. Cambridge: Cambridge University Press, 1983.

Madrian, Brigitte C. "Employment-Based Health Insurance and Job Mobility: Is there Evidence of Job-Lock?" *Quarterly Journal of Economics*, February 1994, 109, 27-54.

Manning, Willard G., Joseph P. Newhouse, Naihua Duan, Emmett B. Keeler, Arleen Leibowitz, and M. Susan Marquis. "Health Insurance and the Demand for Medical Care: Evidence from a Randomized Experiment." *American Economic Review*, June 1987, pp. 251-277.

Marquis, M. Susan, and Stephen H. Long. "Worker Demand for Health Insurance in the Non-Group Market." *Journal of Health Economics*, 1995, 14, 47-63.

Marquis, M. Susan, and Charles E. Phelps. "Price Elasticity and Adverse Selection in the Demand for Supplementary Health Insurance." *Economic Inquiry*, April 1987, 25, 299-313.

McCahan, David, ed. *Accident and Sickness Insurance*. Philadelphia: University of Pennsylvania Press, 1954.

McDonald, J. and R. Moffitt. "The Uses of Tobit Analysis." *Review of Economics and Statistics*, 1980, 62, pp. 318-321.

Mitchell, Bridger M., and Ronald J. Vogel. "Health and Taxes: An Assessment of the Medical Deduction," Santa Monica: Rand Report R-1222-OEO, August, 1973.

Oaxaca, Ronald. "Male-Female Wage Differentials in Urban Labor Markets." *International Economic Review*, October 1973, 14, 693-710.

Oaxaca, Ronald, and Michael R. Ransom. "On Discrimination and the Decomposition of Wage Differentials." *Journal of Econometrics*, 61 (1994) 5-21.

Phelps, Charles E. "Demand for Health Insurance: A Theoretical and Empirical Investigation," Santa Monica: Rand Report R-1054-OEO, July 1973.

_____. "Demand for Reimbursement Insurance," in The Role of Health Insurance in the Health Services Sector, ed. Richard N. Rosett. New York: National Bureau of Economic Research, 1976.

Reed, Louis S. Blue Cross and Medical Service Plans. Washington, D.C.: U.S. Public Health Service, 1947.

Report of the Health Insurance Commission of the State of Illinois, 1919. Springfield: 1919.

Rubinow, Isaac M. Social Insurance. New York: Henry Holt and Company, 1916.

Scofea, Laura A. "The Development and Growth of Employer-Provided Health Insurance." *Monthly Labor Review*, v.117, 73, March, 1994 p. 3(8).

Sloan, Frank A., and Killard W. Adamache. "Taxation and the Growth of Nonwage Compensation." *Public Finance Quarterly*, April 1986, 14(2), 115-137.

Starr, Paul. The Social Transformation of American Medicine. New York: Basic Books, 1982.

_____. The Logic of Health Care Reform. New York: Penguin Books, 1992.

Taylor, Amy K., and Gail R. Wilensky. "The Effect of Tax Policies on Expenditures for Private Health Insurance," in Market Reforms in Health Care, ed. Jack A. Meyer. Washington, D.C.: American Enterprise Institute for Public Policy Research, 1983.

Thomasson, Melissa A. “From Sickness to Health: The Twentieth-Century Development of the Demand for Health Insurance.” University of Arizona Doctoral Dissertation, 1998.

Turner, Robert W. “Are Taxes Responsible for the Growth in Fringe Benefits*?” National Tax Journal*, June 1987, 40(2), 205-220.

Woodbury, Stephen A. “Substitution Between Wage and Nonwage Benefits.” *American Economic Review*, March 1983, 73(1), 166-182.

Woodbury, Stephen A., and Daniel S. Hammermesh. “Taxes, Fringe Benefits, and Faculty.” *Review of Economics and Statistics*, May 1992, 74(2), 287-296.