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FROM SICKNESS TO HEALTH: THE TWENTIETH-CENTURY
DEVELOPMENT OF THE DEMAND FOR HEALTH INSURANCE

by

Melissa Anne Thomasson

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A Dissertation Submitted to the Faculty of the

DEPARTMENT OF ECONOMICS

In Partial Fulfillment of the Requirements
For the Degree of

DOCTOR OF PHILOSOPHY

In the Graduate College

THE UNIVERSITY OF ARIZONA

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Development of the Demand for Health Insurance

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To June and Harris

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ABSTRACT

This dissertation examines how governmental policies and other incentives have shaped the health insurance market over the period 1900-1960. The dissertation opens with an examination of the early health insurance market, and identifies key factors that contributed to both the initial development of the health insurance market, as well as to its development over time. While rising medical expenditures are usually posited as the catalyst for the initial development and the later growth of the market, results suggest that the true story of market development is more detailed. Strategic behavior on the part of hospitals affected health insurance markets, as did state-level regulatory policies.

In addition to state-level government policies, policies at the federal level also had a fundamental impact on the development of health insurance in the United States. A major portion of the dissertation is devoted to examining the impact of the 1954 tax subsidy of employer-provided health insurance. For the first time, the tax subsidy can be analyzed using data that span the period of its implementation. Analysis conducted with these data indicates that the implementation of the tax subsidy generated an increase in the amount of health insurance coverage purchased by lowering its relative price. Perhaps more importantly, the tax subsidy encouraged the development of group health insurance. This partially tax-induced institutional change made health insurance available to more people, and affirmed the development of employer-based health insurance in the United States.

The dissertation also focuses on two aspects of the relationship between health insurance and medical expenditures. First, what affect did the tax subsidy have on medical expenditures? Insured households spent more on medical care than their uninsured counterparts. Since the tax subsidy generated an increase in the number of people with insurance, it also contributed to a corresponding increase in medical expenditures. Second, since health insurance coverage during the 1950s was much more heterogeneous than it is today, the dissertation is able to examine the effect of increasing the comprehensiveness of coverage on medical expenditures. Surprisingly, increasingly comprehensive insurance coverage did not necessarily lead to higher medical expenditures in the 1950s.

1. Introduction

Spending on private health insurance accounts for about five cents of every dollar spent in the United States, or about \$313 billion dollars in 1994. The private health insurance sector provides coverage for 70.5 percent of the U.S. population, 90 percent of them through group insurance policies sponsored by their employers (U.S. GAO, 1997). Private health insurance coverage is such a dominant feature of the U.S. health care system that many people fail to realize that it did not exist at the turn of the century. Even by 1940, only 10 percent of the population had private health insurance. However, the period from 1940-1960 was one of major growth in the industry. By 1961, nearly 75 percent of the population in the United States had some form of private health insurance coverage, indicating that most of the growth in the health insurance market took place prior to 1960 (Health Insurance Institute, 1963).

Despite the enormous growth that has occurred in the industry in the twentieth century, and despite the fact that private health insurance coverage is an important part of the U.S. health care system, most of the research in the area of health insurance has focused on the current issues of health care financing, access to care, and health care reform. As a result, there is a significant gap in our understanding of the institutional development of health insurance in the United States. What forces have contributed to the unique pattern of development of the U.S. health insurance industry? How and why did the provision of health insurance in the United States evolve as a largely private,

employment-based system? This knowledge is crucial to the development of modern health policy. Without understanding the nature of the health insurance market and its development over time, and without knowledge of how past government policies have shaped and influenced the market, policymakers cannot make fully informed decisions.

This dissertation bridges this gap in the literature by examining how governmental policies and other incentives have shaped the health insurance and health care markets over the period 1900-1960. The dissertation opens with an examination of the early health insurance market, and identifies key factors that contributed to both the initial development of the health insurance market, as well as to its development over time. While rising medical expenditures are usually posited as the catalyst for the initial development and the later growth of the market, results from the dissertation suggest that the true story of market development is more detailed. Strategic behavior on the part of hospitals affected health insurance markets, as did state-level regulatory policies.

In addition to state-level government policies, policies at the federal level also had a fundamental impact on the development of health insurance in the United States. A major portion of the dissertation is devoted to examining the impact of the 1954 tax subsidy of employer-provided health insurance. This tax law represented a pivotal crossroads in the development of the health insurance industry, and is a key feature in the modern system. For the first time, the tax subsidy can be analyzed using data that span the period of its implementation. Analysis conducted with these data indicates that the implementation of the tax subsidy generated an increase in the amount of health

insurance coverage purchased by lowering its relative price. Perhaps more importantly, the tax subsidy actually encouraged the development of group health insurance. This partially tax-induced institutional change made health insurance available to more people, and affirmed the development of employer-based health insurance in the United States.

Given the relationship between health insurance and medical expenditures, the tax subsidy may have also affected the demand for medical care. To address this issue, the dissertation focuses on the relationship between health insurance and medical expenditures, and answers two primary questions. First, what affect did the tax subsidy have on medical expenditures? Insured households spent more on medical care than their uninsured counterparts. Since the tax subsidy generated an increase in the number of people with insurance, it also contributed to a corresponding increase in medical expenditures. Second, health insurance coverage during this period was much more heterogeneous than it is today. Using data from the 1950s, then, the dissertation is able to examine the effect of increasing the comprehensiveness of coverage on medical expenditures. Surprisingly, increasingly comprehensive insurance coverage did not necessarily lead to higher medical expenditures in the 1950s

1.1 Chapter Summaries

Chapter two provides a detailed investigation of the development and expansion of the health insurance market from 1900-1950. Central themes in this chapter focus on reasons why the United States did not implement a nationalized system of health insurance, and on what forces contributed to the initial growth and later expansion of the

health insurance market. Using state-level, panel data from the *Spectator Insurance Year Books*, this chapter combines an historical overview and discussion of the early years with an empirical analysis of the period from 1930-1950.

The initial growth of the market in the early 1930s resulted not from an initial surge in the demand for health insurance, but rather from a push by hospitals to develop pre-payment plans for hospital services. Using these plans, which later became unified under Blue Cross, hospitals were able to reduce competition and to guarantee income during the Great Depression. Later, as medical technology advanced and medical expenditures began to rise, the demand for health insurance increased. Increases in both supply and demand were spurred by government policies in the 1930s and 1940s. At the state-level, several state governments exempted Blue Cross and Blue Shield plans from traditional insurance regulations and reserve requirements, and allowed them to operate as non-profit plans. Non-profit, tax-exempt status initially gave the Blues an edge in the market, but as employment-based insurance developed in the 1940s, commercial firms easily gained ground by offering plans with lower premiums to groups of employees.

Chapter two further shows that employment-based insurance grew dramatically in the 1940s, aided by several key federal government policies. In 1942, the War Labor Board ruled that firms who could not use wage increases to attract labor during World War II could offer lucrative fringe benefit packages. One year later, an administrative tax court ruled that in certain cases, employer contributions to the health insurance premiums of their employees were exempt from employee taxable income. The National Labor

Relations Board (NLRB) affirmed the ability of unions to negotiate on behalf of workers for fringe benefit packages in 1948. Finally, in 1954, the revised Internal Revenue Code cemented the employment-based nature of health insurance in the United States by extending the 1943 administrative tax ruling from its narrowly defined scope to cover a wider range of employer-employee health plan relationships. Further, the law expanded the use of employment-based health insurance by eliminating much of the uncertainty associated with its eligibility requirements.

Chapter three provides an in-depth look at the implementation of the 1954 tax subsidy. Previous studies looking at the tax subsidy for employment-based health insurance have relied on data collected after 1960. In this chapter, I use newly uncovered data from 1953 and 1958 to provide a first-time test of the initial effect of the tax subsidy on the market for health insurance. The data are taken from the Nationwide Family Expenditures Surveys conducted by the National Opinion Research Center (NORC) in 1953 and 1958. These surveys represent some of the first nationwide, comprehensive surveys on health insurance coverage and medical expenditures ever conducted in the United States, and provide a natural experiment to test the initial effect of the tax subsidy on the market for health insurance and to gauge its effects over time.

Using the NORC data, the demand for health insurance is estimated for each year, and a decomposition technique is employed to measure the effect of individual variables on the increase in health insurance purchase from 1953 to 1958. While most modern researchers focus almost exclusively on the direct price effect of the tax subsidy, the

results reported here suggest that the tax subsidy had a broader effect on the health insurance market. Not only did the tax subsidy lead to an increase in the purchase of health insurance by lowering its relative price, it also generated an increase in the amount of health insurance that was purchased as it encouraged the development and growth of group health insurance.

This effect of encouraging the growth of group health insurance is a critical one in market development because group insurance is less expensive than individual insurance, and it is much easier to obtain. By increasing access to group insurance, the tax subsidy fostered an increase in the purchase of group health insurance coverage by people who may not have purchased individual coverage. Thus, the tax subsidy not only affected the price of health insurance coverage, but it also generated institutional change as it cemented a system of private, employment-based group health insurance coverage in the United States. Modern policy decisions that affect the tax subsidy should be evaluated not only with respect to how they might affect the relative price of health insurance, but also with respect to what ramifications they might have on access to health insurance coverage.

Given that the tax subsidy lowers the relative price of health insurance, it is also thought to lead consumers to buy more and increasingly comprehensive insurance, which further contributes to rising health care expenditures. While modern studies have found support for this hypothesis (see Feldstein, 1973; Manning et al. 1987), the effect of health insurance on the demand for medical care has not been examined in an historical context.

The fourth chapter of the dissertation examines the relationship between health insurance and the demand for medical care, at a time when relatively few Americans had comprehensive health insurance coverage. In the 1950s, people with insurance spent significantly more than people without insurance. Thus, by increasing the number of people with health insurance coverage, the tax subsidy led to an increase in the level of medical expenditures, although this study is unable to determine the welfare effects associated with the increase.

Chapter four also provides a closer examination of how the purchase of medical care changes with changes in levels of health insurance coverage. Analysis conducted using the NORC data suggest that it is not the case that people who have more comprehensive insurance coverage spend more than people whose insurance policies cover fewer services. This disparity with modern results stems from the fact that health insurance first developed as protection against hospital, and possibly hospital and surgical expenditures. Thus, only in-hospital expenses were covered. Comprehensive insurance that covered in-hospital as well as non-hospital medical expenditures was slower to develop. In 1958, only 29 percent of households had health insurance that covered hospital, surgical, and non-hospital medical expenses. It may be the case that people with less comprehensive insurance coverage substituted more expensive (but insured) hospital care for less expensive (but uninsured) non-hospital medical care, or that they put off treating illnesses until those illness actually required hospitalization. As a result, there is no statistical evidence that supports the fact that people with more comprehensive

insurance coverage actually had greater medical expenditures than people with less comprehensive insurance.

2. From Sickness to Health: The Twentieth-Century Development of Health Insurance in the United States

2.1 Introduction

By 1920, 16 European countries had adopted some form of nationalized, compulsory health insurance that provided income replacement and medical care in the event of accident or illness.¹ In the United States, private health insurance did not develop until the 1930s, and it was not until the 1940s and 1950s that health insurance became widespread and experienced substantial growth.² Further, despite movements for compulsory insurance in the 1910s, 1930s, 1940s, and 1990s, the health insurance market in the United States remains a unique blend of private, employment-based insurance for the majority of people, with governmental provision of insurance for the indigent and the aged.

Knowledge about the institutional development of health insurance in the United States is limited. Little is known about basic questions surrounding the evolution of the health insurance market. Why did the U.S. system develop around a system of employment-based, voluntary health insurance when compulsory health insurance was popular in Europe? What factors spurred the development of health insurance in the 1930s, and what contributed to the expansion of the market in the 1940s and 1950s?

There are several competing hypotheses that attempt to explain the development and the growth of the market for health insurance in the United States. One of the most common is that insurance developed as consumers felt increasingly burdened by rising

medical expenditures, and that this initial increase in demand was bolstered by government tax policies in the 1940s and 1950s. This chapter suggests that although the increase in demand in the 1940s certainly contributed to the expansion of the market, it may have not been the major catalyst for market development. Instead, results suggest that the initial growth in the market was driven by an effort on the part of hospitals to secure revenue and to eliminate competition by implementing pre-payment plans (that later became Blue Cross) during the Great Depression.

Growth was further spurred by state-level policies that enabled Blue Cross and Blue Shield plans to operate as non-profit organizations, so that they were not subject to the usual insurance regulations. Later, demand in the health insurance market increased as a result of income growth, advances in medical technology (and growing public awareness about the efficacy of medicine), and governmental policies that encouraged the relationship between employment and health insurance.

This chapter characterizes the development and growth of the U.S. health insurance market by offering a qualitative history of the development of health insurance in the United States, together with an analysis of a panel of health insurance data. Identifying the major forces underlying market development, and analyzing key periods of transition in the market provide a first-time look at the development of the institution of health insurance in the United States.

2.2 The Institutional Development of the U.S. Health Insurance Market

2.2.1 1900-1930: Health v. "Sickness" Insurance

In the United States, modern health insurance evolved from "sickness" and accident insurance, which paid indemnities in the event of illness or accident. While modern health insurance protects consumers against uncertain medical expenditures, early health insurance policies offered protection against lost income due to accidents and illness, but did not cover actual medical services. One of the first such accident insurance policies was written by the Massachusetts Health Insurance Company of Boston in 1847. By 1899, a typical policy offering such disability coverage provided a \$1,000 death benefit and a five dollar weekly disability benefit, and 47 companies had written 463,000 such policies (Faulkner, pp. 519-22). However, industrial insurance, which provided a cash benefit at the time of death to protect families against the costs of burial was still far more popular with consumers.

The first successful attempt to add indemnification for a few selected diseases to these individual accident insurance policies occurred in 1899, when the Aetna Life Insurance Co. and Travelers Insurance Co. offered a policy that provided coverage against loss due to temporary disability for all diseases except tuberculosis, venereal disease, substance abuse, and mental illness. Premiums for the policy ranged from \$8 to \$50 annually depending on age, with a limit of one year of disability payments (Faulkner,

p. 523). In 1903, the first surgical insurance appeared when a surgical rider offering a cash indemnity for surgery was attached to a regular accident insurance policy.

It was not until 1910 that an insurance policy appeared that offered indemnity coverage for actual medical expenses (Faulkner, p. 537). Generally, accident-disease indemnity policies were not common, and it was not until the late 1920s that consumers regarded riders covering medical expenditures as more than just frills on disability insurance policies (Goldmann, p. 68). Similarly, such policies were not widely offered by insurance companies, since insurance companies were reluctant to insure against what they perceived to be an uninsurable event. An insurable loss was thought to be one which was (1) definite and measurable, (2) unexpected and uncontrolled, and (3) widely disbursed and not subject to catastrophic loss (Eilers, p. 13). When attempting to insure against health losses and medical expenditures, would-be health insurers faced a severe adverse selection and monitoring problem. In addition, the loss attributable to sickness and medical treatment was far from definite, since actuarial data on morbidity were not well-collected. Commenting on the reluctance of insurance companies to offer health insurance, one author noted that, "... to collect on life insurance, the insured must be dead, to collect on accident insurance, he must have had an accident, while to collect on sickness insurance he must have a policy" (McCahan, p. 187).

Unlike health insurance, the major function of sickness insurance was not to provide reimbursement for the costs of medical treatment, although some commercial insurance policies did offer limited riders for hospital or medical expense. Instead, its

primary purpose was to provide income replacement for wages lost due to illness or disability. The wage loss due to illness was usually more significant than the costs of medical treatment. A 1919 State of Illinois Commission report estimated the total cost of sickness for individual wage earners and found that for each dollar of wages lost by individual wage earners, an additional 24 cents had to be added to cover medical expenses (State of Illinois, pp. 15-17). Overall, the total cost per wage earning family of lost wages and medical expenses totaled approximately \$75. By way of comparison, the Commission found that on average, a funeral in a wage-earner's family cost \$132.40 (State of Illinois, p. 17). These findings suggest one reason why industrial (burial) insurance and sickness insurance for income replacement were more popular in the early twentieth century than actual insurance against medical expenditures.

With respect to the number of people with sickness insurance, the Commission estimated that about 36.7 percent of those who were the main support of families had sickness insurance or sickness and accident insurance, either through fraternal societies, mutual benefit organizations, trade unions, or commercial casualty firms (State of Illinois, p. 164). However, only 30 percent of the working class were insured against sickness. Of these, very few held actual commercial sickness insurance policies: in Illinois, only 100,000 of the estimated 1.85 million wage earners held commercial sickness insurance policies in 1917. The remaining 25 percent received sickness benefits through mutual benefit organizations, fraternal societies, or trade unions (State of Illinois, p. 146). For the working-class, commercial insurance tended to be prohibitively

expensive, and it was mainly purchased by professionals and wage earners with high salaries.

Several sources suggest that in the 1910s, a typical commercial sickness insurance policy cost \$60 annually, provided a \$5,000 death benefit, and offered a \$25 weekly indemnity in the event of total disability (Rubinow, p. 295). Rates varied by occupation, with the more dangerous trades incurring higher premiums. For a policy with a monthly accident/sickness indemnity of \$100 and a \$1,000 death benefit, employees in the least hazardous of occupations could secure an annual premium of \$26. In contrast, those in the most hazardous of occupations could expect to pay \$56 annually for a monthly indemnity of only \$50 and a \$100 death benefit. All commercial sickness insurance policies tended to have high administrative costs and paid out only about 40 percent of premiums received in claims (State of Illinois, pp. 425-27). In Illinois between 1913 and 1916, a total of \$12,655,973 was collected for accident and health premiums, with losses paid of \$5,300,176. The ratio of losses paid to premiums over this period was 41.88. By 1917, the ratio had risen to 49.16, with premiums collected of \$3,848,485 against losses paid of \$1,891,894 (State of Illinois, p. 130).

The primary reason as to why commercial insurance was so expensive was due to the problem in underwriting such policies (given a possibility of indefinite risks), verifying loss, and the way in which such insurance was marketed. Each individual prospect had to be visited by a salesman, and premiums were collected in person either monthly (for the working-class), or annually (for professionals). Marketing premiums on

an individual basis was so expensive that one insurance agent complained that even if plans were actuarially sound, "... such individual soliciting would entail a large overhead expense" (American Foundation, p. 1024). Convincing people that they needed sickness insurance was difficult, and considerable effort was devoted by agents to the "creation of a belief that the policies of this or that company" were better bargains than the policies of all other companies. On behalf of their efforts, sickness insurance salesmen received higher commissions than the salesmen of other types of insurance. While commissions ranged from 10 to 40 percent, the average commission was usually around 30 percent (State of Illinois, pp. 130-31.). Given the relatively high premiums on these policies, consumers were reluctant to purchase insurance, especially when the success of medical treatment was very limited.

Indemnity sickness insurance offered by commercial insurance companies was not the only means by which workers could protect themselves against income loss associated with illness and accidents. Fraternal organizations, mutual benefit associations and trade unions also offered members some sort of sickness benefits to workers. The Seroco Mutual Benefit Association, serving employees of Sears, Roebuck & Co., had a sickness insurance plan based on employee wages. Those employees earning less than \$9 weekly paid monthly dues between 10 and 30 cents in order to be entitled to sick benefits ranging from two to four dollars weekly. Employees earning more than \$9 paid between 40 and 60 cents monthly in order to receive sick benefits between eight and \$12 weekly (Henderson, p. 71). In return for paying weekly dues of 30 cents, members of the Union

of Cigarmakers were entitled to strike benefits and a weekly sick benefit of five dollars payable for 13 weeks. Members were also entitled to death benefits based on their tenure of membership in the union (Henderson, pp. 96-99).

The Bureau of Labor estimated that workers belonging to the 19 national unions granting sickness benefits in 1907 received \$832,760 in sick benefits, out of \$7,829,121 in total union expenditures for all benefits (Rubinow, pp. 284-85). Fraternal organizations and other mutual benefit associations offering sickness insurance paid out \$2,375,967 in sickness-related claims from total income of \$5,873,6338 in 1910 (Rubinow, p. 294). Very little of these sickness benefits went towards medical care: in 1914, only one percent of the \$97 million in benefits paid from such societies actually went specifically to medical care (Starr, p. 209). In Illinois in 1919, trade unions insured about 136,000 workers against sickness, fraternal insured 275,000, and independent societies provided sickness insurance to 35,000 individuals. However, while many workers received sickness benefits through such organizations, the actual benefits were limited compared to those offered by commercial firms. Benefits offered by fraternal organizations ranged from \$5 to \$25 weekly, unions paid \$3 to \$12 per week (State of Illinois, p. 551).

The first employer-provided, group sickness insurance plan in the United States was provided by Montgomery Ward and Co. in 1910. Providing coverage for disability and injury, the plan provided benefits equal to 50 percent of the employee's regular weekly salary with a minimum benefit of five dollars and a maximum weekly benefit of \$28.85. However, the plan did not reimburse employees for medical expenses (Scofea,

p. 4). Commercial group health insurance was also uncommon at this time. In Illinois in 1917, only a few thousand dollars in group health insurance premiums had been written (State of Illinois, p. 140). In general, group insurance was something of a novelty during this period. Even in the relatively established market for life insurance, group insurance was a new, although growing proportion of policies written. Nationwide, insurance companies wrote group life insurance for 11,450 persons in 1912, 105,000 in 1915, and 325,000 by 1917 (State of Illinois, p. 137).

2.2.2 The Beginnings of Contract Medical Care

Thus, while individuals could purchase sickness insurance during the early twentieth-century, they did not generally purchase insurance coverage to offset costs associated with medical expenditures. During this period, medical care was largely furnished on a fee-for-service basis in which physicians practiced independently, and charged patients for each procedure they performed. Physicians also practiced price discrimination by charging more affluent people higher prices than those with lower incomes, and they gave some free care to the indigent. In certain industries, physicians contracted with firms to provide medical care for workers for a fixed fee. One such contract practice arrangement was founded at the University of California in 1906. For three dollars each semester, students could receive medical and hospital care at the school infirmary (Numbers, p. 7). For the most part, however, contract practice prevailed only in the timber, mining, and railroad industries, where employees worked in isolated areas in which they could not easily receive medical treatment.

In the state of Washington, such physician/employer arrangements were common in the timber and railroad industries. Even as areas became more densely populated, potentially eliminating the need for such contractual arrangements with physicians, contract medicine continued to grow as doctors started to make supplemental contracts for the care of workers' families. One of the first clinics to offer such contracts was the Western Clinic and Hospital Association in Tacoma, which opened in 1912 to provide care to the general population for a fixed, pre-paid fee. One founder, Dr. Curran, is said to have started the clinic because "... the loggers were always passing the hat around to help some poor individual pay his doctor and hospital bill. Well, Dr. Curran was a practical fellow and decided, what the heck, instead of collecting after the fact, let's collect before the fact" (Group Health Cooperative of Puget Sound, pp. 5-6).

2.2.3 A Movement for Compulsory Insurance

Despite the fact that insurance companies generally did not offer actual health (as opposed to sickness) insurance during the early twentieth century, one organization sponsored a model bill for compulsory health insurance in 1915. Following compulsory health insurance initiatives in Germany and Great Britain, the American Association for Labor Legislation (AALL) proposed a plan calling for comprehensive medical benefits for low income workers. As part of the widespread Progressive movement occurring in the United States in the early twentieth century, members of the AALL created a Committee on Social Insurance in 1912 with the goal of investigating the insurance needs of American workers and preparing needed legislation (Numbers, p. 16).

In November 1915, the Committee on Social Insurance published a draft of its model bill, which was based on both the German and British systems. Under the proposed legislation, each insured worker was entitled to four kinds of benefits. First, the worker and his family were entitled to receive medical, surgical, and nursing care. Second, members were eligible to cash benefits equal to two-thirds their weekly wage for a period up to 26 weeks. Third, the bill provided maternity benefits: insured women and the wives of insured men were entitled to all necessary medical care. In addition, insured women were eligible for an eight week maternity benefit. Finally, insured workers could receive a \$50 funeral benefit (Numbers, p. 25). Under the plan, local mutual insurance companies would manage premium contributions shared by employers, workers, and the state. Employers and workers would each contribute 40 percent of the plan's premium, while the state would contribute the remaining 20 percent (Chasse, p. 1067).

The movement for compulsory health insurance died out as the bill was proposed in several state legislatures over the period 1916-1922, but was never signed into legislation. New York, Massachusetts, and New Jersey all proposed a model bill, and several other states, including California, Illinois, Wisconsin, Pennsylvania, Connecticut, and Ohio sponsored commissions to further study the possibility of compulsory health insurance. After 1919, Ohio, New York, and California commissions supported compulsory health insurance, while Connecticut, Illinois, and Wisconsin did not. The Pennsylvania commission remained undecided.

Ultimately, compulsory health insurance faced strong opposition from commercial insurance companies, pharmacists, organized labor, and physicians. In addition to encountering this opposition, the AALL's legislation also suffered from a lack of widespread public support. Since actual health insurance at the time was not popular with the public at large, and since many people did not recognize a need for insurance against medical expenditures, they were not a strong force in rallying for the compulsory health insurance legislation. As Anderson notes, "the fight was between individual giants on Olympus, to which the general public seemed to pay only passing interest" (Anderson, *The Uneasy Equilibrium*, p. 87)

Organized labor, commercial insurance companies, and pharmacists opposed the AALL's bill from the beginning. Commercial insurance companies opposed the bill because they were excluded from serving as carriers. In addition, insurance companies opposed compulsory health insurance because of its inclusion of a \$50 death benefit. At the time, industrial insurance that offered a funeral benefit was very popular among working class families who purchased it in order to guard against a pauper burial. By including the funeral benefit in the compulsory health insurance plan, a substantial portion of the business of commercial insurance companies would be eliminated (Scofea, p. 5). T. Leigh Thompson, the general manager for National Life Insurance, summed up the fears of insurers by stating that compulsory health insurance was a "... Pandora's box," which would ultimately lead to a time when "... all the insurance business of every kind will be conducted as a state or Federal monopoly" (*Economic World*, Vol. XI,

p. 315). One insurance trade magazine once again reiterated its fears about the viability of health insurance. *The Insurance Monitor* stated that “the opportunities for fraud upset all statistical calculations... Health and sickness are vague terms open to endless construction. Death is clearly defined, but to say what shall constitute such loss of health as will justify insurance compensation is no easy task” (July 1919, vol. 67 (7), p. 38). Druggists, afraid of losing business to hospital dispensaries, also opposed the legislation.

Surprisingly, organized labor also refused to support compulsory health insurance. Instead of requiring employers to contribute to a fund to pay for laborers’ health care costs, trade unions preferred that the employers pay workers higher wages so that workers themselves could pay for their health care costs. Underlying this philosophy was a belief that compulsory health insurance legislation would also make unions less valuable to workers. Speaking before the House Committee on Labor in reference to a resolution to establish a commission to study social insurance, AFL leader Samuel Gompers stated,

I would rather help in the inauguration of a revolution against compulsory health insurance and regulation than submit...I will help in crystallizing the spirit and sentiment of our workers against this attempt to enslave them by the well-meaning siren songs of philosophers, statisticians, and politicians (Anderson 1968, p. 77).

Unlike the groups that had always opposed compulsory health insurance, physicians were initially in favor of the idea. In January, 1916, the AALL’s bill was first proposed in the New York Senate. While physicians generally accepted the idea of compulsory health insurance, some members of the Medical Society of the County of New York opposed certain aspects of the bill, most notably that the proposed legislation

did not specifically state how doctors would be paid, and that the bill encouraged competition among physicians. Physicians also wanted to ensure that patients had free-choice of physician and that they would have physician input on all decisions. In March, fearing that their bill would not pass, the AALL prepared another bill, calling for the creation of a committee to investigate sickness among New York's workers. The bill died in committee (Numbers, pp. 39-41).

Similar conditions greeted the proposed bill in Wisconsin, Pennsylvania, Illinois and California. By the end of 1916, no states had passed a compulsory health insurance bill, but several had formed committees to study the issue. For the most part, the rank and file of the medical profession seemed to lack interest in the issue. A survey of 32 state medical societies on their sentiment towards compulsory health insurance indicated that only two societies found compulsory health insurance to be favorable, four found it unfavorable, while 24 societies reported that they did not know how their members felt (Numbers, p. 50).

The initial support of the AALL's bill waned over the period 1917-1920. While the American Medical Association (AMA) initially supported compulsory health insurance, it rapidly changed its stance as its members began to fear the physician income implications of compulsory health insurance. Doctors who were used to charging patients on a fee-for-service, sliding scale of payment actually stated that they feared government intervention in the doctor-patient relationship; however, it seems more that physicians feared the government's ability to limit their ability to engage in discretionary billing

practices. One joke making the rounds in New York summarized physician sentiment, saying that to pick out a doctor in any crowd, all a person had to do was to “whisper ‘health insurance’ in a man’s ear and see whether his hand goes instinctively to his pocket” (Numbers, p. 89).

In addition to growing physician opposition, the advent of World War I caused many states to postpone consideration of the bill. Anti-German sentiment against social insurance also hurt the AALL’s cause, as did the Red Scare following the Bolshevik Revolution. Finally, a last-ditch effort to enact the bill culminated with the New York Senate’s endorsement of the measure —and the subsequent death of the bill in a House committee. By 1922, the AMA consolidated physician opinion against compulsory health insurance, and the idea of state-sponsored health insurance died out until its revival during the Great Depression.

2.2.4 Advancing Technology, Rising Expenditures

The lack of popularity of actual health (as opposed to sickness) insurance during this period stemmed not only from its high cost, but also because the demand for actual health insurance early in the century was not yet manifest. As noted previously, the financial losses associated with sickness were really associated with lost wages. The losses associated with actual medical expenditures were small because of the low state of medical technology. Prior to the development of anti-infection methods in the late nineteenth century, invasive surgery was nearly always fatal. Hospitals, far from being places of cure, were charity institutions where the danger of cross-infection gave them a

well-earned reputation as being places of death. Since most patients were treated by their families in their homes, the major monetary losses associated with illness were generally confined to lost income. A 1918 Bureau of Labor Statistics survey found that hospital costs in Ohio averaged about \$3.69 of a family's total annual medical bill of \$48.41 (Starr, p. 259). The low costs 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 1968, p. 86). Thus, sickness insurance policies designed to protect the insured against loss of income developed, while actual health insurance remained relatively unknown.

Table 2.1 provides a brief list of major medical discoveries since the mid-nineteenth century. As medical technologies advanced, medical care moved out of American homes and into hospitals. Hospitals became centers for surgery as well as for expensive medical technologies such as X-rays. In part, this shift reflected the increasing urbanization and industrialization of the early twentieth century. As America became a leading industrial power, injuries and illnesses increased. Women worked more, and had less time to care for the sick in their homes. Urban homes tended to be smaller than rural ones, with less room to care for sick family members (Faulkner, p. 509).

While these socioeconomic factors may have contributed to the movement of medical care into the hospital setting, the development of technology, as well as improving standards in medical care and medical education also influenced the increasing

Table 2.1: Milestones in Medical Technology

1850-1870:	Louis Pasteur, Joseph Lister and others develop understanding of bacteriology, antisepsis, and immunology.
1870-1910:	Advances in microscopy allow identification of various infectious agents including <i>spirochaeta pallida</i> (syphilis), typhus, <i>pneumococcus</i> , and malaria. Diphtheria antitoxin developed. Surgery becomes more widely practiced and fatality rates fall.
1887:	S.S.K. von Basch invents instrument to measure blood pressure.
1895:	Roentgen develops X-rays.
1910:	Salvarsan (for syphilis) proves to be first drug treatment that destroys disease without injuring patient.
1922:	Insulin isolated.
1935:	Sulfa drugs developed.
1946:	Large-scale production of synthetic penicillin discovered.
1955:	Salk announces discovery of vaccine for polio.

role of hospitals in providing health care services, and the movement of medical technologies into hospitals. Hospitals were natural locations for expensive, capital intensive technologies such as X-rays. As the medical profession evolved and developed fixed standards, gaining accreditation required that hospitals possess minimum medical technologies. In 1913, the American College of Surgeons (ACS) was founded. Would-be members of the ACS had to meet strict standards. For a hospital to gain the accreditation of the ACS, it had to meet a set of standards relating to the staff, records, and diagnostic and therapeutic facilities available. Of 692 large hospitals examined in 1918, only 13 percent were approved. By 1932, 93 percent of the 1,600 hospitals examined met ACS requirements (Shyrock, p. 348).

The growing use of hospitals and medical technology, as well as increasing requirements for hospital and physician accreditation generated an increase in medical expenditures. Standardization of requirements for hospital accreditation actually followed similar requirements of physicians and medical schools. In 1904, the AMA formed the Council on Medical Education to standardize the requirements for medical licensure. The CME invited Abraham Flexner of the Carnegie Foundation for the Advancement of Teaching to evaluate the status of medical education. Flexner's report, a scathing indictment of medical education, was published in 1910. According to Flexner, the current methods of medical education had "... resulted in enormous over-production at a low level, and that, whatever the justification in the past, the present situation... can be more effectively met by a reduced output of well trained men than by further inflation

with an inferior product” (Flexner, p. 16). Flexner argued for stricter entrance requirements, better facilities, higher fees, and tougher standards. Following the publication of the Flexner Report, the number of medical schools in the United States dropped from 131 in 1910 to 95 in 1915. By 1922, the number of medical schools in the U.S. had fallen even further to 81 (*Journal of the American Medical Association*, August 12, 1922, p. 633). These increased requirements for physician licensure, education and the accreditation of medical schools restricted physician supply, putting upward pressure on the costs of physicians’ services. As a result of these increasing costs, the demand for health insurance to avert financial losses due to medical expenditures became more noted as the twentieth century progressed.

In 1927, the Committee on the Costs of Medical Care (CCMC) was formed to investigate the medical expenses of American families. Comprised of physicians, economists, and public health specialists, the CCMC published 27 research reports, offering reliable estimates of national health care expenditures. According to one CCMC study, the average American family had medical expenses totaling \$108 in 1929, with hospital expenditures comprising 14 percent of the total bill (Falk, Rorem, and Ring, p. 89). In 1934, Michael M. Davis, a leading advocate of reform, noted that hospital costs had risen to nearly 40 percent of a family’s medical bill (Davis, *The American Approach to Health Insurance*, p. 211). A study completed in 1934 by the Metropolitan Life Insurance Company confirms these findings. Examining the medical costs of over 8,000 field employees, Metropolitan Life found that 42.4 percent of an average family’s yearly

medical bill went to hospital care. 39.7 percent paid for physician services. 8.7 percent paid for nursing care. 2.8 percent for drugs. and 2.7 percent paid for extra household assistance (Armstrong, Dublin, and Steele, p. 61). As a result, the middle class that previously emerged relatively unscathed from episodes of illness began to suffer the brunt of escalating health care and hospital expenditures. Further, the variation in expenditures increased as technology progressed and a greater number of illnesses became treatable.

In the 1930s, 1940s, and 1950s, the steady development of medical technology further contributed to rises in health care costs. Improvements in pharmaceuticals such as sulfa in 1935 and penicillin in 1946 created an awareness of medical technology among Americans, which was further enhanced after Salk invented a vaccine for the dreaded childhood disease of poliomyelitis in 1955. This awareness of medical technology contributed to the perceived increase in a need for medical care and, correspondingly, health insurance over the period.

2.3 1930-1940: The Birth of Blue Cross and Blue Shield

2.3.1 Blue Cross and Group Hospitalization Insurance

The precursor to Blue Cross was founded in 1929 by a group of Dallas teachers who contracted with Baylor University Hospital to provide 21 days of hospitalization for a fixed \$6.00 payment. Pre-paid hospital service plans grew over the course of the Great Depression: pre-paid hospital care was mutually advantageous to both subscribers and hospitals during the early 1930s, when both consumers and hospitals suffered from

falling incomes. Hospital receipts per patient dropped from \$236.12 in 1929 to \$59.26 one year later (Starr, p. 296). According to one study, only 62 percent of beds in private hospitals were occupied on average, compared to 89 percent of beds in public hospitals that accepted charity care (Davis and Rorem, p. 5). As one pediatrician in the Midwest noted, "Things went swimmingly as long as endowed funds allowed the hospitals to carry on. When the funds from endowments disappeared the hospitals got into trouble and thus the various plans to help the hospitals financially developed" (American Foundation, p. 756).

There is also indication that the Baylor plan developed as a way to ensure that people paid their hospital bills. One official connected with the plan compared hospital bills to cosmetics, noting that the nation's cosmetic bill was actually more than the nation's hospital bill, but that "We spend a dollar or so at a time for cosmetics and do not notice the high cost. The ribbon counter clerk can pay 50c, 75c, or \$1 a month, yet.... it would take about twenty years to set aside a large hospital bill" (The American Foundation, p. 1023). Soon, other hospitals were establishing their own insurance plans. Since single-hospital plans generated greater competition among hospitals, community hospitals began to organize with each other to offer hospital coverage and reduce inter-hospital competition. Later, these plans consolidated under the name Blue Cross.

The American Hospital Association (AHA) encouraged such endeavors as a means of relieving "... from financial embarrassment and even from disaster in the emergency of sickness those who are in receipt of limited incomes" (Reed 1947, p. 14).

The AHA also developed a set of guidelines outlining the essential requirements for such hospital service plans. Specifically, the AHA required that any plan wanting to join Blue Cross (1) stress public welfare, (2) limit its protection to hospital charges only, (3) enlist professional and public interests, (4) provide free choice of physician and hospital, (5) maintain itself as a non-profit organization, (6) maintain itself on a sound economic basis, and (7) promote itself in a cooperative spirit and dignified manner (Eilers, p. 11). By limiting the coverage of the plans to only hospital charges, Blue Cross plans could not trespass on the territory of physicians and surgeons. The guidelines also eliminated inter-hospital competition, since the fourth requirement essentially barred single-hospital plans from joining. By 1937, any hospital plan meeting these requirements and approved by the AHA was entitled to operate under the Blue Cross symbol.

Blue Cross plans also initially benefited from special state-level enabling legislation allowing them to act as non-profit corporations and enjoy tax-exempt status. Originally, the reason for this exemption was that Blue Cross plans were considered to be in society's best interest since they often provided insurance benefits to low-income individuals (Eilers, p. 82). Without the enabling legislation, Blue Cross plans would have to meet the capital and reserve requirements of insurance companies, or would have assessment liability as did mutual companies. Under the enabling legislation, the plans "...enjoy the advantages of exemption from the regular insurance laws of the state... are freed from the obligation of maintaining the high reserves required of commercial insurance companies and are relieved of paying taxes" (Anderson 1944,

p. 11). However, the enabling legislation also required the plans to be non-profit, and to allow free choice of physician by subscribers. In 1934, New York was the first state to enact such enabling legislation. By 1943, 32 states had adopted special enabling legislation for hospital service plans, while other states exempted Blue Cross plans by categorizing them strictly as nonprofit organizations (Eilers, pp. 100-01).

2.3.2 Blue Shield: The Physicians' Response

Despite the success of Blue Cross and pre-paid hospitalization policies, physicians were much slower in developing pre-paid care plans for their services. Blue Cross and Blue Shield developed separately, with little coordination between them (McDavitt, 1946). Physicians worried that a third-party system of payment would lower their incomes by interfering with the physician-patient relationship and restricting the ability of physicians to price discriminate. However, in the 1930s, physicians were faced with two situations that spurred them to develop their own pre-paid plans. First, Blue Cross plans were becoming popular, and some physicians feared that hospitals would move into the realm of providing insurance for physician services, thus limiting physician autonomy. In addition, advocates of compulsory health insurance looked to the emerging social security legislation as a logical means of providing national health care. Compulsory health insurance was even more anathema to physicians than voluntary health insurance. It became clear to physicians that in order to protect their interests, they would be better off pre-empting both hospitals and compulsory insurance proponents by sculpting their own plan that would serve the needs of physicians.

Thus, to protect themselves from competition with Blue Cross, as well as to provide an alternative to compulsory insurance, physicians began to organize a framework for pre-paid plans that covered physician services. In this regard, the American Medical Association (AMA) adopted a set of ten principles in 1934 "... which were apparently promulgated for the primary purposes of preventing hospital service plans from underwriting physician services and providing an answer to the proponents of compulsory medical insurance" (Hedinger, p. 82). Within these rules were provisions that ensured that voluntary health insurance would remain under physician supervision and not be subject to the control of non-physicians. In addition, physicians wanted to retain their ability to price discriminate.

These principles were reflected in the actions of physicians as they established enabling legislation similar to that which allowed Blue Cross plans to operate as non-profits. Like the Blue Cross enabling legislation, these laws allowed Blue Shield plans to be tax exempt and free from the provisions of insurance statutes. Physicians lobbied to ensure that they would be represented on the boards of all such plans, and acted to ensure that all plans required free choice of physician. In 1939, the California Physicians' Service (CPS) began to operate as the first prepayment plan designed to cover physicians' services. Open to employees earning less than \$3,000 annually, the CPS provided physicians' services to employee groups for the fee of \$1.70 per month for employees (Scofea, p. 5). To further these efforts, the AMA encouraged state and local medical

societies to form their own pre-payment plans. These physician-sponsored plans ultimately affiliated and became known as Blue Shield in 1946.

Blue Shield plans offered primarily medical and surgical benefits for hospitalized members, although certain plans also covered visits to doctors' offices. While some plans offered service benefits to low-income subscribers, most Blue Shield plans operated on an indemnity basis. Doctors charged patients who were subscribers to Blue Shield the difference between their actual charges and the amount for which they were reimbursed by Blue Shield. In this manner, doctors could retain their power to price discriminate by charging different patients different prices. As the number of Blue Shield plans that provided service benefits expanded, hospitals and physicians began to gain a monopoly in plans that provided service-benefits to enrollees rather than simple cash indemnities. Other firms could not offer to pay for services if they did not first negotiate the price of services with providers, who were generally unwilling to engage in such negotiation. Hospitals refused to contract with plans other than Blue Cross, and many doctors avoided any plan involving pre-paid group practice, which would obligate them to surrender control of their fee schedules.

2.4 1940-1960: An Expanding Market

2.4.1 The Continued Evolution of Contract Practice

In the 1940s, the market for health insurance exploded in size, growing from a total enrollment of 20,662,000 in 1940 to nearly 142,334,000 in 1950 (Health Insurance

Institute, 1961 Source Book, p. 10). Figure 2.1 shows how hospital, surgical, and major medical insurance grew over the period from 1940-1960. All insurers enjoyed the growth of the market: Blue Cross and Blue Shield, commercial insurance companies, and other pre-paid plans. Evolving from the industry-oriented, contract practice plans of the 1910s, pre-paid group practice plans that owned their own hospitals and that employed physicians on a salaried basis also expanded during this period. One of the first of these plans, later called Health Maintenance Organizations (HMOs), was the Ross-Loos Clinic in Los Angeles. In 1929, a clinic operated by Doctors Ross and Loos entered into a contract with the city's water and power department to provide city employees with hospital and medical care for two dollars monthly. For an extra fifty cents per visit, the dependents of employees could also receive medical care (Reed, p. 196).

Kaiser Permanente, a modern HMO giant, also grew from the roots of contract practice. During the construction of a dam in an isolated area in California, the Kaiser Co. contracted with Dr. Sidney Garfield to provide medical services on-site for employees in return for a fixed pre-payment. In addition, workers could elect to have additional amounts deducted from their salaries in order to have medical services furnished to their families (Scofea, p. 6). Kaiser asked Garfield to establish other such plans, which eventually united under the Kaiser Permanente umbrella. Other early HMOs included Kaiser Permanente, Group Health of Puget Sound, and the Health Insurance Plan of New York.

Figure 2.1: Growth in All Types of Insurance, 1940-1960

The American Medical Association (AMA) viewed the growth of contract practice as a threat to physician autonomy and income. Accordingly, in response to the growth of these plans, the AMA and state and local medical societies attempted to suppress contract medicine by harassing physicians who chose to engage in contract practice. Local medical societies routinely expelled such physicians (Drs. Ross and Loos were expelled from the Los Angeles County Medical Society in 1934), or tried to revoke the medical licenses of doctors who agreed to practice on a salaried, contract basis. When Dr. Michael Shadid tried to found a cooperative health clinic in 1929 that offered pre-paid medical and surgical care to families in Elk City, OK, other local physicians declared his actions unethical, expelled him from the medical society, and hindered his ability to practice (Starr, pp. 303-04).

Although Shadid managed to enlist political allies to help his cause, such behavior on the part of local medical societies and the AMA was commonplace and continued throughout the 1930s and early 1940s. In 1940, an appellate court for the District of Columbia found the AMA and local D.C. medical societies guilty of restraint of trade under the Sherman Act for their actions against the Group Health Association of Washington, D.C. Group Health had formed as a non-profit organization in 1937 to provide medical services to the employees of the Federal Home Loan Bank. Under guidance from the AMA, local medical societies in the District of Columbia expelled physicians who agreed to practice for Group Health, thus limiting the ability of those physicians to practice medicine. Expelled physicians could not consult with physicians

who remained society members, and they also found it difficult to secure hospital privileges for their patients. In *United States v. American Medical Association*, an appellate court found that organized medicine had engaged in "... conspiracy to hinder and obstruct the (Group Health) association in procuring and retaining on its staff qualified doctors.. and to hinder and obstruct its physicians from the privilege of consulting with others and using the facilities of hospitals."³ The AMA appealed the ruling to the U.S. Supreme Court. Interestingly, the AMA did not contest the fact that it had conspired to obstruct the ability of Group Health Association to do business. Instead, the AMA's defense relied on the argument that medicine was a profession, not a trade, and thus not subject to the provisions of the Sherman Act. The Supreme Court disagreed and affirmed the appellate court's decision.⁴

2.4.2 The Foundation of the Employment-Based Health Insurance System

While commercial insurance companies were reluctant to insure health risks early in the twentieth century, they began to move rapidly into the health insurance market once it was apparent that Blue Cross and Blue Shield were successful. As the Superintendent of Insurance in New York, Louis H. Pink, noted in 1939,

...There are twenty stock insurance companies which are today issuing in this state Individual Medical Reimbursement, Hospitalization, and Sickness Expense Policies. About half of these have only recently gone into this field. It is no doubt the interest aroused by the non-profit associations which has induced the regular insurance companies to extend their activities in this way (Pink, 1939).

The success of the commercial plans was aided by two factors. First, the competitiveness of Blue Cross and Blue Shield was limited by the fact that their non-profit status required

that they community rate their policies. Under a system of community rating, insurance companies charge the same premium to sicker people as they do to healthy people. Since they were not considered to be non-profit organizations, commercial insurance companies were not required to community rate their policies. Instead, commercial insurance companies could engage in experience rating, whereby they charged sicker people higher premiums and healthier people lower premiums.

Recognizing the profits to be made by insuring people who had little risk of becoming ill, commercial insurance companies focused their efforts on insuring healthy groups of workers through their employers. By insuring healthy groups, commercial insurance companies could effectively reduce adverse selection, thus lowering their costs. Because they could experience rate the policies, commercial insurers could then offer employee groups lower rates than Blue Cross and Blue Shield. In addition, administrative costs were lower when insurance plans were made available as an employee benefit. As a result, the commercial insurance business boomed. Figure 2.2 illustrates the growth of commercial insurance relative to Blue Cross and Blue Shield. So successful was commercial insurance that by the early 1950s, commercial plans had more subscribers than either Blue Cross or Blue Shield. In 1951, 41.5 million people were enrolled in group or individual hospital insurance plans offered by commercial insurance companies, while only 40.9 million people were enrolled in Blue Cross or Blue Shield plans (Health Insurance Institute, 1965 Source Book, p. 14).

Figure 2.2: Growth of Commercial Insurance Relative to the Blues

Offering insurance policies to employee groups not only benefited insurers, but also benefited employers. During World War II, wage and price controls prevented employers from using wages to compete for scarce labor. Under the 1942 Stabilization Act, Congress limited the wage increases that could be offered by firms, but permitted firms to adopt employee insurance plans. Thus, health benefit packages offered one means of securing workers. In the 1940s, two major government policy rulings also reinforced the foundation of the employer-provided health insurance system. First, in 1945 the War Labor Board ruled that employers could not modify or cancel group insurance plans during the contract period. Then, in 1949, the National Labor Relations Board ruled in a dispute between the Inland Steel Co. and the United Steelworkers Union that the term “wages” included pension and insurance benefits. Therefore, when negotiating for wages, the union was allowed to negotiate benefit packages on behalf of workers as well. This ruling, affirmed later by the U.S. Supreme Court, further reinforced the employment-based system.⁵

Perhaps the most influential aspect of government intervention that shaped the employer-based system of health insurance was the tax treatment of employer-provided contributions to employee health insurance plans. First, employers did not have to pay payroll tax on their contributions to employee health plans. Further, under certain circumstances, employees did not have to pay income tax on their employer’s contributions to their health insurance plans. The first such exclusion occurred under an administrative ruling handed down in 1943 that stated that payments made by the

employer directly to commercial insurance companies for group medical and hospitalization premiums of employees were not taxable as employee income (*Yale Law Journal*, 1954, pp. 222-247). This ruling was highly restrictive and limited in its applicability since it only affected direct employer contributions to group plans issued by commercial insurance companies. Private programs of employee associations or of employers were not covered under the ruling, nor were employer contributions to the individual health plans of employees. In addition, there was confusion as to what actually constituted "insurance." Even plans that could meet the criteria of insurance such as contractual enforceability, indemnification, and limits of liability were often not covered under the 1943 ruling (*Yale Law Journal*, 1954, pp. 222-47).

Thus, the applicability of the 1943 ruling was definitely limited. Further, later changes in the tax treatment of employer contributions generated confusion as to what actually could be exempted. On July 20, 1953, an administrative ruling specific to the New York workers' compensation law extended the tax exemption to employer contributions made to private (i.e. non-commercial insurance) employee benefit plans under the New York workers' compensation laws.⁶ While this ruling was eventually interpreted as extending the tax-exemption to all private plans, so that the exemption now applied to private as well as to commercial insurance, another ruling in 1953 reinforced the limitations of the 1943 ruling, emphasizing that employer contributions to individual health plans were taxable to the employee (*Yale Law Journal*, 1954).

A major change in the tax code occurred in 1954, when the Internal Revenue Service codified earlier rulings pertaining to the tax treatment of employer contributions to employee benefit plans. In so doing, the changes in the 1954 Internal Revenue Code (IRC) accomplished primarily three things. First, they expanded the scope of previous administrative rulings by extending the tax exemption of employer contributions to include contributions towards individual health plans, which were important for smaller employers for whom group plans were not easily established. Previous IRS rulings pertained only to group plans. Second, since it clarified earlier rulings, the 1954 IRC eliminated much of the uncertainty surrounding the tax treatment of employer contributions. Finally, the 1954 IRC was likely associated with substantial announcement effects, since it provided an actual statutory basis for the tax treatment of employer contributions, instead of forcing employers and employees to rely on a series of administrative rulings buried in tax court cases.

2.5 Empirically Analyzing the Development of the Health Insurance Market

In this section, I quantify the extent to which these various factors contributed to the development of the health insurance market, and to identify how government policies impacted market growth. The development of the health insurance market in the United States as an employment-based system of voluntary health insurance had its roots in the opposition of the American Medical Association to compulsory health insurance. As

America became more urbanized and as medical technology advanced, the demand for health insurance in the early twentieth century grew. With the advent of the Great Depression, pre-payment hospital plans became popular as hospitals used such plans as a means of smoothing income during the Great Depression, and of reducing inter-hospital competition. These hospital plans eventually unified under the Blue Cross umbrella in the late 1930s, and commercial insurance companies entered the market in the 1940s. Health insurance grew in popularity throughout the period, and also benefited from several governmental rulings and favorable tax treatment in the 1940s and 1950s.

Measuring how these and other factors influenced the development of the health insurance market from 1930-1950 involves estimating the supply and demand for accident and health insurance using a two-way, fixed effects technique. In order to measure the amount of insurance purchased over the period, I use a panel of state-level accident and health insurance premium information culled from the *Spectator Insurance Year Books*. Unfortunately, actual “health” insurance data are difficult to obtain. The *Spectator* data contain information about the total premiums written and total losses incurred on accident and health insurance data by state for each year. However, as reported in the *Spectator*, insurance against medical expenditures and indemnity sickness insurance is uniformly reported as “health” insurance. Further, some companies did not distinguish between accident and health insurance. As a result, information on accident insurance often contains some premiums sold as health insurance, and vice versa. In some states, insurance companies always reported accident and health business together: in

these cases, it is impossible to tell what is health insurance and what is accident insurance. Given the difficulty in distinguishing accident and health insurance, I sum all categories and use the measure of real total accident and health insurance premiums written per capita as the measure of insurance purchase within a state. The Consumer Price Index for all items is used to deflate the series.

2.5.1 Estimating the Supply and Demand of Accident and Health Insurance

The supply and demand of accident and health insurance in a state will depend on several of the factors discussed in the preceding section. Ideally, I would like to estimate the following system of supply [2.1.1] and demand [2.1.2] equations:

$$[2.1.1] \quad \ln\left(\frac{Prem}{Cap}\right)_{it} = \alpha_i + \gamma_t + \beta_1 Z_{1it} + \beta_2 Z_{2it} + \beta_3 Z_{3it} + \beta_4 Z_{4it} + \beta_5 Z_{5it} + \beta_6 Z_{6it} + \varepsilon_{it}.$$

where:

Z_1 = natural logarithm of the number of hospitals per 100,000 population

Z_2 = dummy variable equal to one if the state had Blue Cross enabling legislation

Z_3 = dummy variable equal to one if the state had Blue Shield enabling legislation

Z_4 = percentage of the state's population that is black

Z_5 = percentage of the state's population living in an urban area

Z_6 = price of accident and health insurance

$$[2.1.2] \quad \ln\left(\frac{Prem}{Cap}\right)_{it} = \alpha_i + \gamma_t + \delta_1 X_{1it} + \delta_2 X_{2it} + \delta_3 X_{3it} + \delta_4 X_{4it} + \delta_5 X_{5it} + \varepsilon_{it}.$$

where:

X_1 = natural logarithm of real state income per capita

X_2 = percentage of the state's population over age 25 that is illiterate

X_3 = percentage of the state's population that is black

X_4 = percentage of the state's population living in an urban area

X_5 = price of accident and health insurance

Both equations contain state-specific fixed effects (α_i), and yearly time effects (γ_t). In the supply equation, three variables are included to control for the influence of hospitals and physicians on the amount of health insurance written. As previously mentioned, one reason for the growth of Blue Cross following the Great Depression may have been that hospitals were attempting to eliminate inter-hospital competition and to smooth hospital revenues in an adverse economic environment. It follows that Blue Cross plans may have been more likely to form in states with a greater number of hospitals serving a fixed population than in states with less hospital competition. Thus, the natural logarithm of the number of hospitals per 100,000 population is included in the supply equation. Another factor influencing the amount of Blue Cross and Blue Shield plans that developed in a state is whether or not the state had enacted special enabling legislation that exempted Blue Cross and Blue Shield plans from traditional insurance regulatory requirements. To control for this effect, dummies equal to one if states had passed such legislation are also included.

Two variables are included in the demand equation that are not included in the supply equation. The first is the natural logarithm of real state income per capita, which is

included to control for the fact that state income may be a factor in determining how much accident and health insurance is purchased within a state. A second demand variable that is not included in the supply equation is the approximate percentage of the state's population over age 25 that is illiterate. This variable is included as a measure of educational attainment, since educated people may be more likely to purchase insurance than non-educated people. This variable represents an approximate measure of illiteracy because there is not a standard measure of adult education across Censuses. The U.S. Censuses in 1920 and 1930 provide numbers on adult literacy rates, while the 1940, 1950 and 1960 Censuses report years of school completed.

A rough approximation of how years of school completed translates into illiteracy is provided by a Special Report of the U.S. Census published in 1948 that lists the proportion of the population that is illiterate, based on the number of years of school they completed, as shown in Table 2.2 (also see Smith, 1984). Unfortunately, the census does not disaggregate the number of school years a person has completed; it reports years of schooling as zero years, 1-4 years, 4-6 years, etc. Given this, I obtain the percentage of persons who have completed 1-4 years of schooling who are illiterate by taking the ratio of the average of people who are illiterate with one year of schooling and with four years of schooling, to the average of people over age 25 who have one year of schooling and who have four years of schooling. Because the probability of illiteracy falls dramatically between three and four years of schooling completed, I assume (as does the Census report) that people who have completed more than four years of school are not illiterate.

Table 2.2: Illiteracy in the Civilian Non-Institutional Population over age 25 by Years of School Completed*

Number (percent) of males with no schooling who are illiterate 721.000 (78.2)	Number (percent) of males with one year of schooling who are illiterate 183.000 (70.7)	Number (percent) of males with four years of schooling who are illiterate 71.000 (5.3)	Average number (percent) of males with 1-4 years of schooling who are illiterate 127.000 (15.8)
Percent of females with no schooling who are illiterate 783.000 (80.7)	Number (percent) of females with one year of schooling who are illiterate 103.000 (57.2)	Number (percent) of females with four years of schooling who are illiterate 42.000 (3.1)	Average number (percent) of females with 1-4 years of schooling who are illiterate 51.521 (0.1)

*Source: U.S. Bureau of the Census. Special Reports of the U.S. Census. Current Population Reports Series P-20, No. 20, 1948. Percentages calculated as the ratio of the sum of illiterate persons over age 25 to the total population over age 25.

Illiteracy in a state is then calculated by multiplying the number of persons in a given category of school years completed by the percentage of people in that category who are illiterate.

There are three variables that are common to both equations. The percentage of a state's population living in an urban area is included to function as a proxy for the degree of urbanization within a state. Urbanization is important factor contributing to the amount of health and accident insurance sold because insurance companies had lower costs in urban areas than in rural areas because they could reach more customers in a group setting and have lower overhead costs. As one insurance agent noted, "Southwestern Virginia is a largely rural community... We should have to place our contracts *individually*... such individual soliciting would entail a large overhead expense" (American Foundation, p. 1024). In the demand equation, urbanization may be a determinant of insurance purchase, given that living in an urban area may have provided a greater opportunity to purchase group insurance. Since people who have access to group insurance are statistically more likely to purchase insurance, people in urban areas may have purchased more insurance than people in rural areas. An alternative interpretation may be that people in urban areas feared epidemics and other outbreaks of disease more than people in rural areas, so that the demand for insurance in urban areas was greater than the demand in rural areas.

The percentage of a state's population that is black is included in the supply and demand equations to control for the fact that insurance companies may have used race as

a factor in selection. As Faulkner notes, “the underwriting problems involved in attempting to insure members of more than one race would be considerable owing to differences in physique, temperament, habit and environment” (p. 118). If this were the case, it may be that less insurance was sold in states with a higher percentage of black people than in states where there were fewer blacks.

In addition to the percentage of blacks and the percentage of the population living in an urban area, price is also included in both the demand and supply equations. Unfortunately, data on price are not available, so that estimating the equations separately would lead to omitted variable bias in the coefficients. Since price is also endogenously determined with the quantity of accident and health insurance in the system, I instead estimate the reduced form equation of the quantity of health and accident insurance on all of the exogenous variables in the system as previously defined in equations [2.1.1] and [2.1.2]:

$$[2.2.1] \quad \ln\left(\frac{Prem}{Cap}\right)_{it} = \alpha_i + \gamma_t + \pi_1 Z_{1it} + \pi_2 Z_{2it} + \pi_3 Z_{3it} + \pi_4 Z_{4it} + \pi_5 Z_{5it} \\ + \pi_6 X_{1it} + \pi_7 X_{2it} + \varepsilon_{it}$$

The estimated coefficients are the reduced-form parameters that combine the supply and demand effects of the variables on the quantity of accident and health insurance sold. Appendix A gives the algebraic derivation of the reduced form coefficients and their expected signs in terms of the structural parameters of the models.

A priori, the estimated coefficients on the natural logarithm of hospitals per 100,000 population (π_1), the dummy variables for Blue Cross and Blue Shield enabling

legislation (π_2 and π_3), the percent of the population living in an urban area (π_4), and the natural logarithm of income per capita (π_5), should all be positive in sign. The estimated coefficients on the percent of the population that is black (π_6), and the percent of people over age 25 who are illiterate (π_7) should be negative.

2.5.2 Results from Estimation

While the health and accident insurance premium data, income data, and hospital data are reported yearly, the other variables in the equation are reported only in census years. Thus, I first linearly interpolate the census-year-only variables in order to take advantage of the annual data and estimate the sample over the entire 1930-1950 period.⁷ Summary statistics for both the census-year-only sample and the full sample are reported in table 2.3. Table 2.4 reports the results from estimation of the equation over the period 1930-1950⁸.

As shown in table 2.4, results indicate that hospitals may have established pre-paid service benefit (Blue Cross) plans as a means of raising revenue and of reducing inter-hospital competition. More insurance per capita was sold in states with many hospitals per 100,000 people as opposed to states that had fewer hospitals. It may be that as the number of hospitals increased, more hospitals founded Blue Cross plans to reduce competition, thus increasing the amount of insurance sold within a state. Increasing the number of hospitals per 100,000 population by one percent increases the amount of accident and health insurance coverage purchased per capita by 0.3529 percent.

Table 2.3: Summary Statistics

Census-Year-Only Data (1930, 1940, 1950)*

Variable	Mean	Std. Dev.	Min	Max
Total Real Premiums	22.600.000	45.100.000	381.712	334.000.000
Premiums/Capita	6.4146	5.7858	0.7814	27.6332
Ln(Premiums/Capita)	1.5226	0.8098	-0.2467	3.319
Population	2.802.276	2.773.064	91.058	14.800.000
Population/Sq. Mile	100.4097	151.844	0.8	748.3894
Hospitals/100.000	6.1919	3.2303	2.99	25.3
Ln(Hospitals/100.000)	1.7224	0.4284	1.0953	3.2308
BC Enabling Law	0.4167	0.4947	0	1
BS Enabling Law	0.2292	0.4218	0	1
Percent Black	0.0925	0.1267	0.0003	0.5024
Percent Illiterate	0.0453	0.0379	0.0092	0.1947
Real Income	4.480.000.000	6.080.000.000	150.000.000	37.800.000.000
Income/Capita	1.444.90	596.6847	398.0454	2.924.07
Ln(Income/Capita)	7.184	0.4444	5.9866	7.9807

*n = 144

Yearly Data, 1930-1950*

Variable	Mean	Std. Dev.	Min	Max
Total Real Premiums	14.600.000.00	24.800.000.00	307.653.40	334.000.000.00
Premiums/Capita	4.4969	3.2766	0.5297	27.6332
Ln(Premiums/Capita)	1.2913	0.6493	-0.6355	3.319
Population	2.786.559	2.734.818	91.058	14.800.000
Population/Sq. Mile	99.8391	150.1485	0.8	748.3894
Hospitals/100.000	6.0704	2.891	2.76	25.2586
Ln(Hospitals/100.000)	1.7124	0.4108	1.0152	3.2292
BC Legislation	0.4077	0.4917	0	1
BS Legislation	0.2103	0.4077	0	1
Percent Black	0.0924	0.1265	0.0003	0.5024
Percent Illiterate	0.046	0.034	0.0092	0.1947
Real Income	4.410.000.000	5.940.000.000	121.000.000	38.600.000.000
Income/Capita	1.439.99	618.3394	300.1502	3.647.86
Ln(Income/Capita)	7.1715	0.4675	5.7043	8.2019

*n = 1008

Table 2.4: Estimation Using Annual Data*

Variable	Coefficient	Std. Error	P-Value
BC Enabling Law	0.0477	0.0252	0.0590
BS Enabling Law	0.0931	0.0265	0.0000
Percent Black	-1.7746	0.9297	0.0570
Percent Urban	-0.2563	0.3231	0.4280
Percent Illiterate	-0.2182	0.4465	0.6250
Ln(Real Income/Capita)	0.2733	0.0668	0.0000
Ln(Hospitals/100.000)	0.3529	0.0711	0.0000
1931	0.0124	0.0388	0.749
1932	0.0542	0.0419	0.196
1933	-0.0424	0.0421	0.314
1934	-0.0552	0.0400	0.168
1935	-0.0374	0.0397	0.347
1936	-0.0206	0.0408	0.614
1937	0.1066	0.0419	0.011
1938	0.1652	0.0414	0.000
1939	0.2148	0.0436	0.000
1940	0.3437	0.0451	0.000
1941	0.3577	0.0500	0.000
1942	0.3572	0.0572	0.000
1943	0.3423	0.0615	0.000
1944	0.5070	0.0637	0.000
1945	0.5818	0.0657	0.000
1946	0.6810	0.0661	0.000
1947	0.7642	0.0641	0.000
1948	0.9145	0.0652	0.000
1949	1.0638	0.0634	0.000
1950	1.4313	0.0682	0.000
Constant	-1.3838	0.4314	0.000

*n = 1008. $R^2 = 0.88$

Favorable regulatory-exempt status for Blue Cross and Blue Shield plans also plays a statistically significant role in determining the amount of health and accident insurance per capita sold within a state. States that had enacted a Blue Cross enabling law that exempted the plans from insurance regulatory requirements had roughly 4.89 percent more insurance sold per capita than states without such legislation. Similarly, states that had enacted special Blue Shield enabling legislation had 9.76 percent more insurance sold per capita than states without such legislation. Thus, exempting Blue Cross and Blue Shield plans from traditional regulatory reserve and capital requirements, and allowing them to operate as non-profits increased the amount of health insurance sold, potentially opening the health insurance market up to more people. Thus, while medical expenditures and advancing technology may have played a role in the early health insurance market, it is clear that inter-hospital competition and favorable tax status of Blue Cross and Blue Shield were important factors in the institutional development of health insurance in the United States.

Other effects are consistent with *a priori* hypotheses. The estimated coefficient on the natural logarithm of income per capita is positive and statistically significant, indicating that more insurance was purchased in states with higher real per capita incomes. Race has a negative and statistically significant impact on the quantity of accident and health insurance sold in a state, while neither the degree of urbanization nor the degree of illiteracy in a state have a significant impact on the amount of accident and health insurance sold within a state.

Estimated coefficients on the year dummies are reported in order to identify possible structural changes occurring between 1930 and 1950, with 1930 being omitted from the regressions. The magnitude of the estimated coefficients on each of the dummies is shown graphically in figure 2.3. By looking at the graph, it may be possible to shed light on whether or not various policy changes had an effect on the health insurance market.

In general, the magnitude of the estimated coefficient grows throughout the 1940s, even after controlling for changes in income, population density and characteristics, the number of hospitals, and hospital and medical enabling legislation. What this suggests is that the estimated coefficients on the year dummy variables are capturing an effect not explicitly included in the estimation. Most likely, this is the effect of an increase in medical technology coinciding with governmental policies that encouraged employment-based, group insurance. The advent of sulfa drugs in the 1930s and penicillin in the 1940s no doubt contributed to an increase in the awareness of medical technology among all Americans. This increased awareness may have led to an increase in the demand for health insurance. At the same time, workers found they could get less expensive insurance through their workplace, and insurance companies discovered that they could reduce their administrative costs and the risk of adverse selection by marketing employment-based, group insurance policies.

Figure 2.3: Estimated Coefficient on Year Dummies, 1930-1950

Figure 2.3 also illustrates that in 1933, the sign on the estimated coefficient of the year dummy is negative, although it is not statistically significant. The magnitude falls further in 1934, but then begins to rise in 1935 and 1936 before becoming positive (and statistically significant) in 1937. This further reinforces the hypothesis that the initial growth of the market may be attributed to the fact that hospitals used pre-payment plans such as Blue Cross as a means of smoothing their revenues and eliminating inter-hospital competition during the Great Depression.

The magnitude of the estimated coefficient continues to rise in the 1930s, and levels out in the early 1940s. Little initial effect is seen from the implementation of the 1942 Stabilization Act that enabled employers to offer fringe benefit packages to workers in lieu of wage increases during WWII: the estimated coefficient actually falls in 1943, suggesting that relative to 1950, less insurance was purchased in 1943 than in 1942. However, there is an increase from 1943-1944, which may in part be explained by the 1942 legislation. In addition, the 1943 tax court ruling that exempted certain employer contributions to the health insurance plans of their employees may have also contributed to the increase in the size of the estimated coefficient at this time.

2.6 Conclusions

Contrary to hypotheses that claim that the growth of health insurance in the United States was largely demand-based and highly influenced by government policy, this chapter presents results that suggest other forces had a major impact on the initial development of the market. Evidence indicates that the growth of pre-payment plans in

the 1930s occurred in part as hospitals attempted to eliminate inter-hospital competition and to smooth revenue uncertainty during the Great Depression. The role of hospitals is confirmed by the fact that the estimated coefficient on the number of hospitals per 100,000 population is statistically significant. Further, state-level governmental policies that limited regulation for Blue Cross and Blue Shield plans also played a significant role in determining the size of a health insurance market in a state: Results show that states in which legislatures had enacted special enabling laws for Blue Cross and Blue Shield had a statistically significantly greater amount of health insurance sold than in states that did not enact this enabling legislation.

While the results substantiate the importance of certain demand and supply factors in explaining the growth of health insurance over time, perhaps the most interesting part of the analysis is the untold story reflected in the estimated coefficients on the dummies controlling for individual year effects. Even after controlling for the other variables, the estimated coefficients on the dummies controlling for years are relatively large in magnitude and are for the most part statistically significant. These results indicate that a large part of the growth of health insurance from 1930-1950 is not being captured with the other independent variables, and suggest that other factors may have significantly influenced the health insurance market over the period.

The most plausible effect that the year dummies capture is that of the growth in medical technology and of the increasing awareness of medical technology among Americans. While this effect is not measurable, it no doubt contributed to an increase in

the demand for health insurance during the late 1930s and 1940s. In addition, the year dummies capture the effect of government policy interventions discussed earlier in the chapter: the 1942 War Labor Board ruling, the 1943 precursor to the tax subsidy, and the 1948 NLRB ruling. Surprisingly, the estimated coefficient on the year dummies falls between 1942 and 1943, suggesting the War Labor Board ruling had little initial effect on the market, although the effect over time may have been larger.

Considering both the measurable effects reflected in the supply and demand equations, as well as the effects captured in the individual year dummies, the growth of the health insurance market between 1930 and 1950 resulted from no single force, but rather the simultaneous occurrence of a number of factors. Starting from the pre-payment schemes fostered by the hospitals in the early 1930s, health insurance grew into its own as improvements in medical technology stimulated the demand for health insurance, and insurance companies began offering insurance to employee groups. Government policy in the 1940s and 1950s reinforced this trend, and cemented the employer-based system of private health insurance that the United States has today.

2.7 Endnotes

¹ Germany established the first nationalized system of health insurance in 1883, followed by Austria (1888), Hungary (1891), Norway (1909), Serbia (1910), Britain (1911), Russia (1912), and the Netherlands (1913). See Millis, p.50 or Starr, p. 237 for greater discussion.

² Certain exceptions do exist. For example, in 1798 Congress established the United States Marine Hospital to provide medical care for members of the U.S. Navy who supported the program with compulsory salary deductions (see Faulkner, p. 530). However, broad-based health insurance did not develop in the United States until the late 1930s.

³ 110 F. 2d 703. A similar case in Washington state, *Group Health Cooperation v. King County Medical Society* (237 P. 2d 737 (1951)) was similarly decided.

⁴ 317 U.S. 519 (1943).

⁵ Scofea, p. 6. See also *Inland Steel Co. v. NLRB* (170 F. 2d 247 (7th Cir. 1948). See also Eilers, p. 19.

⁶ Rev. Rul. 130, 1953 *Internal Revenue Bulletin*, no. 15, p. 6.

⁷ A potential criticism of these results lies in the fact that interpolated variables are used in the regression. As a check, I also estimate the equation using data only from the census years. Results are shown in Appendix A, Table A.3. While they are somewhat disappointing, they are not necessarily unexpected considering that a sample of only three years is unable to capture the full changes in legislation, hospitals, and state income that may have been crucial determinants of insurance purchase.

⁸ State-level fixed effects are reported in Appendix A, Table A.2.

3. Tax Policy, Group Insurance, and Health Insurance Demand: New Evidence on how the 1954 Tax Subsidy Encouraged Market Expansion

3.1 Introduction

People whose employers help pay for their health insurance premiums have enjoyed some form of limited tax subsidy on these contributions since 1943. In 1954, major changes in the Internal Revenue Code made this previously limited exemption broadly available and affirmed the system of employment-based health insurance in the United States. Today, the tax subsidy is one of the major features of the U.S. health insurance system. 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 1954 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 chapter, 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 effects on the market for health insurance. First, since it lowered the relative price of insurance, the tax subsidy contributed to 12.5 percent of the total explained change in the amount of coverage purchased between 1953 and 1958. Second, and perhaps more importantly, the tax subsidy also encouraged increased access to group health insurance. Given that people with access to group insurance are much more likely to buy health insurance, this effect also had a significant impact on the market. Analysis indicates that increased access to group insurance explains 13.7 percent of the explained change in coverage purchased between 1953 and 1958. These results are important, since they indicate that while the price effect of the tax subsidy mattered, the tax subsidy also had broader implications in that it may have stimulated institutional change in the health insurance market as it directed it towards an employment-based system.

3.2 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. As noted in chapter 2, most health insurance sold prior to 1930 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. The 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. By the 1930s, however, the cost of medical care was rising as medical technology advanced, and hospitals sponsored Blue Cross service benefit plans to smooth revenue and lure consumers during the Great Depression. Physicians followed with Blue Shield in the late 1930s and early 1940s.

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. In so doing, they could effectively reduce adverse selection and lower their 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 3.1 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, group policies offered by commercial insurance companies benefited from government tax policy in the 1940s.³ In 1943, an administrative tax ruling stated that employers' payments to commercial insurance companies for group medical and hospitalization premiums on behalf of their employees were not taxable as employee income.⁴ This tax policy further reinforced the efforts of business to attract workers during a period of scarce labor. Not only could companies compete for labor by offering workers fringe benefit packages, but now the contributions that employers made to some of these plans were not considered taxable by the Internal Revenue Service. However, while the ruling offered the first tax subsidy of employment-based health insurance, it 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.

Figure 3.1: Growth of Group v. Individual Insurance Policies

In addition to the limited applicability of the 1943 ruling, the effect of the ruling on health insurance demand may have been dampened by subsequent administrative rulings that made the Internal Revenue Service's position on employer contributions unclear. 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 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, the Internal Revenue Service's position 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. For the first time, the 1954 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. 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 associated with substantial announcement effects, since it provided a statutory basis for the tax treatment of employer contributions that were heretofore buried in administrative tax court cases.

3.3 The Debate on the Effects of the 1954 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).

3.4 The NORC Nationwide Family Expenditures Surveys

In 1953 and 1958, the National Opinion Research Center conducted the Nationwide Family Expenditures Surveys as part of its program to examine the kinds of medical expenses that Americans were incurring, and to investigate how these expenses were being paid. The NORC first canvassed 8,846 members of 2,809 families in July, 1953. Those 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. The data include information on medical expenditures, health insurance coverage, and socioeconomic and demographic characteristics of interviewed households. These data are rich in detail, and provide valuable information on medical expenditures and health insurance coverage at a time when health care markets were dramatically changing. Since the studies represent one of the first comprehensive studies of nationwide health insurance, they play an important role in understanding the development of the market, and may provide crucial insights into the institutional development of the U.S. health insurance market.⁸

Results from the original studies consisted of tables and tabulated data, and were published in 1958 and 1963. Since that time, the data have not been examined, as researchers have focused primarily on data from the 1960s or later. However, the time

period spanned by the two surveys provides an unparalleled opportunity to study the market for health insurance before the inception of key government policies that significantly impacted market development, including the 1954 tax subsidy.

3.5 Using the NORC Data to Estimate the Effect of the 1954 Tax Subsidy

Determining the effect of the tax subsidy on the market for health insurance first involves estimating the demand for insurance in 1953 and 1958. After the demand equations in each year have been estimated, a decomposition can be performed to determine how much of the change in quantity demanded between the years is due to a change in price, and how much is attributable to changes in other variables, including access to group insurance (see Oaxaca and Ransom, 1994). Using this method, the effect of the tax subsidy in 1954 on the amount of health insurance coverage purchased, as well as the extent to which increased access to group insurance influenced insurance purchase over the period 1953-1958 can be determined.

3.5.1 Estimating the Demand for Health Insurance Coverage

The demand for insurance 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. 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. Group insurance plans are less expensive than individual plans because they have a lower load than individual plans, and also have lower access costs because they are much easier for consumers to obtain. 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, the lower load on group insurance reflects the fact that insurance companies face a lower risk of adverse selection when they insure young, relatively healthy employee groups.

Even after controlling for the lower explicit cost of 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 that 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.

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 that 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 that 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 that 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 that 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:

$$\begin{aligned} [3.5.1] \quad E[u_i(c, h)] &= (1 - \pi) \cdot c_i + \pi \cdot (c_i - S + \alpha_i \ln(1 + h_i)), \\ \text{s.t.} \quad c_i + p_i h + F &\leq m_i. \end{aligned}$$

Note that in this framework, 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:

$$[3.5.2] \quad h_i^* = \frac{\alpha_i \pi}{p_i} - 1$$

Substituting for p_i gives:

$$[3.5.3] \quad h_i^* = \frac{\alpha_i}{(1 + \lambda_i)} - 1,$$

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

$$[3.5.4] \quad h_i = \frac{\alpha_i}{(1 + \lambda_i)} - 1 \quad \text{if } \alpha_i > (1 + \lambda_i), \text{ and}$$

$$[3.5.5] \quad h_i = 0 \quad \text{otherwise.}$$

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 .

Since not every household in the sample purchases health insurance coverage, the sample is censored, and is estimated using Tobit. Thus, the amount of health insurance coverage a household buys, h_i^* , is observed to be equal to:

$$[3.5.6] \quad h_i = 0 \quad \text{if } h_i^* \leq 0.$$

$$[3.5.7] \quad h_i = h_i^* \quad \text{if } h_i^* > 0.$$

If the data are censored, the expected value of health insurance coverage, conditional on the price per dollar of coverage, access to group insurance, and individual characteristics is equal to the probability that a household buys coverage, multiplied by the expected value of coverage, given that the household purchased coverage. The expected value of health insurance coverage can be written as:

$$[3.5.8] \quad E(h_i | x_i) = \Phi\left(\frac{\beta' x_i}{\sigma}\right) \left(\beta' x_i + \sigma \phi\left(\frac{\beta' x_i}{\sigma}\right) / \Phi\left(\frac{\beta' x_i}{\sigma}\right) \right),$$

where Φ is the cumulative distribution function for the standard normal distribution, and ϕ is the probability density function.

In this case, the probability that a person buys health insurance is equal to the probability that $h_i > 0$. Since $h_i > 0 \Leftrightarrow \alpha_i > (1 + \lambda_i) \Leftrightarrow \ln\left(\frac{\alpha_i}{(1 + \lambda_i)}\right) > 0$, it follows that

$$[3.5.9] \quad P(h_i > 0 | z_i, \lambda_i) = P([z_i\gamma + u_i - \ln(1 + \lambda_i)] > 0 | z_i, \lambda_i)$$

$$[3.5.10] \quad = P\left(\frac{u_i}{\sigma} > \frac{[\ln(1 + \lambda_i) - z_i\gamma]}{\sigma}\right)$$

$$[3.5.11] \quad = 1 - \Phi\left(\frac{[\ln(1 + \lambda_i) - z_i\gamma]}{\sigma}\right)$$

$$[3.5.12] \quad = \Phi\left(-\frac{[\ln(1 + \lambda_i) - z_i\gamma]}{\sigma}\right)$$

$$[3.5.13] \quad = \Phi(x_i\beta).$$

The demand for health insurance coverage is estimated by maximum likelihood on the following Tobit log-likelihood function:

$$[3.5.14] \quad \ln L = \sum_{h_i > 0} -\frac{1}{2} \left[\ln(2\pi) + \ln \sigma^2 + \frac{(h_i - \beta' x_i)^2}{\sigma^2} \right] + \sum_{h_i = 0} \ln \left[1 - \Phi\left(\frac{\beta' x_i}{\sigma}\right) \right], \text{ where}$$

$h_i > 0$ if the individual has insurance coverage and is equal to 0 otherwise

x = vector of load, access to group, other socioeconomic and demographic characteristics

Φ = standard normal cumulative distribution function.

Socioeconomic and demographic characteristics that contribute to an individual's decision to insure include marital status, family size, age, income, level of education, region, race, occupation, and whether or not the individual belongs to a union or lodge.

In order to capture both the load and the access costs associated with purchasing health insurance, it is necessary to include an estimate of the load in the estimation, as well as a variable that captures access to group insurance. To control for access to group insurance, I include a dummy variable equal to one if the individual had the opportunity to purchase group insurance. Traditionally, the load has been proxied with a measure of

work-group size (see Phelps, 1973), or by using the employee's marginal tax rate (see Holmer, 1984; Taylor and Wilensky, 1983). However, for the purposes of this study, neither of these measures is satisfying. Using work-group size relies upon a conversion factor to change a measure of establishment size into the price elasticity of demand.⁹ Similarly, using marginal tax rates as a proxy for the price of insurance is not optimal because it excludes people who did not receive employer contributions from the sample.

To attempt to proxy the load, I calculate it as the price of one dollar of coverage, which is equal to the ratio of premiums to coverage.¹⁰ Using premium alone is not sufficient because it is a measure of expenditure on health insurance, and not the load. Constructing the ratio of premiums to coverage as an estimate of the load is complicated for two reasons. First, total premiums are observed only if a consumer actually purchases insurance, so the loading factor on insurance that non-purchasers faced in the market is not observed. Following Marquis and Long (1995), I proxy the unobserved premiums of non-purchasers with rates from archival premium schedules issued by Mutual of Omaha and Blue Cross in 1953 and 1958. In this manner, I can attempt to gauge the premium that consumers who did not actually purchase insurance would have faced in the market.

The second complication arising when estimating the loading factor results from trying to measure the coverage of a policy given the considerable heterogeneity among policies. For example, some people in the NORC sample had both hospitalization and surgical expense coverage, while others had only hospital coverage. In the 1950s, people who wanted to purchase insurance often faced a menu of choices. While the exact levels

of coverage available under various plans differed. consumers interested in hospital coverage generally selected a per diem hospital benefit ranging from \$3 to \$22, and 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. To obtain a realistic estimate of the loading charge that people paid for their insurance coverage, it is first necessary to calculate the expected value of a policy's coverage (in dollar terms), so that policies with different benefits can be easily compared.

As noted previously, 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. Thus, information on the expected value of the coverage of a particular policy is embedded in the premium schedules of insurance companies. To determine the expected value of a given level of coverage, insurance companies assign weights to hospital and surgical benefits based on a consumer's age and gender. By estimating these weights in a separate regression, and then applying them to the benefits as stated in the NORC data, it is possible to estimate the expected value of coverage associated with a given policy in the NORC sample.

In order to calculate these weights, I use archival rate data from Mutual of Omaha that provide information on the premiums charged for various levels of hospital benefits.

given an insured's age and gender. A separate surgical rider gives the additional premium associated with various levels of surgical coverage, again dependent on age and gender. The weights insurance companies assigned to hospital and surgical coverage when determining premiums are the estimated coefficients in separate regressions of the log of premiums on the log of hospital benefits, and on the log of surgical benefits, as shown in equations [3.5.15-3.5.16].

$$[3.5.15] \quad \ln(\text{premium}) = \hat{\alpha}_1 + \hat{\beta}_1 \ln(\text{hospital})$$

$$[3.5.16] \quad \ln(\text{premium}) = \hat{\alpha}_2 + \hat{\beta}_2 \ln(\text{surgical})$$

To compute the expected value of the coverage of a given insurance policy, I multiply these weights by the log of benefits, and sum over all types of coverage, as shown below:

$$[3.5.17] \quad E(\ln(\text{coverage})) = \hat{\alpha} + \hat{\beta}_1 \ln(\text{hospital}) + \hat{\beta}_2 \ln(\text{surgical}),$$

where $\hat{\alpha} = \hat{\alpha}_1 + \hat{\alpha}_2$.

After computing the expected value of the coverage associated with each policy in the NORC sample, I calculate a proxy for load by taking the ratio of annual premiums paid by the consumer to this measure of the expected value of coverage. In essence, the ratio represents an index of how much the consumer paid for his level of coverage relative to the industry standard, thus providing information about the size of the loading fee associated with the policy.

After 1954, the changes in the Internal Revenue Code stipulated that employer contributions to the health insurance premiums of employees were excludable from

employee taxable income. For those individuals in the 1958 sample without employer contributions, then, the loading factor on a policy is calculated as described above. However, for those people whose employers did contribute to their health insurance premiums, the calculated load of insurance in 1958 must now take into account the tax subsidy. Assuming a full compensating differential, the employee pays for the entire premium through lower wages regardless of the amount of employer contribution.¹¹ In this case, the employee pays the entire premium, but 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

$$[3.5.18] \quad \text{Premium} = (1 - t)E + e$$

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.

One problem with the NORC data is that if the employer only paid part of the employee’s premium, the exact contribution of the employer is not known. However, in several cases, the interviewer noted in the margin of the questionnaire that the employer paid 50 percent. Thus, the partial premium reported is assumed to be fully 50 percent of the total premium, and the employer’s contribution is assumed to match. The total premium paid by the employee is then calculated as in [3.5.18].

If the employer paid the entire premium, however, then the employee paid nothing explicitly. In these cases, there is not enough information to calculate the load for each

observation as described above. Instead, I take the mean premium for those people with group insurance in the sample, and assign it to these observations. Then, the estimated premium is multiplied by $(1 - t)$ to determine the actual premium faced by the employee after the tax subsidy is taken into account.

When estimating the demand for coverage, three variables can be considered to be endogenous: coverage, load, and group. More comprehensive policies may have higher loads, and the load may rise as policies become more comprehensive. In addition, more comprehensive policies may have initially been offered only to members of groups. To the extent that people may simultaneously choose to gain access to group insurance so they can obtain certain levels of coverage, access to group insurance is an endogenous variable as well. As a result, simultaneity bias must be considered when estimating the likelihood that an individual has insurance coverage. In order to solve the problem of simultaneity bias, I perform a limited information, two stage procedure. First, I separately estimate equations for the endogenous variables *load* and access to group (*group*) as functions of the exogenous variables in the system (*marital status*, *family size*, (*family size*)², *age*, *age*², union and lodge membership, employment status, occupation, industry, and regional dummy variables). *Load* is estimated using an OLS regression, while the limited dependent variable *group* is estimated in a probit framework. I then use the estimated values from these regressions, *loadhat* and *grouphat*, as instruments in the actual Tobit equation in which I estimate the demand for health insurance coverage¹².

3.5.2 Results of Estimations

After eliminating observations with missing values for variables in the regression, the estimated sample in 1953 has 1166 observations, while 1132 observations are used in estimating the 1958 equation.¹³ The descriptive statistics of the data are listed in Table 3.1. The percentage of people in the sample purchasing insurance increased from 30 percent in 1953 to 40.4 percent in 1958, an increase of 34.7 percent. Over the same period, access to group insurance increased from 27.7 to 39.4 percent, an increase of 42.2 percent. Before estimating the demand for health insurance using Tobit, I use probit to estimate the probability that an individual purchases insurance coverage. 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. Following the two-stage procedure described earlier, I run the probit first to establish a baseline for later comparison with the Tobit results. The results from the probit estimation should reinforce those of the Tobit; if the two estimations are very different, it may be indicative of a problem with the way I calculated insurance coverage. Results from the second-stage of the probit estimation are reported in Table 3.2.

In both 1953 and 1958, the estimated coefficients on *grouphat* and *loadhat* are statistically significant. However, the size of the marginal effect on *loadhat* in 1953 is much greater than in 1958. Calculated at the variable means, increasing the mean load by 10 percent (\$0.107) in 1953 generates a 9.28 percent decrease in the predicted probability of insurance coverage, from 26.75 percent to 17.46 percent.

Table 3.1: Summary Statistics. 1953 and 1958*

Variable	Mean, 1953	Std. Dev., 1953	Mean, 1958	Std. Dev., 1958
Marital Status	0.7221	0.4481	0.7633	0.4253
Family Size	2.9914	1.7023	3.1979	1.9187
(Family Size) ²	11.8439	14.689	13.9046	18.7468
Age	50.9657	15.858	49.4161	16.6062
(Age) ²	2848.762	1664.37	2717.471	1711.101
Ln(Income)	7.8454	0.8891	8.0236	0.9538
Education	0.2787	0.4486	0.2456	0.4306
Race	0.1346	0.3415	0.1087	0.3113
Gender	0.2221	0.4159	0.1661	0.3723
Lodge	0.169	0.3749	0.2235	0.4168
Union	0.2624	0.4401	0.2067	0.4051
Employed	0.7444	0.4364	0.7323	0.4429
Load	1.077	0.3354	1.1413	0.3758
Group	0.277	0.4477	0.394	0.4888
Insured	0.3002	0.4585	0.4037	0.4909
Premium	3.4011	2.6154	5.6216	4.6979
Ln(Coverage)	1.2617	1.9576	1.8603	2.2878
Occupation Dummies				
Professional	0.1698	0.3756	0.0901	0.2865
Farmer	0.1475	0.3548	0.1201	0.3253
Clerk	0.0455	0.2084	0.0495	0.2169
Sales	0.0352	0.1843	0.0406	0.1975
Crafts	0.1449	0.3522	0.1846	0.3882
Service	0.0875	0.2827	0.0786	0.2693
Laborer	0.0686	0.2529	0.0813	0.2734
Industry Dummies				
Trade	0.1372	0.3442	0.1219	0.3273
Manufacturing	0.1775	0.3823	0.2341	0.4236
Finance	0.018	0.133	0.0283	0.1658
Service Industry	0.1141	0.318	0.1537	0.3608
Transportation	0.0566	0.2312	0.0548	0.2276
Agriculture	0.1724	0.3779	0.1546	0.3617
Regional Dummies				
NE	0.1938	0.3955	0.1784	0.3831
NC	0.2702	0.4442	0.2323	0.4225
SE	0.1818	0.3859	0.1882	0.391
SC	0.2161	0.4118	0.2385	0.4264
PAC	0.0918	0.2888	0.121	0.3263

*n = 1166 in 1953, n = 1132 in 1958.

Table 3.2: Probit Estimation of Health Insurance Purchase. 1953 and 1958*

Dependent Variable: Health Insurance Purchase (0, 1)

Variable	Coefficient, 1953	Std. Error	P-Value	Coefficient, 1958	Std. Error	P-Value
Constant	0.26531	1.777	0.88132	-0.51528	1.2595	0.68245
Marital Status	5.87E-02	0.12933	0.64989	0.45343	0.15987	0.00456
Family Size	-0.1055	0.15078	0.48413	-2.03E-02	0.10247	0.84288
(Family Size) ²	-9.45E-05	1.50E-02	0.99496	-7.37E-03	9.65E-03	0.44485
Age	4.46E-02	1.91E-02	0.01933	2.53E-02	2.05E-02	0.21738
(Age) ²	-5.16E-04	1.91E-04	0.00674	-3.57E-04	1.97E-04	0.06939
Ln(Income)	0.23754	6.91E-02	0.00058	0.10701	5.70E-02	0.06052
Education	0.10362	0.1084	0.33909	0.21467	0.10104	0.03363
Race	-8.91E-02	0.13703	0.51575	-0.58482	0.16391	0.00036
Trade	0.30991	0.13386	0.02061	0.26414	0.15036	0.07897
Manufacturing	0.65062	0.15703	0.00003	0.64073	0.13696	0
Finance	-1.81E-02	0.32463	0.95549	0.44991	0.25821	0.08144
Service Industry	-8.77E-02	0.15467	0.57053	0.22608	0.14039	0.10732
Transportation	0.38978	0.18453	0.03466	0.72894	0.21091	0.00055
Agriculture	-0.26833	0.15134	0.07623	8.88E-02	0.1522	0.55967
GroupHat	0.43088	0.16059	0.00729	0.69652	0.12779	0
LoadHat	-3.157	1.1603	0.00651	-1.3378	0.64319	0.03753
NE	-0.2836	0.23788	0.23319	-0.3462	0.23631	0.14291
NC	2.66E-04	0.22294	0.99905	-0.12585	0.23549	0.59304
SE	-0.11115	0.25664	0.66493	6.16E-02	0.24948	0.80511
SC	0.16818	0.22447	0.45373	-1.10E-02	0.24483	0.9643
PAC	-0.53479	0.25831	0.03842	-0.30654	0.2547	0.22876

*Mean of dependent variable in 1953 is equal to 0.300; in 1958, mean equals 0.404.
LRI = 0.1735 in 1953; LRI = 0.2438 in 1958.

Looking at table 3.2, a 10 percent increase in the mean load in 1958 (\$0.114) decreases the predicted probability of insurance coverage by 5.6 percent, from 37.55 percent to 31.92 percent. It is probably the case that the demand for health insurance is much more elastic in 1953 than in 1958. There is some evidence to support the idea that people may more strongly felt a need for health insurance in 1958 than in 1953. The ratio of personal consumption expenditures for medical care to disposable personal income increased from only 4.0 percent in 1948 to 4.4 percent in 1953, compared to 5.2 percent in 1958. The cost of medical care increased more rapidly than the cost of other consumer goods from 1949 to 1960. Medical care prices increased by 56 percent during the period, followed by transportation (46 percent), personal care (33 percent), and housing (32 percent) (Source Book of Health Insurance Data, 1961, pp. 52-54). It may also be the case that since fewer people had access to group coverage in 1953 than in 1958, they responded more strongly to changes in price.

In addition to the effect of the tax subsidy on lowering the load on insurance, the tax subsidy also may have increased the number of people with access to group insurance, especially among union members. Even controlling for the lower actuarial load associated with group insurance coverage, table 3.2 shows that the estimated coefficient on *group_{hat}* is statistically significant in both 1953 and 1958, suggesting that access to group insurance is a statistically important factor in determining whether or not an individual purchases insurance coverage. Besides having a lower actuarial load, group insurance has lower access costs and can be obtained even when individual coverage may

be unavailable. If the tax subsidy encouraged access to group insurance, then it not only affects the load on insurance, but it also increases the number of people with insurance by making group insurance (with its lower access costs) available to more people who may not have purchased individual coverage. If this is the case, then the effect of the tax subsidy on the market for health insurance is greater than its observed price effect.

While the probit results lend support to the idea that both load and access to group insurance play a statistically significant role in determining whether or not an individual purchases insurance, they do not really allow a direct examination of how changes in load and access to group insurance affected the *amount* of health insurance coverage people purchased. As a result, probit cannot thoroughly answer the question of how the tax subsidy actually affected insurance coverage. To accomplish this, I use Tobit estimation of the demand for health insurance coverage. In the first stage of estimation, the results of the OLS estimation of the load equation are reported in Appendix B, Tables B.1 and B.2. Results of the probit estimations predicting the probability that an individual has access to group coverage yield some interesting findings and are reported in table 3.3. In both 1953 and 1958, the estimated coefficient on the dummy variable controlling for employment (*employed*) is statistically significant, as are the estimated coefficients on the log of income, and the dummy variables controlling for employment in a manufacturing or clerical industry, and race.

Table 3.3: First-Stage Access to Group Probit Estimation, 1953 and 1958

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

Variable	Coefficient, Std. Error	P-Value	Coefficient, Std. Error	P-Value
	1953		1958	
Constant	-4.0571 0.72494	0	-3.2896 0.68121	0
Marital Status	0.14333 0.15431	0.35298	9.91E-03 0.18586	0.95748
Family Size	7.67E-02 0.11207	0.49349	0.11968 8.79E-02	0.17355
(Family Size) ²	-1.74E-02 1.31E-02	0.18658	-1.16E-02 8.25E-03	0.16141
Age	5.59E-03 1.98E-02	0.77732	2.70E-02 1.88E-02	0.15143
(Age) ²	-7.67E-05 1.97E-04	0.69705	-3.93E-04 1.95E-04	0.04413
Ln(Income)	0.36444 7.39E-02	0	0.25711 6.14E-02	0.00003
Education	-2.41E-02 0.11049	0.82728	5.92E-02 0.1114	0.59505
Race	-0.38798 0.14958	0.00949	-0.56225 0.16501	0.00066
Gender	-6.06E-02 0.15603	0.69786	-0.14742 0.20458	0.47114
Lodge	-6.36E-02 0.13948	0.64852	-2.51E-02 0.10843	0.8171
Union	8.32E-02 0.1195	0.48612	0.59186 0.12324	0
Employed	0.53825 0.16282	0.00095	0.66014 0.13923	0
Professional	0.23642 0.15637	0.13055	0.53727 0.17856	0.00262
Farmer	-0.41278 0.33368	0.21606	0.17655 0.32295	0.58459
Clerk	0.39564 0.2092	0.0586	0.81114 0.22203	0.00026
Sales	0.16258 0.23838	0.49523	0.68776 0.24521	0.00504
Crafts	-0.13369 0.13557	0.32407	7.51E-02 0.12951	0.56199
Service	7.60E-02 0.17937	0.67178	0.37031 0.18804	0.04892
Laborer	-5.41E-02 0.20599	0.79289	-0.19693 0.20961	0.34747
Trade	-0.13718 0.15782	0.38471	-0.38272 0.16817	0.02285
Manufacturing	0.67599 0.13274	0	0.7633 0.13475	0
Finance	-0.55753 0.35134	0.11254	-0.25294 0.28371	0.37264
Service Industry	-0.15966 0.16655	0.33776	-0.19459 0.16001	0.22395
Transportation	2.16E-02 0.19188	0.91024	0.52755 0.21865	0.01583
Agriculture	-0.26361 0.31199	0.39815	-0.14898 0.29596	0.6147
NE	-0.10974 0.21445	0.60883	-0.33951 0.24226	0.16109
NC	8.22E-04 0.20774	0.99684	-0.48229 0.2373	0.04211
SE	7.07E-02 0.21665	0.74434	-0.41189 0.24317	0.0903
SC	-0.11546 0.21536	0.59188	-0.58763 0.24059	0.01459
PAC	-0.61721 0.24952	0.01338	-0.62598 0.25305	0.01337

*Mean of dependent variable in 1953=0.277; mean in 1958=0.394.

LRI = 0.1883 in 1953; LRI = 0.3082 in 1958.

The estimated coefficient on the variable controlling for union membership as shown in table 3.3 is statistically insignificant in 1953, but it is statistically significant in 1958. This is a potentially important result because until the 1954 IRC was implemented, employer contributions to union sponsored (or other non-group or privately sponsored) insurance plans were not eligible for the tax subsidy. It may have been the case that more unions began offering group insurance after the tax subsidy was passed. Thus, one reason for the disparity in access to group insurance among union members between 1953 and 1958 may be the effect of the change in the tax code in 1954. Table 3.4 lists the results of probit estimations using the pooled sample for 1953 and 1958.

To test whether or not there is a statistically significant difference between access to group for union members in 1953 and 1958, I include the interactive dummy variables *union*year* and *employed*year*, where *year* is equal to one in 1958 and zero otherwise. As reported in table 3.4, the estimated coefficients on both of these variables are statistically significant, suggesting that a union member in 1958 was more likely to have access to group insurance than a union member in 1953, as was an employed person. These results support the argument that the implementation of the tax subsidy increased access to group insurance and may have generated institutional change in the health insurance market.

Table 3.4: First-Stage Access to Group Probit Estimation. Pooled Sample

Dependent Variable: Access to Group Insurance

Variable	Coefficient	Std. Error	P-Value
Constant	-3.4817	0.48763	0
Marital Status	9.99E-02	0.11554	0.38708
Family Size	6.16E-02	6.49E-02	0.34303
(Family Size) ²	-9.40E-03	6.67E-03	0.15879
Age	1.38E-02	1.33E-02	0.29945
(Age) ²	-2.12E-04	1.35E-04	0.11655
Ln(Income)	0.29829	4.62E-02	0
Education	7.66E-03	7.53E-02	0.91889
Race	-0.46191	0.10942	0.00002
Gender	-8.81E-02	0.12138	0.46795
Lodge	-4.12E-02	8.43E-02	0.62449
Union	8.74E-02	0.10478	0.40418
Employed	0.41316	0.14085	0.00335
Professional	0.38877	0.1151	0.00073
Farmer	-0.149	0.22772	0.51291
Clerk	0.58508	0.14926	0.00009
Sales	0.40725	0.16752	0.01505
Crafts	-2.32E-02	9.22E-02	0.80154
Service	0.20435	0.12883	0.11268
Labor	-0.1148	0.1447	0.42758
Trade	-0.24027	0.11364	0.03448
Manufacturing	0.73398	9.26E-02	0
Finance	-0.29792	0.21244	0.16081
Service Industry	-0.17886	0.11279	0.11278
Transportation	0.2555	0.14018	0.06836
Agriculture	-0.17741	0.21036	0.39901
NE	-0.17929	0.1563	0.25134
NC	-0.18741	0.15207	0.21781
SE	-0.10739	0.15692	0.49377
SC	-0.28486	0.15579	0.06747
PAC	-0.5599	0.17059	0.00103
Union*Year	0.52989	0.15174	0.00048
Employed*Year	0.35275	0.17112	0.03927
Year	-9.00E-02	0.15638	0.565

n = 2298. Mean of dependent variable = 0.3346.

LRI = 0.2466.

The predicted values of load and access to group derived in the first stage of estimation (*loadhat* and *grouphat*) are next used as regressors in the tobit estimation of health insurance coverage. Results from this estimation are reported in table 3.5, which reports the marginal effects for the latent variable, and in table 3.6, in which I report the results of a McDonald-Moffitt (1980) decomposition on the estimated coefficients. The McDonald-Moffitt technique decomposes the total change in the dependent variable into two parts: the change in the dependent variable for non-limit observations, weighted by the probability of being above the limit, and the change in the probability of being a non-limit observation, weighted by the expected value of the dependent variable, given the fact that it is a non-limit observation.

As seen in table 3.5, the estimated coefficients on *loadhat* are negative and statistically significant in both 1953 and 1958, indicating that the amount of coverage a consumer purchased rose as the load on the policy decreased. The size of the estimated coefficient in 1953 is much greater (as it was in the probit model) than in 1958, and than any other coefficients. While I would expect the elasticity of demand for health insurance coverage to be more elastic in 1953 than in 1958, I do not have a good explanation as to why the estimated coefficient should be so large. Part of the reason for the difference in the coefficients is that the probability that a person purchased health insurance in 1953 is much more sensitive to changes in the load than the probability that a person purchased health insurance in 1958.

Table 3.5: Results of Tobit Estimation, 1953 and 1958*

Dependent Variable: Ln(Coverage)

Variable	Coefficient , 1953	Std. Error	P-Value	Coefficient, 1958	Std. Error	P-Value
Constant	-0.3615	6.9524	0.95853	-3.058	4.1595	0.46222
Marital Status	0.33821	0.51768	0.51354	1.6941	0.53242	0.00146
Family Size	-0.16236	0.59339	0.78438	0.20469	0.33501	0.54121
(Family Size) ²	-1.95E-02	5.93E-02	0.74218	-4.53E-02	3.14E-02	0.14964
Age	0.17538	7.63E-02	0.02149	0.12298	6.71E-02	0.06674
(Age) ²	-2.02E-03	7.65E-04	0.00815	-1.56E-03	6.49E-04	0.01619
Ln(Income)	1.0317	0.28301	0.00027	0.35834	0.18928	0.05833
Education	0.37879	0.42203	0.36943	0.73038	0.32013	0.02252
Race	-0.376	0.56046	0.50229	-2.2802	0.5588	0.00004
Trade	1.2741	0.53954	0.0182	1.0232	0.50619	0.04323
Manufacturing	2.4183	0.62068	0.0001	1.961	0.43958	0.00001
Finance	-9.94E-02	1.3247	0.9402	1.6365	0.83726	0.05064
Service	-0.53321	0.63345	0.39992	0.75588	0.47067	0.10828
Transportation	1.5003	0.73308	0.0407	2.1942	0.64424	0.00066
Agriculture	-1.3871	0.62157	0.02564	8.79E-02	0.51932	0.86561
GroupHat	1.4015	0.62285	0.02444	2.4396	0.4258	0
LoadHat	-12.098	4.487	0.00701	-4.1998	2.1225	0.04784
NE	0.1938	0.3955	0.22073	-1.2048	0.70726	0.08849
NC	0.2702	0.4442	0.98953	-0.35857	0.7106	0.61384
SE	0.1818	0.3859	0.66966	3.98E-02	0.75954	0.95821
SC	0.2161	0.4118	0.54843	-0.14812	0.74094	0.84155
PAC	0.0918	0.2888	0.02839	-0.94713	0.77871	0.22388
σ	4.4491	0.20058	0.00000	3.8198	0.14646	0

*Mean of Dependent Variable in 1953 is 1.26; mean in 1958 is 1.86.

Table 3.6: McDonald-Moffitt Decomposition of Coefficients, 1953 and 1958

Variable	Marginal Effect on Coverage for Purchasers, 1953*	Marginal Effect on Probability of Purchasing, 1953**	Marginal Effect on Coverage for Purchasers, 1958*	Marginal Effect on Probability of Purchasing, 1958**
Constant	-0.02881	-0.07994	-0.44852	-0.9008
Marital Status	0.026958	0.074794	0.248477	0.499032
Family Size	-0.01294	-0.03591	0.030022	0.060296
(Family Size) ²	-0.00156	-0.00432	-0.00665	-0.01335
Age	0.013979	0.038785	0.018038	0.036226
(Age) ²	-0.00016	-0.00045	-0.00023	-0.00046
Ln(Income)	0.082233	0.228156	0.052558	0.105556
Education	0.030192	0.083768	0.107126	0.215148
Race	-0.02997	-0.08315	-0.33444	-0.67168
Trade	0.101554	0.281762	0.150075	0.301405
Manufacturing	0.192755	0.534798	0.287624	0.577653
Finance	-0.00792	-0.02198	0.240029	0.482065
Service	-0.0425	-0.11792	0.110867	0.22266
Transportation	0.119584	0.331785	0.321828	0.646347
Agriculture	-0.11056	-0.30675	0.012891	0.02589
GroupHat	0.111709	0.309936	0.357821	0.718634
LoadHat	-0.96429	-2.67543	-0.61599	-1.23714
NE	-0.09284	-0.25759	-0.17671	-0.3549
NC	0.000933	0.002588	-0.05259	-0.10562
SE	-0.03471	-0.09629	0.005838	0.011725
SC	0.043058	0.119463	-0.02173	-0.04363
PAC	-0.18278	-0.50713	-0.13892	-0.279

*Coefficient is equal to the change in the expected value of coverage for non-limit observations (i.e. $h_i > 0$), weighted by the probability that an observation is non-limit. In 1953, the probability that an observation is non-limit (calculated at the variable means) is equal to 0.30058. In 1958, the probability is equal to 0.4419.

**Coefficient is equal to the change in the probability that an observation is non-limit, weighted by the expected value of coverage for non-limit observations. In 1953, the expected value of Ln(Coverage) for non-limit observations is equal to 4.2032. In 1958, it is equal to 4.6081.

Looking at table 3.6, a one dollar increase in the 1953 load (an increase of 93.46 percent) generates a \$3.21 decrease in the amount of $\ln(\text{coverage})$ purchased for purchasers of health insurance. In 1958, the same one dollar increase in the load (an increase of 87.7 percent) generates a \$1.39 decrease in the amount of $\ln(\text{coverage})$ purchased. In contrast, the one dollar increase in the load generates a 63.6 percent decrease in the probability of health insurance purchase in 1953, and only a 26.8 percent decrease in the probability of health insurance purchase in 1958.

The estimated coefficient on *group_{hat}* is also statistically significant in both years, suggesting that as access to group insurance increased, the amount of coverage purchased also increased. This is consistent with the fact that transactions costs played an important role in determining whether or not an individual purchased insurance in the 1950s. People without access to group insurance were not only statistically significantly less likely to buy health insurance coverage (as reported in table 3.2), but they also tended to buy less insurance. Again, this also reflects the fact that in the 1950s, high-premium, extremely comprehensive policies were only offered to members of large groups. In 1953, a one percent increase in the number of people with access to group insurance would lead to \$0.37 increase in the amount of $\ln(\text{coverage})$ purchased in 1953, and a 7.4 percent increase in the probability that a person purchased health insurance coverage. In 1958, the same one percent increase generates a \$0.81 increase in the amount of $\ln(\text{coverage})$ purchased in 1958, and an increase in the probability that a person purchased coverage of 15.6 percent.

While estimating the demand for health insurance coverage in both 1953 and 1958 gives an idea of the relative sizes of factors that influenced health insurance purchase in each year, it does not answer the question of how much of the increase in health insurance coverage between 1953 and 1958 can be attributed to the implementation of the tax subsidy in 1954. To isolate this effect, I rely on a decomposition technique (Oaxaca and Ransom, 1994). Using this technique, it is possible to determine how much of the explained change in the amount of health insurance coverage purchased between 1953 and 1958 is due to a change in the price of one dollar of coverage caused by the tax subsidy, and how much is due to changes in access to group insurance.

Calculated at the variable means, the predicted amount of the log of coverage purchased by an individual was equal to 0.85. By 1958, this had increased to 1.26. Of this total increase, the decomposition explains 64.2 percent. One method of calculating how much of this explained change can be attributed to the 1954 tax subsidy is to estimate how the amount of health insurance coverage purchased in 1953 would change if people in 1953 faced 1958 prices for health insurance coverage, both with and without the tax subsidy in place. To estimate the effect of the tax subsidy in this way, I replace the 1953 price structure ($\bar{P}_{53}$) with that of 1958 ($\bar{P}_{58}$), and estimate the change in the predicted amount of health insurance coverage if the tax subsidy were in effect and if it were not.

If the effect of the tax-subsidy is assumed to be zero, so that the estimated load in 1958 is not adjusted for taxes, then substituting the 1958 price structure ($\bar{P}_{58} = 1.17$) for that of 1953 causes the predicted amount of health insurance coverage purchased in 1953

to decline from 0.85 to 0.56. When the tax changes are taken into account, so that the price of insurance reflects the tax subsidy that existed in 1958 ($\bar{P}_{58} = 1.14$), the predicted amount of health insurance coverage falls to only 0.64. Thus, the price effect of tax subsidy itself seems to account for about eight percentage points of the 64.2 percent total explained change, or about 12.5 percent. However, it is important to note that this method may understate the actual effect of the tax subsidy on price over time since it does not take into account the fact that some people actually enjoyed a tax subsidy prior to 1954 under the original 1943 ruling. Thus, while the effect of the tax subsidy from 1953-1958 may seem small, the effect over time (1943-1958) may be larger.

In addition to its effect on the direct price of insurance, the tax subsidy also promoted a switch 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 lowering the administrative costs of insurance companies. This reduction in adverse selection and administrative costs is in turn reflected in the lower load of group insurance relative to individual insurance coverage. Thus, if people purchasing individual insurance in 1953 gained access to group insurance in 1958, part of the price effect of the tax subsidy is reflected in the fact that they paid a premium in 1958 that was roughly 30 percent less than their former premium, not including the tax break they may have received on their employer's contribution. In addition, since purchasing group insurance is associated with much lower transactions costs than obtaining individual coverage, the tax subsidy further reduced the price of insurance for anyone

who gained access to group insurance after 1954. The true price effect of the tax subsidy, then, must include the fact that consumers who gained access to group insurance after the tax subsidy enjoyed a lower price (both with lower premiums and with lower transactions costs) than they did previously.

How did the change in access to group insurance increase the likelihood that a person purchased health insurance from 1953 to 1958? Performing a similar decomposition on the dummy variable controlling for access to group insurance shows that if as many people had access to group insurance in 1953 as they did in 1958, the predicted amount of health insurance coverage purchased in 1953 would have increased from 0.85 to 0.937, an increase of 8.7 percentage points, or 13.6 percent of the 64.2 percent explained change.¹⁴ The effect of access to group coverage is even stronger if the decomposition is performed in the other direction. If the percentage of people with access to group insurance in 1958 fell to the 1953 level, the amount of the natural logarithm of health insurance coverage purchased decreases from 1.26 to 1.06, a decline of 20 percentage points.

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. The increase in access to group insurance explain slightly more of the increase in health insurance coverage purchased between 1953 and 1958 than does the decrease in the price per dollar of coverage caused by the tax subsidy. The fact that the tax subsidy presumably increased access to group insurance, especially among union

members. provides additional evidence that the tax subsidy may have fostered institutional change and cemented the health insurance market as an employment-based, group system.

3.5 Conclusions

First, this chapter suggests that the 1954 tax subsidy only explains about 26 percent of the increase in the amount of health insurance coverage purchased between 1953 and 1958. However, the chapter suggests that the long run effects of the tax subsidy on the market for health insurance go far beyond that of increasing the relative amount of health insurance coverage purchased by decreasing its relative price. While this effect of the tax subsidy accounts for 12.5 percent of the total explained change in health insurance purchase between 1953 and 1958, increased access to group insurance accounts for 13.6 percent of the increase. This is an important finding, since results indicate that even after controlling for the actuarially lower price of group insurance, access to group insurance is a statistically significant factor in determining whether or not an individual purchases health insurance coverage. If the tax subsidy encouraged the growth of group insurance, then it did far more than just lower the price of insurance coverage— it also enabled many more people to have access to health insurance and health care.

There is substantial support for the theory that the tax subsidy increased access to group insurance. Between 1953 and 1958, the percentage of people with health insurance coverage in the NORC sample increased by roughly 35 percent, while the number of people with access to group insurance rose by 42 percent. Furthermore, both union

members and employed persons were more likely to purchase health insurance in 1958 than in 1953. The 1954 tax subsidy may have contributed to increased access to group insurance, especially among union members.

For insurance companies, group insurance is profitable because it reduces the risks of adverse selection and has lower administrative costs. From the perspective of consumers, group insurance is less expensive than individual insurance even without a tax advantage. Not only is group insurance less expensive on an actuarial basis, but the transactions costs associated with enrolling in group coverage are less than those associated with purchasing individual coverage. Persons who may not have wished to actively seek out individual insurance coverage in the 1950s may have purchased insurance if all they had to do was sign up at work. Furthermore, many people who may not have been individually insurable may have been able to purchase group coverage. For all of these reasons, the tax subsidy extended health insurance to people who may not have otherwise had coverage. The true effect of the tax subsidy, then, must be measured not only with respect to the price of insurance coverage, but also with respect to how it may have expanded the market by encouraging the growth of group insurance.

Figure 3.1 illustrates how the rate of growth in group insurance increased following 1954, and how the rate of growth of individual insurance slowed following the tax changes. If it is indeed the case that the indirect 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 access to health insurance coverage.

3.6 Endnotes

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 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.

⁶ *ibid.*

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

⁸ Prior to the 1953 NORC survey, there was one modern study of American health insurance that occurred earlier in the twentieth-century. From 1926-1932, the Committee on the Costs of Medical Care (CCMC) conducted a nationwide study of medical expenses that was published in 1933. While the CCMC study provided information on medical expenditures, it did not provide any information about health insurance coverage, since health insurance was still relatively rare at the time of the study.

⁹ In addition, there is some evidence that insurance companies initially only offered high-benefit/high premium plans to larger work groups. If this rationing by group size did occur, then the estimated price elasticity of demand would be overstated. See Holmer (1984) for a closer examination.

¹⁰ Since the loading fee is the percentage increase in the premium that insurance companies charge on a policy to cover expenses, this cost per dollar of benefit is technically equal to $(1 + \text{load})$.

¹¹ Evidence exists for such compensating differentials (see Fishback and Kantor, 1995 for a brief overview).

¹² This procedure yields consistent estimates, although standard errors are biased. Correcting the standard errors in this probit—OLS-tobit procedure is mathematically

intractable. The best course of action, and one that will be undertaken in the near future is to estimate the system of simultaneous equations using maximum likelihood.

¹³ Harmful selectivity bias does not seem to result from eliminating observations with missing variables.

¹⁴ The next three largest effects as isolated by the decomposition are *age*², *age*, and *income*. The other effects combined make up the difference. The full decomposition is available in Appendix B, Table B.3, and a similar decomposition using results from the probit estimation (reported in Table 3.2) is given in Appendix B, Table B.4. Since my focus is on the effect of the tax subsidy rather than to fully explain all the factors which may have contributed to an increase in health insurance coverage, I do not report them here.

4. Comprehensive Enough? Incentives, Medical Expenditures, and Utilization in 1950s Health Care Markets

4.1 Introduction

The incentives that consumers face determine the decisions that they make regarding the purchase of health insurance and medical care. For example, it is a relatively well-established fact that first-dollar, comprehensive health insurance coverage leads people to increase their demand for medical care, thus leading to rising health care prices. Equally well-known is that writing insurance policies that contain incentives to reduce usage (such as implementing cost-sharing by beneficiaries) tends to mitigate this increase in demand. The effect of incentives, however, depends crucially on the nature of the institution in which consumers and producers make choices.

Today, about 90 percent of Americans have health insurance coverage that provides protection for a wide range of physician, hospital, and laboratory services. In 1955, the nature and scope of the health insurance market was much different. While 73 percent of Americans had some form of protection against unforeseen medical expenditures, the extent of coverage varied widely. The most popular form of insurance at the time provided coverage for hospital expenses such as room and board, as well as coverage for surgical expenses-nearly 58.3 percent of people had both hospital and surgical insurance. Less common was insurance that also provided protection against non-hospital medical expenditures: only 35.2 percent of Americans had insurance that protected them from hospital, surgical, and non-hospital physicians' charges as well.

Given the greater degree of heterogeneity in the scope of health insurance coverage in the 1950s than today, this time period presents an ideal opportunity to examine how differential health insurance incentives may have affected medical expenditures. Comparable modern studies (such as the RAND Health Care Experiment) must rely on induced experimental data to study these same issues. This chapter uses previously unexamined data from the 1950s in order to gauge how consumer decisions to purchase medical care differed in a health insurance market that was much less saturated than it is today. Did comprehensive insurance coverage that provided coverage for hospital, surgical, and non-hospital medical care generate an increase in expenditures and utilization relative to other, less comprehensive forms of insurance? Or might it be the case that the fragmentation of the health insurance market generated incentives that led to a different outcome? Results in this chapter suggest that this may indeed be the case. People with comprehensive hospital, surgical, and medical expenditures coverage did not purchase a statistically significantly greater amount of medical care than people with less comprehensive insurance. Instead, results indicate that people with less comprehensive insurance coverage actually may have spent more on total medical expenditures as they substituted more expensive (but insured) hospital care for less expensive (but uninsured) visits to physicians outside of the hospital.

4.2 Comprehensive Health Insurance and the Demand for Medical Care

A combination of advancing medical technology and rising expenditures, combined with the economic hardships of the Great Depression contributed to the

development of private health insurance in the United States in the 1930s. Blue Cross and Blue Shield were the pioneers in the marketplace offering pre-paid hospital, surgical, and occasionally even non-hospital medical care. By 1940, roughly 9.4 percent of the U.S. population had some form of insurance against unforeseen hospital expenditures. Four percent had additional protection for surgical expenditures, while 2.3 percent had insurance for medical expenditures outside of the hospital, such as visits to doctors' offices. However, rapid growth occurred in the U.S. health insurance market after 1940. Commercial firms joined the Blues in offering health insurance to Americans. Medical technology continued to advance, and governmental policies that allowed employers to use health insurance to attract scarce labor during World War II generated further increases in demand.

As noted previously, 73 percent of people had some form of either hospital insurance, hospital and surgical insurance, or hospital, surgical, and non-hospital medical expenditures insurance by 1955 (Health Insurance Institute, 1961). About 58 percent of people had additional protection for surgical expenditures, while only 35 percent of Americans had insurance that provided coverage for hospital, surgical, and non-hospital medical expenditures. Figure 4.1 shows the percentage change in the number of people covered by hospital, surgical, and non-hospital medical expenditures insurance.

Figure 4.1: Percentage Change in Growth of Hospital, Surgical, and Medical Coverage, 1940-1960

Until about 1950, the rate of growth of hospital and surgical coverage per capita outstripped the rate of growth of non-hospital medical expenditures coverage. After 1950, however, the rate of growth in non-hospital medical expenditures coverage exceeded that of hospital and surgical coverage as saturation in the hospital and surgical markets increased.

Certain tax incentives promoted the development of employer-provided, comprehensive forms of insurance coverage. Since 1954, employer contributions to the health insurance premiums of employees are exempt from employee taxable income. *Ceteris paribus*, employees with higher marginal tax rates thus prefer to receive increases in compensation in the form of increasingly lucrative fringe benefit packages rather than as taxable wage income. As a result, employees tend to buy more insurance than they would if such compensation were taxable. Once hospital and surgical coverage became widespread, more comprehensive forms of insurance developed. In the 1950s, more and more people began to buy insurance against medical expenditures. Today, individuals can now buy not only hospital, surgical, and medical insurance coverage, but they can also purchase insurance for dental and optical expenses, as well as for the expenses associated with long-term care.

Given that health insurance is thought to be subject to moral hazard (see Arrow, 1963; Feldstein, 1971, 1973, 1977), the tendency for people to overinsure due to tax incentives may be problematic. Because people with insurance do not pay the full cost of their treatment, they do not equate the full marginal cost of their care with the marginal

benefit they receive. As a result, they overconsume medical resources. This overconsumption is considered to be inefficient and contributes to rising health care prices.

There are some studies that support the hypothesis that overinsurance generates a welfare loss to society. Feldstein (1973) looks at the demand for hospital insurance and hospital care, and finds that excess insurance increases the price of care, which ultimately results in an increase in the demand for insurance. He also finds that while reducing insurance coverage results in lost utility since people are exposed to greater risk, this loss in utility is overshadowed by the gain resulting from lower prices and the reduced purchase of excess care. In another study, Manning, Newhouse, Duan, Keeler, Leibowitz and Marquis (1987) use data from the RAND health care experiment and show that first dollar coverage is associated with as much as a \$60-70 billion welfare loss, and that spending falls significantly if cost sharing is introduced. Goldman (1985) also uses experimental data to show that HMOs with generous benefits increase the demand for ambulatory services relative to less generous plans.

There is little doubt that people today dramatically respond to incentives in the health insurance and health care markets, and that increasingly generous health insurance benefits lead to the increased use of medical services. Correspondingly, tax incentives that lead employers to provide increasingly comprehensive insurance plans contribute to rising health care costs. The goal of this chapter is not to argue this point, but rather to look upon the issue from a new vantage point, that of the 1950s marketplace. While the

implementation of the tax subsidy in 1954 did generate an increase in the amount of coverage purchased, it did not lead to the immediate saturation of the health insurance market. In the 1950s, hospital and surgical insurance coverage was relatively well-established, but coverage for non-hospital medical expenditures was less far-reaching. In addition, medical technology was far less advanced, and the demand for medical services was correspondingly lower. By combining results from this chapter with results from chapter three, it is also possible to analyze the effect of the 1954 tax subsidy on medical expenditures in 1958.

Analyzing data from this period also provides a glimpse into the relationship between health insurance and the demand for medical care at a time when insurance was much less comprehensive and the demand for medical care was much lower than it is today. What was the effect of different types of health insurance coverage on the demand for medical care? How did increasing the scope of insurance plans affect the demand for medical services, and expenditures on medical services? Did people with coverage for hospital, surgical and medical expenditures spend significantly more than people with only hospital and surgical insurance? The data also provide insights into an equally important question: How are decisions about how to seek care and how to treat a patient influenced by the patient's insurance status?

4.3 Analyzing the Demand for Medical Care in the 1950s

4.3.1 A Description of the Data Used to Analyze the Demand for Medical Care

To answer these questions, I use data from the 1958 Nationwide Family Expenditures Survey conducted by the National Opinion Research Center (NORC). As part of its program to determine what kinds of medical expenses Americans were incurring and how they were meeting these expenses, the NORC sampled approximately 2800 people in an area probability sample of the non-institutionalized, civilian population of the United States. Families were asked detailed information about medical expenditures, insurance coverage, and other socioeconomic and demographic characteristics. Because the NORC determined that describing families with relatively high medical expenditures was a primary objective of the study, families with total medical expenditures exceeding \$500 were intentionally oversampled. The data are rich in detail, containing information on minor medical expenditures, major medical expenditures, and hospital/surgical expenditures. Expenditures data in each category are disaggregated into physician expenditures, prescription expenditures, laboratory and X-ray expenditures, and so on. Further, data on hospitalization also include the total number of days family members were hospitalized, and the average cost of the hospital bed per day. Insurance benefits received for any expenditure are also reported.

4.3.2 Model Framework

In order to frame the theoretical effect of insurance and of increasingly comprehensive insurance on the demand for medical services, consider the following consumer choice model. Individual families are endowed with an initial level of health, H_i , (measured in a monetary equivalent). Sickness, $s_i < H_i$, detracts from health, so that net health status following an illness is $(H_i - s_i)$, which dependent on socioeconomic and demographic characteristics such as education, age, and occupation. Thus, net health status can be written as a function of these characteristics: $(H_i - s_i) = z_i\gamma + u_i$, where u_i is a normally distributed random variable with mean zero and variance σ^2 . A family can alleviate illness with medical treatment, m_i .

Consumers choose to allocate their budgets between spending on other goods (x_i) and spending on medical treatment. For convenience, the price of the composite other good x is equal to one dollar. For the uninsured household with income y_i , medical treatment is available at a constant marginal cost of p_m . The consumer's problem can be written as:

$$\begin{aligned}
 [4.3.1] \quad & \max_{m_i} U(x, m) = x_i + \ln(H_i - s_i + m_i) \\
 & \text{subject to:} \quad x_i + p_m \cdot m_i \leq y_i.
 \end{aligned}$$

For an interior solution, the model yields:

$$[4.3.2] \quad m_i^* = \frac{(1 - p_m)}{p_m} \cdot (H_i - s_i).$$

If the household has insurance, then the price of medical care decreases by the coinsurance rate, so that the household pays only a percentage $\delta \in (0,1]$ of the price of medical care. The price the consumer faces for a unit of medical care is thus δp_m . For an insured household, the medical treatment purchased is then equal to:

$$[4.3.3] \quad m_i^* = \frac{(1 - \delta p_m)}{\delta p_m} \cdot (H_i - s_i) \geq \frac{(1 - p_m)}{p_m} \cdot (H_i - s_i).$$

A household will purchase medical treatment only if its utility conditional on purchasing medical treatment exceeds the utility it receives when it simply suffers the illness and receives no treatment. If a household without insurance purchases medical care, its utility is equal to:

$$[4.3.4] \quad U(x, m^*) = y_i - (1 - p_m)(H_i - s_i) + \ln(H_i - s_i) - \ln(p_m).$$

If the same household does not purchase medical care, its utility can be written:

$$[4.3.5] \quad U(x, m = 0) = y_i + \ln(H_i - s_i).$$

Thus, a household purchases medical treatment for an illness s_i if the utility associated with receiving medical treatment is greater than the utility received if medical treatment is foregone. That is, a person buys medical treatment for an illness s_i such that

$$U(x, m^*) > U(x, m^* = 0) \text{ and}$$

$$[4.3.6] \Rightarrow y_i - (1 - p_m)(H_i - s_i) + \ln(H_i - s_i) - \ln(p_m) > y_i + \ln(H_i - s_i)$$

$$[4.3.7] \Rightarrow s_i > H_i - \frac{\ln(p_m)}{(1 - p_m)}$$

$$[4.3.8] \Rightarrow (H_i - s_i) - \frac{\ln(p_m)}{(1 - p_m)} < 0.$$

In the NORC data, some households purchase medical treatment, while others choose not to consume medical services. As a result, the data on medical utilization and medical expenditures are censored at zero. One way to estimate the demand for medical care in this situation is to use a tobit procedure, which combines the level of utilization or expenditure (conditional on positive utilization or expenditure) and the probability of a household using medical care.

In this setting, the probability that a household purchases medical care can be thought of in the following way. A household will purchase medical treatment if it has an illness, s_i , which is sufficiently severe, and will not consume medical treatment otherwise. If Φ is the standard normal cumulative distribution function, the probability of purchasing medical treatment is thus:

$$[4.3.9] \quad P\left(\left(H_i - s_i\right) - \frac{\ln(p_m)}{(1-p_m)} < 0 \mid z_i, p_m\right) = P\left(z_i\gamma + u_i - \frac{\ln(p_m)}{(1-p_m)} < 0 \mid z_i, p_m\right)$$

$$[4.3.10] \quad = P\left(\frac{u_i}{\sigma} < \frac{1}{\sigma}\left(\frac{\ln(p_m)}{(1-p_m)} - z_i\gamma\right) \mid z_i, p_m\right)$$

$$[4.3.11] \quad = 1 - \Phi\left(\frac{1}{\sigma}\left(\frac{\ln(p_m)}{(1-p_m)} - z_i\gamma\right)\right)$$

$$[4.3.12] \quad = \Phi\left(-\frac{1}{\sigma}\left(\frac{\ln(p_m)}{(1-p_m)} - z_i\gamma\right)\right)$$

$$[4.3.13] \quad = \Phi(\beta' x_i)$$

Given that $\Phi(B'x_i)$ represents the probability that a household incurs positive medical expenditures, the expected value of medical services for an observation that may or may not be censored can be written:

$$[4.3.14] \quad E[m_i|x_i] = \Phi\left(\frac{B'x_i}{\sigma}\right) \left(B'x_i + \frac{\phi\left(\frac{B'x_i}{\sigma}\right)}{\Phi\left(\frac{B'x_i}{\sigma}\right)} \right).$$

The demand for medical services can be estimated by maximum likelihood on the tobit log-likelihood function:

$$[4.3.15] \quad \ln L = \sum_{m_i > 0} \lambda_i \left[-\frac{1}{2} \left[\ln(2\pi) + \ln \sigma^2 + \frac{(m_i - B'x_i)^2}{\sigma^2} \right] \right] + \sum_{m_i = 0} \ln \left[1 - \Phi\left(\frac{B'x_i}{\sigma}\right) \right].$$

where x_i is a vector of socioeconomic and demographic characteristics, m_i is medical treatment, and Φ is the standard normal cumulative distribution function. λ_i is a weighting term that is included in the equation to account for the intentional oversampling of high expenditure households (defined as medical expenditures greater than \$500) by the NORC. Since the probability that high expenditure families were included in the sample is 40 percent greater than the probability that families with expenditures less than \$500 were included, that is equal to 2.5 for families with expenditures less than \$500, and equal to one for families with expenditures greater than \$500.

4.3.3 Measuring the Effect of Insurance on the Demand for Health Care Services

To measure the effect of insurance and of increasingly comprehensive insurance on the demand for medical services, I estimate two types of equations. One way to measure the demand for medical services (m_i) is to use a measure of expenditures. As a result, I gauge the effect of insurance on various types of medical care by analyzing equations with the following dependent variables (all in natural logarithms): total medical expenditures, total hospital and surgical expenditures, and total expenditures on physician care outside of the hospital. Looking separately at the various components of health care services may help to isolate the effects of insurance coverage on the demand for medical services. Expenditures are logged because it is possible that a regression of expenditures without taking the log would yield an error distribution that is skewed to the right (Welch, Frank, and Diehr, 1985). Given the censored nature of the tobit, I add one dollar to all dependent variables before transforming them to avoid taking the log of zero. Independent variables in the equations are socioeconomic and demographic characteristics, whether anyone in the household suffers from a chronic illness, receives outside assistance in paying for medical expenditures, and whether or not the household has insurance coverage.

A second way to measure the demand for medical services is to measure utilization. The NORC data set includes only one variable that is well-suited to measure utilization: the total number of days spent in a hospital by members of a household. Estimating how hospital days vary with insurance coverage will also provide a test to

gauge the robustness of the estimates that use expenditures as the dependent variable. Thus, I estimate the natural logarithm of the number of days spent in a hospital as a function of the per diem cost of the hospital bed, socioeconomic and demographic characteristics such as occupation, income, education, age, race and family size, whether anyone in the household suffers from a chronic illness, receives outside assistance such as welfare in paying for medical expenditures, and whether or not the household is insured. Since per diem hospital cost is only known if a household member had been in the hospital, I assign the average value of per diem hospital cost (\$14.65) for the entire sample to those observations where a per diem hospital cost had not been reported.

Before estimating the equations, families with any missing observations in the variables of interest are deleted from the sample. For the full sample, this leaves 2215 out of 2662 original observations. Summary statistics (unweighted) are reported in table 4.1. For the whole sample, total medical expenditures average \$424.60, while the average total medical expenditure for only those people with positive medical expenditures is \$432.61. The highest total medical expenditure reported in the sample is \$13,015.22. With respect to total hospital and surgical expenditures, the average for the sample is \$206.74, while the average for only those people with positive hospital expenditures is \$594.71. The highest hospital/surgical expenditure reported in the sample is \$12,745.22. On average, families in the sample spent \$68.25 on visits to physicians outside of the hospital: the average for only those families who visited physicians outside of the hospital is \$83.06. For all insured families, the average insurance benefit received was \$128.75.

Table 4.1: Summary Statistics. Full Sample

Variable	n	Mean	Std. Dev.	Minimum	Maximum
Family Size	2215	3.263205	1.763265	1	14
(Family Size) ²	2215	13.75621	15.88916	1	196
Income	2215	5496.775	4222.109	37	57000
Age	2215	47.54402	15.40216	1	90
(Age) ²	2215	2497.553	1544.461	1	8100
Professional	2215	.1056433	.30745	0	1
Clerk	2215	.0835214	.2767313	0	1
Sales	2215	.0487585	.2154113	0	1
Crafts	2215	.1941309	.3956195	0	1
Service	2215	.0722348	.2589347	0	1
Labor	2215	.0663657	.2489764	0	1
Operative	2215	.1810384	.3851369	0	1
Agriculture	2215	.0799097	.2712146	0	1
Manufacturing	2215	.2911964	.4544164	0	1
Finance	2215	.0374718	.1899577	0	1
Service Industry	2215	.1480813	.3552607	0	1
Public	2215	.0559819	.2299388	0	1
Trade	2215	.1363431	.34323	0	1
Transportation	2215	.0848758	.2787598	0	1
Union	2215	.3038375	.4600172	0	1
Lodge	2215	.255079	.436004	0	1
Race	2215	.0803612	.2719129	0	1
Gender	2215	.1530474	.3601145	0	1
High School Grad	2215	.2930023	.4552422	0	1
Northeast	2215	.2713318	.4447473	0	1
North Central	2215	.2446953	.4300035	0	1
Southeast	2215	.1521445	.359242	0	1
South Central	2215	.1733634	.3786466	0	1
Pacific	2215	.1200903	.3251405	0	1
Firm Size	2215	4.828894	2.939633	0	8
Assistance	2215	.0505643	.2191558	0	1
Chronic Illness	2215	.1986456	.3990707	0	1
Days in Hospital	2215	4.962077	12.76815	0	148
Per diem Hosp. Cost	2215	14.63865	2.562344	3	38
High59	2215	.206772	.405082	0	1
Insured	2215	.7512415	.4323911	0	1
Veteran	2215	.3620767	.4807094	0	1
Hospital Insurance Only	2215	.0401806	0.196427	0	1
Hosp/Surgical Insurance Only	2215	0.424831	0.494429	0	1
Hosp/Surg/Medical Insurance	2215	0.286230	0.452100	0	1

Table 4.1: Summary Statistics. continued

Variable	n	Mean	Std. Dev.	Minimum	Maximum
Total Medical Expenses	2215	424.5996	564.733	0	13015.22
Total Medical Expenses (only families who used care)	2174	432.6073	566.9877	.39	13015.22
Hospital M.D. Expenses	2215	37.73912	120.094	0	4000
Hospital M.D. Expenses (only families who used care)	681	122.7491	191.0706	.7	4000
Non-Hospital M.D. Expenses	2215	68.24878	125.2826	0	2400
Non-Hospital M.D. Expenses (only families who used care)	1820	83.06101	133.6904	.5	2400
Total Hospital Expenses	2215	206.7384	493.6069	0	12745.22
Total Hospital Expenses (only families who used care)	770	594.7085	685.8924	18	12745.22

Some of the variables listed in table 4.1 may need further explanation. Of particular note is the dummy variable *assistance*. *Assistance* is a dummy variable equal to one if a member of the household received assistance to pay for medical expenditures associated with hospital care, either public or private. Examples of assistance include care in a Veteran's Administration hospital, which is free to veterans, welfare, or free care given by a health care provider. While it is not possible to disentangle these effects, the estimated coefficient on the dummy variable will provide additional evidence of how people respond to financial incentives when making decisions about purchasing medical care.

Other variables that may need further explanation include *high school grad*, *high59*, *gender*, *firm size*, and *chronic illness*. *High school grad* is a dummy variable equal to one if the head of the household had earned a high school diploma. *Gender* is a dummy equal to one if the head of the household is female, and *chronic illness* is a dummy equal to one if a member of the household suffered from a chronic condition. The variable *high59* is a dummy variable equal to one if the person self-reported that he or she expected relatively high medical expenditures in the upcoming year. *Firm Size* is a scaled variable from zero to eight that controls for the number of employees in a person's workplace. If *firm size* equals zero, the person either worked alone or did not work. A value of eight indicates that the person worked in a firm with at least 500 employees.

4.4 Results of Estimations

4.4.1 Controlling for the Endogeneity of Insurance and the Demand for Health Care

For the utilization and expenditures equations, whether or not a person had insurance is an endogenous binary variable. As a result, I estimate the equations in a two-stage probit-tobit procedure (see Maddala, 1983)¹. In the first stage, I use probit to estimate the probability that a person had insurance as a function of all of the exogenous variables in the system. The predicted values from this equation are then used in the tobit equation. Estimates from the first stage probit regression on insurance are reported in table 4.2. The results are as expected. The estimated coefficients on the dummy variable controlling for union membership (*union*) and on *firm size* are positive and statistically significant, indicating that people with a greater probability of obtaining group insurance were more likely to buy insurance than people who were less likely to have the opportunity to purchase group insurance through the workplace or through a union. The estimated coefficients on income, family size, and age are positive and statistically significant, although the magnitude of the estimated coefficient on income is small. Black people had a lower probability of having insurance than non-blacks: the estimated coefficient on the *race* dummy variable is negative and statistically significant.

Table 4.2: Probability of Insurance Purchase*

Variable	Coefficient.	Std.Error	P-Value
Family Size	.1713073	.0732929	0.019
(Family Size) ²	-.0219048	.0077015	0.004
Income	.0000445	.0000221	0.044
Age	.0522113	.0135165	0.000
(Age) ²	-.0006051	.0001379	0.000
Professional	-.0101821	.1693732	0.952
Clerk	.2104968	.1843966	0.254
Sales	-.1111245	.1757222	0.527
Crafts	-.2854515	.1242747	0.022
Service	-.0872585	.1632631	0.593
Laborer	-.4644622	.1487885	0.002
Operative	-.1299199	.1423105	0.361
Agriculture	-.1205803	.1442274	0.403
Manufacturing	.4668986	.1221806	0.000
Finance	.1295529	.2204472	0.557
Service Industry	.2337246	.1363354	0.086
Trade	.1926633	.1306776	0.140
Public	.0176522	.1971751	0.929
Transportation	.4768971	.1676507	0.004
Union	.5025407	.1048806	0.000
Lodge	.1049822	.0843506	0.213
Race	-.54966	.1188887	0.000
Gender	.0412497	.1117193	0.712
High School Grad	.0815042	.087647	0.352
Northeast	.2495198	.2034204	0.220
North Central	.0473295	.2059724	0.818
Southeast	-.0534977	.2146958	0.803
South Central	-.0944184	.2082038	0.650
Pacific	-.0916697	.2212136	0.679
Firm Size	.1070481	.0161368	0.000
Assistance	-.1432274	.160071	0.371
Chronic Illness	-.0498005	.0876586	0.570
Predict High Exp.	-.0746441	.082225	0.364
Veteran	.0702481	.0810092	0.386
Constant	-1.486649	.4112014	0.000

*n = 2215. log-likelihood=-973.57488. Pseudo R² = 0.2483.

4.4.2 Results from Estimating the Medical Expenditures Equations

Using the predicted probabilities of having insurance from the first stage, I then estimate the tobit equations for the natural logarithm of expenditures in the second stage. Results are reported in tables 4.3-4.5. Table 4.3 presents the results from tobit estimation of the natural logarithm of total medical expenditures. Given that insured households face a lower marginal cost for insured medical services, insurance is a statistically important factor in determining how much families spend on medical care. The probability that insured families have positive medical expenditures is statistically significantly greater than it is for uninsured households, and insured families spend significantly more on total medical expenditures than do uninsured families. Increasing the predicted probability of having insurance from zero to one increases the expected change in desired total medical expenditures by 118 percent.²

Chronic illness is also an important factor in determining how much households spend on medical care. Households with a member that has a chronic condition also spend significantly more than families that do not; a change in the chronic illness dummy variable from zero to one leads to a 147 percent increase in expected desired total medical expenditures. Further, results show that family size and income have a positive, statistically significant effect on total household medical expenditures. Race has a negative, statistically significant effect on total medical expenditures; a change in the race dummy variable from zero to one leads to a 35.5 percent decrease in expected desired medical expenditures.

Table 4.3: Tobit Estimation of Total Medical Expenditures*

Variable	Coefficient	Std. Error	P-Value
Family Size	.4924164	.0721057	0.000
(Family Size) ²	-.0330496	.007375	0.000
Age	-.0159325	.0142692	0.264
(Age) ²	.0002002	.0001543	0.195
Income	.0000317	9.12e-06	0.001
Professional	-.0380678	.1042082	0.715
Clerk	-.028462	.1337679	0.832
Sales	.0600582	.1591273	0.706
Crafts	-.2568104	.0963897	0.008
Service	-.0519388	.1353292	0.701
Labor	-.2963049	.1369829	0.031
Operative	-.2073575	.1065729	0.052
Race	-.3038912	.1380446	0.028
Gender	-.149683	.1107179	0.176
High School Grad	-.0038108	.0700981	0.957
Northeast	.16983	.178012	0.340
North Central	-.0264631	.1819778	0.884
Southeast	.2708355	.186956	0.147
South Central	.2147084	.1832177	0.241
Pacific	.1858008	.1944272	0.339
Assistance	.1744295	.1518108	0.251
Chronic Illness	.9045632	.0663495	0.000
P(Insurance)	1.178106	.2531061	0.000
Constant	2.881427	.3787557	0.000
Sigma	1.349413	.0321888	0.000

*n = 2215. log-likelihood=-7768.8472

Disaggregating total medical expenditures into its various components confirms the fact that insured households spend more on all types of medical care than households without insurance coverage.³ Results from tobit estimation on the natural logarithm of hospital and surgical expenditures, shown in table 4.4, also verify that having insurance is a statistically significant factor in determining both the probability that a family has positive hospital expenditures, as well as how much the family spends on hospital care. Table 4.4 shows that insured families spend significantly more on hospital and surgical expenditures than non-insured families. In addition, the estimated coefficient on the predicted probability of having insurance is nearly three times larger than it is for total medical expenditures, indicating that uninsured people spend much less on hospital care than do people with insurance. Some differences are apparent between table 4.3 and table 4.4. The estimated coefficients on race, income, and chronic illness are no longer statistically significant. However, the estimated coefficient on gender is negative and now statistically significant, indicating that female-headed households spend significantly less than male-headed households. Further, the estimated coefficient on *assistance* is now large and statistically significant, indicating that people that receive help in paying hospital and surgical expenses spend more on those services than people who do not.

Insurance coverage also plays a statistically significant role in determining how much families spend on physician expenditures outside of the hospital. Table 4.5 reports the results from tobit estimation of the natural logarithm of expenditures on non-hospital physicians' services.

Table 4.4: Tobit Estimation of Total Hospital Expenses*

Variable	Coefficient	Std. Error	P-Value
Family Size	1.400718	.3362279	0.000
(Family Size) ²	-.034489	.0317826	0.278
Age	-.4012926	.0896757	0.000
(Age) ²	.0037658	.0009345	0.000
Income	-.0000482	.0000554	0.384
Professional	-1.278484	.8010414	0.110
Clerk	.0188242	.855043	0.982
Sales	-1.011087	1.066017	0.343
Crafts	-1.097795	.6518756	0.092
Service	.2674206	.8598856	0.756
Labor	-.6272068	.8871542	0.480
Operative	-.1325118	.6978993	0.849
Race	-1.086389	.8010426	0.175
Gender	-1.169106	.679078	0.085
High School Grad	.2583208	.4562709	0.571
Northeast	-.871555	1.017753	0.392
North Central	-.3600199	1.024921	0.725
Southeast	.0431132	1.070678	0.968
South Central	-.4388371	1.056611	0.678
Pacific	-.9716584	1.10214	0.378
Assistance	3.949444	.7883838	0.000
Chronic Illness	.5598609	.500662	0.263
P(Insurance)	3.109644	1.557063	0.046
Constant	-.2319963	2.306394	0.920
Sigma	7.319421	.1471721	0.000

*n = 2215, log-likelihood = -5315.4048

Table 4.5: Tobit Estimation of Non-Hospital Physician Expenditures*

Variable	Coefficient	Std. Error	P-Value
Family Size	.874634	.1098897	0.000
(Family Size) ²	-.0728786	.0120376	0.000
Age	-.0358161	.0191659	0.062
(Age) ²	.0003712	.0002038	0.069
Income	.0000265	.0000187	0.156
Professional	-.1327818	.1724558	0.441
Clerk	-.0327546	.1987353	0.869
Sales	.2266115	.2053941	0.270
Crafts	-.4649927	.1481131	0.002
Service	-.2633921	.1954843	0.178
Labor	-.365283	.1926844	0.058
Operative	-.3457275	.1574264	0.028
Race	-.1122953	.1926918	0.560
Gender	-.1057981	.1562731	0.498
High School Grad	-.0781426	.1074438	0.467
Northeast	-.0991059	.2247603	0.659
North Central	-.2724189	.2258009	0.228
Southeast	-.0926172	.2377939	0.697
South Central	-.0935978	.2335437	0.689
Pacific	-.113348	.2453895	0.644
Assistance	-.3717868	.207555	0.073
Chronic Illness	1.419795	.1042385	0.000
P(Insurance)	1.029825	.3694484	0.005
Constant	.9817254	.5223738	0.060
Sigma	1.920138	.0409185	0.000

*n = 2215. log-likelihood = -8548.3178

Again, as shown in table 4.5, families with insurance spend significantly more on non-hospital physicians' expenditures than do uninsured households, although the estimated coefficient is smaller than it is for hospital expenditures. An increase in the predicted probability of having insurance from zero to one increases the desired non-hospital expenditures on physicians by 103 percent.

As with spending on total medical expenditures, chronic illness is a statistically significant factor in determining both the probability of positive physician expenditures outside of the hospital, as well as the total amount spent on these services. A change in the chronic illness dummy variable status from zero to one generates a 314 percent change in expected desired non-hospital expenditures on physicians. Interestingly, people who received free care in the hospital, or who received partially free care spent significantly less on non-hospital physicians' services than people who did not. A change in the assistance dummy variable from zero to one generates a 31 percent decrease in expected desired expenditure on non-hospital physicians' services. This negative, statistically significant coefficient may support the hypothesis that people substituted reimbursed hospital care for non-compensated services provided by doctors outside of hospitals.

4.4.3 Results from Estimating the Hospital Days Equation

It is also possible to look at the effect of insurance directly on utilization for hospital stays. Table 4.6 reports the results of tobit estimation of the natural logarithm of total days spent hospitalized. The results are generally consistent with earlier estimations.

Table 4.6: Tobit Estimation of Days Spent in Hospital*

Variable	Coefficient	Std. Error	P-Value
Family Size	.4652649	.1268239	0.000
(Family Size) ²	-.0095254	.0123422	0.440
Income	-.0000211	.0000208	0.311
Age	-.1309128	.0333784	0.000
(Age) ²	.0012526	.0003482	0.000
Professional	-.4703794	.2932584	0.109
Clerk	.0242697	.3122081	0.938
Sales	-.2953036	.3814249	0.439
Crafts	-.4045293	.2384516	0.090
Service	-.0144155	.322944	0.964
Laborer	-.1737025	.331649	0.600
Operative	.0048035	.2569577	0.985
Race	-.4067063	.294388	0.167
Gender	-.3858684	.245223	0.116
High School Grad	.0110211	.1675021	0.948
Northeast	-.086611	.3753289	0.818
North Central	-.0357088	.3790243	0.925
Southeast	.047367	.393858	0.904
South Central	-.0271308	.3894892	0.944
Pacific	-.1985651	.4033846	0.623
Assistance	2.623858	.2961858	0.000
Chronic Illness	.2653907	.1839581	0.149
Hospital Cost	-.0166211	.0357234	0.642
P(Insurance)	1.243756	.5788544	0.032
Constant	-.4293831	.9713885	0.658
Sigma	2.737358	.0638754	0.000

*n = 2215, log-likelihood = -4282.6121

Insured families have a greater probability of using hospital care than uninsured households, and their hospital stay is significantly longer than that of uninsured households. An increase in the predicted probability of having insurance from zero to one leads to a 124 percent increase in the expected desired stay. Households receiving outside financial assistance for hospital care also stay longer than households that do not. Included in this estimation is the per diem cost of room and board for a hospital stay. The estimated coefficient on this variable is negative, but is not statistically significant.⁴

The results reported in tables 4.3-4.6 support the hypothesis that people with insurance and people who receive some kind of financial assistance are more likely to access health care services, and to spend more when they do use medical services. In addition, people with chronic illness spend more on overall expenditures and non-hospital physician expenditures, but chronic illness does not appear to affect the amount spent on hospital stays and surgical procedures, nor does it affect the length of stay. While tables 4.3-4.6 give some indication of how having insurance affects the demand for medical care services, they do not provide insights as to how increasingly comprehensive insurance affected the demand for medical care in 1958. To further examine this effect, I estimate the equations again using only part of the sample that is insured.⁵

By partitioning the sample in this way, it is possible to measure whether there are differences in the demand for health care between people with different types of insurance coverage. Do people with hospital, surgical, and medical expenditures coverage spend significantly more than people with just hospital and surgical coverage? The

question is interesting because while hospital and surgical care may have been costly in the 1950s, visits to physicians were relatively inexpensive. The average family with a mean income of \$5497 who accessed non-hospital physician care spent \$83 annually on these services. Unfortunately, specific information about the actual number of visits is unavailable, so it is not possible to precisely calculate the average cost per visit. However, anecdotal evidence in the surveys suggest that doctors visits averaged around \$5-\$10 depending on the type of service performed. Given the relatively low cost of physicians visits relative to overall time costs, it is not clear that having insurance would dramatically increase the demand for these services.

In order to gauge how increasing the comprehensiveness of insurance affects the demand for medical services, I re-estimate the tobit analysis of total medical expenditures, and use only the insured sample to estimate the equations. To measure the effect of comprehensive coverage, I include dummies in the equation for those people who have only hospital and surgical insurance, or who have hospital, surgical and medical coverage (the most comprehensive form). This type of insurance pays for hospital expenditures, surgical expenditures, and physician expenditures both inside and outside of the hospital. The omitted category is hospital insurance coverage only.

Table 4.7 reports the results from tobit estimation of the natural logarithm of total medical expenditures⁶. With the exception of the estimated coefficients on the predicted probabilities of having hospital and surgical, or hospital, surgical and medical insurance, the results are similar to those in table 4.3.

Table 4.7: Tobit Estimation of Total Medical Expenditures. Insured Sample Only*

Variable	Coefficient	Std. Error	P-Value
Family Size	.7244169	.1104675	0.000
(Family Size) ²	-.0590618	.0111606	0.000
Age	-.0008413	.0155154	0.957
(Age) ²	.0000587	.0001637	0.720
Income	.0000362	.0000102	0.000
Professional	-.0668514	.1109595	0.547
Clerk	.1483258	.1909382	0.437
Sales	.1283795	.1443049	0.374
Crafts	-.2372447	.1050219	0.024
Service	-.0404267	.1569403	0.797
Laborer	-.1293364	.2001429	0.518
Operative	-.07381	.1022624	0.470
Race	-.3111849	.1596008	0.051
Gender	-.1532904	.1320353	0.246
High School Grad	.0722955	.073039	0.322
Northeast	-.0295285	.2303651	0.898
North Central	-.3790844	.3302702	0.251
Southeast	-.0206612	.3688283	0.955
South Central	-.2221926	.2702177	0.411
Pacific	.1457571	.2402637	0.544
Assistance	.1859301	.1278432	0.146
Chronic Illness	.7631175	.0741738	0.000
P(Hosp/Surg Insurance)	1.177445	.8641337	0.173
P(Hosp/Surg/Med Insurance)	.5319952	1.095134	0.627
Constant	2.451037	.86828	0.005
Sigma	1.230185	.0349506	0.000

*n = 1664, log-likelihood = -5364.5449

Income, chronic illness, race, and family size all have statistically significant effects on total medical expenditures. However, the estimated coefficients on both of the insurance dummies are positive, but are not statistically significant. From this analysis, it does not appear that people with hospital and surgical insurance, or people with hospital, surgical, and medical coverage spend more on total medical expenditures than people with only hospital insurance. I next look at the equation that examines how insurance affects the demand for non-hospital physician expenditures.

Presumably, it is exactly these types of expenditures that medical insurance pays for relative to insurance that covers only hospital and surgical expenditures. Results from estimation are reported in table 4.8. Again, there is little evidence to support the fact that households more comprehensive insurance coverage spent more on physicians outside of hospitals than families with less comprehensive coverage. Neither the estimated coefficient on the predicted probability of hospital and surgical coverage, nor the estimated coefficient on the predicted probability of hospital, surgical and medical expenditures coverage are statistically significant. As before, the estimated coefficients on family size, income, and chronic illness remain positive and statistically significant.

Given modern-day intuition, these results may seem surprising. However, they are less surprising if one considers the institution of health care in the 1950s. While 60.1 percent of insured households carried insurance coverage for hospital and surgical expenditures, only 39.6 percent of all insured households also had insurance for medical

expenses in 1958. It may be the case that the effect of increasing comprehensiveness of insurance is offset by other incentives that were at work in the 1950s marketplace.

To some extent, health care inputs to a consumer's health are substitutable: some things can be treated inside or outside of a hospital, for example. People who did not have coverage for non-hospital physician expenditures may have substituted more expensive (but insured) in-hospital physician care to treat their illnesses. Thus, while people with more comprehensive insurance may actually demand more of certain types of care, they may actually spend somewhat less on other types of care than people with less comprehensive insurance. There is some support for this hypothesis. Table 4.9 presents mean expenditure figures for people with and without medical expenditures coverage.

It is indeed the case that people with medical insurance do spend slightly more on average on non-hospital visits to physicians than people without such insurance (\$80.99 v. \$69.45). This "moral hazard" effect may not be large because, as previously noted, visits to physicians were relatively inexpensive. If the average cost of a physician's visit was \$5, then this was only about one-tenth of one percent of the median income (\$4900) in the sample. However, people without medical expenditures coverage spend more on total hospital expenses than people with medical coverage (\$255.90 v. \$196.35), and spend more on in-hospital physicians' charges (\$46.04 v. \$38.75). Further, people without medical expenditures coverage spend more on total medical expenses than households with medical insurance (\$483.51 v. \$455.21).⁷

Table 4.8: Tobit Estimation of Non-Hospital Physician Expenditures. Insured Sample*

Variable	Coefficient	Std. Error	P-Value
Family Size	.8749748	.1527248	0.000
(Family Size) ²	-.0724444	.0157711	0.000
Age	-.0147442	.0225153	0.513
(Age) ²	.0001388	.0002373	0.558
Income	.0000359	.0000148	0.016
Professional	-.2137601	.1715856	0.213
Clerk	-.0232415	.2539293	0.927
Sales	.0677192	.2238298	0.762
Crafts	-.5092979	.1523126	0.001
Service	-.3513562	.219144	0.109
Laborer	-.5159981	.2832233	0.068
Operative	-.2701577	.1516033	0.075
Race	-.0612051	.2279757	0.788
Gender	-.1180794	.1850504	0.523
High School Grad	-.058296	.1171378	0.619
Northeast	-.2079092	.3305629	0.529
North Central	-.5040903	.4876201	0.301
Southeast	-.3516573	.544749	0.519
South Central	-.3448619	.3916577	0.379
Pacific	.0549255	.3071718	0.858
Assistance	-.1166466	.2150702	0.588
Chronic Illness	1.209484	.1132301	0.000
P(Hosp/Surg Insurance)	-.515809	1.331389	0.698
P(Hosp/Surg/Med Insurance)	-.8185898	1.441641	0.570
Constant	2.260358	1.241245	0.069
Sigma	1.745384	.0438027	0.000

*n = 1664, log-likelihood = -6150.4309

Table 4.9: Differences in Average Expenditures between People with and without Medical Expenditures Coverage

Insured Sample (n = 1664)

Expenditure Category	No Medical Insurance	Medical Insurance
Total Medical Expenses	\$483.51	\$455.21
Non-Hospital Physicians' Expenses	\$69.45	\$80.99
Hospital Physicians' Expenses	\$46.04	\$38.75
Total Hospital Expenses	\$255.90	\$196.34
Days Spent in Hospital	5.66	4.44

There may be a second reason that there is not wide variation between total medical expenditures between people with only hospital insurance and people with hospital, surgical, and medical expenditures coverage. Persons without coverage for medical expenditures outside of the hospital may elect not to seek early care for an illness because they are uninsured. As they delay treatment, it may be the case that their conditions worsen sufficiently so as to require hospitalization. Thus, society ends up paying more in the end because the patient is uninsured than if the patient had sought relatively inexpensive care at the onset of illness. While this hypothesis really cannot be tested using these data, it is perhaps another reason why fully comprehensive care does not necessarily lead to rising expenditures.

4.5 The Early Effect of the Tax Subsidy on Medical Expenditures

As noted previously, several researchers have suggested that the tax subsidy of employer provided health insurance has led people to overinsure and consume too much medical care, thus contributing to rising health care costs. By combining the medical expenditures data reported here with the results from chapter three, it is possible to directly measure the effect of the tax subsidy on medical expenditures between 1953 and 1958.

Chapter three suggests that the probability of having insurance increased by 10 percent from 1953-1958, and that the tax subsidy accounts for 2.9 percentage points of this 10 percent increase. Table 4.3 suggests that insured households spend 118 percent more on total medical expenditures than uninsured households. Given that the tax subsidy

increased the number of households with insurance, and that these households spend more than uninsured households, how much more was spent on total medical expenditures in 1958 because of the tax subsidy? A back of the envelope calculation (derived in Appendix C) suggests that by increasing the number of people with health insurance, *ceteris paribus*, the tax subsidy generated a 2.5 percent increase in total medical expenditures in 1958.

Similar calculations can be done to measure the effect of the tax subsidy on hospital expenditures as well as non-hospital expenditures on physician care. Tables 4.4 and 4.5 shows that insured families spent 311 percent more on hospital expenditures and 103 percent more on non-hospital visit to physicians than did uninsured households. Since the tax subsidy increased the number of people with insurance coverage, it also generated (*ceteris paribus*), a 4.66 percent increase in hospital expenditures, and a 2.28 percent increase in non-hospital expenditures on physicians' services.

Clearly, by insuring more people, the tax subsidy led to increased medical expenditures in 1958 than would have otherwise occurred. However, whether or not this increase represents a true welfare loss to society remains unknown. The calculations reported above consider only the effect of the tax subsidy on increasing the number of people with insurance coverage; they do not consider the fact that the tax subsidy also caused people with existing insurance to purchase additional coverage. To the extent that the tax subsidy made health insurance (and hence medical care) available to some people who may not have otherwise been able to receive such care it was beneficial. The welfare

loss that may occur if the tax subsidy leads people with existing insurance purchase additional coverage and overinsure cannot be measured here due to the dichotomous way health insurance coverage enters into the medical expenditures equation.

4.6 Conclusions

It has long been understood that comprehensive, first-dollar health insurance coverage leads to greater expenditures on health care, and ultimately leads to rising health care prices. This chapter looks at the problem from a different perspective, that of the 1950s. The broad variation in the scope of insurance coverage in the 1950s presents a unique opportunity to study how people with differential insurance incentives differently purchase medical care. In the 1950s, health insurance markets were much less complete than they are today. Results do support the hypothesis that people with insurance spend more on medical care

than people who are not insured. Thus, policies that increase the number of people with insurance may tend to lead to rising medical expenditures.

While the difference in medical expenditures between insured and uninsured households is important, this chapter looks beyond this difference to examine how medical expenditures change as insurance becomes more comprehensive. In the 1950s, insurance was much less comprehensive than it is today. Most insured people were covered only for hospital and surgical care; less than 40 percent also had coverage for medical expenditures outside of the hospital. *A priori*, one might expect that due to moral hazard, households with the most comprehensive form of insurance (insurance for hospital, surgical and medical expenditures) would spend the most on medical care. However, this is not the case. While people with medical expenditures coverage do spend slightly more on non-hospital physician expenditures (as theory would predict), they do not spend more overall. In fact, households with the most comprehensive form of insurance spend less than lesser insured households. Households with less comprehensive coverage either substitute uninsured non-hospital care for more expensive, but insured, hospital care, or they delay seeking medical care until their condition actually warrants hospitalization. As a result, their total expenditures rise.

These results suggest that while comprehensive insurance does lead to rising medical expenditures, a market combining comprehensive insurance with insurance that is less comprehensive may lead expenditures to rise more quickly. Families may substitute insured hospital care for uninsured visits to the doctor, or even worse, may wait

to seek medical treatment, thus aggravating their illnesses and requiring more expensive medical treatment in the long run. Given these results, it seems that the villain in the 1950s health care markets may not have been either the tax subsidy or comprehensive insurance coverage, but rather insurance coverage that was not comprehensive enough.

4.6 Endnotes

¹ The two-stage procedure yields consistent parameter estimates, but standard errors should be considered with caution.

² The estimated coefficient of the tobit model reflects the expected change in desired expenditure, but not the expected change in actual expenditure. The difference reflects the fact that the tobit model incorporates both the expected change in the probability of positive expenditure as well as the expected change in expenditure conditional on purchasing medical care.

³ First-stage results from probit estimations corresponding to Tables 4.4 and 4.5 are provided in Appendix C.

⁴ The lack of statistical significance of this estimated coefficient in the entire sample may reflect the fact that insured persons are relatively insensitive to price. When the same equation is estimated using only the sample with uninsured persons, the estimated coefficient on hospital cost per day is negative and is statistically significant.

⁵ At first glance, it may seem that it may be possible to measure the effect of increasing comprehensive insurance by including dummies for each type of coverage in the whole sample. However, the left out dummy variable category is the uninsured population. As a result, the estimated coefficients on the dummy variables reflect their significance relative to uninsured people, not people with lesser coverage.

⁶ First-stage probit analysis of the decision to purchase hospital, medical, and surgical coverage is reported in the Appendix.

⁷ It is important to note that they do not spend a statistically, significantly greater amount. Otherwise the estimated coefficients on the hospital/surgical/medical insurance dummy in the tobit regressions would be negative and statistically significant.

5. Conclusions

Today, the private health insurance industry in the United States is an intricate conglomeration of fee-for-service plans, managed care plans, for-profit companies, and non-profit organizations. Ninety percent of people purchasing private health insurance do so through their employers; the remainder purchase private health insurance individually. While the structure of the modern institution of health insurance may seem chaotic, this dissertation shows that it has actually been carefully sculpted over the course of the twentieth century by several competing interests. Hospitals, doctors, insurance companies, druggists, employers, unions, consumers, and the government have all contributed to shaping the modern health insurance market. Understanding how these different forces have influenced market structure and performance is an important factor in developing effective modern health policy, and in understanding how the modern system of health insurance works.

With this in mind, the focus of the dissertation is to examine the development of the health insurance market, and to identify the roles that these various factors played in contributing to the initial growth and to the later expansion of the market. Each of the three central chapters explores key periods of transition in the development of the market, casting new light on several features of the U.S. health insurance system. The dissertation provides the first quantitative, in-depth analysis of the early market for health insurance in the United States, and provides evidence that hospitals may have used pre-payment plans to reduce competition. In addition, Blue Cross and Blue Shield plans pushed for

enabling laws at the state level that exempted them from insurance regulations, citing that they operated as a service to society. These enabling laws are shown to have contributed to the growth of the plans and to the health insurance market. Ironically, many Blue Cross and Blue Shield plans today are opting to drop their non-profit status (which has become more heavily regulated and restrictive) in order to better compete with for-profit insurance companies, providing even more evidence that despite their protests, they never truly operated only for the good of society.

The growth of the health insurance market was also aided by a key government tax policy, the 1954 tax subsidy of employer provided health insurance. Today, this tax subsidy is under attack because researchers believe it leads to higher health care prices. Results from this dissertation suggest that even in the 1950s, the effect of the tax subsidy in contributing to increasing health insurance purchase was not overwhelmingly large (accounting for only 26 percent of the increase in health insurance coverage between 1953 and 1958).

In the 1990s, it is reasonable to assume that the demand for health insurance is even more price inelastic than it was in the 1950s, so that the price effect of curtailing the tax subsidy on the quantity of coverage purchased will not be large. However, the implications of the tax subsidy go beyond its effect on price. The dissertation also suggests that the tax subsidy promoted the growth of group insurance, and actually reinforced the development of the institution as an employment-based system. As shown in chapter three, access to group health insurance is an important factor in determining

whether or not a household purchases coverage. Thus, it is important to realize that any debate about the tax subsidy should consider not only the price effect it may have on coverage, but also how altering the tax subsidy may change access to group insurance.

Finally, results from the dissertation illustrate the fact that increasing the comprehensiveness of insurance coverage may not lead to higher health care prices under certain conditions. In the 1950s, health insurance coverage was less complete than it is today. Many people had coverage for hospital expenses, but coverage for routine visits to doctors' offices was less common. Given that there is some degree of substitutability between in-hospital services and ambulatory care, people with only hospital insurance may have substituted insured hospital care for uninsured visits to doctors. Alternatively, they may have delayed seeking treatment until they actually required hospitalization.

The result in chapter four is analogous to a situation commonly seen today: poor people often use the emergency rooms of community hospitals as their primary caregivers. This behavior is costly to society (which usually ends up paying the bill), but is less costly to the indigent person than seeking preventative care (which may not be paid for by the county). Thus, while comprehensive insurance coverage may lead people to consume more inexpensive health care services (such as preventative care), it may reduce the demand for more expensive services (such as hospital care). Overall, the net effect is difficult to determine.

Much work remains to be done in this area. This dissertation provides only a starting point in the history of the U.S. health insurance market, but will hopefully

illustrate the importance of understanding the institution and inspire further research in that direction.

APPENDIX A: Derivations and Tables for Chapter 2

Derivations of the Reduced-Form Coefficients

The supply equation from [2.1.1] is written as:

$$\ln\left(\frac{Pr\ em}{Cap}\right)_{it} = \alpha_i + \gamma_t + \beta_1 Z_{1it} + \beta_2 Z_{2it} + \beta_3 Z_{3it} + \beta_4 Z_{4it} + \beta_5 Z_{5it} + \beta_6 Z_{6it} + \varepsilon_{it}$$

and the demand equation from [2.1.2] is written as:

$$\ln\left(\frac{Pr\ em}{Cap}\right)_{it} = \alpha_i + \gamma_t + \delta_1 X_{1it} + \delta_2 X_{2it} + \delta_3 X_{3it} + \delta_4 X_{4it} + \delta_5 X_{5it} + \varepsilon_{it}$$

A priori, the signs on the expected coefficients are:

$$\beta_1, \beta_2, \beta_3, \beta_5, \beta_6, \delta_1, \delta_4 > 0 \text{ and } \beta_4, \delta_2, \delta_3, \delta_5 < 0.$$

Since price (Z_6) and the quantity of accident and health insurance premiums written are endogenous variables, the reduced form equation for accident and health insurance can be written as in equation [2.2.1]:

$$\ln\left(\frac{Pr\ em}{Cap}\right)_{it} = \alpha_i + \gamma_t + \pi_1 Z_{1it} + \pi_2 Z_{2it} + \pi_3 Z_{3it} + \pi_4 Z_{4it} + \pi_5 Z_{5it} + \pi_6 X_{1it} + \pi_7 X_{2it} + \varepsilon_{it}$$

The reduced form coefficients and their expected signs are:

$$\pi_1 = \frac{\delta_5 \beta_1}{(\delta_5 - \beta_6)} > 0$$

$$\pi_2 = \frac{\delta_5 \beta_2}{(\delta_5 - \beta_6)} > 0$$

$$\pi_3 = \frac{\delta_5 \beta_3}{(\delta_5 - \beta_6)} > 0$$

$$\pi_4 = \frac{(\delta_5 \beta_4 - \delta_3 \beta_6)}{(\delta_5 - \beta_6)} < 0$$

$$\pi_5 = \frac{(\delta_5 \beta_5 - \delta_4 \beta_6)}{(\delta_5 - \beta_6)} > 0$$

$$\pi_6 = -\frac{\delta_1 \beta_6}{(\delta_5 - \beta_6)} > 0$$

$$\pi_7 = -\frac{\delta_2 \beta_6}{(\delta_5 - \beta_6)} > 0$$

Table A.1

State-Level Fixed Effects for Table 2.4

State	Fixed-Effect	State	Fixed-Effect
CT	.271453	AR	-.1130645
ME	-.3131609	FL	-.0347437
MA	.0410265	GA	.3336546
NH	-.2286849	LA	.6355886
RI	-.1112708	MS	-.0303461
VT	-.2198842	NC	-.0725348
DE	.4886348	SC	.160495
NJ	.1397535	TX	.0011312
NY	.0943542	KY	.1087704
PA	.1741664	MD	.2375986
IL	.6361308	OK	-.2082343
IN	.3983972	TN	.4395335
MI	.4993811	WV	.3547497
OH	.5118251	AZ	-.5597551
WI	.0020694	CO	-.1633464
IA	-.042563	ID	-.7019841
KS	-.1924171	MT	-.4919271
MN	-.2263126	NV	-.2609386
MO	.3989163	NM	-.7632455
NE	.4510641	UT	-.2713847
ND	-.701951	WY	-.6787239
SD	-.8726045	CA	.3121009
VA	.181459	OR	.0271812
AL	.272844	WA	.086798

Table A.2

Estimation in Census Years Only*

Variable	Coefficient	Std. Error	P-Value
BC Enabling Law	-0.0451	0.1201	0.7080
BS Enabling Law	0.2864	0.1151	0.0150
Percent Black	-0.3749	3.0268	0.9020
Percent Urban	-0.8808	0.9846	0.3730
Percent Illiterate	-0.0023	2.1485	0.9990
Ln(Real Income/Capita)	0.3160	0.2831	0.2670
Ln(Hospitals/100,000)	0.2550	0.2469	0.3050
1930	-1.3859	0.2293	0.0000
1940	-1.0301	0.1551	0.0000
Constant	0.0300	1.9386	0.9880

*n = 144, $R^2 = 0.9049$

APPENDIX B: Tables for Chapter 3

Table B.1

First-Stage OLS Regression of Load, 1953*

Dependent Variable: Load			
Variable	Coefficient	Std. Error	P-Value
Constant	1.4280	0.15185	0.00000
Marital Status	0.65050E-01	0.33191E-01	0.05001
Family Size	-0.98522E-01	0.21133E-01	0.00000
(Family Size) ²	0.78950E-02	0.22844E-02	0.00055
Age	0.14514E-02	0.42270E-02	0.73133
(Age) ²	-0.37873E-04	0.41173E-04	0.35765
Ln(Income)	-0.82503E-02	0.14783E-01	0.57679
Education	0.27376E-01	0.25340E-01	0.28000
Race	0.15773E-01	0.31171E-01	0.61285
Lodge	-0.44301E-01	0.34241E-01	0.19573
Union	0.37880E-01	0.29578E-01	0.20030
Gender	0.34146E-01	0.33426E-01	0.30700
Employ	-0.47052E-01	0.34431E-01	0.17176
Professional	-0.26191E-01	0.33721E-01	0.43734
Farm	-0.18462E-04	0.67120E-01	0.99978
Clerk	-0.11570	0.50576E-01	0.02216
Sales	-0.20549E-01	0.57797E-01	0.72219
Crafts	-0.39546E-01	0.32554E-01	0.22446
Service	-0.28881E-01	0.40854E-01	0.47961
Laborer	-0.67053E-01	0.47114E-01	0.15467
Trade	0.13842E-01	0.37269E-01	0.71034
Manufacturing	0.23025E-01	0.32114E-01	0.47338
Finance	0.30607E-01	0.79292E-01	0.69950
Service Industry	0.20595E-02	0.38301E-01	0.95712
Transportation	0.29032E-01	0.46724E-01	0.53438
Agriculture	0.50879E-01	0.62544E-01	0.41594
NE	-0.93631E-01	0.50895E-01	0.06582
NC	-0.76362E-01	0.49299E-01	0.12139
SE	-0.12431	0.51454E-01	0.01569
SC	-0.56619E-01	0.50853E-01	0.26554
PAC	-0.35348E-01	0.56016E-01	0.52802

*n = 1166, mean of dependent variable = 1.08, Adj. R² = 0.0301

Table B.2

First-Stage OLS Regressions on Load, 1958*

Dependent Variable: Load			
Variable	Coefficient	Std. Error	P-Value
Constant	1.9323	0.16192	0.00000
Marital Status	0.82112E-02	0.41136E-01	0.84179
Family Size	-0.70765E-01	0.20582E-01	0.00059
(Family Size) ²	0.42544E-02	0.19086E-02	0.02580
Age	-0.17258E-01	0.42109E-02	0.00004
(Age) ²	0.13391E-03	0.42151E-04	0.00149
Ln(Income)	-0.20170E-01	0.14636E-01	0.16816
Education	0.40802E-01	0.27251E-01	0.13432
Race	0.12606E-01	0.36485E-01	0.72971
Lodge	-0.31680E-01	0.26686E-01	0.23517
Union	-0.18172E-02	0.31024E-01	0.95329
Gender	-0.22578	0.44036E-01	0.00000
Employ	-0.72471E-01	0.32430E-01	0.02544
Professional	-0.50260E-01	0.45653E-01	0.27093
Farm	-0.66073E-01	0.76835E-01	0.38983
Clerk	-0.25207E-01	0.53459E-01	0.63727
Sales	-0.17558	0.62523E-01	0.00498
Crafts	0.10560E-01	0.32520E-01	0.74538
Service	0.18607E-01	0.46549E-01	0.68935
Laborer	-0.13055E-01	0.48225E-01	0.78661
Trade	0.13594E-01	0.41659E-01	0.74418
Manufacturing	-0.66667E-01	0.32828E-01	0.04228
Finance	0.14552	0.74955E-01	0.05221
Service Industry	0.51437E-01	0.39868E-01	0.19698
Transportation	0.24629E-01	0.52657E-01	0.63999
Agriculture	0.75982E-01	0.69329E-01	0.27309
NE	0.77442E-01	0.59416E-01	0.19244
NC	0.99286E-01	0.58471E-01	0.08950
SE	0.15163	0.59710E-01	0.01110
SC	0.14225	0.58821E-01	0.01559
PAC	0.12608	0.62168E-01	0.04255

*n = 1132, mean of dependent variable = 1.14, Adj. R² = 0.0806

Table B.3

Tobit Decomposition Results

Variable	Percentage of Explained Change Due to Change in Variable
Price	0.3294
Group	0.1371
(Age) ²	0.1304
Age	0.1237
Income	0.0892
Manufacturing	0.0657
PAC	0.0313
(Family Size) ²	0.0188
Family Size	0.0158
Public	0.0117
Service Industry	0.0099
Trade	0.0092
NE	0.0085
Marital Status	0.0066
Education	0.0059
SC	0.0057
Race	0.0046
Transportation	0.0013
SE	0.0013
Finance	0.0005
NC	0.0002

Table B.4

Probit Decomposition Results

Variable	Percentage of Explained Change Due to Change in Variable
Price	0.33511
Group	0.15713
(Age) ²	0.12356
Age	0.12013
Income	0.07651
Manufacturing	0.06615
Family Size	0.03853
PAC	0.02763
Agriculture	0.00850
Trade	0.00841
NE	0.00777
SC	0.00670
Service Industry	0.00617
Education	0.00609
Marital Status	0.00430
Race	0.00410
Transportation	0.00127
SE	0.00126
(Family Size) ²	0.00035
Finance	0.00033
NC	0.00002

Appendix C: Derivations and Tables for Chapter 4

Table C.1

First-Stage Probit Estimation of Hospital Insurance Only*

Dependent Variable: Hospital Insurance Only or Not (0.1)			
Variable	Coefficient	Std. Error	P-Value
Family Size	.1362753	.1426074	0.339
(Family Size) ²	-.03034	.0187503	0.106
Income	-4.96e-06	.0000151	0.742
Age	.0076103	.0239772	0.751
(Age) ²	-.0000437	.0002336	0.852
Professional	.4401131	.2248501	0.050
Clerk	-.2887002	.2849175	0.311
Sales	.0826338	.2647474	0.755
Crafts	.0047737	.1919661	0.980
Service	.0847492	.2442219	0.729
Laborer	-.3406955	.2707324	0.208
Operative	-.1433815	.2287871	0.531
Agriculture	.3727522	.2285209	0.103
Manufacturing	.2026528	.2079615	0.330
Finance	.0942312	.3435388	0.784
Service Industry	-.0343787	.2063121	0.868
Trade	.250198	.211368	0.237
Public	.8484334	.2654672	0.001
Transportation	.388862	.2545868	0.127
Union	.4921403	.1438819	0.001
Lodge	.1043561	.1209884	0.388
Race	-.1418431	.2349815	0.546
Gender	-.0799003	.16944	0.637
Education	-.0260468	.128711	0.840
Northeast	.444797	.2996686	0.138
North Central	-.0855113	.3164717	0.787
Southeast	.1884689	.315654	0.550
South Central	.1240539	.3066643	0.686
Pacific	-.4363843	.3679799	0.236
Firm Size	-.0958743	.0266365	0.000
Assistance	-.0548156	.2546727	0.830
Chronic Illness	.0503793	.1286962	0.695
High59	.1598771	.132585	0.228
Veteran	-.0016861	.1169009	0.988
Constant	-2.233098	.66015	0.001

n = 2215, log-likelihood = -324.35666, Pseudo R² = 0.1040

Table C.2

First-Stage Probit Estimation of Hospital and Surgical Insurance Only*

Dependent Variable: Hospital and Surgical Insurance Only or Not (0,1)			
Variable	Coefficient	Std. Error	P-Value
Family Size	-.0582131	.0597799	0.330
(Family Size) ²	.0007189	.006275	0.909
Income	.0000127	9.68e-06	0.190
Age	.0209614	.0122116	0.086
(Age) ²	-.0002986	.0001257	0.018
Professional	-.0269388	.13513	0.842
Clerk	-.2086688	.1375345	0.129
Sales	-.1373625	.1650081	0.405
Crafts	-.0261108	.1102665	0.813
Service	-.122846	.1505342	0.414
Laborer	-.2766339	.1420801	0.052
Operative	.0778468	.1160799	0.502
Agriculture	-.1414492	.1442009	0.327
Manufacturing	.2473455	.1048345	0.018
Finance	.072443	.191572	0.705
Service Industry	.161656	.12311	0.189
Trade	.2788192	.1217481	0.022
Public	.0770986	.1684777	0.647
Transportation	.126387	.1337725	0.345
Union	.0351276	.0792806	0.658
Lodge	.0419361	.0707909	0.554
Race	-.2234225	.1119166	0.046
Gender	-.0593995	.0983713	0.546
Education	.1094088	.07245	0.131
Northeast	.3650071	.1699061	0.032
North Central	.6669221	.1729159	0.000
Southeast	.6217606	.1777848	0.000
South Central	.3765479	.1763571	0.033
Pacific	-.4071851	.1899607	0.032
Firm Size	.0684716	.0141644	0.000
Assistance	.0208328	.154049	0.892
Chronic Illness	.0070461	.0772061	0.927
High59	-.0851427	.0723999	0.240
Veteran	.0659424	.0672955	0.327
Constant	-1.21078	.358911	0.001

*n = 2215, log-likelihood = -1355.3013, Pseudo-R² = 0.0986

Table C.3

First-Stage Probit Estimation of Hospital, Surgical, and Medical Insurance*

Dependent Variable: Hospital, Surgical, and Medical Expenditures Coverage (0.1)			
Variable	Coefficient	Std. Error	P-Value
Family Size	.2601171	.0725765	0.000
(Family Size) ²	-.0246257	.0078887	0.002
Income	.0000242	8.55e-06	0.005
Age	.0333516	.0135282	0.014
(Age) ²	-.00035	.0001386	0.012
Professional	-.0758702	.1466017	0.605
Clerk	.4016766	.140424	0.004
Sales	.0616419	.16988	0.717
Crafts	-.1089863	.1216513	0.370
Service	.0749007	.1487683	0.615
Laborer	-.0021167	.1516809	0.989
Operative	-.0960043	.1268296	0.449
Agriculture	-.1839727	.1716486	0.284
Manufacturing	.0263253	.1122067	0.815
Finance	.0867773	.1938872	0.654
Service Industry	.1367758	.1336564	0.306
Trade	-.0396455	.1341105	0.768
Public	-.1928338	.1695651	0.255
Transportation	.1348976	.1394512	0.333
Union	.1831749	.0824385	0.026
Lodge	.0101541	.0751647	0.893
Race	-.2905436	.1288031	0.024
Gender	.0860712	.1076808	0.424
Education	-.0411182	.0778428	0.597
Northeast	-.3455966	.1589187	0.030
North Central	-.6789742	.1639273	0.000
Southeast	-.8498195	.1759808	0.000
South Central	-.5406919	.1678023	0.001
Pacific	.3410487	.1703781	0.045
Firm Size	.0458663	.015162	0.002
Assistance	-.1651045	.1609758	0.305
Chronic Illness	-.0861049	.0819202	0.293
High59	-.0357209	.0791175	0.652
Veteran	-.0190999	.072213	0.791
Constant	-1.790834	.4030411	0.000

n = 2215, log-likelihood = -1134.1665, Pseudo R² = 0.1288

Calculating the Effect of the Tax Subsidy on Medical Expenditures

As shown in table 4.3, insured households spend 118 percent more on total medical expenditures than uninsured households (insured households spend \$2.18 for every \$1.00 spent by an insured household). Thus, prior to the implementation of the tax subsidy, total medical expenditures for insured and uninsured households can be calculated as:

$$[A.4.5.1] \quad E = (1 - x)(1) + x(2.18) = 1 + 1.18x,$$

where x is equal to the percent of population that has insurance coverage (predicted to be 30 percent, or 0.30 in chapter three).

As discussed in chapter three, the tax subsidy was responsible for 2.9 percentage points of the 10 percent increase in the probability of health insurance purchase between 1953 and 1958. Thus, 0.029 percent of the people gained insurance coverage, so they are subtracted from the uninsured population and added to the insured population. In 1958, medical expenditures are calculated as:

$$[A.4.5.2] \quad E = (1 - x - 0.029)(1) + (x + 0.029)(2.18)$$

$$[A.4.5.3] \quad E = 1.03422 + 1.18x.$$

Thus, the percentage change in medical expenditures is:

$$[A.4.5.4] \quad \frac{(1.03422 + 1.18x) - (1 + 1.18x)}{(1 + 1.18x)} = 0.025.$$

Calculations for the increase in hospital expenditures and non-hospital expenditures on visits to physicians are similarly computed, except that insured

households spend 311 percent more than uninsured households on hospital expenditures, and 103 percent more than insured households on visits to physicians outside of the hospital.

For hospital expenditures, then, [A.4.5.4] becomes:

$$[A.4.5.5] \quad \frac{(1.09019 + 3.11x) - (1 + 3.11x)}{(1 + 3.11x)} = 0.0467.$$

Similarly for non-hospital visits to physicians:

$$[A.4.5.6] \quad \frac{(1.02987 + 1.03x) - (1 + 1.03x)}{(1 + 1.03x)} = 0.0228.$$

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