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Rising health insurance costs, declining benefits, and metro-nonmetro and firm size compensation gaps

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Abstract

This study analyzes the impact of rising health insurance costs and changing tax rates on wages and health insurance benefits. The study also investigates the underlying reasons for large metro-nonmetro and firm size gaps in wages and health insurance benefits.

The cost of firm-provided health insurance net of inflation rose 104% from 1987 to 2002. This trend should increase the likelihood that firms will reduce their contribution to health insurance benefits or drop them altogether. Over that same period, significant variation in the average marginal tax rate occurred in a number of states. Higher tax rates should raise the cost of compensation in the form of wages relative to benefits because benefits typically are untaxed. Consistent with these two hypotheses, empirical results show that both insurance costs and taxes have a significant impact on health insurance benefits and wages. The combined effects of the changes in health insurance costs and taxes was a 4.6% reduction in the probability of firm-provided health insurance coverage, an 18.2% reduction in average employer contributions to health insurance, and a 17.9% increase in wages as employers shifted compensation from providing benefits to wages.

Workers residing in nonmetro areas have less generous health insurance benefits and receive lower wages than workers residing in metro areas. Similarly, individuals working for smaller firms have less generous benefits and wages than individuals working for larger firms. Although health insurance costs and taxes have significant effects on benefits and wages, they explain little of the metro-nonmetro and firm size gaps. Consequently, equalizing health insurance premiums will have very little impact on the proportion of workers covered by employer-provided health insurance in small firms or in nonmetro areas. Differences in the education level of workers explain the largest portion of both the metro-nonmetro and firm size compensation gaps. The higher incidence of nonmetro residents

employed by the smallest firms also explains a large portion of the metro-nonmetro gap. Other variables explaining the firm size gap include the lower incidence of workers employed full-time in small firms and local labor market conditions.

Chapter 1: General Introduction

Introduction

In this study, we examine the factors influencing employer-provided health insurance benefits and wages. In particular, we look at the role of rising health insurance costs and changing marginal tax rates. We extend our analysis to examine metro-nonmetro and firm size differences in health insurance benefits and wages. Specifically, we explore how the metro-nonmetro and firm size gaps have evolved over time and investigate the underlying factors explaining the divide.

In Chapter 1, we review the existing literature on employer-provided health insurance and wages. We begin by discussing the key trends affecting the level of health benefits in the U.S. We follow this discussion with an examination of the independent variables influencing health insurance provision, including taxes and health insurance costs. Our literature review ends with a review of research on both metro-nonmetro and firm size gaps in health insurance benefits. We conclude Chapter 1 with a simple theoretical model that illustrates how firms jointly choose hours, wages, and benefit levels so as to maximize profits.

In Chapter 2, we discuss the independent and dependent variables in our study. These variables primarily come from the March Current Population Survey (CPS). A state-specific time series for health insurance costs was created using data from a national health insurance company and the *Source Book of Health Insurance Data* (Health Insurance Association of America & Health Insurance Institute, various years). Chapter 2 concludes with a presentation of trends from 1987 to 2002. In particular, we discuss trends in health insurance costs, tax rates, employer-sponsored health insurance benefits, and wages. Trends are given for the sample as a whole, by region, and by firm size.

In Chapter 3, we use a probit model to determine the underlying factors of whether an individual is covered by employer-sponsored health insurance. We then apply an ordinary least squares (OLS) model to identify the underlying factors of an employer's contribution to health insurance. We finish our general analysis with an OLS model that analyzes the employer's wage decision. In all three models, we pay particular attention to changes in health insurance costs and marginal tax rates. We then split the sample into metro and nonmetro regions and use these same models to investigate regional differences in health insurance coverage, health insurance quality, and wages. We use the Blinder-Oaxaca decomposition to identify which variables are most important in explaining the metro-nonmetro differences in health insurance benefits and wages. This decomposition is also used to estimate how much of the observed differences can be explained by our model as a whole.

In Chapter 4, we identify the underlying reasons for the difference in health insurance benefits and wages between different firm sizes. To accomplish this, we split the sample into five different firm sizes and utilize the three models discussed in Chapter 3. Again, we identify which variables explain the largest portion of the difference in health insurance provision between large and small firms.

In Chapter 5, we discuss the main findings and implications from our study. We also suggest possible extensions to our research.

Literature Review

The dominant feature of the health insurance market in the U.S. has been the provision of private health insurance through the workplace. Table 1 reports the Employee Benefit Research Institution's (2003) calculations of health insurance coverage by source using data from the March CPS. EBRI showed that 64% of the non-elderly Americans obtained their insurance coverage through the workplace in 2002. The remaining non-

elderly Americans were uninsured (17.3%), received public health insurance (15.9%) or purchased an individual policy (6.7%). EBRI attributed the increase in the uninsured between 1987 and 1993 to the erosion of employment-based health benefits. The decline in employer-provided health insurance overwhelmed the growth in insured due to public programs. By contrast, between 1993 and 1999, the dynamic reversed and the growth in employment-based coverage was overshadowed by a reduction in those covered by public programs. EBRI provided an explanation for the increase in the percentage of Americans with employment-based health benefits between 1997 and 2000, despite rapidly rising costs of health insurance. A strong economy and low unemployment rates caused more employers to provide health benefits in order to attract and retain workers, and also may have resulted in more workers being able to afford individual health coverage.

Cubbins and Parmer (2001) identified four economic trends from 1988 to 1997 that changed the level of health benefits in the U.S. First, the authors discussed the increase of part-time jobs in the U.S. These part-time workers were less likely to receive health benefits than full-time workers. Second, Cubbins and Parmer examined corporate reengineering, which often involved business cost cutting measures such as reductions in employee benefit programs. Third, they reviewed the shift in employment from manufacturing to service industries. One consequence of these industry shifts was the decline in unions, which historically played a critical role in obtaining health insurance for their members. Finally, the authors highlighted the increased cost of health services, which translated into higher health insurance premiums for employers.

A number of studies have documented increased health expenditures and health insurance premiums. As shown in Figure 1.2, health insurance premiums rose above both inflation and workers' earnings for most of 1988-2002 (Kaiser Family Foundation & Health Research Educational Trust, 2005). Their survey will understate the true increase in

insurance costs to the extent that employers have reduced the quality of their health insurance benefits over time. According to researchers at LIMRA International, national health expenditures more than doubled during the 1990's and have continued to increase in the 21st century (Hekeler, Witt, Potter, & Selby, 2003). Reasons provided for increased health expenditures included an aging U.S. workforce, consolidation of for-profit health care providers, labor shortages of certain health care workers, increased direct-to-consumer advertising of prescription drugs, escalating costs of malpractice insurance, and erosion in the value of fixed-dollar copayments. Increases in health expenditures led to double-digit premium rate hikes that proved challenging for both employers and employees.

We found little empirical work on the effect of rising health insurance costs on health insurance provision and wages. This was probably because most researchers have used an employer's contribution to health insurance as the explanatory variable rather than actual health insurance costs. Kaestner and Simon (2002) concluded that state-level insurance reforms that raised insurance costs resulted in a decrease in the firm provision of health insurance benefits. A number of studies used the theory of compensating differentials to determine the effect on wages if changes were made to an employer's health insurance contribution (see Table 8 of Currie & Madrian, 1999, for a review of recent literature).These studies looked at employer expenditures on health insurance, rather than an exogenous cost variable. Many studies failed to find that wages and health insurance benefits were inversely related, as one would expect from the theory (Currie & Madrian, 1999).

Although health insurance costs have not been explored in depth, a strand of research concentrated on other independent variables affecting employer-sponsored health insurance. Using data from the CPS, Cubbins and Parmer (2001) showed that demographic composition and organizational characteristics alter the level of health benefits, and that these industry level effects have changed from 1988 to 1997. Farber and Levy (2000) found

that the health coverage rate increased monotonically with workers' education. EBRI (2002) reported that full-time workers, public sector employees, workers employed in manufacturing, professional workers, and individuals living in high-income families were most likely to have employment-based health benefits. Furthermore, workers in large firms were more likely to be covered than workers in small firms. Bundorf (2002) found that worker wages were positively correlated with the probability of offering health insurance. Furthermore, establishments with a greater proportion of workers in higher wage categories offered more generous plans. However, if firms choose the level of wages and benefits simultaneously, the positive correlation between high wages and high benefits does not imply a causal link.

Correcting for the joint causality between wages and benefits makes the tradeoff between wages and benefits more apparent. Olson (2002) specifically researched the relationship between wages and health insurance. He used the husband's health insurance, union status, and firm size as instruments for their wives' probability of receiving employer-sponsored health insurance. His estimates suggested that wives with their own employer health insurance accepted a wage around 20 percent lower than what they would have received working in a job without health insurance. Alternatively, women married to men with health insurance through their jobs earned 1.6%-2.6% more per hour. Olsen hypothesized that spousal health insurance allowed these women to accept a higher-paying job because they did not need health insurance through their own employer.

Employer contributions to health insurance can be deducted as a business expense, and they are not counted for the employer's share of employment taxes. This preferential tax treatment is highly controversial due to its potential economic distortion and effect on government revenues. The current tax policy of excluding employer-provided health insurance from a firm's payroll base provides incentives for higher levels of insurance than

individuals might otherwise choose, leading to proposals that the tax exclusion for health insurance be eliminated or capped (Royalty, 2000). Furthermore, preferential tax treatment of health insurance has a large impact on the fiscal budget. For the fiscal year 2005, health insurance accounts for 15.6% of total tax expenditures in the budget. The FY 2005 budget reports that the tax exemption for employment-based health insurance is projected to cost the federal government $ 653.7 billion from 2005 through 2009 (EBRI, 2004).

Many papers have estimated the effect of taxes on the provision or quality of health insurance. Virtually all studies have concluded that taxes were an important factor in the provision of health insurance, although there is a wide range in the magnitude of estimates (Currie & Madrian, 1999). Using data from the Employment Cost Index, Gruber and Lettau (2004) found the elasticity of a firm offering health insurance with respect to the tax price of insurance for the median worker to be -0.25. Furthermore, the elasticity of firm spending conditional on offering health insurance was -0.7. Their simulations suggested that major tax reform could lead to a large reduction in employer-provided health insurance spending. Royalty (2000) also concluded that tax rates do exert a significant positive effect on employer offerings of health insurance. The effect of a one point increase in taxes on the probability of health provision by the employer ranged from 0.8 to 1.0 point, depending on the model specified. Thomasson (2003) used a micro-level dataset from the 1950's to examine how the 1954 codification of the tax subsidy affected the quantity demanded of health insurance. After the tax subsidy, she found that households with higher marginal tax rates were both more likely to purchase health insurance coverage and to purchase more coverage than lower marginal tax rate households. She estimated an elasticity of the amount of health insurance coverage purchased with respect to the after-tax price of insurance of -0.54, and cautioned that the health care system has changed dramatically since 1954. Turner (1987) took an alternate view, and argued that the tax effect was

economically insignificant. Although he found that taxes had a statistically significant effect, he claimed that less than five percent of the growth of the fringe share from 1954 to 1979 could be attributed to changes in marginal federal, state and social security tax rates. In particular, he found the elasticity of the health insurance share of employee compensation with respect to the marginal federal tax rate was 0.21.

One in five Americans lives in rural America. Compared to residents who live in urban communities, rural residents are generally poorer, older, and less healthy (Kaiser Commission on Medicaid and the Uninsured & The Edmund S. Muskie School of Public Service, 2003). Rural concerns have become central to health policy, yet few studies examine the wide gap in health insurance coverage and quality between rural and urban areas.

The Kaiser Commission and The Muskie School (2003) used the Medical Expenditure Panel Survey (MEPS) to identify the causes of health insurance disparities faced by rural residents. They found that there were wide gaps in health insurance coverage between rural residents who lived in counties adjacent versus not adjacent to an urban county. As shown in Figure 1.3, both types of rural workers were less likely to work for an employer who offered them health insurance. Residents of rural, non-adjacent counties had the lowest rate of employer-provided health insurance coverage. When health benefits were offered, enrollment rates were similar between rural and urban workers.

The Kaiser Commission and The Muskie School (2003) found at least 40% of all rural workers were employed by small businesses with fewer than 20 employees. They also showed that health benefits were less likely to be offered in these smaller firms, especially in rural areas. Only 35% of workers in rural, non-adjacent areas who worked for a small business had an employer who offered them health benefits. This compared to 47% of urban workers in small businesses. Furthermore, they showed that over two-thirds of

uninsured workers who lived in rural, non-adjacent counties were working for firms with less than 20 employees.

Variyam and Kraybill (1998) examined the relationship between employer size and the provision of health insurance in a sample of rural businesses. This sample of businesses was drawn from a relatively small region in Georgia, so their conclusions may not be applicable to all rural areas. As firm size increased by ten employees, they found the probability of health insurance provision increased by 3.2%. They also concluded that the educational level of owners/managers and the skill levels of workers were positively related to the employer provision of health insurance.

Jensen (1982) analyzed the nonwage compensation practices of metro and nonmetro establishments using the 1974 Employer Expenditures for Employee Compensation Survey (EEEC). The dependent variable was the amount of employer expenditures for combined life, accident, and health insurance per employee. She reported data separately by metro status for office workers and non-office workers. Establishment size, manufacturing industry, unionization, and wage levels all had a positive effect on the level of employer-provided insurance in both markets. However, the marginal effects of these factors differed, evidence of different compensation strategies for nonmetro and metro firms. For example, there were large differences in compensation levels in specific industries such as mining and construction.

Jensen (U.S. Department of Agriculture, 1983) found that farmers and farm families were less likely to have health insurance coverage than nonfarm families. According to the 1976 Survey of Income and Education (SIE), 86% of families with farm income had health insurance coverage in 1976, compared with over 90% of the total population. Furthermore, only 82% of farmers and farm managers had coverage. In contrast to the overall population, the majority of insured farmers and farm managers had individual health insurance

coverage. Only around 23% of insured farmers and farm managers had firm-provided health insurance coverage. Jensen found that age, family status, region, employment status, occupation, and income all had a statistically significant effect on the likelihood of health insurance coverage.

Small businesses are an important component of the U.S. economy and the labor market. The Small Business Administration (2004) defines a small business as a company with fewer than 500 employees. As shown in Tables 1.2 and 1.3, small businesses represent over 99 percent of employer firms and employ around half of all private sector employees (SBA, 2005).

The quality of jobs in small businesses has concerned both economists and policymakers. The employer size-wage effect has been well documented in a number of studies (see Troske, 1999, for a review of seven possible explanations). Brown, Hamilton, and Medoff (1990) reported that workers in companies with 500 or more employees earned 35% higher wages than workers in companies with fewer than 500 employees. This made the employer size-wage premium as large as the gender-wage gap and larger than the wage differential associated with race and union status. Troske (1999) found the matching of more-skilled workers together in larger plants accounted for approximately 18% of the firm size-wage premium, while capital-skill complementarity accounted for approximately 45% of the firm size-wage premium. Oi and Idson (1999) showed that the wage-size premium decreased to 27.8% when education, job tenure, and other worker traits were included in the wage equation. In both Troske and Oi and Idson's studies, there still remained a large, significant, and unexplained employer size-wage premium.

Employee benefit provision and quality has also been documented as lower in smaller firms (EBRI, 2003; Hekeler et al., 2003; Kaiser, 2005). Bundorf (2002) reported that larger establishments were more likely to offer health insurance, offer more generous plans,

and offer a choice among plans. Cubbins and Parmer (2001) found a negative relationship between the level of health benefits received and the proportion of employees in small firms in an industry. The size of this effect grew between 1988 and 1997. We found few studies that examined the underlying reasons for this gap in employee benefits between small and large firms. Leibowitz and Chernew (1992) concluded that the primary reason small firms do not offer health insurance as often as large firms is the prohibitively high premium cost.

As shown in Figure 1.4, health insurance premium increases accelerated for all sizes of firms from 1996 to 2002 (Kaiser Family Foundation & Health Research Educational Trust, 2005). Again, the Kaiser survey will understate the true increase in insurance costs. Small firms experienced larger premium increases than large firms in all of these years. Higher rates of premium inflation for small firms reflect their inferior bargaining position with insurers and heavy reliance on fully insured plans. The firm-size gap widened from 1996 to 2001, and then decreased significantly in 2002. In 1996, firms with 3 to 199 employees experienced a 2.1% premium increase compared to 0.3% for firms with 5,000 or more employees. In 2002, firms with 3 to 199 employees experienced a 13.5% premium increase compared to 12.7% for firms with 5,000 or more employees. One of our goals is to determine if differences in health insurance costs by firm over time explains the firm size-benefit gap.

Employers made many changes to their health insurance plans to manage price increases (Hekeler et al., 2003). This included the share of the premium they covered, the types of coverage allowed, and the employees' out-of-pocket expenses. As shown in Table 1.4, small employers were less likely than large employers to pass along premium increases to employees. Only 49% of firms with 10 to 19 employees passed along premium increases to employees, compared with 85% in firms with at least 5,000 employees. According to Hekeler et al. (2003), this may be due to the fact that fewer small employers offered health

insurance. When they did offer benefits, their motivations may have been more deliberate. For example, small employers were more apt to operate family businesses or have only a few key employees for whom they provided medical benefits. As shown in Table 1.5, employers also reduced the quality of their health insurance plans to manage costs. Again, smaller employers were less likely to do so than large employers. Increasing co-payments for doctor visits and other services was the most common cost management activity. Twenty-five percent of firms with 10 to 19 employees increased co-payments, compared with 41% in firms with at least 5,000 employees.

This study examines several areas that have not been explored in depth in the existing literature. First, we use a previously unavailable price series to analyze the impact of rising health insurance costs on health insurance coverage, health insurance quality, and wages. Second, we investigate the underlying reasons for the wage and health insurance gaps between metro and nonmetro areas. Finally, we examine the underlying reasons for the differences in wage and health insurance benefits between different firm sizes. For both the regional and firm size analysis, we evaluate how these differences have changed over time.

Theoretical Model

In this section we present a simple theoretical model that illustrates how firms jointly choose hours, wages, and benefit levels so as to maximize profits. We extend the model of Cutler and Madrian (1998) to the case where wages and benefits are endogenous.

We are primarily interested in illustrating why firms may make different choices regarding the mix of wages and benefits to offer their employees. Firms offer employment contracts that specify wage and benefit levels so as to maximize profits, given the cost of offering each of these two elements of the contract.[1] The relative cost of benefits changes over time as a result of changes in the tax rate and the cost of health insurance. Firms are

assumed to have some control over the wages and benefits they offer, but the cost of the benefit and the tax rate is exogenous.[2]

A primary reason firms provide health insurance to their employees is because they can obtain more favorable terms in acquiring health insurance than can their employees [Currie & Madrian, 1999; Gruber, 2000]. Thus, by offering the benefit rather than a similar dollar amount of wages, the firm may be able to raise worker utility without adding compensation cost.[3] There are two main reasons why employers can access health insurance at a lower cost than can individual workers. First, employers can reduce adverse selection and lower administrative expenses by bundling many health insurance policies into one. Insurance companies are willing to cut the price of a pooled policy because of the lower cost of providing multiple clients the same menu of services. Firm costs of purchasing health insurance are also lower because of the favorable tax treatment given to benefits versus wages. A worker who buys an insurance policy must pay with after-tax earnings. Thus, if a worker earns $W in wages which he uses to purchase health insurance, he will only have $W(1-t) left to purchase the insurance policy, where t < 1 is the marginal income tax rate. Alternatively, if the firm pays the same amount in compensation but in the form of a health insurance benefit, the worker receives $W of the insurance benefit.

For the firm to attract workers, it must offer a compensation package that at least meets a worker's opportunity wage at other firms, $\overline{U}(Z)$. Z is an index of skill such that $\overline{U}_Z > 0$. The firm's wage, W, health insurance benefit, B, and work hours, h, must satisfy $\overline{U}(Z) \leq U(W(1-t), B, h,)$ where $U_W > 0, U_B > 0, \text{and } U_h < 0$, and where t is the tax rate.

This implies that for workers of a given skill level Z, and other attributes X, a firm will face a supply schedule of hours that their employers are willing to work. The supply schedule is given by

$$(1.1) \quad h = h((1-t)W, B; Z, X)$$

where $h_W > 0, h_{WW} < 0,$ and $h_{BB} < 0$. Equation (1) implies that the firm can induce more hours from its workers of a given skill level by raising the after-tax wage rate, (1-t)W, or by raising health insurance benefits, B. However, it becomes more expensive to increase hours of work by raising compensation as the levels of W and B increase.

Given (1.1), the firm is assumed to choose an employment and compensation mix that maximizes profit. The firm's profit maximization problem, treating the output price as numeraire, can be written

$$(1.2) \quad \max_{N,W,B} \pi = f(Nh) - N(Wh + C^B B)$$

where C^B is the cost of obtaining a health insurance policy for an employee and N is the number of workers.

The firm chooses N directly but sets h implicitly by its choices of W and B. The firm's short-run production function, f(•), depends on the total hours of labor employed. The production function is assumed to be concave in the labor input.

Inserting (1.1) into (1.2) and taking the first order conditions, we obtain

$$(1.3A) \quad \frac{\partial \pi}{\partial N} = hf' - (wh + C^B B) = 0$$

$$(1.3B) \quad \frac{\partial \pi}{\partial W} = NF'(1-t)h_W - Nh - NW(1-t)h_W = 0$$

$$(1.3C) \quad \frac{\partial \pi}{\partial B} = Nf' h_B - NC^B - NWh_B = 0$$

We can calculate the reduced form by solving equations 1.3A-1.3C simultaneously. This allows us to write the endogenous variables as a function of the exogenous variables. We then arrive at the following three equations:

(1.4A) $N = N(t, C^B, Z, X)$

(1.4B) $W = W(t, C^B, Z, X)$

(1.4C) $B = B(t, C^B, Z, X)$

Since our primary interest is wages and benefits, we focus on equations 1.4B and 1.4C. Specifically, our endogenous variables are the probability of being covered by firm provided health insurance, the quality of health insurance, and hourly wages. We will use probit estimation for health insurance coverage, and ordinary least squares regression for the quality of health insurance and hourly wages. The empirical strategy will be discussed in more detail in Chapter 3.

The exogenous variables central to our study are health insurance costs and tax rates. We expect that health insurance costs will have a negative effect on the probability that an employer provides benefits and on the employer's contribution to benefits if they do offer health insurance. Higher insurance costs should raise the wage offer because the relative cost of wages will be cheaper to the firm. Higher tax rates raise the cost of compensation in the form of wages relative to benefits because benefits typically are untaxed.

In Figure 1.1, we illustrate the nature of the wage and benefit contract two types of firms offer to their workers. We assume that these firms are perfectly competitive so that they earn zero economic profit. The firms hire from a homogeneous labor pool and so they have to offer a competitive utility level $\bar{U}$ in order to attract and retain workers.

To show how the relative cost of compensation affects the firms' wage and benefit offers, suppose that Firm 1 faces a lower cost of benefit provision and a higher cost of offering wages. Specifically, assume that $C_1^B < C_2^B$ and that $t_1 > t_2$. Since benefits are relatively less costly in Firm 1 than Firm 2, Firm 1 provides higher benefits. At the same time, wages are more costly for Firm 1 to provide, and so they offer lower wages than Firm

2. Firm 1's optimal contract is given by point A and Firm 2's contract by point B. Despite offering different contracts, both are on the same indifference curve, and so the firms' contracts provide the same level of utility to workers.

We found that otherwise equivalent firms faced different marginal tax rates and health insurance costs. For example, the cost of insurance for employees in the smallest firms was modestly more expensive than for employees in the largest firms. According to Currie and Madrian (1999), this was because the average administrative costs of health insurance provision were lower in big firms. Furthermore, the marginal tax rate for small firms was slightly lower than for large firms. Following the contract presented in Figure 1.1, large firms will offer more benefits to their employees than small firms. The employer's contribution to health insurance divided by wages was 5.6% for employees in the largest firms and 3.7% for employees in the smallest firms.

We found the cost of insurance for employees living in nonmetro areas was less expensive than for employees living in metro areas. Furthermore, the marginal tax rate for nonmetro residents was slightly higher than for metro residents. However, the employer's contribution to health insurance divided by wages was 4.9% for employees living in nonmetro areas and 5.1% for employees living in metro areas. Our analysis suggests that the regional difference in the contribution/wage ratio was largely due to firm sizes. For employees residing in nonmetro areas, this ratio was 2.9% if they worked in the smallest firms and 5.7% if they worked in the largest firms. For employees residing in metro areas, this ratio was 3.8% if they worked in the smallest firms and 5.6% if they worked in the largest firms. These ratios suggest the regional difference was largely due to firm size.

Tables & Figures

Table 1.1 – Nonelderly Americans with Selected Sources of Health Insurance Coverage, 1987-2002

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 [a]	2001	2002
	(millions)															
Total Population	214.4	216.6	218.5	220.6	222.9	225.5	228.0	229.9	231.9	234.0	236.2	238.6	240.7	244.8	247.5	250.8
Employment-based Coverage	150.3	151.2	151.7	149.6	149.5	147.8	146.7	148.1	149.7	151.7	153.6	156.7	160.3	164.4	162.3	161.0
Own name	73.5	74.5	75.1	74.1	74.1	72.7	76.0	76.3	76.9	78.0	78.5	80.2	81.4	84.8	84.1	82.5
Dependent coverage	76.8	76.7	76.6	75.5	75.4	75.0	70.7	71.9	72.8	73.7	75.1	76.5	78.9	79.6	78.2	78.5
Individually Purchased	15.0	14.3	15.2	15.1	14.3	15.3	17.5	17.3	16.8	16.8	16.6	16.3	16.6	16.1	16.4	16.8
Public	28.8	29.1	29.1	32.2	34.8	36.4	38.5	39.4	38.8	37.8	35.3	34.6	34.5	34.6	37.9	40.0
No Health Insurance	29.5	31.1	31.7	32.9	33.6	35.4	36.4	36.5	37.3	38.3	39.9	40.7	39.0	39.4	40.9	43.3

	(percentage)															
Total Population	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Employment-based Coverage	70.1	69.8	69.4	67.8	67.1	65.5	64.3	64.4	64.6	64.8	65.0	65.7	66.6	67.1	65.6	64.2
Own name	34.3	34.4	34.4	33.6	33.2	32.2	33.3	33.2	33.2	33.3	33.2	33.6	33.8	34.6	34.0	32.9
Dependent coverage	35.8	35.4	35.1	34.2	33.8	33.3	31.0	31.3	31.4	31.5	31.8	32.1	32.8	32.5	31.6	31.3
Individually Purchased	7.0	6.6	7.0	6.8	6.4	6.8	7.7	7.5	7.2	7.2	7.0	6.8	6.9	6.6	6.6	6.7
Public	13.4	13.4	13.3	14.6	15.6	16.1	16.9	17.1	16.7	16.2	15.0	14.5	14.3	14.1	15.3	15.9
No Health Insurance	13.7	14.4	14.5	14.9	15.1	15.7	16.0	15.9	16.1	16.4	16.9	17.0	16.2	16.1	16.5	17.3

Note: Columns may not add to totals because individuals may receive coverage from more than one source. From "Sources of Health Insurance and Characteristics of the Uninsured: Analysis of the March 2003 Current Population Survey," by P. Fronstin, 2003, *Employee Benefit Research Institute Issue Brief, 264*. Copyright 2003 by the Employee Benefit Research Institute. Reprinted with permission of the author.

[a]Results are based on Census 2000-based weights

Table 1.2: Share of Firms by Firm Employment Size

	1988	1993	1998	2002
<20 employees	89.7%	89.8%	89.4%	89.3%
20-99 employees	8.7%	8.6%	8.9%	8.9%
100-499 employees	1.3%	1.4%	1.4%	1.4%
500+ employees	0.3%	0.3%	0.3%	0.3%
Total	100%	100%	100%	100%

Note: From U.S. Small Business Administration, Office of Advocacy, based on data provided by the U.S. Census Bureau, Statistics of U.S. Business and Nonemployer Statistics.

Table 1.3: Share of Employees by Firm Employment Size

	1988	1993	1998	2002
<20 employees	20.9%	20.1%	18.8%	18.3%
20-99 employees	19.2%	18.4%	17.9%	17.7%
100-499 employees	14.5%	14.6%	14.3%	14.2%
500+ employees	45.5%	46.9%	49.1%	49.9%
Total	100.0%	100.0%	100.0%	100.0%

Note: From U.S. Small Business Administration, Office of Advocacy, based on data provided by the U.S. Census Bureau, Statistics of U.S. Business and Nonemployer Statistics.

Table 1.4: Management of Medical Premium Rate Increases, by Size of Employer

	Total	**10-19**	**20-99**	**100-499**	**500-999**	**1000-4,999**	**5000+**
Absorb entire increase	43%	51%	39%	20%	20%	12%	15%
Passed all onto employees	7	5	9	13	7	2	3
Passed some onto employees	50	44	53	67	73	87	82

Note: From "The Changing Group Insurance and Health Care Marketplace: The Medical Marketplace 2003,"by R. Hekeler, J. Witt, A. Potter, and M. Selby, 2003, LIMRA International. Copyright 2003 by LIMRA International. Reprinted with permission.

Table 1.5: Other Cost Management Activities, by Size of Employer

	Total	10-19	20-99	100-499	500-999	1000-4,999	5000+
Increase copayments for doctor visits and other services	28%	25%	28%	36%	38%	42%	41%
Increase employee deductibles	26	26	24	44	39	43	41
Switch to a lower cost plan with the same carrier	21	21	20	25	14	15	13
Switch to a lower cost plan with a different carrier	10	6	11	20	11	9	13
Introduce tiered pricing for hospital procedures	6	12	1	6	1	4	5
Something else	5	3	6	10	21	19	26

Note: From "The Changing Group Insurance and Health Care Marketplace: The Medical Marketplace 2003," by R. Hekeler, J. Witt, A. Potter, and M. Selby, 2003, LIMRA International. Copyright 2003 by LIMRA International. Reprinted with permission.

Figure 1.1: Wage/benefit contract

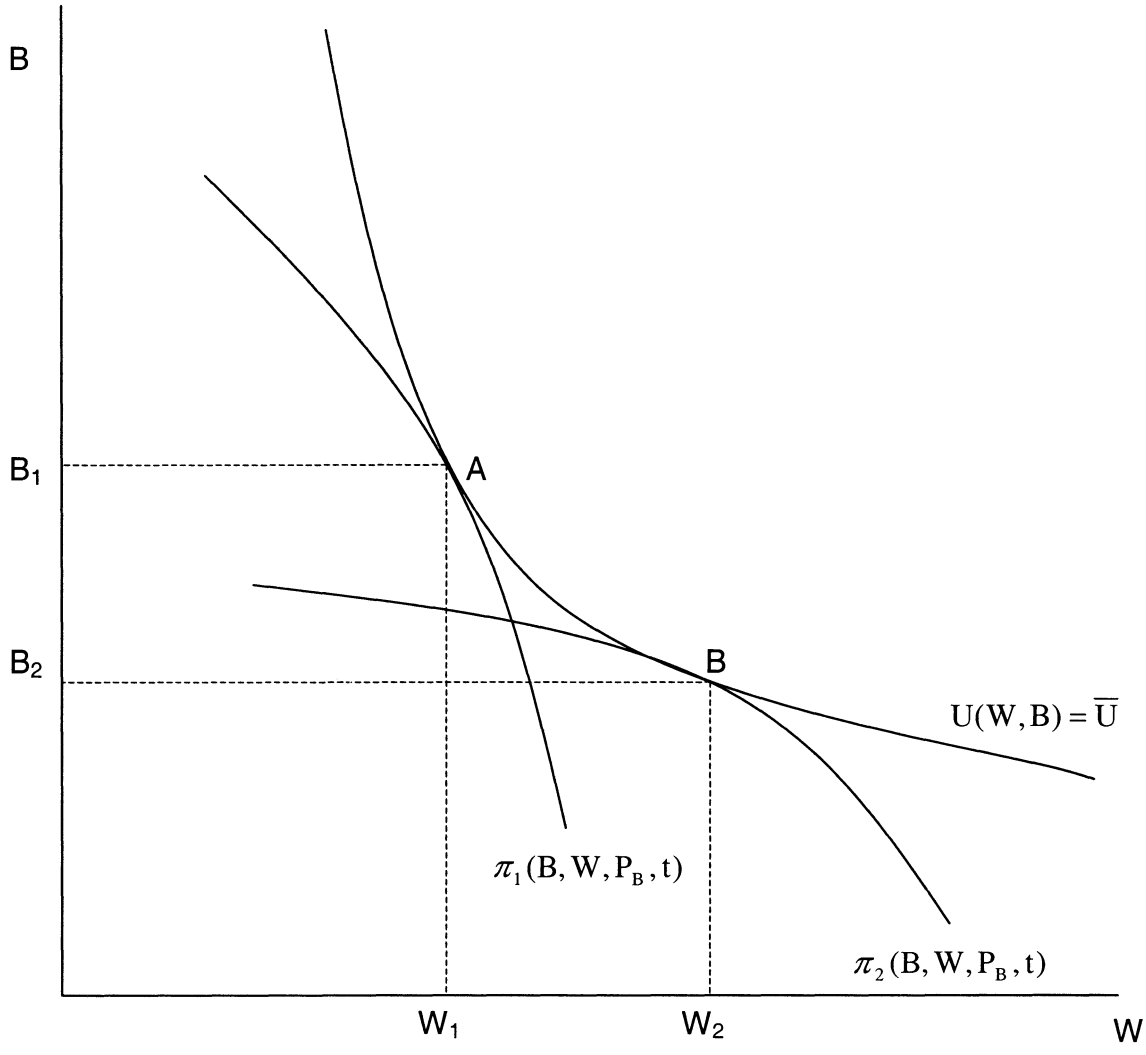
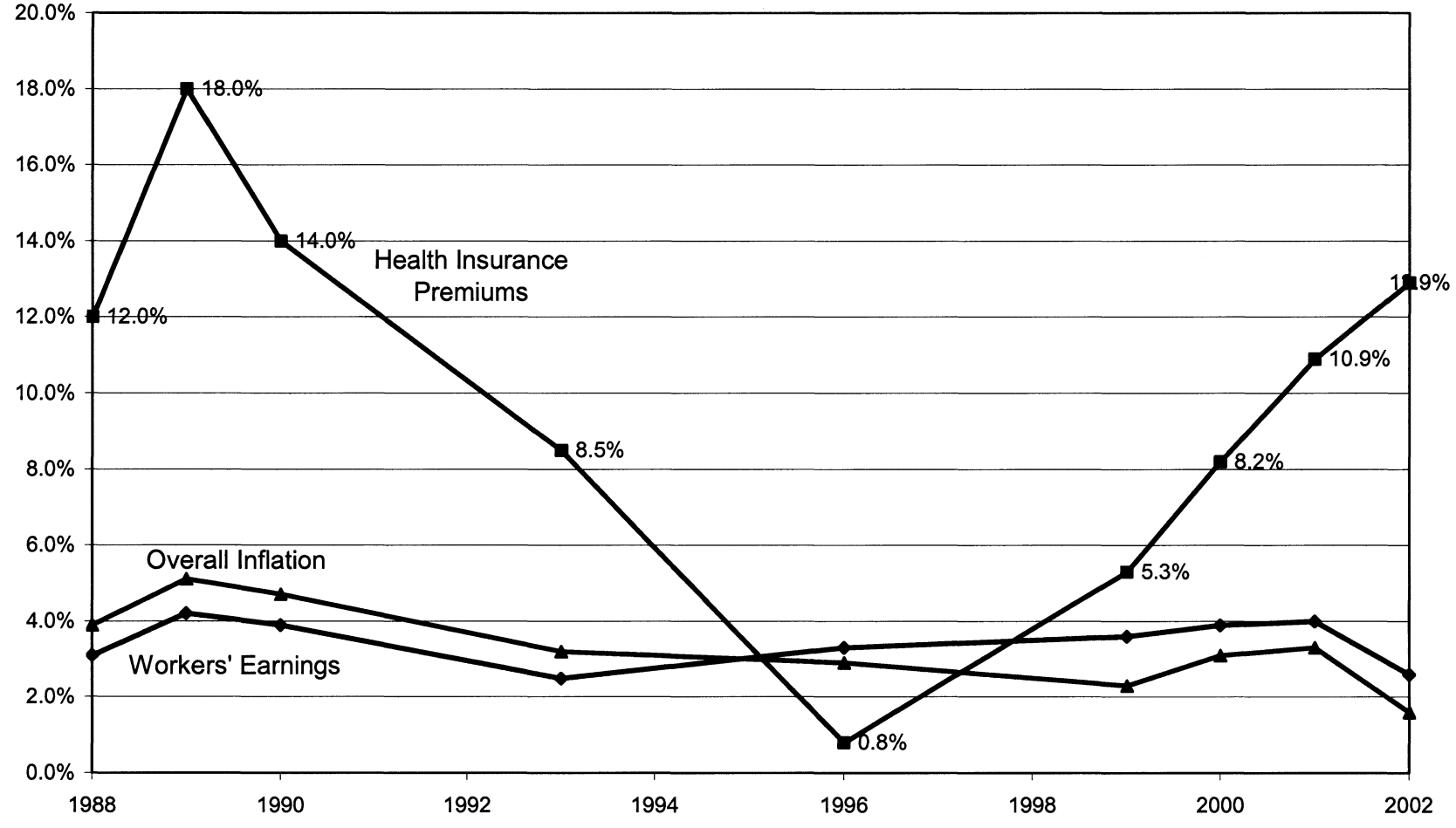
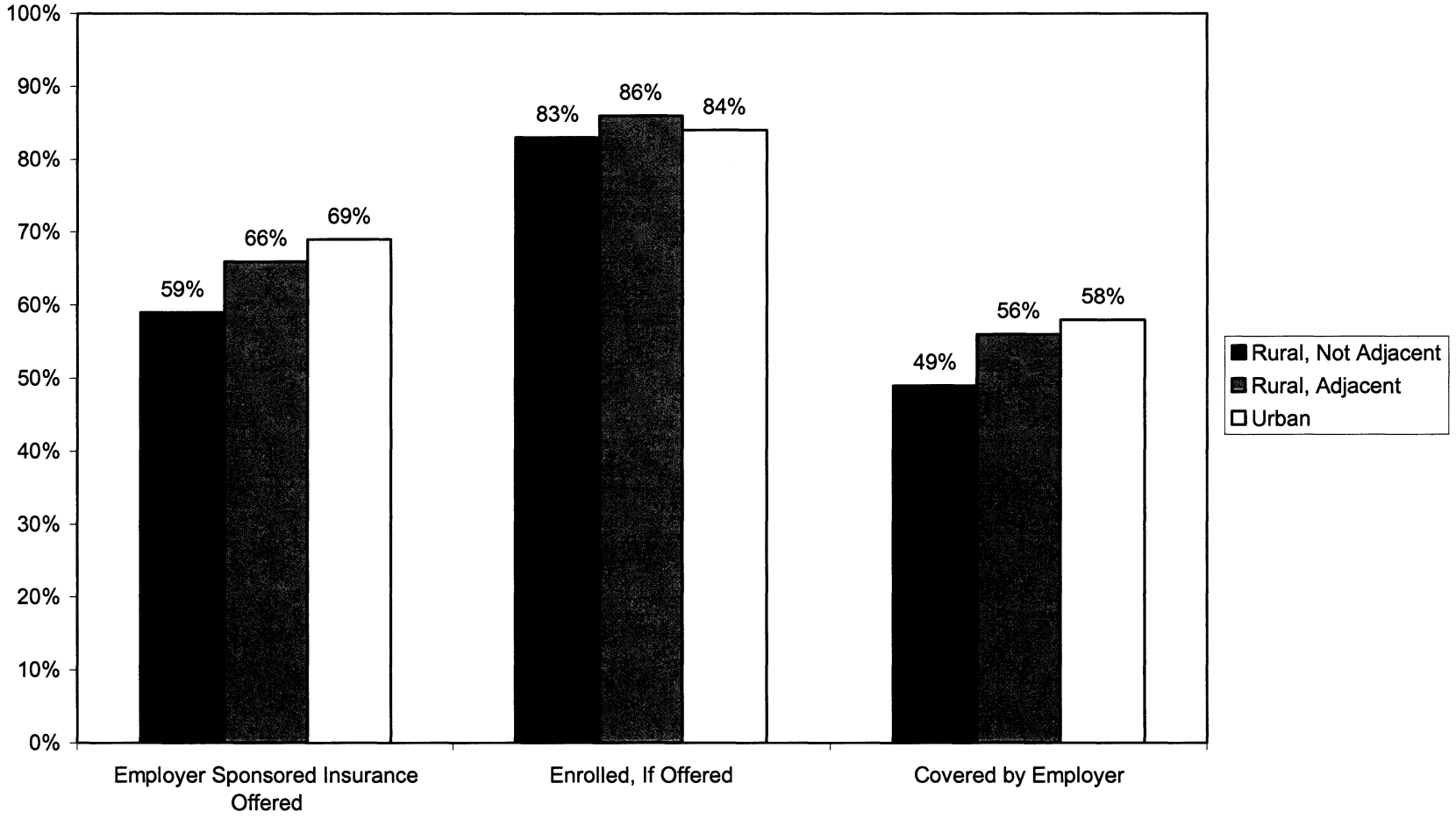


Fig. 1.2: Increases in Health Insurance Premiums Compared to Other Indicators



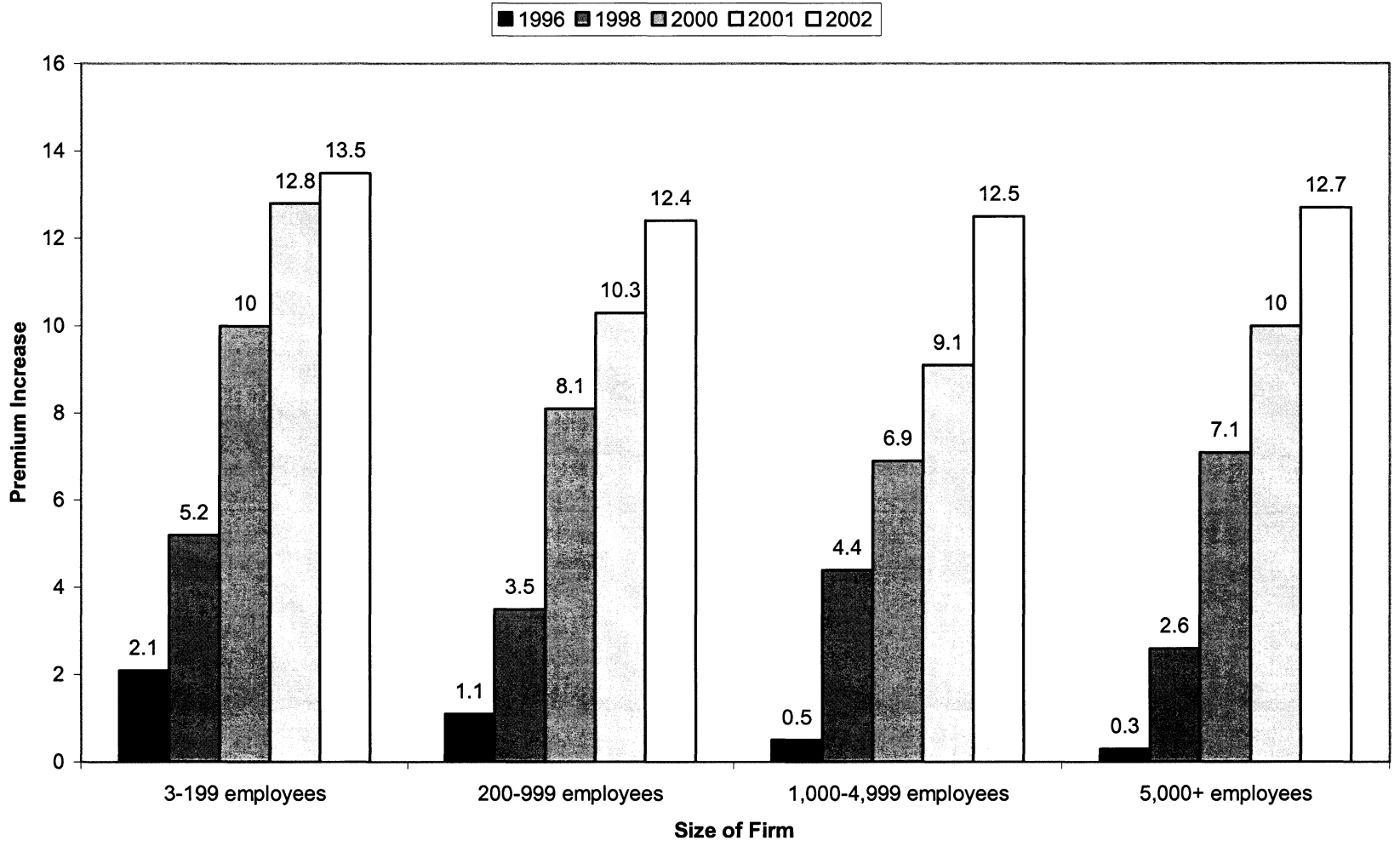
Note: From *"Employer Health Benefits, 2005 Annual Survey (#7315)* by Kaiser Family Foundation and Health Research Educational Trust, 2005. Copyright 2005 by The Henry J. Kaiser Family Foundation and Health Research and Educational Trust. The Kaiser Family Foundation, based in Menlo Park, California, is a nonprofit, independent national health care. Reprinted with permission.

Fig. 1.3: Employer-Sponsored Health Insurance among Workers



Note: From *"Health Insurance Coverage in Rural America #4093* by E. Ziller, A. Coborn, S. Loux, C. Hoffman, & D. McBride, 2003. Copyright 2003 by the Henry J. Kaiser Family Foundation. The Kaiser Family Foundation, based in Menlo Park, California, is a nonprofit, independent national health care philanthropy and is not associated with Kaiser Permanente or Kaiser. Reprinted with permission.

Figure 1.4: Premium Increase, by Firm Size



Note: From *"Employer Health Benefits, 2005 Annual Survey (#7315)* by Kaiser Family Foundation and Health Research Educational Trust, 2005. Copyright 2005 by The Henry J. Kaiser Family Foundation and Health Research and Educational Trust. The Kaiser Family Foundation, based in Menlo Park, California, is a nonprofit, independent national health care. Reprinted with permission.

Chapter 2: Data

Discussion of Data

The majority of the data came from the 1988-2003 editions of the March CPS (Unicon, 2004). The March CPS is the primary source of labor force characteristics of the U.S. civilian population. It is also the official source of data on unemployment rates, poverty, and income in the U.S. All CPS questions on wages and health insurance refer to the previous year. For example, in March of 2003, interviewers asked about health insurance coverage during 2002.

The focus of our study was on employer-provided health insurance, so we made a number of restrictions. Because the CPS only includes information on compensation for the previous year, we excluded individuals who did not work at all the previous year. We also did not include those individuals serving in the armed forces, those who were self-employed, or those classified as students, retired, or disabled. Finally, due to a lack of data on their health insurance costs, we excluded individuals from the state of Hawaii.

Our sample included only single workers age 25 to 60. This age range covered an individual's prime working years. We excluded married couples to avoid complications caused by one spouse's compensation package affecting the other spouse's acceptance of health insurance coverage. Farber and Levy (2000) found that half the decline in benefit take-up was attributable to spousal benefits, and concentrating on single workers provided us a one-to-one correspondence between the wage and health benefits offered by the firm and the decisions made by the worker. Our final sample consisted of 249,821 individuals spread over the studied period of 1987 to 2002.

As shown in Table 2.1, the sample distributions of single workers approximated the range of health insurance benefits received by the labor force as a whole. For example, the estimates for all workers of employer-sponsored health insurance coverage for 1987, 1995,

and 2002 were 63%, 59% and 61% respectively. This corresponds to estimates for single workers of 65%, 62% and 64%. Overall, single workers were slightly more likely to be covered by firm-provided health insurance, from 1.5% more likely in 1993 to as high as 4.2% in 1999. We include selected sample statistics and regression results for all workers in the Appendix. While the coefficient signs are similar between single workers and all workers, the magnitudes of the coefficients differ. However, changes in the sample will not alter the conclusions dramatically.

We provide summary information on the variables of our study and their empirical definitions in Tables 2.2-2.4. Due to the sensitive nature of the insurance cost data, means are not reported for specific regions or firm sizes. For the dependent variables in our wage and benefit equations we used 1) health insurance coverage through an employer, 2) the quality of health insurance, 3) and hourly wages. We obtained all three dependent variables from the CPS.

First, we measured health insurance coverage through an employer using a dummy variable to indicate whether or not the employer contributed to health insurance. The March CPS asked about health insurance coverage in the previous calendar year. According to the U.S. Census Bureau (2005), health insurance was likely to be underreported on the March CPS. One reason for this may be the fact that the March CPS collected health insurance information by asking in February through April about the previous year's coverage. Some people may have reported their insurance coverage status at the time of their interview rather than their coverage status during the previous calendar year. Berger, Black, and Scott (1998) found that individuals who were in both the March CPS and April/May CPS often gave inconsistent responses on their health insurance status, perhaps due to the differences in the wording of the health insurance questions. They recommended changing the wording of the March survey to make it similar to the April/May survey. Starting in 1995, the March

CPS questions around employer-provided health insurance coverage were more similar to the April/May questions. Berger et al. (1998) found that the differences in the firm and worker reports of coverage were uncorrelated with standard worker and firm characteristics, suggesting classical measurement error that does not bias the parameters of models explaining health coverage.

Second, we estimated the quality of health insurance using a continuous measure of the dollar amount the employer contributed to health insurance. Our measure of the employer contribution was based on Census Bureau simulations using data from the 1977 National Medical Care Expenditure Survey. Therefore, the employer's contribution is best thought of as the expected rather than as the actual employer contribution. Series P60-186RD, *Measuring the Effect of Benefits and Taxes on Income and Poverty* (U.S. Department of Commerce and Bureau of the Census, 1992) discusses these simulations in detail. Finally, we measured wages by multiplying weeks worked by average weekly earnings, and dividing the result by the annual hours worked for wages.

For the independent variables in our wage and benefit equations, we utilized 1) metropolitan status, 2) worker status, 3) cost of health insurance, 4) marginal tax rates, 5) employer size, 6) local labor market conditions, 7) measures of skill, 8) living costs, and 9) personal characteristics.

First, we measured metropolitan status with a dummy variable that came from the Master Segment Tape in the CPS, which supplied all geographic identifiers for the CPS data. The CPS identified whether or not an individual resided in a metro area, but did not specify the location of their employment. As a result, it is possible we understated the differences in metro and nonmetro compensation, as some nonmetro workers may have commuted to metro areas for their job and vice-versa. Additionally, the CPS changes its definition of metro status as populations change, so the same area might change from

nonmetro to metro and vice versa. Next, we measured worker status with a dummy variable indicating whether or not the individual was a full-time worker at any time during the previous year.

Then, we used data for 2000-2003 provided by a national insurance company to compute cross-sectional health insurance costs. These health insurance costs varied by state, by areas within each state, as well as by employer size. Using the *Source Book of Health Insurance Data* (Health Insurance Association of America and Health Insurance Institute, various years), we created state-specific time series back to 1988. The *Source Book* provided us by state with the average daily cost per patient in community hospitals for the years 1987-2000. The hospital costs reflected total inpatient and outpatient costs per inpatient equivalents.

There are a number of advantages to using the hospital bed data. First, it is the only known publicly available data source for medical costs with state variation. Second, it is highly correlated with the national consumer price index on medical care. Third, insurance companies base rate changes in part on the change in costs of hospitalization. According to McKinsey & Company (2002), inpatient and outpatient facilities represented around 38% of health care costs from 1995-2001. Finally, the hospital bed data allows us to hold constant the quality of the health insurance policy as we go back in time. The main disadvantage to using the hospital bed data is it doesn't represent other medical costs, such as physician services. Additionally, it may reflect changes due to changes in demographics that are unrelated to the actual cost of insurance, such as the elderly moving into the state of Florida.

Our price series was unique because it remained unclouded by changes in the quality of benefits offered by firms. This is because the cross sectional relationship is based on a specific health insurance policy that does not vary across time. In contrast, estimates

based on average employer contributions to health insurance understated the true change in insurance prices because firms reduced the quality of the benefits offered over time.

To show how we generated the price series, let $C_{i,t}^{00}$ be the cost of insuring an individual worker i if he were given the health insurance package provided by this national insurance company in the year 2000. The insurance cost is based on the individual's state, metropolitan area, and firm size. To create a year t cost of providing that same insurance package, the price series for hospitalization is applied. Let $B_{i,t}^{00}$ be the average cost of hospital beds in individual i's state in 2000 and let $B_{i,t}^{t}$ be the average cost of hospital beds in the same state in year t. Then the estimated cost of the 2000 health insurance package for individual i in year t is:

$$C_{i,t} = C_{i,t}^{00} * (B_{i,t}^{t} / B_{i,t}^{00})$$

We calculated the individual's income tax rate as the average sum of both the state and federal marginal tax rates in the state. Unicon Research Corporation included projected tax information in their CPS data release. The tax rates were Census Bureau simulations based on data from the CPS and statistical summaries of individual income tax returns compiled by the Internal Revenue Service. The tax rates were primarily generated from income and demographic information. Therefore, the tax rate should be seen as an expected, not an actual, tax rate.

The Census Bureau federal income tax simulation required up to four separate operations: 1) an estimate of the tax filing unit based on household relationship, marital status, and dependency rules; 2) an estimate of adjusted gross household income based on the defined tax filing unit; 3) an estimate of federal income tax from the household income and filing status; 4) if applicable, an estimate of earned income tax credits. A model of each state's income tax regulations allowed the Census Bureau to project state income tax, also,

and Series P60-186RD, *Measuring the Effect of Benefits and Taxes on Income and Poverty* (U.S. Department of Commerce and Bureau of the Census, 1992) discusses these tax projections in detail.

The CPS reported employer size with five separate dummy variables. The smallest employers had fewer than 25 employees who comprised 23.3% of the workers in the data set. The largest employers had more than 1,000 employees with 39.2% of workers in the data set. The middle-sized employers incorporated the remaining 37.5% of the workers.

We used the unemployment rate, the average non-supervisory manufacturing wage, and the sum of union membership and union coverage to describe local labor market conditions. Tight labor market conditions, resulting from a strong economy, should have a positive effect on employee compensation. We utilized the log of the state average non-supervisory manufacturing wage for an indicator of local wage competition. It was important for us to include union membership/coverage because numerous studies have shown that unionized workers receive higher wages and benefits than do non-unionized workers (Freeman and Medoff, 1984).

The remainder of our independent variables included measures of skill, living costs, and personal characteristics. The measures of skill contained linear and quadratic terms in experience and education. Changes in the consumer price index controlled for changes in the cost of living over time, and measures of the land prices in the state controlled for cross-sectional variation in living costs. The dummy variables used to identify personal characteristics were gender, race, marital status, and the number of children under the age of 18. Specifically, the CPS reported marital status with three separate dummy variables: 1) never married, 2) divorced, and 3) widowed.

The March CPS included a March supplement weight. This weight is the measure of the number of actual persons that each observation in the sample represents. The Census

Bureau uses weights to correct for nonresponse and for subpopulations that are oversampled to allow more precision in reported statistics for minority groups. These weights divided by 100 were applied using the frequency weight command in Stata for all summary statistics and regressions to derive population means and regression coefficients.

Trends Over Time

Firm-provided health insurance costs rose rapidly over the years we studied. As shown in Figure 2.1, after correcting for inflation, average costs rose 104% from 1987 to 2002. The largest premium increases occurred between 1993 and 1994, and 2000 to 2002.

The average income tax rate for all individuals in the sample remained relatively stable over the sample period. However, as shown in Figure 2.2, significant variation occurred in a number of states. In South Carolina, the average tax rate rose by 27% and in Arizona the average tax rate fell by 11%. Both states experienced considerable volatility from 1987 to 2002. Because health insurance premiums were untaxed, firms were more likely to provide benefits in states or in years of high income tax rates.

In apparent response to the dramatic increase in the cost of providing health insurance, firms cut back on both health insurance provision and the quality of benefits offered. As demonstrated in Figure 2.3, the proportion of single workers covered by firm-provided health insurance fell from 63% to 61% between 1987 and 2002.

We found that nonmetro workers were less likely than metro workers to be covered by health insurance through their employer. This gap narrowed over the time period studied. In 1987, 56% of nonmetro workers and 67% of metro workers were covered by firm-provided health insurance. In 2002, this proportion had changed to 57% for nonmetro workers and 65% for metro workers. Though most nonmetro gain occurred right after a low point in 1996, the net change has been a reduction of metro and an increase in nonmetro coverage.

Employees in large firms were more likely to be covered by firm-provided health insurance than employees in small firms, as illustrated in Figure 2.4. About 77% of employees in the largest firms, those with more than 999 employees, were covered by health insurance through their employer across the sample period. This contrasted with only 37% in the smallest firms, or those firms with less than 25 employees. The most significant increase in the proportion of employees covered by firm-provided health insurance occurred when a firm reached the second size group of 25 employees.[4]

Firms that have continued to offer health insurance benefits appear to have cut back significantly on the quality of benefits offered. Average real employer contributions for health insurance benefits across all firms only rose 42% over the time period, considerably short of the 104% increase in insurance costs. As discussed by Cutler and Madrian (1998), the average cost of benefits cannot be used as a measure of the price of health insurance because the expenditures are the product of exogenous prices and endogenous benefit quality. As shown in Table 2.5, the time path of employer health insurance expenditures per worker understates the actual increase in the price of health insurance by 59 percentage points.

Real employer contributions followed a similar pattern for employees in both metro and nonmetro areas, as shown in Figure 2.5. However, small employers increased their contributions more than large employers. As illustrated in Figure 2.6, real employer contributions for health insurance by the smallest firms rose by 47% over the sample period. This compared to an increase of only 34% for the largest firms. However, regardless of the segment chosen, the quality of health insurance benefits clearly declined from 1987 to 2002.

When we looked only at employers who continued to provide health insurance benefits over the time period, employer expenditures rose only 45% compared to the increase in prices of 104%. As shown in Figure 2.7, though we found that both groups

followed the same general trends, metro employers increased their contributions more than nonmetro employers. This caused the metro-nonmetro gap to widen over the period studied. Including only the employers who provided health insurance, small and large employers contributed close to the same for health insurance. In fact, as illustrated in Figure 2.8, the firm-size gap narrowed between 1987 and 2002. In 1994, small employers actually contributed more than large employers to health insurance benefits.

Real hourly wages rose by 17% from 1987 to 2002, during this same period of rising health insurance costs, so it is possible that employers substituted wages for contributions to health insurance. As demonstrated in Figure 2.9, nonmetro workers received lower real hourly wages than metro workers. This regional gap was relatively stable over the time period. Consistent with other studies (see Brown and Medoff, 1990; Troske, 1999), employees in small firms had lower real hourly wages than employees in large firms. We found it interesting that, as shown in Figure 2.10, the gap between the smallest and largest firms narrowed from 1987 to 2002. Real hourly wages for employees in firms with less than 25 employees rose by 20%, compared with only 11% in firms with more than 1,000 employees.

Table 2.6 reports summary statistics for each dependent variable by metro status and the five different firm sizes. To illustrate key changes over the sample period, means are provided for 1987 and 2002.

Tables & Figures

Table 2.1: Percent of Workers with Firm-Provided Health Insurance Coverage

Year	All Workers	Single Workers
1987	63.2%	65.1%
1988	62.6%	65.4%
1989	62.1%	65.6%
1990	61.1%	63.7%
1991	59.9%	62.9%
1992	58.8%	61.7%
1993	59.7%	61.2%
1994	60.5%	63.3%
1995	59.4%	61.5%
1996	59.9%	62.1%
1997	60.1%	62.5%
1998	61.3%	64.2%
1999	60.8%	65.0%
2000	62.6%	66.5%
2001	61.8%	65.5%
2002	60.8%	63.7%

Note: Author compilation of average values for employees in the Current Population Survey, various years. Sample statistics are corrected for sample weights.

Table 2.2: Sample Statistics and Definitions

Variable	Mean	Standard Deviation	Description of Variable
BEN	0.637	0.481	Dummy variable: Indicates employer provides health insurance contribution
CON	1332.715	1399.512	Employer health insurance contribution
ln CON	4.749	3.625	Log of one plus the employer health insurance contribution
WAGE	13.368	13.123	Hourly wage last year
ln W	2.358	0.694	Log of hourly wage last year
INSPRICE	3560.478	1394.964	Cost of insurance
ln (PRICE)	8.104	0.385	Log of the cost of insurance
FT	0.898	0.302	Dummy variable: Worked full-time at least part of the prior year
MICROER	0.233	0.423	Dummy variable: Employed by a firm with <25 employees
SMER	0.149	0.356	Dummy variable: Employed by a firm with 25-99 employees
MEDER	0.162	0.369	Dummy variable: Employed by a firm with 100-499 employees
LGER	0.063	0.242	Dummy variable: Employed by a firm with 500-999 employees
INSTER	0.392	0.488	Dummy variable: Employed by a firm with 1000+ employees
FEMALE	0.487	0.500	Dummy variable: Female
BLACK	0.166	0.372	Dummy variable: Black
OTHMIN	0.040	0.196	Dummy variable: Other minority groups
WIDOW	0.046	0.209	Dummy variable: Widowed
DIVOR	0.378	0.485	Dummy variable: Divorced
CHILD<18	0.304	0.715	Number of children never married <18 in family
UNION	0.035	0.185	Dummy variable: Member of a labor union or covered by a labor union
EXP	18.529	10.153	Age—years of education—6
EDUC	13.189	2.628	Index of education level (from 0: none to 18: Master's degree or beyond)
TAX	0.218	0.036	Average sum of state and federal marginal tax rate in the state
ln (STEARN)	2.520	0.163	Log of state average manufacturing earnings
ln (PLAND)	7.312	0.688	Log of state average farmland value
URATE	5.534	1.464	State unemployment rate
ln (CPI)	5.400	0.120	Log of the consumer price index
METRO	0.851	0.356	Dummy variable: Metropolitan residence
AGE	37.718	9.673	Age
Number of Observations = 249,821			

Note: Author compilation of average values for single employees in the Current Population Survey, various years. Sample statistics are corrected for sample weights.

Table 2.3: Sample Statistics, by Metro Status

Variable	Mean: Metro	Mean: Nonmetro
BEN	.651 (.477)	.558 (.497)
CON	1398.182 (1423.612)	959.441 (1186.142)
ln CON	4.879 (3.610)	4.011 (3.625)
WAGE	13.870 (13.451)	10.503 (10.620)
ln W	2.398 (.687)	2.128 (.685)
FT	0.901 (0.298)	0.882 (.322)
MICROER	0.225 (0.417)	0.283 (.450)
SMER	0.148 (0.355)	0.153 (.360)
MEDER	0.157 (0.364)	0.194 (.395)
LGER	0.063 (0.242)	0.064 (.244)
INSTER	0.407 (0.491)	0.307 (.461)
FEMALE	0.488 (0.500)	0.477 (.499)
BLACK	0.172 (0.377)	0.129 (.335)
OTHMIN	0.042 (0.202)	0.025 (.158)
WIDOW	0.043 (.204)	0.060 (.238)
DIVOR	0.364 (0.481)	0.462 (.499)
CHILD<18	0.293 (0.703)	0.368 (.778)
UNION	0.036 (0.187)	0.030 (.170)
EXP	18.274 (10.129)	19.984 (10.171)
EDUC	13.300 (2.654)	12.559 (2.380)
TAX	0.218 (0.036)	0.215 (.036)
ln (STEARN)	2.525 (0.160)	2.490 (.176)
ln (PLAND)	7.363 (0.684)	7.023 (.631)
URATE	5.573 (1.462)	5.311 (1.458)
ln (CPI)	5.401 (0.120)	5.395 (.120)
AGE	37.574 (9.655)	38.543 (9.735)
Number of Observations	203,453	46,368

Note: Author compilation of average values for single employees in the Current Population Survey, various years. Standard deviations in parenthesis. Sample statistics are corrected for sample weights.

Table 2.4: Sample Statistics, by Firm Size

Variable	Mean: <25 employees	Mean: 25-99 employees	Mean: 100-499 employees	Mean: 500-999 employees	Mean: 1000+ employees
BEN	0.372	0.601	0.696	0.747	0.767
	(0.483)	(0.490)	(0.460)	(0.435)	(0.423)
CON	757.946	1205.763	1420.979	1548.455	1651.528
	(1236.185)	(1339.993)	(1357.092)	(1377.210)	(1421.244)
ln CON	2.759	4.455	5.173	5.558	5.739
	(3.612)	(3.668)	(3.466)	(3.292)	(3.220)
WAGE	11.281	12.224	13.191	14.218	14.979
	(12.719)	(12.508)	(12.821)	(13.975)	(13.346)
ln W	2.152	2.271	2.357	2.437	2.501
	(0.734)	(0.689)	(0.678)	(0.667)	(0.644)
FT	0.841	0.907	0.921	0.923	0.916
	(0.365)	(0.290)	(0.270)	(0.267)	(0.278)
FEMALE	0.425	0.440	0.498	0.536	0.529
	(0.494)	(0.496)	(0.500)	(0.499)	(0.499)
BLACK	0.125	0.143	0.162	0.180	0.198
	(0.330)	(0.350)	(0.369)	(0.384)	(0.398)
OTHMIN	0.040	0.037	0.039	0.042	0.041
	(0.196)	(0.190)	(0.194)	(0.202)	(0.197)
WIDOW	0.046	0.044	0.048	0.049	0.045
	(0.210)	(.206)	(.214)	(.217)	(.207)
DIVOR	0.371	0.365	0.379	0.388	0.386
	(0.483)	(0.482)	(0.485)	(0.487)	(0.487)
CHILD<18	0.298	0.308	0.307	0.312	0.304
	(0.716)	(0.729)	(0.715)	(0.714)	(0.710)
UNION	0.010	0.023	0.038	0.041	0.053
	(0.101)	(0.150)	(0.191)	(0.199)	(0.224)
EXP	18.729	18.221	18.636	18.601	18.471
	(10.125)	(10.078)	(10.175)	(10.149)	(10.187)
EDUC	12.629	12.859	13.169	13.483	13.610
	(2.735)	(2.706)	(2.679)	(2.560)	(2.436)
TAX	0.216	0.218	0.219	0.219	0.218
	(0.037)	(0.036)	(0.036)	(0.036)	(0.037)
ln (STEARN)	2.516	2.519	2.522	2.525	2.520
	(0.162)	(0.163)	(0.164)	(0.163)	(0.163)
ln (PLAND)	7.300	7.316	7.326	7.339	7.308
	(0.699)	(0.696)	(0.681)	(0.678)	(0.681)
URATE	5.580	5.551	5.516	5.501	5.512
	(1.473)	(1.475)	(1.469)	(1.461)	(1.453)
ln (CPI)	5.401	5.397	5.397	5.402	5.401
	(0.119)	(0.121)	(0.120)	(0.120)	(0.120)
METRO	.819	.847	.821	.849	.883
	(.385)	(.360)	(.383)	(.358)	(.321)
AGE	37.358	37.080	37.805	38.084	38.081
	(9.646)	(9.534)	(9.670)	(9.673)	(9.722)
Number of Observations	59,074	37,855	40,753	15,597	96,542

Note: Author compilation of average values for single employees in the Current Population Survey, various years. Standard deviations in parenthesis. Sample statistics are corrected for sample weights.

Table 2.5: Average Real Insurance Costs, Tax Rates, and Benefit Levels, 1987-2002

	1987	1990	1993	1996	1999	2002
Insurance Cost Index[a,b]	1.0	1.12	1.34	1.53	1.59	2.04
Benefit Level Index[a]	1.0	1.11	1.30	1.32	1.22	1.42
Coverage Rate[c]	.63	.61	.59	.60	.61	.61
Benefit Level Index for Covered Employees[a,d]	1.0	1.13	1.38	1.38	1.22	1.45
Marginal Tax Rate	0.22	0.22	0.21	0.21	0.23	0.21

Source: Author compilation of average values for single employees in the Current Population Surveys, various years. Corrected for sample weights.

[a] In constant 1977 dollars.

[b] Based on data provided by a national insurance company and the Source Book of Health Insurance Data.

[c] Proportion of employees covered by firm-provided health insurance benefits.

[d] Excludes all employees who are not covered by firm-provided health insurance benefits.

Table 2.6: Mean Values of Dependent Variables, 1987 and 2002

	% Covered by Firm-provided Health Insurance		Real Employer Contribution for Health Insurance[a b]		Real Hourly Wage[b]	
	1987	2002	1987	2002	1987	2002
Metro	66.7	64.8	875.1	1235.8	10.0	11.7
Nonmetro	56.2	57.3	587.7	834.6	7.4	8.6
<25 employees	38.4	37.8	454.8	666.6	7.5	9.0
25-99 employees	60.2	60.3	733.9	1105.2	8.7	11.0
100-499 employees	68.3	71.0	834.6	1294.2	9.3	11.5
500-999 employees	77.2	74.0	953.0	1356.4	10.4	11.9
>999 employees	79.7	76.1	1074.9	1439.9	11.2	12.5

Note: Author compilation of average values for single employees in the Current Population Survey. Corrected for sample weights.

[a]Averages include zeroes for firms not providing health insurance.

[b] Base CPI year = 1987.

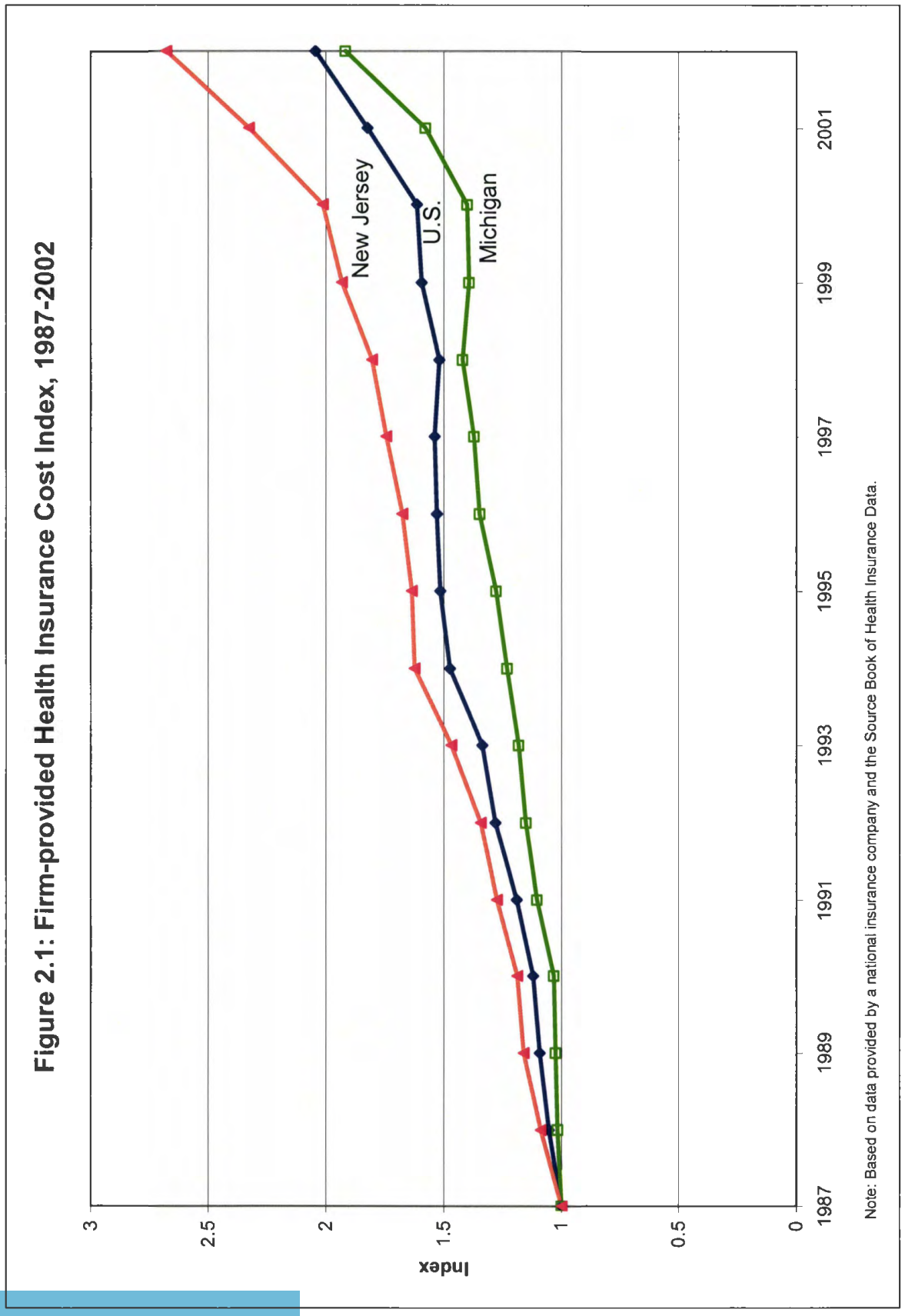
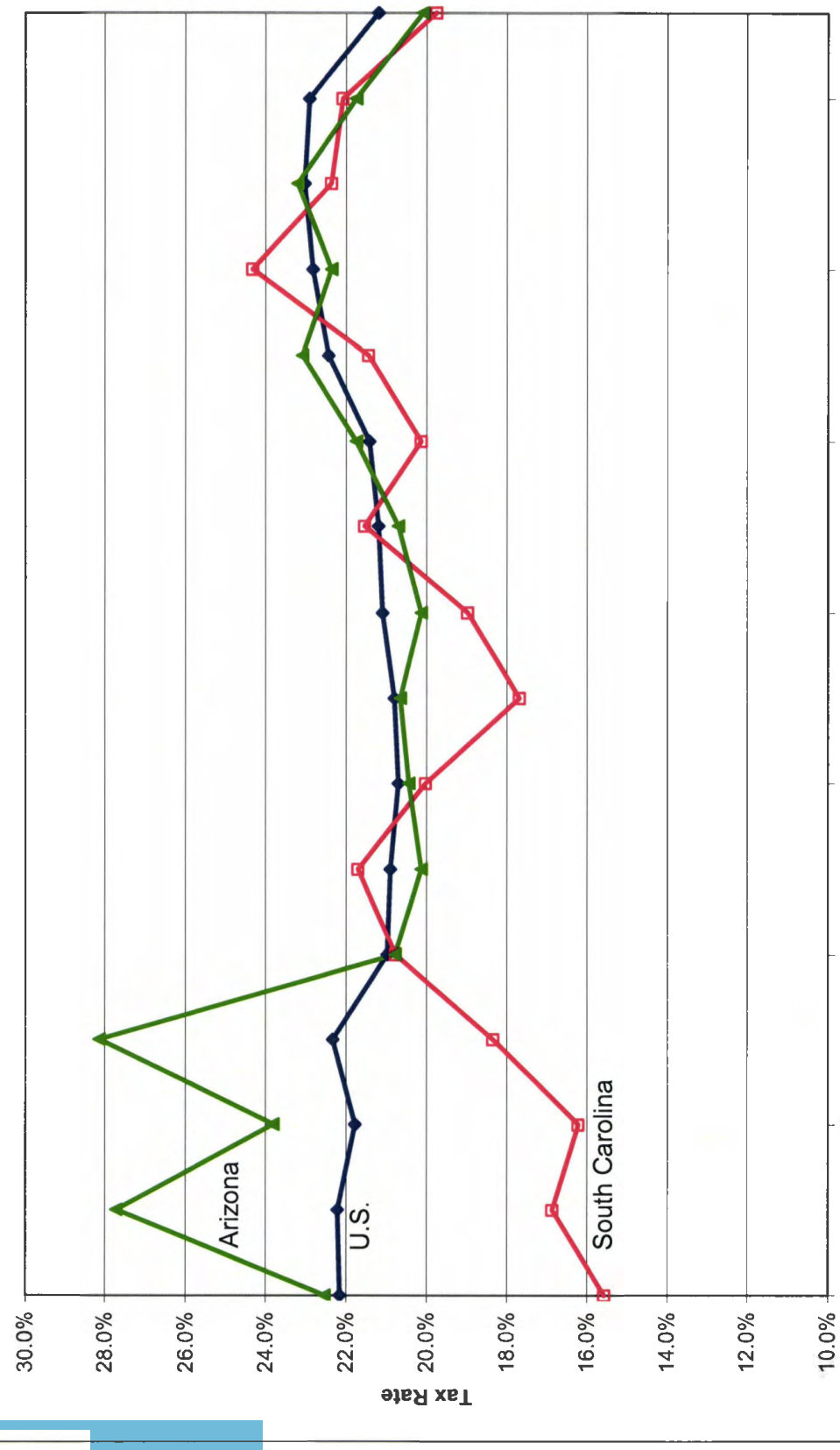
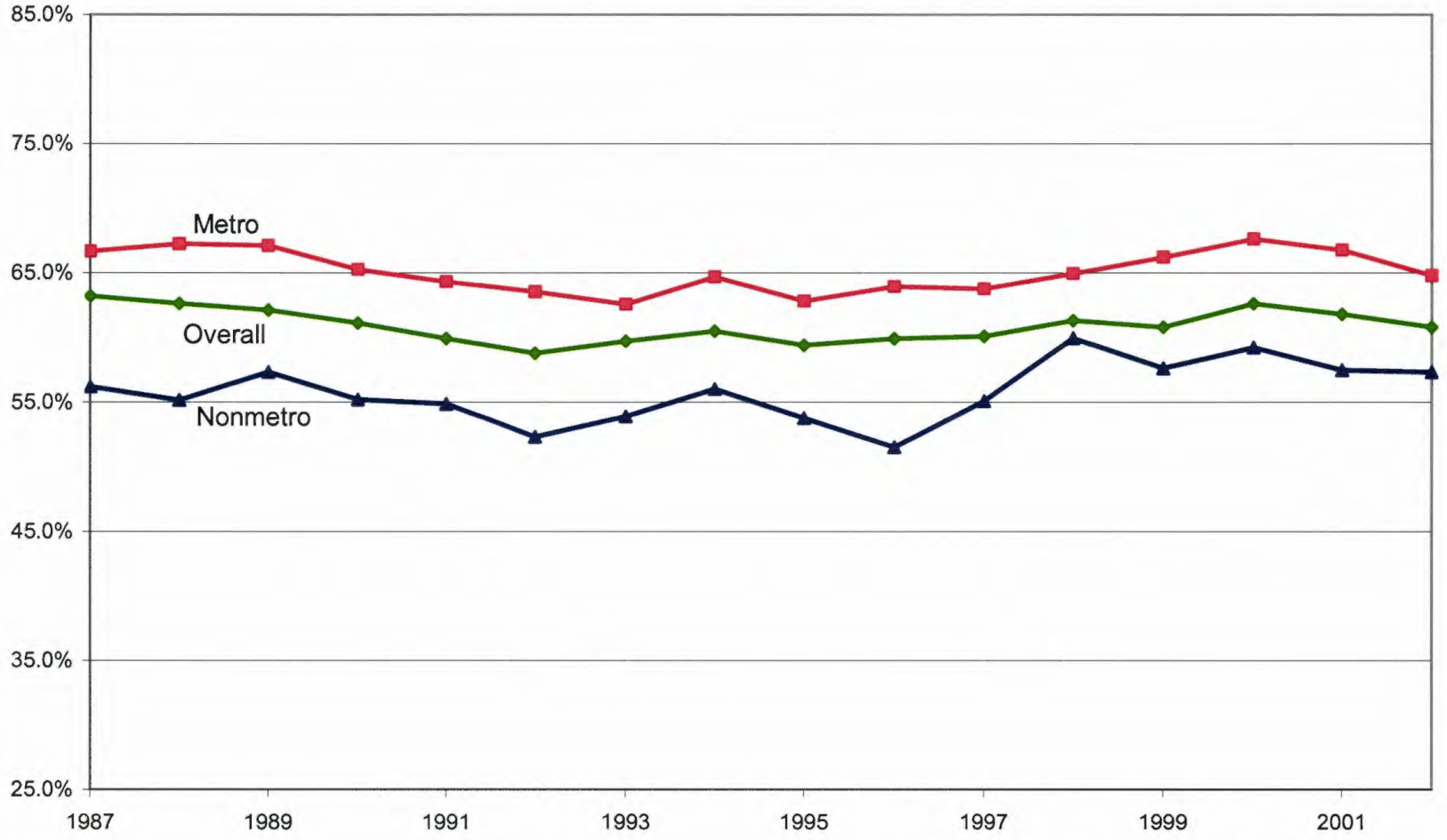


Figure 2.2: Average Tax Rate, 1987-2002



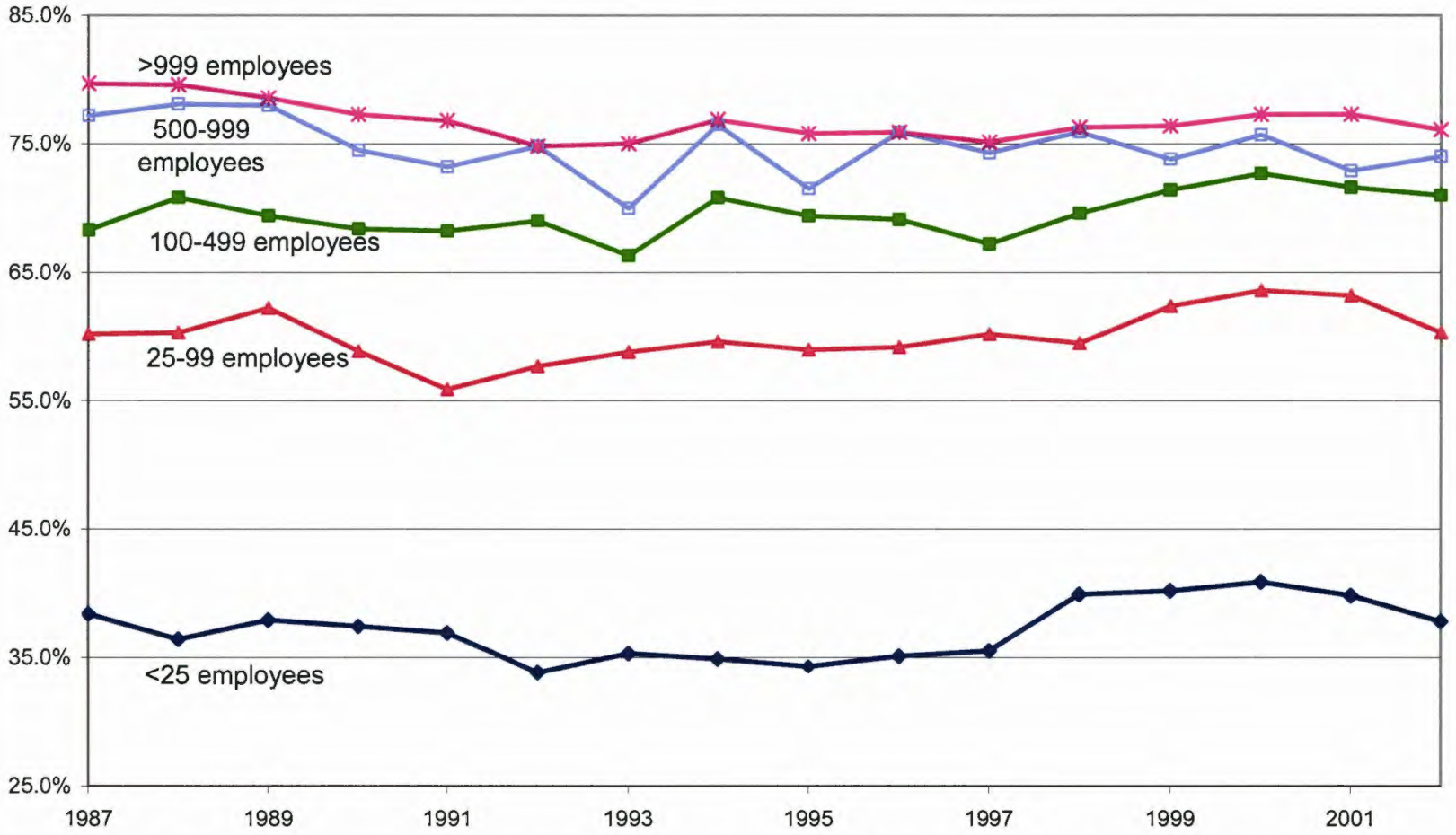
Note: Author calculations based on data from the Current Population Survey. Tax rate defined as the average sum of state and federal marginal tax rate in the state.

Figure 2.3: Percent of Single Workers with Firm Provided Health Insurance Coverage, by Metro Status



Note: Author calculations of frequency weighted average values. Based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002.

Figure 2.4: Percent of Single Workers with Firm Provided Health Insurance Coverage, by Firm Size



Note: Author calculations of frequency weighted average values. Based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002.

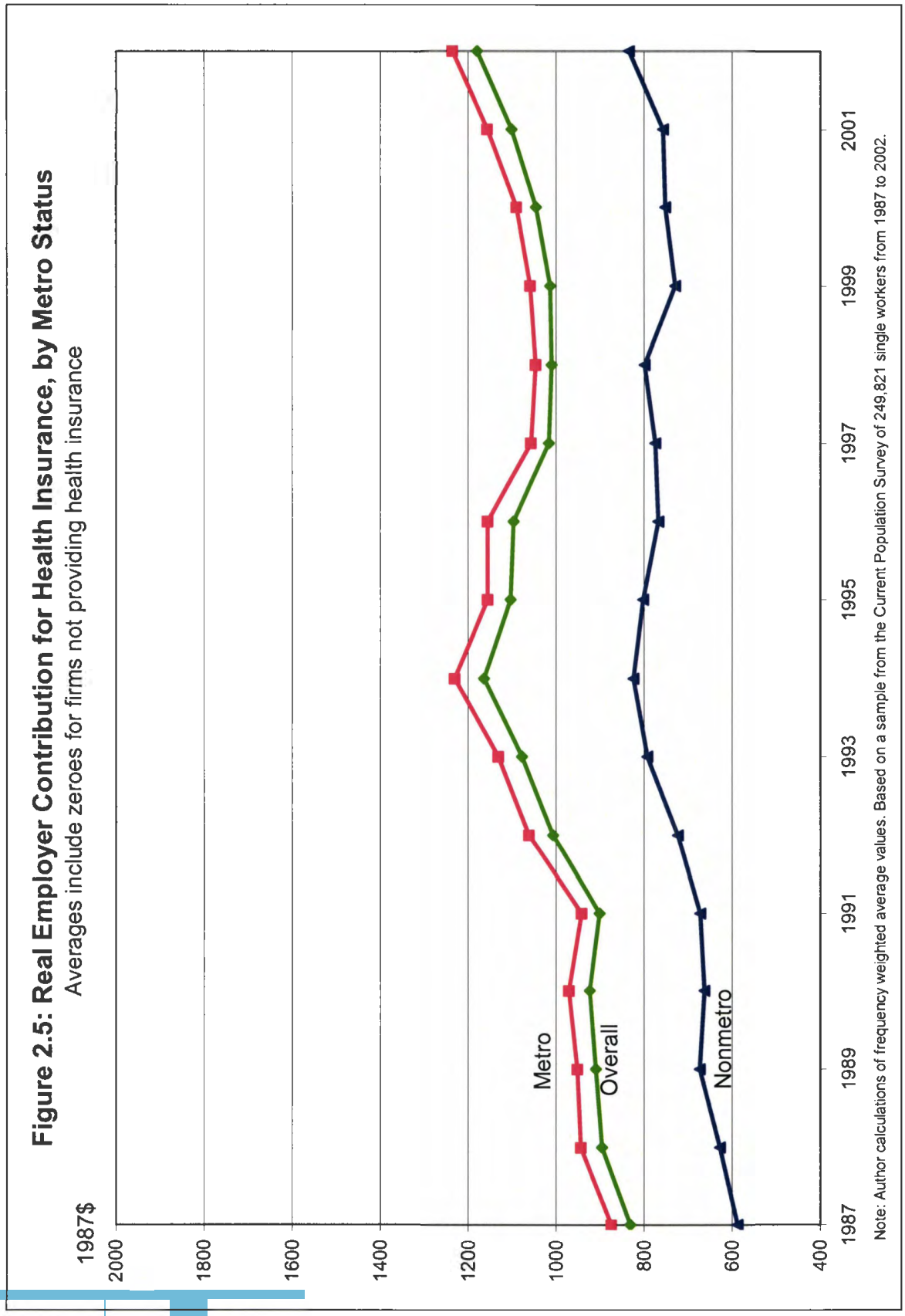
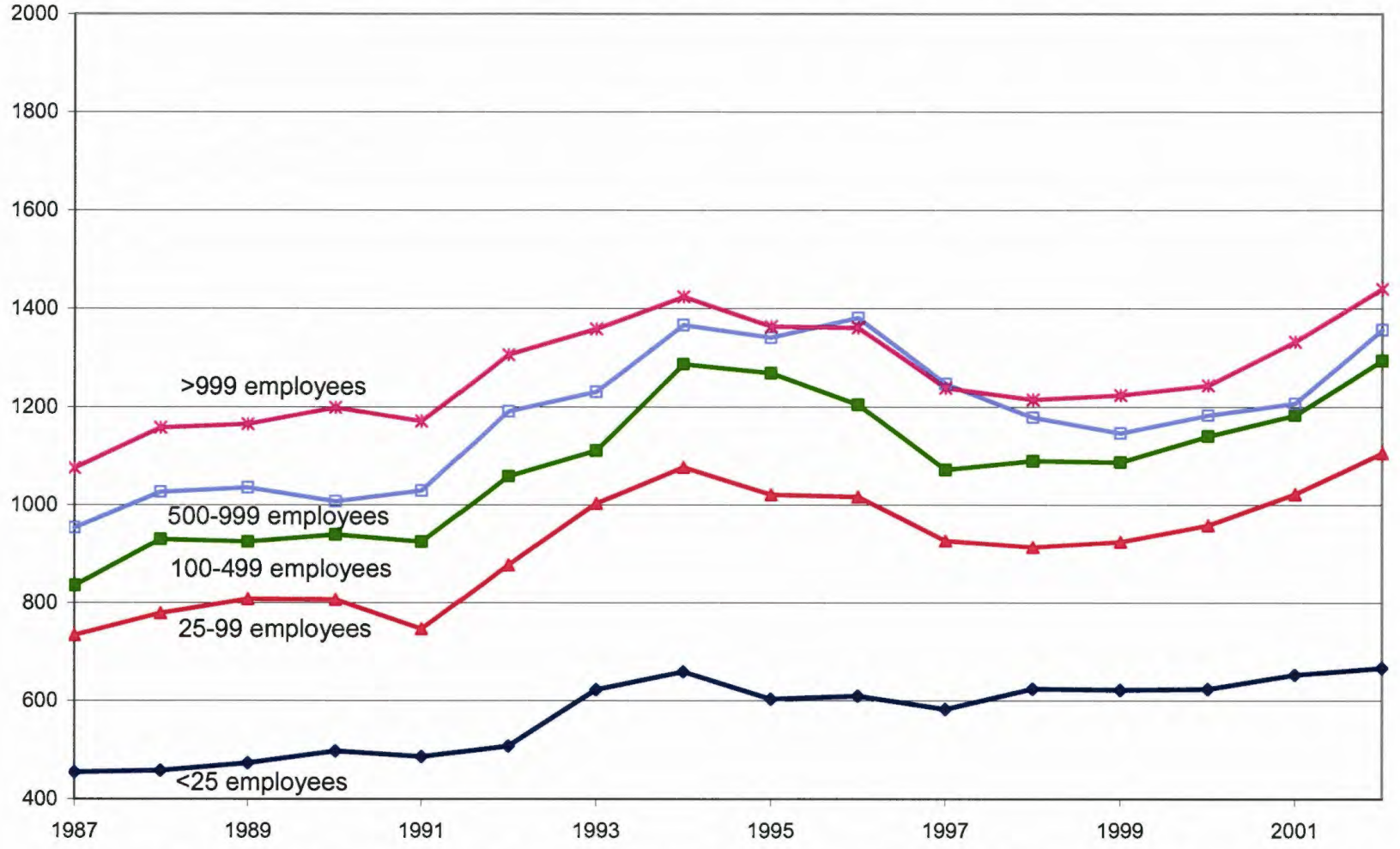
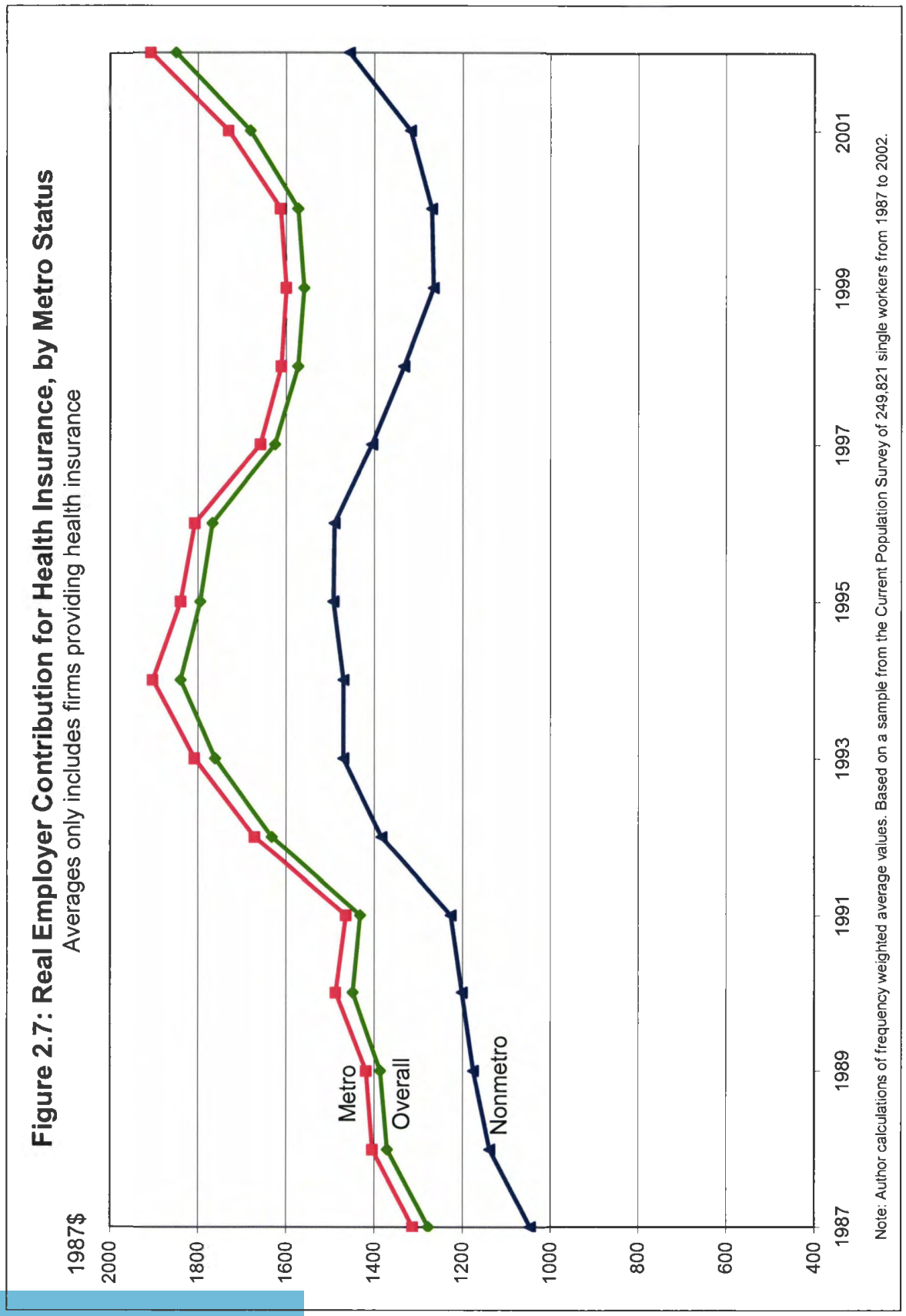


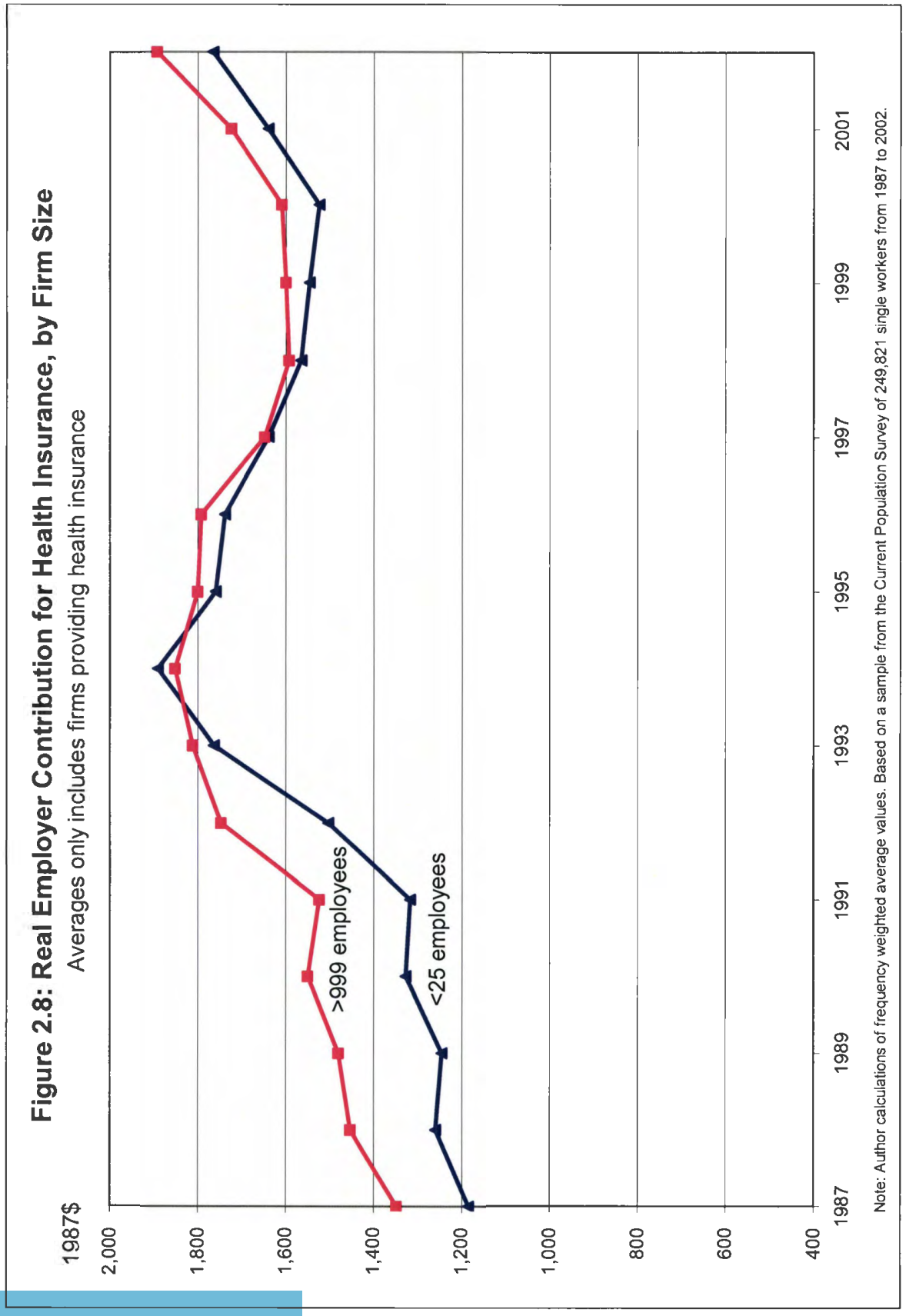
Figure 2.6: Real Employer Contribution for Health Insurance, by Firm Size

Averages include zeroes for firms not providing health insurance



Note: Author calculations of frequency weighted average values. Based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002.





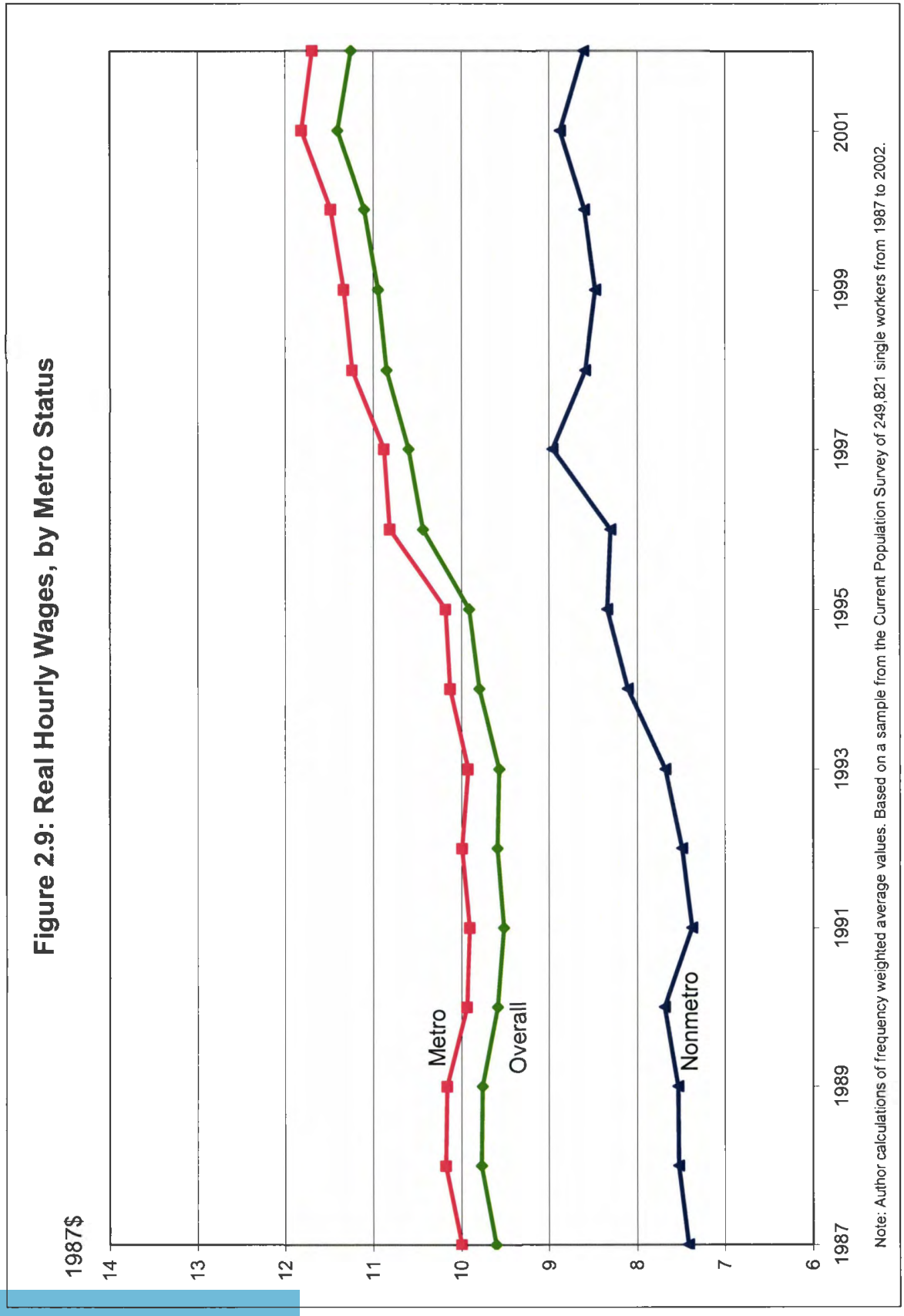
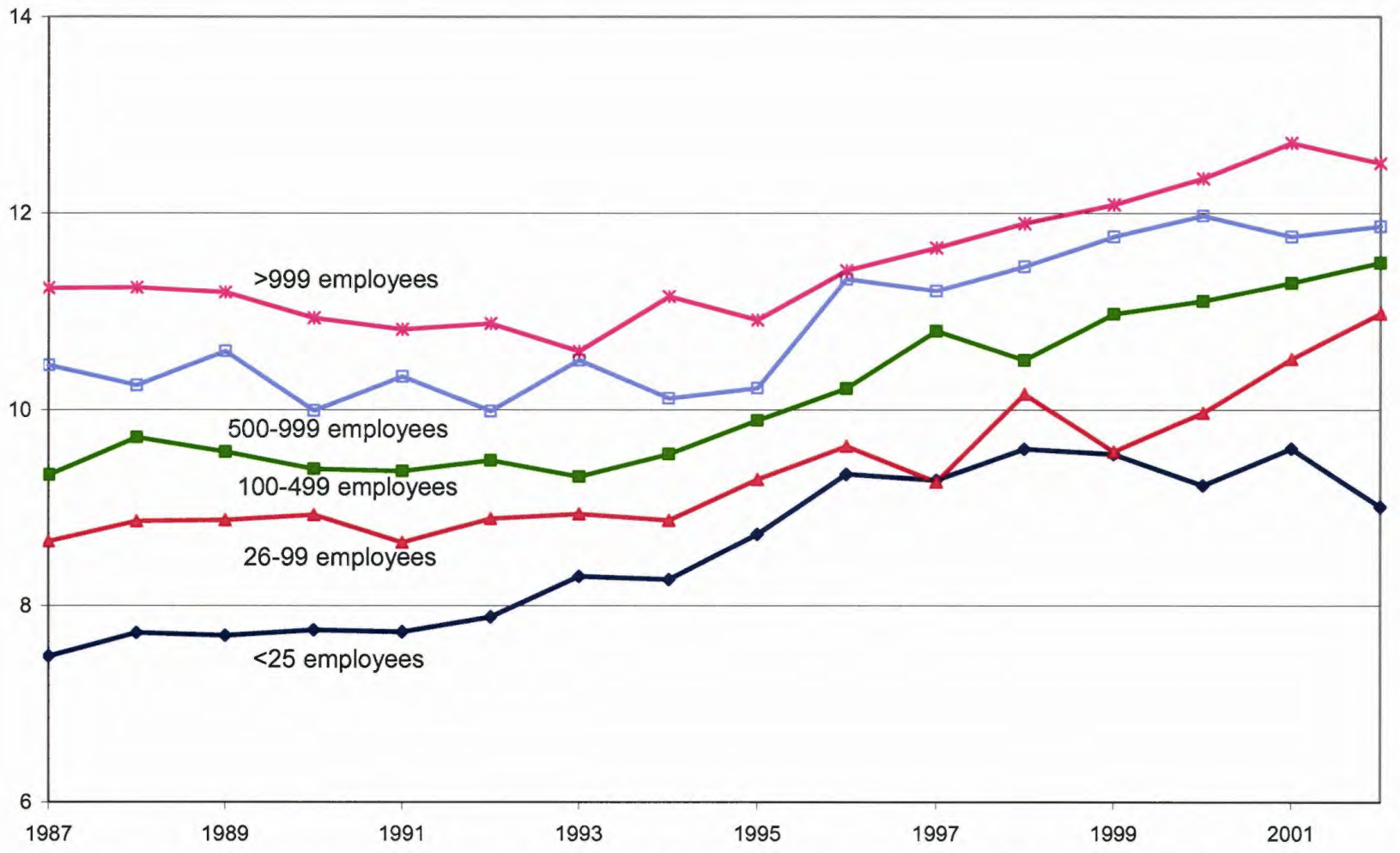


Figure 2.10: Real Hourly Wages, by Firm Size



Note: Author calculations of frequency weighted average values. Based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002.

Chapter 3: Metro-nonmetro Differences in Health Insurance Coverage, Health Insurance Quality, and Wages

Empirical Model

We use the following probit model to determine the underlying factors influencing whether an individual is covered by employer-provided health insurance. Where possible, we transform variables into logarithmic form so that their associated coefficients can be interpreted as elasticities.

$$(3.1)\ \mathrm{BEN} = \mathrm{B}_0 + \mathrm{B}_1 \ln(\mathrm{price}) + \mathrm{B}_2\mathrm{ft} + \mathrm{B}_3\mathrm{firmsz} + \mathrm{B}_4\mathrm{tax} + \mathrm{B}_5\mathrm{metro} + \mathrm{B}_6\mathrm{P} + \mathrm{B}_7\tau + \mathrm{B}_8\mathrm{Z} + \mathrm{B}_9\mathrm{L} + \mathrm{e}_{\mathrm{BEN}}$$

where BEN is a binary indicator of whether the individual is covered by firm-provided health insurance, tax is the marginal tax rate, P is a vector of cost of living measures, τ is a vector of personal characteristics, L is a vector of local labor market conditions, Z is a vector of skills. Ft and metro are dummy variables for full-time status and metropolitan residence respectively. Firmsz is a dummy variable for the size of the employer, which we use as an indicator of the fixed capital.

We apply the following ordinary least squares (OLS) model to determine the underlying factors driving an employer's contribution to health insurance. Where possible, we transform variables into logarithmic form so that their associated coefficients can be interpreted as elasticities.

$$(3.2)\ \ln\mathrm{CON} = \mathrm{B}_0 + \mathrm{B}_1 \ln(\mathrm{price}) + \mathrm{B}_2\mathrm{ft} + \mathrm{B}_3\mathrm{firmsz} + \mathrm{B}_4\mathrm{tax} + \mathrm{B}_5\mathrm{metro} + \mathrm{B}_6\mathrm{P} + \mathrm{B}_7\tau + \mathrm{B}_8\mathrm{Z} + \mathrm{B}_9\mathrm{L} + \mathrm{e}_{\mathrm{CON}}$$

where CON is a continuous measure of the dollar amount the employer contributes to health insurance and all other variables are as defined in Equation 3.1. Since the natural log must be greater than 0, we change the dollar amount of an employer's contribution from \$0 to \$1 if they do not provide health insurance.

We utilize the following OLS model to determine the underlying factors affecting an employer's wage decision. Where possible, we transform variables into logarithmic form so that their associated coefficients can be interpreted as elasticities.

$$(3.3)\ \ln W = B_0 + B_1 \ln(\text{price}) + B_2 \text{ft} + B_3 \text{firmsz} + B_4 \text{tax} + B_5 \text{metro} + B_6 P + B_7 \tau + B_8 Z + B_9 L + e_W$$

where W is the individual's hourly wage and all other variables are as defined in Equation 3.1.

One of our objectives is to identify the underlying reasons for the difference in health insurance benefits and wages between workers residing in metro and nonmetro areas. We also want to investigate why these differences have changed over time. To accomplish this, we split the data set into metro and nonmetro regions and use the models identified in Equations 3.1 through 3.3. In each case, we run a separate model that interacts metro status with each independent variable to determine whether the metro-nonmetro difference is statistically significant.

Results

Firm-provided health insurance coverage and quality. The first column in Table 3.1 reports the estimates with firm provided health insurance coverage as the dependent variable. The second column in Table 3.1 reports the estimates using the employer contribution to health insurance as the dependent variable. All independent variables are significant at the .01 level. As expected, employees working for firms that face higher insurance costs are significantly less likely to be covered by employer-provided health insurance. A 10% increase in health insurance premiums causes a 0.4% decrease in the probability of getting benefits. Additionally, the employer's contribution to health insurance decreases as the cost of health insurance rises. A 10% increase in health insurance premiums causes a 1.4% decrease in real employer contributions.

Higher average state and federal marginal income tax rates lead to a higher probability of firm-provided health insurance coverage. A 10% increase in the marginal tax rate raises the probability of health insurance coverage by 1.2%. Higher marginal income tax rates also lead to a higher employer contribution for health insurance. A 10% increase in the marginal tax rate raises the employer contribution for health insurance by 6.3%.

In Figure 3.1, we show how the estimated probability of firm-provided health insurance coverage changes holding the cost of health insurance and marginal tax rates fixed at their 1987 values. The sample means of all other variables are allowed to change each year. Our simulation demonstrates that the estimated probability of health insurance coverage in 2002 would be 66.7% instead of 62.1% if prices and taxes had remained at their 1987 level. The rising cost of health insurance accounts for the majority of this difference.

In Figure 3.2, we present a similar simulation for the log of employer contributions to health insurance. As before, we hold the cost of health insurance and marginal tax rates fixed at their 1987 values and allow the sample means of all other variables to change each year. Our simulation shows that the log of employer contributions would be 5.0 instead of 4.8 if prices and taxes had remained at their 1987 levels. This implies that contributions decreased by 18.2% from 1987 to 2002 due to changes in prices and taxes. Again, the rising cost of health insurance accounts for the majority of this decrease.

A number of other independent variables in our equation influenced health insurance benefits. First, the probability of firm-provided health insurance coverage and the quality of this insurance rises with skill. At the sample means, the probability of health insurance coverage rises by 0.5% per year of experience and 4.1% per year of educational attainment. The corresponding impacts on an employer's contribution to health insurance are 3.3% per year of experience and 26% per added education level. Second, both the probability of benefits and the employer contribution to benefits are higher for whites, females, and those

covered by a union.[5] Third, employees in the smallest firms are 36.9% less likely to be covered by firm-provided health insurance than employees in the largest firms and receive 91.4% lower contributions to health insurance. Finally, employees in areas with rising employment are significantly more likely to be covered by employer-provided health insurance, and also receive a higher quality of health insurance. This suggests that benefits are used to attract or retain workers as labor markets tighten.

Firm-provided health insurance coverage, by metro status. Workers residing in metro areas are 5.3% more likely to be covered by employer-provided health insurance than workers residing in nonmetro areas, holding everything else constant. The first column in Table 3.2 reports the estimates for metro areas using health insurance coverage through an employer as the dependent variable. The second column in Table 3.2 reports similar estimates for nonmetro areas. The third column in Table 3.2 reports whether these estimates are significantly different between metro and nonmetro areas. All independent variables are significant at the .01 level.

We found that health insurance costs, taxes, and union coverage have significantly larger effects in nonmetro areas. Our calculations show a 10% increase in health insurance premiums causes a 0.7% decrease in the probability of health insurance coverage for nonmetro residents and a 0.4% decrease for metro residents. The tax elasticity is 0.20 in nonmetro areas and 0.10 in metro areas. This implies a 10% increase in tax rates in nonmetro areas will raise the probability of health insurance coverage by 2.0%. The corresponding effect in metro areas is only 1.0%. Nonmetro residents covered by a union are 21.1% more likely to have health insurance coverage than nonmetro residents not covered by a union. The corresponding effect in metro areas is only 15.4%.

In Figure 3.3, we show how the estimated probability of being covered by firm-provided health insurance changes for residents in metro and nonmetro areas holding

health insurance costs and tax rates fixed at their 1987 value. The sample means of all other variables are allowed to change each year. Our simulation demonstrates that the estimated probability of health insurance coverage for metro areas in 2002 would be 68.3% instead of 63.4% if prices and taxes had remained at their 1987 levels. The estimated probability of health insurance coverage for nonmetro areas would be 57.7% instead of 53.8%.

Employer's contribution to health insurance, by metro status. Workers residing in metro areas receive 61% higher employer contributions to benefits than do workers residing in nonmetro areas, holding everything else constant. The first column in Table 3.3 reports the estimates for metro areas using the employer contribution to health insurance as the dependent variable. The second column in Table 3.3 reports similar estimates for nonmetro areas. The third column in Table 3.3 reports whether these estimates are significantly different between metro and nonmetro areas. All independent variables are significant at the .01 level.

Health insurance costs and union coverage have significantly larger effects for nonmetro residents. A 10% increase in health insurance premiums causes a 3.3% decrease in real employer contributions for nonmetro residents and a 1.3% decrease for metro residents. Nonmetro residents covered by a union receive 250% higher contributions to health insurance than nonmetro residents not covered by a union. The corresponding effect in metro areas is less at 181%.

Conversely, gender and tax rates have significantly smaller effects for nonmetro residents. Females residing in nonmetro areas receive a 9.4% lower employer contribution than males residing in nonmetro areas. On the other hand, females in metro areas receive a 26% higher employer contribution than males in metro areas. The tax elasticity is 0.66 in metro areas and 0.60 in nonmetro areas. This implies a 10% increase in tax rates in metro

areas will raise the employer contribution to benefits by 6.6%. The corresponding effect in nonmetro areas is only 6.0%.

In Figure 3.4, we show how the log of employer contributions to health insurance changes for residents in metro and nonmetro areas holding the health insurance costs and tax rates at their 1987 value. The sample means of all other variables are allowed to change each year. The simulation shows that the log of employer contributions in metro areas would be 5.1 instead of 4.9 in 2002 if prices and taxes had remained at their 1987 levels. The log of employer contributions in nonmetro areas would be 4.4 instead of 4.0. This implies that the changes in prices and taxes between 1987 and 2002 lowered contributions to health insurance by 17.9% in metro areas and 32.4% in nonmetro areas.

Workers residing in nonmetro areas are more likely to work for a small employer, a factor that causes lower health insurance coverage and contributions. The Center for the Study of Rural America (2001) found that approximately three-fourths of all rural firms (over a million firms) had fewer than 20 employees in 1998. In our sample, 28% of nonmetro residents are employed by the smallest firms with less than 25 employees. In contrast, only 22% of metro residents are employed by the smallest firms. As discussed before, benefits provision and quality is lower in small firms.

Hourly wages. Table 3.4 reports the estimates with the log of wage as the dependent variable. All independent variables are significant at the .01 level. We find that wages increase in response to higher health insurance costs, as would be expected if firms trade off wages and benefits. A 10% increase in health insurance premiums causes a 1.5% increase in wages. Higher average state and federal marginal income tax rates also lead to higher wages. The tax elasticity is 0.21. Therefore, a 10% increase in the tax rate causes a 2.1% increase in wages. The positive effect of income taxes on wages suggests that some of the incidence of the income tax is shifted from workers to firms.

We examine the effect of other key variables on wages, outside of cost and taxes. First, we found that wages rise with skill. At the sample mean, wages rise by 0.9% per year of experience and 9.7% per year of educational attainment. Second, wages are higher for whites, males, and those covered by a union. Finally, the unemployment rate has very little impact on wages.

In Figure 3.5, we show how the log of wages changes holding the cost of health insurance and marginal tax rates at their 1987 value. The sample means of all other variables are allowed to change each year. The simulation shows that wages would be 2.4 instead of 2.6 if prices and taxes had remained at their 1987 level. This implies that wages increased by 17.9% from 1987 to 2002 due to the changes in prices and taxes. The cost of health insurance accounts for the majority of this decrease.

In Figure 3.6, we demonstrate the tradeoff between wages and benefits through a simulation. We allow the cost of health insurance and marginal tax rates to vary, while holding the sample means of all other variables fixed at their 1987 value. In response to rising health insurance costs and changing tax rates, the employer's contribution to health insurance decreases and wages increase. The correlation between wages and the employer's contribution in the simulation is –0.79.

Hourly wages, by metro status. Workers residing in metro areas receive 17% higher wages than workers residing in nonmetro areas, holding everything else constant. The first column in Table 3.5 reports the estimates for metro areas using the log of wages as the dependent variable. The second column in Table 3.5 reports similar estimates for nonmetro areas. The third column in Table 3.5 reports whether these estimates are significantly different between metro and nonmetro areas. All independent variables are significant at the .01 level.

Health insurance costs and tax rates have significantly larger effects in metro areas. A 10% increase in health insurance premiums causes a 1.7% increase in wages for metro residents and a 0.4% increase for nonmetro residents. The tax elasticity is 0.23 in metro areas and 0.09 in nonmetro areas. This implies a 10% increase in tax rates in metro areas will raise wages by 2.3%. The corresponding effect in nonmetro areas is only 0.9%.

In Figure 3.7, we show how the log of wages changes for residents in metro and nonmetro areas holding health insurance costs and tax rates fixed at their 1987 value. The sample means of all other variables are allowed to change each year. Rising health insurance costs widened the metro-nonmetro wage gap. The simulation shows that the log of wages in metro areas would be 2.4 instead of 2.6 if prices and taxes had remained at their 1987 level. The log of wages in nonmetro areas would be 2.3 instead of 2.4 if prices and taxes had remained at their 1987 level. This implies that the changes in prices and taxes between 1987 and 2002 increased wages by 18.6% in metro areas and 4.3% in nonmetro areas.

Decomposition of Metro-nonmetro Gaps

We estimate how much of the observed differences in firm-provided health insurance coverage between workers residing in metro and nonmetro areas can be explained by our model using a variation of Blinder-Oaxaca decompositions (Blinder, 1973; Oaxaca, 1973) adapted to the probit regression model. The original Blinder-Oaxaca decompositions assumed a linear regression model. However, a probit model cannot be decomposed exactly because it is nonlinear. Some studies use the coefficient estimates from a linear probability model to approximate the decomposition (Fairlie, 2004; Kilkenny and Huffman, 2003). The potential problem is that the linear probability model is sensitive to outliers and it is possible to have an estimated probability over 1 or under 0. Our decomposition strategy follows that of Moohoun Song (2005).

The explained difference between metro and nonmetro health insurance coverage is

$$D_{BEN} = F(\overline{X}^{M}\beta^{M}) - F(\overline{X}^{NM}\beta^{M})$$

where F is the normal density function, D_{BEN} is the observed difference in health insurance coverage between metro and nonmetro areas, $\overline{X}$ is a vector of average values of all the independent variable in area j and β is a vector of the coefficient in area j. We calculate the share of each variable i in explaining this gap by

$$X_i = \frac{(\overline{x}_i^{M} - \overline{x}_i^{NM})\beta_i^{M}}{(\overline{X}^{M} - \overline{X}^{NM})\beta^{M}}$$

where $\overline{x}_i^{j}$ is the average value of independent variable i in area j and B_i^{m} is the associated coefficient estimate. By multiplying D_{ben} by X_i we can estimate the explained metro-nonmetro difference attributable to independent variable i.

The first column in Table 3.6 reports the results from this decomposition. Negative values mean the variable lowers the difference between metro and nonmetro areas while positive numbers increase the difference. The total difference in firm-provided health insurance coverage is 11.1%. Overall, our model explains 5.6% of the difference in coverage, leaving 5.5% unexplained. Lower education levels in nonmetro areas are responsible for the largest portion of the explained gap, or 82%. This is partially offset by higher experience in nonmetro areas, which serves to shrink the gap. The higher incidence of workers employed by the smallest firms in nonmetro areas accounts for 37% of the explained gap. Even though the cost of health insurance and the marginal tax rate have significant effects on the probability of health insurance coverage, they explain little of the gap in coverage between metro and nonmetro areas. Marginal tax rates do not vary greatly between metro and nonmetro areas, and so they cannot explain the gap. There is a more substantial difference in average health insurance costs across metro and nonmetro areas,

but the gap favors rural firms. Nevertheless, the firm response to health insurance price is too inelastic for the cost difference to explain much of the gap in firm provision.

Next, we estimate how much of the observed difference in the employer's contribution to health insurance between workers residing in metro and nonmetro areas can be explained by our model. Because our model is linear, we are able to use the original Blinder-Oaxaca decomposition. The explained difference between metro and nonmetro areas is

$$D_{\ln CON} = (\overline{X}^{M}\beta^{M}) - (\overline{X}^{NM}\beta^{M})$$

where $D_{\ln CON}$ is the observed difference in an employer's contribution to health insurance between metro and nonmetro areas, $\overline{X}$ is a vector of average values of all the independent variable in area j and β is a vector of the coefficient in area j. We calculate the share of each variable i in explaining this gap by

$$X_i = \frac{(\overline{x}_i^{M} - \overline{x}_i^{NM})\beta_i^{M}}{(\overline{X}^{M} - \overline{X}^{NM})\beta^{M}}$$

where $\overline{x}_i^{j}$ is an average value of independent variable i in area j and B_i^{m} is the associated coefficient estimate.

The second column in Table 3.6 reports the results from this decomposition. Negative values mean the variable lowers the difference between metro and nonmetro areas while positive values increase the difference. The total difference in the log of the employer's contribution to health insurance is 0.88. Overall, our model explains 0.4 of the difference in the employer's contribution, leaving 0.48 unexplained. In other words, our model explains 45% of the difference. Our results are very similar to the health insurance coverage decomposition. Lower education levels in nonmetro areas are responsible for the largest portion of the explained gap, at 77%. This is partially offset by higher experience in

nonmetro areas, which serves to shrink the gap. The higher incidence of nonmetro residents employed by the smallest firms accounts for 35% of the explained gap in employer contributions. Local labor market conditions, such as the unemployment rate and union coverage, are responsible for 15.6% of the explained gap. Health insurance costs and marginal tax rates explain little of the difference in an employer's contributions to health insurance between residents in metro and nonmetro areas.

Last, we estimate how much of the observed differences in wages between workers residing in metro and nonmetro areas can be explained by our model. Because our model is linear, we are able to use the original Blinder-Oaxaca decomposition. The explained difference between metro and nonmetro areas is

$$D_{\ln W} = (\overline{X}^{M}\beta^{M}) - (\overline{X}^{NM}\beta^{M})$$

where $D_{\ln W}$ is the observed difference in wages between metro and nonmetro areas, $\overline{X}$ is a vector of average values of all the independent variable in area j and β is a vector of the coefficient in area j. We calculate the share of each variable i in explaining this gap by

$$X_i = \frac{(\overline{x}_i^{M} - \overline{x}_i^{NM})\beta_i^{M}}{(\overline{X}^{M} - \overline{X}^{NM})\beta^{M}}$$

where $\overline{x}_i^{j}$ is an average value of independent variable i in area j and B_i^{m} is the associated coefficient estimate.

The third column in Table 3.6 reports the results from this decomposition. Negative values mean the variable lowers the difference between metro and nonmetro areas while positive numbers increase the difference. The total difference in the log of wages is 0.28. Overall, our model explains 0.12 of the difference in the log of wages, leaving 0.16 unexplained. In other words, our model explains 43% of the difference. Our results for wages vary somewhat from the benefit decompositions. Health insurance costs account for

21.9% of the explained gap, a substantial portion. The higher incidence of nonmetro residents employed by the smallest firms is responsible for 12.3% of the explained gap, a smaller fraction than that found in the benefit decompositions. Personal characteristics such as gender and race serve to shrink the gap. Similar to prior results, education still explains the largest portion of the gap. Also, marginal tax rates explain little of the difference in wages between workers residing in metro and nonmetro areas.

Conclusions

Our first objective was to determine the impact of rising health insurance costs on health insurance coverage, health insurance quality, and wages. We found that the increased cost of health insurance had a substantial effect on both the probability that employees were covered by firm-provided health insurance and the employer's contribution to health insurance. The 104% increase in the real price of health insurance between 1987 and 2002 lowered the probability of health insurance coverage by 4.3% and caused firms to lower their contribution to health insurance by 15.8%. Importantly, firms were more apt to decrease the level of health insurance benefits than to eliminate the benefit completely. We found a clear tradeoff between wages and benefits. Wages increased by 19% over the sample period in response to higher health insurance costs.

Our second objective was to determine the effect of changes in marginal tax rates on health insurance coverage, health insurance quality, and wages. We found empirical evidence that firm benefit and wage offers decline as the marginal income tax rate decreases. The average income tax rate fell slightly from 1987 to 2002, although there was significant variation in some states. The net effects of these changing tax rates over the sample period lowered the probability of health insurance coverage by 1.8%, lowered the real employer contribution to health insurance by 4%, and decreased real wages by 1%.

Our final objective was to determine the reasons behind the difference in health insurance coverage, health insurance quality, and wages between residents in metro and nonmetro areas. We also investigated why these differences have changed over time.

Workers who lived in metro areas were 5.3% more likely to be covered by employer-provided health insurance than were workers who lived in nonmetro areas, holding everything else constant. We found that health insurance costs, taxes, and union coverage affected the probability of health insurance coverage more in nonmetro area than in metro areas. The changes in prices and taxes between 1987 and 2002 lowered the probability of being covered by firm-provided health insurance by 4.9% in metro areas and 3.9% in nonmetro areas. Our model explained around half of the difference in coverage between metro and nonmetro areas. Lower education levels in nonmetro areas were responsible for the largest portion of the explained gap. Health insurance costs and marginal tax rates explained very little of the difference in coverage between metro and nonmetro areas. This suggests that changes to insurance costs and marginal taxes alone will do little to improve the metro-nonmetro gap in health insurance coverage.

Workers who lived in metro areas received 61% higher employer contributions to benefits than did workers who lived in nonmetro areas, holding everything else constant. We determined that health insurance costs and union coverage affected the employer's contribution to health insurance more in nonmetro areas than in metro areas. Conversely, gender and tax rates had significantly smaller effects in nonmetro areas. The changes in prices and taxes between 1987 and 2002 lowered the real employer contribution to health insurance by 17.9% in metro areas and 32.4% in nonmetro areas. Our model explained close to half of the difference in the log of an employer's contribution to health insurance. Similar to our results for the health insurance coverage decomposition, lower education levels in nonmetro areas accounted for the largest portion of the explained gap. Again,

health insurance costs and marginal tax rates explained very little of the difference in an employer's contributions to health insurance between metro and nonmetro areas.

Workers who lived in metro areas received 17% higher wages than workers who lived in nonmetro areas, holding everything else constant. We concluded that health insurance costs and tax rates have significantly larger effects on wages in metro areas. The changes in prices and taxes between 1987 and 2002 increased real wages by 18.6% in metro areas and 4.3% in nonmetro areas. The model explained close to half of the difference in the log of wage. Again, lower education levels in nonmetro areas accounted for the largest portion of the explained gap. Interestingly, health insurance costs were responsible for 21.9% of the explained gap, a substantial portion. Marginal tax rates still explained little of the difference in wages between metro and nonmetro areas.

Tables & Figures

Table 3.1: Probit Estimation of Firm-Provided Health Insurance Coverage and OLS Estimation of the Log of the Real Employer Contribution to Health Insurance

Variable	BEN[a]	ln CON[b]
ln (PRICE)	-0.025	-0.140
	(209.90)	(190.64)
FT	0.419	2.739
	(4893.20)	(5429.21)
MICROER	-0.369	-2.455
	(5603.75)	(6083.49)
SMER	-0.163	-1.039
	(2146.03)	(2240.28)
MEDER	-0.075	-0.464
	(1016.38)	(1039.43)
LGER	-0.027	-0.176
	(248.41)	(272.26)
FEMALE	0.043	0.185
	(840.74)	(577.43)
BLACK	-0.091	-0.569
	(1324.65)	(1354.03)
OTHMIN	-0.075	-0.397
	(588.19)	(506.55)
WIDOW	-0.008	0.031
	(58.44)	(38.33)
DIVOR	0.026	0.260
	(440.13)	(696.80)
CHILD<18	-0.027	-0.066
	(763.58)	(290.08)
UNION	0.161	1.060
	(1182.64)	(1293.11)
EXP	0.023	0.180
	(964.00)	(1245.76)
EDUC	0.088	0.587
	(1202.84)	(1433.77)
TAX	0.350	3.010
	(425.96)	(588.75)
EXP^2	-0.0002	-0.001
	(580.97)	(870.49)
$EDUC^2$	-0.001	-0.008
	(500.04)	(603.34)
EDUC x EXP	-0.001	-0.007
	(800.86)	(1008.39)
ln (STEARN)	0.188	1.946
	(749.16)	(1246.70)
ln (PLAND)	0.018	0.160
	(460.36)	(650.69)
URATE	-0.011	-0.044
	(586.43)	(379.21)
ln (CPI)	-0.264	-1.488
	(557.90)	(507.03)
METRO	0.053	0.475
	(742.30)	(1066.91)
CONSTANT		-2.129
		(193.70)
Predicted Probability (at x-bar)[c]	.654	
Observed Probability	.637	
R^2	0.178[d]	0.225
Log likelihood	-2.426e+08	

Note: Frequency weighted regressions based on a sample of 249,821 single workers from 1987 to 2002.
[a]Dummy variable equal to 1 if the individual is covered by firm-provided health insurance. z statistics in parenthesis.
[b]Log of one plus the employer contribution to health insurance. t statistics in parenthesis.
[c]Predicted probability at the mean value for each independent variable.
[d]Pseudo-R-square

Table 3.2: Probit Estimation of the Probability of Firm-Provided Health Insurance Coverage, by Metro Status

Variable	BEN: Metro[a]	BEN: Nonmetro[a]	z statistic for metro interaction[b]
ln (PRICE)	-0.025 (201.83)	-0.037 (92.77)	25.31
FT	0.420 (4515.71)	0.404 (1874.76)	8.14
MICROER	-0.366 (5136.34)	-0.373 (2176.15)	18.28
SMER	-0.161 (1979.94)	-0.161 (786.77)	29.23
MEDER	-0.083 (1034.16)	-0.032 (166.85)	263.08
LGER	-0.034 (293.23)	0.019 (64.43)	174.55
FEMALE	0.048 (881.74)	0.010 (69.31)	278.34
BLACK	-0.088 (1224.36)	-0.099 (461.71)	23.61
OTHMIN	-0.070 (525.17)	-0.119 (267.44)	95.88
WIDOW	-0.007 (46.04)	-0.009 (27.92)	6.9
DIVOR	0.026 (400.42)	0.025 (159.69)	17.93
CHILD<18	-0.028 (715.61)	-0.023 (252.50)	63.36
UNION	0.154 (1077.26)	0.211 (495.67)	79.19
EXP	0.022 (859.78)	0.028 (430.48)	67.36
EDUC	0.086 (1120.58)	0.096 (420.89)	10.01
TAX	0.313 (354.98)	0.529 (236.38)	74.05
EXP^2	-0.0001 (-488.88)	-0.0002 (327.85)	108.8
$EDUC^2$	-0.001 (463.51)	-0.001 (182.94)	16.93
EDUC x EXP	-0.001 (731.34)	-0.001 (309.22)	17.89
ln (STEARN)	0.172 (625.48)	0.269 (421.59)	118.25
ln (PLAND)	0.015 (368.48)	0.036 (302.86)	151.83
URATE	-0.010 (485.76)	-0.018 (350.88)	138.42
ln (CPI)	-0.233 (466.54)	-.413 (285.68)	102.68
Pred. Probability (at x-bar)[c]	.670	.560	
Obs. Probability	.651	.559	
Pseudo R^2	0.175	0.18	
Log likelihood	-2.047e+08	-37708190	

Note: Frequency weighted regressions based on a sample of 249,821 single workers from 1987 to 2002.
[a]Dummy variable equal to 1 if the individual is covered by firm-provided health insurance. z statistics in parenthesis.
[b]z statistics from the interaction of metro status with each independent variable.
[c]Predicted probability at the mean value for each independent variable.

Table 3.3: Estimation of the Log of the Real Employer Contribution for Health Insurance, by Metro Status

Variable	ln CON: Metro[a]	ln CON: Nonmetro[a]	t statistic for metro interaction[b]
ln (PRICE)	-.127 (162.96)	-0.326 (141.79)	84.19
FT	2.789 (5047.85)	2.476 (1999.82)	228.03
MICROER	-2.450 (5580.49)	-2.467 (2369.74)	14.59
SMER	-1.023 (2041.78)	-1.087 (881.77)	50.21
MEDER	-0.498 (1024.55)	-0.263 (231.88)	190.09
LGER	-0.210 (299.57)	0.052 (30.48)	142.9
FEMALE	0.232 (671.08)	-0.099 (117.60)	364.56
BLACK	-0.557 (1245.02)	-0.609 (478.24)	37.34
OTHMIN	-0.373 (454.21)	-0.635 (242.69)	95.65
WIDOW	0.047 (52.47)	0.001 (0.69)	23.9
DIVOR	0.264 (649.22)	0.231 (245.70)	34.17
CHILD<18	-0.074 (296.59)	-0.009 (17.07)	103.29
UNION	1.032 (1177.10)	1.254 (544.11)	87.37
EXP	0.176 (1128.20)	0.193 (509.50)	42.49
EDUC	0.595 (1358.45)	0.533 (452.18)	47.75
TAX	3.032 (545.49)	2.787 (210.60)	20.17
EXP^2	-0.001 (764.26)	-0.002 (423.31)	92.72
$EDUC^2$	-0.008 (582.31)	-0.007 (178.11)	30.58
EDUC x EXP	-0.007 (930.79)	-0.007 (352.06)	12.36
ln (STEARN)	1.832 (1059.41)	2.441 (648.80)	148.63
ln (PLAND)	0.147 (558.04)	0.243 (346.70)	128.89
URATE	-0.032 (259.90)	-0.113 (-370.80)	246.29
ln (CPI)	-1.279 (406.38)	-2.362 (279.52)	119.53
Constant	-2.671 (226.49)	3.346 (111.77)	
R^2	0.219	0.228	

Note: Frequency weighted regressions based on a sample of 249,821 single workers from 1987 to 2002.
[a]Log of one plus the employer contribution to health insurance. t statistics in parenthesis.
[b]t statistics from the interaction of metro status with each independent variable.

Table 3.4: Estimation of the Log of the Wage Equation

Variable	ln W[a]	t statistic
ln (PRICE)	0.154	1126.27
FT	0.233	2478.91
MICROER	-0.248	3308.27
SMER	-0.154	1778.99
MEDER	-0.097	1163.26
LGER	-0.052	436.12
FEMALE	-0.138	2314.54
BLACK	-0.133	1697.26
OTHMIN	-0.032	220
WIDOW	0.031	204.77
DIVOR	0.082	1187.43
CHILD<18	-0.017	406.17
UNION	0.113	744.29
EXP	0.031	1165.09
EDUC	0.059	774.55
TAX	0.970	1019.85
EXP^2	-.0004	1283.22
$EDUC^2$	.002	785.56
EDUC x EXP	-.001	427.2
ln (STEARN)	0.202	694.69
ln (PLAND)	0.036	776.08
URATE	-0.006	272.01
ln (CPI)	0.458	838.25
METRO	0.158	1908.63
Constant	-3.875	1894.3
R^2	0.267	

Note: Frequency weighted regressions based on a sample of 249,821 single workers from 1987 to 2002.

[a]Log of the hourly wage last year

Table 3.5: Estimation of the Log of the Wage Equation, by Metro Status

	ln W: Metro[a]	lN W: Nonmetro[a]	t statistic for metro interaction[b]
ln (PRICE)	0.165 (1137.45)	0.037 (85.35)	282.67
FT	0.234 (2281.39)	0.219 (937.88)	60.54
MICROER	-0.241 (2961.27)	-0.290 (1479.77)	229.43
SMER	-0.148 (1585.56)	-0.187 (807.19)	162.89
MEDER	-0.098 (1088.90)	-0.086 (401.72)	53.64
LGER	-0.055 (421.72)	-0.038 (117.52)	49.74
FEMALE	-0.126 (1970.16)	-0.205 (1285.65)	460.02
BLACK	-0.133 (1605.04)	-0.126 (527.12)	27.36
OTHMIN	-0.037 (239.78)	-0.012 (25.28)	44.41
WIDOW	0.027 (161.40)	0.058 (162.84)	78.4
DIVOR	0.080 (1058.65)	0.098 (552.71)	92.43
CHILD<18	-0.019 (409.42)	-0.006 (61.46)	109.73
UNION	0.100 (614.29)	0.213 (490.02)	242.08
EXP	0.033 (1129.97)	0.021 (298.82)	147.7
EDUC	0.059 (731.13)	0.062 (279.42)	11.53
TAX	1.053 (1020.07)	0.399 (160.30)	245.99
EXP^2	-0.0004 (1247.08)	-0.0002 (339.09)	167.73
$EDUC^2$	0.002 (769.21)	0.001 (144.11)	126.21
EDUC x EXP	-0.001 (422.57)	-0.0003 (71.34)	85.8
ln (STEARN)	0.207 (645.43)	0.160 (226.38)	59.65
ln (PLAND)	0.035 (715.60)	0.035 (267.80)	3.46
URATE	-0.006 (252.60)	-0.007 (129.08)	27.52
ln (CPI)	0.418 (715.28)	0.861 (540.90)	263.15
Constant	-3.649 (1666.17)	-4.674 (829.15)	836.33
R^2	0.2567	0.2342	

Note: Frequency weighted regressions based on a sample of 249,821 single workers from 1987 to 2002.
[a]Log of the hourly wage last year. t statistics in parethesis.
[b]t statistics from the interaction of metro status with each independent variable.

Table 3.6: Blinder-Oaxaca Decomposition: Weighted Percentage of Explained Variation

	BEN[a]	ln CON[b]	ln W[c]
ln (PRICE)	-6.9%	-4.8%	21.2%
FT	13.9%	13.1%	3.7%
EXP	-42.2%	-42.9%	-20.8%
EDUC	82.0%	76.9%	72.6%
MICROER	37.4%	35.6%	11.9%
SMER	1.3%	1.2%	0.6%
MEDER	5.5%	4.6%	3.1%
LGER	0.1%	0.0%	0.0%
TAX	1.6%	2.2%	2.5%
Cost of living	7.2%	10.7%	12.1%
Personal characteristics	-8.4%	-12.2%	-12.5%
Local labor market conditions	8.5%	15.6%	5.4%
Sum	100.0%	100.0%	100.0%

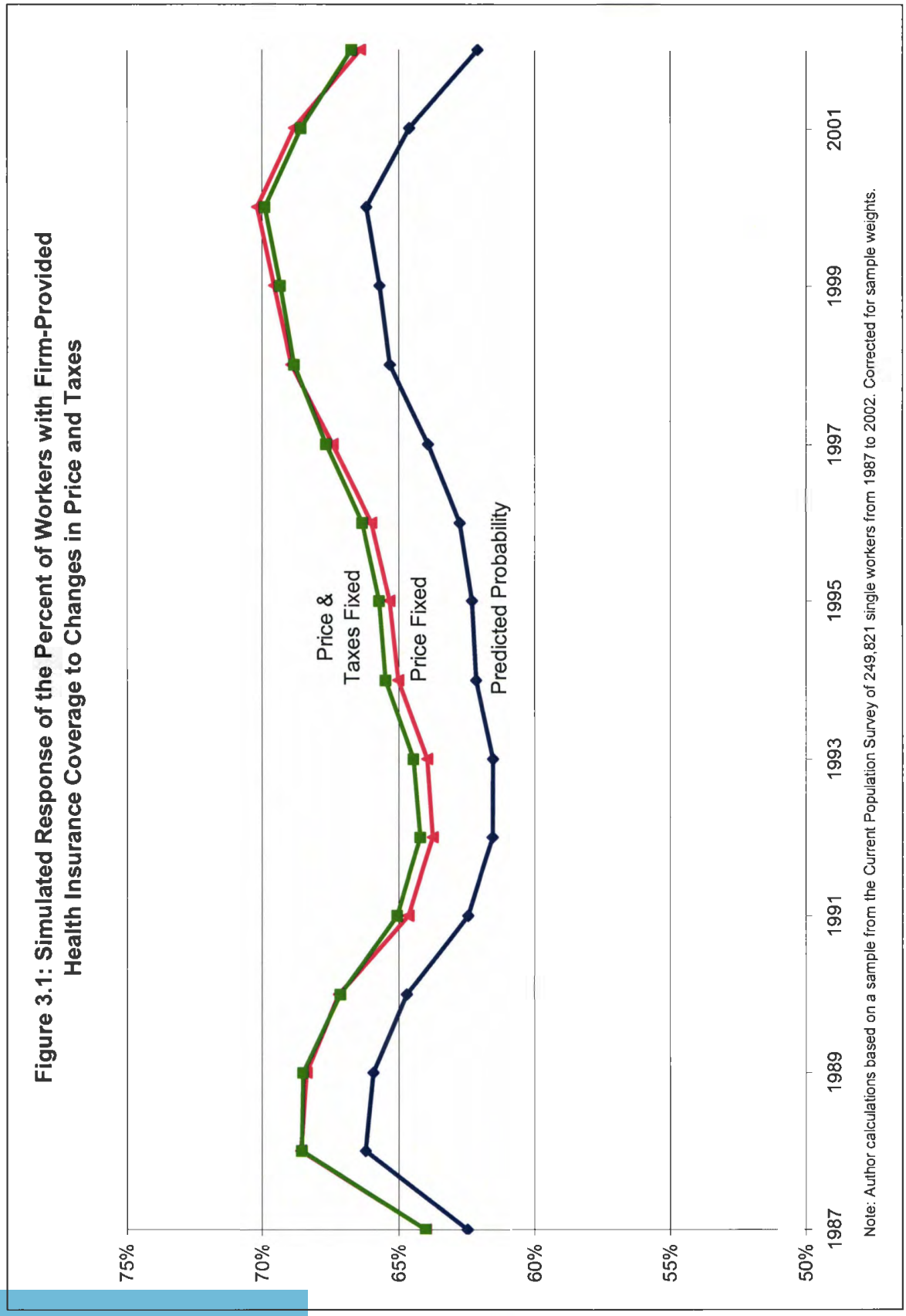
Note: Author calculations based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002. Corrected for sample weights.

[a]The total difference in firm-provided health insurance coverage is 11.1%. 5.6% of this is explained, leaving 5.5% unexplained.

[b]The total difference in the log of the employer's contribution to health insurance is 0.88. 0.4 of this is explained, leaving 0.48 unexplained.

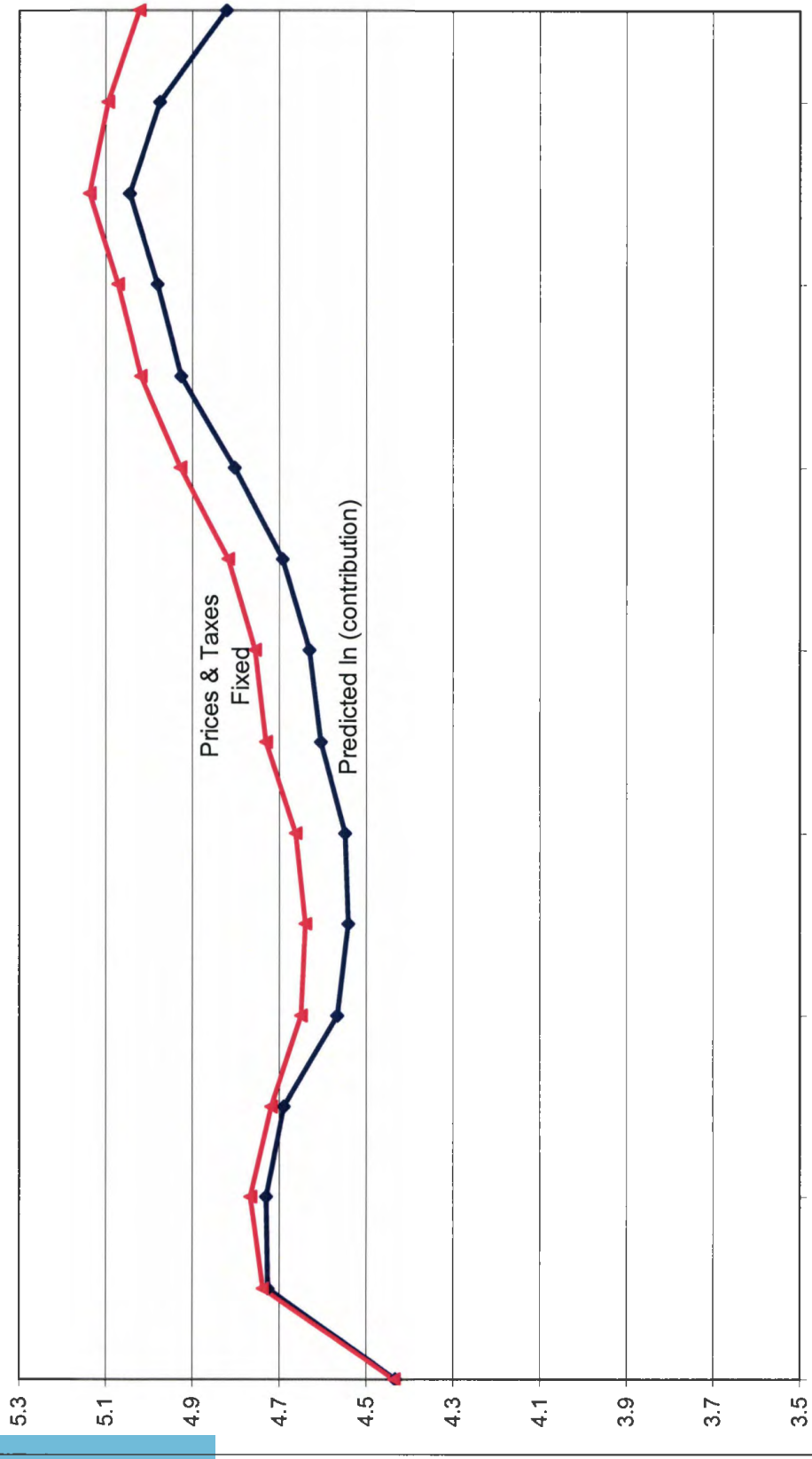
[c]The total difference in the log of wages is 0.28. 0.12 of this is explained, leaving 0.16 unexplained.

Figure 3.1: Simulated Response of the Percent of Workers with Firm-Provided Health Insurance Coverage to Changes in Price and Taxes



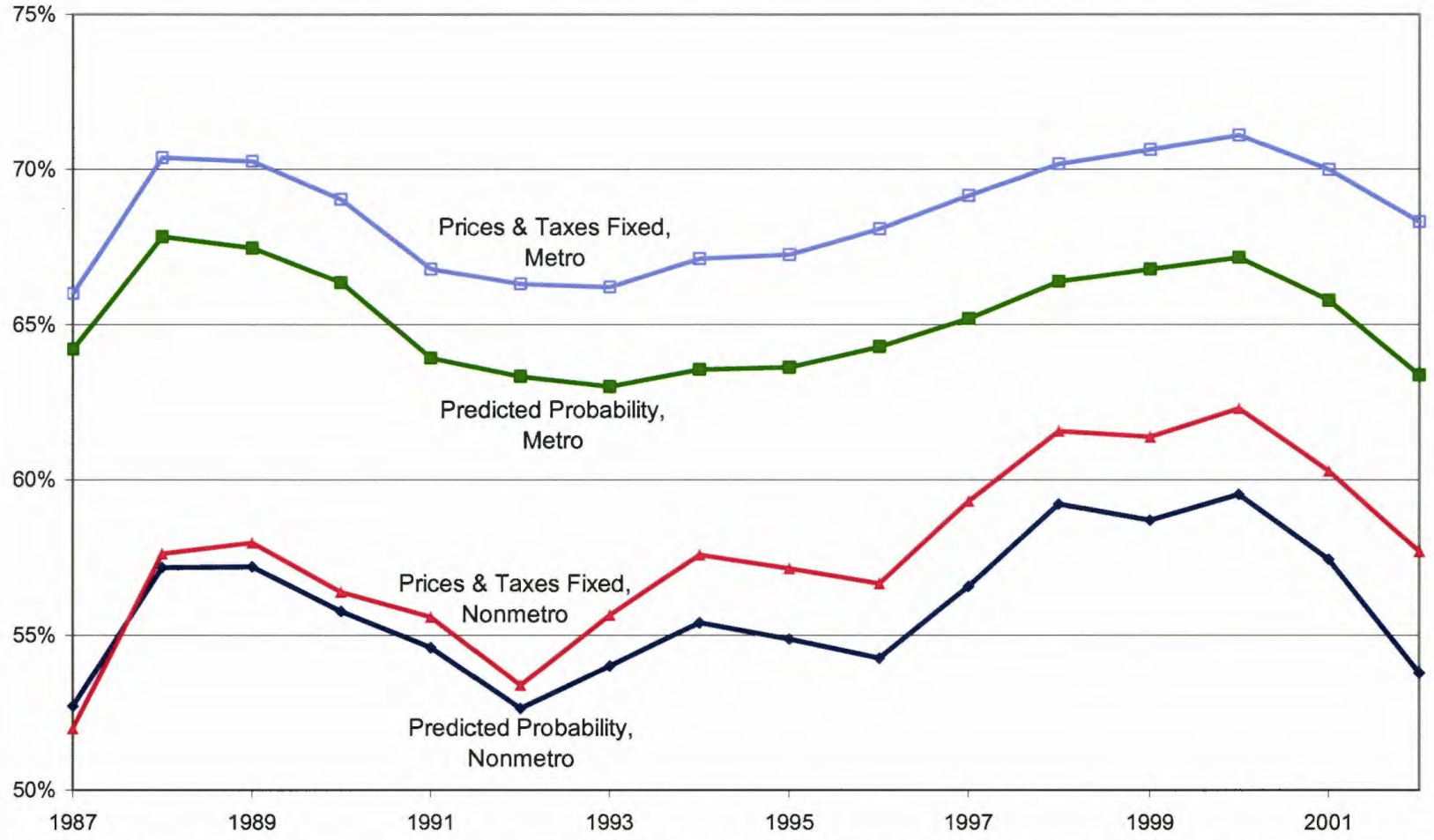
Note: Author calculations based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002. Corrected for sample weights.

Figure 3.2: Simulated Response of the Log of the Employer's Health Insurance Contribution to Changes in Price and Taxes



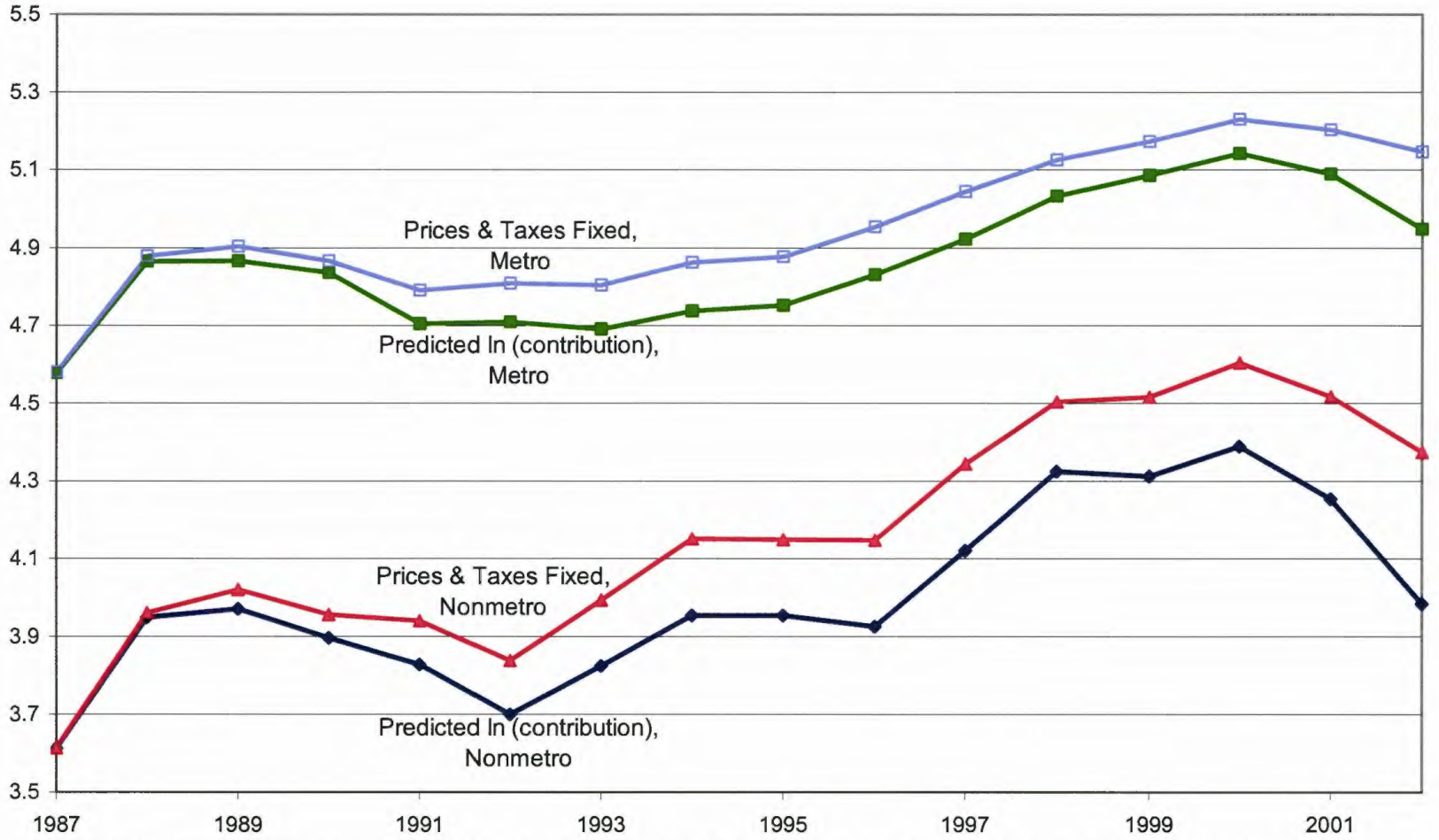
Note: Author calculations based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002. Corrected for sample weights.

Figure 3.3: Simulated Response of the Percent of Workers with Firm-Provided Health Insurance Coverage to Changes in Price and Taxes, by Metro Status



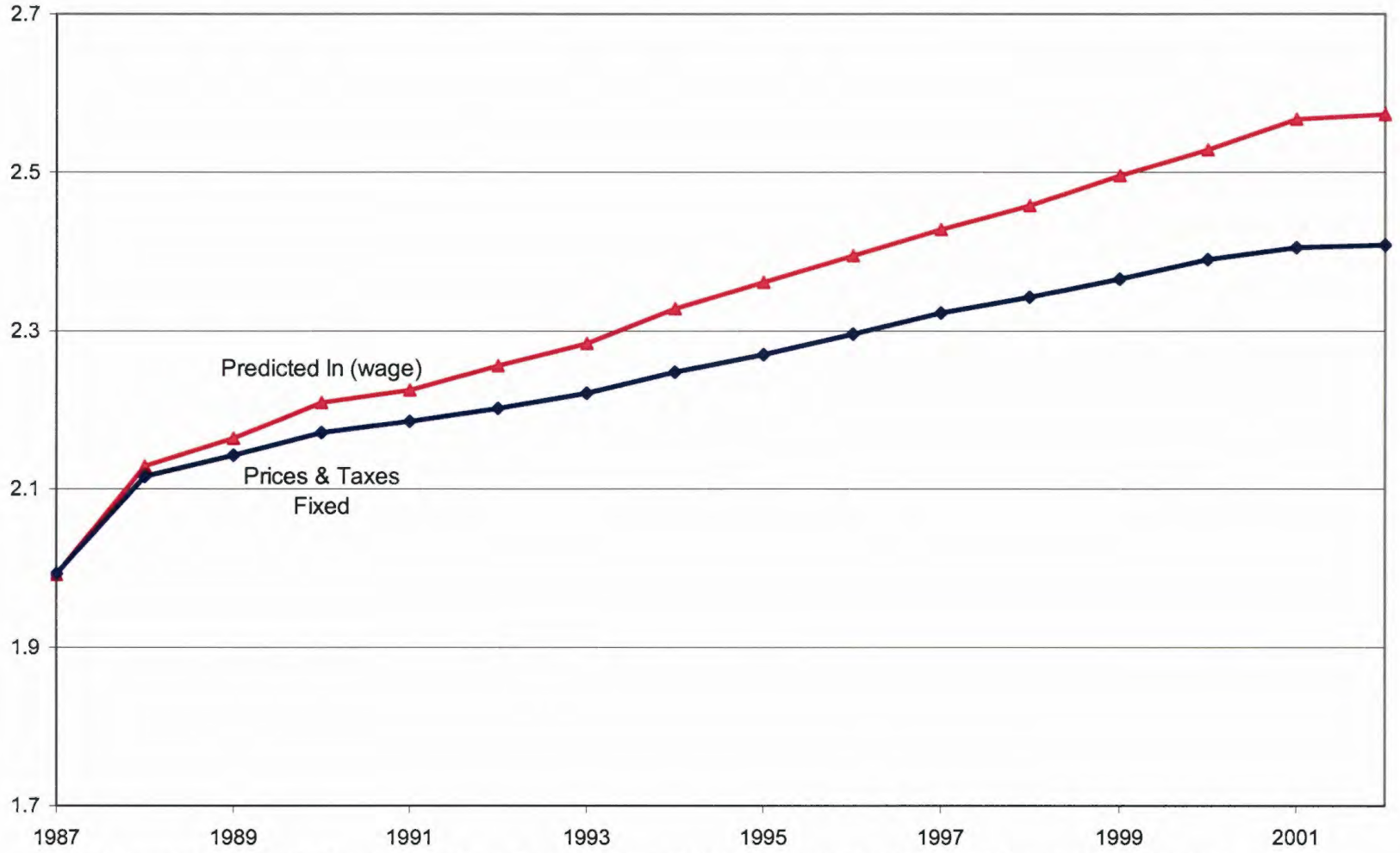
Note: Author calculations based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002. Corrected for sample weights.

Figure 3.4: Simulated Response of the Log of the Employer's Health Insurance Contribution to Changes in Price and Taxes, by Metro Status



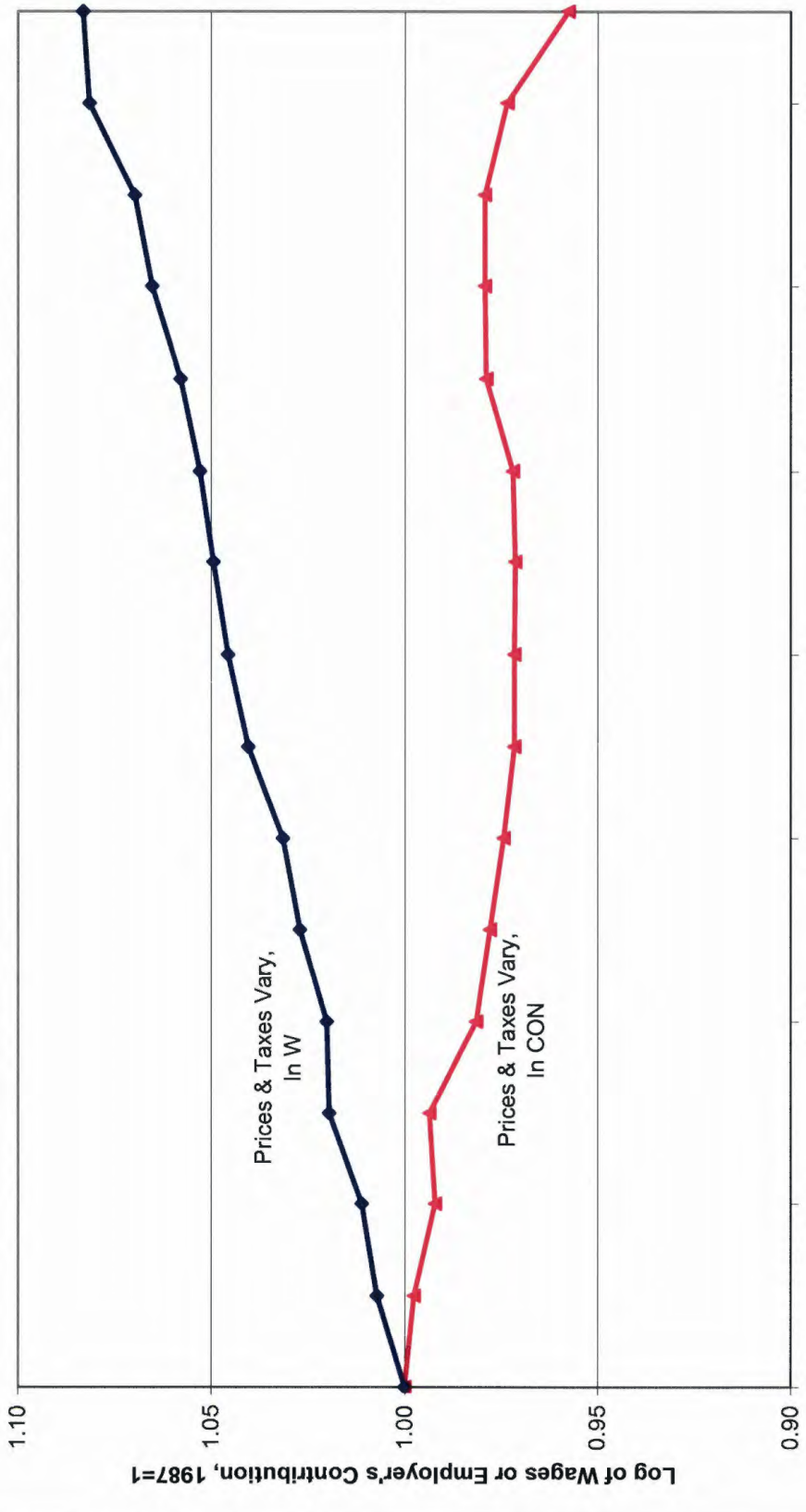
Note: Author calculations based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002. Corrected for sample weights.

Figure 3.5: Simulated Response of the Log of Wages to Changes in Price and Taxes



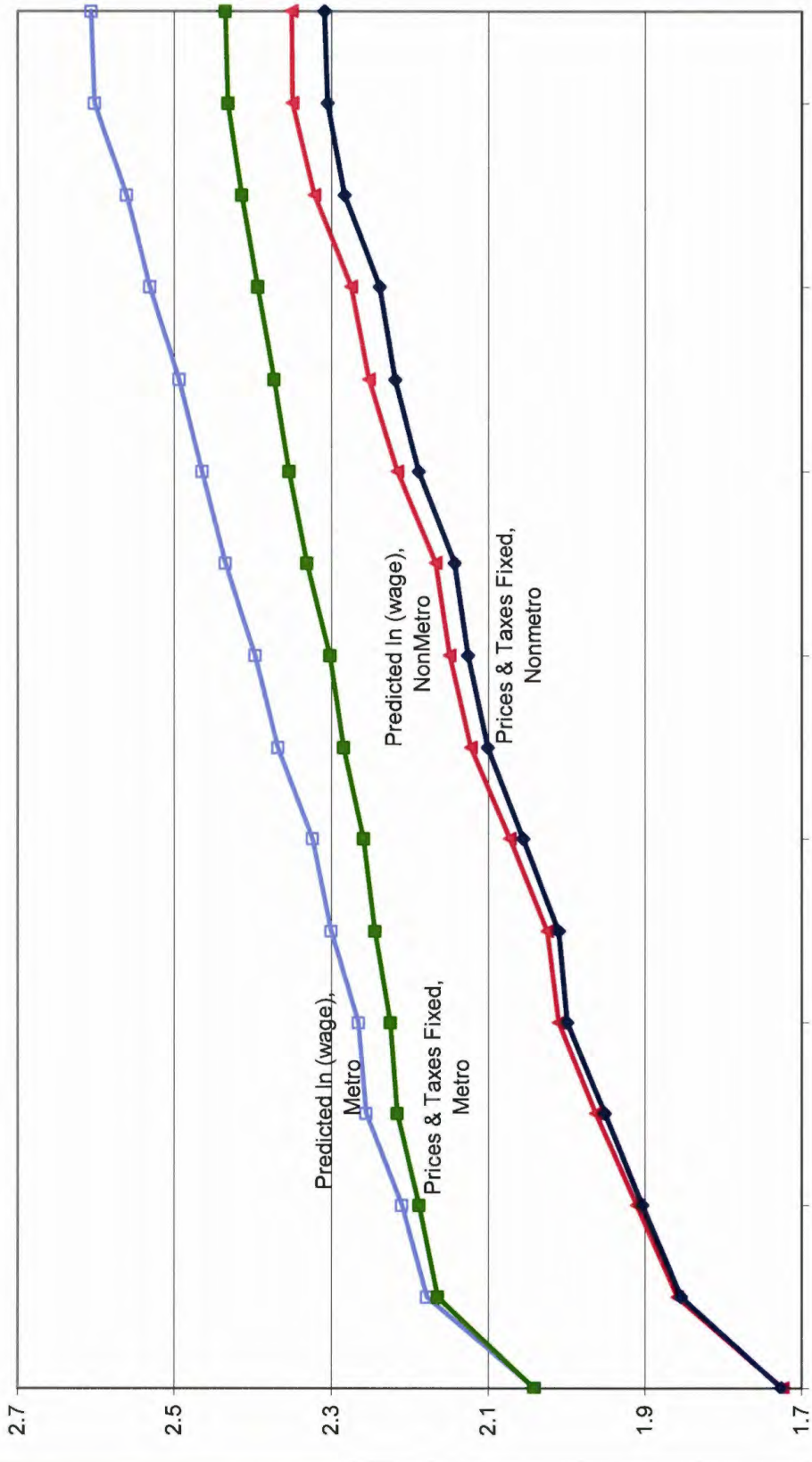
Note: Author calculations based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002. Corrected for sample weights.

Figure 3.6: Simulated Response of Wages and Employer's Health Insurance Contribution to Changes in Price and Taxes



Note: Author calculations based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002. Corrected for sample weights.

Figure 3.7: Simulated Response of the Log of Wages to Changes in Price and Taxes, by Metro Status



Note: Author calculations based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002. Corrected for sample weights.

Chapter 4: Firm Size Differences in Health Insurance Coverage, Health Insurance Quality, and Wages

Empirical Model

One of our objectives is to identify the underlying reasons for the difference in health insurance benefits and wages between different firm sizes. We also want to investigate why these differences have changed over time. To accomplish this, we split the sample into five distinct firm sizes and use the following three models. Where possible, variables are transformed into logarithmic form so that their associated coefficients can be interpreted as elasticities.

We utilize the following probit model to determine the underlying factors influencing whether an individual is covered by health insurance.

$$(4.1)\ \mathrm{BEN} = \mathrm{B}_0 + \mathrm{B}_1 \ln(\mathrm{price}) + \mathrm{B}_2\mathrm{ft} + \mathrm{B}_3\mathrm{tax} + \mathrm{B}_4\mathrm{metro} + \mathrm{B}_5\mathrm{P} + \mathrm{B}6\tau + \mathrm{B}_7\mathrm{Z} + \mathrm{B}_8\mathrm{L} + \mathrm{e}_{\mathrm{BEN}}$$

where BEN is a binary indicator of whether the individual is covered by firm-provided health insurance, tax is the marginal tax rate, P is a vector of cost of living measures, τ is a vector of personal characteristics, L is a vector of local labor market conditions, and Z is a vector of skills. Ft and metro are dummy variables for full-time status and metropolitan residence respectively.

We apply the following ordinary least squares (OLS) model to identify the underlying factors affecting an employer's contribution to health insurance.

$$(4.2)\ \ln\mathrm{CON} = \mathrm{B}_0 + \mathrm{B}_1 \ln(\mathrm{price}) + \mathrm{B}_2\mathrm{ft} + \mathrm{B}_3\mathrm{tax} + \mathrm{B}_4\mathrm{metro} + \mathrm{B}_5\mathrm{P} + \mathrm{B}_6\tau + \mathrm{B}_7\mathrm{Z} + \mathrm{B}_8\mathrm{L} + \mathrm{e}_{\mathrm{CON}}$$

where CON is a continuous measure of the dollar amount the employer contributes to health insurance and all other variables are as defined in Equation 4.1.

We use the following OLS model to determine the underlying factors affecting an employer's wage decision.

$$(4.3)\quad \ln W = B_0 + B_1 \ln(\text{price}) + B_2 \text{ft} + B_3 \text{tax} + B_4 \text{metro} + B_5 P + B_6 \tau + B_7 Z + B_8 L + e_w$$

where W is the individual's hourly wage and all other variables are as defined in Equation 4.1.

Results

Firm-provided health insurance coverage, by firm size. Employees in the smallest firms are 36.9% less likely to be covered by firm-provided health insurance than employees in the largest firms, holding everything else constant. Table 4.1 reports the estimates for five different firm sizes using health insurance coverage through an employer as the dependent variable. All independent variables are significant at the .01 level.

Health insurance costs and union coverage have significantly larger effects in smaller firms. A 10% increase in health insurance costs causes a 0.8% decrease in the probability of being covered by firm-provided health insurance for workers in the smallest firms. The corresponding effect for workers in the largest firms is 0.07%. A significant drop in the size of the cost effect occurs when the firm reaches the third size group of 100 employees. Workers in the smallest firms that are covered by a union are 17.2% more likely to be covered by health insurance than workers in the smallest firms that are not covered by a union. The corresponding effect in the largest firms is only 11.4%.

Full-time status has a significantly larger effect in the largest firms. A significant increase occurs when the firm reaches the second size group of 26 employees. Employees in the largest firms that work full-time are 40.7% more likely to be covered by health insurance than workers in the largest firms that do not work full-time. The corresponding effect in the smallest firms is only 29.1%.

Measures of skill and marginal income tax rates have close to the same effect across all firm sizes. At the sample mean, the probability of health insurance coverage for small firm workers rises by 0.2% per year of experience and 4.1% per year of educational attainment. The corresponding effect for large firm workers is an increase of 0.5% per year of experience and 3.1% per added educational level. A 10% increase in the marginal tax rate raises the probability of benefits coverage by 1.1% for employees in the smallest firms and 1.0% for employees in the largest firms.

In Figure 4.1, we show how the estimated probability of being covered by firm-provided health insurance changes for workers in different firm sizes holding health insurance costs and tax rates fixed at their 1987 value. The sample means of all other variables are allowed to change each year. The gap is widest at the second size group of 26-99 employees. The simulation shows the estimated probability of health insurance coverage for this group would be 66.2% instead of 58.9% if prices and taxes had remained at their 1987 level. The estimated probability of health insurance coverage for the largest firms would be 77.9% instead of 74.8% if prices and taxes had remained at their 1987 level.

Employer's contribution to health insurance, by firm size. Employees in the smallest firms receive 91.4% lower employer contributions to health insurance than employees in the largest firms, holding everything else constant. Table 4.2 reports the estimates for five different firm sizes using the employer contribution to health insurance as the dependent variable. All independent variables are significant at the .01 level.

Health insurance costs and union coverage have significantly larger effects in smaller firms. A 10% increase in health insurance premiums causes a 2.2% decrease in employer contributions to health insurance for workers in the smallest firms and only a negligible decrease for workers in the largest firms. A significant drop in the size of the cost effect occurs when the firm reaches the third size group of 100 employees. Workers in the

smallest firms that are covered by a union receive 271.7% higher employer contributions to health insurance than workers in the smallest firms that are not covered by a union. The corresponding effect in the largest firms is less at 158.1%.

Gender and race also have significantly larger effects in smaller firms. Female workers in the smallest firms receive a 50.7% higher contribution to health insurance than males in the smallest firms. The corresponding effect in the largest firms is only 5.6%. Black workers in the smallest firms receive a 47.7% lower contribution than non-black workers in the smallest firms. The corresponding effect in the largest firms is only 32.9%. Workers from other minorities in the smallest firms receive a 46% lower contribution than workers not classified as other minorities. The corresponding effect in the largest firms is only 21.8%.

Experience has a larger effect in the largest firms. In contrast, education has a smaller effect in the largest firms. At the sample mean, an employer's contribution to health insurance rises for workers in the smallest firms by 1.7% per year of experience and 27.7% per year of education. The corresponding effect for the largest firms is an increase of 4.3% per year of experience and 23.6% per added educational level.

Marginal tax rates have larger effects in larger firms. The tax elasticity is 0.84 for workers in the largest firms and 0.31 for workers in the smallest firms. This implies a 10% increase in marginal tax rates in the largest firms will raise employer contributions to benefits by 8.4%. The corresponding effect is only 3.1% in the smallest firms. A significant increase in the tax elasticity occurs when the firm reaches the second size group of 25 employees.

In Figure 4.2, we show how the log of an employer's contribution to health insurance changes for workers in different firm sizes holding health insurance costs and tax rates fixed at their 1987 value. The sample means of all other variables are allowed to change each year. The gap is widest at the second size group of 26-99 employees. The simulation shows the log of employer contributions for this group would be 5.0 instead of 4.6 if prices and

taxes had remained at their 1987 levels. The log of employer contributions for the largest firms would be 5.7 instead of 5.6 if prices and taxes had remained at their 1987 levels. This implies that the changes in prices and taxes between 1987 and 2002 decreased employer contributions by 33% in firms with 26-99 employees and 9.5% in firms with more than 999 employees.

Hourly wages, by firm size. Employees in the smallest firms receive 22% lower hourly wages than employees in the largest firms, holding everything else constant. Table 4.3 reports the estimates for five different firm sizes with the log of hourly wages as the dependent variable. All independent variables are significant at the .01 level.

The effect of health insurance costs on wages increases until the firm reaches the fourth size group of 500-999 employees, and then reduces slightly. A 10% increase in health insurance costs causes a 1.1% increase in wages for employees in the smallest firms and a 1.7% increase for employees in the largest firms. In the third size group of employers, a 10% increase in health insurance costs causes a 2.1% increase in wages.

Marginal tax rates and measures of skill have significantly larger effects in larger firms. The tax elasticity is 0.18 for the smallest firms and 0.24 for the largest firms. This implies a 10% increase in marginal tax rates in the largest firms will raise wages by 2.4%. The corresponding effect is only 1.8% in the smallest firms. At the sample mean, wages rise for large firm workers by 1.2% per year of experience and 10.2% per year of education. The corresponding effect for small firm workers is an increase of 0.5% per year of experience and 8.7% per added educational level.

Union coverage and metropolitan residence have larger effects in smaller firms. Workers in the smallest firms covered by a union receive 14.5% higher wages than workers in the smallest firms not covered by a union. The corresponding effect in the largest firms is only 11.4%. Workers in the smallest firms residing in metro areas receive 20.8% higher

wages than workers in the smallest firms residing in nonmetro areas. The corresponding effect in the largest firms is only 15.5%.

In Figure 4.3, we show how the log of wages changes for workers in different firm sizes holding health insurance costs and tax rates fixed at their 1987 value. The sample means of all other variables are allowed to change each year. The simulation shows the log of wages for employees in the smallest firms would be 2.2 instead of 2.3 if prices and taxes had remained at their 1987 level. The log of wages for employees in the largest firms would be 2.5 instead of 2.7 if prices and taxes had remained at their 1987 level. This implies that the changes in prices and taxes between 1987 and 2002 increased wages by 10.5% for small firm workers and 22.1% for large firm workers.

Decomposition of Firm Size Gaps

We estimate how much of the observed differences in health insurance coverage between small and large firms can be explained by our model using the Blinder-Oaxaca decomposition (Blinder, 1973; Oaxaca, 1973) adapted to the probit regression model. We provide a detailed discussion of this model in Chapter 3.

The first column in Table 4.4 reports the results from this decomposition. Negative values mean the variable lowers the difference between small and large firms while positive numbers increase the difference. The total difference in firm-provided health insurance coverage is 43.8%. Overall, our model explains 7.0% of the difference in coverage, leaving 36.8% unexplained. Lower education levels in small firms are responsible for the largest portion of the explained gap, or 70%. This is partially offset by higher experience in smaller firms, which serves to shrink the gap. The lower incidence of workers employed full-time in small firms account for 37.6% of the explained gap. Local labor market conditions, such as the unemployment rate and union coverage, account for another 10.5% of the explained gap in coverage. Even though the cost of health insurance and the marginal tax rate have

significant effects on the probability of health insurance coverage, they explain little of the gap in coverage between workers in small and large firms. Marginal tax rates do not vary greatly between metro and nonmetro areas, and so they cannot explain the gap. There is some variance in average health insurance costs across small and large firms, but the firm response to health insurance price is too inelastic for the cost difference to explain much of the gap in firm provision.

Next, we estimate how much of the observed difference in the employer's contribution to health insurance between small and large firms can be explained by our model. Because our model is linear, we are able to use the original Blinder-Oaxaca decomposition. We provide a detailed discussion of this model in Chapter 3.

The second column in Table 4.4 reports the results from this decomposition. Negative values mean the variable lowers the difference between small and large firms while positive numbers increase the difference. The total difference in the log of the employer's contribution to health insurance is 2.99. Overall, our model explains 0.54 of the difference in the employer's contribution, leaving 2.45 unexplained. In other words, our model explains 18% of the difference. Our results are very similar to the health insurance coverage decomposition. Lower education levels in small firms account for the largest portion of the explained gap, at 70%. This is partially offset by higher experience in smaller firms, which serves to shrink the gap. The lower incidence of workers employed full-time in small firms are responsible for 41.7% of the explained gap. The cost of health insurance and the marginal tax rate accounts for little of the gap in an employer's contributions to health insurance between small and large firms.

Last, we estimate how much of the observed difference in wages between small and large firms can be explained by our model. Again, because our model is linear, we are able to use the original Blinder-Oaxaca decomposition. The third column in Table 4.4 reports the

results from this decomposition. Negative values mean the variable lowers the difference between small and large firms while positive numbers increase the difference. The total difference in the log of wages is 0.35. Overall, our model explains 0.11 of the difference in wages, leaving 0.24 unexplained. In other words, our model explains 31% of the difference. In contrast to the benefit decompositions, personal characteristics substantially lower the gap in wages between small and large firms. Specifically, the lower incidence of female and black employees in smaller firms lowers the gap in wages. Similar to prior results, education still explains the largest portion of the explained wage gap. The lower incidence of workers employed full-time in small firms accounts for 41.7% of the explained gap, a smaller fraction than found in the benefit decompositions. Also, insurance costs and marginal tax rates explain little of the difference in wages between small and large firms.

Conclusions

Our main objective was to determine the underlying reasons for the difference in health insurance coverage, health insurance quality, and wages between different firm sizes. We also investigated why these differences have changed over time.

Employees in the smallest firms were 36.9% less likely to be covered by firm-provided health insurance than employees in the largest firms, holding everything else constant. We found that health insurance costs and union coverage affected the probability of health insurance coverage more in smaller firms than in larger firms. Conversely, full-time status had a significantly larger effect in larger firms. Measures of skill and marginal income tax rates had close to the same effect across all firm sizes.

The changes in prices and taxes between 1987 and 2002 lowered the probability of firm-provided health insurance coverage by 1.7% in the smallest firms and 3.0% in the largest firms. Our model explained around 16% of the difference in coverage between small and large firms. Lower education levels in small firms accounted for the largest portion of the

explained gap. Health insurance costs and marginal tax rates explained very little of the difference in coverage between small and large firms. This suggests that changes to insurance costs and marginal taxes alone will do little to improve the firm size gap in health insurance coverage.

Employees in the smallest firms received 91.4% lower employer contributions to benefits than employees in the largest firms, holding everything else constant. We determined that health insurance costs, union coverage, gender, race, and experience affected the employer's contribution to health insurance more in small firms than in large firms. Conversely, experience and marginal tax rates had larger effects in large firms rather than small firms.

The changes in prices and taxes between 1987 and 2002 lowered the real employer contribution to health insurance by 24.8% in the smallest firms and 9.5% in the largest firms. Our model explained around 18% of the difference in the log of an employer's contribution to health insurance. Similar to our results for the health insurance coverage decomposition, the lower education levels in small firms was responsible for the largest portion of the explained gap. Again, health insurance costs and marginal tax rates explained very little of the difference in an employer's contributions to health insurance between small and large firms.

Workers in the smallest firms received 22% lower wages than workers in the largest firms, holding everything else constant. We concluded the effect of health insurance costs on wages increased until the firm reached the third size group of 100 employees, and then reduced slightly. We found that marginal tax rates and measures of skill had significantly larger effects in larger firms. Conversely, union coverage and metropolitan residence affected wages more in smaller firms than larger firms.

The changes in prices and taxes between 1987 and 2002 increased real wages by 10.5% in the smallest firms and 22.1% in the largest firms. Our model explained close to

one-third of the difference in the log of wage. Again, lower education levels in small firms accounted for the largest portion of the explained gap. In contrast to the benefit decompositions, personal characteristics substantially lowered the gap in wages between small and large firms. Health insurance costs and marginal tax rates explained little of the difference in wages between small and large firms.

Tables & Figures

Table 4.1: Probit Estimation of the Probability of Firm-Provided Health Insurance Coverage, by Firm Size

Variable	BEN: <25 employees	BEN: 26-99 employees	BEN: 100-499 employees	BEN: 500-999 employees	BEN: >999 employees
ln (PRICE)	-0.031	-0.058	-0.022	-0.013	-0.005
	(159.25)	(173.90)	(71.47)	(-27.81)	(30.16)
FT	0.291	0.425	0.462	0.412	0.407
	(2216.37)	(1894.85)	(2054.59)	(1195.02)	(3143.32)
FEMALE	0.065	0.032	0.047	0.038	0.023
	(624.52)	(237.10)	(397.68)	(218.46)	(333.62)
BLACK	-0.096	-0.114	-0.109	-0.076	-0.056
	(633.98)	(617.58)	(693.41)	(335.52)	(666.38)
OTHMIN	-0.088	-0.075	-0.079	-0.056	-0.048
	(358.53)	(223.82)	(266.85)	(131.78)	(285.82)
WIDOW	-0.008	0.009	0.007	0.002	-0.023
	(29.03)	(27.66)	(25.37)	(5.76)	(133.91)
DIVOR	0.030	0.032	0.027	0.020	0.015
	(251.68)	(208.28)	(199.13)	(95.31)	(194.90)
CHILD<18	-0.029	-0.022	-0.029	-0.024	-0.021
	(381.35)	(243.64)	(354.13)	(198.39)	(462.30)
UNION	0.172	0.179	0.148	0.132	0.114
	(356.20)	(430.22)	(517.35)	(322.13)	(816.28)
EXP	0.013	0.018	0.020	0.021	0.026
	(280.91)	(290.36)	(373.31)	(255.33)	(829.10)
EDUC	0.078	0.075	0.081	0.054	0.086
	(542.06)	(424.44)	(507.32)	(219.70)	(803.16)
TAX	0.183	0.330	0.306	0.434	0.357
	(107.33)	(156.65)	(163.74)	(157.69)	(333.58)
EXP^2	-0.0001	-0.0001	-0.0001	-0.0002	-0.0002
	(112.29)	(-119.04)	(185.23)	(231.50)	(569.78)
$EDUC^2$	-0.001	-0.001	-0.001	-0.0004	-0.001
	(213.01)	(99.91)	(203.85)	(58.54)	(569.78)
EDUC x EXP	-0.001	-0.001	-0.001	-0.001	-0.001
	(296.52)	(265.57)	(340.05)	(152.57)	(641.75)
ln (STEARN)	0.247	0.235	0.156	0.084	0.119
	(483.67)	(358.70)	(274.86)	(99.39)	(361.87)
ln (PLAND)	0.020	0.026	0.017	0.019	0.010
	(256.56)	(258.63)	(181.11)	(138.97)	(361.87)
URATE	-0.018	-0.012	-0.008	-0.009	-0.006
	(474.81)	(258.35)	(189.34)	(145.50)	(222.30)
ln (CPI)	-0.276	-0.198	-0.172	-0.245	-0.245
	(294.59)	(161.01)	(155.16)	(146.24)	(375.10)
METRO	0.063	0.061	0.014	0.017	0.057
	(465.54)	(330.72)	(89.54)	(72.08)	(547.89)
Pred. P (at x-bar) [a]	.350	.606	.711	.765	.788
Obs. Probability	.372	.601	.696	.747	.768
Pseudo R^2	0.100	0.107	0.113	0.10	0.114
Log likelihood	-62458376	-40379957	-39903181	-14408953	-84906099

Note: Frequency weighted regressions based on a sample of 249,821 single workers from 1987 to 2002. BEN is a dummy variable equal to 1 if the individual is covered by firm-provided health insurance. z statistics in parenthesis.

[a]Predicted probability at the mean value for each independent variable.

Table 4.2: Estimation of the Real Employer Contribution for Health Insurance, by Firm Size

Variable	ln CON: <25 employees	ln CON: 26-99 employees	ln CON: 100-499 employees	ln CON: 500-999 employees	ln CON: >999 employees
ln (PRICE)	-0.223 (169.80)	-0.367 (164.77)	-0.129 (62.67)	-0.068 (21.31)	-0.0003 (0.27)
FT	2.090 (2277.61)	2.978 (2067.30)	3.251 (2325.67)	3.019 (1383.80)	3.025 (3722.25)
FEMALE	0.410 (570.73)	0.127 (143.17)	0.208 (261.54)	0.170 (139.15)	0.055 (116.67)
BLACK	-0.645 (624.20)	-0.794 (649.56)	-0.790 (748.55)	-0.587 (373.80)	-0.399 (683.38)
OTHMIN	-0.616 (358.76)	-0.438 (197.21)	-0.430 (218.02)	-0.306 (104.43)	-0.246 (213.06)
WIDOW	-0.041 (22.92)	0.138 (61.11)	0.152 (77.05)	0.088 (29.22)	-0.066 (54.80)
DIVOR	0.234 (285.40)	0.308 (296.76)	0.286 (307.27)	0.238 (165.64)	0.226 (407.90)
CHILD<18	-0.141 (285.33)	-0.063 (103.40)	-0.086 (152.56)	-0.038 (42.99)	-0.016 (47.45)
UNION	1.313 (400.74)	1.307 (471.07)	1.058 (539.56)	1.008 (346.76)	0.948 (944.16)
EXP	0.095 (309.22)	0.146 (370.30)	0.176 (492.56)	0.200 (355.16)	0.253 (1129.43)
EDUC	0.309 (378.46)	0.513 (483.64)	0.619 (624.99)	0.539 (311.89)	0.808 (1093.28)
TAX	1.468 (126.01)	2.922 (208.77)	2.825 (223.12)	3.926 (203.23)	3.857 (511.35)
EXP^2	-0.001 (176.88)	-0.001 (208.76)	-0.001 (306.90)	-0.002 (326.75)	-0.002 (850.61)
$EDUC^2$	0.002 (72.67)	-0.004 (115.29)	-0.008 (283.34)	-0.007 (137.58)	-0.015 (646.57)
EDUC x EXP	-0.004 (291.27)	-0.006 (323.60)	-0.007 (437.30)	-0.006 (230.90)	-0.010 (878.75)
ln (STEARN)	2.079 (595.39)	2.282 (524.85)	1.933 (502.07)	1.562 (260.74)	1.727 (749.21)
ln (PLAND)	0.162 (304.58)	0.219 (326.48)	0.172 (278.83)	0.206 (215.41)	0.125 (337.83)
URATE	-0.104 (413.38)	-0.062 (196.09)	-0.033 (115.06)	-0.044 (99.23)	-0.006 (32.41)
ln (CPI)	-1.648 (257.88)	-1.166 (142.62)	-0.974 (129.96)	-1.602 (136.34)	-1.617 (354.98)
METRO	0.490 (530.34)	0.555 (142.62)	0.293 (283.99)	0.327 (192.87)	0.566 (778.83)
CONSTANT	0.306 (12.58)	-3.980 (133.57)	-5.993 (219.95)	-1.621 (37.46)	-4.533 (267.81)
R^2	0.12	0.143	0.146	0.129	0.146

Note: Frequency weighted regressions based on a sample of 249,821 single workers from 1987 to 2002. ln CON is the log of one plus the employer contribution to health insurance. t statistics in parenthesis.

Table 4.3: Estimation of the Wage Equation, by Firm Size

Variable	ln W: <25 employees	ln W: 26-99 employees	ln W: 100-499 employees	ln W: 500-999 employees	ln W: >999 employees
ln (PRICE)	0.108	0.147	0.207	0.161	0.171
	(423.47)	(371.77)	(557.69)	(267.05)	(729.42)
FT	0.141	0.277	0.286	0.208	0.275
	(789.78)	(1083.83)	(1132.98)	(506.84)	(1814.94)
FEMALE	-0.149	-0.153	-0.142	-0.105	-0.130
	(1071.48)	(969.71)	(988.85)	(456.47)	(1483.98)
BLACK	-0.143	-0.148	-0.171	-0.153	-0.107
	(712.93)	(683.65)	(897.72)	(518.23)	(979.50)
OTHMIN	-0.072	-0.025	-0.028	-0.041	-0.009
	(215.06)	(64.12)	(79.94)	(74.48)	(40.23)
WIDOW	0.035	0.043	0.086	0.041	-0.002
	(99.95)	(107.47)	(242.36)	(71.64)	(10.06)
DIVOR	0.105	0.096	0.083	0.060	0.068
	(656.00)	(520.17)	(492.35)	(223.66)	(656.56)
CHILD<18	-0.008	-0.014	-0.016	-0.027	-0.023
	(82.95)	(125.36)	(151.95)	(161.15)	(656.56)
UNION	0.135	0.136	0.085	0.097	0.108
	(211.51)	(275.72)	(240.49)	(177.45)	(578.69)
EXP	0.020	0.024	0.030	0.041	0.044
	(338.34)	(344.23)	(466.19)	(389.63)	(1045.55)
EDUC	0.024	0.076	0.100	0.054	0.073
	(153.78)	(403.64)	(558.71)	(165.85)	(533.72)
TAX	0.820	0.759	0.958	1.020	1.082
	(362.22)	(305.83)	(419.20)	(280.48)	(770.41)
EXP^2	-0.0003	-0.0003	-0.0004	-0.001	-0.001
	(358.04)	(360.52)	(506.37)	(450.17)	(1109.54)
$EDUC^2$	0.003	0.001	0.001	0.002	0.002
	(567.30)	(165.93)	(101.31)	(228.31)	(389.19)
EDUC x EXP	-0.0005	-0.0004	-0.001	-0.001	-0.001
	(163.41)	(132.16)	(195.77)	(157.78)	(434.48)
ln (STEARN)	0.186	0.157	0.098	0.222	0.253
	(274.24)	(203.37)	(140.82)	(196.41)	(589.16)
ln (PLAND)	0.044	0.043	0.030	0.041	0.028
	(424.06)	(361.60)	(266.94)	(228.56)	(408.13)
URATE	-0.013	-0.007	-0.006	-0.005	-0.002
	(264.46)	(126.92)	(126.09)	(55.43)	(57.58)
ln (CPI)	0.730	0.578	0.469	0.422	0.261
	(587.75)	(398.41)	(346.74)	(190.64)	(307.37)
METRO	0.189	0.176	0.133	0.130	0.144
	(1049.32)	(819.37)	(712.37)	(406.19)	(1068.19)
Constant	-4.730	-4.563	-4.452	-3.929	-3.349
	(999.61)	(864.05)	(905.28)	(481.91)	(1062.11)
R^2	0.196	0.238	0.272	0.247	0.258

Note: Frequency weighted regressions based on a sample of 249,821 single workers from 1987 to 2002. ln W is the log of the hourly wage last year. t statistics in parenthesis.

Table 4.4: Blinder-Oaxaca Decomposition: Weighted Percentage of Explained Variation

	BEN[a]	ln CON[b]	ln W[c]
ln (PRICE)	0.0%	0.0%	1%
FT	37.6%	41.7%	19%
EXP	-22.2%	-25.0%	-14%
EDUC	70.2%	70.0%	97%
METRO	5.3%	6.7%	9%
TAX	1.0%	1.2%	2%
Cost of living	-0.2%	0.1%	0%
Personal characteristics	-2.2%	-3.7%	-19%
Local labor market conditions	10.5%	9.0%	5%
Sum	100.0%	100.0%	100.0%

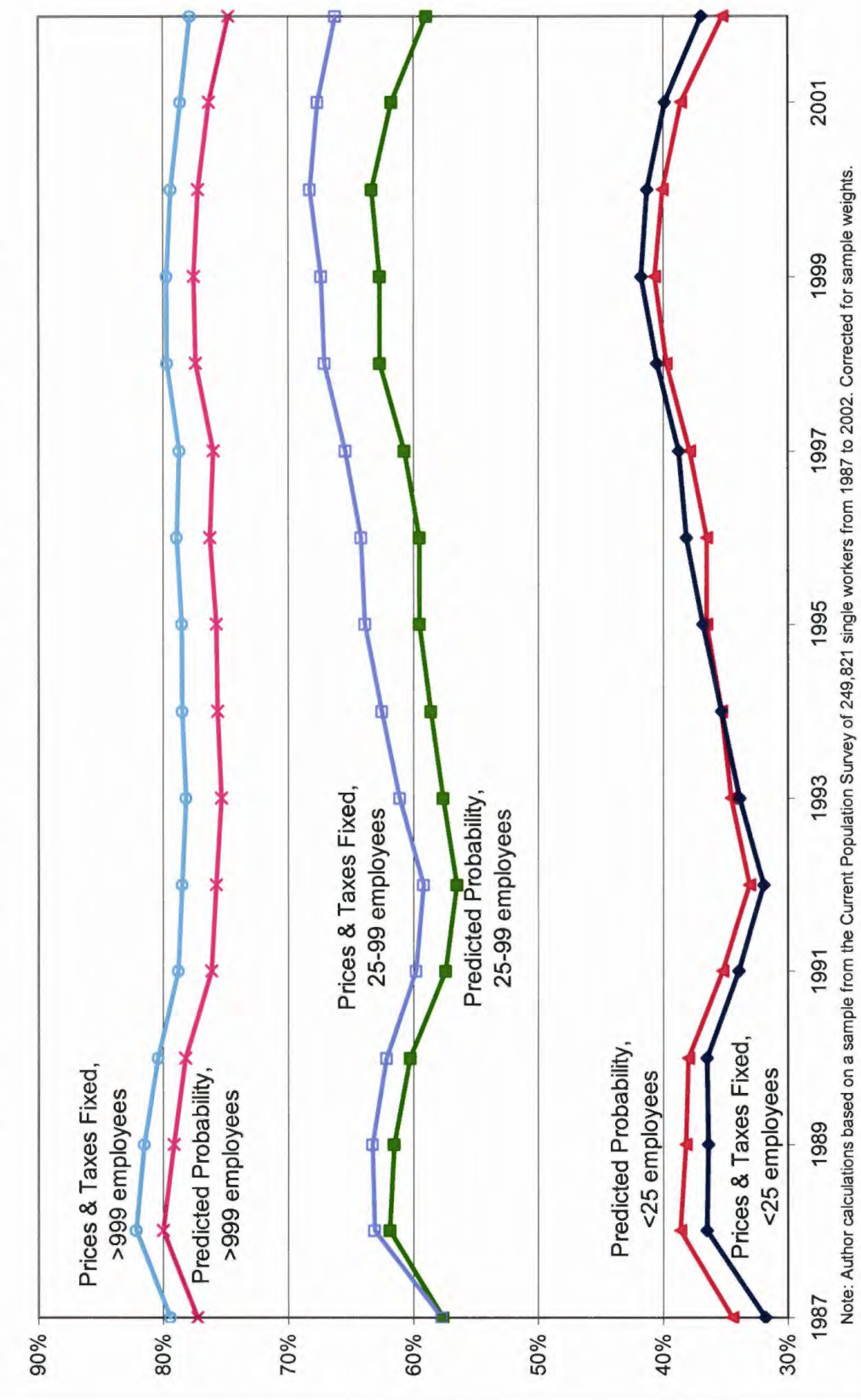
Note: Author calculations based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002. Corrected for sample weights.

[a]The total difference in firm-provided health insurance coverage is 43.8%. 7.0% of this is explained, leaving 36.8% unexplained.

[b]The total difference in the log of the employer's contribution to health insurance is 2.99. 0.54 of this is explained, leaving 2.45 unexplained.

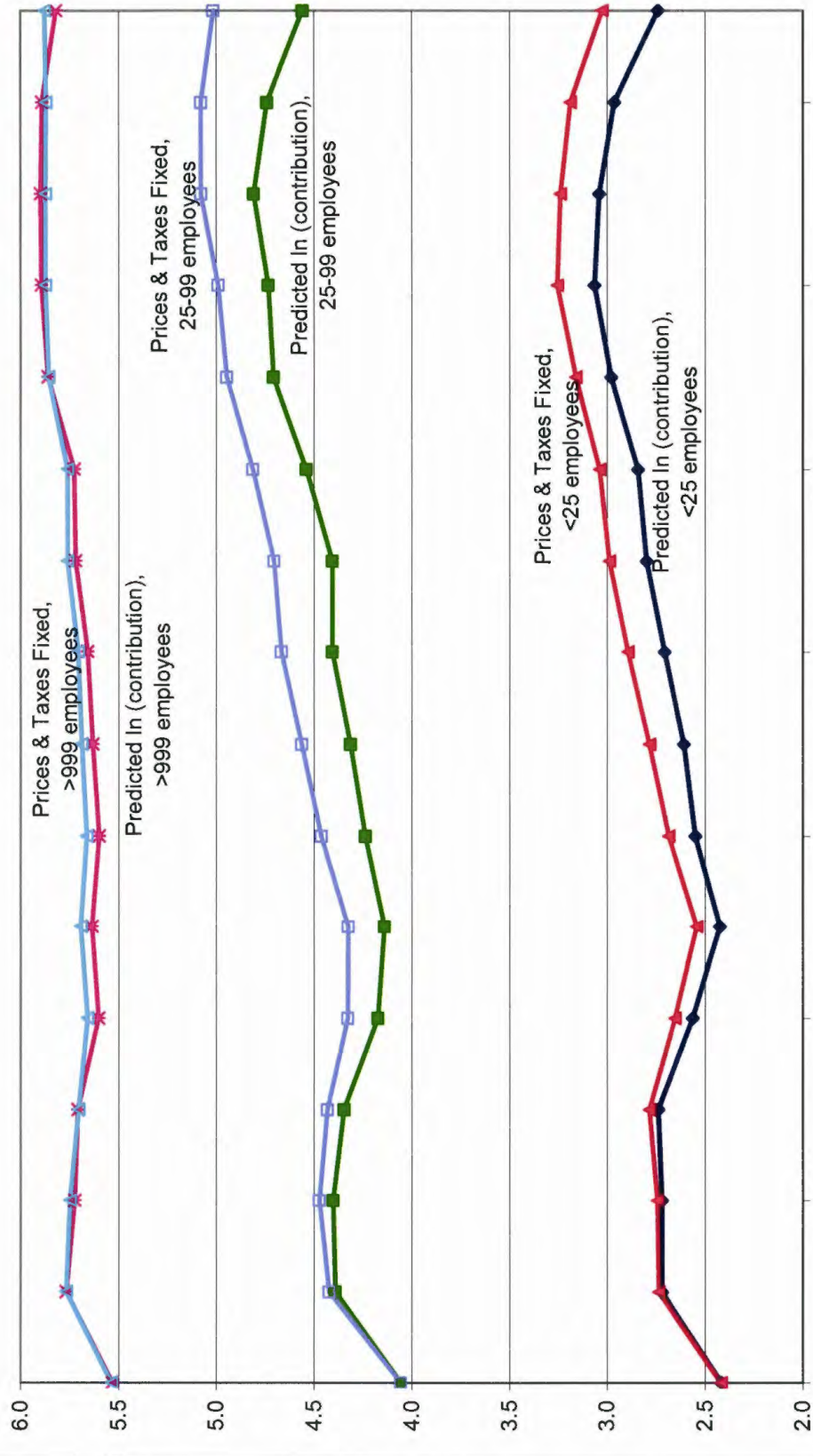
[c]The total difference in the log of wages is 0.35. 0.11 of this is explained, leaving 0.24 unexplained.

Figure 4.1: Simulated Response of the Percent of Workers with Firm-Provided Health Insurance Coverage to Changes in Price and Taxes, by Firm Size



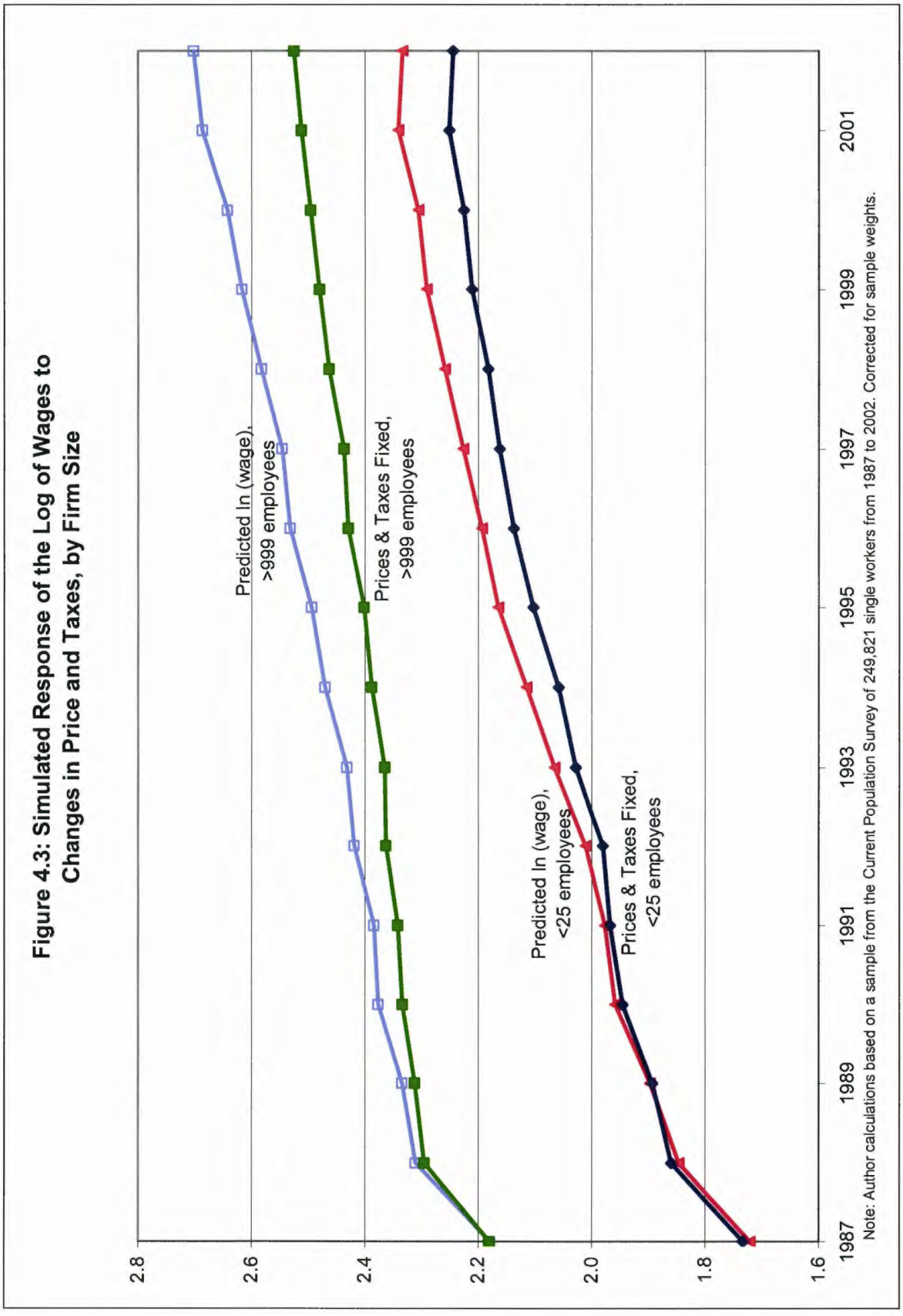
Note: Author calculations based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002. Corrected for sample weights.

Figure 4.2: Simulated Response of the Log of the Employer's Health Insurance Contribution to Changes in Price and Taxes, by Firm Size



Note: Author calculations based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002. Corrected for sample weights.

Figure 4.3: Simulated Response of the Log of Wages to Changes in Price and Taxes, by Firm Size



Note: Author calculations based on a sample from the Current Population Survey of 249,821 single workers from 1987 to 2002. Corrected for sample weights.

Chapter 5: General Conclusions

This paper examines the factors influencing employer-provided health insurance benefits and wages. We use a previously unavailable price series to investigate the role of rising health insurance costs and changing marginal tax rates on compensation choices. We then extend our analysis to examine metro-nonmetro and firm size differences in health insurance benefits and wages. Specifically, we explore how the metro-nonmetro and firm size gaps have evolved over time and research the underlying factors explaining the divide.

The majority of individuals in the U.S. are covered by health insurance through the workplace (EBRI, 2003). The cost of firm-provided health insurance net of inflation rose 104% from 1987 to 2002. This trend should increase the likelihood that firms will reduce their contribution to health insurance benefits or drop them altogether. Over that same period, the average marginal tax rate in the U.S. remained relatively stable. However, significant variation occurred in a number of states. Higher tax rates should raise the cost of compensation in the form of wages relative to benefits because benefits typically are untaxed. Consistent with these two hypotheses, empirical results show that both insurance costs and taxes have a significant impact on health insurance benefits and wages. The combined effects of the changes in health insurance costs and taxes was a 4.6% reduction in the probability of firm-provided health insurance coverage, an 18.2% reduction in average employer contributions to health insurance, and a 17.9% increase in wages as employers shifted compensation from providing benefits to wages.

Workers residing in metro areas had more generous compensation packages than workers residing in nonmetro areas. Metro residents were 5.3% more likely to be covered by firm-provided health insurance, received 61% higher employer contributions to health insurance, and earned 17% higher wages than nonmetro residents, holding everything else constant. The lower education level of workers residing in nonmetro areas explains the

largest portion of the metro-nonmetro compensation gaps. The higher incidence of nonmetro residents employed by the smallest firms also explains a large portion of the difference. Although health insurance costs and taxes have significant effects on health insurance benefits, they explain little of the metro-nonmetro gaps. This suggests that changes to insurance costs and marginal taxes alone will do little to improve the regional gap in health insurance benefits. However, health insurance costs do explain a substantial portion of the difference in wages between metro and nonmetro residents. Rising health insurance costs actually widened the metro-nonmetro wage gap, as illustrated in Figure 3.6. The changes in prices between 1987 and 2002 increased real wages by 20.1% in metro areas and only 4.3% in nonmetro areas.

Small firm workers had less generous compensation packages than large firm workers. Employees in the smallest firms were 36.9% less likely to be covered by firm-provided health insurance, received 91.4% lower employer contributions to health insurance, and earned 22% lower wages than employees in the largest firms, holding everything else constant. The lower education level of individuals working for small firms explains the largest portion of the firm size compensation gaps. Other variables explaining the firm size gap include the lower incidence of workers employed full-time in small firms and local labor market conditions. Health insurance costs and marginal tax rates explain very little of the difference in benefits and wages between small and large firms. Consequently, equalizing health insurance premiums will have very little impact on the proportion of workers covered by employer-provided health insurance in small firms, or the quality of health insurance offered.

Similar to previous studies, we are only able to explain a portion of firm size compensation gaps (see Brown and Medoff, 1990; Oi and Idson, 1999; Troske, 1999). One possible area for further research is the impact of underwriting on small firm and nonmetro

health insurance provision and quality. This research would require an employer-employee matched data set. Since we did not have demographic data and health history on all employees in a given firm, we were unable to analyze the underwriting effect. However, smaller firms face underwriting similar to individuals, which typically makes their health insurance costs higher than larger firms. A related area for further research would be the effect of small group reform on firm-provided health insurance benefits. Assuming that the firm response to health insurance price is fairly inelastic, small group reform is unlikely to increase the provision of health insurance benefits for small firms.

The CPS identifies whether or not an individual resides in a metro area. However, it does not specify the location of their employment. This may cause us to understate the differences in metro and nonmetro compensation, as some nonmetro workers may commute to metro areas for their job and vice-versa. Also, as shown by The Kaiser Commission and The Muskie School (2003), there are wide gaps in health insurance coverage between nonmetro residents who lived in counties adjacent versus not adjacent to a metro county. An area for further research would be to analyze insurance costs and taxes within a dataset that identifies both the location of an individual's employment and distinguishes between different types of nonmetro areas.

Appendix: Selected Sample Statistics and Regression Results for Married and Single Workers

Table A.1: Sample Statistics and Definitions, Married and Single Workers

Variable	Mean	Standard Deviation	Description of Variable
BEN	0.609	0.488	Dummy variable: Indicates employer provides health insurance contribution
CON	1693.006	1798.970	Employer health insurance contribution
ln CON	4.721	3.820	Log of one plus the employer health insurance contribution
WAGE	15.131	14.596	Hourly wage last year
ln W	2.470	0.702	Log of hourly wage last year
INSPRICE	3478.446	1379.523	Cost of insurance
ln (PRICE)	8.080	0.387	Log of the cost of insurance
FT	0.877	0.329	Dummy variable: Worked full-time at least part of the prior year
MICROER	0.229	0.420	Dummy variable: Employed by a firm with <25 employees
SMER	0.142	0.349	Dummy variable: Employed by a firm with 25-99 employees
MEDER	0.162	0.368	Dummy variable: Employed by a firm with 100-499 employees
LGER	0.065	0.247	Dummy variable: Employed by a firm with 500-999 employees
INSTER	0.402	0.490	Dummy variable: Employed by a firm with 1000+ employees
FEMALE	0.469	0.499	Dummy variable: Female
BLACK	0.112	0.315	Dummy variable: Black
OTHMIN	0.041	0.199	Dummy variable: Other minority groups
WIDOW	0.015	0.120	Dummy variable: Widowed
DIVOR	0.120	0.325	Dummy variable: Divorced
NEVMAR	0.182	0.386	Dummy variable: Never married
SEP	0.028	0.166	Dummy variable: Separated
CHILD<18	0.846	1.101	Number of children never married <18 in family
UNION	0.039	0.194	Dummy variable: Member of a labor union or covered by a labor union
EXP	20.721	9.965	Age—years of education—6
EDUC	13.247	2.683	Index of education level (from 0: none to 18: Master's degree or beyond)
TAX	0.165	0.027	Average sum of state and federal marginal tax rate in the state
ln (STEARN)	2.513	0.165	Log of state average manufacturing earnings
ln (PLAND)	7.283	0.688	Log of state average farmland value
URATE	5.533	1.474	State unemployment rate
ln (CPI)	5.395	0.121	Log of the consumer price index
METRO	0.815	0.388	Dummy variable: Metropolitan residence
AGE	39.968	9.542	Age
Number of Observations = 847,748			

Note: Author compilation of average values for married and single employees in the Current Population Survey, various years. Sample statistics are corrected for sample weights.

Table A.2: Probit Estimation of Firm-Provided Health Insurance Coverage and OLS Estimation of the Log of the Real Employer Contribution to Health Insurance, Married and Single Workers

Variable	BEN[a]	ln CON[b]	ln W[c]
ln (PRICE)	-0.003	-0.042	0.126
	(50.50)	(93.72)	(1662.7)
FT	0.411	2.807	0.194
	(8935.96)	(9831.04)	(3948.96)
MICROER	-0.367	-2.554	-0.248
	(9853.66)	(,)	(6010.98)
SMER	-0.161	-1.100	-0.143
	(3706.75)	(3943.41)	(2988.57)
MEDER	-0.066	-0.450	-0.091
	(1584.55)	(1701.43)	(2019.05)
LGER	-0.019	-0.148	-0.054
	(310.05)	(391.10)	(832.44)
FEMALE	-0.099	-0.812	-0.273
	(3430.51)	(4330.62)	(8496.4)
BLACK	-0.076	-0.505	-0.144
	(1658.24)	(1719.65)	(2864.08)
OTHMIN	-0.075	-0.451	-0.091
	(1043.99)	(990.49)	(1160.75)
WIDOW	0.068	0.250	-0.117
	(593.92)	(328.65)	(899.75)
DIVOR	0.082	0.350	-0.077
	(1870.13)	(1204.79)	(1556.93)
NEVMAR	0.034	-0.055	-0.164
	(801.33)	(201.24)	(3473.09)
SEP	0.005	-0.113	-0.136
	(64.73)	(205.94)	(1446.81)
CHILD<18	-0.010	-0.010	0.006
	(663.82)	(101.44)	(355.79)
UNION	0.152	1.028	0.078
	(2042.41)	(2213.91)	(980.9)
EXP	0.018	0.136	0.037
	(1312.45)	(1555.92)	(2453.46)
EDUC	0.087	0.576	0.056
	(2140.32)	(2320.51)	(1323.89)
MTRBYST	0.257	2.317	1.209
	(393.81)	(550.96)	(1677.15)
EXP^2	-0.00005	-0.001	-0.0004
	(286.43)	(574.32)	(2292.04)
$EDUC^2$	-0.001	-0.009	0.002
	(1102.87)	(1160.14)	(1801.19)
EDUC x EXP	-0.001	-0.006	-0.001
	(1480.18)	(1589.39)	(1189.46)
ln (STEARN)	0.168	1.690	0.242
	(1193.67)	(1864.97)	(1557.32)
ln (PLAND)	0.013	0.123	0.038
	(576.04)	(831.96)	(1492.32)
URATE	-0.006	-0.021	-0.004
	(594.95)	(314.50)	(357.23)
ln (CPI)	-0.314	-1.597	0.488
	(1160.38)	(919.62)	(1639.02)
METRO	0.019	0.234	0.152
	(511.11)	(956.83)	(3621.82)
Constant		-0.013	-3.748
		(1.98)	(3372.33)
Predicted Probability (at x-bar)[d]	.618		
Observed Probability	.609		
R^2	0.17[e]	0.22	0.32
Log likelihood	-7.929e+08		

Note: Frequency weighted regressions based on a sample of 847,748 workers from 1987 to 2002.
[a]Dummy variable equal to 1 if the individual is covered by firm-provided health insurance. z statistics in parenthesis.
[b]Log of one plus the employer contribution to health insurance. t statistics in parenthesis.
[c]Log of the hourly wage last year. t statistics in parenthesis
[e]Predicted probability at the mean value for each independent variable.
[e]Pseudo-R-square

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Endnotes

[1] Firms, particularly partnerships or sole proprietorships, may maximize utility rather than profit. However, profit would be an element in the owner's utility function. Under the assumption that profits are separable from other elements of the owner's utility function, the first order conditions are unchanged. If profits are not separable, then the models conclusions may not apply in the case of partnerships or sole proprietorships.

[2] Even in the case of collective bargaining, firms negotiate compensation terms with the right to make "take it or leave it" offers if there is an impasse.

[3] According to the EBRI Health Confidence Survey (EBRI & Mathew Greenwald & Associates, 2004), 79% of employees say benefits are very important when choosing a job and rank health insurance as the most important benefit. Furthermore, 3 in 4 employees would prefer receiving health insurance benefits rather than the money employers spend on insurance.

[4] The low insurance coverage for employees in the smallest firm could reflect the higher cost of health insurance to providers and/or lower benefits demand by small firms.

[5] The probability of benefits and employer contribution to benefits is higher for single females. This effect appears to be related to the types of occupations that single females are in. Also, it may be the single women value benefits more than single men. As shown in the Appendix, women are less likely to get benefits than men if we look at all workers.

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