Rising Health Care Costs: The Effect on Employment Outcomes

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The strong link between employment and health insurance in the U.S. means that ever rising health care costs may have serious consequences for labor market outcomes such as job creation, employment flows, earnings, and hours of work. In this paper, we analyze the effect of health care costs on these employment outcomes, using a dataset compiled to address these issues at the MSA level. Some caution in interpretation is necessary here due to the imprecision of the estimates but overall we argue that the patterns we find suggest a negative effect on employment, with the impact occurring mostly through reductions in new hires. There is also some evidence that workers are not leaving jobs with higher health insurance premiums which may support the job-lock hypothesis. Last, we find significant and negative effects of higher costs on hours of work, illustrating that the link between health insurance and employment can affect workers along many dimensions.

Keywords: employer-provided health insurance, health care costs, employment, job-lock

JEL codes: J32, J21, J63, I11

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INTRODUCTION

Americans are spending more and more on health care every year. Health expenditures per capita have risen faster than inflation in every year since 1980. Not surprisingly, health insurance premiums have followed suit, increasing by 78% between 2001 and 2007 (Kaiser Family Foundation (2008)). Because of the strong link between private insurance and employment in the U.S., these dramatic premium increases may produce potentially serious consequences for labor market outcomes such as job creation, employment flows, earnings, and hours of work.[1] Serious consequences are certainly suggested by recent media coverage with headlines such as "Rising Health Insurance Costs Are Breaking Small Businesses" (South Bend Tribune (IN), Oct 19, 2005) and "Healthcare Costs Pinch Employers," (Los Angeles Times, May 7, 2008). In this paper, we use data assembled from a variety different sources to analyze the effect of increases in health care costs on a number of employment outcomes. We find some evidence of reductions in employment occurring largely through substantial reductions in new hires. We also find evidence of reductions in hours of work and earnings.

CONCEPTUAL FRAMEWORK

Although these headlines take for granted that rising health care costs must be bad for business, theoretical predictions of the effect of health insurance premiums on labor market outcomes differ depending on the assumptions made. For example, it matters whether workers value the premium increases at their full cost and whether wages adjust downward to offset the rising premium costs. To understand why these factors matter, we must bear in mind that employer-paid

[1] Sixty-one percent of non-elderly Americans (74% of those that are insured) were covered by employment-based insurance in 2004 according to the Kaiser Family Foundation 2005. Additionally, employers who offered health insurance paid an average of 85% of single coverage premiums and 73% of family coverage premiums (Kaiser Family Foundation (2007)).

health insurance premiums are one component of a worker's total compensation package. If wages fully adjust to offset premium increases, total compensation does not change and employers' decisions about hiring will be unaffected. Workers would bear the full brunt of premium increases through lower wages but should see no other negative labor market effects.

There are, however, a number of reasons why wage adjustments may not fully offset premium increases. First, workers may not value the additional insurance premium at its full cost. Premiums rise with the underlying price of health care and those higher costs make health insurance more valuable. However, there are also factors which influence premiums but which may not be valuable to workers. As Chernew and Hirth (2004) put it in their discussion of price elasticity of health insurance, the interpretation of estimated elasticities depends on whether the price variation that generates the estimates stems from "factors that generate value to consumers." If, for example, premiums rise due to higher administrative costs or diminished competition, those premium increases may not be valued by workers. In fact, Royalty (2008) presents evidence that insured workers value the marginal health premium dollar at significantly less than the marginal wage dollar. In the case where workers do not fully value the dollars spent on premium increases, an employer could not lower wages to exactly offset the premium increases and still maintain the value of the compensation package to the worker. Second, in some cases wages may not perfectly adjust even if workers do value the increased premium payments. For example, the wages of workers earning at or near the minimum wage may not be able to be lowered sufficiently to offset premium increases.

If wages do not fully adjust to offset premium increases, employers will face higher total compensation levels and will respond with decreases in employment levels. This is the situation envisioned by the media and described by headlines such as "Health insurance woes: Small

businesses struggling with rising premiums" (The Capital (Annapolis, MD), February 19, 2006) as they implicitly assume that wages do not fully adjust, threatening employment growth or even leading to employment declines. As other researchers have shown more formally, the theoretical effect of rising health insurance premiums on employment depends not only on whether and how much wages adjust but also on parameters such as the elasticity of labor supply and labor demand (Baicker and Chandra (2006a), and Cutler and Madrian (1998)). Without solid evidence on the magnitude of each of those parameters, the labor market effects of rising health care costs on employment levels remains an empirical question.

Employer-provided health insurance can affect other labor market outcomes as well. Some employers provide insurance and some do not. Some employers provide insurance where the insurer can exclude costly preexisting health conditions. If a worker has insurance at a current employer, that worker may not want to move to an otherwise more attractive job if the potential new employer does not provide coverage or if equivalent coverage is not available due, for example, to preexisting conditions exclusions. "Job lock" occurs when workers' mobility is reduced and employer-based health insurance becomes a barrier to efficient labor market movements.

Increases in health insurance premiums could also affect hours of work. Because health insurance is a fixed cost, employers may respond by increasing the hours of work of employees in order to reduce the number of employees who are covered by health insurance (Cutler and Madrian (1998)). On the other hand, part-time workers are often not offered employer health insurance. Employers could therefore respond to increasing costs by cutting back on workers' hours enough to make them ineligible for health insurance. The magnitude of the job-lock problem as well as the size and direction of the effect of health insurance on hours of work also remain open empirical questions.

PREVIOUS LITERATURE AND CONTRIBUTION OF THIS STUDY

Despite the well-publicized concerns about the effect of rising health care costs on competitiveness, there is relatively limited empirical evidence on whether, how, and how much rising health care costs are affecting the labor market. Baicker and Chandra investigate the effect of health insurance premiums on the probability of employment and hours of work, using individual-level CPS data merged with state-level data on health insurance premiums from the Kaiser/HRET employer survey (Baicker and Chandra (2005)) or state-level premiums from the Medical Expenditure Panel Survey (MEPS) (Baicker and Chandra (2006a) (2006b)). They find evidence that increases in health insurance premiums are associated with decreases in wages as well as with decreases in the probability of employment and in hours of work. In contrast, Cutler and Madrian (1998), using individual CPS data merged with industry-level health premium data, find that premium increases are associated with increases in hours of work. Last, Chernew et. al. (2005) find negative effects of health insurance premiums on insurance coverage using individual-level CPS data on coverage merged with MSA-level premiums constructed from the Kaiser/HRET employer surveys.

There is a larger literature on the related topic of job lock but the literature does not reach a clear consensus. Several researchers have analyzed the effect of health care costs on job separations, arguing that workers are "locked" into jobs if they have health insurance on the current job but may not be able to obtain coverage in a new job because of preexisting health conditions or other barriers to coverage. The literature is mixed and estimates are imprecise but some studies report quite large effects and significant job lock. For example, Madrian (1994) estimates that job mobility is reduced by approximately 30% because of employer-provided health insurance. A Gruber and Madrian survey (Gruber and Madrian (2002)) reviews 18 papers on health insurance and job lock. They

report that about one-third of these papers find significant effects of health insurance on job mobility; about one-third find no significant effects, and about one-third find mixed evidence.

The relatively sparse literature on the effect of rising health care costs on employment leaves questions of critical interest not fully answered: Are employers responding to the dramatic increases in health insurance costs by cutting jobs? Are workers seeing changes in their hours or lower wage growth? Or both? The larger literature on job-lock also leaves the size of its effect unsettled; the importance of this phenomenon is still being debated. In this paper, we analyze how health care costs are affecting each of these employment outcomes using data gathered from a variety of sources specifically to understand this problem.

The analysis of this paper is based on metropolitan statistical area (MSA) level observations on employment levels and other labor market outcomes and two MSA-level measures of health insurance costs. This approach improves on or complements the existing literature in several important ways. For example, the data we use have advantages over other data for at least two key reasons. First, health care costs are measured at the MSA-level, a more appropriate level of aggregation for labor market study than the state or industry, the levels at which costs are measured in most previous work. Second, the MSA employment data used to measure several important labor market outcomes (described below) represents a much larger underlying sample than the CPS sample used in prior work and should very accurately capture employment patterns across MSAs and over time. The methodology we use combined with these data also address the difficult econometric issues that arise. For example, MSA-level analysis circumvents some endogeneity problems that plague individual-level studies as well as the inconsistent standard errors caused by within-group correlation in the errors when key variables such as health care costs are measured at a more aggregated level than the individual-level data with which they are merged (Wooldridge

(2002)). We will detail further these advantages of our approach in subsequent sections once we have more fully described the data and methods.

DATA

One major obstacle to research on this topic is lack of data. No one dataset includes all of the variables necessary to identify the effect of health care costs on employment. To conduct this analysis, we have gathered data from Metropolitan Statistical Areas (MSAs) from a variety of different sources to create a dataset that can address the questions posed. One key source of employment data is the Quarterly Workforce Indicators (QWI). Created by the Census Bureau from administrative records provided by partner states (such as UI wage records) merged with government survey and census data, the QWI represent the universe of jobs in partner states that are subject to UI reporting requirements (Abowd et. al. (2005)).[2] The Census Bureau makes public the following QWI measures: Total Employment, Net Job Flows, Job Creation, New Hires, Separations, Turnover, Average Monthly Earnings, and Average New Hire Earnings. The QWI measures are extremely comprehensive – on average across states Abowd et. al. (2005) report that the data cover 96% of private sector jobs and "offer unprecedented detail on the local dynamics of labor markets." These rich data provide the type of data needed for an analysis of labor market outcomes across locations and over time.

We use the QWI measures of employment, new hires, and job separations by MSA. To look at earnings, we use QWI measures of average monthly earnings for all workers and for newly hired workers. The QWI measure of earnings does not account for possible changes in hours worked. To understand possible changes in hours of work, we use CPS data collapsed to the MSA level on

[2]Currently, our data include 35 states. Abowd et. al. (2005) report that 40 states have signed Memoranda of Understanding and that therefore the number of participating states continues to increase.

average hours of work (of those working) and the proportion of workers who are full-time (defined as 35 or more hours per week). For most analyses, we use MSA level observations on 44 large MSAs. We use MSA-level data from 1996 through 2005. By 2005, data are available on 35 states. For some analyses, we also use data at the MSA-by-industry level for broad (1-digit) SIC codes.[3] Because the QWI data do not include information on hours of work, the employment data from the QWI are supplemented with data on hours of work from the Current Population Survey (CPS). Data on usual hours of work and full-time status were taken from the CPS outgoing rotation groups in years 1996-2005. These were then collapsed to the MSA-level and merged with the QWI data. We also calculated average hourly wage by MSA using the CPS data.

We have two measures of health care costs. First, we use health insurance premium data from the Medical Expenditure Panel Survey (MEPS) at the MSA level from 1996 to 2005. Average premium data by MSA constructed from the MEPS Insurance Component[4] will capture underlying costs differences in insurance across MSAs and over time. We use the measure of single premium because that is a consistent series over time.[5] Premiums are adjusted to account for overall inflation using the CPI. Our second measure of health care costs is calculated using the wage index created by the Centers for Medicare and Medicaid (CMS) to adjust Medicare payments for geographic differences in hospital wage rates. In order to have a dollar value that is comparable over time for each area, the CMS wage index is multiplied by the average national hospital wage in each year as

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[3]The QWI data are available at the county, metro, or state level. While some analyses might also be conducted for either smaller or larger geographic areas, we argue below that MSA-level analysis is preferable.

[4]Tabulated at the author's request for large metropolitan areas in consultation with John Sommers, AHRQ statistician (Sommers (2006)).

[5]From 1996-2000, data were collected on single premiums and family premiums. All premiums covering more than one person were grouped together as family premiums. Beginning in 2001, family plans were separated into "Employee +1" plans and family plans covering more than two people. The single premium series is consistent over the entire period of study.

reported by the Bureau of Labor Statistics' Employer Costs for Employee Compensation.[6]

The health care cost measures at the MSA level are preferable to the state- and industry-level cost data used in prior work because the MSA-level measures conform more closely to a relevant labor market.[7] Individual states include multiple labor markets and multiple health care markets that produce within state variation in health care costs. Industry measures are national and do not represent a relevant labor market for most workers. MSA-level cost measures will allow for a much more focused labor market analysis. From the MEPS, we have also obtained estimates of percent of workers eligible for employer insurance by 1-digit industry. These measures are used in an alternative set of models estimated at the industry-by-MSA level that is described below. Means of the data are presented in Table 1.

[6]We also explored two other measures of health care costs. Medicare cost data were obtained from the Dartmouth Atlas project. This measure was meant to capture geographic variation in treatment patterns and reimbursement rates but we found that it also reflected the composition of the population and the composition of the elderly population in ways that we could not adequately control for. We also investigated using the medical care CPI as a measure of costs. However, the medical CPI includes only consumers' out-of-pocket payments for medical care, excluding payments by insurers and government. Because rising costs have been accompanied by higher cost sharing by workers, we concluded that the medical CPI could confound changes in cost-sharing with changes in costs.

[7]See for example the labor market definitions used by the BLS Local Area Unemployment Statistics.

Table 1
Means

	Mean	Standard Deviation
Total Employment (QWI)	704,252	454,417
New Hires (QWI)	145,223	91,303
Job Separations (QWI)	159,650	98,288
Monthly Earnings (QWI)	2934	424
Monthly Earnings of New Hires (QWI)	1859	447
Hourly Wage (CPS)	15.64	2.02
Usual Hours of Work (CPS)	39	0.99
Proportion Full-time (CPS)	0.76	0.04
Single Premium (real) (MEPS)	2504	448
Hospital Wage (real) (CMS, ECEC)	15.91	1.93

METHODS

A second obstacle to knowing just how much health care costs are affecting employment growth is the econometric issue of how to distinguish the effect of health care costs on labor market outcomes from other factors that may affect employment and also be correlated with health care costs. For example, health care costs vary by region but many other factors that may affect employment also vary regionally. We know, for example, that wages and housing prices exhibit regional variation as do unemployment rates. There are likely to be unobservable factors that influence employment growth and other employment outcomes that may also be correlated with health care costs. If those factors are not controlled for, analyses could mistakenly attribute to health

care costs effects that are actually due to these other factors.

The panel dataset we have compiled provides a way to address these econometric issues. The primary aim is to identify the effect of health care costs on a variety of employment outcomes. In the main models, we will use observations on employment outcomes by MSA and will focus on the effect of health care costs on those outcomes. Outcome measures include total employment, new hires, total job separations, usual hours of work, proportion of worker who are full-time, monthly earnings, monthly earnings of new hires, and hourly wages. In the first set of employment models, in order to assure that the health care cost variable is not simply picking up regional variation in employment that is due to other regional differences, we will include MSA fixed effects. This will control for mean differences across MSAs. We will also include either year dummies or a quadratic time trend to capture changes over time. The estimates will be identified by the variation in health care costs over time within a metro area. In other words, we will measure the impact of health care costs on employment by looking at patterns of growth in costs over time within an MSA and corresponding patterns of employment. This approach allows us to identify the effect of health care costs on employment without confounding the health care cost effect with regional employment shifts due to other factors.

More formally, we estimate models such as the following:

$$Employment_{mt} = \alpha + \mu_m + \beta\ HC\ costs_{mt} + \gamma\ Time_t + \varepsilon_{mt}$$

where m indexes metro area (MSA) and t indexes time.[8] *Employment* is one of the several employment outcomes of interest as measured in the QWI indicators or created from the CPS data.[9]

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[8] In specification checks, we estimate models at the MSA by industry level. In those models, industry dummies are also included.

[9] As indicated above, these outcomes include total employment (natural log), new hires (natural log), job separations (natural log), usual hours of work, proportion of workers who are full-time, monthly earnings (natural log), monthly earnings of new hires (natural log), and hourly wages (natural log).

MSA fixed effects are represented by μ_m. In the main models, *HCcosts* is either the natural log of average single premium for the MSA and year, adjusted for inflation or the natural log of the average hospital wage in the MSA and year. Its coefficient, β, is the key parameter of interest.[10] In some specifications *Time* is a set of time dummies. This is our preferred specification of the time effect since it is the least restrictive way to take account of changes over time.. In other specifications, because the time period is relatively short and the sample size is small, we include a quadratic time trend instead.[11]

By including MSA fixed effects (μ), the model controls for unobservable factors that differ across areas that may affect employment such as location or conglomeration effects. MSA fixed effects will also control for differences in base levels in employment across metro areas. The effect of health care costs on employment is identified here by the variation in costs over time within a metro area and its effect on changes in employment (relative to the MSA mean).[12]

To provide further evidence on this question, we use industry-by-MSA level observations in a second set of models. We use data on the proportion of workers eligible for employer health insurance by industry nationally in 1996 to identify industries most likely to be affected by rising costs. Industries with the highest rates of eligibility for coverage should be hardest hit by rising premiums since the higher premiums are paid for a higher proportion of their workers. We identify two categories of industries corresponding to low and high rates of worker eligibility for employer

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[10]We also investigate using lagged values of health care.

[11]We initially also included other controls such as demographic characteristics of the MSA in each year. However, census data on population characteristics was not available on a yearly basis. In future work, we plan to add population characteristics available on an annual basis as well as industry share measures.

[12]There is variation within MSAs over time. The mean difference between the MSA maximum and minimum is 817.44 for real premiums and 1.56 for real hospital wages, The respective standard deviations are 398.48 and .91.

insurance.[13] In a model similar to that described above but including a dummy variable for "High Eligibility Industry," we then test whether there are differential effects of costs on employment for high- versus low- eligibility industries.[14] These comparisons will provide additional evidence about how and how much rising health care costs are affecting employment outcomes.

More formally, this set of models is of the form:

$$Employment_{imt} = \alpha + \mu_m + \lambda HighElig_i + \beta_1 HCosts_{mt} + \beta_2 HCosts_{mt} * HighElig_i + \gamma Time_t + \varepsilon_{imt}$$

where i indexes industry, m indexes metro area (MSA), and t indexes time and most variables are defined as above. The new variable in this model is the dummy variable *"$HighElig_i$"* defined according to the proportion (high relative to other industries) of workers nationally in industry i eligible for employer insurance.[15] We expect that high-eligibility industries will be more affected by rising costs so, for example, we expect β_2 to be negative if health care costs are hurting employment since we would expect disproportionately large effects on industries with high eligibility rates. Note that the (uninteracted) industry category (*HighElig*) is also included in order to control for other differences across these categories that should not be attributed to the effects of health care costs. The estimate of β_2 will therefore be a difference-in-difference estimate, picking up the differential effect of health care costs on industries that have historically had higher health insurance eligibility rates.

In addition to benefitting from the rich QWI data and the MSA-level measures of health care

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[13]Industries were classified as low eligibility if eligibility (unconditional on offering) was less than or equal to 0.67 and high if eligibility was greater than or equal to 0.81. (No industries fell between 0.67 and 0.81.) In this categorization, low eligibility industries were services; construction; retail trade; and agriculture, fishing, and forestry. High eligibility industries were mining; manufacturing; finance, insurance, and real estate; transportation, communications, utilities; and wholesale trade. In an alternative categorization, services industries were dropped to create a greater gap between high and low industries. In this alternative definition, an industry was a low eligibility industry if the eligibility rate was 0.57 or less.

[14]This is similar to the approach taken in Card (1992).

[15]These industry eligibility categories are defined for 1996 at the beginning of the panel in order to avoid picking up any possible effects of rising costs on eligibility over the period.

costs, these models using MSA-level data have some methodological advantages over individual-level alternatives. For example, take the key econometric issue raised by Baicker and Chandra [(2005), (2006a)] who study the effect of health insurance premiums on individual labor market outcomes. They point out that unobserved individual ability is likely to be correlated both with the outcomes of interest such as employment and with individual premiums (or imputed individual premiums) if high ability workers are offered more generous benefits by the employer.[16] Other individual-level unobservables, such as health, are likely to cause similar problems. In the case where the troublesome unobservables are thought to be at the individual level, aggregating up can average across and thereby cancel out these individual-level unobservables as well as classical measurement error (Kennedy (2003), Grunfeld and Griliches (1960)). This aggregation up to the level of the grouped data variable (in this case, the MSA-level measures of health care costs) also solves the problem recognized by Moulton (1990). Moulton showed that standard errors can be seriously underestimated when some variables are measured at an aggregated group level and the individual-level data exhibit within group correlation at that same group level. Wooldrige (2002), as well as others, have pointed out that this problem is avoided if we aggregate all variables to that group level. Our approach will avoid both of these troublesome econometric issues.

RESULTS

The point estimates from the bulk of these models suggest that increasing health care costs are having effects on labor market outcomes. Table 2 presents the effects on total employment, new hires, and total job separations. The models are specified as log-log (the effect of ln single premium

[16] They address this problem by instrumenting imputed premium with state-level measures of per capital medical malpractice payments. The imputed premiums are state-level premiums by type of coverage (family or single) and employer size.

on ln employment, etc.) and so capture a percent change in employment with a percent change in premium. In this Table, four sets of models are presented for each of the dependent variables. We examine both premiums and average hospital costs as the key explanatory variable in each case estimating two specifications, one using time dummies and one capturing time effects using a quadratic time trend. In the case of total employment, we see a small negative and significant (α=0.10) effect of premiums in the latter model and an insignificant effect in the model with the time dummies. The effects are larger (in absolute value) and more significant using the hospital average wage measure. In the preferred model with the full set of time dummies, we find that the elasticity of total employment with respect to average hospital wage is -0.16. All of the models include MSA fixed effects, so the estimated cost effect is identified by the changes over time within the MSA relative to an overall time trend, accounted for either by year dummies or a quadratic time trend. The point estimate from the time trend model implies a 0.05% decrease in total employment with a 1% increase in premiums. The model with time dummies and average hospital wage predicts a 0.16% decrease in employment with a 1% increase in costs. This compares to Baicker and Chandra's estimate of a 0.12% decrease in the probability of employment with a 1% increase in premiums (Baicker and Chandra (2006a)). Even our smaller estimate is not unimportant, implying a 10% increase in costs is associated with a nontrivial 0.5% decrease in employment.[17]

[17]Given the relatively few years of data, it is not surprising that in most cases, the models with time dummies show less statistical significance. They do, in general, however show results in the same direction. (Although that is not the case with employment in Table 2, it is true for a large majority of the many specification checks run.)

Table 2
Effect of Premiums on Employment Outcomes
(t-statistics in parentheses)

	Ln Total Employment				Ln New Hires				Ln Separations			
Ln Single Premium	0.0144 (0.44)	-0.0541 (-1.68)			-0.0910 (-0.86)	-0.270 (-2.54)			-0.0504 (-0.58)	-0.191 (-2.07)		
Ln Hospital Average Wage			-0.163 (-1.88)	-0.491 (-8.03)			-0.309 (-1.14)	-1.652 (-8.09)			-0.238 (-1.03)	-1.229 (-7.43)
MSA Dummies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies?	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Trend and Trend-Squared?	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
N	270	270	266	266	263	263	259	259	269	269	265	265

Data: Total Employment, New Hires, and Separations are taken from the QWI data at the MSA level. The MSA mean single premiums are from the Medical Expenditure Panel Survey Insurance Component. Average hospital premium is calculated from the Medicare wage index used for geographic adjustment and the average national hospital wage from the Employer Costs for Employee Compensation.

Interestingly, we see from the next two sets of models that the point estimates imply that any employment effect appears to be concentrated in new hires. The percentage change in new hires is substantially larger than the percentage change in overall employment, with a 1% increase in premiums resulting in a 0.09%-0.27% decrease in the number of new hires. Given the large increases in premiums over the last decade – reaching as high as 13.9% in 2003 and averaging 9.9% from 1999-2006 (Kaiser Family Foundation (2007)) – this represents a big impact on new hires. The effects are even larger with average hospital premiums. The preferred specification with time dummies included estimates a .31% reduction in new hires with a 1% increase in costs, although the estimate is not statistically significant.

Also of interest are the effects on job separations. The results lend some support to hypotheses of job-lock as we see a negative (significant in two specifications, insignificant in the other two) effect of premiums on job separations. Higher health insurance premiums appear to deter job separations. Again, the point estimates suggest an economically significant effect with a 1% increase in premiums resulting in a decrease in job separations of 0.05% - 0.19%.

Table 3 presents results for models estimating the effect of premiums on earnings and wages. In this table, we present only the preferred specifications with the full set of time dummies. We see weak evidence of wage offsets with health care cost increases. We find significant or marginally significant effects of hospital wages on average monthly earnings and hourly wages and insignificant but negative effects in the other models. The significant effects of hospital wage implies that average monthly earnings decrease by 1.9% with a 10% increase in health care costs and that hourly wages decrease by 2.2% with a 10% increase.. These effects are larger than the 0.9% (insignificant) overall effect on earnings found by Baicker and Chandra (2006a) but is quite similar to the -0.20 earnings elasticity they found for workers covered by employer-sponsored insurance.

Table 3
Effect of Premiums on Earnings
(t-statistics in parentheses)

	Ln Average Monthly Earnings		Ln Average Monthly Earnings of New Hires		Hourly Wage	
Ln Single Premium	-0.0096 (-0.47)	---	-0.111 (-1.03)	---	0..00004 (0.19)	---
Ln Hospital Average Wage	---	-0.188 (-2.29)	---	-0.125 (-0.44)	---	-0.215 (-1.60)
MSA Dummies?	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies?	Yes	Yes	Yes	Yes	Yes	Yes
N	269	265	261	257	229	223

Data: Average Monthly Earnings and Average Monthly Earnings of New Hires are are taken from the QWI data at the MSA level. Average Hourly Wage by MSA are taken from the outgoing rotation group data of the Current Population Survey. The MSA mean single premiums are from the Medical Expenditure Panel Survey Insurance Component. Average hospital premium is calculated from the Medicare wage index used for geographic adjustment and the average national hospital wage from the Employer Costs for Employee Compensation.

As discussed above, there are a number of avenues through which health insurance premiums may affect employment.. Rising costs could cause decreases in hours of work if employers are able to shift workers to part-time status, allowing them not to offer health insurance. In Table 4, we present models that investigate the effect of premiums on hours of work. We find significant and negative effects on the log of worker's usual hours of work and negative, although not significant, effects on the proportion of workers working full-time. The magnitude of the effect on hours is large: a 10% increase in costs reduces average work hours by 1-2% depending on which cost measure we use. Decreases in hours of work are also found by Baicker and Chandra (2006a). This is in contrast to the estimates of a positive effect on hours found by Cutler and Madrian (1998).

Table 4
Effect of Premiums on Hours of Work
(t-statistics in parentheses)

	Ln Usual Hours of Work		Full-Time Worker Proportion	
Ln Single Premium	-0.215 (-1.78)	---	-0.0342 (-1.21)	---
Ln Hospital Average Wage	---	-0.101 (-2.50)	---	-0.115 (-1.51)
MSA Dummies?	Yes	Yes	Yes	Yes
Year Dummies?	Yes	Yes	Yes	Yes
Trend and Trend-Squared?	No	No	No	No
N	229	223	229	223

Data: Average Usual Hours of Work and Full-time Worker Proportion by MSA are taken from the outgoing rotation group data of the Current Population Survey. The MSA mean single premiums are from the Medical Expenditure Panel Survey Insurance Component. Average hospital premium is calculated from the Medicare wage index used for geographic adjustment and the average national hospital wage from the Employer Costs for Employee Compensation.

Last, Table 5 presents results from industry-level data. These models include a dummy variable for whether the industry began this time period with a high level of insurance eligibility and an interaction of this dummy variable with the ln premium variable. We would expect that rising premiums would have a larger effect in high eligibility industries since the compensation of many more workers would be affected by rising costs. With the premium measure, the estimated effects are negative but not statistically significant. Using the hospital average wage measure, however, the effects are large, negative, and significant. The effect of cost increases on high eligibility industries is substantial for total employment, new hires, and separations with respective elasticities of -1.18, -0.85, and -0.88.

Table 5
Effect of Premiums in High Coverage Industries on Employment Outcomes
(t-statistics in parentheses)

	Ln Total Employment		Ln New Hires		Ln Separations	
Ln Single Premium	0.0564 (0.62)	---	-0.0938 (-0.74)	---	-0.0554 (-0.50)	---
LnPremium* High	-0.0845 (-0.49)	---	-0.121 (-0.89)	---	-0.0072 (-0.05)	---
High Cov Industry (High)	-1.347 (-0.99)	1.267 (2.92)	-2.138 (-1.96)	-0.719 (-1.56)	-2.949 (-2.55)	-0.560 (-1.25)
Ln Hospital Avg Wg	---	0.644 (1.31)	---	0.216 (0.41)	---	0.460 (0.90)
Ln Hosp Wg * High	---	-1.181 (-7.54)	---	-0.849 (-5.12)	---	-0.882 (-5.44)
Industry Dummies?	Yes	Yes	Yes	Yes	Yes	Yes
MSA Dummies?	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies?	Yes	Yes	Yes	Yes	Yes	Yes
N	2430	2394	2367	2331	2420	2385

Data: Total Employment, New Hires, and Separations are taken from the QWI data at the MSA level. The High Coverage Dummy is defined based on Medical Expenditure Panel Survey Insurance Component data on eligibility by industry in 1996. The MSA mean single premiums are from the Medical Expenditure Panel Survey Insurance Component. Average hospital premium is calculated from the Medicare wage index used for geographic adjustment and the average national hospital wage from the Employer Costs for Employee Compensation.

SENSITIVITY CHECKS

We have performed a number of specification checks on these models, none of which change the qualitative results. For example, it is difficult to know the timing of how premiums might affect employment. The results presented use premiums from the current period. In the case of average hospital wages, we use the year for which the CMS wage index was applied to Medicare charges. As a robustness check, we have also estimated the models using lags of premiums. The conclusions do not change when we use lagged premiums. We also examined whether the effect of costs varied between the 1990's and the years after and including 2000. There was no significant difference. In the second set of models with the interactions with high eligibility industries, we also defined an alternative measure of high eligibility. This also had no effect on our conclusions. As noted above, we also explored the feasibility of using other measures of health care costs, ultimately concluding that the other measures were flawed.

CONCLUSIONS

As the number of uninsured Americans has continued to rise and the cost of health care has increased so dramatically, we have seen sustained policy interest in providing insurance coverage and controlling costs. Some policies, such as employer mandates, would rely even more heavily than we do currently on the employer-based system of health insurance. Others would move away from the employer-based model. Some, such as single-payer plans, would discard that model. Still others, such as employer subsidies or expansion of public programs, would modify or supplement the employer-based system. Most, if not all, proposed policies would impact the employer-based system in some way. It is therefore crucial to understand more about how the current and evolving health care and health insurance market with its strong ties to the labor market are affecting labor market outcomes.

In this study, we investigate how rising health care costs are affecting a variety of labor

market outcomes. Some caution in interpretation is necessary here due to the imprecision of the estimates but overall we argue that the patterns we find suggest a negative effect on employment, with the impact occurring mostly through reductions in new hires. There is also some evidence that workers are not leaving jobs with higher health insurance premiums which may support the job-lock hypothesis as well as some evidence of wage adjustments. Last, we find significant and negative effects of higher premiums on hours of work, illustrating that the link between health insurance and employment can affect workers along many dimensions.

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