Economic Research Initiative on the Uninsured
CONFERENCE DRAFT

HEALTH INSURANCE AND LABOR MARKET OUTCOMES : JOINT DECISION-MAKING WITHIN HOUSEHOLDS

Draft: Please do not cite or quote without permission.

Anne Beeson Royalty, Ph.D.
Department of Economics
Indiana University Purdue University Indianapolis

Jean M. Abraham, Ph.D.
Department of Healthcare Management
University of Minnesota

Economic Research Initiative on the Uninsured
University of Michigan
555 South Forest Street, 3rd Floor
Ann Arbor, MI 49104-2531

July, 2004

Acknowledgements: This paper was prepared for the conference, "Employee Benefits and Two-Earner Households," sponsored by the U.S. Department of Labor on May 7, 2004. We thank the U.S. Department of Labor and the Robert Wood Johnson Foundation's ERIU Initiative for providing financial support. We would also like to thank John Sommers and Jon Christianson for their helpful advice. The views expressed are solely the authors' and the usual caveat applies.

ABSTRACT:

Most Americans obtain access to health insurance through an employer. In this paper, we ask how the link between health insurance and employment affects labor market choices about whether to work and type of job. To understand the effect of the incentives embedded in the employer-based insurance system, we study the joint decision-making of husbands and wives that determines the household's access to health insurance. We estimate the effect of husband's (wife's) health insurance on the labor market decisions of wives (husbands), allowing the health insurance and other labor market outcomes of both spouses to be endogenous. Obtaining unbiased estimates of such effects is complicated by the likelihood that positive assortative mating creates correlations between a couples's characteristics and the possibility that there are important unobservable household income effects. Our innovation is to measure these biases by examining a second fringe benefit, paid sick leave, in addition to health insurance. Since we do not expect that spouse's health insurance has any behavioral effect on own sick leave, any estimated effect should be due to the correlations induced by assortative mating and shared household income. We can then net out these effects from our estimates in the health insurance equation to obtain the behavioral effect of spouse's insurance on own insurance. We find that, as predicted, spouse's insurance has statistically significant negative effects on being offered own employer insurance, on own labor force participation, on own probability of working full-time, and on own probability of working at a large establishment. These behavioral effects are symmetric for husbands and wives.

I. INTRODUCTION

In the United States, approximately 64% of non-elderly Americans obtain their health insurance through an employer (www.statehealthfacts.kff.org, 2004). In this study, we ask how an individual's labor market choices are affected by this link between employment and health insurance. Employer-based insurance has some clear advantages relative to alternatives. For example, employer group insurance is generally much less costly, is often simultaneously more generous than private insurance obtained in the non-group market, and enjoys a tax advantage relative to insurance not purchased through an employer. However, these advantages may well be offset by some less obvious welfare losses resulting from the link between access to health insurance and employment.

Employers typically do not offer health insurance as compensation for certain types of jobs. In 1999, only 26% of part-time workers in establishments that offered coverage were eligible for the benefit, in contrast to 88% of full-time workers. Only 52.4% of workers in establishments with fewer than 10 employees were offered health insurance (http://www.meps.ahrq.gov, 2002). For workers who desire coverage, these differences in health insurance provision across jobs create incentives to work full-time in larger establishments even when part-time work, employment in a small firm, or opting out of the labor force might otherwise be preferred.

One way of gaining access to employer insurance when it is not available through an individual's own job, or when he or she is unemployed, is through a working spouse. Given that most employer-sponsored insurance plans include an option for family

coverage, it is unnecessary for both spouses to have employer-based offers of insurance.[1] In an earlier, descriptive study we found that having two earners in a household substantially mitigates the negative effect on access to health insurance of workers in part-time jobs, workers in small establishments, and self-employed workers (Abraham and Royalty (forthcoming)). Knowing that a large proportion of married adults who do not have their own access to coverage have access through a working spouse does not tell us, however, whether this is merely fortuitous or whether these couples have sorted themselves systematically into such arrangements. That is, we do not know whether and to what extent these couples make decisions about employment that affect one spouse's health insurance status jointly with decisions that affect the availability of employer insurance to the other spouse.

Knowing the extent to which labor market outcomes depend on each partner's access to coverage is critical to answering many current policy questions. For example, if couples sort themselves into jobs with and without health insurance, it will affect the demand for insurance by workers and therefore the likely effectiveness of policies designed to increase insurance coverage by encouraging employers to offer insurance in jobs where they have not done so historically. Understanding these joint decisions will also help us to identify how much health insurance drives other labor market decisions when access to health insurance depends on the choice made. If workers are locked into full-time jobs or jobs in large firms, for example, because of employer health insurance, our system of employer-based insurance may produce large welfare losses.

Related questions have been investigated in previous studies. Some recent work

[1]Data from the 2001 Medical Expenditure Panel Survey (MEPS) Insurance Component show that less than 2% of workers in establishments offering insurance were not offered a family coverage option (Sommers,

has assumed that some particular labor force decision is endogenous with respect to a spouse's employer insurance options, using that assumption to identify the labor market effect of insurance. For example, a number of studies have focused on women's labor supply (Buchmueller and Valletta (1998), Olson (1998), Olson (2000), Wellington and Cobb-Clark (2000), Schone and Vistnes (2001), and Bhargavan (2000)). Specifically, work on women's labor supply such as Buchmueller and Valletta (1998) assumes that a wife's hours of work are likely to be sensitive to whether or not her husband has health insurance, since she is more likely to be offered insurance if she works full-time. These studies consistently find significant negative effects of husband's health insurance on wife's labor supply; however, these effects are identified by assuming that the husband's health insurance is exogenous to the labor supply decision of the wife.[2]

As Currie and Madrian (1999) point out, the assumption of exogeneity "is clearly problematic if husbands and wives make joint labor supply and job choice decisions." Schone and Vistnes (2001) do attempt to account for the endogeneity of husband's health insurance by instrumenting husband's insurance using husband's employment characteristics. Although job characteristics such as hours of work and establishment size are good predictors of insurance status, these may be the very job attributes that change as workers adjust in order to obtain health insurance if a spouse chooses a job without employer insurance. Therefore, using job characteristics as instruments is not an effective solution to the problem if husbands' decisions about what types of jobs to take are also endogenous.

The key challenge to investigating the joint decision-making of husbands and

---

2003).

wives is finding valid instruments for spouse's health insurance. While a worker's age and education are good predictors of having an insurance offer, employing these measures as instrumental variables (IV) may still be insufficient if positive assortative mating or unmeasured income effects are present. Then, an IV model using spouse characteristics as instruments still will yield biased estimates since the observed attributes of the spouse are correlated with unobservable factors that influence both own and spouse labor market outcomes.

In this study, we develop a method to address these challenges. The innovation is to estimate the direction and size of the bias due to assortative mating and income effects by looking at a second fringe benefit, paid sick leave, in addition to health insurance. Since spouse's health insurance should not have a behavioral effect on own sick leave, any estimated effects should be due to the correlations induced by assortative mating and shared household income. Then, we can net out these effects from our estimates in the health insurance equation to obtain the behavioral effect of spouse's insurance on own insurance. This allows us to examine how much behavior changes as married couples take advantage of the flexibility provided by being eligible for one another's employer health insurance and, conversely, by how much labor market outcomes may be distorted by having health insurance tied to employment when no other access to insurance is available.

We begin to investigate households' access to employer health insurance by measuring the effect of one spouse having an insurance offer on the probability that the other spouse also will be offered employer insurance. We analyze the decisions of

[2] A related literature stream focuses on the impact of health insurance access on job turnover. See Gruber and Madrian (2002) for a comprehensive review.

married partners to seek any employment outside the home and whether having access to health insurance through a spouse affects this outcome. Then, for the subset of married couples in which both spouses are employed, we examine the joint decision-making of household members with respect to two dimensions of a job: hours of work and establishment size. In what follows, we present a conceptual framework and econometric approach to investigate married couples' joint decision-making with respect to labor supply and access to health insurance, allowing spousal decisions to be endogenous.

II Institutional Background and Hypotheses

As we stated above, we hypothesize that the probability a married person is offered employer insurance is inversely related to whether or not his or her spouse is offered employer coverage. In our second set of hypotheses, we posit that labor market outcomes that tend to be associated with employer health insurance, such as full-time work or work in a large establishment, will be negatively associated with whether or not the spouse is offered employer insurance.

The predicted relationship between the health insurance offers of two spouses arises as a consequence of some important institutional features of the employer-based health insurance system, as well as the conclusions of models of compensating wage differentials. The key institutional feature of the system is the fact that of employers that offer health insurance, most offer family coverage; therefore, a married worker who is offered insurance is able to cover his or her spouse and any children. As a consequence, having health insurance offers through the employers of both spouses is redundant with respect to *access* to coverage.

A second key fact is that offering health insurance is costly to employers.

Employers incur costs associated with administering a health plan, including such things as human resources staffing and the development of information materials. Most firms also incur direct premium costs by paying some portion of an employee's premium.[3] Employer costs also can vary with certain job characteristics. For example, insurance premiums are higher for smaller firms due to higher loading fees. Similarly, the fixed costs of provision make it more expensive to provide health insurance for part-time workers. As a result, workers in small establishments and part-time workers are less likely to be offered employer health insurance relative to other workers. Table 1 summarizes rates of insurance offers for these job classifications using data on workers in married households from the Medical Expenditure Panel Survey (MEPS). Workers with a preference for job characteristics that are associated with lower insurance offer rates must make some tradeoff between having access to insurance through their employer and job characteristics such as part-time work. And, of course, deciding not to participate in the labor force assures that a person will not have access to own employer coverage.[4]

Even for full-time workers in large establishments, theory predicts tradeoffs between health insurance, wages, and other job attributes. The theory of compensating differentials suggests that since insurance is costly to the employer and valuable to the employee, we should expect to see compensating differentials for health insurance. That is, all else equal, a job without health insurance must compensate with higher wages, other fringe benefits, or better working conditions. Workers with low demand for health

[3] Employers often have to subsidize premiums in order to obtain high enough participation rates to satisfy insurer requirements. In 2003, only 3% of employers contributed less than 50% toward the total premium for single coverage and 14% contributed less than 50% for family coverage (www.kff.org, 2004).
[4] Individuals have the option of seeking health care coverage through non-employment sources. For example, they may purchase a policy in the non-group market or if they qualify, they may enroll in public insurance (e.g., Medicaid). In this paper, we analyze only access to insurance through an employer.

insurance may be able to choose jobs without health insurance in exchange for higher wages or other desirable job characteristics.

These observations suggest that there should be a negative relationship between the employer health insurance offers of husbands and wives. To the extent that health insurance can be traded off for higher wages, other fringe benefits, part-time work, or other desirable job characteristics that are negatively associated with health insurance, workers eligible for insurance through their spouse will maximize household utility by choosing jobs without employer insurance. Similarly, individuals on the margin of labor force participation may decide against employment if access to insurance is available through a working spouse. Thus we hypothesize that, all else equal, the probability that a worker is offered employer insurance and the probability of having a job or the type of job more likely to have insurance is inversely related to whether or not his or her spouse is offered employer insurance.

In its most extreme form, this hypothesis would suggest that spouses should never both have an offer of employer insurance—they would always make the kinds of tradeoffs described above and would therefore never choose to both have employer health insurance offers. However, there are many factors likely to blunt observed job choice behavior relative to this most extreme conclusion. For example, it is important to note that although two offers of health insurance may be redundant with respect to the family's *access* to insurance, both spouses *holding* insurance, conditional on both having offers, may nonetheless be optimal in some cases, since some employers subsidize single premiums at a higher rate than family premiums. We abstract from this point in order to concentrate on the access to coverage represented by being offered employer insurance

either through one's own employer or through a working spouse.[5]

Furthermore, we assume that workers cannot sort themselves perfectly along all dimensions of a compensation package or in terms of all job characteristics. There are institutional features of the labor market and the insurance market that prevent firms from offering a continuum of job packages along these dimensions. Therefore, we do not expect that workers who do not demand health insurance can always easily obtain some other desired feature of compensation, such as more vacation days. This imperfect sorting is another factor that will soften our hypothesis relative to the extreme case. Therefore, our hypothesis is that having access to employer insurance through a working spouse will lower the probability that a person is offered his or her own insurance. Other labor market outcomes, such as the probability of full-time work, will be affected by a spouse's insurance in an analogous manner since they are associated with a greater likelihood of health insurance eligibility.

III. ECONOMETRIC APPROACH

We now turn to the issue of finding an econometric specification that will enable us to estimate whether and to what extent married couples are making their job choices with respect to health insurance jointly. To reiterate, the crux of the problem is to eliminate the bias caused by the endogeneity of spouse's health insurance. In this section, we identify and briefly discuss two possible IV models and then argue that the suggested instruments are not valid. This discussion should make clear the problems that will have to be solved in order to obtain unbiased estimates. Following this, we present

[6] We also ignore other differences in the generosity of benefits, such as what types of health plans are offered and the coverage provisions of those plans in order to concentrate only on access to health insurance. The same inverse relationship would be predicted to hold, however, with respect to spousal tradeoffs in generosity of employer insurance as those that we describe in access to employer insurance.

our estimation strategy.

Problems with Traditional Instrumental Variables Approaches

The most obvious way to examine a spousal insurance effect would be simply to include spouse insurance variables in the own health insurance equation. For example, take whether or not a worker in a two-earner couple is offered employer insurance. A natural starting place would be to specify the following two-equation system:

$$\begin{aligned} H_{ih} &= X_{ih}'\beta_h + \gamma_h' H_{iw} + \mu_{ih} + u_{ih} \\ H_{iw} &= X_{iw}'\beta_w + \gamma_w' H_{ih} + \mu_{iw} + u_{iw} \end{aligned} \qquad (1)$$

where i subscripts the household, h subscripts husbands, and w subscripts wives. In these equations, H_h and H_w are binary indicators representing whether a husband and wife have employer health insurance offers respectively, X represents personal characteristics, β and γ are parameters, μ represents unobservable person- or household-specific determinants such as ability, income, or tastes for work that influence whether an individual is offered insurance, and u is a random error term.

We want to know whether having a wife (husband) with an offer of health insurance makes it less likely that the husband (wife) will have an offer. Similarly, we can replace the health insurance offer outcomes with other labor market outcomes in order to assess the effect of spouse's insurance on whether the husband (wife) chooses not to work or chooses a job without health insurance, perhaps working part-time or trading off employer health insurance for higher wages. If couples are making these decisions jointly, then the spouse is simulataneously making decisions that affect his or her health insurance, and the spouse's health insurance is endogenous. Simple OLS will produce biased estimates, but if we could find valid instruments for spouse's health

insurance, we could obtain unbiased estimates with an IV procedure.

Two types of instruments for spouse's health insurance have been used in previous work.[6] One approach is to instrument for spouse's health insurance with spouse's job characteristics. Certain job characteristics—for example, part-time work or work in a small establishment—are highly negatively correlated with the probability of being offered employer insurance. However, these are likely to be the very job attributes that change as workers respond to a spouse's employer insurance. We want to allow for the endogeneity of all types of job choices. Under the hypothesis of joint job choice, the spouse's job characteristics that are correlated with his or her own insurance will be correlated with the worker's own probability of having insurance, and therefore the spouse's job characteristics are not appropriate.

A second approach is to instrument spouse's health insurance with spouse's human capital characteristics. The rationale behind this strategy is that factors such as spouse's age and education will affect the spouse's health insurance offer but not the worker's own offer. If these characteristics of the spouse also are uncorrelated with the unobservable determinants of the worker's own insurance, then this procedure should provide unbiased estimates of the behavioral effect on a worker's own insurance of the spouse's insurance.

We argue that there are at least two possible reasons that make this unlikely. If assortative mating is important, then any unobservable individual-specific factors (μ) that affect whether or not the worker is offered insurance are likely to be correlated with the spouse's personal characteristics. For example, in the case of positive assortative mating,

[6] See for example, Olson (1998) and Schone and Vistnes (2001).

if high ability workers are both more likely to have an offer of employer insurance and more likely to be married to workers with high levels of human capital, then the spouse's characteristics may simply pick up the unobserved own ability variable**.** This would produce an upward bias on IV estimates of the spouse's health insurance effect.

On the other hand, labor market models predict that many labor market outcomes will depend on household income. If our measures of household income are imperfect, which we think is possible, then the spouse's characteristics may be correlated with unobservables that affect own outcomes via an income effect. This would produce a downward bias on IV estimates that use spouse characteristics as instruments.[7]

Using the wife's health insurance outcome equation, we illustrate this econometric problem more formally. We begin by expressing the health insurance variables in deviation form, $H_w^* = H_{iw} - \overline{H}_w$ *and* $H_h^* = H_{ih} - \overline{H}_h$, and suppressing the vector of personal characteristics (X_w) for ease of exposition. We can restate the wife's equation as:

$$H_w^* = H_h^* g_w + m_w + u_w . \qquad (2)$$

Our goal is to obtain an unbiased estimate of $\gamma_{w.}$ The challenge is that H_h^* is endogenous and that our best instruments, husband's age and education, are thought to be correlated with $\mu_{w.}$ While our IV procedures should take care of any correlation between husband's health insurance and u_w, the IV estimator will be inconsistent because of the presence of μ_w and its correlation with the instruments.

Using quadratics in husband's age and education, we instrument for husband's

[7]Buchmueller and Valletta (1998) address these issues in a different way in their study of women's labor force participation but without allowing husband's insurance to be endogenous.

health insurance and write the IV estimator for the linear probability model as:

$$\hat{g}_w^{IV} = (\hat{H}_h^{*\prime} H_h^*)^{-1} \hat{H}_h^{*\prime} H_w^*. \quad (3)$$

Substituting for H_w^*, we get:

$$\hat{g}_w^{IV} = (\hat{H}_h^{*\prime} H_h^*)^{-1} \hat{H}_h^{*\prime} (H_h^* g_w + m_w + u_w) \quad (4)$$

$$= g_w + (\hat{H}_h^{*\prime} H_h^*)^{-1} \hat{H}_h^{*\prime} m_w + (\hat{H}_h^{*\prime} H_h^*)^{-1} \hat{H}_h^{*\prime} u_w \quad (5)$$

an expression which includes the true effect of husband's health insurance on wife's health insurance (γ_w), as well as two additional terms. Since we think that our instruments are uncorrelated with u_w, asymptotically the third term in (5) should go to zero. However, the second term may be non-zero if the instruments (e.g., age and education) used to construct the predicted value of husband's health insurance, $\hat{H}_h^*$, are correlated with μ_w. This second term represents the asymptotic bias ($B_{\gamma w}$) in the IV estimate due to assortative mating and income effects:

$$B_{gw} = (\hat{H}_h^{*\prime} H_h^*)^{-1} \hat{H}_h{}' m_w. \quad (6)$$

The size of the bias will depend on the degree of correlation between spousal characteristics and unobserved attributes of the wife, such as ability or income, that affect her propensity to have a health insurance offer. If the instruments were uncorrelated with μ_w this bias would be zero.

We tested for the exogeneity of spouse's age and education by estimating a three stage least squares model of the effect of wife's insurance offer on husband's offer and the effect of husband's offer on wife's offer using a sample of two-earner households from the MEPS. Using quadratics in age and education of the spouse as instruments for spouse's health insurance implies that the model is overidentified. However, the model

fails the overidentification test for both the husband's and the wife's equations.[8] Since the rationale for all of the instruments is the same (that spouse's characteristics do not belong in the worker's own equation), we conclude that these instruments are not exogenous due to assortative mating and unobserved income effects and that this approach by itself is unsatisfactory.

Estimation Strategy

In order to address the endogeneity of spouse's health insurance, we will instrument with spouse's personal characteristics, as described above. However, we must additionally find a solution to the problem that is caused by the correlation between the instruments and the unobservables denoted by μ.

One way to solve this problem is to use a standard fixed effects approach where the equations are differenced across time (Lundberg, 1988). However, this approach is difficult to implement due to the limited availability of data sets that contain information on employment and fringe benefits for all household members. Furthermore, if individuals have stable employment over time, there may be insufficient variation to permit identification of an effect.[9]

We develop an alternative to the standard fixed effects panel method to account for unobservable factors that we think might bias the estimates of the effect of spouse's health insurance on various labor market outcomes obtained by instrumenting spouse's

[8] We estimated three stage least squares models in which the wife's offer equation included wife's education, education-squared, age, age-squared, race, region dummies, and whether or not the husband is offered insurance. The husband's equation was symmetric. The test statistics for overtidentifying restrictions were 13.71 and 12.21 for the wife's and husband's equations respectively. The Chi-Square critical value at significance level .05 is 9.49.

[9] The MEPS conducts five rounds of the survey with respondents over 2 ½ years. We considered a fixed effects modeling strategy with the MEPS, but there was too little variation in outcomes during this relatively short panel.

health insurance with spouse's characteristics. Instead, we use data on whether husbands and wives have paid sick leave, a fringe benefit that should not depend in a causal way on spouse's health insurance, but, we argue, does depend on the same types of unobservables as those that affect the own health insurance benefit. We argue that there is no causal effect of spouse's insurance on own sick leave since, while spouse's insurance confers own access to insurance, it does not provide any access to own sick leave.

To see how data on sick leave can help us solve our problem, consider both the wife's health insurance equation and an equation that corresponds to whether or not she receives paid sick leave (S_w). As before, we express the sick leave and health insurance terms in deviations and suppress personal characteristics (X_w) for ease of exposition.

$$\begin{aligned} H_w^* &= H_h^* g_w + m_w + u_w \\ S_w^* &= m_w + u_w \end{aligned} \qquad (7)$$

Although the sick leave equation does not contain H_h^* since we assume the behavioral effect of husband's health insurance on wife's sick leave is zero, our estimating equation *does* includes H_h^*. As with the health insurance equation, we instrument for husband's health insurance in the sick leave equation using husband's quadratics in age and education. Let the estimated coefficient on H_h^* in the sick leave equation be represented by $\hat{h}_w$. The IV estimator $\hat{h}_w$ will be:

$$\hat{h}_w^{IV} = (\hat{H}_h^{*\prime} H_h^*)^{-1} \hat{H}_h^{*\prime} S_w^*. \qquad (8)$$

$$\hat{h}_w^{IV} = (\hat{H}_h^{*\prime} H_h^*)^{-1} \hat{H}_h^{*\prime} (m_w + u_w) \qquad (9)$$

$$= (\hat{H}_h^{*\prime} H_h^*)^{-1} \hat{H}_h^{*\prime} m_w \quad + \quad (\hat{H}_h^{*\prime} H_h^*)^{-1} \hat{H}_h^{*\prime} u_w \qquad (10)$$

Again, since we think that our instruments are uncorrelated with u_w, the second term

should not cause a bias. However, the first term will be non-zero asymptotically if the husband's characteristics used to predict H_h^* are associated with wife's unobservables, $\mu_{w,}$ that help to determine whether or not she has health insurance and sick leave. The key to our estimation strategy is that, given our assumptions, the probability limit of $\hat{h}_w$ is equivalent to the bias on g_w^{IV} in (6).

Our estimate $\hat{h}_w$ will capture the partial correlation between husband's characteristics and wife's unobservable factors such as ability or tastes for work—the spousal correlations that we expect may be biasing our IV estimate γ_w. For example, we expect that a highly educated man is more likely to be married to a woman of high ability who is in turn more likely to have both health insurance and sick leave. The husband's education being used to predict his health insurance will, in this case, pick up his wife's propensity to have fringe benefits. But only in her health insurance equation will there also be a behavioral effect. A comparison of the effect of (instrumented) spouse's health insurance on own health insurance to the effect of (instrumented) spouse's health insurance on own receipt of paid sick leave $(\hat{g}_w^{IV} - \hat{h}_w^{IV})$ will help us tease out the behavioral effect of spouse's health insurance on own health insurance. However, this strategy relies on two key assumptions which we want to reiterate.

The first assumption is that the true effect of spouse's insurance on own sick leave is zero. The behavioral effect in the case of health insurance stems from the fact that a married person is eligible for a spouse's insurance, thereby lessening the need for access to own employer insurance. No such eligibility effects are in play in the case of sick leave. Spouse's health insurance confers no sick leave benefits. This is our justification

for assuming that the causal effect of spouse's health insurance on own sick leave is zero.

Second, we assume that there is a strong correlation between the unobservables that affect health insurance and sick leave. If μ_w is equal in the two equations, as we have written it above, the bias is exactly identified. More likely, we argue that there is a high correlation between the μ_ws in the two equations and that the common factors are similarly correlated with predicted insurance of the spouse. The coincidence of having an offer of insurance and having paid sick leave for individuals in the MEPS provides support for the assumption of a strong fringe benefit effect on demand common to both health insurance and sick leave. In the data, we find that 80% of workers are either eligible for both employer health insurance and sick leave or neither of these benefits. The high correlations in the unobservables across the two equations that we estimate and report below also support this assumption. The frequency with which eligibility for paid sick leave and employer health insurance coincides supports the view that these benefits have substantial factors in common. At the same time, there are a considerable number of cases where eligibility for these two benefits does not coincide. The identification strategy implied by these comparisons asks whether spouse's health insurance can help to explain when employer provision of sick leave diverges from provision of health insurance. We will follow this same comparative strategy when we move to analyses of the effect of spouse's insurance on own labor market outcomes such as full-time versus part-time work and labor force participation.

IV. DATA AND MEASURES

We use data from the Household Component (HC) of the 1996, 1997, and 1998 Medical Expenditure Panel Survey (MEPS). The MEPS-HC is a random sample of the

civilian non-institutionalized population of the United States, containing individual level data on demographic characteristics, employment attributes, health insurance, health status, and medical care utilization for individuals within households.

Our study population consists of married households in which both partners are between 19 and 64 years of age, non-disabled, and not full-time students. We restrict our sample to only those married households in which at least one partner is employed outside the home.[10] Based on these criteria, our final sample includes 6,782 one- and two-earner households. We refer to this sample as the "two-adult" sample. Given our particular interest in the subset of married households in which both husband and wife are employed, we additionally define our "two-earner" sample to consist of these 4,491 households.

In the MEPS, household members who reported being employed were asked several questions about their compensation. Using this information, we define two binary indicator variables corresponding to whether an individual had an offer of health insurance through his or her employer (H) and whether the individual had paid sick leave (S) as a fringe benefit.[11]

The MEPS also contains other employment-related questions, including average hours of work per week and establishment size. From these questions, we constructed three labor market outcomes. The first is a binary indicator to capture whether an

[10] Our definition of a "household" is based on the constructed Health Insurance Eligibility Unit (HIEU) identifier contained in the data file. Specifically, an HIEU is a sub-family relationship unit constructed to include adults plus those family members who would typically be eligible for coverage under private family plans. These family members include spouses, unmarried natural or adoptive children who are 18 or under, and children under age 24 who are full-time students (AHRQ, 2001).

[11] We assume that, by definition, self-employed workers do not receive paid sick leave since their pay is directly tied to their productivity. Therefore we assigned self-employed workers a value of zero for the sick leave indicator although questions regarding paid sick leave were not asked of self-employed workers.

individual reported having any employment outside the home. Second, we are interested in whether a married partner is less likely to work full-time if he or she has access to coverage through a spouse. Individuals are coded as "full-time" if they reported working at least 35 or more hours per week on average. Our third measure captures an individual's preference regarding employment in a large establishment. Here, we define a large establishment as one having greater than 25 employees.[12]

In our specification we include several worker and household characteristics that are related to employer health insurance offers and labor market outcomes. Specifically, we include both linear and quadratic measures of an individual's age and education, as well as a dummy variable corresponding to whether an individual is non-white. Other attributes of the household may influence preferences for health insurance or employment. For example, we include the total number of children in the household who are 18 years of age or younger. We predict that the presence of children will make it less likely that an adult seeks employment outside the home or seeks full-time employment. To capture the health status of household members, we define a measure corresponding to the number of serious medical conditions reported by all members.[13] The predicted effect of health status is ambiguous. While poorer health status may decrease an individual's probability of working outside the home or working full-time, this effect may be offset by the choice to work, given stronger preferences for employer health insurance access. Reported income from dividends and interest represents a third

---

The values for offered insurance and paid sick leave of unemployed adults were also set to zero, since they have no employer benefits.

[12] While firm size might be preferable, the MEPS HC only asks for the number of workers employed at the establishment of the survey respondent.

[13] This variable was constructed using the priority list of conditions found on the MEPS Medical Conditions File.

household attribute that we include in the model. As described in the section above, there may be important income effects associated with an individual member's propensity to pursue employment.[14]

In order to control for local labor market conditions, we include a measure of the unemployment rate for the county in which the household resides. Since there is potential for geographic variation in employer health insurance offers and labor market outcomes that may not be controlled for with the unemployment rate, we also include a set of geographic region dummies for the Northeast, Midwest, and South (West is the excluded variable). Finally, to control for any time trends, we include year indicator variables for 1997 and 1998 (1996 is the excluded variable). Tables 2 and 3 provide variable definitions and descriptive statistics.

V. RESULTS AND DISCUSSION

In Table 4 we report results for two-earner couples estimated using a linear probability model. These linear probability models allow us to use the standard instrumental variables procedures discussed in section III. Using the linear model we can also easily estimate the difference-in-difference between the effect of spouse's offer on own health insurance offer and on own sick pay simply by using a differenced dependent variable. In all cases, the variable for the predicted probability of spouse's insurance is scaled to represent the effect of a 10 point change in that probability. The first three columns of Table 4 report results for women. Column 1 reports results for the regression of the differenced dependent variable for the wife on the predicted probability that her husband is offered employer insurance. Specifically, the dependent variable is wife's

[14]We do not include spouse's earned income as an explanatory variable since it is endogenous and jointly determined with the type of job and access to health insurance.

health insurance offer dummy minus wife's paid sick leave dummy. Husband's offer is predicted in a first stage linear probability model (results not reported) of husband's offer on quadratics in husband's age and education and all of the variables included in the wife's equation. The coefficient on predicted insurance of the husband in this equation will capture the difference-in-difference that we want. In order to see the separate effects of spouse's insurance on own insurance offer and own sick leave, we also report the results from the regression equations run separately. Column 2 reports results from a regression of whether the wife is offered employer health insurance on the predicted probability of her husband's having an offer. The results in Column 3 are analogous except that the dependent variable is the wife's sick leave rather than her health insurance. Columns 4-6 are the equivalent specifications for men.

The difference-in-difference results (Column 1 for women and Column 4 for males) are both statistically significant and of the expected sign. The estimates imply that a 10 point increase in the probability of the husband having employer insurance reduces the probability that the wife will have insurance by 2.84 points. Interestingly, the effect is the same size for men: a 10 point increase in the probability of the wife's having an offer decreases the man's probability of an offer by 2.96 points.

By looking at the other columns that report the results for health insurance and sick leave separately, we see an interesting asymmetry for men and women. Recall that the coefficient on predicted spouse's insurance in the sick leave equation in equation (6) is the bias caused by assortative mating or unmeasured income effects. A positive assortative mating effect suggests an upward bias while an income effect implies a negative bias. For men, the assortative mating effects dominate. Having a wife with

characteristics associated with having her own employer insurance is positively correlated with the husband having paid sick leave. For women, it appears that the income effect outweighs the assortative mating effect, producing a negative coefficient on predicted husband's offer in the women's sick leave equation. For women, the effect of having a husband with characteristics associated with having his own insurance is negative – she is less likely to have her own employer insurance. The strong income effect for women suggests a more traditional spousal relationship where women respond to husband's income by, say, working part-time but where men do not respond to the same degree to wife's income. Nonetheless, the incentives associated specifically with access to employer insurance appear to work very similarly for husbands and wives, since the within-household tradeoffs that we observe when we look specifically at being offered employer insurance are equivalent for men and women in two-earner households.

Next we examine other types of labor market outcomes that may be affected by whether or not an individual has access to health insurance through a working spouse. For two-earner couples, we estimate the effect of the spouse being offered insurance on the probability of working full-time and the probability of working in a large establishment. For the two-adult sample, we investigate the effect of spouse's insurance on the decision to enter the labor force and the decision to work full-time.

Although the simple linear probability models reported in Table 4 have an advantage in terms of simplicity, there are also some well-known disadvantages to the linear probability model. In our case, we are most concerned with the linear extrapolations that may produce predicted probabilities outside the (0,1) interval. Therefore, in what follows, we estimate instead bivariate probit models. The intuition

remains the same: we compare the effect of predicted spouse insurance in the own health insurance equation to its effect in the own sick leave equation. Spouse's insurance is predicted using all the variables in the own equation and quadratics in spouse's age and education as instruments. Estimating the two equations as a bivariate probit also allows us to estimate the correlation ($\hat{r}$) in the unobservables across the two equations. The large correlations that we estimate lend support to our claim that the unobservables in the two equations are highly correlated, providing justification for using the sick leave results as a measure of the size of the assortative mating and income effects that would otherwise bias our estimates.

All of the spousal insurance effects in Tables 5-9 are reported in terms of the effect of a 10 point increase in the predicted probability of the spouse being offered insurance.[15] To compute the reported marginal effects of this 10 point change, we use the bivariate probit coefficient estimates and the mean values of our explanatory variables to predict the probability of own offer and own sick leave. We take the difference of the predicted probabilities evaluated at the mean value of spouse's insurance probability and evaluated 10 points above the mean. The column labeled "Difference" is the difference in the effect of the 10 point change on own health insurance offer and the effect of the 10 point change on own sick leave. Although we have not yet obtained standard errors on these difference-in-difference estimates for the probit models, all of the analogous difference-in-difference estimates for the analogous linear probability models are statistically significant at conventional levels.

[15] A complete set of results for the reported bivariate probit models are in the Appendix.

The bivariate probit results for the two-earner households are reported in Tables 5-7. Table 5 reports results for the effect of spouse's offer on own offer and own sick leave, while Tables 6 and 7 report models designed to investigate the effect of spouse's insurance on full-time employment and work in a large establishment.

The results in Table 5 are just the bivarate probit version of the linear probability models reported in Table 4. The results are quite similar to the linear probability estimates. A 10 point increase in the husband's predicted probability of having an offer decreases the wife's probability by 2.78 points. The effect of wife's offer on husband's offer is a similar -2.95 points. As in the linear probability model, the health insurance effects are symmetric for men and women although the relative size of the assortative mating and income effects varies by gender.

Next, we turn to analysis of the effect of spouse's insurance on full-time work, work in a large establishment, and any employment. In each case, we condition the outcome on being offered employer insurance since if one is, say, working full-time without health insurance then the decision to work full-time must not have been made in order to acquire employer health insurance. We then compare the effect of spouse's insurance on working full-time with an offer to the effect of spouse's insurance on the outcome of full-time with paid sick leave. The intuition for this comparison is similar to the results for the effect of spouse's offer on own offer. In this case, the coefficient on spouse's insurance in the "labor market outcome with sick leave" equation will capture assortative mating and income effects that may be correlated with spouse's characteristics. For example, having a husband with a "good job" may make it less likely that a woman will work full-time with an offer of coverage due to income effects. The

predicted probability of the husband having insurance could pick up this "good job" effect if we did not control for it in some way. We hope to pick up that effect in the full-time with sick leave equation. The difference-in-difference estimate then will capture the effect of an increased probability in access to health insurance via a spouse on the own probability of a worker's working full-time with own access to insurance.

Table 6 reports models designed to investigate the effect of spouse's insurance on the probability of a worker working full-time. The dependent variable in Column 1 is an indicator variable for whether the woman works full-time and is offered own employer insurance. The dependent variable in Column 2 is an indicator variable for whether the woman works full-time and has paid sick leave. The results are again obtained from a bivariate probit model. Column 3 reports the difference in the effects of a 10 point change in predicted probability that the husband is offered insurance in those two models. Columns 4-6 report the results from the same model for men.

We find that, as predicted, greater access to health insurance via a spouse decreases the probability of working full-time and being offered employer insurance. For women, the difference-in-difference estimate suggests that a 10 point increase in the probability of husband's offer is associated with a 1.3 point decrease in the probability of full-time work with insurance. For men, the effect is a 3.2 point decrease. This is the largest gender difference in the size of the effects for any of the outcomes that we model. We see no obvious explanation for why the effect would be larger for men than for women. Table 7 reports models exploring the effect of spouse's offer on the worker's own probability of working in a large establishment with employer-provided insurance. The effects again go in the predicted direction. Increasing the probability of the husband

being offered insurance decreases the probability that the wife will work in a large establishment with employer insurance by 1.66 points. An increase of 10 points in the wife's offer probability, decreases her husband's probability of working in a large establishment with insurance by 1.61 points.

For the two-earner couples, we see very definite and economically significant effects on labor market outcomes of having access or, conversely, of not having access to employer health insurance through one's spouse. We see the largest effects when we look specifically at the own health insurance outcome, but we also see that access to insurance affects outcomes such as hours of work and establishment size of the worker.

Next we move to the broader sample of two-adult households in order to explore the effect of insurance eligibility on labor force participation decisions. Table 8 presents the results for labor force participation. We find a 10 point increase in husband's offer probability reduces the probability that a wife will participate in the labor market and have her own employer insurance by 1.6 points relative to the probability she will participate and have paid sick leave. The effect for men is a reduction of 1.72 points. Table 9 shows that the results are very similar when we condition on full-time work rather than any work.

In all of the models for both the two-earner and the two-adult samples, the estimated correlation of the unobservables in the health insurance and the sick leave equation is very high, ranging from 0.83 to 0.96. This supports our argument that the unobservable factors that affect both of these fringe benefits are likely to be very similar and supports our approach to solving the problem of assortative mating and income effects within households.

Another pattern that holds consistently across models is the gender difference in the bias term estimated in the sick leave equation. In every case but one, the bias for women is negative while the bias for men is positive. We interpret this to mean that the bias due to income effects outweighs any positive assortative mating effect for women while the opposite is true for men. This can be explained if women's labor market decisions are more sensitive to household income than men's.

The third important pattern is the consistent labor market effects in the predicted direction for both men and women. In all cases, we see that a greater probability that one has access to insurance through a spouse reduces the probability of labor market outcomes associated with employer insurance such as full-time work. Or, when addressing the possibility of labor market distortions caused by our employer health insurance system, perhaps we should state the result differently: a lower probability of access to health insurance through a spouse increases the probability of particular labor market outcomes, including full-time work, work in a large establishment, and labor force participation. The behavioral effects of spousal health insurance on own outcomes are generally similar for men and women and point to a symmetric relationship in household decision-making on this dimension.

VI. Concluding Remarks

In this study, we have investigated how much behavior changes as married couples take advantage of the flexibility provided by being eligible for one another's employer health insurance and, conversely, by how much labor market outcomes may be distorted by having health insurance tied to employment when no other access to insurance is available.

One key challenge to examining the joint decision-making of husbands and wives is finding valid instruments for spouse's health insurance. Though a worker's age and education are good predictors of having an insurance offer, using these measures in an instrumental variables (IV) framework may still lead to biased estimates if positive assortative mating or unmeasured income effects are present. We introduce an innovative method to estimate the direction and size of the bias due to assortative mating and income effects by looking at a second fringe benefit, paid sick leave, in addition to health insurance. Under certain assumptions, using the sick leave estimates we can identify the bias due to assortative mating and income effects and then net out these effects to obtain the behavioral effect of spouse's insurance on own insurance.

As hypothesized, we find that spouse's insurance has statistically significant negative effects on being offered own employer insurance. For our two-earner couples, we also find significant inverse relationships between the probability that the spouse is offered insurance on both own full-time employment and own employment in a large establishment. Our results also suggest an inverse relationship between employer insurance access of one spouse and labor force participation of the other, though these effects tend to be somewhat smaller. Interestingly, the overall, behavioral effects are symmetric for husbands and wives. However, we do find an interesting asymmetry for men and women. For men, the assortative mating effects dominate while the income effect appears to dominate for the women.

Knowing the extent to which labor market outcomes depend on each partner's access to coverage can provide important insights for assessing the potential effectiveness of policies designed to increase access to coverage, either through employer incentives to

offer insurance in jobs where typically they have not done so or through premium subsidies to employees. If, as we find, married households actively sort into jobs with and without health insurance knowing that only one source of employer coverage is needed to ensure access, then part-time workers or workers in small firms who become eligible for coverage through a policy intervention, may not exhibit strong demand for insurance. On the other hand, our results imply that other access to insurance is likely to increase part-time work and employment in small firms. Therefore, if insurance became more widely available in part-time jobs or small firms, some workers currently working in full-time jobs or large firms for the sake of health insurance may switch jobs. These workers would be expected to have a higher demand for insurance than workers in those jobs who are already eligible for an alternative source of insurance.

Our results also imply some welfare losses due to the link between health insurance and employment. We find that individuals are more likely to work, to work full-time, and to work in large establishments when the probability of having insurance through a spouse is lower. If employer insurance were offered more widely or if insurance were available through non-employer sources on similar terms, individuals would make some different choices about their employment.

REFERENCES

Abraham, Jean M. and Anne Beeson Royalty. 2004. "Does Having Two Earners in the Household Matter for Understanding How Well Employer-Based Health Insurance Works?" *Medical Research and Review*, forthcoming.

Bhargavan, Mythreyi. 2000. "The Effect of Employer-Provided Health Insurance on Labor Market Participation." Ph.D. Dissertation, Rutgers University.

Buchmueller, Thomas C. and Robert G. Valletta. 1998. "The Effect of Health Insurance on Married Female Labor Supply." *Journal of Human Resources* 34(1): 42-71.

Currie, Janet and Brigitte Madrian. 1999. "Health, Health Insurance, and the Labor Market." *Handbook of Labor Economics*, Volume 3C, pp. 3309-3416.

Gruber, Jonathan and Brigitte C. Madrian. March 2002. "Health Insurance, Labor Supply, and Job Mobility: A Critical Review of the Literature." National Bureau of Economic Research Working Paper #8817.

Lundberg, Shelly. 1988. "Labor Supply of Husbands and Wives: A Simultaneous Equations Approach" *Review of Economics and Statistics*, vol. 70(2): 224-35.

Olson, Craig A. 1998. "A Comparison of Parametric and Semiparametric Estimates of the Effect of Spousal Health Insurance Coverage on Weekly Hours Worked by Wives." *Journal of Applied Econometrics* 13(5): 543-565.

Olson, Craig A. 2000. "Part-Time Work, Health Insurance Coverage, and the Wages of Married Women." in Employee Benefits and Labor Markets in Canada and the United States, William T. Alpert and Stephen A. Woodbury, eds. Kalamazoo, Michigan: W.E. Upjohn Institute for Employment Research. Pp. 295-324.

Schone, Barbara Steinberg and Jessica Primoff Vistnes. 2001. "The Relationship Between Health Insurance and Labor Force Decisions: An Analysis of Married Women." Working Paper.

Sommers, John. 2003. Personal correspondence with the authors.

U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality. Medical Expenditure Panel Survey: Household Component. September 2001. http://www.meps.ahrq.gov/data_pub/hc_toc.htm.

Wellington, Alison and Deborah Cobb-Clark. 2000. "The Labor-Supply Effects of Universal Health Coverage: What Can We Learn from Individuals with Spousal Coverage?" in Research in Labor Economics (S. Polachek (editor)), vol. 19 Amsterdam: Elsevier Science, pp. 315-344.

Table 1: Proportion of workers with an Offer of Insurance in Two-Earner Households, by Labor Market Outcome (Source: MEPS)

	Full-time (35 or more hours per week)	Not full-time (Less than 35 hours per week)	Large-establishment (Greater than 25 workers)	Small-establishment (25 or fewer workers)
Insurance Offer – Male	.768	.257	.822	.546
Insurance Offer - Female	.785	.319	.737	.476

Table 2: Variable Definitions

Variable	**Definition**
Insurance Offer	=1 if individual has an offer of employer health insurance, 0 otherwise
Paid Sick Leave	=1 if individual has paid sick leave through employer, 0 otherwise
Full-time	=1 if individual is employed 35 or more hours per week, 0 otherwise
Large establishment	=1 if individual is employed by an establishment with 25 or more employees, 0 otherwise
Any employment	=1 if individual is employed outside the home, 0 otherwise
Explanatory Variables	
Age	Age
Age-squared	Age-squared
Education	Number of years of education
Education-squared	Education-squared
Nonwhite	=1 if individual is non-white, 0 otherwise
Number of kids 18 years or younger in household	Number of children in the household who are 18 years of age or younger
Number of medical conditions in household	Number of serious medical conditions reported by all household members
Household investment income	Annual reported dividend and interest income reported by household members (thousands of dollars)
Local unemployment rate	Unemployment rate for county in which household resides
Northeast	=1 if household resides in Northeast Census Region, 0 otherwise
Midwest	=1 if household resides in Midwest Census Region, 0 otherwise
South	=1 if household resides in South Census Region, 0 otherwise
West	=1 if household resides in West Census Region, 0 otherwise
Year 1996	=1 if year is 1996, 0 otherwise
Year 1997	=1 if year is 1997, 0 otherwise
Year 1998	=1 if year is 1998, 0 otherwise

Table 3: Descriptive Statistics

Variable	Two Earner Married Households (N=4491)		Two Adult Married Households (N=6782)	
	Mean	SD	Mean	SD
Insurance Offer – male	.732	.443	.675	.468
Insurance Offer – female	.646	.478	.458	.498
Paid sick leave – male	.581	.494	.528	.499
Paid sick leave - female	.577	.494	.414	.493
Any employment – male	1	0	.940	.238
Any employment- female	1	0	.723	.448
Full-time male	.934	.248	.88	.325
Full-time female	.713	.452	.516	.50
Large-establishment – male	.683	.465	.683	.465
Large establishment-female	.667	.471	.667	.471
Age-male	41.98	9.87	42.36	10.46
Age-squared male	1859.99	843.87	1903.41	906.37
Age-female	39.89	9.49	40.14	10.15
Age-squared female	1681.01	773.35	1714.41	836.31
Education-male	13.206	2.76	12.80	3.10
Education-squared male	182.026	67.13	173.37	71.53
Education-female	13.200	2.66	12.67	3.02
Education-squared-female	181.34	64.46	169.54	68.40
Non-white-male	.142	.349	.136	.343
Non-white female	.144	.351	.138	.345
Total number of kids ≤18	1.22	1.21	1.30	1.28
Number of medical conditions	.423	.777	.448	.809
Investment income (1000s)	.590	2.4	.579	2.395
Local unemployment rate (%)	5.26	3.24	5.54	3.54
Northeast	.183	.39	.1806	.385
Midwest	.237	.425	.216	.411
South	.362	.48	.365	.482
West	.218	.413	.238	.426
Year 1996	.509	.499	.496	.500
Year 1997	.247	.431	.265	.441
Year 1998	.244	.430	.238	.426

Table 4: Two-Earner Households' Health Insurance Outcomes
Linear Probability Model – Effect of a 10 point increase in the predicted insurance offer

	Females			Males		
	(1)	(2)		(1)	(2)	
Parameter Estimates	**(Insurance Offer – Paid sick leave)**	**Insurance Offer**	**Paid Sick Leave**	**(Insurance Offer – Paid sick leave)**	**Insurance Offer**	**Paid Sick Leave**
Predicted Insurance Offer – Male	-.0284** (.0133)	-.0322** (.0141)	-.0006 (.0140)	….	….	….
Predicted Insurance Offer-Female	….	….	….	-.0296*** (.0114)	.0028 (.0107)	.0298*** (.0111)
Age	-.0076 (.007)	.0288*** (.0070)	.0345*** (.0070)	.0087 (.0063)	.0288*** (.0061)	.0200*** (.0063)
Age-squared	.0001 (.0000)	-.0004*** (.0001)	-.0004*** (.0001)	-.0001 (.0001)	-.0004*** (.0001)	-.0003*** (.0001)
Education	.0123 (.0166)	.0463*** (.0168)	.0284* (.0168)	.0332** (.0139)	.0436*** (.0144)	.0096 (.0138)
Educ-squared	-.0010 (.0006)	-.0008 (.0006)	.0004 (.0006)	-.0020*** (.0006)	-.0009 (.0006)	.0010* (.0006)
Non-white	.0300 (.0199)	.1100*** (.0202)	.0726*** (.0203)	-.0068 (.0236)	.0290 (.0219)	.0440* (.0239)
Number of kids	-.0068 (.0065)	-.0648*** (.0068)	-.0601*** (.0067)	-.0179* (.0099)	-.0066 (.0091)	.0066 (.0097)
Household Investment Income	-.0030 (.0031)	-.0020 (.0033)	-.0005 (.0031)	.0041 (.0033)	-.0028 (.0031)	-.0085*** (.0029)
Number of HH medical conditions	.0004 (.0090)	-.0022 (.0097)	-.0002 (.0096)	.0065 (.0093)	.0015* (.0084)	.0152 (.0093)
Unemployment rate	-.0058** (.0023)	-.0046* (.0026)	.0016 (.0023)	-.0046 (.0024)	-.0040* (.0023)	.0003 (.0025)
South	-.0034 (.0189)	.0228 (.0200)	.0327 (.0199)	-.008 (.0198)	.0221 (.0189)	.0299 (.0200)
Midwest	.0275 (.0226)	.0367 (.0237)	.0035 (.0236)	.0524 (.0218)	.0684*** (.0202)	.0155 (.0222)
Northeast	-.0168 (.0226)	.0362 (.0238)	.0577 (.0236)	-.0062 (.0231)	.0447** (.0216)	.0524** (.0235)
Year 1998	-.0026 (.0180)	.0177 (.0191)	.0194 (.0190)	.0116 (.0178)	.0526*** (.0163)	.0464** (.0182)
Year 1997	-.0129 (.0169)	-.0228 (.0182)	-.0004 (.0180)	-.0061 (.0181)	.0223 (.0168)	.0248 (.0181)
Constant	.4888*** (.1403)	-.0347 (.1471)	-.4805 (.1440)	.1188 (.1439)	-.2559* (.1448)	-.3344** (.1457)
Number of obs	4043	4209	4409	4024	4293	4382

*p<.10, **p<.05, ***p<.01

Table 5:

Effect of spouse insurance offer on own offer

Two-Earner Households
Bivariate Probit – Effect of a 10 point increase in the predicted insurance offer

	Wife (n=4175)			Husband (n=4239)		
	Insurance Offer [a]	Paid Sick Leave [b]	Difference [c]	Insurance Offer [a]	Paid Sick Leave [b]	Difference [c]
Predicted Insurance Offer – Husband	-.0344	-.0066	***-.0278***	….	….	….
Predicted Insurance Offer - Wife	…	….	….	.0024	.0319	***-.0295***
$\hat{r}$	.847			.814		

[a] Dependent variable: = 1 if offered employer insurance; =0 otherwise.
Explanatory variables in addition to predicted spouse's offer: own age, own age-squared, own education, own education-squared, own non-white, number of kids, household medical conditions, household investment income, unemployment rate, geographic region dummies, year dummies, and a constant.
Instruments for spouse's offer: spouse's education, education-squared; spouse's age, age-squared, non-white.

[b] Dependent variable: = 1 if offered paid sick leave; =0 otherwise.
Explanatory variables in addition to predicted spouse's offer: own age, own age-squared, own education, own education-squared, own non-white, number of kids, household medical conditions, household investment income, unemployment rate, geographic region dummies, year dummies, and a constant.
Instruments for spouse's offer: spouse's education, education-squared; spouse's age, age-squared, non-white.

[c] Difference = Effect of 10 point increase in predicted offer probability on offer minus effect of 10 point increase in predicted offer probability on sick leave.

Table 6:

Effect of spouse insurance offer on full-time employment with offer

Two-Earner Households
Bivariate Probit – Effect of a 10 point increase in the predicted insurance offer

	Wife (n=4112)			Husband (n=4177)		
	Full-time with Insurance Offer[a]	Full-time with Paid Sick Leave[b]	Difference[c]	Full-time with Insurance Offer[a]	Full-time with Paid Sick Leave[b]	Difference[c]
Predicted Insurance Offer – Husband	-.0404	-.0274	***-.013***	….	….	….
Predicted Insurance Offer – Wife	….	….	….	.0024	.0344	***-.0322***
$\hat{r}$	.942			.842		

[a] Dependent variable: = 1 if full-time with an offer of employer insurance; =0 otherwise.
Explanatory variables in addition to predicted spouse's offer: own age, own age-squared, own education, own education-squared, own non-white, number of kids, household medical conditions, household investment income, unemployment rate, geographic region dummies, year dummies, and a constant.
Instruments for spouse's offer: spouse's education, education-squared; spouse's age, age-squared, non-white

[b] Dependent variable: = 1 if full-time with an offer of paid sick leave; =0 otherwise.
Explanatory variables in addition to predicted spouse's offer: own age, own age-squared, own education, own education-squared, own non-white, number of kids, household medical conditions, household investment income, unemployment rate, geographic region dummies, year dummies, and a constant.
Instruments for spouse's offer: spouse's education, education-squared; spouse's age, age-squared, non-white

[c] Difference = Effect of 10 point increase in predicted offer probability on full-time with offer minus effect of 10 point increase in predicted offer probability on full-time with sick leave.

Table 7:

Effect of spouse insurance offer on large establishment employment with offer

Two-Earner Households
Bivariate Probit – Effect of a 10 point increase in the predicted insurance offer

	Wife (n=4057)			Husband (n=4069)		
	Large establishment with Insurance Offer[a]	Large estab. with Paid Sick Leave[b]	Difference	Large establishment with Insurance Offer[a]	Large estab. with Paid Sick Leave[b]	Difference[c]
Predicted Insurance Offer – Husband	-.0361	-.0194	***-.0166***	….	….	….
Predicted Insurance Offer - Wife	….	….	….	.0062	.0223	***-.0161***
$\hat{r}$	.958			.956		

[a] Dependent variable: = 1 if works at a large establishment with an offer of employer insurance; =0 otherwise.
Explanatory variables in addition to predicted spouse's offer: own age, own age-squared, own education, own education-squared, own non-white, number of kids, household medical conditions, household investment income, unemployment rate, geographic region dummies, year dummies, and a constant.
Instruments for spouse's offer: spouse's education, education-squared; spouse's age, age-squared, non-white

[b] Dependent variable: = 1 if works at a large establishment and offered paid sick leave; =0 otherwise.
Explanatory variables in addition to predicted spouse's offer: own age, own age-squared, own education, own education-squared, own non-white, household medical conditions, household investment income, geographic region dummies, year dummies, and a constant.
Instruments for spouse's offer: spouse's education, education-squared; spouse's age, age-squared, non-white.

[c] Difference = Effect of 10 point increase in predicted offer probability on full-time with offer minus effect of 10 point increase in predicted offer probability on full-time with sick leave.

Table 8:

Effect of spouse insurance offer on own employment with offer

Two-Adult Households
Bivariate Probit – Effect of a 10 point increase in the predicted insurance offer

	Wife (n=6410)			Husband (n=6385)		
	Any Employment with Insurance Offer[a]	Any employment with Paid Sick Leave[b]	Difference[c]	Any Employment with Insurance Offer[a]	Any employment with Paid Sick Leave[b]	Difference[c]
Predicted Insurance Offer – Husband	-.0399	-.0219	***-.0160***	…	…	…
Predicted Insurance Offer – Wife	…	…	…	.0008	.0180	***-.0172***
$\hat{r}$	.917			.833		

[a] Dependent variable: = 1 if employed with an offer of employer insurance; =0 otherwise.
Explanatory variables in addition to predicted spouse's offer: own age, own age-squared, own education, own education-squared, own non-white, number of kids, household medical conditions, household investment income, unemployment rate, geographic region dummies, year dummies, and a constant.
Instruments for spouse's offer: spouse's education, education-squared; spouse's age, age-squared, non-white.

[b] Dependent variable: = 1 if employed with an offer of paid sick leave; =0 otherwise.
Explanatory variables in addition to predicted spouse's offer: own age, own age-squared, own education, own education-squared, own non-white, household medical conditions, household investment income, geographic region dummies, year dummies, and a constant.
Instruments for spouse's offer: spouse's education, education-squared; spouse's age, age-squared, non-white.

[c] Difference = Effect of 10 point increase in predicted offer probability on full-time with offer minus effect of 10 point increase in predicted offer probability on full-time with sick leave.

Table 9:

Effect of spouse insurance offer on own full-time employment with offer

Two-Adult Households
Bivariate Probit – Effect of a 10 point increase in the predicted insurance offer

	Wife (n=6327)			Husband (n=6289)		
	Full-time with Offer [a]	Full-time with Paid Sick Leave [b]	Difference	Full-time with Offer [a]	Full-time with Paid Sick Leave [b]	Difference [c]
Predicted Insurance Offer – Husband	-.0382	-.0310	***-.0072***	…	….	….
Predicted Insurance Offer - Wife	…	…	…	.0011	.0215	***-.0204***
$\hat{r}$	.962			.856		

[a] Dependent variable: = 1 if full-time with an offer of employer insurance; =0 otherwise.
Explanatory variables in addition to predicted spouse's offer: own age, own age-squared, own education, own education-squared, own non-white, number of kids, household medical conditions, household investment income, unemployment rate, geographic region dummies, year dummies, and a constant.
Instruments for spouse's offer: spouse's education, education-squared; spouse's age, age-squared, non-white

[b] Dependent variable: = 1 if full-time and offered paid sick leave; =0 otherwise.
Explanatory variables in addition to predicted spouse's offer: own age, own age-squared, own education, own education-squared, own non-white, household medical conditions, household investment income, geographic region dummies, year dummies, and a constant.
Instruments for spouse's offer: spouse's education, eduation-squared; spouse's age, age-squared, non-white.

[c] Difference = Effect of 10 point increase in predicted offer probability on full-time with offer minus effect of 10 point increase in predicted offer probability on full-time with sick leave.

Appendix Table 1: Bivariate Probit, Two-Earner Households
Effect of spouse insurance offer on own offer

	Females		Males	
Parameter estimates	**Insurance Offer**	**Paid Sick Leave**	**Insurance Offer**	**Paid Sick Leave**
Predicted Insurance Offer – Male	-.916** (.399)	-.168 (.391)	…	…
Predicted Insurance Offer-Female	…	…	.075 (.329)	.815*** (.306)
Age	.082*** (.196)	.100*** (.192)	.082*** (.018)	.052*** (.017)
Age-squared	-.011*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)
Education	.119** (.048)	.098* (.054)	.103*** (.039)	.022 (.040)
Educ-squared	-.002 (.002)	0.000 (.002)	-.001 (.002)	.003* (.002)
Non-white	.312*** (.062)	.206*** (.059)	.098 (.069)	.118* (.066)
Number of kids 18 and under	-.179*** (.020)	-.169*** (.019)	-.021 (.028)	.014 (.027)
Household Investment Income	.006 (.009)	.001 (.009)	-.007 (.008)	.023*** (.001)
Number of HH medical conditions	-.001 (.027)	.003 (.026)	.059** (.028)	.031 (.026)
Local unemployment rate	-.013* (.007)	.001 (.006)	-.013** (.007)	.000 (.007)
South	.070 (.056)	.074 (.056)	.057 (.057)	.111** (.055)
Midwest	.103 (.066)	.015 (.066)	.195*** (.064)	.055 (.060)
Northeast	.097 (.067)	.145** (.066)	.132* (.067)	.144 (.065)
Year 1998	.043 (.054)	.046 (.053)	.175*** (.053)	.118** (.050)
Year 1997	-.062 (.050)	-.026 (.050)	.063 (.052)	.068 (.049)
Constant	-1.486*** (.409)	-2.770*** (.439)	-2.103*** (.404)	-2.206*** (.407)
Rho-hat	.847 (.011)		.814 (.013)	
Number of obs	4175		4239	

Appendix Table 2: Bivariate Probit, Two-Earner Households
Effect of spouse insurance offer on full-time employment with offer

	Females		Males	
Parameter Estimates	**Full-time with Insurance Offer**	**Full-time with Paid Sick Leave**	**Full-time with Insurance Offer**	**Full-time with Paid Sick Leave**
Predicted Insurance Offer – Male	-1.018*** (.390)	-.688* (.393)	…	…
Predicted Insurance Offer-Female	…	…	.067 (.326)	.874*** (.308)
Age	.087*** (.019)	.103*** (.019)	.092*** (.018)	.055*** (.017)
Age-squared	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)
Education	.103** (.049)	.134** (.059)	.108*** (.040)	.020 (.040)
Educ-squared	-.001 (.002)	-.002 (.002)	-.002 (.002)	.003* (.002)
Non-white	.313*** (.060)	.219*** (.059)	.122* (.069)	.110* (.066)
Number of kids 18 and under	-.206*** (.020)	-.202*** (.020)	-.022 (.028)	.026 (.027)
Household Investment Income	.017* (.009)	-.011 (.009)	.011 (.009)	-.022*** (.008)
Number of HH medical conditions	-.036 (.026)	-.028 (.027)	.043 (.027)	.030 (.026)
Local unemployment rate	-.009 (.007)	.000 (.007)	-.013** (.007)	.000 (.007)
South	.092* (.055)	.151*** (.055)	.065 (.057)	.110** (.055)
Midwest	.051 (.066)	.042 (.066)	.198*** (.064)	.048 (.060)
Northeast	.018 (.066)	.102 (.066)	.124 (.067)	.138** (.065)
Year 1998	.017 (.053)	.064 (.053)	.159*** (.053)	.147*** (.050)
Year 1997	-.053 (.050)	-.011 (.050)	.048 (.052)	.083* (.050)
Constant	-1.506*** (.413)	-2.694*** (.462)	-2.349*** (.403)	-2.303 (.406)
Rho-hat	.942 (.005)		.842 .011	
Number of obs	4112		4177	

Appendix Table 3: Effect of a spouse insurance offer on large establishment employment with offer (Two-Earner Households)

	Females		Males	
Parameter Estimates	**Large Estab. with Insurance Offer**	**Large Estab. With Paid Sick Leave**	**Large Estab. With Insurance Offer**	**Large Estab. With Paid Sick Leave**
Predicted Insurance Offer – Male	-.907** (.392)	-.492 (.404)	…	…
Predicted Insurance Offer-Female	…	…	.158 (.310)	.563* (.314)
Age	.079*** (.020)	.099*** (.020)	.090*** (.017)	.078*** (.017)
Age-squared	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)	-.001*** (.000)
Education	.060 (.046)	.034 (.057)	.048 (.041)	.003 (.044)
Educ-squared	.000 (.002)	.003 (.002)	.000 (.002)	.003* (.002)
Non-white	.371*** (.060)	.301*** (.060)	.197*** (.066)	.173*** (.066)
Number of kids 18 and under	-.106*** (.019)	-.106*** (.020)	-.029 (.027)	-.024 (.027)
Household Investment Income	-.002 (.009)	.005 (.004)	-.003 (.009)	.005 (.009)
Number of HH medical conditions	-.002 (.026)	.008 (.027)	.057** (.026)	.033 (.026)
Local unemployment rate	-.022*** (.007)	-.015*** (.007)	-.014** (.007)	-.004 (.007)
South	.101* (.055)	.034 (.056)	.018 (.055)	-.007 (.056)
Midwest	.127* (.066)	.042 (.066)	.099 (.060)	-.004 (.061)
Northeast	.142** (.066)	.123* (.067)	.116* (.065)	.102 (.065)
Year 1998	.051 (.053)	.063 (.053)	.112** (.050)	.048 (.050)
Year 1997	-.060 (.050)	-.052 (.051)	.045 (.050)	.032 (.050)
Constant	-1.658*** (.407)	-2.589*** (.463)	-2.342*** (.413)	-2.580*** (.427)
Rho-hat	.958 (.004)		.956 (.005)	
Number of obs	4057		4069	

Appendix Table 4: Effect of spouse insurance offer on own employment with offer (Two-Adult Households)

	Females		Males	
Parameter Estimates	**Any employment with Insurance Offer**	**Any employment with Paid Sick Leave**	**Any employment with Insurance Offer**	**Any employment with Paid Sick Leave**
Predicted Insurance Offer – Male	-.963*** (.215)	-.561*** (.219)	…	…
Predicted Insurance Offer-Female	…	…	-.022 (.166)	.452*** (.159)
Age	.150*** (.015)	.152*** (.015)	.127*** (.013)	.073*** (.013)
Age-squared	-.002*** (.000)	-.002*** (.000)	-.002*** (.000)	-.001*** (.000)
Education	.132*** (.032)	.132*** (.040)	.075*** (.025)	-.003 (.027)
Educ-squared	-.001 (.001)	.000 (.002)	.000 (.001)	.004*** (.001)
Non-white	.268*** (.048)	.217*** (.048)	.066 (.053)	.141*** (.051)
Number of kids 18 and under	-.219*** (.016)	-.201*** (.016)	-.039** (.019)	-.012 (.018)
Household Investment Income	-.010 (.007)	-.004 (.007)	-.006 (.007)	-.021*** (.007)
Number of HH medical conditions	-.016 (.020)	-.007 (.021)	.017 (.021)	.014 (.020)
Local unemployment rate	-.024*** (.006)	-.010* (.005)	-.023*** (.005)	-.008 (.005)
South	.074* (.044)	.069 (.045)	.047 (.044)	.075* (.043)
Midwest	.177*** (.052)	.115** (.052)	.176*** (.052)	.043 (.050)
Northeast	.094* (.052)	.137*** (.053)	.135** (.053)	.160*** (.052)
Year 1998	.031 (.042)	.039 (.042)	.147*** (.043)	.113*** (.041)
Year 1997	-.130*** (.040)	-.092** (.040)	-.004 (.041)	.086** (.040)
Constant	-3.381*** (.315)	-4.110*** (.353)	-2.774*** (.297)	-2.145*** (.302)
Rho-hat	.917 (.006)		.833 (.009)	
Number of obs	6410		6385	

Appendix Table 5: Effect of spouse insurance offer on own full-time employment with offer (Two-Adult Households)

	Females		Males	
Parameter Estimates	**Insurance Offer**	**Paid Sick Leave**	**Insurance Offer**	**Paid Sick Leave**
Predicted Insurance Offer – Male	-1.108*** (.216)	-.825*** (.222)	…	…
Predicted Insurance Offer-Female	…	…	-.029 (.166)	.538*** (.161)
Age	.146*** (.015)	.152 (.015)	.135*** (.013)	.075*** (.013)
Age-squared	-.002*** (.000)	-.002*** (.000)	-.002*** (.000)	-.001*** (.000)
Education	.124*** (.033)	.140*** (.043)	.080*** (.025)	-.002 (.027)
Educ-squared	-.001 (.001)	-.001 (.002)	.000 (.001)	.004*** (.001)
Non-white	.281*** (.048)	.227*** (.049)	.089* (.053)	.125** (.051)
Number of kids 18 and under	-.235*** (.016)	-.226*** (.017)	-.042** (.019)	-.003 (.019)
Household Investment Income	.000** (.000)	.000* (.000)	.000 (.000)	.000*** (.000)
Number of HH medical conditions	-.040* (.021)	-.033 (.021)	.006 (.021)	.014 (.021)
Local unemployment rate	-.022*** (.006)	-.012** (.006)	-.022*** (.005)	-.007 (.005)
South	.088** (.045)	.127*** (.045)	.056 (.044)	.076* (.044)
Midwest	.116** (.053)	.111** (.053)	.182*** (.052)	.034 (.050)
Northeast	.031 (.053)	.095* (.054)	.137*** (.053)	.160*** (.052)
Year 1998	.015 (.042)	.050 (.043)	.142*** (.042)	.141*** (.041)
Year 1997	-.109*** (.040)	-.074* .041	-.010 (.041)	.104*** (.040)
Constant	-3.263*** (.325)	-3.982*** (.373)	-2.946*** (.299)	-2.233*** (.303)
Rho-hat	.962 (.003)		.856 (.009)	
Number of obs	6327		6289	