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ABSTRACT

This work presents new evidence on the effect of husbands' health insurance on wives' labor supply. Previous cross-sectional studies have estimated a significant negative effect of spousal coverage on wives' labor supply. However, these estimates potentially suffer from bias due to the simultaneity of wives' labor supply and the health insurance status of their husbands. This paper attempts to obtain consistent estimates by using several panel data methods. In particular, the likely correlation between unobserved personal characteristics of husbands and wives—such as preferences for work—and potential joint job choice decisions can be controlled by using panel data on intact marriages. The findings, using data from the National Longitudinal Survey of Youth and the Current Population Survey, suggest that the negative effect of spousal coverage on labor supply found in cross-sections results mainly from spousal sorting and selection. Once unobserved heterogeneity is controlled for, a relatively smaller estimated effect of spousal coverage on wives' labor supply remains.

JEL Classification Codes: J22, J32, I18

Key Words: Health insurance, Labor supply, Marriage, Panel data

1. Introduction

Employment-based health insurance coverage is the most common form of health insurance in the United States: in 2006, 62.2 percent of nonelderly individuals and 70.9 percent of nonelderly workers were covered by employer-provided health insurance (Fronstin 2007). The issue of health insurance being tied to employment in the U.S. health care system has received much attention from both policymakers and researchers. Accordingly, a substantial body of research has been devoted to examining the relationship between health insurance and various labor market decisions, including labor force participation, hours worked, job mobility, and retirement (see the reviews by Currie and Madrian 1999; Gruber 2000; and Gruber and Madrian 2004).

One important group whose labor force outcomes are likely to be affected by the availability of health insurance coverage is married women. Because employers who provide health insurance often provide it to both employees and their families, many married women receive health insurance coverage through their husbands (Madrian 2006). This availability of alternative health insurance may reduce wives' demand for insurance in their own name and therefore affect their labor market decisions.

In the past decade, a number of studies have examined the relationship between husbands' health insurance and wives' labor supply (Buchmueller and Valletta 1999; Olson 1998, 2000; and Wellington and Cobb-Clark 2000). Using cross-sectional data and estimating reduced-form labor supply equations for wives, they estimate that husbands' health insurance has significant negative effects on their wives' labor supply. However, these cross-sectional estimates potentially suffer from bias because of the simultaneity of wives' labor supply and the health insurance status of their husbands.

There are two main reasons for husbands' health insurance to be endogenous to the labor supply decisions of married women. First, unobserved personal characteristics of husbands and wives that affect labor supply—such as preferences for work—might be correlated because of the marriage selection process (Lundberg 1988). For example, if women with strong preferences for leisure, child rearing, or home production tend to marry men who work long hours and hence provide health insurance to the family, then cross-sectional regressions of wives' labor supply on spousal coverage would overstate the negative effect of spousal coverage.

A second possible source of endogeneity is that husbands and wives may make joint job-choice decisions determined by the health insurance options available to the family (Black 2000; Scott, Berger, and Black 1989). For example, because coverage rates typically increase with firm size,[1] husbands may sort into larger firms or into industries—such as the manufacturing or the public sector—that are more likely to provide health insurance coverage to their workers.[2] Again, this sorting behavior would lead the cross-sectional estimates to overstate the negative effect of spousal coverage.

This paper attempts to avoid some of the limitations of earlier empirical work, which likely estimates a spurious negative relationship between spousal coverage and wives' labor supply, by using several panel data methods. Using data from the National Longitudinal Survey of Youth (NLSY) and the March Annual Demographic Supplements to the Current Population Survey (CPS), I compare results obtained from three econometric approaches: 1)

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[1] According to Employee Benefit Research Institute (EBRI) tabulations of data from the March 2007 Supplement to the Current Population Survey (CPS), 27.0 percent of workers in firms with fewer than 10 employees were covered by their own employer's health plan in 2006, compared with 65.0 percent of workers in firms with 1,000 or more employees (Fronstin 2007).

[2] According to EBRI estimates from the CPS, in 2006, 67.1 percent of workers in the manufacturing sector and 74.2 percent of workers in the public sector were covered by their own employer's health plan (Fronstin 2007).

cross-sectional estimation of linear probability and probit models of labor supply, which (perhaps incorrectly) assumes exogeneity of spousal coverage; 2) cross-sectional instrumental variables estimation to handle the potential endogeneity of spousal coverage; and 3) panel data methods to account for the marriage selection process and the joint job-choice decisions. The findings suggest the negative effect of spousal coverage on labor supply found in previous cross-sectional studies results mainly from spousal sorting and selection. Once unobserved heterogeneity is controlled for, a relatively smaller estimated effect of spousal coverage on wives' labor supply remains.

The paper is organized as follows. Section 2 summarizes the empirical literature on the effects of spousal coverage on labor supply. Section 3 describes the econometric methodology and discusses how the possible endogeneity of spousal coverage can be handled. Section 4 describes the data, Section 5 presents the main results, and Section 6 concludes.

2. Previous Research

Previous research on the effects of husbands' health insurance coverage on wives' labor supply has relied on the assumption that a husband's coverage is exogenous to the labor supply decisions of his wife (Buchmueller and Valletta 1999; Olson 1998, 2000; Wellington and Cobb-Clark 2000). Using cross-sectional data, these studies estimate that husbands' health insurance has significant negative effects on wives' labor supply. In particular, Buchmueller and Valletta (1999) use data from the April 1993 CPS to estimate that a husband's health insurance reduces his wife's probability of working by 12 percent and her hours of work by 36 percent.

Buchmueller and Valletta's key independent variable is whether or not the husband has health insurance coverage from an employer (spouse's insurance). Olson (1998) points out that a wife's labor supply decision is affected not by her husband having his own health insurance (that is, whether or not it covers the wife, as used by Buchmueller and Valletta), but rather by whether she receives coverage through her husband's health insurance plan (spousal coverage). Still, using data from the March 1993 CPS, Olson finds effects similar to those estimated by Buchmueller and Valletta: spousal coverage reduces the probability a wife will work by 11 percent and her hours of work by 20 percent.

Like Olson (1998), Wellington and Cobb-Clark (2000) estimate the labor supply effects of spousal coverage. They use the March 1993 CPS data and estimate a 23 percent reduction in wives' labor force participation due to coverage through husbands' health insurance.[3] Conditional on working, spousal coverage is estimated to reduce hours of work by 17 percent for white wives and 8 percent for black wives.

Buchmueller and Valletta (1999), Olson (1998, 2000), and Wellington and Cobb-Clark (2000) all note that the assumption that spousal coverage is exogenous to the wives' labor supply is questionable. Buchmueller and Valletta use a multinomial logit model in an attempt to account for the unobserved heterogeneity among married couples. Olson shows that the estimated effects are sensitive to econometric specification and the underlying exogeneity assumption. Wellington and Cobb-Clark try to sign the bias that would result from ignoring the potential endogeneity of spousal coverage. The present study takes a

[3] The larger effects estimated by Wellington and Cobb-Clark (2000) may be explained by their inclusion of not only spouse's insurance but also of the key variable, spousal coverage, in labor supply models. Because estimated coefficients of spouse's insurance are positive and significant, the net effects of spousal coverage estimated by Wellington and Cobb-Clark (that is, husbands have insurance that covers their wives) are about the same magnitude as those estimated by Olson (1998).

different approach from earlier work in estimating the effect of spousal coverage on wives' labor supply, particularly along the methodological lines described in the next section.

3. Empirical Methodology

An empirical model that relates the labor supply of married women to their health insurance coverage by their husbands' employer-provided plan can be specified as

(1) $$LS_i = \delta SPCOV_i + WIFE_i \beta_1 + HUSBAND_i \beta_2 + FAMILY_i \beta_3 + v_i ,$$

where LS_i is the labor supply of a married woman in family *i*. The key variable, $SPCOV_i$, equals 1 if the wife in family *i* is covered by her husband's employer-provided health insurance, and 0 otherwise. $WIFE_i$ is a vector of wives' personal characteristics (education, experience, experience squared, and race); $HUSBAND_i$ denotes husbands' personal characteristics (education, experience, and experience squared); and $FAMILY_i$ denotes family characteristics (presence of children under age 6, number of children under age 18, region of residence, and family nonwage income). Finally, v_i represents unobservable factors that affect the labor supply of wife in family *i*.

Estimating Equation (1) by ordinary least squares (or probit) may produce inconsistent estimates if unobservable characteristics among married couples that affect wives' labor supply (v_i) are systematically related to the availability of husbands' health insurance coverage ($SPCOV_i$). One possible solution to this endogeneity problem is to find valid instrumental variables for $SPCOV_i$. To be valid, instruments must be correlated with husbands' employer-provided health insurance but unrelated to unobservables affecting wives' labor supply. Some previous studies have suggested husbands' job characteristics (having a part-time job, working in a small firm, and being self-employed) as instruments for $SPCOV_i$ (Royalty and Abraham 2006). These job characteristics negatively affect the availability of husbands' employer-provided health insurance, but they are likely correlated with wives' preferences for work or ability because of the marriage selection process and the jointness of job choice decisions.

Panel data offer additional possibilities to avoid the potential problem of endogeneity. As long as unobservables that affect wives' labor supply remain constant over time, panel data may solve the endogeneity problem in Equation (1). For example, an empirical model with unobserved effects can be written

$$(2) \qquad LS_{it} = \delta \; SPCOV_{it} + WIFE_{it}\beta_1 + HUSBAND_{it}\beta_2 + FAMILY_{it}\beta_3 + c_i + u_{it} \;,$$

where i indexes families and t indexes time, c_i represents time-invariant unobserved effects on wives' labor supply, and u_{it} represents time-varying unobserved effects on wives' labor supply.

If we can assume that time-invariant unobserved effects, c_i, are uncorrelated with each explanatory variable in Equation (2) across all time periods, then Equation (2) becomes a random effects (RE) model. Possible time-invariant influences on labor supply include differences in ability or in preferences for work. It is likely that both factors are correlated with the availability of spousal coverage because of the marriage selection process. In this case, the RE estimator is inconsistent, and first-differencing (FD) or fixed-effects (FE) methods are required for consistent estimation.[4]

FD and FE methods produce consistent estimates of the effect of spousal coverage on wives' labor supply by allowing for arbitrary correlation between unobserved individual effects (c_i) and the explanatory variables in Equation (2). The consistency of FD and FE

[4] The choice between FD and FE depends on the assumptions about time-varying unobserved effects, u_{it}. The FE estimator is more efficient if u_{it} are serially correlated, while the FD estimator is more efficient when u_{it} follow a random walk.

estimators depends on three assumptions: 1) time-varying unobserved effects, u_{it}, that are uncorrelated with the explanatory variables across all time periods; 2) sufficient variation in spousal coverage over time; and 3) strict exogeneity of explanatory variables.

The strict exogeneity assumption rules out feedback effects from wives' labor supply to husbands' health insurance coverage in subsequent years. For example, if husbands switch to jobs that would provide health insurance to the family because their wives decide to leave the labor force or work shorter hours (and hence are less likely to receive health insurance coverage from their own employers), the strict exogeneity assumption is violated, and the FD and FE estimators are inconsistent. In this case, one possible approach to consistent estimation involves using instrumental variables methods applied after a FD or FE transformation, provided valid instruments are available.

4. Data

To examine the effect of spousal coverage on labor supply decisions of wives, I use data from the National Longitudinal Survey of Youth (NLSY). The NLSY is a sample of 12,686 young men and women aged 14–22 at the time of the first interview in 1979. Since their first interview, they were reinterviewed annually until 1994, and then biennially from 1996 to the present. Each survey collected information on demographic characteristics, employment, income, and family structure. In this study, I use eight interviews of the NLSY: 1989, 1990, 1992, 1993, 1994, 1996, 1998, and 2000. These years are selected because the questionnaire included detailed questions on the availability and sources of health insurance coverage only in these survey years. Specifically, respondents were asked whether they were covered by a health plan. If the respondent answered "yes," the interviewer asked who paid for the plan. Responses included current employer, previous employer, spouse's employer, purchased directly, and Medicaid or welfare source. If the respondent was married, the same set of questions on health insurance coverage was asked about the wife or husband. These questions allow me to identify the wives who had health insurance coverage through their husbands' employer-provided health insurance plan.

I am able to follow a sample of 20,396 married women from eight interviews of the NLSY over 12 years. An observation is included if 1) the respondent had an intact marriage from 1989 through 2000, [5] 2) both the respondent and her husband were between the ages of 25 and 64, 3) information on the respondent's source of health insurance was available, and 4) the respondent was not covered by public health insurance. The resulting sample, after pooling all eight years, includes 12,822 married women from the NLSY.

A second source of data I use is the March 2000 Annual Demographic Supplement to the Current Population Survey (CPS), mainly for comparison purposes. The March CPS provides information on demographic characteristics, employment, income, family structure, and health insurance that are comparable to those collected in the NLSY. Using information on both health insurance coverage and sources of that coverage, I can differentiate between wives with and without coverage through their husbands' employer-provided health insurance plan. The criteria used to select the CPS sample are similar to the NLSY: married couples aged 25–64 who did not receive public health insurance. The final sample consists of 19,515 married women from the CPS.

I examine three alternative measures of labor supply: 1) *working,* a binary variable indicating labor force participation defined as positive hours per week; 2) *full-time,* a binary

[5] To test whether the findings are sensitive to restricting the sample to women who remain in a marriage for 12 years, I reestimated the models using all married women. The findings are essentially similar (available on request).

variable indicating that hours worked per week is greater than or equal to 35; and 3) *hours,* usual hours worked per week.

Table 1 displays the three measures of married women's labor supply by spousal health insurance coverage for both the CPS (left-hand panel) and the NLSY (right-hand panel). The top panel of Table 1 shows the labor supply of the entire sample of married women (includes both workers and nonworkers), and the bottom panel shows the labor supply of working married women (a subsample of the entire sample of married women because it includes only women whose weekly hours of work are greater than zero).

The top left-hand panel in Table 1 suggests potential negative effects of spousal coverage on married women's labor supply in the CPS. Wives who were covered by their husbands' employer-provided health insurance (72.8 percent) were less likely to work than wives who were not (83.8 percent). When they worked (bottom left-hand panel of Table 1), they were much less likely to work full-time: 65.0 percent of wives with spousal coverage worked full-time, compared with 83.4 percent of wives without spousal coverage.

The negative correlation between married women's labor supply and spousal coverage is also apparent in the NLSY. The fraction working (top right-hand panel of Table 1) was much lower for wives with spousal coverage (73.8 percent) than for wives without spousal coverage (90.1 percent). Among working wives (bottom right-hand panel of Table 1), those who had spousal coverage were 24.5 percentage points less likely to work full-time (57.8 percent versus 82.7 percent).

Table 2 displays mean characteristics of the entire sample of married women by spousal coverage in the CPS (left-hand panel) and the NLSY (right-hand panel). Overall, the characteristics of married women in the two data sets are quite similar; however, there are some important differences between wives who have spousal coverage and wives who do not. Wives with spousal coverage are more likely to have children under age 6 and to have more children under age 18 than wives without spousal coverage. Also, they tend to be married to more educated husbands. For example, in the CPS, 64 percent of wives with spousal coverage are married to husbands with some college or more, compared with 54 percent of wives without coverage. (The fractions are 59 percent versus 46 percent in the NLSY.)

Table 3 displays mean characteristics of the sample of working married women by spousal coverage in both the CPS and NLSY. The presentation is similar and findings are analogous to those in Table 2.

5. Empirical Findings

This section presents estimates of the effect of husbands' health insurance coverage on wives' labor supply from three econometric approaches. These include 1) cross-sectional estimates from linear probability and probit models, 2) cross-sectional instrumental variable (IV) estimates, and 3) panel estimates.

5.1 Cross-Sectional LPM and Probit Estimates

Table 4 displays the estimated marginal effects of spousal coverage on labor force participation of married women from linear probability and probit models [Equation (1)]. The left-hand panel in Table 4 shows the estimated marginal effects for married women in the CPS, and the right-hand panel shows the estimated marginal effects for married women in the NLSY. Because marginal effects of control variables are of limited interest, they are not reported. The controls included are wives' personal characteristics (education, experience, experience squared, and race); husbands' personal characteristics (education, experience, and experience squared); and family characteristics (presence of children under age 6, number of children under age 18, region of residence, and family nonwage income).

The marginal effect of spousal coverage on labor force participation is essentially similar in size and statistical significance in both models and both data sets. The estimated marginal effect, about −0.11, suggests that spousal health insurance coverage reduces wives' probability of participation by 11 percentage points. This represents a reduction of 12 percent compared with wives who do not have spousal coverage.

These participation estimates are very similar to those obtained by Buchmueller and Valletta (1999) and by Olson (1998), who estimate that spousal coverage reduced married women's labor supply by 12 percent and 11 percent, respectively. However, they are smaller than the 23 percent reduction (19.5 percentage points) estimated by Wellington and Cobb-Clark (2000).

Table 5 displays the estimated marginal effects of spousal coverage on full-time employment of working married women from linear probability and probit models. The estimates are conditional on positive labor force participation. The controls used in the estimation are the same as those in Table 4. In both the CPS and NLSY, the estimated marginal effect of spousal coverage is about −0.16, which suggests that the probability of working full-time is 16 percentage points (22 percent) lower for working wives with spousal coverage than for working wives without spousal coverage.

5.2 Cross-Sectional IV Estimates

Table 6 shows the coefficients on spousal coverage in three labor supply models estimated by OLS and 2SLS using data from the CPS. The controls included are the same as before (see the table notes). Again, three alternative measures of labor supply are used as dependent variables: 1) a binary variable indicating labor force participation (*working*), 2) a binary variable indicating hours worked per week is greater than or equal to 35 (*full-time*), and 3) usual hours worked per week (*hours*).

The instruments for spousal coverage are a dummy variable indicating whether the husband is self-employed and a dummy variable indicating whether the husband works part-time. This choice of instruments is based on the assumption that a wife's coverage by her husband's employer-provided health insurance is negatively correlated with the husband's having a part-time job or being self-employed, but unrelated to unobservable factors affecting the wife's labor supply decisions. The latter of these assumptions is tenuous because the husband's having a part-time job or being self-employed is likely correlated with the wife's preferences for work if there is spousal sorting and selection. However, the purpose is to see whether an instrumental variable approach that has been used in the past yields plausible findings.

The top panel of Table 6 displays the estimated effects of spousal coverage on the participation of all married women. The OLS estimate repeats the main finding from Table 4. The 2SLS estimate is essentially similar (−0.091). As expected, the standard error of the 2SLS estimate is larger than the OLS standard error (0.024 versus 0.006), but the estimate is still significant at conventional levels (p-value = 0.000).

In the model of working married women's full-time work (middle panel of Table 6), the OLS estimate is −0.153, which suggests that spousal coverage reduces wives' probability of full-time work by 15.3 percentage points (a 21.9 percent reduction). But the estimate is quite different when we use 2SLS: the estimated spousal effect is now 0.236 (p-value = 0.000). Similarly, in the hours equation for working married women (bottom panel of Table

6), the OLS estimate (−3.772) suggests that wives with spousal coverage work almost 4 hours less per week than wives without spousal coverage (p-value = 0.000), but 2SLS estimate is 3.413 with a p-value of 0.000.

Table 7 shows the estimated effect of spousal coverage on labor supply for women in the NLSY. The presentation is similar to that of Table 6. Because information on whether the husband is self-employed is not available in the NLSY, husbands' part-time work status is the only available instrument for spousal coverage. This, however, does not affect the main finding: once again, the OLS and 2SLS estimates differ in significant ways.

That OLS and 2SLS estimations produce such different results suggests the importance of testing for the endogeneity of spousal coverage in the labor supply equations. The regression-based Hausman test that compares OLS and 2SLS estimates (see Wooldridge 2002, Section 6.2.1) is well-suited for this. Heteroskedasticity-robust Hausman test statistics are given in both Tables 6 and 7 (see "Hausman test"). The test statistic suggests strong evidence of endogeneity of spousal coverage in the three labor supply models for both samples in both data sets (p-values = 0.000). This suggests in turn that 2SLS is needed for consistent estimation provided that the instruments are valid, which is what we consider next.

Because the 2SLS estimation in the CPS uses two instruments for spousal coverage, there is one overidentifying restriction. The overidentifying restriction can thus be tested in the model estimated using the CPS data, but not when using the NLSY. In order to determine the validity of the instruments, I use the Sargan statistic. This is calculated as $N \times R$-squared from a regression of the IV residuals on the full set of instruments (Wooldridge 2002, Section 6.2.2; Baum, Schaffer, and Stillman 2003). The null hypothesis is that the variables used as instruments for spousal coverage (husband's self-employment and part-time work) are uncorrelated with unobservables affecting wives' labor supply.

Table 6 displays the results. In the model of married women's participation, the Sargan test rejects the hypothesis of instrument validity (*p*-value = 0.039). For the sample of working married women, the instruments pass the overidentification test in the full-time work equation, which suggests that the instruments are valid (*p*-value = 0.728), but in the hours equation, we reject the validity assumption of the instruments at the 10 percent significance level (*p*-value = 0.089).

That the Sargan test produces inconsistent results is not actually surprising because it evaluates the entire set of overidentifying restrictions but requires that at least some of the instruments be valid. However, as discussed before, using variables for husband's work status as instruments for spousal coverage raises concerns because the husband's having a part-time job or being self-employed is likely correlated with the wife's preferences for work due to spousal sorting and selection.

Given that cross-sectional IV estimation does not provide a solution to the endogeneity problem of spousal coverage, I now turn to panel estimates.

5.3 Panel Estimates

Table 8 shows estimates of the spousal coverage effect using the NLSY. Unlike the estimates in Sections 5.1 and 5.2, these estimates take advantage of the panel nature of the NLSY and use the 1989, 1990, 1992, 1993, 1994, 1996, 1998, and 2000 interviews of the NLSY. Table 8 displays estimates of four different models: 1) pooled ordinary least squares (POLS), 2) random effects (RE), 3) fixed effects (FE), and 4) first differencing (FD). The POLS and RE models include a full set of year dummies, wives' personal characteristics (education, experience, experience squared, and race); husbands' personal characteristics (education, experience, and experience squared); and family characteristics (presence of children under age 6, number of children under age 18, region of residence, and family non-wage income) as controls. The FE and FD models include the same controls, except race, which is not time-varying.

The POLS estimates of the effect of spousal coverage are given in column 1 of Table 8. The reported standard errors are robust to serial correlation and heteroskedasticity. The estimated effect of spousal coverage is negative and statistically significant in the three labor supply models for both samples of married women. The results suggest that married women with spousal coverage are 9.4 percentage points (14 percent) less likely to be working, and those who work are 18.4 percentage points (28 percent) less likely to work full time. In the hours equation for working married women, the estimated effect of spousal coverage is −3.790 (p-value = 0.000), which suggests that married women with spousal coverage work almost 4 hours less per week (a 13 percent reduction) than married women without spousal coverage.

Column 2 in Table 8 displays the RE estimates. The estimated spousal coverage effects are still negative and statistically significant, but they are smaller in absolute value than the POLS estimates. Thus, it seems that controlling for random unobserved effects (assuming they are uncorrelated with explanatory variables) diminishes the negative effect of spousal coverage on wives' labor supply.

The FE model in column 3 produces estimated coefficients for spousal coverage that are even smaller in absolute value. The FE estimates are about half the size of the RE estimates. For example, spousal coverage is estimated to reduce weekly hours worked by 1.6 hours for working married women, compared with 2.5 hours in the RE model.

Because the key assumption underlying the consistency of RE is whether unobserved effects and the explanatory variables are correlated, I test this assumption using a Hausman test that compares random and fixed effects estimates (see Wooldridge 2002, Section 10.7.3). The test strongly rejects (p-value = 0.000) the hypothesis that unobserved effects are uncorrelated with spousal coverage in the three labor supply models for both samples of married women. This suggests that the random effects estimators are inconsistent but the fixed effects estimator is consistent conditional on strict exogeneity of the explanatory variables.

Finally, estimates obtained using FD are given in column 4 of Table 8. The FD estimates are even smaller in absolute value than the FE estimates but generally the same order of magnitude. To choose between FE and FD, I test whether the differenced errors are serially uncorrelated. The results indicate that there is substantial negative serial correlation in the differenced errors ($\hat{\rho} \approx -0.30$ with p-value = 0.000), suggesting fixed effects is more efficient than first differencing (Wooldridge 2002, Section 10.7.1).

As mentioned above, consistency of FE estimates requires that spousal coverage be strictly exogenous with respect to time-varying unobserved effects—u_{it} in Equation (2), after accounting for the individual effect—c_i in Equation (2). To test for feedback effects from wives' labor supply to future values of spousal coverage, I generate the lead of the spousal coverage variable and use it as a regressor in the FE model (Wooldridge 2002, Section 10.7.1). The estimated leads of spousal coverage are insignificant in the three labor supply models for both samples of married women. This suggests that there is no evidence against strict exogeneity of spousal coverage after netting out the individual effect using the FE.

6. Conclusion

The empirical analysis in this paper yields three main findings. First, there is strong evidence that spousal coverage is endogenous to the labor supply of married women (Section 5.2). This results from the simultaneity of wives' labor supply decisions and the health insurance status of their husbands. Second, cross-sectional instrumental variables estimation does not provide a viable solution to the endogeneity problem (Section 5.2). The close link between health insurance and labor supply makes it difficult to identify suitable instruments that are correlated with wives' coverage by their husbands' health insurance, but unrelated to wives' labor supply decisions. This is confirmed by the results of the test for overidentifying restrictions (see "Sargan test," presented in Table 6), which reject the hypothesis of instrument validity. Third, once unobserved heterogeneity is controlled for, spousal coverage has a smaller negative effect on wives' labor supply (Section 5.3).

Specifically, it appears that controlling for sorting and selection of married couples diminishes the negative effect of spousal coverage found in cross-sections. The FE estimates in Table 8 suggest that spousal coverage reduces wives' probability of participation by 7.7 percent. Conditional on working, spousal coverage is estimated to reduce the probability that wives work full-time by 15 percent, and to reduce their hours of work by 6.5 percent. In contrast, the cross-sectional estimates, which are similar to those estimated by Buchmueller and Valletta (1999), Olson (1998, 2000), and Wellington and Cobb-Clark (2000), suggest that spousal coverage reduces wives' probability of participation by 14 percent, working wives' probability of full-time work by 28 percent, and their hours of work by 13 percent.

The results have potentially important implications for the debate over health care reform in the United States. A major goal of most proposed reforms is to expand access to health care and health insurance coverage. Doing this generally entails uncoupling health insurance from employment, as would happen under universal single-payer health care, or at least weakening the link, as occurs under a plan like that adopted by Massachusetts in 2007. The question is whether the divorce of health insurance from employment would reduce the labor supply of workers who currently work (or have adjusted their work hours) so as to acquire health insurance. The results of the present analysis suggest that universal coverage would reduce the labor supply of married women, but not as significantly as estimated by previous studies.

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Table 1
Labor Supply of Married Women by Spousal Health Insurance Coverage, 2000 CPS and NLSY

	CPS		NLSY	
	Wife covered	Wife not covered	Wife covered	Wife not covered
All married women				
Working (%) (weekly hours>0)	72.8	83.8	73.8	90.1
Full-time (%) (weekly hours>=35)	47.3	69.9	42.7	74.5
Hours (weeks)	25.0	32.5	25.7	36.1
Number of observations	10,019	9,496	1,076	1,113
Working married women				
Working (%) (weekly hours>0)	100.0	100.0	100.0	100.0
Full-time (%) (weekly hours>=35)	65.0	83.4	57.8	82.7
Hours (weeks)	34.4	38.8	34.9	40.1
Number of observations	7,337	7,907	807	1,010

NOTE: The data are from the March 2000 Annual Demographic Supplement to the Current Population Survey (CPS) and the 2000 interview of the 1979 National Longitudinal Survey of Youth (NLSY). Means are tabulated using CPS March Supplement and NLSY weights.

Table 2
Summary Statistics for Married Women by Spousal Health Insurance Coverage, 2000 CPS and NLSY

	CPS			NLSY		
Variable	All	Wife covered	Wife not covered	All	Wife covered	Wife not covered
Spousal coverage	0.52	1	0	0.52	1	0
	(0.50)	(0)	(0)	(0.50)	(0)	(0)
Labor supply measures						
Working	0.78	0.73	0.84	0.82	0.74	0.90
	(0.41)	(0.45)	(0.37)	(0.39)	(0.44)	(0.30)
Full-time	0.58	0.47	0.70	0.58	0.43	0.74
	(0.49)	(0.50)	(0.46)	(0.49)	(0.49)	(0.44)
Hours	28.61	25.04	32.55	30.67	25.74	36.10
	(18.35)	(18.60)	(17.25)	(18.94)	(20.25)	(15.67)
Education						
Less than high school	0.09	0.07	0.11	0.05	0.05	0.05
	(0.29)	(0.25)	(0.32)	(0.22)	(0.22)	(0.21)
High school	0.33	0.34	0.32	0.40	0.38	0.42
	(0.47)	(0.47)	(0.46)	(0.49)	(0.49)	(0.49)
Some college	0.28	0.30	0.27	0.24	0.23	0.25
	(0.45)	(0.46)	(0.44)	(0.43)	(0.42)	(0.44)
College	0.21	0.21	0.20	0.18	0.20	0.15
	(0.41)	(0.41)	(0.40)	(0.38)	(0.40)	(0.35)
More than college	0.09	0.08	0.10	0.13	0.13	-0.14
	(0.29)	(0.28)	(0.30)	(0.34)	(0.34)	(0.34)
Experience	22.57	22.21	22.96	19.74	19.74	19.75
	(10.08)	(9.64)	(10.52)	(3.41)	(3.47)	(3.34)
Race						
White	0.88	0.89	0.86	0.87	0.90	0.84
	(0.33)	(0.31)	(0.35)	(0.34)	(0.31)	(0.37)
Black	0.07	0.06	0.08	0.07	0.06	0.09
	(0.26)	(0.24)	(0.27)	(0.26)	(0.23)	(0.29)
Other	0.05	0.05	0.06	0.06	0.05	0.06
	(0.22)	(0.21)	(0.24)	(0.23)	(0.21)	(0.25)
Region						
Northeast	0.19	0.21	0.17	0.18	0.20	0.15
	(0.39)	(0.41)	(0.38)	(0.38)	(0.40)	(0.36)
Midwest	0.25	0.27	0.22	0.27	0.32	0.23
	(0.43)	(0.45)	(0.41)	(0.45)	(0.47)	(0.42)

(continued)

Table 2 (continued)

	CPS			NLSY		
Variable	All	Wife covered	Wife not covered	All	Wife covered	Wife not covered
South	0.35	0.32	0.38	0.37	0.31	0.43
	(0.48)	(0.47)	(0.49)	(0.48)	(0.46)	(0.50)
West	0.21	0.20	0.23	0.17	0.17	0.18
	(0.41)	(0.40)	(0.42)	(0.38)	(0.37)	(0.38)
Presence of children under age 6	0.24	0.27	0.20	0.27	0.30	0.23
	(0.43)	(0.45)	(0.40)	(0.44)	(0.46)	(0.42)
Number of children under age 18	1.09	1.24	0.92	1.83	2.02	1.61
	(1.19)	(1.20)	(1.15)	(1.16)	(1.12)	(1.16)
Family nonwage income	4,089	4,468	3,671	5,277	6,080	4,415
	(12,851)	(13,298)	(12,328)	(4,111)	(4,167)	(3,871)
Husband's education						
Less than high school	0.11	0.07	0.15	0.08	0.06	0.10
	(0.31)	(0.25)	(0.35)	(0.27)	(0.24)	(0.31)
High school	0.30	0.29	0.32	0.39	0.35	0.44
	(0.46)	(0.46)	(0.47)	(0.49)	(0.48)	(0.50)
Some college	0.26	0.27	0.25	0.21	0.21	0.22
	(0.44)	(0.44)	(0.43)	(0.41)	(0.40)	(0.41)
College	0.21	0.22	0.19	0.17	0.21	0.12
	(0.41)	(0.42)	(0.39)	(0.38)	(0.41)	(0.33)
More than college	0.12	0.14	0.10	0.15	0.17	0.12
	(0.33)	(0.35)	(0.30)	(0.35)	(0.38)	(0.32)
Husband's experience	24.38	23.78	25.04	21.64	21.08	22.27
	(10.29)	(9.84)	(10.73)	(5.78)	(5.45)	(6.06)
Number of observations	19,515	10,019	9,496	2,189	1,076	1,113

NOTE: See Table 1. Figures represent rates except for four categories: "Hours," "Experience," "Family nonwage income," and "Husband's experience." "Experience" and "Husband's experience" represent years. Standard deviations are in parentheses.

Table 3
Summary Statistics for Working Married Women by Spousal Health Insurance Coverage, 2000 CPS and NLSY

	CPS			NLSY		
Variable	All	Wife covered	Wife not covered	All	Wife covered	Wife not covered
Spousal coverage	0.49	1	0	0.47	1	0
	(0.50)	(0)	(0)	(0.50)	(0)	(0)
Labor supply measures						
Working	1	1	1	1	1	1
	(0)	(0)	(0)	(0)	(0)	(0)
Full-time	0.74	0.65	0.83	0.71	0.58	0.83
	(0.44)	(0.48)	(0.37)	(0.45)	(0.49)	(0.38)
Hours	36.68	34.41	38.85	37.60	34.89	40.06
	(11.66)	(12.36)	(10.50)	(13.37)	(15.38)	(10.67)
Education						
Less than high school	0.07	0.05	0.08	0.04	0.04	0.04
	(0.25)	(0.22)	(0.28)	(0.19)	(0.19)	(0.20)
High school	0.32	0.33	0.31	0.41	0.40	0.41
	(0.47)	(0.47)	(0.46)	(0.49)	(0.49)	(0.49)
Some college	0.29	0.31	0.28	0.25	0.24	0.25
	(0.46)	(0.46)	(0.45)	(0.43)	(0.43)	(0.44)
College	0.22	0.22	0.21	0.17	0.18	0.15
	(0.41)	(0.41)	(0.41)	(0.37)	(0.39)	(0.36)
More than college	0.10	0.09	0.11	0.14	0.14	0.14
	(0.31)	(0.29)	(0.32)	(0.35)	(0.35)	(0.35)
Experience	22.03	21.72	22.32	19.71	19.73	19.68
	(9.66)	(9.15)	(10.12)	(3.41)	(3.49)	(3.34)
Race						
White	0.87	0.89	0.86	0.86	0.89	0.84
	(0.33)	(0.32)	(0.35)	(0.35)	(0.32)	(0.37)
Black	0.08	0.07	0.08	0.08	0.06	0.10
	(0.27)	(0.26)	(0.28)	(0.27)	(0.24)	(0.30)
Other	0.05	0.04	0.05	0.06	0.05	0.06
	(0.21)	(0.20)	(0.23)	(0.23)	(0.22)	(0.25)
Region						
Northeast	0.19	0.21	0.17	0.17	0.19	0.16
	(0.39)	(0.41)	(0.38)	(0.38)	(0.39)	(0.37)
Midwest	0.26	0.28	0.23	0.28	0.33	0.23
	(0.44)	(0.45)	(0.42)	(0.45)	(0.47)	(0.42)

(continued)

Table 3 (continued)

	CPS			NLSY		
Variable	All	Wife covered	Wife not covered	All	Wife covered	Wife not covered
South	0.35	0.32	0.38	0.37	0.32	0.42
	(0.48)	(0.46)	(0.49)	(0.48)	(0.47)	(0.49)
West	0.20	0.19	0.22	0.17	0.16	0.18
	(0.40)	(0.39)	(0.41)	(0.38)	(0.37)	(0.39)
Presence of children under age 6	0.22	0.24	0.19	0.23	0.25	0.21
	(0.41)	(0.43)	(0.39)	(0.42)	(0.44)	(0.41)
Number of children under age 18	1.04	1.19	0.89	1.71	1.90	1.55
	(1.13)	(1.14)	(1.10)	(1.12)	(1.08)	(1.13)
Family nonwage income	3,990	4,428	3,572	4,799	5,545	4,146
	(12,457)	(13,100)	(11,796)	(3,672)	(3,737)	(3,488)
Husband's education						
Less than high school	0.09	0.06	0.12	0.08	0.05	0.10
	(0.29)	(0.24)	(0.33)	(0.27)	(0.23)	(0.30)
High school	0.31	0.30	0.32	0.41	0.37	0.44
	(0.46)	(0.46)	(0.47)	(0.49)	(0.48)	(0.50)
Some college	0.27	0.29	0.26	0.22	0.22	0.23
	(0.44)	(0.45)	(0.44)	(0.42)	(0.41)	(0.42)
College	0.21	0.22	0.20	0.16	0.21	0.12
	(0.41)	(0.41)	(0.40)	(0.37)	(0.40)	(0.33)
More than college	0.12	0.14	0.10	0.13	0.15	0.11
	(0.33)	(0.35)	(0.30)	(0.34)	(0.36)	(0.31)
Husband's experience	24.05	23.54	24.54	21.76	21.17	22.31
	(9.99)	(9.43)	(10.48)	(5.75)	(5.27)	(6.11)
Number of observations	15,244	7,337	7,907	1,817	807	1,010

NOTE: See Table 1. Figures represent rates except for four categories: "Hours," "Experience," "Family nonwage income," and "Husband's experience." "Experience" and "Husband's experience" represent years. Standard deviations are in parentheses.

Table 4
Linear Probability and Probit Estimates of Married Women's Labor Force Participation, 2000 CPS and NLSY

Dependent variable: *working*	**CPS**		**NLSY**	
Variable	**LPM**	**Probit**	**LPM**	**Probit**
Spousal coverage	−0.103	−0.109	−0.106	−0.115
	(0.006)	(0.006)	(0.018)	(0.017)
Number of observations	19,515	19,515	1,763	1,763
R -squared	0.103	0.099	0.141	0.161

NOTE: The data are from the March 2000 Annual Demographic Supplement to the Current Population Survey (CPS) and the 2000 interview of the 1979 National Longitudinal Survey of Youth (NLSY). Figures are estimated changes in the probability of labor force participation from linear probability and probit models. All models include wives' personal characteristics, husbands' personal characteristics, and family characteristics as controls. Robust standard errors are in parentheses. The *R* -squared for the probits is the pseudo-*R* -squared.

Table 5
Linear Probability and Probit Estimates of Working Married Women's Full-Time Work, 2000 CPS and NLSY

Dependent variable: *full-time*	**CPS**		**NLSY**	
Variable	**LPM**	**Probit**	**LPM**	**Probit**
Spousal coverage	−0.153	−0.156	−0.170	−0.174
	(0.007)	(0.007)	(0.023)	(0.024)
Number of observations	15,244	15,244	1,473	1,473
R-squared	0.083	0.076	0.142	0.131

NOTE: The data are from the March 2000 Annual Demographic Supplement to the Current Population Survey (CPS) and the 2000 interview of the 1979 National Longitudinal Survey of Youth (NLSY). Figures are estimated changes in the probability of full-time work from linear probability and probit models. All models include wives' personal characteristics, husbands' personal characteristics, and family characteristics as controls. Robust standard errors are in parentheses. The *R* -squared for the probits is the pseudo-*R* -squared.

Table 6
OLS and 2SLS Estimates of the Effect of Spousal Coverage on Labor Supply: 2000 CPS

All married women **Dependent variable: *working***	**OLS**	**2SLS**
Spousal coverage	−0.103	−0.091
	(0.006)	(0.024)
First stage *F* -statistic		675.38
[*p* -value]		[0.000]
Hausman test		−0.103
[*p* -value]		[0.000]
Sargan statistic		4.269
[*p* -value]		[0.039]

Working married women **Dependent variable: *full-time***	**OLS**	**2SLS**
Spousal coverage	−0.153	0.236
	(0.007)	(0.033)
First stage *F* -statistic		575.42
[*p* -value]		[0.000]
Hausman test		−0.177
[*p* -value]		[0.007]
Sargan statistic		0.121
[*p* -value]		[0.728]

Working married women **Dependent variable: *hours***	**OLS**	**2SLS**
Spousal coverage	−3.722	3.413
	(0.186)	(0.934)
First stage *F* -statistic		575.42
[*p* -value]		[0.000]
Hausman test		−4.160
[*p* -value]		[0.000]
Sargan statistic		2.889
[*p* -value]		[0.089]

NOTE: The data are from the March 2000 CPS. Robust standard errors are in parentheses. In brackets are *p* -values. All models include wives' personal characteristics, husbands' personal characteristics, and family characteristics as controls. The instruments for spousal coverage include a dummy variable indicating whether the husband is self-employed and a dummy variable indicating whether the husband is working part-time. The first stage *F* -statistic is a test statistic for joint significance of the instruments in the first stage regression of spousal coverage on the exogenous variables and instruments. The Hausman test is a regression-based Hausman test. The Sargan statistic is a test of overidentifying restrictions. Sample sizes are 19,515 (all married women) and 15,244 (working married women).

Table 7
OLS and 2SLS Estimates of the Effect of Spousal Coverage on Labor Supply: 2000 NLSY

All married women **Dependent variable:** ***working***	**OLS**	**2SLS**
Spousal coverage	−0.106	0.083
	(0.018)	(0.288)
First stage *t* -statistic		−2.820
[*p* -value]		[0.005]
Hausman test		−0.103
[*p* -value]		[0.000]

Working married women **Dependent variable:** ***full-time***	**OLS**	**2SLS**
Spousal coverage	−0.169	0.094
	(0.023)	(0.331)
First stage t-statistic		−2.980
[*p* -value]		[0.003]
Hausman test		−0.171
[*p* -value]		[0.000]

Working married women **Dependent variable:** ***hours***	**OLS**	**2SLS**
Spousal coverage	−3.082	11.740
	(0.711)	(11.503)
First stage *t* -statistic		−2.980
[*p* -value]		[0.003]
Hausman test		−2.765
[*p* -value]		[0.000]

NOTE: The data are from the 2000 interview of the 1979 National Longitudinal Survey of Youth (NLSY). Robust standard errors are in parentheses. In brackets are *p* -values. All models include wives' personal characteristics, husbands' personal characteristics, and family characteristics as controls. The instrument for spousal coverage is a dummy variable indicating whether the husband is working part-time. The first stage *t* -statistic is a test statistic for the significance of the instrument in the first stage regression of spousal coverage on the exogenous variables and the instrument. The Hausman test is a regression-based Hausman test. Sample sizes are 1,763 (all married women) and 1,472 (working married women).

Table 8
Panel Estimates of the Effect of Spousal Coverage on Labor Supply: 1989-2000 NLSY

All married women **Dependent variable:** ***working***	**(1) POLS**	**(2) RE**	**(3) FE**	**(4) FD**
Spousal coverage	−0.094	−0.051	−0.026	−0.005
	(0.009)	(0.007)	(0.009)	(0.009)
Hausman test		125.16		
[*p* -value]		[0.000]		
Strict exogeneity test			−0.020	
[*p* -value]			[0.120]	
Number of observations	12,888	12,888	12,888	8,543
Working married women **Dependent variable:** ***full-time***	**(1) POLS**	**(2) RE**	**(3) FE**	**(4) FD**
Spousal coverage	−0.184	−0.132	−0.088	−0.052
	(0.012)	(0.009)	(0.013)	(0.012)
Hausman test		99.79		
[*p* -value]		[0.000]		
Strict exogeneity test			−0.036	
[*p* -value]			[0.280]	
Number of observations	10,584	10,584	10,584	7,072
Working married women **Dependent variable:** ***hours***	**(1) POLS**	**(2) RE**	**(3) FE**	**(4) FD**
Spousal coverage	−3.790	−2.504	−1.596	−0.989
	(0.318)	(0.238)	(0.338)	(0.380)
Hausman test		82.81		
[*p* -value]		[0.000]		
Strict exogeneity test			−0.883	
[*p* -value]			[0.196]	
Number of observations	10,584	10,584	10,584	7,072

NOTE: The data are from the 1989–2000 interviews of the 1979 National Longitudinal Survey of Youth (NLSY). Robust standard errors are in parentheses. In brackets are *p* -values. POLS and RE models include a full set of year dummies, wives' personal characteristics, husbands' personal characteristics, and family characteristics as controls. FE and FD models include the same controls, except race, which is not time-varying. Hausman test is based on the comparison of estimates obtained from the RE and FE models. Strict exogeneity test is the test for feedback effects from dependent variable to future values of explanatory variables.