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Bob Wen
Clemson University

Zhao Liu
Clemson University

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The Causal Effects of Wages on Labour Supply for Married Women — Evidence from American Couples
Bob Wen, Zhao Liu
John E. Walker Department of Economics, Clemson University

Motivation
❖ The research question: How to consistently estimate the causal effects of own-wages on hours of work (i.e., the hours-wage elasticities) for married women?

The negative correlation between average wages and labour supply is misleading, because relevant factors are not held constant and endogeneity problems have not been taken into account.

❖ After modeling the interaction between husbands and wives, and alleviating self-selection, individual heterogeneity, and simultaneity bias, we find consistent, significant and positive causal effects of wages on labour supply.

Outline and Methods

Interior Solution and Comparative Statics

The FOCs give the optimal hours of work equation:
\[
\frac{\partial u}{\partial w} = \frac{\partial u}{\partial H} + \frac{\partial u}{\partial v}
\]

Implicit differentiation yields:
1. The partial effects of own wages on labour supply (hours-wage elasticity) \( \frac{\partial H}{\partial w} \)
   - The sign is uncertain. When \( \beta \) is low, it is positive.
   - When \( \beta \) is high, it could be negative, i.e., a backs-and-wrongs labour supply curve.
2. The partial effects of couple relationship on labour supply \( \frac{\partial H}{\partial \phi} \)
   - It is negative. Close couple relationship results in lower willingness to work:
     \[
     \frac{\partial H}{\partial \phi} \rightarrow 0 \quad \text{as} \quad w \rightarrow \infty
     \]
   - Higher relative wages lead to independence and a diminishing role of couple relationship.
3. The partial effects of husband's wages on wife's labour supply (cross-wage elasticity) \( \frac{\partial H}{\partial w'} \)
   - It is negative. Higher husband's wages reduce his wife's work hours:
     \[
     \frac{\partial H}{\partial w'} \rightarrow 0 \quad \text{as} \quad w' \rightarrow \infty
     \]
   - The effects of husband's wages disappear when both sets of wages dominate husband's income.
4. The partial effects of non-labour income on labour supply \( \frac{\partial H}{\partial v} \)
   - It has the same effects as the husband's wages.
5. How the wife's working decision changes with the value of her dedication to the family:

Boundary Solution

Married women choose not to work \( h=0 \) when the market wage is lower than their reservation wage, where the reservation wage is:
\[
w^R = \beta [w^{W'} + v] / \alpha
\]
The wife’s reservation wage increases with:
- husband’s wage \( w^{W'} \)
- non-labour income and family wealth \( v \)
- couple relationship \( \phi \)
- value of family \( \beta \)

A higher reservation wage implies a lower probability to work outside the family.

Identification Challenge I: Sample Selection

We observed wages and hours of work only for the employed women who were self-selected into the labour force.

The hours of work equation:
\[
\ln(\text{work hours}) = \beta_0 + \beta_1 \ln(\text{wage}) + \beta_2 \text{selection variables} + \beta_3 \text{independent variables} + \epsilon
\]
The selection equation:
\[
\text{selection} = 1 \quad \text{if} \quad M_0 > 0
\]
where \( M_0 \) include exogenous variables \( Z_{ik} \) and other exogenous variables that determine the labor force participation choice.

Identification Challenge II: Individual Heterogeneity

The unobserved individual-specific characteristics, such as preference for work, ability, and family tradition, could bias the effects of wages on labour supply.

The panel data fixed effects model controls for the individual heterogeneity by including the individual-level fixed effects component in the model (Model 3).
\[
\ln(\text{work hours}) = \beta_0 + \beta_1 \ln(\text{wage}) + \beta_2 \text{selection variables} + \beta_3 \text{independent variables} + \alpha_i + \epsilon
\]

Identification Challenge III: Simultaneity

The causal effects of wages on labour supply (the hours-wage elasticities) decrease from 0.29 to 0.16 as we alleviate various endogeneity problems.

Holding other factors constant, a 1% increase in a married woman’s wages raises her hours of work by 0.16% on average.

The hours-wage elasticities are much larger and more significant for part-time female workers than full-time female workers.

There is evidence of backwards-bending labour supply curves.