Does the labor force participation of women increase BMI?

Evidence from Mexico

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Introduction

- More than 60% of Mexican adults were overweight or obese in 2012. The percentage is higher among women than men.
- Overweight and obesity are caused by several factors, and those can be grouped in the following categories: nutrition, food prices, physical activity, and genetics.
- Research objective: analyze the relationship between labor force participation and BMI.

Theoretical Framework

I propose a two-period consumer model to establish the relationships between the BMI and the labor force participation. The parameters of the model are:

- \( i = 1,2 \)
- \( c_{it} \): street food consumption
- \( c_{it}^{nh} \): home food consumption
- \( l_{it} \): leisure time
- \( o_{it} \): work time
- \( \mu_{it} \): health status
- \( \beta_{it} < 0 \) and \( \beta_{it} > 0 \)
- \( \delta \): total time
- \( p_{it} \): price of home food, \( p_{it} > p_{it} \), \( p_{it} = 1 \)
- \( w \): wage
- \( r \): interest rate
- \( A_{it} \): asset at period 1
- \( \beta \): discount rate
- \( u_{it} \): utility function

\[
\begin{align*}
\delta & = \delta_{it} + \delta_{it}^{nh} \\
\beta & = \beta_{it} + \beta_{it}^{nh} \\
0 & = u_{it} + u_{it}^{nh} + u_{it}^{nw} > 0
\end{align*}
\]

Consumer Problem

Max \( U = \sum (c_{it} + c_{it}^{nh} + \frac{c_{it}^{nh}}{1 + r}) + \beta_{it} \sum (c_{it} + c_{it}^{nh}) \)

Subject to:

\[
\begin{align*}
\frac{p_{it}^{nh}}{1 + r} + \frac{p_{it}^{nh}}{1 + r} + \frac{p_{it}}{1 + r} & = A_{it} + w_{it} + \frac{w_{it}^{nw}}{1 + r} \\
\delta_{it} + \delta_{it}^{nh} + \delta_{it}^{nw} & = d
\end{align*}
\]

Inferences from this model:

- A woman who works outside the home has a diet of lower quality
- A woman who works outside the home has less time for physical activity

Mexican Life Family Survey

- Panel data set covering the 2005-2006 and 2009-2012 waves of the MFLS, retaining individuals who were 15 years or older in the first wave.
- The data set contains information about food expenditures, household demographics, diet and nutrition, anthropometric measures, time allocation, and employment.
- People were classified into two groups to determine their labor status: worker, and unemployed or inactive.
- To construct the BMI, I used weight (in kilograms) and height (in meters), which were measured in both waves.
- The sample size was 12,269 observations, consisting of 7,197 women and 5,072 men.

BMI and Employment

Preliminary Results

- Is the employment of women correlated with BMI?
  - BMI is not correlated with employment after controlling by food expenditures, activities, urban status, and wealth

Econometric Framework

The model first differences to estimate the correlation between changes in BMI and labor status is:

\[
\Delta \text{BMI}_t = \beta_0 + \beta_1 \Delta \text{emp}_t + \beta_2 \Delta \text{emp}_t \Delta \text{age}_t + \beta_3 \Delta \text{edu}_t + \beta_4 \Delta \text{wealth}_t + \beta_5 \Delta \text{wealth}_t + \beta_6 \Delta \text{wealth}_t + \beta_7 \Delta \text{wealth}_t + u_t
\]

The food expenditures and time use variables could be affected by the employment. Thus, I estimate the correlation between BMI and employment after excluding the controls of time allocation and food expenditures:

\[
\Delta \text{BMI}_t = \beta_0 + \beta_1 \Delta \text{emp}_t + \beta_2 \Delta \text{edu}_t + \beta_3 \Delta \text{wealth}_t + u_t
\]

Inferences from this model:

- A woman who works outside the home has a diet of lower quality
- A woman who works outside the home has less time for physical activity

Conclusion: there does not exist evidence to affirm a positive correlation between employment and BMI in the case of women