The Problem

The co-movement of hours and productivity along the business cycle can be characterized by two observations:

- Hours and productivity are negatively correlated
- Hours are almost two times more volatile than productivity

The standard real business cycle model fails to account for these observations.

What this paper does?

The goal of the paper is to reproduce the co-movements of hours and productivity in the neoclassical model driven by a single shock - aggregate technology shock.

I do it by extending the standard RBC model to account for:

- Two-person households
- Home production
- The possibility for the agents to enter and exit the labor market

The Model: Two-Person Household

The household maximizes the weighted sum of utilities of two agents:

\[
U = \mu \left( c_t^{1/\xi} l_{1,t}^{1-\xi} \right)^{1-\gamma} + (1-\mu) \left( c_t^{1/\xi} l_{2,t}^{1-\xi} \right)^{1-\gamma} \quad (1)
\]

Agents differ in their market productivity:

\[
H_{mt} = h_{mt} + \nu h_{2mt}, \quad \nu \in (0, 1) \quad (2)
\]

If both agents work on the market, the household faces a fixed utility cost.

The Model: Home Production

Consumption is a composite of market good consumption, and home-produced consumption:

\[
c_t = (a c_m t^e + (1-a) c_h t^{1/e}) \quad (3)
\]

Agent allocates time among leisure, hours worked in the market and hours worked at home:

\[
T = l_t + h_{mt} + h_{ht} \quad (4)
\]

Motivation: some data

All the proposed modifications are supported by the data.

- 60% of the U.S. adult population are married. In other words, they live in two-person households.
- An average American spends impressive 13% of his discretionary time working in home production (compare it to the 25% spent working on the market). Moreover, home production is countercyclical.
- We know that most of the adjustments in aggregate hours happens on the extensive margin, or by the movements in and out of employment.

The Story Behind Results

What happens when bad times come:

- Low productivity and low wages, if no hours adjustment
- Its not optimal for a woman to work - she stays at home - hours fall
- Productivity goes up
- A man is trying to compensate, but not enough
- Bad times - very low hours - high productivity

Results

The model is able to reproduce the co-movement features of hours and productivity observed in the data:

- Hours and productivity are negatively correlated (the correlation in the data is -0.18; in the model its -0.99)
- The volatility of hours are 1.82 times higher than the volatility of productivity, exactly as in the data.

Co-Movement of Hours and Productivity in The U.S. and in The Model Economies

Figure: Hours as a Function of Productivity

A: U.S. economy
B: RBC Model
C: Our Model