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Housework and fiscal expansions

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ABSTRACT

In an otherwise-standard business cycle model with housework, calibrated consistently with data on time use, we discipline complementarity between consumption and hours worked and relate its strength to the size of fiscal multipliers. Evidence on the substitutability between home and market goods confirms that complementarity is an empirically relevant driver of fiscal multipliers. However, in a housework model substantial complementarity can be generated without imposing a low wealth effect, which contradicts the microeconomic evidence. Also, explicitly modeling housework matters for assessing the welfare effects of government spending, which are understated by theories that neglect substitutability between home-produced and market goods.

1. Introduction

The propagation of exogenous changes in public consumption to macroeconomic variables is at the center of a controversial and ongoing debate. Fiscal multipliers depend on assumptions about preferences, technology, policies and various frictions like nominal rigidities or the presence of hand-to-mouth consumers. Lack of consensus in the theoretical debate reflects disagreement about these assumptions. Recent contributions, such as Nakamura and Steinsson (2014), Christiano et al. (2011), Bilbiie (2011), Hall (2009a) and Monacelli and Perotti (2008, 2010), focus on preferences. In particular, they emphasize the importance of complementarity between consumption and hours worked for fiscal multipliers. The intuition is straightforward: a government expenditure shock generates a need for higher labor supply. If consumption and hours worked are complements, the surge in labor supply further stimulates output and consumption. Hence, complementarity is potentially an important driver of fiscal multipliers.

Since complementarity is often interpreted as an outcome of housework, in this paper we explicitly model a home-production sector and study the transmission of government expenditure shocks. As argued by Becker (1968), consumption is the final stage of production, which takes place at the household level and combines time with expenditure on market goods. The amount of time varies across consumption activities: a meal purchased and consumed at a cafeteria can be less time intensive than a home-produced meal. If households substitute towards market goods and work longer hours on the market when the opportunity cost of time is high, their expenditure on consumption goods increases in market hours, even if labor income is controlled for. In other words, substitutability between home-produced and market goods generates complementarity between market consumption and hours worked.

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Explicitly modeling home production might have some advantages, even if complementarity can be captured by hard-wiring it in preferences over consumption and leisure. On the one hand, direct evidence on the strength of complementarity is rather scant. Yet, estimates about the substitutability between home and market goods have recently been made available by the home-production literature. These estimates can be used to discipline complementarity and assess its relevance for fiscal multipliers. On the other hand, one might suspect that the welfare implications of government expenditure shocks are potentially different, depending on whether complementarity is modeled in a structural way or simply embedded in preferences. As emphasized by Aguiar and Hurst (2005), drawing welfare-relevant implications from changes in consumption expenditure might be misleading if substitution pushes consumption expenditure and consumption in opposite directions.

Following Benhabib et al. (1991), an otherwise-standard business cycle model with nominal price rigidities is considered, where the household can employ time and capital to produce a good that is non-tradable on the market. The model is calibrated consistently with data on time use in the United States. This paper contributes to the literature on fiscal multipliers in several respects. First, our analysis confirms that complementarity is a quantitatively relevant mechanism. After showing that substitutability between home and market goods generates complementarity, substitutability is calibrated on the empirically relevant range, which results in theoretical fiscal multipliers spanning the whole range of estimates from vector autoregressions (VARs). Consistently with our model, we refer to estimates relative to temporary and unexpected increases in deficit-financed government-consumption expenditures that are unproductive. Second, the paper shows that interpreting theories relying on Jaimovich and Rebelo (2009) (JR henceforth) or Greenwood et al. (1988) (GHH henceforth) preferences as equivalent to housework is misleading. In fact, in the housework model substantial degrees of complementarity are achieved without ruling out the wealth effect on hours worked, which is sizeable according to the microeconomic evidence (Imbens et al., 2001).[1] Moreover JR preferences are not a reduced form for housework, because they deliver more persistent dynamics by assuming that marginal utility depends on the history of consumption. Furthermore, substitutability between consumption and leisure – as advocated by Bilbiie (2011) – can be made observationally equivalent to substitutability between home and market goods. Intuitively, substitutability between consumption and leisure can be made large enough to make up for the absence of substitutability between home and market goods. As an implication, a model without housework would appear at least as plausible as ours by looking at the behavior of market variables. Nevertheless, as emphasized by Aguiar et al. (2013), substitution between housework and market work at business-cycle frequencies is a more elastic margin than substitution between market work and leisure; substitutability between consumption and leisure is overstated by models that omit housework. The paper concludes by showing that such an omission might result in misleading welfare calculations. In particular, the cost of a government spending shock is higher when the home sector is included, because it induces substitution away from home goods, which are valuable to the household. But also, overlooking substitution from home to market goods understates the benefits of expanding aggregate demand with government spending when market activity is inefficiently low.

The rest of the paper is organized as follows: Section 2 presents the model; Section 3 inspects our mechanism and compares it to the alternatives proposed by the literature; Section 4 studies the quantitative relevance of complementarity and conducts robustness analysis; Section 5 concludes.

2. The model

Consider an otherwise-standard New Keynesian model, where households can combine time and capital to produce non-tradable home goods and enjoy consumption of home goods, market goods and leisure.[2] The fiscal authority buys market goods and subsidizes production so as to offset the steady-state distortion due to firms' market power. Expenditures are financed by levying lump-sum taxes. Finally, the central bank is in charge of setting the nominal interest rate.[3]

2.1. Households

Households start every period t with capital stock K_t, a portfolio of state-contingent nominal assets B_t and a time endowment that is normalized to 1. Households are assumed to be price takers in all markets and financial markets are complete. The capital stock can be rented to firms at price r_t^k or retained within the household for home production purposes. Let $K_{m,t}$ be the capital stock rented to firms and $K_{n,t}$ the capital stock available for home production. Hence,

$$K_{m,t}+K_{n,t}=K_t. \tag{1}$$

[1] Our findings parallel the results by Furlanetto and Seneca (2014): they show that complementarity accounts for the dynamics of macroeconomic variables, conditional on an investment shock, without the need of relying on low wealth effects on hours worked.

[2] As in Benhabib et al. (1991) and McGrattan et al. (1997), some goods produced on the market, such as houses and durable goods, are interpreted as home capital, which is used as input for home production.

[3] The paper describes the primitives of the model and illustrates only the key equilibrium conditions. All derivations are relegated to the Online Appendix available at http://www.sciencedirect.com/science/journal/03043932.