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# Consumption habits and labor supply ☆

Liam Graham *

*Department of Economics, University College London, Gower Street, London WC1E 6BT, UK*

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**Abstract**

Models with habit formation in consumption have proved useful in understanding a number of macroeconomic features. The key finding of this paper is that, when households can use their labor supply to smooth consumption, habit formation worsens a dynamic model's response to both monetary and technology shocks. Some of the counterfactual implications of a model with habit formation can be rectified by introducing credit constrained households.


*JEL classification:* E13; E21; E32

*Keywords:* Habit formation; Dynamic general equilibrium; Consumption

## 0. Introduction

Models with consumption habits have found wide acceptance in recent years, being used to help explain asset pricing puzzles, and the response of the economy to technology and monetary shocks. Fuhrer (2000) argues that habit formation can induce the hump-shaped responses of consumption and inflation which are something of a holy grail in this field. He obtains this result in a simple model without capital or labor. In contrast, much recent work (for example Christiano et al. (2001) or Kim (2000)) uses richer models.

The key finding of this paper is that the hump-shaped responses that Fuhrer (2000) finds for consumption and inflation are dependent on the assumption of constant labor

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* Tel.: +44 20 7679 5850; fax: +44 20 7916 2775.
*E-mail address:* Liam.Graham@ucl.ac.uk

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supply. Using a model of the type that is becoming standard for monetary policy analysis I show that, when households can smooth their consumption by varying their labor supply, consumption and inflation act as jump variables.

The intuition for this result is straightforward. Habit formation in consumption means that households have a strong preference for smooth paths of consumption. In the absence of other margins to adjust, the household will adjust consumption gradually in response to a shock giving hump-shapes. However, if households are sufficiently willing to substitute labor across time, they will choose a path of labor which achieves a smooth path of consumption. So they will take the benefit of the technology shock as leisure with the twin consequences that the hump-shape vanishes and the response of consumption becomes an order of magnitude too small.

The result is dependent on the intertemporal elasticity of labor supply. While the baseline calibration takes this to be infinite, which means that households are indifferent, other things being equal, between paths for leisure, the result is robust to values for this parameter at the upper end of the range found in microeconomic studies. And further there are theoretical reasons to expect labor to be more intertemporally elastic at the macro level than at the micro.

The standard model for monetary analysis shares with most DGE models the assumption that households have access to perfect credit markets enabling them to smooth their consumption across time. There is a large body of evidence (for a review, see Mankiw, 2000) that many individuals consume their current income rather than their permanent income. Mankiw (2000) refers to such individuals as ''spenders'' (as opposed to the ''savers'' who obey the permanent income hypothesis) and calls for an examination of the policy consequences of their presence. A growing the literature looks at implications for fiscal (e.g. Mankiw, 2000) and monetary policy (e.g. Stephen, 2004).

This paper shows that introducing spenders improves the ability of a model with consumption habits to produce a reasonable volatility of consumption. The intuition is simple: since spenders cannot (by assumption) smooth their consumption intertemporally, their consumption is volatile so, if they constitute a sufficient proportion of households, the volatility of aggregate consumption will be increased. Unsurprisingly though, the introduction of spenders does not improve the performance of the model in producing a hump-shape in consumption. In fact, the full monetary model with both savers (with consumption habits) and spenders give responses to a technology shock that are very similar to a baseline RBC model which suggests habit formation may simply not be very important for DGE modelling.

The remainder of the paper is structured as follows. Section 1 presents the model. Section 2 presents results of simulating the model, firstly without spender households in order to focus on the interaction between consumption habits and labor supply and then introducing spenders to show how they improve the performance of the model. Section 3 concludes.

## 1. The model

The model is a version of the standard dynamic new Keynesian model common in the literature (e.g. Goodfriend and King, 1997). Households consume final goods, supply labor and hold assets. Intermediate firms produce differentiated goods which are imperfect substitutes in the production function of final firms. Calvo pricing on the part of intermediate firms gives rise to a new Keynesian Phillips curve. A monetary authority sets the