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Journal of Monetary Economics 50 (2003) 1257–1291

Journal of  
MONETARY  
ECONOMICS

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## Precautionary savings and wealth distribution under habit formation preferences<sup>☆</sup>

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Received 2 January 2001; received in revised form 9 August 2002; accepted 11 September 2002

### Abstract

We study the role of habit formation in shaping the amount of precautionary savings and the wealth distribution in heterogeneous agents model economies with idiosyncratic uncertainty. We adjust preferences to equate the Intertemporal Elasticity of Substitution in all model economies. We find that habit formation brings a hefty increase in precautionary savings and very mild reductions in the coefficient of variation and in the Gini index of wealth. These findings hold for both persistent and non-persistent habits, with the effects of the former being much larger.

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*JEL classification:* D31; D91; C68

*Keywords:* Habit formation; Precautionary savings; Wealth distribution

<sup>☆</sup>The previous version of this paper had the title “Habit Formation: Implications for the Wealth Distribution”. We are grateful to the attendants to the V Workshop in Dynamic Macroeconomics, Vigo, July 2000, 2001 North American Summer Meeting of the Econometric Society, Washington, 2001 Annual Meeting of the Society for Economic Dynamics, Stockholm, XXV Simposio de Análisis Económico, Alicante, December 2001, and to seminar participants in University College of London, Universidad Carlos III de Madrid, and Universidad Autónoma de Barcelona for their very constructive comments. We thank Michele Boldrin for comments in the first stages of this research. Díaz thanks the Spanish Ministry of Education, DGI, project BEC2001-1653, for financial support. Pijoan-Mas thanks the Bank of Spain for financial support and the Economics Department of University of Pennsylvania for its hospitality. Ríos-Rull thanks the National Science Foundation for Grant SES-0079504 and the University of Pennsylvania Research Foundation for their support. Pijoan-Mas and Ríos-Rull thank the Centro de Altísimos Estudios Ríos Pérez for its hospitality.

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doi:10.1016/S0304-3932(03)00078-3

## 1. Introduction

Models with a large number of ex-ante identical agents with standard preferences subject to uninsurable, idiosyncratic shocks to income are the main tool used to answer two questions that many economists see as important: (1) what is the size of precautionary savings (savings held for the sole purpose of smoothing consumption across different contingencies)?, and (2) what accounts for the very large differences in assets holdings among American households? The accepted answer to the first question as posed, for example, by Aiyagari (1994) is that precautionary savings are small, no more than 3% of total savings. With respect to the second question, there is a debate about the extent to which a theory of wealth inequality can be based on standard and identical preferences and on uninsurable shocks to income.<sup>1</sup>

In this paper we study, in the context described in the previous paragraph, the role played by habit formation in determining the volume of precautionary savings and in shaping the distribution of wealth, and hence, the answers to those two important questions.

Habit formation has been recently used to improve the predictions of time-separable models in different fields where savings behavior under uncertainty and the income-fluctuation problem are the chief ingredients. For instance, some authors have pursued this path and studied various formulations of habit formation to improve our understanding of the equity premium puzzle.<sup>2</sup> Other authors have used this class of preferences to study the observed relationship between savings and growth.<sup>3</sup> Finally, Fuhrer (2000) shows how the presence of habits in consumption can generate slow and hump-shaped reactions of consumption to monetary and other shocks. Despite all this work with habits,<sup>4</sup> its implications for

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<sup>1</sup>For example Krusell and Smith (1998) postulate shocks to preferences to account for wealth inequality while Carroll (2000) argues that we should use models where consumers consider the accumulation of wealth as an end in itself or models where wealth yields a large unobservable flow of services. Quadri and Ríos-Rull (1997) contains a review of the literature and its successes and failures in accounting for wealth inequality with uninsurable shocks to income. On the other hand, recently Castañeda et al. (2001), argues that a suitably modified version of the basic model with identical and standard preferences and uninsurable shocks does account for the wealth inequality observed in the U.S. An important modification proposed by these authors is the use of a process for earnings with more volatility than those found in previous work.

<sup>2</sup>Abel (1990) and Constantinides (1990) show that adding habit formation to an otherwise standard exchange model economy, the equity premium puzzle as stated by Mehra and Prescott (1985) disappears. The same result is obtained by Heaton (1995), Boldrin et al. (1997, 2001) and Campbell and Cochrane (1999).

<sup>3</sup>The evidence shows that, across countries and across households, the growth rate of income has a positive and significant effect on the savings rate (see Edwards (1995), Carroll and Weil (1994), Deaton and Paxson (1994), for instance). To account for this observed pattern Carroll et al. (2000) modify the standard *Ak* model to display habit formation. They show that the model is successful to replicate the positive response of the savings rate to the growth rate of income.

<sup>4</sup>In this work, as in ours, households do not value leisure. The role of time non-separabilities in leisure is dormant since its early appearance in quantitative theory in Kydland and Prescott (1982). Also we do not look at the feature opposite to habit formation, that is durability of consumption, even though in the context of our model preferences could display durability of consumption by simply setting one parameter to a negative value. The reason is that the definition of wealth that we use already includes a large fraction of the stock of consumer durables.

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