

Liquidity Constraints and Precautionary Saving

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Christopher D. Carroll¹
Johns Hopkins University

Martin B. Holm²
University of Oslo

Miles S. Kimball³
University of Colorado at Boulder

Abstract

We provide the analytical explanation of strong interactions between precautionary saving and liquidity constraints that are regularly observed in numerical solutions to consumption/saving models. The effects of constraints and of uncertainty spring from the same cause: counterclockwise concavification of the consumption function, which can be induced either by constraints or by uncertainty. Such concavification propagates back to consumption functions in prior periods. But, surprisingly, once a linear consumption function has been concavified by the presence of either risks or constraints, the introduction of *additional* concavifiers in a given period can *reduce* the precautionary motive in earlier periods at some levels of wealth.

Keywords liquidity constraints, uncertainty, precautionary saving

JEL codes C6, D91, E21

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¹Carroll: Department of Economics, Johns Hopkins University, email: ccarroll@jhu.edu

²Holm: Department of Economics, University of Oslo, email: martin.b.holm@outlook.com

³Kimball: Department of Economics, University of Colorado at Boulder, email: miles.kimball@colorado.edu

All figures and other numerical results were produced using the Econ-ARK/HARK toolkit, which can be cited per

1 Introduction

The rest of the paper is structured as follows. To fix notation and ideas, the next section sets out the general theoretical framework. Section 3 then defines what we mean by consumption concavity and shows how consumption concavity propagates backward and heightens prudence of the value function. In Section 4, we show how liquidity constraints cause consumption concavity and thereby also prudence. And Section 5 presents our results on the interactions between liquidity constraints and precautionary saving. The final section concludes.

our references (2018); for reference to the toolkit itself see Acknowledging Econ-ARK. Thanks to the Consumer Financial Protection Bureau for funding the original creation of the Econ-ARK toolkit; and to the Sloan Foundation for funding Econ-ARK’s extensive further development that brought it to the point where it could be used for this project. The toolkit can be cited with its digital object identifier, [10.5281/zenodo.1001067](https://doi.org/10.5281/zenodo.1001067), as is done in the paper’s own references as 2018. This paper supercedes NBER working paper no. 8496 from 2001. We are grateful to Mark Huggett for suggesting the current proof of one of our lemmas, Luigi Pistaferri, Misuka Otsuka, and to conference participants in the conferences “Macroeconomics and Household Borrowing” sponsored by the Finance and Consumption program and the European University in May 2005 and “Household Choice of Consumption, Housing, and Portfolio” at CAM in Copenhagen in June 2005. Kimball is grateful to the National Institute on Aging for research support via grant P01-AG10179 to the University of Michigan.

2 The Setup

3 Consumption Concavity and Prudence

4 Liquidity Constraints and Consumption Concavity

5 Liquidity Constraints and Precautionary Saving

6 Conclusion

The central message of this paper is that the effects of liquidity constraints and future risks on precautionary saving are very similar because the introduction of either a liquidity constraints or a risk (or both) makes the consumption function more concave than the perfect foresight consumption function. Such an increase in concavity heightens prudence, inducing consumers to save more for precautionary reasons.

In addition, we provide an explanation of the apparently contradictory results that constraints in some cases intensify and in other cases weaken precautionary saving motives. The insight here is that the effect of introducing a constraint or risk depends on whether it weakens the effect of any pre-existing constraints or risks. If the new constraint or risk does not interact in any way with existing constraints or risks, it intensifies the precautionary saving motive. If it ‘hides’ or moves the effect of any existing constraints or risks, it may weaken the precautionary saving motive at some levels of market resources.

Appendix

References

CARROLL, CHRISTOPHER D., ALEXANDER M. KAUFMAN, JACQUELINE L. KAZIL, NATHAN M. PALMER, AND MATTHEW N. WHITE (2018): “The Econ-ARK and HARK: Open Source Tools for Computational Economics,” in *Proceedings of the 17th Python in Science Conference*, ed. by Fatih Akici, David Lippa, Dillon Niederhut, and M Pacer, pp. 25 – 30. doi: [10.5281/zenodo.1001067](https://doi.org/10.5281/zenodo.1001067).