

Quantitative Macro: Lessons Learnt from Fourteen Replications

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Abstract

I replicate all tables and figures from fourteen papers in Quantitative Macroeconomics, with an emphasis on incomplete market heterogeneous agent models. I report three main findings: (i) all (non-welfare related) major findings of the papers replicate, (ii) welfare findings based on linear approximation methods —1st-order perturbation, linear and log-linearization around steady-state, and linear-quadratic methods— should be treated as quantitatively suspect, (iii) decisions around methods for discretizing exogenous shocks have a large and unappreciated influence on results and should be prominently discussed in papers. While some smaller aspects of the papers do not replicate exactly, rather than nitpick in the body of this paper I instead describe some lessons learnt that may be useful for practitioners working with Quantitative Macroeconomic models. The replications use global methods allowing for non-linearities and I argue that these are important and need to be more widely used I provide a checklist that researchers can use when trying to check that their work will be more easily reproducible. Matlab codes implementing the replications using the VFI Toolkit are provided, and full results of all replications are given in the online appendix. I conclude with three core points for best practice: (i) codes be made directly available (e.g., on github, not only 'on request', and not just inside a zip file), (ii) report not just baseline parameters but also hyperparameters, equilibrium values, non-baseline parameters and initial conditions, and (iii) replication means rewriting codes from scratch, not just re-running available codes.

Keywords: Quantitative Macroeconomics, Numerical methods, Replication.

JEL Classification: E00; C68; C63; C15