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On Ramsey's conjecture: efficient allocations in the neoclassical growth model with private information

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Abstract

In his seminal paper of 1928, Ramsey conjectured that if agents discounted the future differently, in the long run all agents except the most patient would live at the subsistence level. The validity of this conjecture was investigated in different environments. In particular, it has been confirmed in the neoclassical growth model with dynamically complete markets. This paper studies this conjecture in a version of this model that includes private information and heterogeneous agents. A version of Bayesian implementation is introduced and a recursive formulation of the original allocation problem is established. Efficient allocations are renegotiation-proof and the expected utility of any agent cannot go to zero with positive probability if the economy does not collapse. If the economy collapses all agents will get zero consumption forever. Thus, including any degree of private information in the neoclassical growth model will deny Ramsey's conjecture, if efficient allocations are considered.

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1. Introduction

Will modern societies display extreme levels of wealth concentration in the long-run if people discount the future differently? Ramsey [23] conjectured an affirmative answer

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to this question.[1] These extreme levels of concentration would be the natural outcome to the rational behavior of agents, as long as the market structure allowed for enough consumption smoothing through both time and states of nature. Thus, all consumers except the most patient would live at the subsistence level. The validity of this conjecture has been investigated in different environments. In fact, it turns out that in the standard stochastic neoclassical growth model with the limit assumption of dynamically complete markets, this conjecture is impressively accurate. That is, given an equilibrium interest rate sequence, impatient consumers will trade away their distant future wealth to consume as much as possible in the relatively near present.[2]

The literature has also been trying to analyze this conjecture under more realistic assumptions regarding the market structure. Would this conjecture be valid if some markets are missing? Important contributions have been made in this dimension as well. In general, these attempts have arbitrary closed some markets to analyze how these predictions would change.[3] Considering borrowing constraints, Becker [6] shows that Ramsey's conjecture holds for the stationary equilibria of one-sector economies.[4] Becker and Zilcha [8] study the stochastic version of Becker [6] with similar credit market imperfections. They show that there exist stochastic stationary equilibria where Ramsey's conjecture is not longer valid. See Ghiglino [14, Section 4] for an excellent discussion of this literature.

But there is another important issue involved here. Suppose that some markets are not present: can extreme levels of wealth concentration be still *efficient*? In general, in economies with incomplete markets it is possible to check if the resulting allocation satisfies some efficiency criteria. But after all, why are markets incomplete? One of the standard arguments to justify different incomplete market structures is the fact that there are informational frictions and therefore some markets will not be present (see, for example, Arrow [3]). Fundamental contributions were also made regarding this issue in a different branch of the literature. Consider first an endowment economy populated with a large number of ex-ante identical agents that are subject to privately observed idiosyncratic shocks every period. In this environment, Atkeson and Lucas [5] and Green [15] have shown that (constrained) efficient allocations, independently of the feasibility technologies, will display extreme levels of "immiserization": the expected utility level of (almost) every agent in the economy converges to the lower bound with probability one. This result is also present in Thomas

[1] "[E]quilibrium would be attained by a division into two classes, the thrifty enjoying bliss and the improvident at the subsistence level" [23, p. 559].

[2] There are, however, variants of the neoclassical growth model in which the long-run distribution of wealth can be nondegenerate. Lucas and Stokey [19] show that if preferences are represented by recursive utility functionals satisfying certain assumptions, there exist stationary equilibria in which all households have positive wealth in the limit.

[3] Of course, predictions will change in some other important dimensions. For example, Aiyagari [2] extends the standard neoclassical growth model to include uninsured idiosyncratic risk and borrowing constraints in an economy populated by a continuum of ex-ante identical agents. Compared with the complete markets economy, he shows that agents overaccumulate capital in order to smooth consumption in the face of idiosyncratic risk. See also [16] for a related result.

[4] Becker and Foias [7] found sufficient conditions such that the equilibrium converges to the steady state.