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General equilibrium, wariness and efficient bubbles ☆

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Abstract

Wary consumers overlook gains but not losses in remote sets of dates or states. As preferences are upper but not lower Mackey semi-continuous, Bewley's (1972) [4] result on existence of equilibrium whose prices are not necessarily countably additive holds. Wariness is related to lack of myopia and to ambiguity aversion (and, therefore, to Bewley's (1986) [6] work on Knightian uncertainty). Wary infinite lived agents have weaker transversality conditions allowing them to be creditors at infinity and for bubbles to occur in positive net supply assets completing the markets. There are efficient allocations that can only be implemented with asset bubbles.

JEL classification: D52; D53; G12

Keywords: General equilibrium; Wariness; Bubbles; Ambiguity; Transversality condition; Pure charges

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1. Introduction

Occurrence of bubbles in the prices of assets in positive net supply is an important phenomenum, nevertheless the theory of general equilibrium has not managed to accommodate it satisfactorily. Contrary to the well-known examples of bubbles in long lived assets traded by overlapping generations, there was no robust case when agents are infinite lived. In this paper, we address the case of complete markets, which was actually the most hostile to these price bubbles. We show that equilibrium prices may include a bubble, even under positive net supply, due to precautionary demands for assets resulting of an asymmetric behavior of consumers that we will call wariness: while gains in consumption that happen in a remote set of dates (or states) are neglected, the losses are not. This notion can be formulated by modeling consumption bundles as bounded sequences on a countable infinite set of dates (or states) and assuming that preferences are upper but not lower Mackey semi-continuous.

Wariness is akin to some important concepts discussed in decision theory. It is related to lack of impatience, as infinite lived wary agents are only semi-impatient, in the sense of overlooking what they earn but not what they lose at far away dates. Moreover, examples of wary preferences can be obtained in some contexts of aversion to ambiguity in discount factors (or probabilities). For instance, this is the case when the utility deviates from separable utility by adding a term dealing specifically with the infimum of the utilities (at all states or dates), as in our main examples. Wariness is in this way linked also to Bewley's [6] work on Knightian uncertainty, which was one of the papers that pioneered the ambiguity literature.

A multiply discount factors model was suggested by Gilboa [13] and explored by Marinacci [23] to characterize complete patience. This model can portrait a consumer being unsure about his own preferences in a distant future. The multiplicity of future preferences has motivated some authors to model the incompleteness of preferences (see Dubra, Maccheroni and Ok [10]), but our approach allows us to get interesting insights while preserving completeness.

Mackey discontinuous preferences have been studied before in the general equilibrium literature and, initially, in the context of a contingent claims economy with a single budget constraint. Bewley [4] proved two important theorems on existence of equilibrium in an economy with ℓ^∞ as the commodity space[1]: his first theorem has equilibrium prices that are finitely additive, while his second theorem has equilibrium prices that are countably additive. The additional assumption that guarantees countable additivity of prices is full Mackey continuity of preferences as opposed to merely upper semi-continuity assumed in the first theorem. The present paper points out that there is an interesting class of economies to which Bewley's first theorem applies but the second theorem does not. Those economies have agents' preferences obtained, for instance, from the Gilboa and Schmeidler [14] model of ambiguous beliefs. Non-countably additive prices have been called bubbles by Gilles and LeRoy [15], but it was not clear what was the relation with the usual concept of asset price bubble. This paper studies whether and how equilibria with prices that lack countable additivity can be implemented in sequential asset markets and whether the implementing equilibrium must have an asset pricing bubble in the standard sense of the price exceeding present value of the asset's dividends.

This paper makes a contribution over what was known before, in a general equilibrium approach, about asset price bubbles (see Santos and Woodford [26]) and how they relate to Arrow–Debreu equilibrium prices (see Huang and Werner [18] and Huang and Werner [19]).

[1] Actually, Bewley's works cover also the case of an uncountable set of commodities.