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Intertemporal equilibrium with heterogeneous agents, endogenous dividends and collateral constraints

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Abstract

We build a dynamic general equilibrium model with heterogeneous producers and financial frictions (collateral constraints and incompleteness). First, we provide a characterization to check whether a sequence is an equilibrium or not. Second, we study the effects of financial imperfections on output and land prices. Third, we develop a theory of valuation of land by introducing the notion of endogenous land dividends (or yields) and different concepts of land-price bubbles. Some examples of bubbles are provided in economies with and without short-sales.

Keywords: Infinite-horizon, general equilibrium, collateral constraint, incomplete markets, asset valuation, rational bubbles.
JEL Classifications: C62, D53, D9, E44, G10.

1. Introduction

The interplay between asset prices and economic activities is an important topic, especially after the Great Recession. A vast literature has flourished on this transmission mechanism focusing on the notion of asset-price bubble. Many articles have addressed this issue in overlapping generations (OLG) models (Tirole, 1985; Farhi and Tirole, 2012; Martin and Ventura, 2012) while others have adopted an infinite-lived agent's approach (Tirole, 1982; Santos and Woodford, 1997; Kocherlakota, 2009; Hirano and Yanagawa, 2016). However, most of this literature ignores the productive role of assets. Our paper aims to develop a theory of asset valuation in the case the asset is not only a collateral but also an input. We contribute to explain the asset pricing in terms of production activity. Although many papers have raised the question of asset valuation, most of them have focused on assets with exogenous positive dividends (Lucas, 1978; Santos and Woodford, 1997) or zero dividend (Bewley, 1980; Tirole, 1985; Pascoa et al., 2011). Unlike this literature, in our paper, every agent can use the asset to produce the consumption good according to her own technology. More precisely, we consider an infinite-horizon general equilibrium model with three assets: a consumption good, land (to produce the consumption good), and a short-live financial asset with zero supply. There is a finite number of agents who differ in terms of endowments, technology, preferences and borrowing limits. In each period, agents may produce, exchange and consume. In the spirit of Geanakoplos and Zame (2002) and Kiyotaki and Moore (1997), agents can borrow but must hold land as collateral. The repayment does not exceed a given

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