



Asset bubbles, collateral, and policy analysis



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ABSTRACT

This paper provides a theory of credit-driven asset bubbles in an infinite-horizon production economy. Entrepreneurs face idiosyncratic investment distortions and credit constraints. An intrinsically useless asset such as land serves as collateral for borrowing. A land bubble can form because land commands a liquidity premium. The land bubble can provide liquidity and relax credit constraints, but can also generate inefficient overinvestment. Its net effect is to reduce welfare. Property taxes, Tobin's taxes, macroprudential policy, and credit policy can prevent the formation of a land bubble.

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1. Introduction

Many countries have experienced asset bubbles. As evidence, Fig. 1 presents the real housing price indexes, the price–income ratios, and the price–rental ratios for the United States, Japan, Spain, and Greece. This figure reveals that the three series comove for each country, indicating that fluctuations in housing prices may not be driven entirely by fundamentals (i.e., incomes or rents). The collapse of housing bubbles is often accompanied by a financial crisis. It is widely believed that the credit crisis resulting from the bursting of the housing bubble is the primary cause of the 2007–2009 recession in the United States. The collapse of the Japanese housing bubble contributed to the so-called “Lost Decade”. The collapse of housing bubbles in European countries may be partly to blame for the European sovereign debt crisis.

What causes an asset bubble? What is its welfare effect? If an asset bubble reduces welfare, what policies can prevent a bubble from forming? The goal of this paper is to present a theoretical study to address these questions by providing a model of credit-driven asset bubbles in an infinite-horizon production economy. To be concrete, we focus on bubbles on an intrinsically useless asset such as land bubbles.¹ The model economy is populated by a continuum of identical households. Each household is an extended family consisting of a continuum of entrepreneurs and a continuum of workers. Each entrepreneur runs a firm and workers work for the firms. There is no aggregate uncertainty about fundamentals.

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¹ Davis and Heathcote (2007) document that fluctuations of housing prices are largely driven by those of land prices. Thus the emergence and crash of land bubbles can help explain the large fluctuations of housing prices.

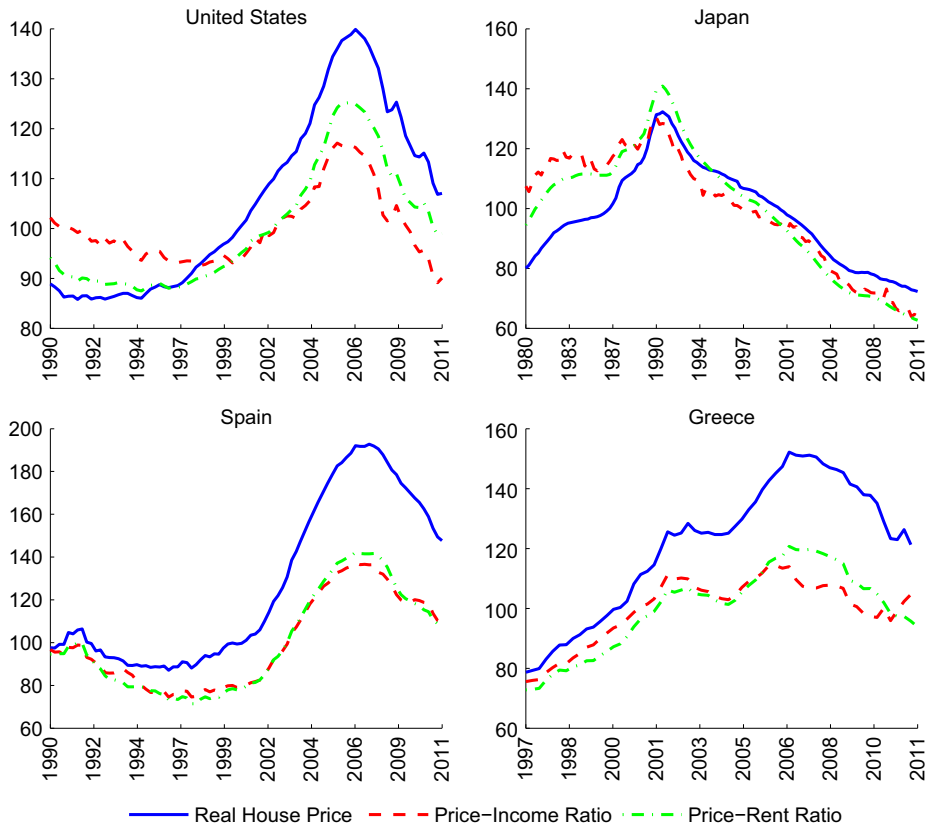


Fig. 1. Real housing price indexes, price-income ratios, and price-rental ratios. See the online appendix for the data description.

There are three key assumptions in our model. First, entrepreneurs face borrowing constraints because of financial market imperfections. In particular, they have limited commitment and contract enforcement is imperfect. They must pledge land as collateral and borrow against at most a fraction of the land value. That is, they must make down payments in order to purchase land. This kind of borrowing constraint is often called a leverage constraint or a margin constraint. It is related to the idea put forth by [Kiyotaki and Moore \(1997\)](#) and [Brunnermeier and Pedersen \(2009\)](#), among others.

Second, entrepreneurs face idiosyncratic distortions on the investment good price. For example, governments may offer different tax credits or subsidies to different firms financed by lump sum taxes on households. As [Restuccia and Rogerson \(2008\)](#) and [Hsieh and Klenow \(2009\)](#) argue, policy distortions can generate resource misallocations and are widespread in many developed and developing countries. In this paper we consider idiosyncratic investment subsidies, e.g., investment tax credit (ITC), which are an important policy tool to stimulate investment.²

Third, land trading is illiquid. Following [Kiyotaki and Moore \(2008\)](#), we assume that entrepreneurs face a resaleability constraint, which means that they can resell at most a fraction of their existing land. In addition, they cannot short sell land.

Land plays two important roles in the model. First, it is an asset that allows resources to be transferred intertemporally and generate capital gains or losses. Second, it is used as collateral to facilitate borrowing. In general, land may be productive and useful for producing agriculture products. In this paper we abstract away from this role of land and focus on its first two roles instead. In particular, we assume that land is intrinsically useless so that its fundamental value is zero. We will show that land can have a positive value in equilibrium, which represents a bubble.

In standard models with infinitely-lived agents, bubbles can typically be ruled out by transversality conditions. Why can a land bubble exist in our model? The reason is that in our model entrepreneurs face borrowing constraints and land can provide liquidity. Hence land commands a liquidity premium. Consider the special case where entrepreneurs cannot borrow. Since they face idiosyncratic ITC, those with high ITC are willing to invest more. Resources should be reallocated from entrepreneurs with low ITC to those with high ITC. In the absence of a credit market, land as an asset plays the role of transferring resources among entrepreneurs and also over time. As a result, land is valuable just like money. In the presence

² As [Hassett et al. \(2002\)](#) point out, since 1962, the mean duration of a typical state in the United States in which an ITC is in effect has been about three and a half years, and the mean duration of the no-ITC state has been about the same length. [Goolsbee \(1998\)](#) documents evidence that the ITC varies across time and across assets and firms. In October 2003, China's government provided investment tax credits to six industries of the manufacturing sector in Northeastern provinces and later the tax reform was expanded to more industries in more provinces ([Chen et al., 2013](#)).

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