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Market imperfections and the instability of open economies

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Abstract

In the presence of small market imperfections, the transitional dynamics of an open economy can become indeterminate, in that there exist an infinite number of equilibrium paths converging to a unique steady state. In contrast to closed economy models, in the open economy, such indeterminacy can arise independently of the curvature of the utility function in consumption. The results suggest that with market imperfections, open economies can be subject to fluctuations caused by randomness unrelated to the economy's fundamentals.

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1. Introduction

Are macroeconomic equilibria unique? A growing literature argues they are not and explores the possibility of indeterminacy and sunspots in dynamic general equilibrium economies with market imperfections.¹ Indeterminacy means that from the same initial condition there exist an infinite number of equilibria, all of which converge to a common steady state. This allows for the existence of sunspot equilibria—that is, equilibrium

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¹ See Benhabib and Farmer (1999) for a survey paper and also the treatise by Farmer (1999).

allocations influenced by purely extrinsic beliefs unrelated to the economy's fundamentals (see, e.g., Cass and Shell, 1983; Woodford, 1986). In turn, such sunspot equilibria provide a modern interpretation of Keynes's hypothesis that economic fluctuations are driven by the "animal spirits" of businessmen.

Most models in the indeterminacy literature are closed economy. This has made it hard to satisfy the conditions necessary for generating indeterminacy. One issue has to do with technology. While early models relied on large increasing returns or large external effects to generate indeterminacy (e.g., Benhabib and Farmer, 1994), recent theoretical work, in particular in multisector models, demonstrates that only small market imperfections are required.² The other issue has to do with preferences. These closed-economy models also require restrictions on the curvature on the utility function to generate indeterminacy. With small market imperfections, the models can only generate indeterminacy when the intertemporal elasticity of substitution in consumption is high—indeed, in some cases, the utility function has to be linear or close-to-linear in consumption.³ In short, there exists a tradeoff between the size of market imperfections and the magnitude of intertemporal elasticity of substitution needed for indeterminacy.

The intuition for this tradeoff is easy to understand. Suppose there are two sectors in the closed economy: a consumption good sector and an investment good sector. Indeterminacy occurs if, while going along an equilibrium path, the representative agent decides to invest more and to jump onto an alternative path—and this turns out also to be an equilibrium, in that asset prices and returns then move in such a way as to make the jump optimal. But in the closed economy, for the agent to invest more, he must first curtail consumption. If the elasticity of intertemporal substitution in consumption is sufficiently low, doing so will be very costly, and the desire to smooth consumption may dominate the incentive to invest more, making the existence of an alternative equilibrium path impossible.

In this paper, we focus on a small open economy model and investigate how and when indeterminacy can occur. Our main finding is that in an open economy, the conditions for indeterminacy can be satisfied more easily than in a closed economy. We show that in a two-sector small open economy with perfect access to a world bond market, indeterminacy can occur under very small or even negligible market imperfections, for technologies that exhibit constant marginal costs, and independently of the curvature of utility in consumption.⁴ These results suggest that in the presence of market imperfections, small open economies can be vulnerable to fluctuations caused by extrinsic uncertainty unrelated to the economy's fundamentals.

² For recent theoretical papers in this area, see, for example, Benhabib and Farmer (1996) and Benhabib and Nishimura (1998). While empirical evidence on the size of returns to scale remains controversial, a number of researchers have recently found that returns to scale seem to be roughly constant and that market imperfections are small. See Basu and Fernald (1997) and Burnside et al. (1995), whose findings are in contrast to those by Hall (1988b) and others.

³ Linear or close-to-linear utility in consumption runs counter to most empirical estimates on elasticities of intertemporal substitution. See, e.g., Hall (1988a).

⁴ As will be clear in the next section, the externalities or market imperfections required for indeterminacy can be *arbitrarily* small.

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