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Shadow rates and multiple equilibria in the theory of currency crises

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Abstract

This note generalizes to second generation models of currency crises the arbitrage-based approach first applied by Flood and Garber to first generation models. Deriving policy-switching rules based on the 'shadow exchange rate' facilitates the comparative analysis of the literature. Using the 'shadow rate', we provide and discuss an example of a common mechanism generating multiple equilibria in both first and second generation models.

Keywords: Balance of payment crises; Speculative attack; Devaluation; Fixed exchange rate; Multiple equilibria

JEL classification: F33; E58

1. Introduction

The literature on the theory of currency crises traditionally distinguishes between first generation and second generation models. The former focus on the dynamics of speculative attacks against a currency and emphasize fundamental imbalances at the root of the crisis; the latter analyze the abandonment of an exchange rate peg as a rational choice by optimizing policymakers and stress the role of self-fulfilling speculative attacks in generating currency and financial

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instability. This note generalizes to second generation models of currency crises the regime-switching rule first discussed by Flood and Garber (1984) in relation to first generation models. Define the shadow exchange rate as the exchange rate when the policymakers stop defending the current parity. Then, a necessary and sufficient condition for a currency crisis to occur is that the shadow rate exceeds the current parity by the cost of arbitraging across regimes. The shadow rate is a synthetic indicator of both the conditions for an optimal switch across regimes, and the percentage change in the exchange rate following the switch.

A generalized regime-switching rule facilitates the comparison across models, by stressing core differences in the mechanism generating the exchange rate crisis. In the classical approach, a crisis is forced by the portfolio behavior of private agents who arbitrage profits across exchange rate regimes. Private arbitrage is possible because there are constraints on monetary policies: in the usual interpretation of the theory, monetary authorities are subordinated to fiscal authorities (so that part of the deficit is money-financed) *and* face an upward sloping supply of foreign reserves (international reserves can be borrowed but only at an increasing cost, as in Buiter (1987)). The shadow exchange rate indexes private profits from attacking the currency, while the arbitrage costs are transactions costs in financial markets that are usually assumed to be negligible.

In the endogenous policy approach, the crisis of a fixed-exchange rate regime is modelled from the standpoint of rational policymakers who decide whether to abandon the defense of the current parity by assessing the social costs and benefits of alternative monetary policies: policymakers arbitrage social welfare across exchange rate regimes. There are no constraints on the use of monetary policy: policy switches arise endogenously as optimal policy choices. The shadow exchange rate indexes social welfare gains from switching exchange rate regimes, while arbitrage costs measure the loss of reputation and political credibility associated with a devaluation.

Multiple equilibria are possible in both classes of models, and carrying out the analysis in terms of the shadow exchange rate provides a simple way to highlight this point. Multiplicity of equilibria can occur when the shadow rate is a function of expectation variables – such as the wage rate or the interest rate – that are predetermined when monetary policy is decided. We will provide an example of a mechanism generating self-fulfilling crises that is common to both first and second generation models.[1]

This note is organized as follows. Section 2 presents a simple specification of a small open economy. Within this common analytical framework, Sections 3 and 4 develop and contrast two models of exchange rate crises, representative of the first and the second generation literature.

[1] An example of self-fulfilling equilibria in first generation models is provided by Flood and Marion (1996). Their specification includes a time-varying stochastic risk premium.