North American Journal of Economics and Finance xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

North American Journal of Economics and Finance

journal homepage: www.elsevier.com/locate/najef

A model of currency crises with heterogeneous market beliefs☆

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ARTICLE INFO

JEL classification:
E58
F31
F41

Keywords:
Currency crises
Speculative attacks
Fixed exchange rates
Heterogeneous market beliefs

ABSTRACT

This paper shows that the approach followed by Tamborini (2015) in analyzing and interpreting the euro area public debt crisis, based on the role played by agents characterized by heterogeneous market beliefs, can be applied also to the case of currency crises. By doing so, rather than considering the private sector as an atomistic player endowed with perfect information, and by considering a central bank that optimizes the amount of unsterilized inflow of foreign reserves in a Mundell-Fleming type speculative attack model, allows to explain the interest rates convex non-linearity that characterized, for example, a country like Italy during the 1992–93 EMS crisis.

1. Introduction

Tamborini (2015) explains the recent euro area public debt crisis by considering the private sector as populated by agents characterized by heterogeneous market beliefs. He departs, then, from the assumption of a private sector characterized by perfect information and homogeneous beliefs and therefore acting like an atomistic player. He concludes that the larger is the primary surplus which is required for debt stabilization, the lower the degree of heterogeneity of agents' beliefs becomes, because the larger will be the fraction of market participants who will share the belief that the primary surplus required for stability is approaching its upper feasibility constraint, above which the stability of public debt cannot be assured anymore. In turn, such a shared belief of a more likely default increases the risk premium on public debt and, as a result, the interest rate to service it. This implies, then, that the closer the primary surplus gets to the expected upper limit, the more the interest rate will increase, so as to provide an explanation for the interest rate convex non-linearity identified – but not explained – by De Grauwe and Ji (2013a, 2013b).

This paper shows that the same approach can be applied also to currency crises, and in particular to the fundamentals-driven crisis that in 1992–93 affected some EMS countries, the most significant example of them being Italy, on which I will focus in this paper.[1] I do this by considering an optimizing central bank, which is assumed to decide what is the level of unsterilized inflow of foreign reserves to be let into the country in order to minimize its loss function.

☆ I gratefully acknowledge financial support from the PRA program of Pisa University. I would like to thank also two anonymous referees for their helpful comments. Of course, I am the sole responsible for any remaining mistake.

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[1] The crisis hitting France in July 1993 has been interpreted by Eichengreen, Wyplosz, Branson, and Dornbusch (1993) as having been caused by negative self-fulfilling expectations that would have been driven by the prescriptions contained in the Maastricht Treaty, rather than by diverging economic fundamentals. However, in spite of the good condition of the inflation rate and public finance variables, France was characterized by a high unemployment rate and – as it will be argued more in detail below – by a negative business cycle, that did not allow that country to accept the higher interest rates decided by the Bundesbank after German reunification.

https://doi.org/10.1016/j.najef.2018.02.008
Received 7 July 2017; Received in revised form 11 February 2018; Accepted 19 February 2018

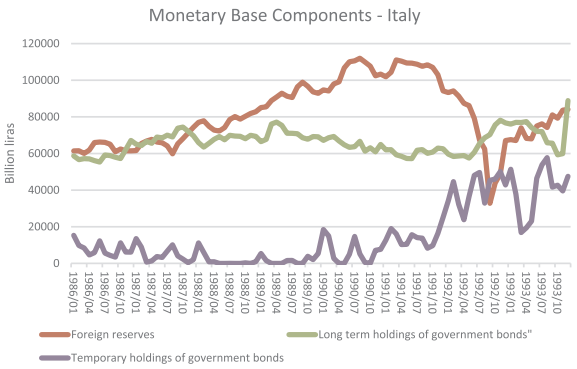

Fig. 1. Monetary base components: Foreign reserves, long term and temporary holdings of government bonds.
Source: BDS, Bank of Italy.

As a matter of fact, the data show clearly that the period 1987-1992[2] was characterized by an inflow of only partially sterilized foreign reserves in Italy that on one hand supported the Italian economy and GDP (being directed mostly to finance the Italian public debt), but on the other hand determined a growth of the Italian monetary base. In turn, the latter induced a divergent core inflation rate with respect to the EMS monetary leader, namely Germany,[3] that appreciated in real terms the Italian lira and increased the Italian current account deficit, thereby making necessary at some point an exchange rate adjustment that re-established the initial conditions of country competitiveness.

The 1992–93 EMS speculative attack against the Italian lira, then, appears as related to a significant and clear divergence in the state of economic fundamentals.

Fig. 1 shows the inflow of foreign reserves, together with the partial sterilization operated by the Bank of Italy by reducing the permanent holdings of government bonds when foreign capital was flowing into the country (the partial sterilization appears clearly by observing that over the period considered, the increase of the stock of foreign reserves exceeded significantly the reduction of permanent holding of government bonds by the Bank of Italy). Fig. 1 also shows clearly how the central bank's temporary holdings of government bonds (*pronti c/termine*) had to step in when the fear of an exchange rate devaluation started growing and foreign residents began withdrawing their funds.

Fig. 2 shows the resulting inflationary divergence in Italy compared to Germany, and Fig. 3 shows the growing Italian current account deficit over the period 1987–1992.

During the 1992–93 EMS crisis a convex non-linearity characterized the behavior of the interest rate of most of the countries whose currencies were under attack. The case of Italy,[4] for example, one of the first countries whose currencies have been hit by speculation, is shown in Fig. 4. The short term interest rate went up from 12.41% in May 1992, to 18.22% in September 1992. But a similar pattern can be found, for example, in Finland, Spain and Sweden, not to mention the case of Ireland, whose interest rate skyrocketed to 40% at the peak of the EMS crisis.[5]

This implies that the speculative attack gradually piled up over the time span of a few months and it became more and more predictable. These features, as I am going to argue more in detail below, are only partially captured by previous studies.

The model that I am proposing analyzes the consequences of the unsterilized inflow of foreign reserves (and therefore of a divergent inflation rate, as it will be discussed more in detail below) in a country belonging to a fixed exchange rate, like Italy in the EMS, by considering also the role of an optimizing central bank.

In addition to the inflationary divergence determined by capital inflows, the model that I am presenting allows also to account for the other elements that contributed to the EMS crisis.

The first of those additional causes is the destabilizing effect on partner countries resulting from the German refusal to honor the Basel-Nyborg agreement.[6]

The destabilizing effects of an increase of the foreign interest rate, like the one decided by the Bundesbank after the German reunification because of the need to avoid the risk of inflation resulting from the adoption of the excessively expansionary 1-to-1

[2] From its inception in 1979, the EMS went through different phases characterized by an increasing degree of institutional rigidity. The third phase, from 1987 to 1992, during which the exchange rate was kept fixed and no devaluation was allowed, and corresponding with the peak of popularity of credibility theory, was explicitly considered as representing a 'new' EMS regime (Giavazzi and Spaventa, 1990, chap. 4).

[3] This mechanism is closely related to the one identified with the so-called Walters critique (Walters, 1986), according to which the capital inflow from northern to southern EMS countries, by reducing the nominal interest rate with an unchanged inflation rate, would reduce the real interest rate, thereby heating up the economies of the latter countries, appreciating the real exchange rate and creating the conditions for a future current account imbalance and instability.

[4] Although not part of the EMS, the Swedish Krona was 'shadowing' the DM, and the Sveriges Riksbank had been trying to resist its devaluation (in order to do that the overnight interest rate was even allowed to reach for a while the clearly unsustainable level of 500%!).

[5] In the case of Ireland and Finland, the violence of the crisis was also due to the previous devaluation of the currencies of their commercial competitors, namely the UK and the former Soviet Union, that had just broken up.

[6] With the Basel-Nyborg agreement, signed in 1987, the Bundesbank promised to supply the (unlimited) amount of German Marks that would have been necessary to support the central banks of partner countries in the EMS fixed exchange rate agreement suffering a liquidity crisis. The fear that an excessive money creation would produce, one way or another, a higher inflation rate in Germany, however, induced later on the Bundesbank to disregard its commitment.