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Defending against speculative attacks – It is risky, but it can pay off

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ABSTRACT

While currency crises are typically considered to be painful and costly events, a closer look reveals that economic developments after a speculative attack differ considerably. Monetary authorities can play a central role in determining the economic course and costs of currency crises. They have to decide whether to defend or not to defend the domestic currency giving rise to three different types of crises: (i) an immediate depreciation if the central bank does not intervene and either (ii) a successful defense or (iii) an unsuccessful defense in the case of an intervention. We find that a central bank has two options to mitigate the costs of speculative attacks, namely an immediate depreciation and a successful defense. If a central bank intervenes she might be able to stabilize the exchange rate only temporarily and risks to ultimately fail facing the worst of the three scenarios with the highest economic costs.

1. Introduction

Currency crises are considered to be painful events as they are often associated with poor economic developments, i.e. negative real growth, high inflation as well as severe trade and budget deficits. However, a closer look reveals that economic developments after currency crises differ considerably. Korea, for example, was subject to five currency crises between 1990 and 2006, which had quite different real effects (see Fig. 1).[1] While output growth remained relatively stable during the post-crisis periods of 1991 and 1995, it declined severely after the crisis of 1997/98. In the aftermath of the crisis in 2000 output growth decelerated only somewhat, while during the post-crisis period of 2005 output growth even increased.

In analyzing why the economic costs of currency crises vary so greatly, neither theoretical nor empirical studies have paid much attention to central banks' intervention policies.[2] In case of a speculative attack the central bank can in principle either remain passive or intervene in the foreign exchange market in order to avoid a depreciation. This gives rise to the following four outcomes: three different types of currency crises, namely, (i) immediate depreciation, (ii) successful defense, and (iii) unsuccessful defense (see Fig. 2) and the no attack situation.[3] In this context an unsuccessful defense might also be characterized as a delayed depreciation. Once a central bank has started to intervene in the foreign exchange market she can end the intervention and let the currency depreciate for basically two reasons: she is no longer either able to intervene, e.g. the reserves are depleted, or she is not willing to further intervene, e.g. the expected benefits of the intervention policy do no longer exceed the expected costs. As we cannot differentiate between these two cases we use the terms unsuccessful defense and delayed depreciation interchangeably.

This paper analyzes how central bank intervention policies affect the economic costs of currency crises. Accordingly, we distinguish the various types of currency crises and identify the three cases. We find that intervention policies do make a difference for the economic development after currency crises. The empirical results provide evidence that a central bank has two options to mitigate the costs of speculative attacks, an immediate depreciation and a successful defense. Abstaining from an intervention, i.e. allowing an immediate depreciation, yields an "intermediate" scenario with only a relatively mild recession. If the central bank

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[1] For details concerning the identification of crisis events, see Appendix A.

[2] Among the few exception are, e.g., Bauer and Herz (2007) and Daniëls et al. (2011), who explicitly model the simultaneous interactions between policy makers and speculative traders.

[3] Since currency crises – as we define them (see Appendix A) – are not limited to de jure or de facto fixed exchange rate regimes and to simplify terminology, we uniformly apply the term depreciation to depreciation as well as devaluation events.

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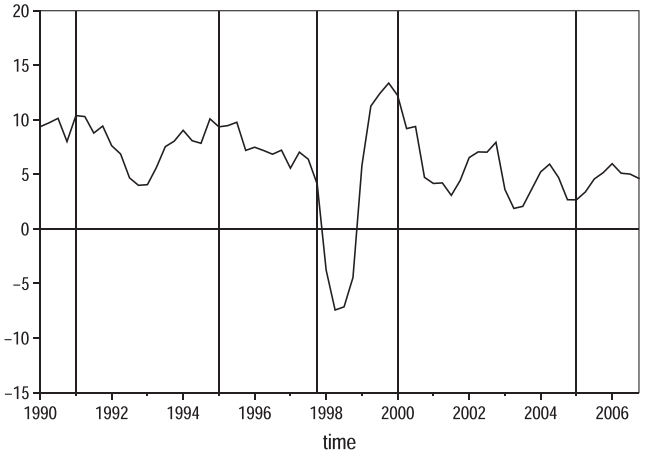

Fig. 1. Korea: real GDP and currency crises (1990–2006).

		Defensive action	
		No	Yes
Depreciation	No	no crisis	successful defense
	Yes	immediate depreciation	unsuccessful defense/ delayed depreciation

Fig. 2. Crisis definitions.

intervenes and permanently succeeds she can achieve the best economic performance and avoid output losses all together. However, if she is only able to stabilize the exchange rate transitorily and ultimately fails in her intervention policy, she faces the worst of the three scenarios with a particularly bad economic performance.

The paper closest to our empirical analysis of the costs of different types of currency crises is Eichengreen and Rose (2003), who analyze and compare the economic consequences of successful attacks and successful defenses. The authors find that a successful attack is on average followed by a loss of 3% of GDP in the subsequent year. However, their results are not informative concerning the important decision whether a central bank should intervene or not intervene as they combine an immediate depreciation and an unsuccessful defense to the successful attack scenario. In another interesting study Gupta et al. (2007) analyze the output effects of currency crises in a more general approach. The authors adopt the crisis definitions of other studies, i.e. they only identify those periods as crisis years that were already tagged by a majority of other studies, thereby intermingling different types of crisis definitions. Their empirical results indicate that crises can have very different economic outcomes and are typically more severe in the case of large capital inflows during pre-crisis periods, fewer capital market restrictions, lower trade openness and higher external long-term debt. Again, due to the encompassing crisis definition it remains unclear what role central bank policies could have in explaining the diversity of crisis outcomes. Cerra and Saxena (2008) and Bussière et al. (2010) propose a new way to examine the persistence of output effects in the aftermath of currency crises. Their findings indicate that currency crises are associated with a permanent output loss of 2–6% of GDP relative to the no-crisis trend. However, as both studies are based on aggregated crisis definitions, namely the so-called Exchange Market Pressure Index (EMPI) in the case of Cerra and Saxena (2008) and a significant depreciation measure in the study of Bussière et al. (2010) they cannot differentiate between the three types of crises and the respective role of central banks.

The paper is organized as follows. Section 2 presents some stylized facts. The empirical analysis to evaluate the economic consequences of the different types of currency crises which is based on a panel VAR framework is outlined in Section 3. The main findings are summarized in Section 4.

2. Some stylized facts

To examine the economic consequences of the three types of crises, namely immediate depreciations, successful interventions, and unsuccessful interventions, we characterize these crisis events along two dimensions. On the one hand we use an intervention index (INTX) to capture the central bank's (no) intervention decision. The INTX is defined as the standard deviations weighted sum of interest rate changes and percentage changes in reserves ($\text{INTX} = \Delta i_t/\sigma_{\Delta i_t} - \Delta r_t/\sigma_{\Delta r_t}$). On the other hand we use changes of the exchange rate (Δs_t) to measure the outcome of the central bank's policy.[4]

Our empirical analysis is in principle based on annual data due to data limitations. However, as the data relevant for the timing of currency crises, especially interest rates, exchange rates and reserves, are typically available at higher frequencies, we determine the crisis events on the basis of monthly data and assign them to the respective years (see, e.g., Bussière et al., 2010). An important issue in identifying crisis events is to appropriately differentiate whether subsequent crises are individual events or part of an ongoing crisis. After determining currency crisis events we apply a one-year window and drop all crises with overlapping time windows, i.e. crises have to be at least two years apart to be considered as distinct currency crises.[5] By doing so we ensure that the effects of a specific crisis type in year T are not biased by other nearby currency crises. If, for instance, a successful defense occurs in year T and an unsuccessful defense in year $T+1$, the post-crisis effects of the successful defense could be influenced by the effects of the unsuccessful defense. Therefore, to avoid possible interferences in such a situation, these two crisis events are dropped from our analysis.

Our sample covers the years from 1960–2011 and incorporates 32 emerging market economies. We identify 163 crisis events with 42 immediate depreciations, 87 successful interventions and 34 unsuccessful interventions.[6] To better understand the role of macroeconomic fundamentals and central bank policies on the course of currency crises we examine several macroeconomic indicators in the pre- and post-crisis periods. We follow the literature and focus in principle on output, consumer prices, current account balances and private capital inflows (see, e.g., Calvo and Reinhart, 2000; Hong and Tornell, 2005; Rancière et al., 2006; Gupta et al., 2007; Lahiri and Végh, 2007; Bussière et al., 2010). In addition, we consider components of aggregate demand to better understand how the different sectors of an economy behave in the wake of the different types of crises. Furthermore, we take into account the development of the unemployment rate, the real effective exchange rate, the nominal exchange rate, money, and reserves.[7]

[4] To be more precise, we first check the input data for significant interventions and depreciations. In a second step, we examine whether the interventions are followed by deprecations within a 12-month time window or if both are single situations. This allows us to differentiate between the three crisis types. For further details see appendix and Bauer et al. (2012).

[5] See Bussière et al. (2010) for a similar approach.

[6] See Appendix for an overview concerning the identified currency crises across the different countries.

[7] See Appendix for a detailed description of the data.

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