Experimental analysis on the role of a large speculator in currency crises[☆]

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ABSTRACT

Corsetti et al. (2004) demonstrate that the presence of a large speculator in the foreign exchange market makes the remaining traders more aggressive in their speculative attacks. We conduct an experiment designed to test their theoretical predictions and also use the experiment to analyze an additional aspect that has not been previously covered in the literature: namely, whether the entry of a large speculator and the exit of the same speculator have the same effect in magnitude on the probability of a successful speculative attack. We obtain two main findings. First, the results support the main conclusion of Corsetti et al. (2004) that the presence of a large speculator makes other small speculators more aggressive. Second, the results suggest that the effect of the entry of a large speculator on the probability of successful speculative attacks is larger than that of the exit of the same speculator.

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1. Introduction

A common view underlying accusations against large speculators, like George Soros and Julian Robertson, is that they can exercise a disproportionate influence on the likelihood and severity of currency crises. Examples of crises in which this common view was debated include the ERM crisis of 1992, in which George Soros was named "the man who broke the Bank of England", and the Asian crisis of 1997, in which he was accused of being included among "the anarchists, self-serving rogues, and international brigandage" by the then Prime Minister of Malaysia, Mahathir Mohamad.[1]

The literature has not yet reached a consensus on the question whether this common view behind these accusations is correct. Corsetti et al. (2004) raise this question theoretically while Brown et al. (1998), Fung and Hsieh (2000), Fung et al. (2000), and Corsetti et al. (2002) present it empirically. Corsetti et al. (2004) provide a theoretical prediction that the presence of a large speculator makes all other speculators more aggressive in their attacks on a currency peg. Unfortunately, empirical studies in this area provide no clear answer.

In this paper, we use an experimental analysis to contribute to the literature. The experimental analysis provides an interesting alternative to the empirical analysis, because data constraints may make it difficult to empirically discern the effects of the presence of a large speculator in speculative attacks on a currency peg. Data constraints arise because large speculators' personal funds are typically registered in so-called tax havens and they do not have to disclose data as regulations are far less stringent. As a result, it is difficult to obtain sufficiently detailed data to empirically determine the role of a large speculator in these attacks.

The contribution of this paper is twofold. First, we conduct an experiment designed to test the theoretical predictions of a speculative-attack model following Corsetti et al. (2004). Second, we also use the experiment to analyze an additional aspect that has not been previously covered in the literature: namely, whether the entry of a large speculator and the exit of the same speculator have the same effect in magnitude on the probability of a successful speculative attack.

Our main findings can be summarized as follows. First, the results of the experiment support the main conclusion of Corsetti et al. (2004) that the presence of a large speculator causes other speculators to be more aggressive in their attacks. Second, the results also suggest that the effect of the entry of a large speculator is larger than that of the exit of the same speculator. Policymakers should take the second result into consideration if they impose or remove limitations on speculative position holdings for the large speculator. The paper is organized as follows. Section 2 reviews the literature. Section 3 explains the speculative-attack model used in our experiment. Section 4 describes the experimental design. Section 5 presents the results. Section 6 discusses an implication of the results that may be related with a possible regulatory aspect. Section 7 concludes the paper.

2. Literature

In this section, we review the experimental papers related to this study and explain the important differences between them and the current work.

The experimental papers closest in spirit to this analysis are Heinemann et al. (2004) and Cheung and Friedmann (2009). Heinemann et al. (2004) conduct an experiment to test the predictions of the theory of global games. Their experiment imitates the speculative-attack model of Morris and Shin (1998). They conclude that the global game solution (the so-called threshold strategy) is an important reference point and provides correct predictions for comparative statics with respect to the parameters of the payoff function. Cheung and Friedmann (2009) consider the role of a large speculator in their experiment. They conclude that while the presence of a larger speculator increases the likelihood of a successful attack, giving the large speculator a larger size does not significantly strengthen the impact.

There are three important differences between these experimental papers and the current analysis. First, the experiment in Heinemann et al. (2004) is not designed to test the implications of the existence of a large speculator, which is one of the central objectives of our experiment. Second, the experiment of Cheung and Friedmann (2009) is not designed to imitate very closely the model of Corsetti et al. (2004), while our experiment is designed to imitate it closer than Cheung and Friedmann (2009).[2] This is an important difference because their experimental design is closer to the first generation models of currency crises pioneered by Krugman (1979) and Flood and Garber (1984), rather than to the global game models introduced by Morris and Shin (1998) and Corsetti et al. (2004), in the sense that the economic fundamentals are deteriorating in their experiment to determine the timing of speculative attacks. It is possible that their experimental design of deteriorating economic fundamentals could induce the global game solutions (threshold strategies). However, Morris and Shin (1998) and Corsetti et al. (2004) demonstrate that threshold strategies are the only equilibrium strategies, even in the absence of deteriorating economic fundamentals. Therefore, care should be taken when we interpret the result of their experiment as being supportive (or not) to the global game solutions. In contrast, this paper conducts an experiment designed to imitate the Corsetti et al. (2004) model in order to test the global game solutions closer than Cheung and Friedmann (2009). Third, the experiments of Heinemann et al. (2004) and Cheung and Friedmann (2009) are not designed to investigate the possibility that the effect of the entry of a large speculator due to deregulation of position holdings limitations is not necessarily equal in magnitude to the effect of the exit of the same large speculator due to the regulation of position holdings limitations. This is also one of the central objectives of our experiment.

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[2] This does not mean that our experiment deals with all the theoretical predictions by Corsetti et al. (2004). Our experiment concentrates on the size effect that is one of their main theoretical predictions: the presence of a large speculator makes all other speculators more aggressive in their attacks on a currency peg. See footnote 3 for another theoretical prediction (the information effect), which is not covered by our experiment.