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# Currency substitution, seigniorage, and currency crises in interdependent economies

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**Abstract**

This paper applies a two-country framework that allows for currency substitution in an environment in which policymakers optimally vary interest rates in light of utility-based objectives, one country pegs the value of its currency to the other nation's currency, and government revenue is generated via explicit taxes and seigniorage. The analysis illustrates the roles that currency substitution, currency preferences, and efficiency of tax systems play in contributing to the likelihood of a "run" on one nation's currency. We explore how these factors interact to influence the probability of a currency crisis in the country that fixes its exchange rate.


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## 1. Introduction

Recent crises in Mexico, East Asia, Russia, Brazil, and Argentina have spurred a renewed interest in understanding the sources of currency crises. As a result, an already large literature has expanded further within the past few years. Most research on currency crises have examined variants of two families of theoretical models of speculative attacks. One strand of the

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literature emphasizes, how inconsistencies between a nation's economic fundamentals and its exchange-rate target can engender a run on its currency. Another strand focuses on the potential role of self-fulfilling anticipations that can induce crises even when underlying fundamentals are consistent with a pegged exchange rate.

Thus far, surprisingly little attention has been given to the role of international interdependence as a factor influencing the likelihood of currency crises (one noteworthy exception to this is the World Bank, 2000). This paper develops one approach to addressing this issue. We explore how currency substitution, monetary policy (via settings of interest rates), and fiscal policy (through taxation) can produce an environment in which there is a general unwillingness by foreign and/or domestic residents to hold a nation's currency, creating a more fertile environment for a potential "run" on its nation's currency. Because of the importance that pegged exchange rates played in the recent financial crises, our analysis centers on a regime of fixed exchange rates. We thereby examine factors, in addition to those already identified in the literature, that may contribute to an increase in the likelihood of a currency crisis.

In addition to the slight attention paid to the role of interdependence as a factor influencing the likelihood of a currency crisis, there have been relatively few recent studies of currency substitution. Most of these use money demand formulations to estimate degrees of currency substitution for nations within selected regions of the world (see Mizen & Pentecost, 1996, for more detailed discussions). As Giovannini and Turtelboom (1992) indicate, these and other approaches to measuring the extent of currency substitution suffer from a number of conceptual and data problems. Nevertheless, because currency substitution affects real money demand, it necessarily influences a nation's susceptibility to currency crises. Studies of currency substitution in Latin American nations that historically have been prone to such events, such as Canto and Nickelsburg (1987), typically conclude that there is evidence of a significant degree of substitution among national and foreign currencies by residents of these nations.

This relationship between currency substitution and currency crises is inherently complex. The degree of substitution among national currencies can influence the probability of a crisis, but it is also likely that currency-market instabilities can affect the willingness of agents to seek to substitute among currencies. In this exploratory analysis, we focus solely on the former linkage. Our purpose, therefore, is to evaluate how agents' fundamental preferences regarding currency substitution influences the underlying favorability of conditions that contribute to currency crises through its effects on the demand for real money balances.

As van Aarle and Budina (1996) and Imrohoroglu (1996) have recently re-emphasized, the demand for real money balances form the tax base for seigniorage revenues. Click (1998) measures seigniorage in a cross-section of 90 countries. He finds that seigniorage, on an average, finances 10.5% of government spending while conventional taxation covers 78.5% of government spending. In general, seigniorage is more important in developing and emerging nations than in developed nations. For instance, Click's estimates indicate that seigniorage finances 2% of government spending in the US, 2.4% in Germany, and 5.6% in Japan. In contrast, seigniorage finances 6.3% in Thailand, 6.9% in Indonesia, 5.3% in Malaysia, 13.7% in Brazil, 19.0% in Mexico, and 62.0% in Argentina. Hence, even though seigniorage is not as important as conventional taxation as a source of government revenue for most nations, it is nonetheless an important component, particularly for developing nations that have experienced currency crises.