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## Identifying the effects of an exchange rate depreciation on country risk: Evidence from a natural experiment

Michael D. Bordo<sup>a</sup>, Christopher M. Meissner<sup>b,\*</sup>, Marc D. Weidenmier<sup>c</sup>

<sup>a</sup> Rutgers University and NBER, Department of Economics, New Jersey Hall, 75 Hamilton Street, New Brunswick, NJ 08901, USA

<sup>b</sup> University of California, Davis and NBER, Department of Economics, One Shields Avenue, Davis, CA 95616, USA

<sup>c</sup> Claremont McKenna College and NBER, Department of Economics, Claremont, CA 91711, USA

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A natural experiment is used to study exchange rate depreciation and perceived sovereign risk. France suspended coinage of silver in 1876 provoking a significant exogenous depreciation of *all* silver standard countries versus gold standard currencies like the British pound – the currency in which their debt was payable. The evidence suggests an exchange rate depreciation can significantly increase sovereign risk if a country is exposed to foreign currency debt. We implement a difference-in-differences estimator and find that the average silver country's spread on hard currency debt increased over ten percent relative to non-silver countries.

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## 1. Introduction

A currency mismatch occurs when a country's debt is denominated in a foreign currency while its revenue streams are largely in local currency. Currency mismatches make a country vulnerable. A sudden real exchange rate depreciation can abruptly reduce the ability to repay foreign currency debt. This deterioration of a country's "balance sheet" could easily increase default risk.<sup>1</sup>

Currency mismatches are in fact ubiquitous, and they are deemed by many to create financial fragility by accelerating the onset of a financial crisis or exacerbating the severity of financial crises.

\* Corresponding author. Tel.: +1 530 752 3108; fax: +1 530 752 9382.

E-mail address: [cmmeissner@ucdavis.edu](mailto:cmmeissner@ucdavis.edu) (C.M. Meissner).

<sup>1</sup> The literature on balance sheets in international finance builds off [Bernanke and Gertler \(1989\)](#) who analyzed collateral constraints, net worth and balance sheets in imperfect domestic capital markets and their role in accentuating economic fluctuations.

Balance sheet problems are at the heart of many explanations for the severity of the 1997 Asian financial crisis and have been analyzed in new micro-founded open-economy models such as that found in Céspedes et al. (2004).<sup>2</sup> Eichengreen et al. (2005) discuss the impact of 'original sin' on various macroeconomic indicators.<sup>3</sup>

However, few, if any, papers have been able to empirically assess the precise links among currency depreciation, a country's balance sheet, and default risk given the endogeneity of the exchange rate.<sup>4</sup> There is typically a link between depreciation episodes and perceived policy problems or poor fundamentals that are hard to measure. Hence econometric studies of the issue make identification of the exchange rate channel difficult. Nevertheless the logic that exchange rates themselves matter independent of policy is quite evident.

Fortunately, history provides a natural experiment to isolate the effect on sovereign risk of an exogenous exchange rate depreciation unrelated to fundamentals. We focus on the accelerated depreciation of silver in early 1876 which was connected to the anticipation of France's August 1876 decision to suspend the coinage of silver. France's move in August 1876 accelerated the trend depreciation of silver already underway since 1873. As shown in Fig. 1, this decreased demand for silver (and increased demand for gold) led to an historically abrupt depreciation of silver.<sup>5</sup> We argue that France's decision and the depreciation of silver was exogenous for countries with silver-based commodity money systems. The French debate was watched closely by markets throughout early 1876, and French suspension of silver coinage became an increasingly sure thing up to August 1876. Between January 1876 and mid-1876 markets incorporated this information into their expectations perceiving the likelihood of an accelerated and sustained silver depreciation to be greater and greater with each passing week. These factors, combined with the fact that a large portion of countries' liabilities were denominated and payable in gold currency, suggest that the rapid depreciation of silver-based exchange rates vis-à-vis their gold creditors in early 1876 provides a unique historical experiment to study one of the key predictions of the theoretical literature on currency mismatches.

We use a new weekly database of sovereign debt prices collected from *The Economist*, and undertake a before-and-after comparison or event study using a difference-in-differences (DID) regression strategy. This approach eliminates pre-existing differences in risk between silver and non-silver countries and controls for market forces affecting all countries. We measure the impact of the French suspension of silver coinage on sovereign yield spreads on hard currency debt for countries on a silver standard compared to non-silver countries.

Our key finding is that the exchange rate is an important determinant of sovereign risk if a country has foreign currency debt. Interest-rate spreads rise by 61 basis points for countries that experience an exogenous depreciation of ten percent depreciation and have a foreign currency debt to export ratio of one. The comparison group is other countries with similar levels of hard currency that did not suffer such a depreciation. The exchange rate shock appears to precipitate a ten percent rise in bond spreads for the average country faced with this shock.

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<sup>2</sup> They present a micro-founded open-economy model with nominal rigidities and balance sheet effects. Their theoretical analysis suggests that the impact of a surprise devaluation on economic activity depends on several crucial country characteristics: the total level of indebtedness (relative to net worth), the degree of financial friction in an economy, the responsiveness of exports to devaluations and the importance of exports in total output.

<sup>3</sup> There are quite a number of theoretical and empirical studies on the origins of *original sin* or the reason why countries seem to issue most international debt in hard currency. Flandreau and Sussman (2004) and Eichengreen et al. (2003), for example, argue that liquidity is an important factor in explaining the existence of original sin. Bordo et al. (2005) find that sound financial institutions, monetary regimes, and financial development are not sufficient conditions for a country to borrow in its own currency. They argue that large shocks such as the Great Depression, wars, and the emergence of a liquid global capital market in the second half of the nineteenth century were important factors in explaining how the United States and former British colonies overcame original sin. Eichengreen and Hausmann (2002) have also offered some solutions to the currency mismatch problem.

<sup>4</sup> Powell and Sturzenegger (2003) is an exception. Using a number of event studies, they find that the link between announcements about currency stability and sovereign risk varies from country to country. They suggest further investigation of the possibility that country characteristics and policies could influence the level of the impact.

<sup>5</sup> Oppers (1996) notes that by 1876 the gold–silver ratio had reached up to 20, but that for the prior 250 years the ratio had fluctuated between 14.14 and 16.25.

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