

# What drives credit dollarization in transition economies? ☆

Alina Luca <sup>a,\*</sup>, Iva Petrova <sup>b</sup>

<sup>a</sup> *Department of Economics and International Business, Drexel University, 3200 Market Street, Suite 503-D, Philadelphia, PA 19104, USA*

<sup>b</sup> *International Monetary Fund, Washington, DC 20431, USA*

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## Abstract

This paper provides an in-depth analysis of the use of foreign currencies in the lending activities of banks in transition economies. The impact of bank and firm variables on credit dollarization is studied in an optimal portfolio allocation model and estimated using new aggregate data for 21 transition economies for the period 1990–2003. Empirical results provide evidence that credit dollarization is the combined outcome of domestic deposit dollarization and banks' desire for currency-matched portfolios beyond regulatory requirements. The effects of international financial factors and natural hedges are less robust across alternative specifications. The paper further discusses the role of regulations in affecting the impact of these factors on credit dollarization and calls for more developed domestic forward foreign exchange markets.

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## 1. Introduction

Bank loans in emerging market and transition economies are increasingly denominated in foreign currencies and may expose economies to balance of payments and financial crises, in the presence of large exchange rate fluctuations. Over the period 1990–2001, foreign currency loans to the private sector maintained an upward trend and averaged 39% of total loans in transition economies and 38% in Latin American economies. This paper analyzes the practice of dollar lending by constructing an optimal portfolio allocation model and testing it using aggregate data for transition economies.<sup>1</sup>

Emerging market and transition economies have, in general, insufficient domestic capital, and use international markets to finance domestic production. Most often, foreign capital is denominated in foreign currencies, a phenomenon that Eichengreen and Hausmann (1999) first referred to as the “original sin”. Domestic deposit dollarization also tends to be high and persistent because of high inflation and accommodative monetary and exchange rate policies that erode domestic currency credibility (e.g., Sahay and Vegh, 1996; Reinhart et al., 2003).<sup>2</sup>

Facing large domestic and external liabilities denominated in foreign currencies, banks may either absorb the currency risk by making domestic currency loans or shift the currency risk onto their borrowers by lending in foreign currencies. In the first case, banks can contain their exchange rate risk if

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\* Corresponding author. Tel.: +1 215 895 2536; fax: +1 215 895 6975.  
E-mail address: [aluca@drexel.edu](mailto:aluca@drexel.edu) (A. Luca).

<sup>1</sup> The terms “dollar” and “foreign currency” are used interchangeably in this paper.

<sup>2</sup> Financial dollarization occurs when a large share of domestic financial contracts are denominated in foreign currencies. More specifically, credit dollarization denotes the ratio of foreign currency loans to total loans, from domestic banks to domestic borrowers, while deposit dollarization is the ratio of foreign currency deposits to total deposits held by residents at domestic banks.

forward foreign exchange markets are deep and liquid, allowing banks to cover their foreign currency open positions. If, however, banks transfer the currency risk to firms who have insufficient natural or other hedges, then the risk is only shifted between sectors without being diminished.<sup>3</sup>

Concentration of currency imbalances in one sector may lead to spillovers of financial difficulties throughout the economy (Allen et al., 2002; Delgado et al., 2002). This is an issue of concern for policy makers, who frequently impose limits on banks' open foreign currency positions. However, prudential regulation that does not account for the multicurrency environment in which banks operate can further amplify these imbalances.

The empirical evidence on whether banks or firms bear the currency risk, and how regulation affects risk sharing, is scant. This paper fills the gap by: (1) providing theoretical arguments about the risk-sharing forces behind foreign currency lending; (2) examining empirically the contributions of bank- and firm-specific factors to the credit dollarization phenomenon; and (3) discussing the impact of prudential regulation on credit dollarization.

Our paper builds on a growing body of literature that examines the determinants of the currency composition of banks' and firms' portfolio allocations. Calvo (2001, 2002) argues that banks with highly dollarized deposits lend to domestic firms in dollars in order to avoid currency mismatched portfolios. Ize and Levy-Yeyati (2003) further argue that banks hold matched foreign exchange positions not only due to regulatory requirements but also because they are "generally adverse to assuming currency risk directly" (pp. 330). Martinez and Werner (2002), Gelos (2003), Galindo et al. (2003) show, using firm-level data and abstracting from any bank-related factors, that firms with exporting activities, and thus natural hedges, tend to borrow more in foreign currencies.

Arteta (2002) and Barajas and Morales (2003) evaluate the effects of exchange rate policy on financial dollarization. Using a large sample of emerging market and transition economies, Arteta (2002) provides evidence that a flexible exchange rate regime may amplify bank currency mismatches by decreasing credit dollarization and increasing deposit dollarization. Arteta assumes that banks' credit supply determines credit dollarization; thus, he does not include firms' hedging incentives as a factor in his model. Barajas and Morales (2003) provide evidence that, at least in the short run, greater exchange rate volatility reduces credit dollarization in a sample of Latin American economies. Their results also indicate that both bank asset and firm liability allocation decisions are important determinants of dollarization.

Our paper differs from the existing literature in an essential way. We use a portfolio allocation model to conduct an in-depth analysis of the credit market. Unlike previous models that assume risk-neutral banks (e.g., Ize and

Levy-Yeyati, 2003), our model assumes risk-averse firms and banks. The equilibrium credit dollarization ratio depends on bank-specific factors (asset and liability management indicators), firm-specific factors (natural hedges), and macroeconomic determinants (exchange rate volatility and the cost of foreign capital).

The model generates testable hypotheses about firms' and banks' contributions to the credit dollarization phenomenon. We apply the model to a sample of 21 transition economies from Central and Eastern Europe and Central Asia during the period 1990–2003. Our empirical analysis uses *aggregate* data since firm- and bank-level data are not available for these countries. This analysis complements and is most closely related to Barajas and Morales' (2003) work on financial dollarization in Latin America.

We estimate the effects using pooled ordinary-least-squares (OLS) and panel data methods. We report results for a benchmark model closely following the theoretical model and for extensions including measures of prudential regulation and derivative market development. We also address the possibility that bank and firm variables are endogenous and respond to credit dollarization changes.

The empirical results provide evidence that banks' currency matching determines credit dollarization in transition economies. In particular, high deposit dollarization is associated with high credit dollarization. Firms' factors, such as natural hedges and access to alternative financing sources (external trade credit) are also important, although their effects are less robust to different specifications.

Finally, we discuss policy responses to financial dollarization and emphasize that capital adequacy requirements, which do not explicitly consider currency risks, and restrictions on open foreign exchange positions of banks may not be successful in containing risks. Instead, we suggest fostering the development of forward and futures foreign exchange markets to enable domestic agents to effectively hedge exchange rate risk.

The remainder of the paper is organized as follows. Section 2 develops the theoretical model and discusses determinants of credit dollarization. Section 3 outlines the econometric model and the estimation methods and results, while Section 4 describes several robustness tests. Section 5 discusses policy implications and directions for future work.

## 2. A portfolio allocation model of credit dollarization

We develop a portfolio allocation model of competitive and *risk-averse* firms and banks. The model is similar to Ize and Levy-Yeyati (2003) in that credit dollarization is the outcome of domestic agents' minimum variance portfolio allocation choices. It differs by assuming risk-averse banks, and hence makes banks' currency matching an important determinant of credit dollarization.<sup>4</sup> We believe this

<sup>3</sup> A natural hedge occurs when a firm matches the currency of denomination of its cash flows; for example, a firm receiving dollar revenues borrows in dollars and pays wages in dollars.

<sup>4</sup> Our partial equilibrium model does not explicitly include households' allocation decisions. The empirical analysis allows for deposit reallocations and feed-back effects.

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