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# International reserves for emerging economies: A liquidity approach



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### ABSTRACT

The massive stocks of foreign exchange reserves, mostly held in the form of U.S. T-bonds by emerging economies, are still an important puzzle. Why do emerging economies continue to willingly loan to the United States despite the low rates of return? We suggest that a dynamic general equilibrium model incorporating international capital markets, characterized by decentralized trade and U.S. T-bonds as facilitators of trade, can provide one possible resolution to this question. Declining financial frictions in these over-the-counter (OTC) markets would generate rising liquidity premium on U.S. T-bonds, thereby causing low U.S. real interest rates. Meanwhile, the superior liquidity properties of the U.S. T-bonds would induce recipients of foreign investments, namely emerging economies, to hold more liquidity, that is U.S. T-bonds, in equilibrium. The prediction of our model is confirmed by an empirical simultaneous equations approach considering an endogenous relationship between OTC capital inflows and reserve holdings.

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## 1. Introduction

International reserves, mostly held in the form of U.S. T-bonds by emerging economies, are thought to have played a major role in shaping global financial flows and real interest rates over the last decade. However, economists are still unclear about the root causes of the rapid growth in reserve holdings by emerging economies. Most economists studying this topic point to either risk or policy-related factors. The risk approach stresses the hedging role of reserve assets against random sudden stops, whereas the policy approach focuses on reserve assets as a tool in a policy of currency undervaluation.<sup>1</sup>

Although these explanations admittedly provide important insights, one major challenge with them is that the calibrated versions and/or forecasts of their models usually fail to match the sheer size and trend of many emerging markets' reserve accumulation by a large margin. Some even call this failure an *excess reserve accumulation puzzle* (Jeanne and Ranciere, 2011; Summers, 2006). In an attempt to solve this puzzle, others have offered new theories of international reserve determination, emphasizing the role of structural changes in global economic systems and financial market conditions since the late 90s.<sup>2</sup> Nevertheless, we believe that the literature is still incomplete in two dimensions. First, it lacks a fully-fledged analysis on the equilibrium relationship between reserve accumulation, interest rates, and net foreign asset positions. Second, most existing theories have largely neglected a very important attribute of the reserve assets: *liquidity*.

The starting point of this paper is, therefore, to postulate that reserve assets possess liquidity properties because they can help emerging economies facilitate trade for foreign investments in international capital markets. It should be noted that our notion of liquidity is closely linked to the one adopted by modern monetary theory, and refers to the ease with which an asset can help agents purchase consumption. While money is the most obvious example of assets that can help agents carry out transactions, it is definitely not the only one.<sup>3</sup>

Although we are the first to formalize the asset liquidity in a model of international reserve determination (and bring it to the data), this idea is not completely new. As a matter of fact, it is traced back to Dooley et al. (2004). They argue that the purchase of U.S. T-bonds by China's central bank, for example, is effectively equivalent to financing U.S. foreign investment into China.<sup>4</sup> We can also find more detailed empirical evidence that reserve assets could *effectively* serve as a medium of exchange for foreign capital inflows. China's joint ventures are a case in point.

A joint venture in China is an OTC form of foreign investment where a foreign investor and a state-owned local Chinese company negotiate and agree to develop a new entity in a bilateral fashion. A key point here is that U.S. T-bonds held by the Chinese government play a major role in making joint ventures as safe bets, thereby facilitating foreign investment inflows into China. More precisely, such a role can be categorized into two types: *a source for U.S. dollar lending to joint ventures*, and *a facilitator for remittances of profits as well as repatriation of funds*. The former role arises since U.S. dollar holdings by the national government serve as a major funding source for foreign currency loans made to joint ventures.<sup>5</sup> Unlike the former, the latter role is more about a collateral role of the reserves. This

<sup>1</sup> For a more comprehensive literature review, see Bernanke (2005); Lane and Milesi-Ferretti (2007a); Ghironi et al. (2007); Gourinchas and Rey (2007); McGrattan and Prescott (2007); Warnock and Warnock (2009); Obstfeld et al. (2010), and Aizenman et al. (2015).

<sup>2</sup> See, for example, Bird and Rajan (2003), Rodrik (2006), Aizenman and Lee (2008), Cheung and Qian (2009), Obstfeld et al. (2010), Steiner (2013), Cheng (2015), and, Aizenman et al. (2015).

<sup>3</sup> This liquidity notion actually intends to capture a wider range of asset classes than money. For instance, certain types of assets, e.g., bonds and houses, can be used as collateral to generate the consumption utility in the case of collateralized-credit transactions such as repurchase agreements; see Lagos (2010) and Lagos (2011).

<sup>4</sup> "This acquisition of foreign assets (U.S. T-bonds) favors the importing country (U.S.) in general rather than just the (U.S.) foreign investor. The foreign investor then has to borrow in the importing country at his own normal (and potentially lower) cost of funds, and then buy yuan to make the investment (into China)." on page 13 in Dooley et al. (2004).

<sup>5</sup> China allows joint ventures to borrow foreign currency (FX) loans from designated state-owned Chinese banks (Bank of China for the most part). This amount varies depending on the size of total investment, and up to 70% of total investment can be financed from those Chinese banks; see e.g., Folta (2005), Bosshart et al. (2010) and Baker and McKenzie (2007) for details.

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