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Currency interdependence and dollarization

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ABSTRACT

This paper constructs a search model of currency interdependence, and uses it to examine how in dollarized economies the foreign currency reacts to various shocks to the domestic currency. Currency interdependence is generated by allowing sellers to take into account their outside option of trading with the domestic currency while bargaining with buyers holding the foreign currency. The shocks consist in movements in the domestic interest rate, domestic inflation and the domestic currency's market power. We show that if the purchasing power of the domestic currency is low, any shock that increases its value, such as a higher domestic interest rate, translates into a depreciation of the foreign currency. However, the result is opposite when the purchasing power of the domestic currency is high. We show that when money is indivisible these shocks can drive in or out the foreign currency. When money is divisible, this currency substitution effect is more limited. We use our results to discuss the opportunity of various de-dollarization policies and show that some can be counterproductive.

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1. Introduction

This paper extends dual-currency search models by examining a new form of currency interdependence. Virtually in most dual-currency search models, terms of trade are determined via take-it-or-leave-it offers in which the buyer has all the bargaining power. Though convenient, this particular bargaining protocol prevents sellers from internalizing their outside option of trading with a different currency. To see this, think about a dollarized economy such as Argentina's and the effect of an increase in the domestic interest rate. If buyers with Pesos catch all the gains from trade, they will

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be the only agents to benefit from the increase in the domestic interest rate, with no side effect for sellers especially. If gains from trade are split between buyers and sellers, however, the increased domestic interest rate will also benefit to sellers and will reinforce their position when bargaining with buyers holding US dollars. Consequently, the value of US dollars will be driven down in bilateral trades. The seller's surplus, which is now positive, works like the seller's outside option in negotiations with buyers holding US dollars. It generates a link between the two currencies, a new form of currency interdependence, with potentially interesting applications.

The goal of this paper is twofold: first, to examine the working of this new form of currency interdependence, and second, to use it to study how various shocks to the domestic currency spill over to the foreign currency. More precisely, we intend to answer the following questions: (a) How does a shock to the domestic interest rate, domestic inflation tax or the domestic currency's market power spill over to the foreign currency? (b) Can these shocks drive the foreign currency in or out of circulation? We believe answering these questions can help understand the working of multiple-currency economies.

We proceed in the following way: first, a model of dual monetary circulation is built in which each currency is defined by its market power, interest rate and inflation tax, and where buyers and sellers share the gains from trade. We then define the equilibria with one or two currencies in circulation. Finally, we change one of these three parameters and do some comparative statics to track the consequences for the foreign currency in terms of acceptability and purchasing power. We start with a simple divisible goods indivisible money model in the vein of Shi (1995) and Trejos and Wright (1995). We show that the effect of the shock can be very different whether the domestic currency's purchasing power is low or high. For instance, if it is high, an increase in the inflation tax will actually translate into a *fall* in the foreign currency's purchasing power. To see this, note that when the domestic currency is expensive, because of concave utility and convex production costs, the seller's gains from trade decrease less than his production costs following this shock. In the end the seller is better off following higher inflation, improving his outside option while bargaining with buyers holding US dollars, which enables him to drive down the value of US dollars in bilateral trades.

This mechanism is the heart of the model. Thanks to the richer bargaining environment, any shock to the domestic economy will now spill over to the foreign currency via two effects for producers. By altering the equilibrium price of the domestic currency, it first alters sellers' gains from trade. But it also impacts on their production costs. It is the difference between these two effects that will tell whether overall sellers are better off after a shock, and consequently whether they are able to drive down (or must concede an increase in) the price of the foreign currency in meetings with buyers holding the foreign currency.

Interestingly, the indivisible money version of the model generates currency substitution via the hoarding of the foreign currency. That is, under some circumstances, a shock to the domestic currency can drive in (or out) the foreign currency. For instance, when the domestic currency's purchasing power is high, an increase in the domestic interest rate harms sellers because of high marginal production costs, which decreases their outside option when facing buyers holding the foreign currency. This may eventually drive out the foreign currency by raising its asked value too high. As shown by Berentsen and Rocheteau (2002), however, the indivisibility of money in Shi (1995) and Trejos and Wright (1995) generates inefficient terms of trade, and especially too high purchasing powers for currencies. We therefore suspect that some of our results on currency substitution rely on this inefficiency. To see how divisibility matters here, we introduce lotteries on money and then conduct the same exercise as in the model without lottery: define a dual-currency monetary equilibrium, change one characteristics of the first currency and see how the terms of trade of the second currency are affected. We show that, with lotteries, no shock on the domestic currency can trigger the hoarding of the foreign currency: when the domestic currency's purchasing power is high, as in our above example, a fall in sellers' outside option will only decrease the probability with which the foreign currency is traded. This result can be contrasted with models of currency substitution with indivisible money such as Li (2002) in which currencies are hoarded when their asked value is raised to high. Lotteries, however, do not prevent the foreign currency from being dropped following a sharp increase in the outside option of trading with the domestic currency.

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