

## Observations on Currency Invoicing of International Trade

by

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The 10th anniversary of the euro is an excellent opportunity to explore the role of the euro as an international currency, and some consequences of this role. For this conference I have been asked to address the issue of the use of euros and dollars in international trade transactions. Specifically, I will explore the extent to which export and import transactions are invoiced in dollars, and reasons for these choices. Also, I will comment on some related consequences for international transmission of shocks and for monetary policy effectiveness. I will not, however, address the *value* of euros or dollars, which is a very different concept than the role and consequences discussed here; nor will I turn to the extensive evidence about the extent to which dollars and euros are used in exchange rate arrangements, central bank foreign exchange reserve portfolios, or in a broad range of international financial transactions. For instance, substantial changes have occurred in corporate bond issuance, particularly in growth of the euro's use in international bond issuance. Specifics on the role of euros and dollars in international financial transactions are well explicated in an excellent report published by the ECB,

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“The International Role of the Euro.” The most recent issue of the report, published in July 2008, provides rich and extensive information on this subject.<sup>2</sup>

### **Evidence on Dollar and Euro Use in International Trade**

The dollar continues to be the dominant currency of choice in international trade transactions. Examples of the dollar’s share and usage for invoicing of exports in various countries are presented in Table 1. Korea and Thailand use the dollar extensively, invoicing more than eighty percent of their exports using dollars. The U.S. represents only around 20 percent of the direct exports of these countries, while other “dollar bloc” countries (i.e. countries with currencies that have exchange rate arrangements vis-à-vis the U.S. dollar) as export destinations account for an additional twenty to thirty percent of exports. Even beyond exports to the United States and to other dollar bloc countries from Korea and Thailand there is a clear residual use of the dollar in international transactions. The extra euro-area exports of France and Germany use the dollar to invoice roughly a third of transactions. While much of this activity is likely accounted for by exports to the United States and to dollar bloc countries, there is still a small residual use of dollars on exports to other locations. This description is not the case for Hungary and Poland, which use the dollar less extensively.<sup>3</sup> Indeed, Goldberg (2007) raises a question of whether the low share of dollars used in invoicing international trade is consistent with utility maximization for these countries seeking to join the euro area, given the share of commodities in their export baskets.

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<sup>2</sup>See the discussion by Coeurdacier and Martin (2007) and by Martin in this volume.

<sup>3</sup>Goldberg (2007) explores the use of dollars and euros among the accession countries to the euro area.

<b>Table 1: International Role of the Dollar</b>				
	Exports Invoiced in Dollars (1)	Share of Country Exports		
		To the U.S.	To “Dollar Bloc” Countries	
		(2)	(3)	(1)-(2+3)
<i>Asia</i>				
Korea	84.9	20.8	28.2	35.9
Thailand	83.9	17.8	17.5	48.6
<i>European Union</i>				
France	34.2	15.4	11.8	7.0
Germany	31.6	17.9	10.8	2.9
<i>EU-Accession</i>				
Hungary	12.2	3.5	2.7	6.0
Poland	29.9	2.7	4.9	22.3

*Source:* Linda Goldberg and Cedric Tille “Macroeconomic Interdependence and the International Role of the Dollar”, NBER working paper 13820. All data corresponds to 2002, except for Korea (2001) and Thailand (1996). Data for France and Germany correspond to extra-euro-area trade.

A different pattern emerges in the international trade usage of the euro. The euro’s role has grown over time, but mainly from its inception through 2004. Initially, the extent and the growth in the role of the euro came about through its replacement of the euro area legacy currencies in invoicing international trade transactions. Later, the role of the euro expanded within countries which were at that point in the periphery of the euro area. Now, we broadly observe euro use as a European phenomenon, with widespread use of euros concentrated in, but not extending broadly beyond, transactions between countries with geographical proximity to the Euro Area.

Table 2 presents examples of euro use in settling or invoicing international trade transactions, focusing on the same group of countries as shown in Table 1. The euro is used only minimally by Korea and Thailand, despite more than 10 percent of their exports reaching euro area destinations. By contrast, Hungary and Poland use the euro on the majority of their export transactions. This use is largely accounted for by the share of the euro area and euro bloc countries in Hungarian and Polish exports. Interestingly, as suggested by the negative sign for Poland in the rightmost column of the Table, some exports to these regions are not denominated in euros, perhaps due to the continuing role of the dollar in invoicing commodities and reference-priced international transactions.

<b>Table 2: International Role of the Euro</b>				
	Exports Invoiced in Euros (1)	Share of Country Exports		
		To the Euro Area (2)	To "Euro Bloc" Countries (3)	(1)-(2+3)
<i>Asia</i>				
Korea	1.3	10.4	1.8	-10.9
Thailand	0.5	10.5	1.6	-11.6
<i>European Union</i>				
France	55.8	n/a	13.2	42.6
Germany	49.0	n/a	21.6	27.4
<i>EU-Accession</i>				
Hungary	83.1	65.5	13.1	4.5
Poland	60.2	57.6	16.5	-13.9

*Source:* Linda Goldberg and Cedric Tille "Macroeconomic Interdependence and the International Role of the Dollar", NBER working paper 13820. . All data corresponds to 2002, except for Korea (2001) and Thailand (1996). Data for France and Germany correspond to extra-euro-area trade.

## **Determinants of Invoice Currency Selection in Trade**

What are the reasons underlying dollar or euro use in the international trade of producers around the world? Work by Goldberg and Tille (forthcoming) looks carefully at data across countries and over time in order to answer this question, expanding on the insights of a range of theoretical papers and empirical case studies.<sup>4</sup> Empirically, the key determinants of the role of the dollar and euro in trade use are the issuing “country” region size — so the size of the United States in dollar use or the size of the euro area in euro use; the exchange rate regime, which would capture the economic importance of the countries with currencies anchored in one way or another to dollars or to euros; transactions costs — including costs of moving in and out of currencies, for example captured by bid-ask spreads, although this is not the dominant force at work by any means; and which currency other producers use for export and import transactions. Two other empirical determinants are the industry compositions of goods exported or imported, and specific aspects of macroeconomic volatility.

Conceptually, two key types of influences dominate which currency exporters choose for their transactions. One type is a “herding” or a “coalescing” force. The second is a “hedging” force. Below, I will discuss the intuition in more detail, and then conclude by noting that whatever currency is used for invoicing international trade transactions matters for a country’s susceptibility to shocks and for a country’s monetary policy effectiveness.

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<sup>4</sup> Theoretical antecedents include Bacchetta and vanWincoop (2005), Devereux and Engel (2001), Devereux, Engel and Storgaard (2004), and Krugman (1980). Empirical contributions are surveyed in Goldberg and Tille (forthcoming). More recently, Kamps (2006) also explores the determinants of euro use.

In order to understand the “herding” or “coalescing” influence, consider the exporter’s goal of maximizing expected profits. Part of the exporter’s decision pertains to which currency he or she should use for invoicing international transactions. A very important factor is what the exporter’s competition is doing. In particular, an exporter may want to stay close to the invoicing strategies of her competitors. The reason is that the exporter sets her price in advance in some currency. Ideally, the price is set in a currency that is going to keep the demand for the exporter’s products relatively stable after the exchange rate realizations determine future sales. Recognizing that there will be exchange rate fluctuations, the exporter has an incentive to set a price similarly to her competitors’ prices. If the exporter chooses otherwise, and if other producer’s products can substitute for her product, expected profits will not be maximized since exchange rate movements can lead her price to be very different in the destination markets than the prices charged by competitors. Expected product demand will vary leading to higher average marginal costs.

The herding or coalescing motive in invoice currency choice is strongest among goods and industries where goods for sale by various producers are closer substitutes for each other. Higher degrees of substitutability make it easier for purchasers to shift among suppliers after the exchange rates and final local currency prices are observed. Indeed, this idea of herding or coalescing in currency choice is consistent with a common invoicing currency in commodity markets or in other industries where goods produced by different players are close substitutes for each other.

Hedging motives are also important for the currency invoicing choices of exporters. Some academic literature argues that the invoice currency selected should be

the currency of whatever country has the most macroeconomic stability (Devereux and Engel 2001). While this is a reasonable rule-of-thumb, a more specific formulation for capturing the hedging benefit from invoice currency choice on exporters stems from an analysis of producer income and costs. The exporter observes his marginal revenues moving around with exchange rates and their underlying drivers such as demand shocks, financial conditions, and monetary policies, but also observes marginal costs that fluctuate. The exporter should choose an invoice currency so that marginal revenues and marginal costs move together – hedging profit risks. In states of the world where the price that the exporter receives (the marginal revenues) are going to be lower, the exporter wants to choose an invoicing currency so that her marginal costs are lower as well.

Foreign exchange transaction costs also matter. Bid-ask spreads, which are one proxy for the transaction costs in foreign exchange markets, still often generally favor the dollar.<sup>5</sup> There are exceptions, however, where the euro is favored as a low transaction cost currency. These mostly occur in the context of some of the euro area periphery countries, reinforcing the idea that geographic proximity has an effect on the international reach of the euro. Inertial forces influence transaction costs, since currencies that are extensively used and have high volumes likewise have lower transaction costs (Rey 2001).

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<sup>5</sup> Goldberg and Tille (forthcoming) use bid-ask spreads observed through the mid-2000s. Detken and Hartmann (2002) and Goodhart, Love, and Dagfinn (2002) examine bid-ask spreads over the early years of the euro.

## **Consequences of Invoice Currency Selection for Policy**

Having described the motives influencing the choices of currencies for use in trade invoicing, it is useful to likewise consider the policy consequences of these decisions by individual exporters. For this purpose, it is useful to divide the outcomes of individual decisions along two distinct dimensions which relate to the specific counterparties in trade. These counterparties may be customers in the country issuing the currency, or could be located elsewhere. For example, consider the case of U.S. dollars used as an invoice currency. Most countries largely use the dollar in their trade transactions with the United States. This use in invoicing trade with the issuing country is the first dimension of a currency's role in international trade. The second dimension arises when a currency is used on transactions between third countries, or transactions that don't involve the United States but nonetheless utilize the dollar. In practice, the U.S. dollar is extensively applied in both of these roles. The euro, by contrast, is mainly still used by countries with geographic proximity to the euro area, but is not extensively used elsewhere.

A well-developed literature considers the implications of invoice currency choice and pricing decisions – local currency pricing or producer currency pricing – for optimal monetary policy in two trading countries, as in the contributions of Obstfeld and Rogoff (2002), Devereux and Engel (2003), Corsetti and Pesenti (2005) and Devereux, Shi and Xu (2008). These implications apply to countries directly engaged in trade with the issuer of the currency used for invoicing, which is the first dimension of the international role of a currency. The basic message is that prices in the country whose currency is used



are relatively stable. By contrast, in other markets the prices of traded goods move substantially in local currency terms when exchange rates move. As a result, it is primarily in these other countries that consumption responds to the relative price changes induced by exchange rates. The center country will have more stable prices, although this is not necessarily a good thing. It implies stable relative prices, which may be undesirable if the efficient market response instead calls for a movement in the terms of trade.

Overall, a country with high pass-through of exchange rate movements into their own prices will have local inflation rates that are more sensitive to exchange rate movements than a country that has lower exchange rate pass-through. There will also be more expenditure switching and movement imports in response to those exchange rate movements in these high pass-through countries.

The second dimension of the international role of a currency arises when countries other than the issuing country use a currency for invoicing their international trade transactions. This use of a vehicle currency on trade among “periphery” countries has fundamental implications for periphery policy effectiveness, welfare, and the transmission of shocks internationally (Goldberg and Tille 2008). If the periphery countries use the center’s currency on their bilateral international trade transactions, periphery economies are more sensitive to the center country’s monetary policy, and their own national monetary policies are less effective at influencing prices in local markets.

The center country monetary policy decisions also have externalities for the periphery. This second dimension, under some conditions, can be inefficient for periphery countries in their bilateral transactions. Given such inefficiencies, in some

cases periphery countries could benefit from international monetary policy cooperation with the center country. However, engaging in such cooperation would not be welfare enhancing for the center country, which otherwise would set policy only with its own welfare as criteria.

As a final point, suppose periphery countries use the center country currency on their trade transactions, and exchange rate movements between the center currency and periphery countries influence economic conditions in the periphery. Would it be better for those countries to peg against the dollar or the center country's currency? In fact, in the simplified example and setup of Goldberg and Tille (2008) pegged exchange rates do not dominate more flexible currency arrangements. The reason is that, even if countries are using the dollar in their own trade transactions, they remain better off maintaining domestic monetary policy as a tool at their disposal. This tool still presents monetary policy makers with flexibility so that monetary policy might be targeted an offsetting some adverse consequences of domestic shocks. This benefit is lost if the country fully abandons independent monetary policy and instead follows a currency peg. While certainly there may be many other reasons for choosing to have a pegged exchange rate regime, in this particular context, the peg is not the solution to the inefficiencies that arise from using vehicle currencies in the periphery countries.

## **Conclusion**

In conclusion, the dollar still is the dominant currency in international trade transactions, but the euro has gained substantial ground since its inception ten years ago. Key commodities and goods that are close substitutes for each other tend to be invoiced

in dollars even within the euro area. Overall, an open question remains: what conditions would give rise to tipping from dollars to euros in currency use? It is likely that there would have to be very large shocks for this to occur, but the particular conditions await more research from the academic and policy communities.

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