Box 9

New estimates of the determinants of global invoicing currency choice

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Recent literature in the field of international macroeconomics departs from the standard open economy framework under which export prices are set in the producer's currency. Rather than using the conventional assumption applied since the seminal work of Mundell (1963)[115], it is instead assumed that export prices are set in a so-called vehicle currency, i.e. the currency of neither the exporter nor the importer, but of a third country.[116] An important observation underlying this assumption – known in the literature as the dominant currency paradigm – is that most global trade transactions are invoiced in just a few currencies, most frequently the US dollar, but also the euro, regardless of the countries involved in the transaction.[117] It is therefore important to establish whether this assumption is supported by recent and comprehensive data, since the predictions of the dominant currency paradigm differ from those of the conventional assumption along several dimensions, such as the impact of exchange rate movements, the conduct of monetary policy and international spillovers of monetary policy from countries that issue a dominant currency.

The new dataset can help shed light on a range of international macroeconomic questions. First, it enables the role of vehicle currency invoicing for exchange rate pass-through to import prices and trade volumes to be revisited. Boz et al. (2020) combine the new dataset on invoicing currency patterns with expanded and updated datasets for bilateral trade price and volume indices to obtain estimates of exchange rate pass-through in the spirit of earlier literature, such as Gopinath et al. (2020). They find that the pass-through to import prices and trade volumes from fluctuations in US dollar exchange rates is higher than from fluctuations in the bilateral exchange rate between the importer's and the exporter's currencies. The propensity to invoice international trade transactions in US dollars drives the importance of the dollar exchange rate. These findings confirm the results of Gopinath et al. (2020), who conduct similar analyses on a smaller sample.

Moreover, the dataset can shed light on the determinants of invoicing currency choice. Recent theory suggests that complementarities in price-setting and cross-border input-output linkages are key determinants of an exporter's invoicing currency choice (see, for example, Mukhin, 2018). This leads to four predictions. First, the large size of the United States and euro area as destination markets creates strategic complementarities in price-setting for exports. This is expected to encourage local currency pricing, whereby exporters to the United States (euro area) minimise deviations of their prices from the prices of their competitors by invoicing in dollars (euro). Second, the stability of marginal costs in their currencies in turn encourages US and euro area exporters to invoice in US dollars and euro respectively, and to choose producer currency pricing. Third, outside the United States and the euro area, strong complementarities in price-setting in markets for homogenous goods, such as oil and other commodities, encourage vehicle currency pricing in major currencies like the US dollar and the euro. Finally, countries other than the United States and the euro area that are integrated in global value chains are expected to use vehicle currencies for invoicing as hedges against shocks to marginal costs relative to their revenues. In a recent paper, Georgiadis et al. (forthcoming) compare these predictions

[115] See Mundell, R., "Capital mobility and stabilization policy under fixed and flexible exchange rates", *Canadian Journal of Economics and Political Science*, Vol. 29, 1963, pp. 475-85.

[116] See Gopinath, G., "The international price system", *NBER Working Paper*, No 21646, 2015. Local currency pricing is the other conventional assumption – exporters invoice in the currencies of destination markets, in other words, in the currency of the importer.

[117] See Gopinath, G., Boz, E., Casas, C., Diez, F., Gourinchas, P.O. and Plagborg-Moller, M., "Dominant currency paradigm", *American Economic Review*, Vol. 110, 2020, pp. 677-719.

with the data.[118] Table A gives a snapshot of their panel regression estimates. The dependent variable is the share of countries' exports invoiced in US dollars (in columns 1 to 3) and in euro (in columns 4 to 6). The table gives results for the full country sample (in columns 1 and 4), a sample excluding euro area countries (columns 2 and 5), and a sample excluding European countries, i.e. the euro area, other EU countries and a few countries in their neighbourhood (columns 3 and 6).

Empirical results largely confirm theoretical predictions. The share of exports invoiced in US dollars and euro increase with the share of a country's exports to the United States and the euro area respectively. This is consistent with the prediction that strategic complementarities in price-setting encourage local currency pricing for large destination markets. The estimates for imports – not shown in the table – are similar, consistent with the prediction that the stability of marginal costs in their currencies encourage US and euro area exporters to choose producer currency pricing in US dollars and euro respectively. Moreover, the share of trade invoiced in US dollars tends to increase for countries which export more homogenous goods; by contrast, the share of the euro declines.[119] This suggests that complementarities in price-setting in homogenous goods like oil and other commodities encourage vehicle currency pricing in the US dollar at the expense of the euro. Finally, there seems to be no systematic relationship between invoicing in US dollars and euro and integration in cross-border input-output linkages and invoicing in dollars, while there is evidence for such a relation for the euro in the full sample.[120]

Table A

Regression estimates of the determinants of US dollar and euro invoicing

	US dollar			Euro		
	(1) Full sample	(2) Excluding euro area	(3) Excluding Europe	(4) Full sample	(5) Excluding euro area	(6) Excluding Europe
Share of exports to the United States in total exports	0.81 ***	0.78 ***	0.95 ***			
	(0.00)	(0.00)	(0.00)			
Share of exports to the euro area in total exports				0.26 ***	0.17 **	0.12 ***
				(0.00)	(0.02)	(0.00)
Share of homogeneous good in total exports	0.23 ***	0.26 ***	0.12 **	-0.12 ***	-0.12 ***	-0.06 ***
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Backward global value chain integrations	-0.14	0.12	0.07	0.29 **	-0.00	0.04
	(0.31)	(0.32)	(0.50)	(0.03)	(0.96)	(0.70)
Within R^2	0.32	0.34	0.51	0.35	0.40	0.23
Observations	1,006	714	457	1,014	718	461
Countries	91	73	56	90	72	55

Source: Georgiadis et al. (forthcoming).
Notes: Inference is based on Driscoll-Kraay robust standard errors. p-values are reported in parentheses below the point estimates and *,** and *** indicate statistical significance at the 10%, 5% and 1% significance levels. Country and time-fixed effects are included in all regressions. The coefficient estimates for countries' bilateral exchange rates against the US dollar and the euro and for the shares of exports to countries have the US dollar (euro) as a currency anchor in total exports are not shown to save space.

118 See Georgiadis, G., Le Mezo, H., Mehl, A. and Tille, C., "Markets vs. policies: can the US dollar's dominance in global trade be dented?", Working Paper Series, ECB, Frankfurt am Main, forthcoming.

119 Homogenous goods are identified using a standard classification that distinguishes between goods traded on organised exchanges, with reference prices or which are differentiated; see Rauch, J., "Networks versus markets in international trade", *Journal of International Economics*, Vol. 48, 1999, pp. 7-35.

120 Integration in cross-border input-output linkages is measured using a vertical specialisation index which captures the imported input content of exports. See Hummels, D., Ishii, J. and Yi, K., "The nature and growth of vertical specialization in world trade", *Journal of International Economics*, Vol. 54, 2001, pp. 75-96.

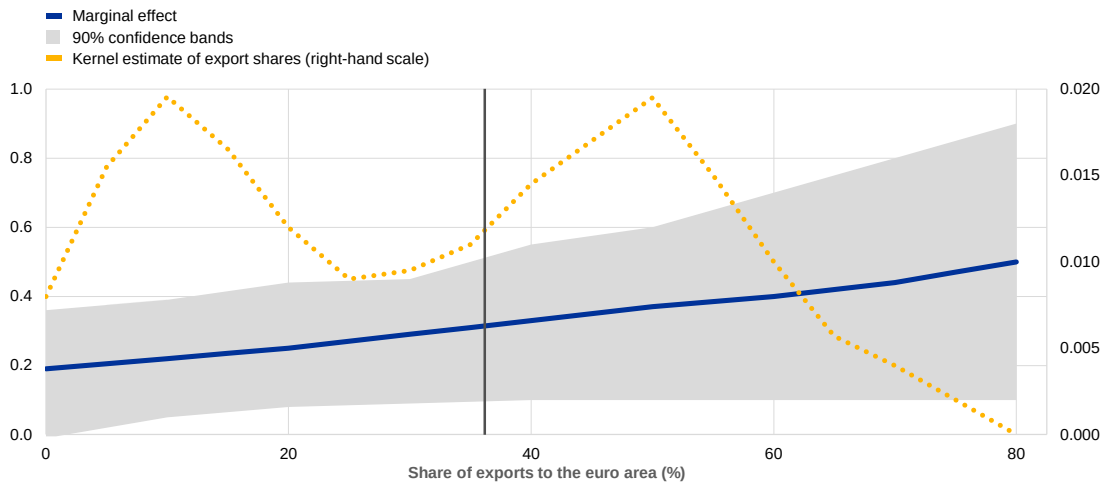
The impact of global value chain integration on currency invoicing depends significantly on the extent of countries' trade with the United States and the euro area. This is visible from **Chart A**, which shows estimates of the marginal effect of global value chain integration on export invoicing conditional on imports from the euro area.[121] The blue solid line shows the marginal effects evaluated at different values of the share of countries' imports from the euro area. The grey shaded area shows the 90% confidence bands, while the yellow dotted line shows the distribution of the shares of imports from the euro area across the sample. As the chart makes clear, stronger integration in global value chains is associated with a higher share of the euro as an invoicing unit, but more distinctively when countries tend to trade to a more significant extent with the euro area and are therefore part of the European value chain.

Chart A

Global value chain integration associated with higher euro invoicing for countries in the European value chain

Marginal effect estimates of global value chain integration on euro invoicing conditional on imports from the euro area

(percentages)



Source: Georgiadis et al. (forthcoming).
Notes: The chart shows estimates of the marginal effect of global value chain integration on export invoicing conditional on exports to the euro area. The blue solid line shows the point estimates evaluated for different values of the share of countries' imports from the euro area. The grey shaded area shows the 90%-confidence bands, while the yellow dotted line shows the estimated density of the shares of imports from the euro area across the sample.

[121] The estimates are obtained by interacting countries' global value chain integration with the share of their exports to the euro area.