

Box 4

How important is invoicing currency choice for the impact of exchange rate fluctuations on trade?

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The magnitude and speed of the trade impact of exchange rate changes is of significant importance for economic activity and inflation. This is especially the case for open economies such as the euro area. Yet, structural characteristics, such as firms' choices of invoicing currency for international trade and their participation in global value chains (GVCs), may influence the pass-through of exchange rate changes to trade prices and volumes.

The choice of invoicing currency for international trade has consequences for exchange rate elasticities. For countries or regions with widely used currencies, such as the euro area or the United States, trade adjustments to exchange rate changes manifest themselves mainly in export volumes but only to a small extent in import volumes. This is because, if prices are settled in an international currency, e.g. the euro, exchange rate variations would immediately translate into changes in export prices faced by customers in their own domestic currency, driving demand for euro area exported goods and services. Conversely, many euro area import prices are sticky in euro terms in the short run, i.e. they do not change with the exchange rate. Invoicing in euro thus

lowers the pass-through of exchange rate fluctuations to import prices, limiting the implications of exchange rate fluctuations for euro area demand for imports.^{56 57}

In this box, the dynamic reaction of trade prices and trade volumes to changes in the euro exchange rate is estimated on the basis of trade equations that consider structural factors, such as invoicing shares and GVC participation. In a sample of euro area bilateral trade with countries outside the euro area, panel local projections⁵⁸ are used to examine the historical correlations between exchange rate changes and trade prices (in unit values) and trade volumes over a two-year horizon. The estimated equations take into account and investigate the role of the trading partners' invoicing shares and GVC participation by means of interaction terms.⁵⁹

Higher trading partners' euro invoicing shares are related to a stronger sensitivity of euro area export volumes and a lower sensitivity of trade prices to changes in the exchange rate. **Chart A** reports the estimated short-run (i.e. up to the first quarter, in Chart A(a)) and medium-run (i.e. up to two years, in Chart A(b)) elasticities of trade volumes and unit values, also accounting for the role of GVCs.⁶⁰ While euro area import volumes do not seem to react to exchange rate movements regardless of the share of euro invoicing,⁶¹ export volumes rise more strongly following a euro depreciation when the share of exports denominated in euro is large with a partner country than they do when euro invoicing shares are low. As regards trade unit values, the higher the share of prices invoiced in euro, the less an exchange rate depreciation would affect prices, as shown in

⁵⁶ See Gopinath, G., Boz, E., Casas, C., Díez, F.J., Gourinchas, P.O. and Plagborg-Møller, M. (2020), "Dominant currency paradigm", *American Economic Review*, Volume 110, Issue 3, pp. 677-719.

⁵⁷ GVC linkages are known to dampen the effect of exchange rate fluctuations on *export* volumes, given that the competitiveness gains on the exporting side are counteracted by a change in the cost of imported intermediate inputs or exported products reimported after undergoing processing. As regards trade prices in euro and *import* volumes, GVCs are expected to increase exchange rate effects given that more imported inputs are used in export production or a sizable share of exports returns to the euro area as final products (see de Soyres, F., Frohm, E., Gunnella, V. and Pavlova, E. (2021), "Bought, sold and bought again: the impact of complex value chains on export elasticities", *European Economic Review*, Volume 140, November).

⁵⁸ See Jordà, Ò. (2005), "Estimation and inference of impulse responses by local projections", *American Economic Review*, Volume 95, Issue 1, pp.161-182.

⁵⁹ The regressor for the baseline specification is the bilateral exchange rate, its interaction with bilateral GVC participation indices and most importantly its interaction with trading partners' invoicing share in overall trade (invoicing shares of bilateral trade are not available). Interaction terms are the product of the bilateral exchange rate and the GVC participation index or invoicing share. The regression also includes both a trading-partner-fixed effect and a time-fixed effect, as well as 14 lags of the dependent variable and additional controls (extra-euro area export producer price index (PPI) and the trading partners' export unit value in the export price regression, the domestic PPI and the trading partners' import unit value in the import price regression, import volumes of the trading partner in the export volumes regression and the euro area industrial production to approximate for euro area import demand in the import volumes regression; one-year ahead proportional deviation of forecasted euro exchange rates to spot exchange rates in all regressions, to take into account expectations of exchange rate developments). The sample includes monthly data from April 2001 to December 2019.

⁶⁰ Average shares of GVC participation over time are considered.

⁶¹ The import volumes' elasticity and interaction terms turn out to be only mildly significant over the horizon considered (i.e. only at specific times). This result may be partly explained by the composition of euro area imports, where energy products are particularly relevant. On the one hand, the exchange rate pass-through to energy product prices is generally larger than to manufacturing product prices – being homogenous, non-differentiated goods (see Campa, J. and Goldberg, L. (2008), "Pass-Through of Exchange Rates to Consumption Prices: What has Changed and Why?", *International Financial Issues in the Pacific Rim: Global Imbalances, Financial Liberalization and Exchange Rate Policy*, National Bureau of Economic Research, pp. 139-176, and Ben Cheikh, N. and Rault, C. (2017), "Investigating first-stage exchange rate pass-through: Sectoral and macro evidence from euro area countries", *The World Economy*, Volume 40, Issue 12, February, pp. 2611-2638). On the other hand, and correspondingly, euro area energy demand, and thus import volumes, may be characterised by relatively low elasticity owing to limited substitution possibilities.

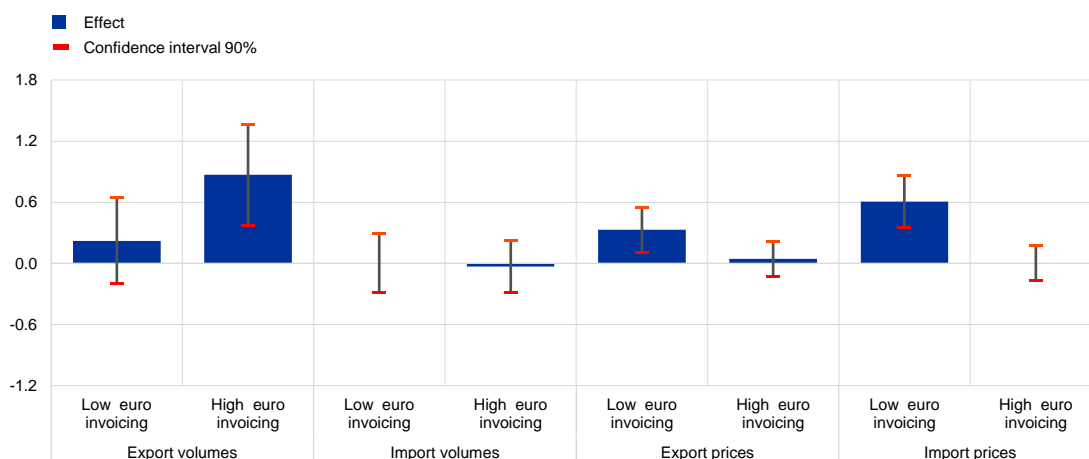
Chart A, where the unit values responses are nullified in the presence of high euro invoicing shares. These results are consistent with existing theoretical and empirical contributions.⁶²

Chart A

Trade elasticities vis-à-vis the exchange rate and invoicing currency

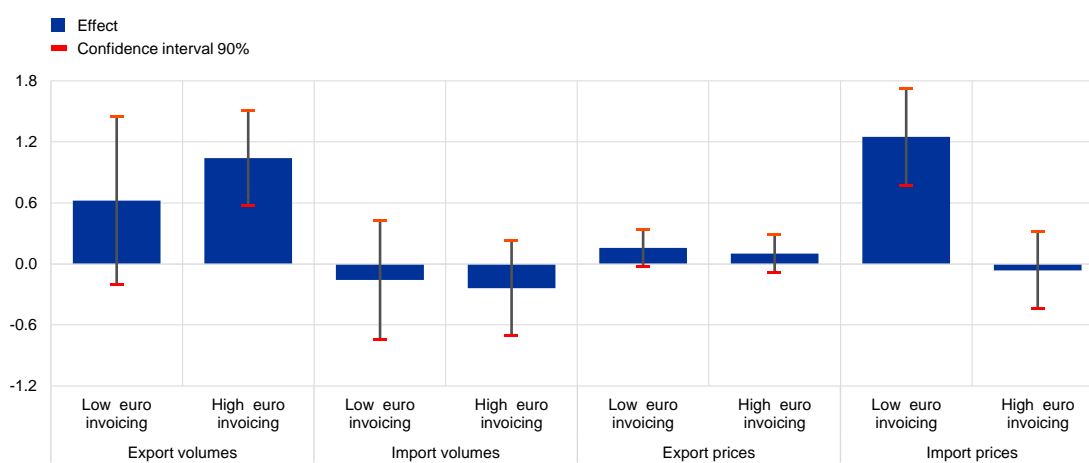
a) Effect of a 1 percentage point euro depreciation – short term

(percentage points)



b) Effect of a 1 percentage point euro depreciation – medium term

(percentage points)



Sources: ECB, Eurostat, de Soyres et al., op. cit., Boz et al., op. cit., CPB Netherlands Bureau for Economic Policy Analysis, Bloomberg and ECB calculations.

Notes: The reported effects consider sample mean values of GVC indices. Import and export prices are unit values expressed in euro (trade values divided by trade volumes). The bars are the cumulative impulse response functions and the whiskers are 90 percent confidence intervals. Short term refers to the first quarter (3rd month) after the change. Medium term refers to two years after the change. Low and high euro invoicing correspond to the 25th and 75th percentile of the euro invoicing share distribution in the sample, namely to 5.8% and 55.9% for imports and 2.4% and 54.2% for exports.

In the event of strong exchange rate movements, invoicing thus plays a key role in terms of trade implications. Euro area export and import prices (and hence inflation) are partially shielded from large euro exchange rate movements when a sizeable share of trade flows is invoiced in euro. On the other hand, euro area export volumes respond more strongly, including in the short-to-medium term, when exports are invoiced in euro.

⁶² For instance, in the case of exports, the results when euro invoicing is low correspond to local currency pricing where at the limit no reaction in volumes to exchange rate changes is expected and results for high euro invoicing is akin to producer currency pricing where full adjustment of quantities is expected.