Estimating the impact of exchange rate fluctuations on domestic prices: an accounting approach
Non-technical summary

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This paper focuses on the impact of exchange rate fluctuations on domestic prices. Indeed, a country's import, producer or consumer prices change in response to a change in its exchange rate. Understanding the influence of the exchange rate on inflation is critically important for setting monetary policy and measuring the extent of expenditure switching that follows exchange rate changes, which, in turn, has an impact on real activity.

We analyse the impact of exchange rate variations on domestic prices using several datasets covering most advanced and emerging economies, from 1995 to 2018. We perform an accounting exercise based on information contained in world input-output tables with large matrices inversion. Our accounting approach helps identifying which countries and sectors are under pressure to adjust their prices when subject to an exchange rate variation.

Our main findings are fourfold. First, we document the evolution over time of the impact of exchange rate variations on consumer prices. In line with the existing literature, we find that in response to a 1% appreciation of the domestic currency, domestic consumer prices decrease by arround 0.10%. This modest estimate is likely an upper bound. Indeed, we make a number of assumptions to simplify our computations. First, we assume that exchange rate fluctuations completely pass-through to import prices. However, a large body of literature suggests that the pass-through is incomplete, even in the long run, as a result of slow nominal price adjustments

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or the pricing-to-market behaviour of firms (see Özyurt [2016] for a discussion of the literature). For example, the pass-through depends on the intensity of competition in domestic markets: while an exchange rate appreciation lowers the price of imported inputs, a firm with limited competitive pressure may avail of greater profit margins rather than reduce prices in an effort to maintain its market share. Hence, pricing-to-market strategies of exporters aiming to defend their market shares would imply a lower exchange rate pass-through. In addition, we work under the producer pricing assumption. However, in large and attractive markets, competitive pressures may push producers to adopt local currency pricing strategies in order to limit the negative volume effect of a currency appreciation. Local currency pricing, which is a particular form of pricing-to-market, refers to the situations where exporting firms adapt their mark-ups depending on the destination market to offset exchange rate movements. Hence, under the local currency pricing paradigm, prices are assumed to be sticky in the currency of the destination market. Settlement and invoicing of imports in the domestic currency is another factor weakening the elasticity of domestic prices to exchange rate movements. Hence, using alternative pricing assumptions would entail lower estimates of the percentage change in consumer prices in response to a 1% change in the exchange rate.

We find that that the impact of exchange rate variations on consumer prices has remained broadly stable over the past two decades. Using the WIOD database, which covers a sample of 43 countries, we find that the mean GDP-weighted elasticity of consumer prices to the exchange rate inreased from 0.08 in 2000 to 0.09 in 2008. After peaking in 2008, the elasticity slightly declined between 2009 and 2015.

Second, we document that the impact of a 1% exchange rate fluctuation on domestic prices is heterogeneous across countries. The impact ranges from 0.05% to 0.22%, reflecting different degrees of openness to trade. In the euro area, the impact ranges from 0.07% in Italy to 0.18% in Ireland. While he elasticity is close to 0.10 in Italy, France, Germany, Spain, Portugal and Greece, it is twice higher for small open economies like Luxembourg, Malta, Slovakia and Ireland. We also estimate the impact of an appreciation of the US dollar on its trading partners. The highest impacts are obseverd for the US neighbouring countries and/or major trading partners (Canada, Mexico and Ireland).

Second, building on sectoral data, we examine which sectors experience higher spillovers from an exchange rate appreciation. We analyse the contribution of manufacturing goods, services, food and energy to the total impact. Non-energy industrial goods explain the bulk of the impact of an exchange rate variation on consumer prices. Services also play a significant role, especially in advanced economies. Although services are mainly produced domestically and do not rely

much on imported inputs, they make up a substantial share of total consumption.

Third, we analyse the role of global value chains in the transmission of an exchange rate appreciation to consumer prices. When production processes are global, an exchange rate appreciation impacts consumer prices through four distinct channels: *i)* the prices of imported final goods sold directly to domestic consumers; *ii)* the prices of imported inputs entering domestic production; *iii)* the price of exported inputs feeding through imported foreign production; *iv)*, changes in domestic and foreign production costs in turn pass through to the price of inputs for domestic and foreign goods and cause further production costs variations through input-output linkages. We find that the first two channels explain three quarters of the transmission of an exchange rate appreciation to domestic prices. By contrast, the last two channels, which reflect the impact of participation in global value chains, play a more limited role, with marked across-countries heterogeneity.

Fourth, we show that a precise assessment of the impact of exchange rate variations on consumer prices can be estimated without resorting to world input output tables.

The construction of World Input-Output tables is data-demanding and WIOTs are typically released with a lag of several years. To fill the data gap, we compute a reliable estimate of the impact of exchange rate variations on consumer prices using up-to-date GDP and trade statistics. We thus provide a simple accounting tool to estimate the percentage change in prices in response to a 1% change in the exchange rate.